Havant
BOROUGH COUNCIL

2025 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995 Local Air Quality Management, as amended by the Environment Act 2021

Date: August, 2025

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Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Havant Borough Council.

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

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Executive Summary: Air Quality in Our Area

This report presents Havant Borough Council's (HBC) 2024 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).

Air Quality in Havant Borough

Air pollution is associated with a wide variety of adverse health impacts. Breathing in polluted air affects our health and costs both the NHS and our society more generally billions of pounds each year, both the in direct costs of treating health conditions and in the indirect costs of lost productivity that arise from illness and absence from the workplace (for example). Air pollution is recognised as a contributing factor in the onset of heart disease and cancer and can cause a range of health impacts, including effects on lung function, exacerbation of asthma, increases in hospital admissions and mortality. In the UK, it is estimated that the reduction in healthy life expectancy caused by air pollution is equivalent to 29,000 to 43,000 deaths a year[1].

Air pollution particularly affects the most vulnerable in society, children, the elderly, and those with existing heart and lung conditions. Additionally, people living in less affluent areas are commonly the most exposed to dangerous levels of air pollution[2].

NO_2 has consistently proven to be principal pollutant of concern nationwide, with the primary source in most locations being from the conventionally fuelled motor vehicles. 87% of all declared local Air Quality Management Areas (AQMA's) have been declared solely to control NO_2, 12% for PM_{10}, and 1% for SO_2. $PM_{2.5}$ is not a Local Air Quality Management regime (LAQM) pollutant, precluding the declaration of a management area to specifically to address the exceedance of an air quality standard.

Any significant local issues with particulate emissions or exposures must be addressed under the wider definition of PM_{10}, which includes all fine particulate matter ($PM_{2.5}$)[3]

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[1] UK Health Security Agency. Chemical Hazards and Poisons Report, Issue 28, 2022.

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

[3] PM_{10} typically comprises approx. 70% fine particles <2.5 μm in diameter, by mass & 30% >2.5-10 μm.

For these reasons, emphasis has been placed on NO_2 through both the active monitoring programme, and within the main body of this report.

Table ES 1 - Description of Key Pollutants

Pollutant	Description
Nitrogen Dioxide (NO_2)	Nitrogen dioxide is a gas which is generally emitted from high-temperature combustion processes such as road transport, energy generation, or cooking & heating processes (domestic & commercial).
Sulphur Dioxide (SO_2)	Sulphur dioxide (SO_2) is a corrosive gas which is predominantly produced from the combustion of coal or heavy fuel oil (e.g. in commercial shipping).
Particulate Matter (PM_{10} and $PM_{2.5}$)	Particulate matter is everything in the air that is not a gas. Particles can come from natural sources such as pollen & sea spray, as well as human made sources such as smoke from fires, emissions from industry and dust from tyres and brakes. PM_{10} refers to particles with a diameter under 10 micrometres. Fine particulate matter or $PM_{2.5}$ are particles with a diameter under 2.5 micrometres.

This Annual Status Report shows that the statutory air quality objectives are likely to be achieved for NO_2 at all relevant locations throughout the borough, with many residential areas likely to enjoy excellent air quality. However, the statutory objective is not risk free, and comparisons with the WHO epidemiological summary data suggest that around 2% of all non-accidental deaths within the borough might be attributable to long term exposure to Nitrogen Dioxide with peak risks at the worst affected locations being equivalent to around 5.3% (as attributable fraction of all-non-accidental death, 3%/7.8% of respiratory deaths, respectively).

There is a general shallow decreasing trend in annual mean NO_2 concentrations over the past five years, with the strongest declines being noted at kerbside monitoring sites. Figures are either broadly equivalent to-, or slightly below- those recorded during the period of pandemic restrictions; indicating a durable impact upon emissions – likely through changes to working and travel practices.

The maximum ambient $PM_{2.5}$ concentration within the borough (on a square-kilometre basis) is expected to be around 8 $\mu g/m^3$, representing a downwards revision of almost 1/3rd from previous estimates, with a smaller reduction of around a quarter for average exposures. These reductions are due to an update of the assumptions used in national modelling, and to the model drawing it's baseline data from a post-pandemic year which accounts for recent changes to both travel & work habits, and for increasing adoption of low emission technologies – e.g. Euro6 or Hybrid vehicles.

The worst affected (rank 1) grid square location for $PM_{2.5}$ exposure remains within the Leigh Park area (Middle Park Way/Purbrook Way), with both domestic sources & local road traffic expected to be important contributors. However, under the revised baseline estimates, the grid squares with the 2nd & 3rd ranked $PM_{2.5}$ concentrations, previously also aggregated in the Leigh Park area, are now located elsewhere. One corresponds to the New Lane Industrial Area (Industrial Contributions), and the other North Emsworth (where traffic on the National Road Network is expected to be a primary contributor).

Notwithstanding regional differences, $PM_{2.5}$ is estimated to be already compliant with the 2040 annual mean concentration target (AMCT) at all locations within the Borough, the 2028 interim population exposure reduction target (PERT) has been met, and the modelled trend trajectory suggests that the 2040 statutory PERT is likely to be met locally a decade ahead of the compliance date, in 2029/30.

Due to the non-threshold nature of health impacts of long-term exposures exposure to fine-particulates, exposure to fine particulates within the borough translate to an attributable contribution to total mortality of around 5.2% across the Borough as a whole, and 4.8% across Hayling Island (see Table 3.4).

Cumulative exposure to short periods of elevated $PM_{2.5}$ concentrations is expected to add around +2% to mortality risk (as hazard ratio[22]).

Nitrogen Dioxide exposure is similarly non-threshold, and the compliant levels within the borough are consequently still expected to contribute up to 4.8% of all deaths from respiratory illness, and up to 3.2% of all non-accidental deaths.

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, the non-threshold nature of the health impacts means that any actions which contribute to reductions in atmospheric concentrations of common air pollutants are likely to translate into a direct health benefit.

The Environmental Improvement Plan[4] sets out actions that central government will take to drive continued improvements to air quality and to meet the national interim (2028) and long-term (2040) targets for fine particulate matter ($PM_{2.5}$); the pollutant of most harmful to human health. The Air Quality Strategy[5] provides more information on the role local authorities' in contributing to reductions in emissions of fine particulate matter in their areas.

The Road to Zero[6] details the Government's approach to reduce exhaust emissions from road transport, in balance with the needs of the local community. This is extremely important given that cars remain the most popular mode of personal travel and >90% of Air Quality Management Areas (AQMAs) have been designated because of road transport emissions.

Whilst levels of Air Pollution within the Borough are fully compliant with all current air quality standards and are expected to be on track to meet future reduction targets, it is recognised that the statutory air quality targets do not represent a 'zero harm' level. Rather, the targets represent the level of public health harm judged to be societally acceptable, after the economic cost and other negative impacts of achieving better standards have been accounted for.

Achieving further improvements to Air Pollution levels beyond the statutory requirements would translate into improved health outcomes, however, having regard to the reasons why the statutory Air Pollution standards differ from the epidemiological advice; significant investment in measures specifically & exclusively seeking to achieve further reductions is not currently considered to be justified within the Borough.

For this reason, efforts to achieve further improvements in local air quality generally take the form of qualitative (unquantified-) measures, e.g. by ensuring that air pollution effects are an important ancillary consideration when exercising other routine Council functions – in particular, in transport, planning & climate change.

The approach that Havant Borough Council takes to improving local air quality is unchanged from that reported in 2024, largely consisting of a strategy of seeking modest incremental

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[4] Defra. Environmental Improvement Plan 2023, January 2023

[5] Defra. Air Quality Strategy – Framework for Local Authority Delivery, August 2023

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

improvements and mitigations through effective & diligent application of planning policy, 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 & securing of local infrastructure which supports and encourages modal-shift from travel by private motor vehicles to more 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 allocation also contributes to achieving air quality objectives, as does the deployment of funds acquired though planning gain (both s106 and s278 agreements and the Community Infrastructure Levy, CIL), where possible allocating these to local infrastructure improvements that aim to facilitate and encourage active travel choices, and so to achieve both incremental emissions reductions and overall public health gains.

Conclusions and Priorities

Air Quality within the Borough is expected to be fully compliant with all current statutory air quality standards, as well as the 2028 interim targets. Trends suggest that the future statutory targets will be met well ahead of the 2040 compliance date. Socio-economic factors arising from pandemic restrictions appear durable, with changes to travel and working habits since 2020 expected to be influencing current trends. However, there are potential signs from roadside AURN within the Southeast region which support the view that a degree of ‘rebound’ might still occur in the coming years which could undermine progress towards these future targets.

Current levels of air pollution do not meet that latest epidemiological recommendations, and so further improvements to health outcomes could be achieved by seeking further improvements in local air quality, though the degree to which these might be pursued will be curtailed by the costs of doing so, and the corresponding ability to leverage existing and emerging policy. There is broad equivalence between Nitrogen Dioxide & Fine Particulate Matter by share of contribution to excess mortality risk within the respective areas of the

Borough worst affected by these pollutants. There is a greater difference when considered as averaged exposures, where Fine Particulate Matter contributes more to the overall non-accidental mortality burden than does Nitrogen Dioxide (5.5 % & 2% for $PM_{2.5}$ & NO_2 respectively, as borough average, long term, all-cause, HR[22]).

Specific actions to improve local air quality are not currently required, but it is recognised that there are areas where additional policy drivers exist through which additional and proportionate co-benefits for local air quality could be sought.

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, the national air-quality strategy, and any further Regulations / Statutory Guidance made under the Environment Act 2021 to which local authorities must have regard;
2. To continue seeking material enhancements to development proposals brought forward, making effective use of adopted national policy, and
3. To produce and publish a 'light touch' air quality strategy which is proportionate to the health risks within the borough, but which also ensures that air quality is an integral consideration in the exercise of the Council's wider duties.

Local Engagement and How to 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. It will require the combined efforts of everyone to ensure that pollutant concentrations remain well below objective limits. There are many ways individuals & local businesses can contribute to reducing air pollution and so improve air quality.

Appendix F includes some ideas and tips on how to reduce personal exposure to air pollutants, and how you or your business might contribute to reductions in local emissions.

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1 Local Air Quality Management

This report provides an overview of air quality in Havant Borough Council during 2024. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. 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 Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

An Air Quality Management Areas (AQMA) is declared where 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 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and should provide dates by which measures will be carried out.

Havant Borough Council currently does not have any declared AQMA's.

Havant Borough Council recognises the expectation that it should develop and publish a local Air Quality Strategy, but at the time of writing no local Air Quality Strategy is currently in place.

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

Defra's appraisal of last year's ASR concluded that the report was well structured and detailed, providing information & analysis beyond the minimum specified in the Guidance. It's conclusions were accepted for all sources and pollutants. Principle notes within the commentary were that;

- Diffusion Tube exposures deviated from the National calendar by up to 7 days between January and March. HBC are encouraged to ensure that all tubes are deployed in line with the National Calendar going forward. *Response; Noted for 2023. Whilst every effort was made to adhere to the collection calendar for the 2024 monitoring period, one deviation of +4 days occurred in September (the minimum possible non-adherence). This level of deviation is considered to have a negligible impact on the annual average estimate; the exposure period has been appropriately taken into account in the calculation of a time-weighted average, and the annual mean is not close the objective value.*

- The Council was unable to upload the correct data to DTDES due to the use of two different laboratories during the reporting year; resolved via the portal inbox for 2024. *Response; This is a consequence of template limitations and portal acceptance rules. Given that only one location has been monitored using the* *alternative laboratory, it was not considered justified to manually reproduce the data processing tool with capability to accept two different bias adjustment factors. The TRL monitoring exercise has now concluded, and so this issue will not occur in future years. For 2025, the Council will submit the DTES Export for locally administered monitoring positions only. Positions managed on behalf of TRL will be reported in the body of this report for context, but will not be included on the submitted DTES.*

Havant Borough Council has taken forward a number of indirect measures during the current reporting year of 2024 to support continued downward trends in the ambient concentrations of local air pollutants.

Such measures have previously been reported to demonstrate that the Council takes this issue of Air Quality seriously, and is committed to seeking incremental improvements where possible through a range of it's functions. However, Table 2.1 is structured to report upon targeted interventions that are specifically funded, and which aim to achieve a quantified & tangible air quality benefit. A slimmed-down list was reported in the 2024 ASR (2023 period), omitting measures for which there has been no material progress (e.g. investment in public rapid charging network), or which have no tangible prospect of being brought forward in the foreseeable future (e.g. the district heat). The table has been further abridged in this report to omit steps taken with Air Quality as an ancillary benefit to, for example, a primary objective of improving adoption of modes of sustainable-travel or reductions in CO2e emissions (etc.).

More detail on measures which contribute to air quality improvement as an ancillary benefit can be found (e.g.) on the Havant Borough Council's Planning Policy web pages[7], within the draft Havant Borough Council Local Cycling and Walking Infrastructure Plan (LCWIP)[8], in the refreshed County Level Local Transport Plan (LTP4)[9], and on Hampshire County Council's web pages[10,11]

[7] Havant Borough Council. Adopted Local Development Framework, March 2011/2014; Withdrawn Submission Local Plan 2019, Position statements, Emerging Local Plan and evidence-base, available from: Local plan | Havant Borough Council

[8] Havant Borough Council and Hampshire County Council (havant.gov.uk). Havant Walking and Cycling Improvements: Cycling and walking infrastructure plan | Havant Borough Council

[9] Hampshire County Council Local Transport Plan 4 (hants.gov.uk): Draft Local Transport Plan 4

[10] Hampshire County Council (hants.gov.uk) Local Transport Improvement Schemes (Havant)

[11] Hampshire County Council (hants.gov.uk) Transport Strategy and Scheme Development Programme, 27/06/2025 (Pg. 19)

The withdrawn Local Plan remains in development, aiming to provide updated and more localised relevant policies.

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

1. *Broad and substantial compliance with all statutory air quality objectives and targets.* This creates tension between the aspiration to drive continual improvements in local air quality and justifying the interventions required to achieve material improvements to local air quality. Worst-case NO_2 monitoring locations now routinely report annual average values <75% of the objective, worst-background $PM_{2.5}$ exposure estimates already comply with the 2028 target (and are trending downwards), and Borough average $PM_{2.5}$ exposure is <70% of the 2040 AMCT. Whilst demonstrating clear & sustained progress, this level of compliance nevertheless represents a direct challenge to achieving further reductions. Justifying allocation of resources towards further interventions will be especially challenging where both local authorities and the local business community are subject to cost pressures which, going forward, are expected to be more likely to intensify than to ease.

2. *Air Quality standards & health-based WHO Air Quality Guidelines not being aligned.* This creates a natural tension between policy that aims to protect & improve public health, and the demonstrable lack of significance against any statutory Air Quality limit, objective or target; affecting the relative-weight afforded to each objective, and so the degree to which beneficial amendments or interventions may be pursued. As an example, National Planning Policy Framework[12] (NPPF) 2024 para 199 requires development to *'contribute towards compliance [with Air Quality objectives]'* (only), whereas para. 124 requires that it *'[improve] the environment …[and ensure] safe and healthy living conditions'*, 135 *'create places…which promote health & well-being'* and 110 *'reduce…emissions, improve [air quality and] public health'*. Whilst possible to meet all policy objectives simultaneously, in practice, NPPF para. 199 is afforded overriding weight. Consequently, negligible weight is then able to be attributed to public health focussed policies, relative to the scale of design intervention or investment required to drive any tangible attributable reductions in $PM_{2.5}$.

3. *The presumption in favour of Sustainable Development, and it's definition.* Para. 11, NPPF'24 has a similar effect to that described above (at 2), representing the central principle of the policy framework. It's wording affords disproportionate weight given to the economic- and social- limbs of 'sustainable development' relative to the

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

'environmental' limb at 11 d) ii.; *'[unless the] …adverse [environmental] impacts… would significantly and demonstrably outweigh the [social and economic] benefits'* (Author's emphasis). Together with an ambient air quality context that is characterized by broad compliance, this presents a direct challenge to the driving improvements through planning gain which are capable of contributing to the PERT, given the scale of investment required to achieve even marginal tangible air quality gains. Whilst this challenge is expressed here in terms of planning policy, it is also illustrative of the balance of priorities signalled by general policy-messaging of central government, similarly influencing local decision-making on measures which target Air Quality as a primary objective; especially under the funding conditions described above (at 1.).

4. *The Local Plan Approvals Process.* Previous reports have described how the approvals process has delayed opportunity to secure Air Quality policy objectives for the medium term, in turn hampering efforts to re-balance the relative weight given to the economic-, social- and environmental- limbs of sustainable development under the NPPF as it relates to Air Quality. Withdrawal of the Council's proposed local plan was recommended on grounds of insufficiently strong evidence to demonstrate the sustainability of the allocations contained within the plan, against NPPF policies (i.e. the proposed development allocations were insufficiently sustainable), however the result has been a significant & persistent increase in speculative applications seeking to secure the principle of development under the presumption in favour, resulting from the Council's failure to demonstrate adequate supply to meet housing need. Such sites are often at unfavourable locations which are not sustainable in terms of access by active modes travel or public transport, being counter-productive to Air Quality objectives, and progress toward the 2040 PERT.

The 2024 ASR outlined several priorities for following years. However, progress on the several measures has stalled, or been slower than expected due principally to challenging budgetary conditions, service capacity issues & service administration – introducing new systems and re-organising office space. Below is a brief summary of progress against the three priority actions from Table 2.1 of the 2024 ASR;

1. *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*[13],[14]. Work on the local plan remains ongoing, and both

[13] HM government Environmental Improvement Plan 2023

[14] HM government Air quality strategy: framework for local authority delivery (HTML Only)

allocations and policy details continue to evolve to ensure that the most sustainable sites are prioritised. The Council conducted a public consultation on it's Draft 'Building a Better Future' Plan between May & July 2025 to capture public views on the latest iteration. The Air Quality policy remains in the consultation draft as policy 44, alongside a suite of environmental policy which whether individually or in combination, is capable of delivering incremental air quality improvements as an ancillary benefit to the primary policy objective. Of particular relevance is draft policy 8 (Health & Climate Change), 12 (High Quality Design), 15 (low carbon development), and 47 (Accessibility, Transport & Parking. Going Forward, additional work will be required on establishing consensus on how relevant policies should be implemented; specifically how they interact, and to what extent it is reasonable to pursue 'additionality' – a particular issue for incremental air quality interventions.

2. *Emissions Reduction & Offsetting in New Development;* The 2024 ASR concluded that the ability to provide integrated air quality response to development proposals should not be expected to arise within this reporting period. Detailed arguments advocating for air-quality-positive features continue to be made at every opportunity, within the constraints of the Draft status of the 'Building a Better Future' plan & the National Policy Framework. However, efforts have been hampered by the Health-Based- & Statutory- Air Quality benchmarking issues described in the 'principal challenges' 1-4, above. Limited direct material impact has been achieved as a result, although it has probably been helpful to bolster efforts to secure sustainable travel improvements with reasoned advocacy for Air Quality benefits.

3. *Local Air Quality Strategy;* No progress has been made this reporting period. It will be a priority going forward to establish the practical scope of a local strategy given the context of broad local compliance with all extant-, and most future- air quality targets, and to develop this into a practical strategy for proportionate interventions. It is expected that the context will demand measures which might be described as 'nudging' or 'steering'; bold interventions are unlikely to be justifiable where Air Quality serves as the primary driver. Opportunities to enhance and complement the provisions of the recently-adopted Climate Change strategy[15]

Havant Borough Council anticipates that the measures outlined within Table 2.1 will serve to proportionately maintain the downward trend in both NO_2 & $PM_{2.5}$ concentrations.

[15] Havant Climate Change Strategy and Action Plan 2024–2030 (Jan 2025)

Additional measures not yet prescribed may be required in subsequent years to achieve compliance with the long-term statutory objectives for $PM_{2.5}$ (-35% PERT, and 10 $\mu g/m^3$ 2040 AMCT). The regional context of the borough makes it more vulnerable to external sources which will tend to keep background levels high, and cultural/political trends are emerging which risk damaging consensus on environmental initiatives, and which could conceivably result in adverse pressures which risk undermining or even reversing recent emission trends.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure Title	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Air Quality Policy - Securing Development that's fit for the future	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2017	2025	HBC	HBC	Not Funded	Not Calculated	Implementation	None	1) Draft a local plan which allocates the most sustainable locations to meet the development needs of the Borough, permits less sustainable development to be resisted, and which embodies a policy framework that empowers the Local Authority to seek high quality development that recognises Air Quality and Emissions reduction to be critical contributors of sustainable development. 2) Seek public views on the local plan, and develop the plan in line with the local consensus opinion, while advocating for a robust environmental policy stance. 3) Deliver a Sound Local Plan to the Planning Inspectorate, complete the Public Hearings Process 4) Implement any required amendments, and formally adopt	• The basis for the Air Quality Policy, and it's wording reaffirmed and refreshed under the renewed 'Building a Better Future' Plan, following the voluntary withdrawal of the LP2036. • Public Consultation Completed July 2025	• Central Government priority to implement further planning reforms, creating additional uncertainty (Timeline for adoption & content)
2	Emissions reduction & Offsetting in new development	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	2025 - 2036	HBC	HBC, Developer	Not Funded	Not Calculated	Implementation	Low	1) Secure material enhancements to specific development proposals which will lead to tangible emissions reduction, or intrinsic air pollution benefits. 2) Assist in securing direct delivery of specific sustainable & active travel infrastructure enhancements that are compliant with the aims of County Policy LTP4/TG10, and in accordance with DfT's LTN1/20. 3) Assist in securing funding via s106 agreements for Highways to deliver a coherent & contiguous network of Walking & Cycling Infrastructure in furtherance of the strategic plan.	• Exercise of policy in planning decisions 2019-2025, according to the weight allowable in accordance with plan status • Exercise of adopted NPPF policy in accordance with the principles of draft local policy where consents rely upon the presumption in favour of sustainable development (NPPF '24 para. 11) • Limited success to date in achieving tangible improvements directly attributable to Air Quality Policies • Success in adding weight to other policy areas, e.g. transport	• Local Plan status currently attracts limited weight to decisions made in reliance upon the presumption in favour • Mis-alignment of statutory and health based Air Quality benchmarks, undermining the weight that may be attributable to design interventions. • Developer Resistance on grounds of viability (cost relative to locally achievable prices, complexity, and impact upon delivery timeline) • Dominance of approaches aimed at Climate and Transport Policy objectives – difficulty in achieving additionality.
3	Local Air Quality Strategy (AQS)	Other	Other	2023	2025	HBC, HCC, and Partners	HBC	Not Funded	Not Calculated	Planning	Low	1) Review example Strategies from Borough's with similar context's 2) Engage with County Public Health & Regional Partnerships on regional approaches to proportionate measures 3) Engage the Portfolio holder on the level of ambition & political commitment to securing Air Quality gains, and seek to establish a local consensus. 4) Draft a local Air Quality Strategy, and present to elected members for local approval	• None	• Mis-alignment of statutory Limit & Objective values and WHO health-based recommended Air Quality Guidelines & experience from other policy areas (e.g. permitting, planning) where overriding weight is given to Legal Compliance over Epidemiology • Limits on achievable additionality – dominance of complementary policy areas likely to result in Air Quality being a *de facto* ancillary benefit of pre-existing measures targeting other primary objectives.

2.3 $PM_{2.5}$ Environmental Targets

Directive 2008/50/EC[16] on Ambient Air Quality and Cleaner Air for Europe established both a Target- & Limit- Value for fine particulate matter ($PM_{2.5}$) alongside a national exposure reduction target, a framework for assessment, and a mechanism for the future review and tightening of standards. This legislation also established the guiding principle of preserving the best possible level of ambient air quality that is compatible with sustainable development.

The Directive was transposed into domestic legislation within SI 2010/1001[17], initially establishing a limit value of 25ug/m^3 (reduced by 1/5th to 20µg/m^3 in 2020), alongside a concentration-dependent national exposure reduction target (NERT) which included a *de minimis* 'nil' value where ambient annual average concentrations fall below 8.5µg/m^3.

Target & Limit values relate to total ambient concentrations averaged over an annual period, within a spatially defined zone or agglomeration. The NERT applies to a 3-year average of measurements taken at specific intervals, from all qualifying urban background monitoring stations operated within the UK, to be compared with a 3-year average baseline period (2009-2011), calculated on the same spatial basis. Neither of the target values, nor the limit value is intended to be applied at smaller scales than specified; consequently, exceedances are permissible at the level of an individual administrative district, 1km x 1km grid square, or at a location of relevant exposure (for example).

The National Emission Ceilings Regulations 2018 (SI 2018/129)[18] introduced a further binding obligation upon the Secretary of State (SoS), requiring that total man-made $PM_{2.5}$ emitted within the UK does not exceed a specified percentage of that emitted in the base year of 2005. The emission ceiling differs from 'ambient air quality' in that it relates to an estimate of total man-made emissions, and not to the concentration of $PM_{2.5}$ in the air. Between 2020 & 2029 National emissions ceiling level is 70% of 2005 emissions (i.e. a 30% reduction), and from 2030 the ceiling falls to a stricter 46% (i.e. a 54% reduction relative to 2005 emissions), with an expectation of achieving the midpoint between the 2020 & 2030 targets by 2025.

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[16] Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

[17] The Air Quality Standards Regulations 2010 SI2010/1001)

[18] National Emission Ceilings Regulations 2018 (SI2018/129)

These binding regulations pre-dated the 2021 publication of revised WHO guidelines for ambient air quality. The 2021 guidelines represented a substantial downwards revision of previous recommendations. The updated advice is based upon the latest available epidemiological evidence, but is made without regard for either the practicality or the cost of achieving the guideline levels, relative to the value of public health benefits. Consequently, while they are informative for assessing health impacts, they are not legally binding.

The UK government recognised the emphasis the WHO places on the non-threshold nature of the health impacts associated with exposure to air pollutants, where no clear 'safe' exposure level has been identified for $PM_{2.5}$. It also recognised the need for action to be taken to manage the transition from the statutory 2020-29 emissions ceiling (which has been met), to the more challenging 2030 level.

In response, The Environment Act 2021[19] created an obligation upon the Secretary of State to make regulations to set at least one environmental target for fine particulate matter ($PM_{2.5}$).

The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023 (SI 2023/96)[20] fulfilled this requirement, setting both a long-term exposure-, and an exposure reduction- target, both with statutory status. These targets are in addition to the existing standards established under SI 2010/1001, and do not replace them. A 'Target' status is distinct from a 'Limit', 'Objective' and 'Ceiling' values set for other pollutants under SI 2000/928, 2010/1001 & 2018/2019 (respectively), with each being subject to differences in the procedure for judging compliance and in body responsible for delivery/monitoring progress.

The Environmental Improvement Plan 2023[13] establishes interim targets for the purposes of SI 2023/96, bridging the gap between the existing (starting point) and future (end point) target levels. These targets are reiterated in the Framework for Local Authority Delivery[14] issued under s80(1), 1995 c.25[21]

The Air Quality standards and emission reduction metrics for $PM_{2.5}$ are summarised in Table 2.2.

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[19] Environment Act 2021 (2021 c.30)

[20] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023

[21] Environment Act 1995 c.25 Part IV

Table 2.2 – Standards & Emissions Metrics for Fine Particulate Matter ($PM_{2.5}$)

Value	Averaging Period	Measured as / Note	Origin	Type	Status (& Responsible Body)
20 µg/m³	Annual	Ambient concentration at any location of relevant exposure. To be met by 2020 Represents +16% excess mortality risk[22]	EU	Limit (Current)	Statutory (SoS)
-0% to -20%	(Rolling) 3-Year *cf.* base AEI	NERT. Reduction in ambient concentration within defined zones, relative to a 3-year average 2008-2010 (base AEI). To be met by 2020	EU	Target (Expired/ Superseded)	Statutory (SoS)
-30%	Annual *cf.* base yr	Reduction in man-made Emissions relative to baseline emissions in 2005. To be met for every year between 2020 & 2029.	EU	Emissions Ceiling	Statutory (SoS)
5 µg/m³	Annual	Ambient concentration at a location of relevant exposure. Applies from 2021. Represents +4% excess mortality risk[22]	WHO	Guideline	Non-Statutory (-)
10 µg/m³	Annual	Ambient, as Guideline. Applies from 2021. Represents +8% excess mortality risk[22]	WHO	Interim Guideline 4	Non-Statutory (-)
15 µg/m³ [25 µg/m³]	24 hr	99th percentile of 24hour exposures (no more than 4 exceedances per annum) at a location of relevant exposure. Applies from 2021. Represents +1% excess mortality risk (additional to long term exposure)[22] [Previous guideline, 2005-2021]	WHO	Guideline (Current)	Non-Statutory (-)
12 µg/m³	Annual	Interim AMCT. Compliance calculated as UK annual 2040 Target. To be met by January 2028	UK	Interim Target (Future)	Non-Statutory (SoS)
-22%	(Rolling) 3-Year *cf.* base PEI	Interim PERT. Compliance calculated as UK 2040 reduction Target. To be met by January 2028	UK	Interim Target (Future)	Non-Statutory (SoS)
-46%	Annual	Reduction in Anthropogenic Emissions relative to baseline emissions in 2005. To be met in 2030 & all subsequent years.	EU	Emissions Ceiling (Future)	Statutory (SoS)
10 µg/m³	Annual	AMCT. Annual Mean of ratified periodic measurements at relevant monitoring stations. To be met by end of 2040.	UK	Target (Future)	Statutory (SoS)
-35%	(Rolling) 3-Year *cf.* base PEI	PERT. Cumulative total change at qualifying monitoring stations, as % of the baseline (2016-2018 average). To be met by end of 2040.	UK	Target (Future)	Statutory (SoS)

[22] Excess Mortality risk as 'Hazard Ratio' (HR), which is not equivalent to an 'Attributable Fraction' (AF). See Table 3.4 for Attributable Fractions at Limit/Target & Guideline levels, and the Glossary of Terms for explanation.

2.3.1 Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG22 (Chapter 8) and the Air Quality Strategy[14], local authorities are expected to contribute to the Secretary of State's population exposure reduction target(s) by considering fine particulate matter ($PM_{2.5}$) emissions / concentrations when exercising their routine administrative functions.

Local Authorities are obliged to have regard to the guidance and the strategy as provided by s81A & s88 of 1995 c.25[23], and are additionally obliged to take the measures specified by the Secretary of State the under s80(5) c), irrespective of whether or not they refer to actions within scope of s81A (i.e., irrespective of whether they are in connection with other duties which are both 'of a public nature' and 'that could affect the quality of air').

Chapter 2 of the Policy Guidance establishes a requirement for Local Authorities which are not obliged to designate a an AQMA to instead draw up a local Air Quality Strategy from 2023. There is no set format or objective for the local Air Quality Strategy, no strict requirement that it must specifically address $PM_{2.5}$, and no requirement that the outcomes of any actions detailed within the strategy must be quantified and measurable so as to allow empirical tracking of local progress between LAQM reporting years.

Similarly, there is no express requirement that the strategy take the form of a stand-alone document, nor that progress in it's implementation be separately reported – it is implicit that any progress is expected to be reported as an integral part of the LAQM ASR process, albeit with no specific performance expectations.

This notwithstanding, Chapter 8 of PG22 (fine particulate matter) provides that Local Authorities should proactively identify existing actions which contribute toward reductions in $PM_{2.5}$ and where applicable, identify new proactive measures to tackle $PM_{2.5.}$

Section 3.3 below explains that even in the areas expected to have the highest concentrations, $PM_{2.5}$ exposure is thought to be already compliant with the 2040 target level, with levels presently on a trend-trajectory that would suggest that they are also likely to fall below the 2040 exposure reduction target ahead the target date.

The 2021 base background $PM_{2.5}$ maps estimates that average population exposure within Havant Borough to be 5.94 µg/m^3 in 2040, -48% of a locally calculated PEI_{base} (indicative only[25]), and exceeding the -35% 2040 PERT (-41% of the official, national PEI_{base}).

[23] Environment Act 1995 c.25 Part IV

In this context, additional priority measures are unlikely to be required.

Havant Borough Council has not yet adopted an air quality strategy, but this has now been added to Table 2.1 as a priority action.

It is expected that a local strategy for Havant would be limited in scope, codifying overarching general measures to apply downward pressure on local emissions, without requiring measures to be subject to full cost accounting, specific emissions reductions estimates, or performance monitoring.

The principal reasons for this may be summarised as;

1) the widespread compliance with statutory targets having been demonstrated to be likely across the borough as a whole,
2) the anticipated measures being likely to deliver relatively intangible benefits in terms of quantifiable reductions of $PM_{2.5}$, not lending themselves to performance monitoring (e.g. wide margins of error when extrapolating $PM_{2.5}$ reductions as a direct result of residential or workplace travel plans, due to poor survey return rates, etc.) and,
3) the costs of implementation of anticipated measures will be difficult to accurately quantify, given that they are often borne by multiple parties, both public & private (e.g. developer-delivered active transport infrastructure)

Whilst no measures are currently being implemented or planned to specifically target reductions of $PM_{2.5}$ concentrations within the Borough, it is nevertheless expected that the combination of direct investments in sustainable travel infrastructure, policy measures discussed in will contribute to reductions in both direct emissions & secondary formation of $PM_{2.5}$.

It is expected that these measures will provide proportionate support to the existing reducing trends in ambient atmospheric concentrations, sufficient to meet the policy obligations.

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

This section sets out the monitoring & assessment undertaken within 2024 by Havant Borough Council, and outlines how measured & modelled air quality compares with the relevant air quality objectives.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Havant Borough Council did not undertake automatic (continuous) monitoring during 2024 for any pollutant.

3.1.2 Non-Automatic Monitoring Sites

Havant Borough Council undertook non-automatic (i.e. passive-) monitoring of NO_2 at 24 locations during 2024. Table A.1 in Appendix A presents the details of the non-automatic sites.

Havant Borough Council keeps it's monitoring strategy under review, proactively amending monitoring locations to ensure resources are deployed effectively. The following recent changes have been made:

1. TRL Site 36296_3 was commissioned as a triplicate exposure site in January 2024 (without co-location with an automatic analyser), positioned approximately 15m from the A27 dual carriageway kerbside, in a down-wind direction.
2. Sites 37 & 38 were established on Southleigh Road in January 2024, at positions north & south of a railway level crossing respectively, to assess the impact of engine idling at the crossing, and the impact of school run traffic on both local residents and pupils of the local Warblington secondary school.

Maps showing the location of the monitoring sites are provided in Appendix D.

3.2 Nitrogen Dioxide (NO_2)

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualization (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 Comparing Local Monitoring to Statutory Objectives

Table A.2 in Appendix A compares the measured NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. The concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualization, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

The full 2024 dataset of diffusion tube monthly mean values is provided in Appendix B. It should be noted that the concentration data presented in Table B.1 includes distance-corrected values only where relevant (see footnotes to Table B.1).

Of the 269 individual measurements taken during 2024, just 1 (<0.5%) came within 10% of the objective value, and none exceeded it. This represents an improvement upon figures reported in the 2024 ASR, where 10 of 296 measurements were within 10% of the objective, and 4 measurements exceeded it.

The maximum recorded 'point of measurement' annual mean concentration within the calendar year 2024 was 25.4µg/m^3, at site 28 (down 9% from 28 µg/m^3 2023). This value represents a concentration of around 28µg/m^3 at the nearest point of relevant exposure – less than 80% of the permissible objective value.

This maximum estimated annual mean exposure at a point of relevant exposure is less than half of the 60 µg/m^3 annual mean threshold value which is generally taken to represent a risk of exceeding the short term exposure objective of 200µg/m^3 (hourly, with more than 18 exceedances per annum). On this basis, the risk of an exceedance of the short term objective having occurrred at any relevant location within the Borough of Havant during 2024 is consdiered to be negligible.

3.2.2 Trends

21 out of the 24 monitoring locations have 5 years of available monitoring data. All but one of these demonstrated an overall downward trend between 2020 and 2024, albeit that the strength of association is poor - reflecting the seasonal variability in monthly data.

Between 2022 and 2023, the NO_2 concentrations at most sites remained very similar, with around 20% of locations recording a marginal year on year increase. These locations were generally clustered around links to A27 at the Havant junction, suggesting a link with traffic sources. The 2024 ASR inferred that this might be to increased personal & commuter travel by private motor car and could suggest the beginnings of a reversal of post-pandemic trends. However, all locations showed a year-on year decline between 2023 & 2024, which does not support that prior interpretation.

The latest results support an interpretation which infers that any growth in the number of trips made by ICE-powered vehicles (if any) has not outweighed the pace of replacement of older (e.g. <Euro 5) vehicles in the national fleet by cleaner ICE, hybrid/plug-in hybrid & fully-electric models.

Figure A.2 & Figure A.3 (Appendix A) show recent trends in NO_2 concentrations at the local diffusion tube monitoring locations over the past 5 years, reported by environment-type, and shown using both raw monthly measurements & as annual average. Trend equations are shown for information (linear, annual), but the illustrative trendline has been omitted for clarity.

The monitoring data shows an overall stable or slight decreasing trend between 2020 and 2024. Low values in the Late-Winter & Spring/Summer of 2020 correspond with the imposition of SARS-CoV2 controls. This notwithstanding, averaged concentrations in 2024 were below the SARS-CoV2-suppressed 2020 levels across all represented environment types, with a similar pace of decline evident across all categories (0.6% maximum difference in rate, between urban background & urban centre categories).

3.2.3 Public Health Outcomes

The current UK objective level for NO_2 is equivalent to the WHO 2021 Interim target 1, representing +9% in excess respiratory mortality risk[22] over & above the 2021 WHO Guideline level (+12% gross/total). At the maximum recorded annual average level within the Borough (Park Road South, Havant), the contribution of NO_2 exposures to respiratory mortality is approximately +8% (gross/total). The risk at all other locations within the borough is likely to fall well below this level, with maximum estimated background exposure (within the top-ranked 1 x 1 km square-) accounting for around **+4.8%** gross/total excess respiratory mortality[22] (or approximately **+3.2%** on an ‘all non-accidental deaths’ basis[22]).

3.3 Fine Particulate Matter ($PM_{2.5}$) – Fine Particulate Matter in Havant Borough

Havant Borough Council does not undertake any physical sampling for $PM_{2.5}$, necessitating a reliance upon 3rd party air quality data to infer likely local conditions. These include estimates of background air quality, produced periodically by Defra on a UK-wide 1km x 1km grid. The most recent release of these background maps uses 2021 as the reference year for meteorology & emission factors, providing projections of background concentrations of $PM_{2.5}$ from 2021 to 2040.

Based upon these data, the estimated 2024 annual average background concentration of $PM_{2.5}$ in Havant is **6.88** µg/m^3, with a maximum (grid square average) of **8.04** µg/m^3. Notably, the maximum modelled concentration already meets the 2040 AMCT (Table 2.2), and (based upon expected rate of annual change-) is now expected to have fallen below the *de minimis* threshold for the $PM_{2.5}$ National Exposure Reduction Target (NERT) before 2020. This means that a nil reduction target would likely have applied within the Borough, even were local background measurements taken at the location where the highest ambient $PM_{2.5}$ concentrations would be expected to occur.

Local AURN data (averaged across Portsmouth & Southampton Urban Background monitoring stations[24]) suggests that local reductions are likely to be at least in line with the national progress towards the statutory PERT (-25% from baseline, meeting the 2028 interim target), and may have slightly outperformed the national average to date. A locally calculated PEI for 2024 yields a reduction estimate of -28% against a locally calculated PEI baseline (indicative only[25]).

3.3.1 Background Mapping Base-Year Models; Changes in Source Apportionment Estimates

Havant Borough Council's 2024 ASR presented a detailed comparison of 2018-base-year modelled background $PM_{2.5}$ and measurements from nearby AURN monitoring stations; concluding both that real-world concentration reductions had significantly outpaced those expected under the model assumptions, and that the background maps would benefit from being re-based.

In 2024, DEFRA published updated background $PM_{2.5}$ estimates, re-based to 2021. As the 2024 ASR assessment would lead us to expect, the re-basing of background maps has

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[24] assumed to be a 'worst-case' proxy for Havant, given population size & density differences

[25] contributing data values includes years with <85% data capture, deviating from the statutory requirements for the official UK-wide metric

resulted in a substantial downwards revision of the previously reported estimates, and as a consequence, has also updated the sector emissions apportionment assumptions. This section provides a brief summary of changes.

The Borough average annual concentration estimate has fallen by around a 1/4, and the maximum annual estimate for an individual grid-square has fallen by around $1/3^{rd}$.

It was previously thought that natural sources of $PM_{2.5}$ (sea salt in particular) were particularly important within Havant Borough due to the proximity of urban areas to coastal water. The proportional contribution is now expected to be less significant, contributing between 14 & 19% to total exposures (down by between 12 & 35% on previous estimates). This compares to <5% as a national average, and 21% averaged across the South-East region. It is possible that the disparity with the regional average reflects the sheltered nature of the transitional waterbodies of Langstone & Chichester Harbours in comparison to the more exposed open waters of the Solent & English Channel.

The contribution from total Domestic sources has also been revised downwards by around $1/3^{rd}$, to 9.2% (from 15% previously), as a Borough average. A reduction of a similar scale is also reflected in the areas with the highest estimated background exposures (Bedhampton, and Leigh Park/Hermitage), where Domestic sources are now expected to contribute around 19% (down from 33% previously).

The reductions in contribution from both 'Domestic'- and 'Salt & Residual'- sources have been offset by increases in the relative importance of other categories – most notably in the 'Secondary' category, which represents the fine particulate matter generated through chemical reactions between gaseous emissions (+6.4% of total exposure). The previous model already expected secondary formation to be the dominant contributor to $PM_{2.5}$ exposure; this upwards-revision means that almost $2/3^{rds}$ of total exposures (64%) is now expected to derive from non-primary emissions (i.e. from emissions of gaseous precursors).

Industrial sources of primary $PM_{2.5}$ emissions are the next most important revision; with the proportional contribution more than doubling from 1.95% to 4.7%, although the contribution to total exposure remains around half that of Domestic sources.

Other notable revisions include all categories of non-combustion road sources (tyre, brake, and road surface wear), and emissions from shipping and aviation. Collectively, the contribution from these sources has increased by more than $1/3^{rd}$, to around 4% of total exposure.

Increases in the contribution from national Trunk Roads, the Local Road network and from Rail sources are modest as a proportion of the total exposure, due principally to their relatively low overall contribution to total exposures under both the 2018 & 2021 base year models. Of all road sources, the most significant increase derives from 'Local Roads +

Engine Cold Starts', with the contribution to total exposure from this category more than doubling from the 2018 estimate of 0.11% to 0.23% in 2024.

Looking at modelled changes over time, future annual reductions in the contribution of local road & domestic sources are expected to get smaller, the contribution of industrial sources is set to remain relatively consistent (negligible annual change), and non-combustion road contributions are set to become increasingly important– likely reflecting an expected increase in the proportion of electric vehicles within the national vehicle fleet, as well as a continuation of existing trends, such as the increasing sizes of passenger cars of all types, and further growth in the popularity of (larger/heavier) SUV's.

A summary of expected $PM_{2.5}$ source apportionment in Havant is presented below in Table 3.1, using figures derived from the 2021 base-year model.

Table 3.1 – Expected $PM_{2.5}$ Source Apportionment, Havant Borough (2024)

Source Category	Description	Contribution to Total PM2.5 Exposure		
		Min.	Max.	Av.
Roads	Combustion Only (All Road Types)	0.1%	1.6%	0.4%
	Non-Combustion Only (All Road Types)	0.7%	7.3%	2.3%
	Strategic Roads Only (Motorway & A Class)	0.1%	1.2%	0.2%
	Local Roads & Journeys Only	0.1%	0.4%	0.2%
	Total (All Road Types, All Sources)	0.8%	8.9%	2.8%
Rail	Combustion & Non-Combustion	0.00%	0.02%	0.01%
Other	Includes all Shipping & Aviation	0.9%	4.7%	1.6%
Industry & Point Sources	Includes Agriculture, Energy, Waste & Minerals	2.6%	15.5%	5.4%
Domestic	All Types of Heating/Cooling in residential, institutional and commercial spaces	3.6%	19.0%	9.2%
Residual + Salt	Sea Salt, Natural Calcium & Iron Rich Dusts, Non-Characterised Sources	14.3%	18.9%	17.0%
Secondary	Atmospheric Formation of PM2.5 form Gaseous Pollutants (organic & Inorganic)	55.1%	73.2%	64.1%

3.3.2 Trends

Havant Borough Council's 2024 ASR presented a detailed assessment of trends in both modelled and measured ambient $PM_{2.5}$, identifying shallow, consistent & robust year-on-year reductions in concentrations. These broad trends remain representative of local conditions.

Updated summary information is presented in Table 3.2 & Table 3.3 (below). Graphed illustrative trends for Southampton & Portsmouth Centre AURN sites are shown in Appendix A, Figures A.4& A.5.

Notwithstanding the apparently robust & improving compliance with even the 10µg/m^3 2040 annual exposure target that is evident from these summaries; performance against the non-statutory short-term guideline values remains challenging. Even at the best-performing site examined, at the rural background monitoring AURN site at Chilbolton; the 2021 WHO short term exposure guideline was exceeded on +11 days of 2024 over & above the recommended limit (of 4 days/annum). This suggests that even at rural locations distant from local sources, the impact of repeated short-term exposure to daily concentrations in excess of the 15 µg/m^3 WHO guideline is contributing to adverse health outcomes, and around +0.6% to attributable mortality (net of the baseline risk associated with exposures at the WHO guideline level), consequently inflating the overall rate per head of population.

The number of days exceeding the WHO short-term guideline level at Chilbolton in 2024 calendar year represents a marginal improvement on the number occurring during 2023, down by around a 1/5th, and a continuation of the pre-existing declining trend. This pattern is broadly consistent across the other AURN sites examined, with Urban Background environments tending to perform better, and the Portsmouth & Southampton locations[24] experiencing more than 1/3rd fewer exceedance days in 2024 than occurred in 2023. Only the roadside location at Worthing has experienced an increase in exceedance days. This is likely due to local factors, but potentially reflects increasing societal pressure to return to pre-pandemic travel habits, or increased non-combustion primary $PM_{2.5}$ emissions from road transport, following trends for larger & heavier vehicles. Either of these factors could become more widely evident in future years, and warrant monitoring.

Whilst the local regional trends identified from the nearby AURN appear to represent a positive continuation of that trend identified within the 2024 ASR, it remains unclear whether the underlying causes are sufficiently entrenched as to represent a 'new normal' upon which future trends may be reliably judged.

The reliability of the trend might be especially at risk as the Labour government progresses it's policy centrepiece of driving increased productivity, accelerating land development and achieving gains in economic growth.

Similar risks also exist in the policies of opposition parties, with a notable increased prominence of anti-net-zero/pro-fossil fuel messaging alongside vocal challenges to remote working practices, amongst other policy-positions which could run counter to the progress made on $PM_{2.5}$ to date.

It is considered plausible that at least a partial reversal of such trends may occur in future years, and the risk of this occurring is likely to increase over foreseeable future parliaments. Trends should be kept under review.

Table 3.2 – Regional AURN Sites, Comparison of Measured Data with Defra Modelled Background (PM2.5)

AURN Site	Modelled			Measured			Comparison		
	Annual Mean		Slope^	Annual Mean		Slope^	Trend	Measured as % of Modelled+	
	2019	2024		2019	2024		Measured [Modelled]	2019	2024
	µg/m³	µg/m³		µg/m³	µg/m³			%	%
Chilbolton	8.41	6.25	-0.33	8.06	6.50	-0.18	Declining [Declining]	96%	104%
Southampton Centre	10.46	7.43	-0.49	9.78	6.94	-0.54		93%	93%
Portsmouth	12.19	8.21	-0.49	8.91	7.61	-0.53		73%	93%
Worthing A27	10.44	6.82	-0.40	10.07	6.82	-0.43		96%	111%
Christchurch Barrak Rd.	8.27	6.23	-0.29	12.77	6.23	-0.80		154%	126%
Bournemouth	9.27	6.96	-0.36	10.81	6.96	-0.46		117%	108%

^ - negative slope value indicates a declining trend. A larger number indicates a steeper slope (stronger trend).

+ - Value >100% indicates that measurement exceeds modelled value; <100% indicates that the model over-estimates real-world concentration. Green highlight = +/- <10% (predictions accurate), Amber = measured value <-25% modelled (inaccurate, model overestimates), Red = Measurement >+25% modelled value (inaccurate, model not representative of local conditions – local concentrations likely affected by a specific local factor – e.g. a busy road)

Table 3.3 – Regional AURN Sites, Peak 24hr Means & Guideline Exceedance Days ($PM_{2.5}$)

AURN Site	Site Environment Type	2019				2024			
		Max 24hr Mean	No. Days >15 µm/m³	No. Days >25 µm/m³	Capture	Max 24hr Mean	No. Days >15 µm/m³	No. Days >25 µm/m³	Capture
		µg/m³	Count		%	µg/m³	Count		%
Chilbolton	Rural Background	43.98	44	14	100%	26.88	15	1	77%
Southampton Centre	Urban Background	45.84	57	23	99%	33.44	19	1	100%
Portsmouth	Urban Background	47.89	45	14	94%	36.43	25	5	93%
Worthing A27	Urban Traffic	45.71	54	15	99%	29.33	20	3	96%
Christchurch Barrak Rd.	Urban Traffic	52.25	83	32	96%	30.83	21	2	94%
Bournemouth	Urban Background	44.71	60	18	98%	33.33	22	2	97%

3.3.3 Public Health Outcomes

Natural sources of $PM_{2.5}$ are generally thought likely to cause negligible harm relative to the serious harm that can be caused by organic compounds such as those associated with combustion (e.g. black carbon & poly-aromatic hydrocarbon compounds).

Combustion-derived organic's are typically fat-soluble, chemically persistent, and bioactive; capable of accumulating within body tissues and causing both short-term harm (e.g. an inflammatory immune response) and long-term harms (e.g. affecting foetal development or contributing to the development of cancer).

The Public Health Outcomes Framework (PHOF)[26] indicator D01 *'fraction of mortality attributable to particulate air pollution'* represents the mortality burden associated with long-term exposures to $PM_{2.5}$ as a percentage of the annual deaths from all causes in those aged 30+. The indicator does not differentiate between cumulative sporadic short-term exposures to high daily average concentrations, and consistent exposure to moderate concentrations – it's focus is the latter, but the effects will include elements of the former, as illustrated by Table 3.3 above.

The latest available PHOF figures relate to the 2023 calendar year, where the proportion of local deaths attributable to *long-term* exposure to particulate air pollution (PM_{10}) within Havant Borough was estimated to be **4.9%**; below the South-East & England average estimates (5.1% & 5.2% respectively).

The PHOF value is not explicitly limited to *fine* particulate matter ($PM_{2.5}$), does not explicitly account for the additive effect of repeated exposures to elevated $PM_{2.5}$ concentrations over short-periods (as a 24hr average), and is not updated annually. Consequently, the 4.9% estimate may not fully represent attributable mortality in the 2024 calendar year.

Public Health England's (PHE) 'Estimating Local Mortality Burdens associated with Particulate Air Pollution'[27] provides guidance on estimating the number of deaths attributable to particulate matter pollution; allowing a current local estimate to be made from the available 3rd party information (modelled and/or measured $PM_{2.5}$).

The 2024 ASR followed the method presented in that document, using it's recommended values. However, it is noted that the underlying Relative Risk value used in the PHE

[26] OHID (2025). Public Health Outcomes Framework.

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

procedure is based upon a single 2002 US study, which has now arguably been superseded by the more recent worldwide meta-analyses included in the systematic review conducted by the WHO in 2021 when updating it's guideline values.

The WHO uses an alternative linear CRF which is greater than that used in the earlier PHE document. This upwards-revision suggests that the PHE value may under-estimate the true attributable fraction. The WHO CRF is both derived from a broader geographic domain and is supported by a substantially increased number of studies; for these reasons it is considered likely to more representative of real-world risks.

This 2025 ASR report substitutes the PHE CRF with the updated WHO function. Because of this, the values presented in the lower section of Table 3.4 are not directly comparable to those presented in the 2024 ASR. The top section presents metrics estimates calculated on the same basis as the 2024 ASR, for comparison purposes (only).

Relative risk (RR) is calculated as:

$$RR(x) = 1 + (CRF * \frac{x}{10})$$

Where: CRF = the concentration-response function appropriate to the pollutant (expressed as the change in base relative risk per 10 µg/m^3) and the exposure scenario (e.g. either annual or 24hr exposure), and

χ = a $PM_{2.5}$ concentration, as averaged across a specific geographic area and over a period that is compatible with the basis of the CRF used.

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

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

Calculated on an equivalent basis (using the PHE CRF), the estimated proportion of deaths attributable to exposure to $PM_{2.5}$ within Havant Borough has *decreased* by 15% (relative to the 2024 ASR 'discounted' estimate). This largely reflects the impact of re-basing the modelled data underlying the exposure estimates, rather than representing a true year-on-year decline (i.e. the 'discounted' estimate, which attempted to account for the disparity between modelled and measured values, probably over-estimated the attributable fraction in that year).

A direct comparison between the updated estimate (using the WHO's recommended CRF) and that presented in the 2024 ASR (using the PHE CRF) shows the change in attributable fraction to be negligible (+0.04% as a Borough-average); the steeper concentration-response function cancelling out the positive impact of the downwards-revision of the average annual exposure which arose from the re-basing of background maps to 2021.

In both cases, the local estimate of attributable fraction exceeds that given in the PHOF, likely reflecting the updated CRF used at it's last calculation; i.e. the PHOF is likely an under-estimate.

The 2024 ASR noted that the 2018 base year background exposure maps placed the top 4 ranked grid squares for $PM_{2.5}$ exposure within the Leigh Park residential area. All 4 of these grid squares feature in the 2021 base-year top 10 ranked squares, but grid squares north of Purbrook Way now fall outside the top 4, and the area around the busy Purbrook Way/Dunsbury Way/Stockheath Road roundabout has been downgraded by two positions (from rank 2, to rank 4). The 2nd & 3rd highest ranked grid squares are now associated with different locations, corresponding to the New Lane industrial area, and North Emsworth (A27 Emsworth bypass).

Table 3.4 Includes an attributable fraction for Leigh Park for the purposes of comparison with the figures reported in the 2024 ASR, but this area is not now expected to be as exceptional a local outlier as was suggested by the 2018 maps, and it's individual consideration as a potential special case appears to be no longer justified.

Table 3.4 – Local Deaths Attributable to Exposure to $PM_{2.5}$

Spatial Averaging area for X	X (µg/m³)	Relative Risk (RR)	Attributable Fraction& (AF)	Local Deaths Attributable to fine Particulate Pollution&
Long-Term (Modelled, Annual); PHE CRF (for comparison with 2024 ASR)	**X = X**	**1+(0.06*x/10)**	**(RR-1)/RR**	**AF as % [2024 ASR est.]**
Borough Average	**6.89**	**1.041**	**0.0397**	**3.97% [5.16%]**
Leigh Park Average	7.80	1.041	0.0447	5.88%
2040 Exposure Target / WHO Interim Guideline	10.00	1.060	0.0566	5.66% [5.66%]
2021 WHO exposure Guideline	5.00	1.030	0.0291	2.91 % [2.91%]
Long-Term (Modelled Annual); WHO CRF (best estimate)	**X = X**	**1+(0.08*x/10)**	**(RR-1)/RR**	**AF as %**
Borough Average	**6.89**	**1.055**	**0.052**	**5.22%**
Maximum Grid Square Concentration (Havant District)	8.04	1.06	0.06	6.04%
Minimum Grid Square Concentration (Havant District)	5.91	1.05	0.05	4.51%
Hayling Island Average	6.29	1.05	0.05	4.79%
2040 Exposure Target / WHO Interim Guideline	10.00	1.060	0.0566	7.41 %
2021 WHO exposure Guideline	5.00	1.030	0.0291	3.85 %
Short-Term (Measured 24hr, Proxy); WHO CRF (99th %'ile of 24hr averages, 1 year).	**X = X**	**1+(0.0065*x/10)**	**(RR-1)/RR**	**AF as %$**
Southampton AURN (UKA00235)	22.02	1.01431	0.0141	1.41%
Portsmouth AURN (UKA00421)	25.36	1.01648	0.0162	1.62%
Average of UKA00235 &UKA00421	**23.69**	**1.01540**	**0.0151**	**1.52%**
WHO 24hr Air Quality Guideline	15.00	1.00975	0.0097	0.97%
Total (Long + Short); WHO CRF	**-**	**-**	**(RR-1)/RR**	**AF as %$**
Borough Average + Short Term Proxy	**-**	**-**	**0.0671**	**6.71%**

$ - Short-Term fraction is additional to-, and not a component of- the Long Term fraction
& - fraction expressed 'gross', including baseline risk at the objective/limit/guideline level; representing the risk relative to a hypothetical group that is not exposed to any level of $PM_{2.5}$ air pollution.

In addition to the health impact of Long-Term exposure to elevated ambient concentrations of $PM_{2.5}$ (described above), repeated exposure to elevated concentrations over short timescales similarly contributes to undesirable adverse health outcomes, and in turn, to overall excess-mortality that is attributable to air pollution.

Whilst there is no statutory objective for short term $PM_{2.5}$ exposure, the WHO does provide a non-statutory guideline as a target for exposure reduction efforts (Table 2.2).

Similar to the statutory objectives, limits and targets; the WHO guideline values, stringent as they are, do not represent zero harm. This means that even where air quality is compliant with the 2021 WHO guideline values, there remains a baseline level of excess mortality that is acknowledged but considered to be acceptably-low, provided that the absolute concentrations on exceedance days are not excessive and that the number of days when the 24hr average exceeds the guideline does not exceed around 1% of the year (i.e. that the peaks are not too high & occurrence of peaks is not too frequent).

Each additional exceedance day beyond 1% will contribute to undesirable cumulative harms, even where the annual averages are otherwise compliant with either the statutory limits or the guideline levels.

It is not possible to make a direct assessment of the contribution of accumulative short-term exposures to excess mortality in the Borough of Havant; in the absence of any local measurements the underlying distribution cannot be known. However, as with long-term exposures, the Portsmouth and Southampton urban Background AURN monitoring stations can be used as a reasonable proxy for Havant Borough[24]. Average equivalent contribution the total attributable fraction across these stations is expected to be 1.52% gross (+0.55% net of WHO baseline risk); notably smaller than that at the Rural Background at Chilbolton, despite it’s urban setting.

Using this value, the combined contribution to the Borough’s ‘all-non-accidental-causes’ mortality rate from both long-term exposures and accumulative exposures to short-episodes of significantly elevated $PM_{2.5}$ is expected to be around **6.7%** gross (5.22% + 1.52%). This equates to around +2.0% attributable mortality net of the fraction attributable to exposures at the WHO guideline level.

This estimate serves to illustrate not only the rate of progress made in recent years, but also the magnitude of health impacts that might be expected in the event of a reversal of recent emissions trends as a result of economic recovery policy (as discussed in 2.2 & 3.3.2 above). While relatively modest, the potential additional contribution is non-negligible; underscoring the importance of taking proportionate steps to support progress toward the -35% exposure reduction target.

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 Road	Suburban	471742	105794	NO2	No	-3.4	11.0	No	2.8
3	Havant Road	Kerbside	472198	102048	NO2	No	0.8	1.0	No	2.6
4	Emsworth (A27)	Suburban	474850	106504	NO2	No	6.2	2.5	No	2.7
7B	Brockhampton Lane	Urban Centre	471180	106064	NO2	No	-5.3	8.0	No	2.7
8	London Road (Purbrook)	Roadside	467364	107981	NO2	No	-0.4	2.5	No	2.7
10	Ramblers Way	Suburban	470028	110044	NO2	No	-15.5	43.5	No	2.7
12	Xyratex	Roadside	471613	105672	NO2	No	3.3	2.8	No	2.5
14	Elm Park Road	Suburban	471783	106794	NO2	No	5.0	1.8	No	2.7
18	Waterlooville Precinct	Urban Background	468264	109400	NO2	No	0.0	120.0	No	2.5
19C	19C - Langstone Rd (Woodbury)	Roadside	471637	105687	NO2	No	1.0	3.8	No	2.6
20	Bosmere Junior School	Urban Centre	471706	105933	NO2	No	-17.1	35.0	No	2.4
22	Park Road South (Bulbeck Jctn)	Roadside	471573	106199	NO2	No	7.0	2.0	No	3.1
25	Stakes Hill Road [Pos'n C]	Roadside	468478	107725	NO2	No	1.0	4.5	No	2.6
27	Havant Precinct	Urban Background	471654	106287	NO2	No	0.0	82.0	No	2.5
28	Park Rd. South (West St)	Roadside	471577	106280	NO2	No	-2.3	4.8	No	2.8
30	St. Peters Square, Ems	Urban Centre	474957	105731	NO2	No	0.0	2.8	No	2.7

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)
31	Emsworth Road (North)	Roadside	472882	106088	NO2	No	-1.6	5.1	No	2.5
33	Maurepas Way	Roadside	467966	109243	NO2	No	0.9	2.6	No	2.8
34	Swiss Road	Urban Centre	468040	109199	NO2	No	-13.3	20.0	No	2.8
35	Milton Road	Kerbside	467736	110085	NO2	No	3.3	0.9	No	2.8
37	Southleigh Rd. (St. Georges)	Suburban	472724	106444	NO2	No	8.6	2.9	No	2.8
38	Southleigh Rd. (St. Glenleigh)	Suburban	472778	106551	NO2	No	7.9	2.0	No	2.8
W10	Compton Court	Roadside	471368	106805	NO2	No	0.0	12.5	No	2.4
36296_3 Av. Of (A-C)	TRL 42 Pook Lane	Suburban	472574	105833	NO2	No	-6.3	15.3	No	2.8

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 representative 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 representative. 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) Earlier 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 NO_2 Monitoring Results: Non-Automatic Monitoring ($\mu g/m^3$)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
2	471742	105794	Suburban	100.0	99.2	18.2	20.1	18.5	18.5	16.8
3	472198	102048	Kerbside	100.0	99.2	22.7	24.7	25.0	23.1	22.2
4	474850	106504	Suburban	84.9	85.2	14.4	15.4	15.4	15.5	13.2
7B	471180	106064	Urban Centre	100.0	99.2	19.5	21.0	20.2	19.4	18.1
8	467364	107981	Roadside	90.6	90.3	18.8	22.2	20.9	18.9	17.8
10	470028	110044	Suburban	100.0	99.2	15.0	16.6	16.2	14.4	13.3
12	471613	105672	Roadside	100.0	99.2	20.6	23.9	22.6	22.3	19.8
14	471783	106794	Suburban	100.0	99.2	15.8	15.9	14.7	13.7	12.4
18	468264	109400	Urban Background	90.6	89.8	13.3	15.1	14.1	13.0	11.8
19C	471637	105687	Roadside	100.0	99.2	27.7	29.9	28.4	26.7	23.9
20	471706	105933	Urban Centre	100.0	99.2	19.9	20.2	19.1	19.8	16.9
22	471573	106199	Roadside	100.0	99.2	23.7	25.9	26.7	25.4	23.3
25	468478	107725	Roadside	90.6	89.8	18.3	18.5	17.9	16.4	17.0
27	471654	106287	Urban Background	100.0	99.2	19.7	19.9	19.2	18.8	17.2
28	471577	106280	Roadside	83.3	81.7	25.1	28.6	28.9	28.0	26.0
30	474957	105731	Urban Centre	92.5	91.9	12.2	13.9	12.8	12.3	11.7
31	472882	106088	Roadside	100.0	99.2	23.4	25.5	21.4	20.9	19.3
33	467966	109243	Roadside	75.0	74.7	19.9	22.6	21.6	19.4	17.5
34	468040	109199	Urban Centre	81.1	79.5	17.2	18.3	17.8	16.5	15.5
35	467736	110085	Kerbside	90.6	90.3	25.0	27.1	26.7	24.4	23.1
37	472724	106444	Suburban	100.0	99.2	-	-	-	-	14.8
38	472778	106551	Suburban	90.6	88.9	-	-	-	-	14.4
W10	471368	106805	Roadside	90.6	90.3	21.4	24.8	23.8	21.2	21.8

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
36296_3 (Averaged)	472574	105833	Suburban	100.0	73.0	-	-	-	-	17.2

☒ **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:

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 **<u>bold and underlined</u>**.

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: Supporting Technical Information / Air Quality Monitoring Data QA/QC for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(1) Data capture for the monitoring period, 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%).

Figure A.1 – Annual Pattern of Monthly Mean NO_2: Average Year 2014-2024

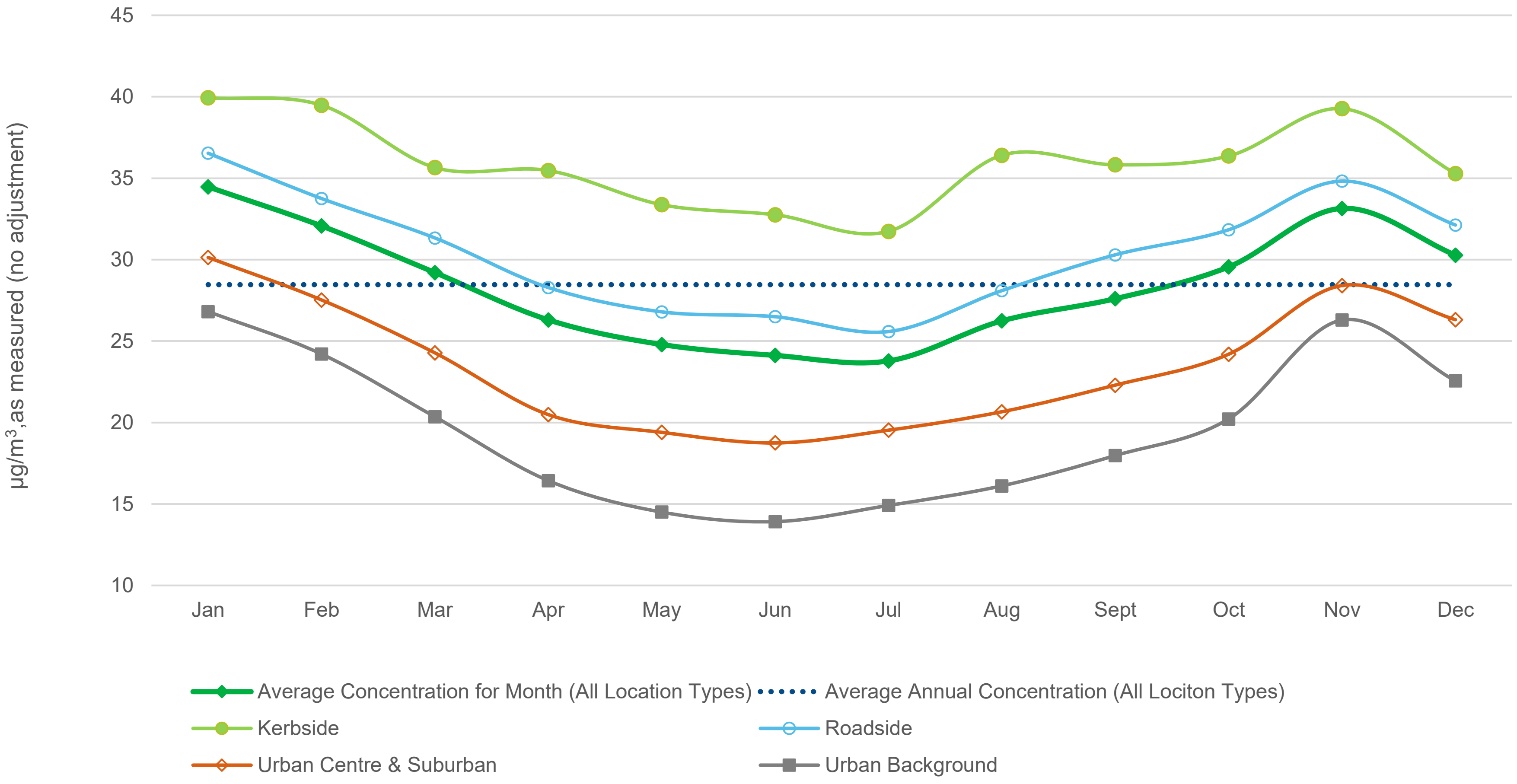


Figure A.2 – Trends in Annual Mean NO_2 Concentrations: Roadside & Urban Centre Averages, 2020-2024

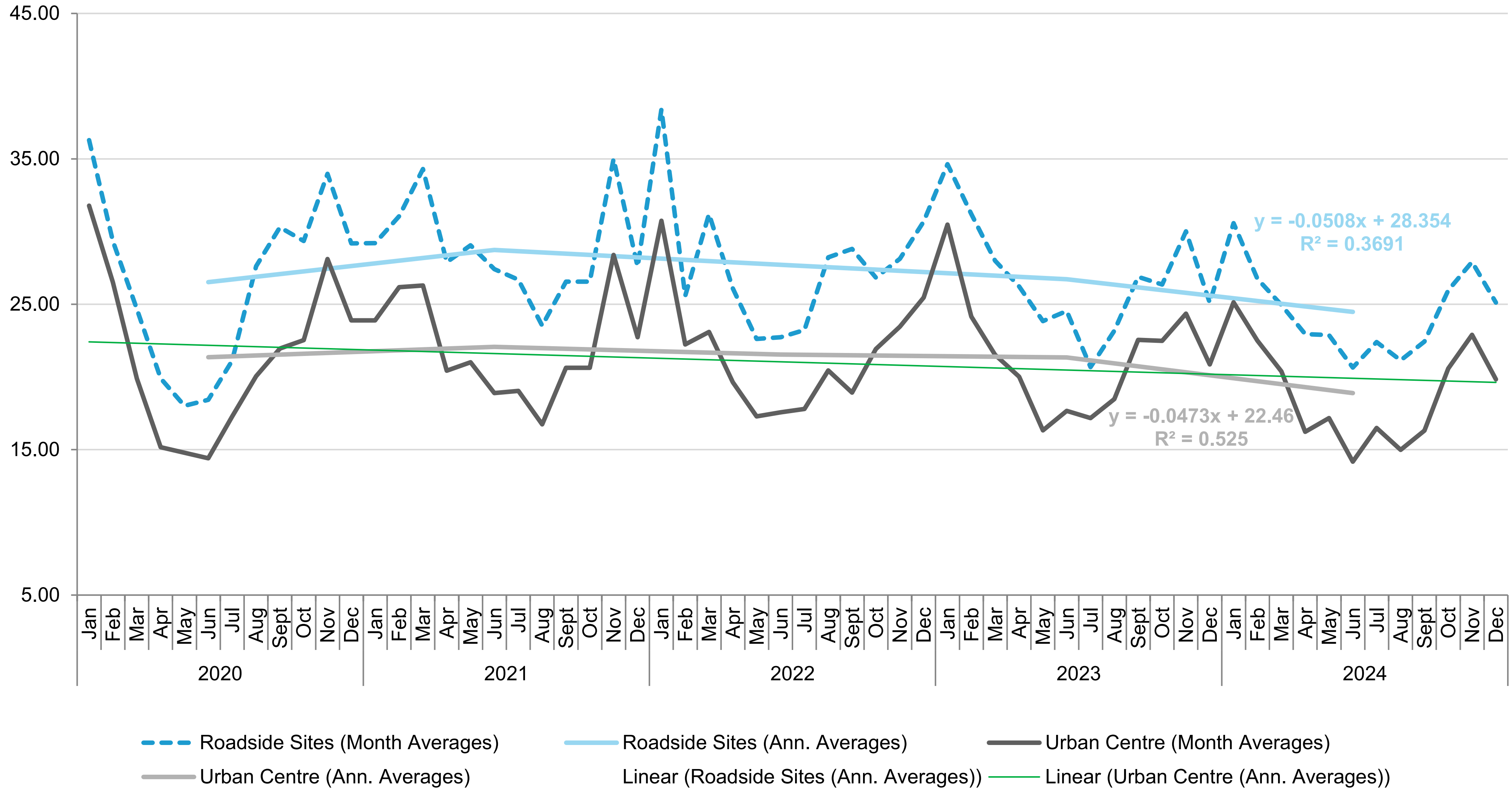


Figure A.3 – Trends in Annual Mean NO_2 Concentrations: Kerbside & Urban Background Averages, 2020-2024

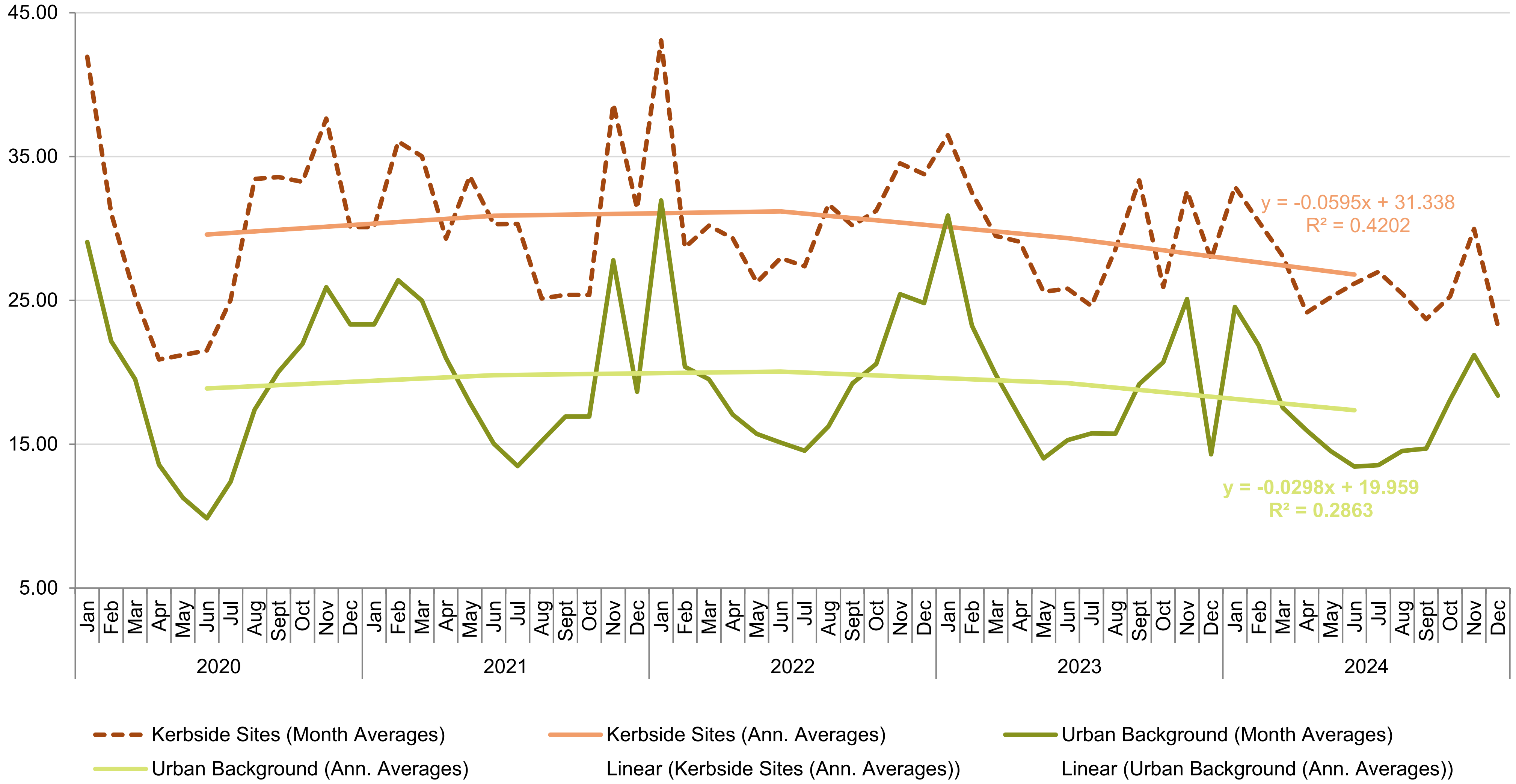


Figure A.4 – Regional $PM_{2.5}$ Trends; Comparison of Measures & Modelled: Urban Background, Portsmouth, 2019-2024

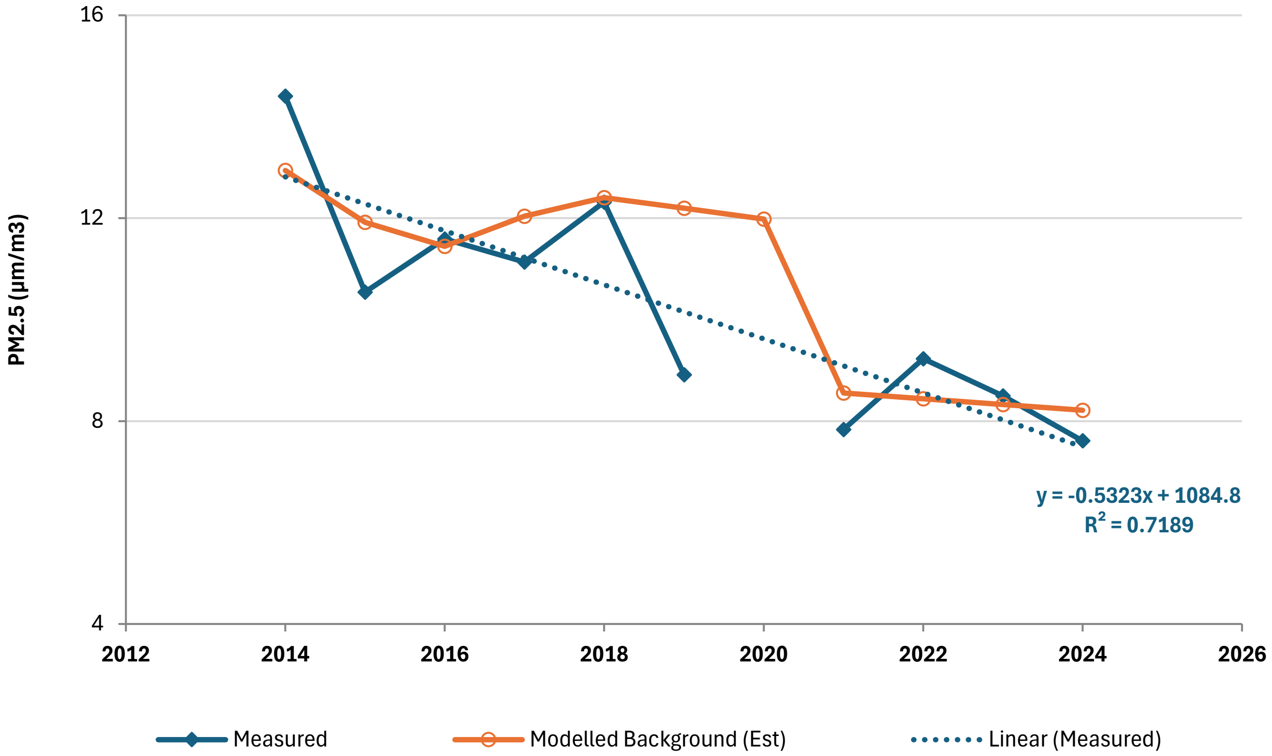
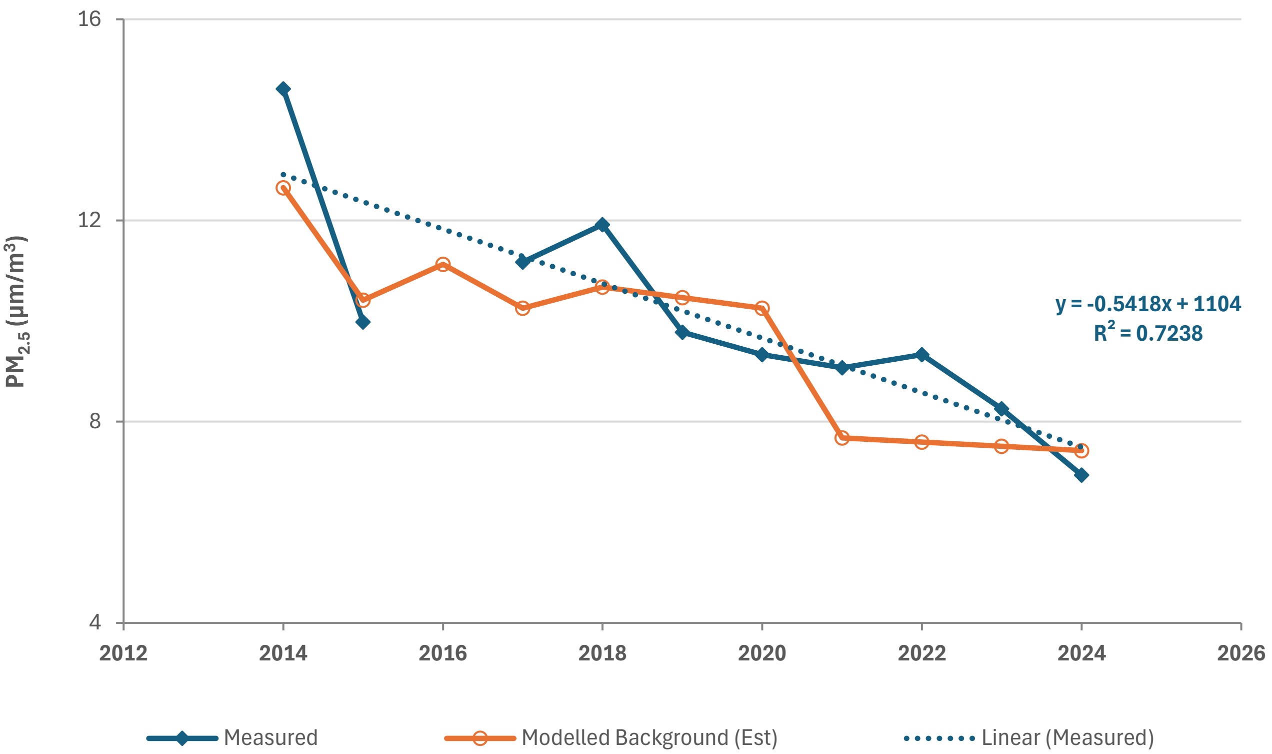


Figure A.5 – Regional $PM_{2.5}$ Trends; Comparison of Measures & Modelled: Urban Background, Southampton Centre, 2019-2024



Appendix B: Full Monthly Diffusion Tube Results for 2024

Table B.1 – NO_2 2024 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (1)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
2	471742	105794	27.2	23.2	18.3	19.3	17.8	17.4	15.2	15.3	20.5	19.9	26.0	22.3	20.1	16.8	17.1	Monitor is >10m further from kerb than is the receptor
3	472198	102048	32.1	29.6	27.7	25.9	25.4	25.7	26.2	25.1	22.4	24.2	29.6	23.5	26.4	22.2	-	
4	474850	106504		17.7		14.3	15.7	12.7	14.4	13.1	15.2	18.4	19.6	15.6	15.7	13.2	-	
7B	471180	106064	28.4	25.3	23.9	19.1	18.9	16.5	18.6	19.9	15.0	23.5	23.9	24.0	21.5	18.1	20.0	
8	467364	107981	28.3	24.3	23.3	18.5	19.6	16.0	19.2	18.8	16.4	23.5	24.5	-	21.2	17.8	18.1	
10	470028	110044	22.0	19.5	16.2	12.8	15.7	11.1	15.1	12.8	12.4	17.9	17.9	15.9	15.8	13.3	14.3	Monitor is >10m further from kerb than is the receptor
12	471613	105672	30.3	24.7	21.8	21.4	22.9	19.8	22.2	20.0	20.7	26.1	29.2	23.8	23.6	19.8	-	
14	471783	106794	22.2	19.0	16.8	13.5	11.8	10.4	11.5	12.1	10.4	15.2	18.9	15.3	14.7	12.4	-	
18	468264	109400	23.5	17.2	13.9	12.1	11.6	9.4	10.6	11.4	11.7	-	18.7	15.0	14.0	11.8	-	
19C	471637	105687	36.1	30.2	26.0	27.2	24.8	27.2	24.6	24.4	28.6	30.2	35.1	29.1	28.5	23.9	-	
20	471706	105933	26.6	28.4	24.7	7.3	17.0	18.4	18.5	18.9	16.6	18.6	23.5	22.2	20.1	16.9	17.9	Monitor is >10m further from kerb than is the receptor
22	471573	106199	31.5	30.1	29.8	26.1	26.2	24.9	27.5	25.8	25.0	31.4	28.6	25.4	27.7	23.3	-	
25	468478	107725	26.6	21.7	22.9	18.2	20.8	16.9	17.9	18.1	16.5	-	24.4	18.4	20.2	17.0	-	
27	471654	106287	25.6	26.5	21.2	19.8	17.4	17.5	16.5	17.6	17.7	20.5	23.7	21.8	20.5	17.2	-	
28	471577	106280	28.2	31.9	30.9	30.6	30.5	-	29.1	-	29.0	34.4	35.0	29.0	31.0	26.0	28.5	
30	474957	105731	20.1	15.2	13.6	12.5	11.5	-	11.5	11.1	11.5	14.1	18.2	15.5	14.0	11.7	-	
31	472882	106088	27.2	27.0	23.9	21.2	21.1	18.2	20.9	21.6	20.9	24.7	25.4	22.4	22.9	19.3	20.1	
33	467966	109243	29.3	21.2	20.3	20.6	21.9	15.8	18.9	14.8	-	-	25.2	-	20.6	17.5	-	
34	468040	109199	26.3	22.4	18.6	16.5	15.6	12.8	14.4	-	16.3	-	23.1	18.7	18.5	15.5	17.9	Monitor is >10m further from kerb than is the receptor
35	467736	110085	33.7	31.4	28.5	22.4	25.1	26.6	27.7	25.9	25.0	26.3	30.3	-	27.5	23.1	-	
37	472724	106444	24.1	21.6	18.5	19.9	15.0	13.9	15.1	15.0	14.8	17.4	19.9	16.5	17.6	14.8	-	
38	472778	106551	23.6	21.0	17.8	14.8	13.2	13.2	14.7	-	13.6	18.1	20.6	18.1	17.2	14.4	-	
W10	471368	106805	31.3	29.8	29.6	25.6	23.7	22.6	23.5	22.5	23.0	27.2	27.3	-	26.0	21.8	-	
36296_3	472574	105833	26.9	25.3	27.0	18.4	20.6	15.4	19.2	15.8	14.3	-	-	-	20.3	17.2	18.5	Average of Triplicate Monitor is >10m further from kerb than is the receptor

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

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

☐ Local bias adjustment factor used

☒ **National bias adjustment factor used (1), (2)**

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

☒ **Havant Borough Council confirm that all 2024 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**

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 **<u>bold and underlined</u>**.

See Appendix C for details on bias adjustment and annualization.

(1) Bias adjustment factor of 0.80 applied to tube analysed by Staffordshire Scientific Services (36296_3 A-C, reflected in the average)
(2) Bias adjustment factor of 0.84 applied to tube analysed by Gradko International Ltd. (2-38 & W10)
(3) 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 in 2024

Havant Borough Council has completed it's assessment of the Air Quality impact of the industrial unit in Marples Way, Havant which was subject to a retrospective application for operation of a dust extraction system (presently operating). Mitigation options were explored & modelled, finding that the operational requirements precluded the achievement of improved exposure outcomes for the closest residents, producing both poorer $PM_{2.5}$ exposure and additional noise exposure – both with adverse outcomes. Ideally, co-location of such industry and residential property would be avoided. However, the industrial class use, and the current occupant was extant at the time of the residential development, making it disproportionate to refuse the application on Air Quality Grounds. The new process represents a primary source of $PM_{2.5}$ that is thought likely to contribute ~20% to short-term $PM_{2.5}$ exposures for the nearest sensitive receptors, with long-term exposures 22% higher than the borough average. Gross excess mortality risk (as HR) is expected to be +7.9% (+2.91% Net of WHO guideline base-risk, as HR). It has been recommended that the application be determined on planning balance, accepting elevated risk for extant residents, and the future residents of nearby sites proposed to be allocated for residential development.

C.2 Additional Air Quality Works Undertaken by Havant Borough Council in 2024

HBC has not completed any additional works in 2024.

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 Water preparation.

TRL's NO_2 diffusion tubes (Managed by Havant Borough Council) are supplied and analysed by Staffordshire Scientific Services Ltd.

Both Laboratories supply Tubes with the 20% TEA in Water preparation, which conforms to the guidelines set out in Defra's Practical Guidance[28] document.

Satisfactory Laboratory performance is assured via 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).

Both suppliers participate in the AIR NO_2 PT scheme, achieving 100% in all reported rounds in 2024. (AIR062-066; Jan–Feb, Apr-Jun, July-Aug & Sept-Oct 2024, respectively)[29]

Diffusion tubes in 2024 were deployed largely in adherence to the Defra Diffusion Tube Monitoring Calendar +/- the standard 2 day allowance. One deviation of +4 days occurred in September (the minimum possible non-adherence). This level of deviation is considered to have a negligible impact on the annual average estimate. Data has been processed using the Defra Issued diffusion tube data processing tool, which automatically applies a time-weighted average for deviating exposures.

3.3.4 Diffusion Tube Annualization

Annualisation is valid to correct for any data capture rate falling between 25% & 100%, but is only strictly required where data capture falls below 75%. Any sites with a data capture below 25% are not considered to be eligible for annualization for regulatory purposes, with any results calculated having 'indicative' status only.

At least 9 months data was available for all Diffusion Tube locations in 2024, however for site 33 & TRL 36296_3 did not meet the minimum >75% data capture when calculated as exposure days/365.

Annualisation has been calculated for these locations. Results are summarised in Table C.1.

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[28] AEA Energy & Environment, Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance for Laboratories and Users. ED48673043 Iss. 1a. 2008

[29] Defra; Summary of Laboratory Performance in AIR NO2 Proficiency Testing Scheme (February 2023 – February 2025).

Table C.1 – Annualisation Summary (concentrations presented in µg/m3)

Site ID	Annualisation Factor					Raw Data Annual Mean	Annualised Annual Mean
	Ports (Cntr.) UKA00421	Ports (Anglesey) UKA00651	Soton (Cntr.) UKA00235	Soton (A33) UKA00613	Average Ann. Factor		
33	1.0110	0.9825	1.0492	0.9956	1.0096	20.6	20.8
36296_3 (Av)	1.0854	1.0154	1.0904	1.0237	1.0537	20.3	21.4

3.3.5 Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within this report for the calendar year of 2024 has 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 on using a bias adjustment factor to correct diffusion tube monitoring. Where Local Authorities operate an AURN monitoring site, triplicate diffusion tube exposures may be compared to with data taken from NO_x/NO_2 continuous analyser to derive a local bias factor. Where a local continuous analyser is not available, a national factor[30] may be derived from the average of all available diffusion tube co-location surveys which use the same laboratory and preparation method may be used instead.

As Havant Borough Council does not operate a continuous monitor, national factors have been used; 0.80 & 0.84 for samples analysed in 2024 by Gradko & Staffordshire Scientific Laboratories respectively. A summary of bias adjustment factors used by Havant Borough Council over the past five years is presented in Table C.2.

[30] DEFRA National Bias Adjustment Factors (LAQM)

Table C.2 – Bias Adjustment Factors Used 2020-2024

Monitoring Year	Local or National	If National, Version of National Spreadsheet	NO. of Available Studies	Adjustment Factor
Gradko International Ltd. – 20% TEA in Water				
2024	National	06/25	31	0.84
2023	National	06/24	27	0.81
2022	National	03/23	33	0.83
2021	National	03/23	34	0.84
2020	National	09/21	27	0.81
Staffordshire Scientific Ltd. – 20% TEA in Water				
2024	National	06/25	20	0.80
2023	National	06/24	12	0.86
2022	National	06/24	13	0.86
2020-2021	(Not Required – Lab not used during period)			

3.3.6 NO_2 Fall-off with Distance from the Road

Wherever possible, monitoring locations should be representative of ambient exposures that are not unduly influenced by highly localised point sources or influences on the targeted emission source. Busy road junctions, crossings or other obstructions should be avoided, and positions should adhere with the other principles of microscale siting criteria given in Schedule 1 SI1001/2010[17] so as to avoid any unrepresentative bias in local measurements.

Where it is not possible to meet all of these criteria, NO_2 may be measured at a location which will derive accurate measurements which are representative of ambient air quality in the area. The measurement can then be used to estimate concentrations at the nearest conceptual location of relevant for exposure, using well established principles of dispersion & dilution from the point of emission. This works particularly well for Nitrogen Dioxide emitted from linear sources – e.g. emitted by conventionally fuelled road vehicles on busy roads.

Distance correction is valid for any measurement not directly representative of relevant exposure, but the estimate is subject to some additional uncertainty. Defra's Diffusion

Tube Data Processing Tool applies a rule which requires distance correction where either or both of the following criteria apply;

- The closest receptor to the targeted source (usually a road link) is closer to the source than is the point of measurement, or;
- In all other cases, where bias-adjusted measured data falls within -10% of the long-term objective (i.e. where >36μg/m^3)

Table B.1 includes distance correction for 12 monitoring locations. In all cases, this is because there is relevant exposure closer to the target road link than the monitoring position. Affected locations are summarised in Table C.3 .

Table C.3 – Diffusion Tube Distance Corrections 2024

Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted	Background Concentration	Concentration Predicted at Receptor	Comments
2	11.0	-3.4	18.5	17.55	18.6	Monitor >10m further from kerb than receptor.
7B	8.0	-5.3	19.4	15.50	20.8	
8	2.5	-0.4	18.9	14.92	19.1	
10	43.5	-15.5	14.4	12.32	15.2	Monitor >10m further from kerb than receptor.
20	35.0	-17.1	22.3	17.55	20.9	
28	4.8	-2.3	19.8	15.50	30.4	
31	5.1	-1.6	20.9	12.44	21.8	
34	20.0	-13.3	16.5	12.43	18.8	Monitor >10m further from kerb than receptor.
36296_1	28.0	-20.0	24.4	13.24	26.9	

Appendix D: Map(s) of Monitoring Locations

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

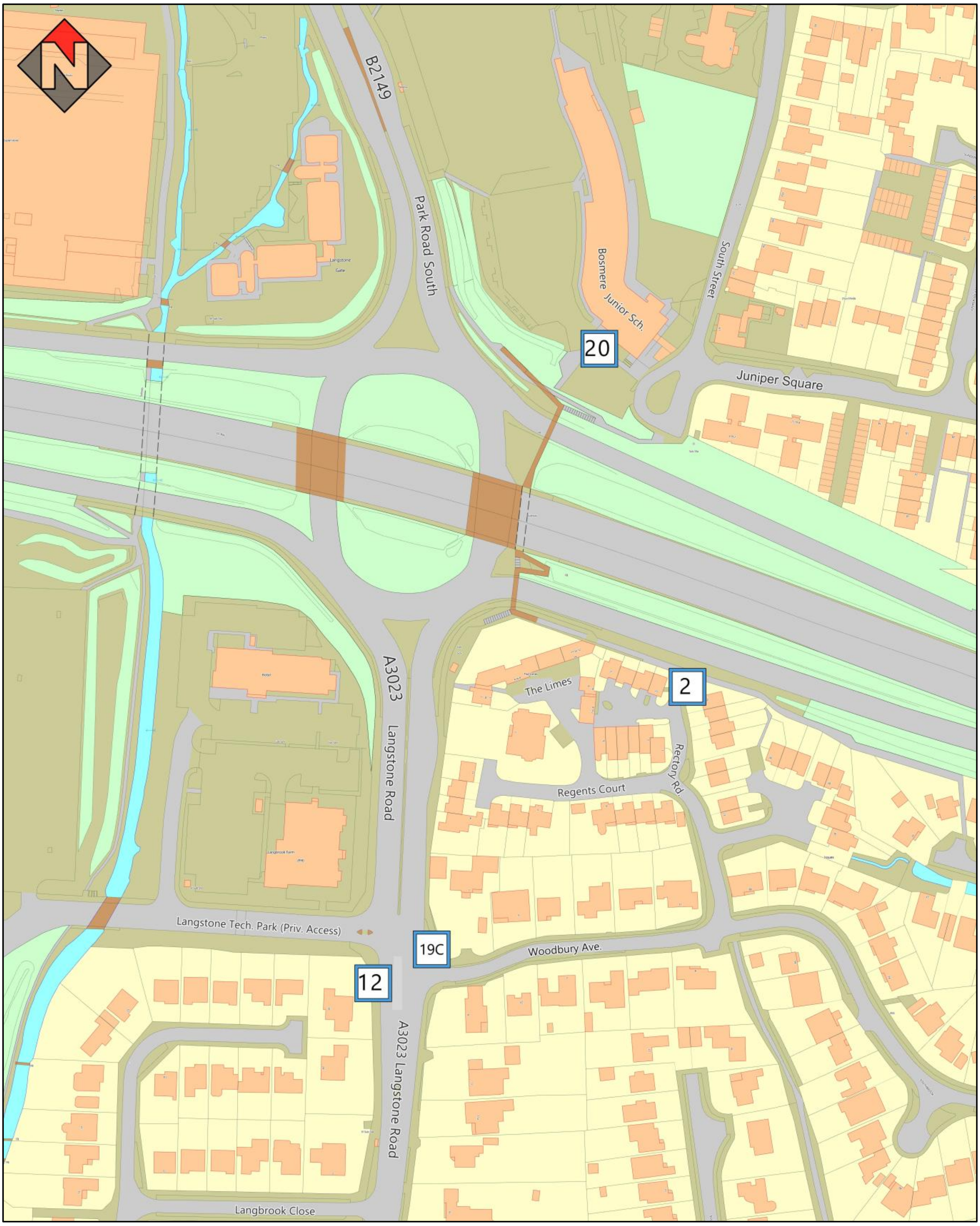

Figure D.2 – Map of Non-Automatic Monitoring Sites at A3023 (Hayling Island): Monitoring Site 3

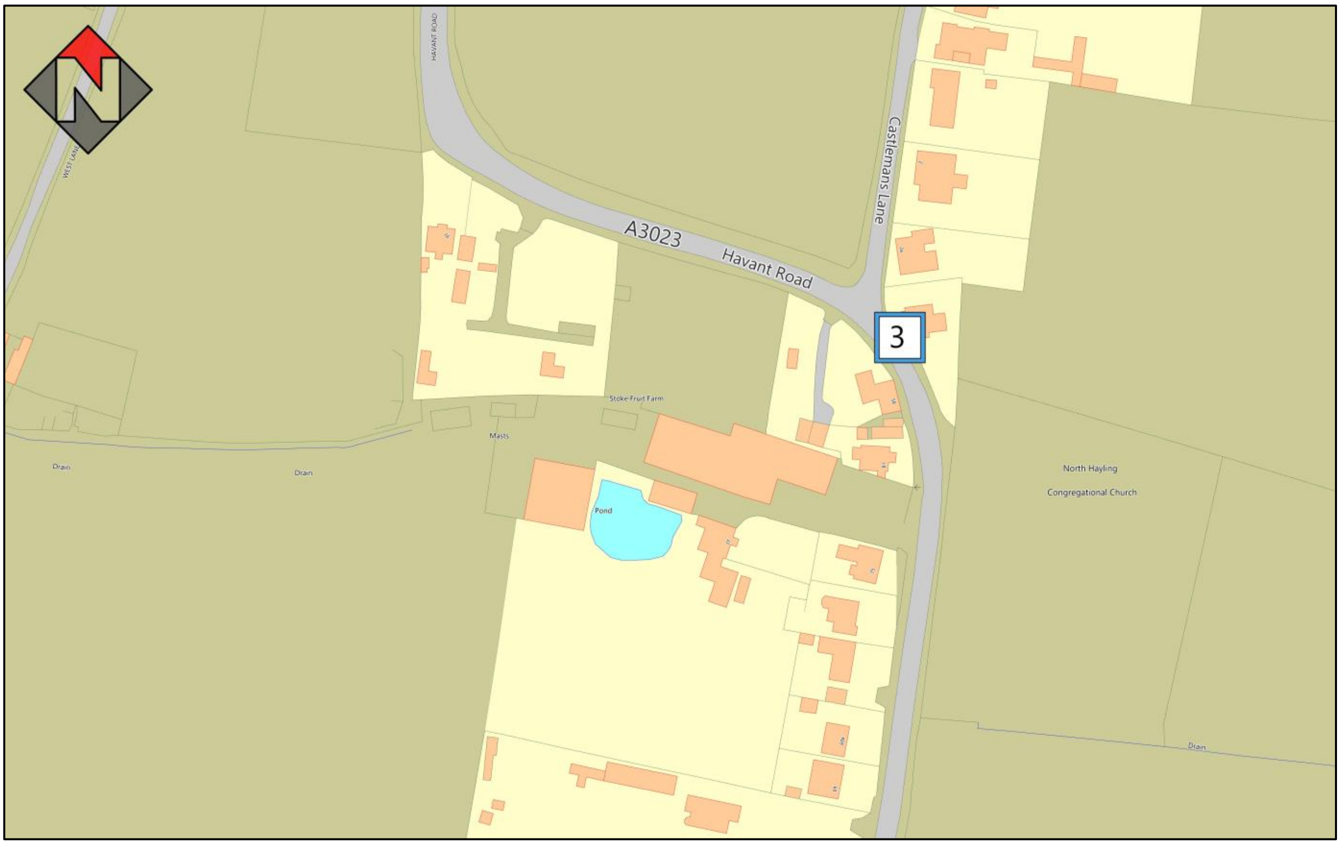

Figure D.3 – Map of Non-Automatic Monitoring Sites at Havant Bypass: Monitoring Site 4

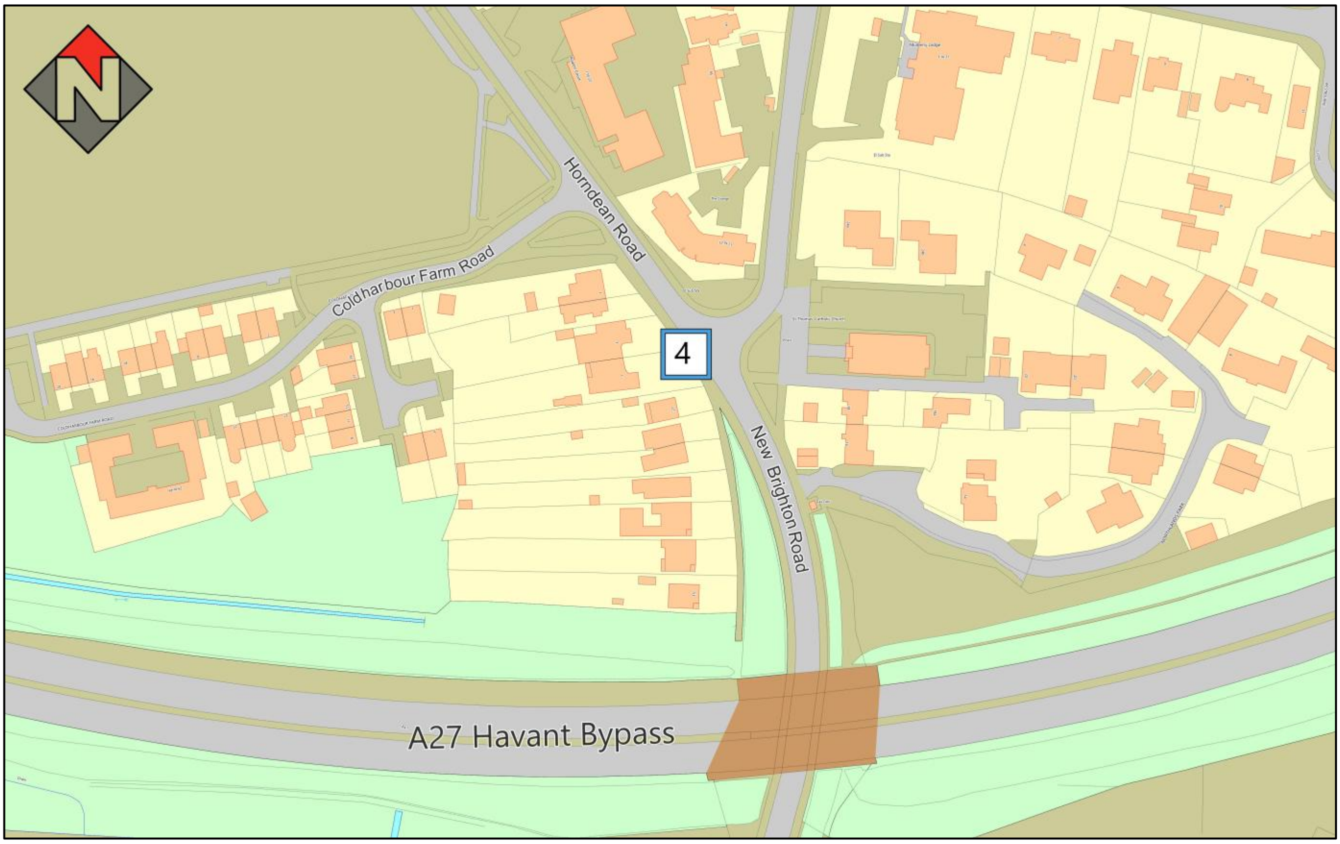

Figure D.4 – Map of Non-Automatic Monitoring Sites at Havant Centre (Solent Road Area): Monitoring Site 7B

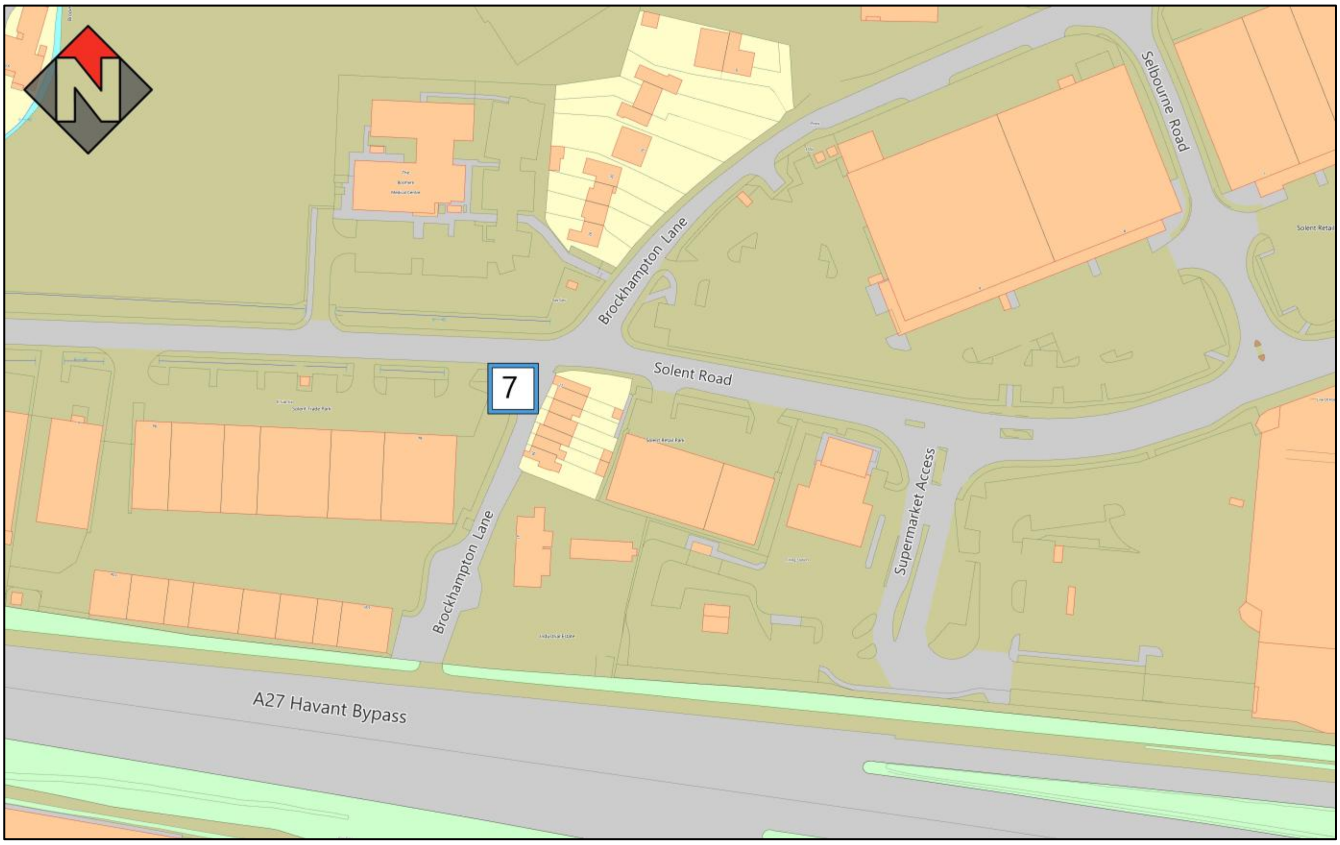

Figure D.5 – Map of Non-Automatic Monitoring Sites at A3 (Purbrook): Monitoring Site 8

Figure D.6 – Map of Non-Automatic Monitoring Sites at A3(M) Trunk Road (Waterlooville): Monitoring Site 10

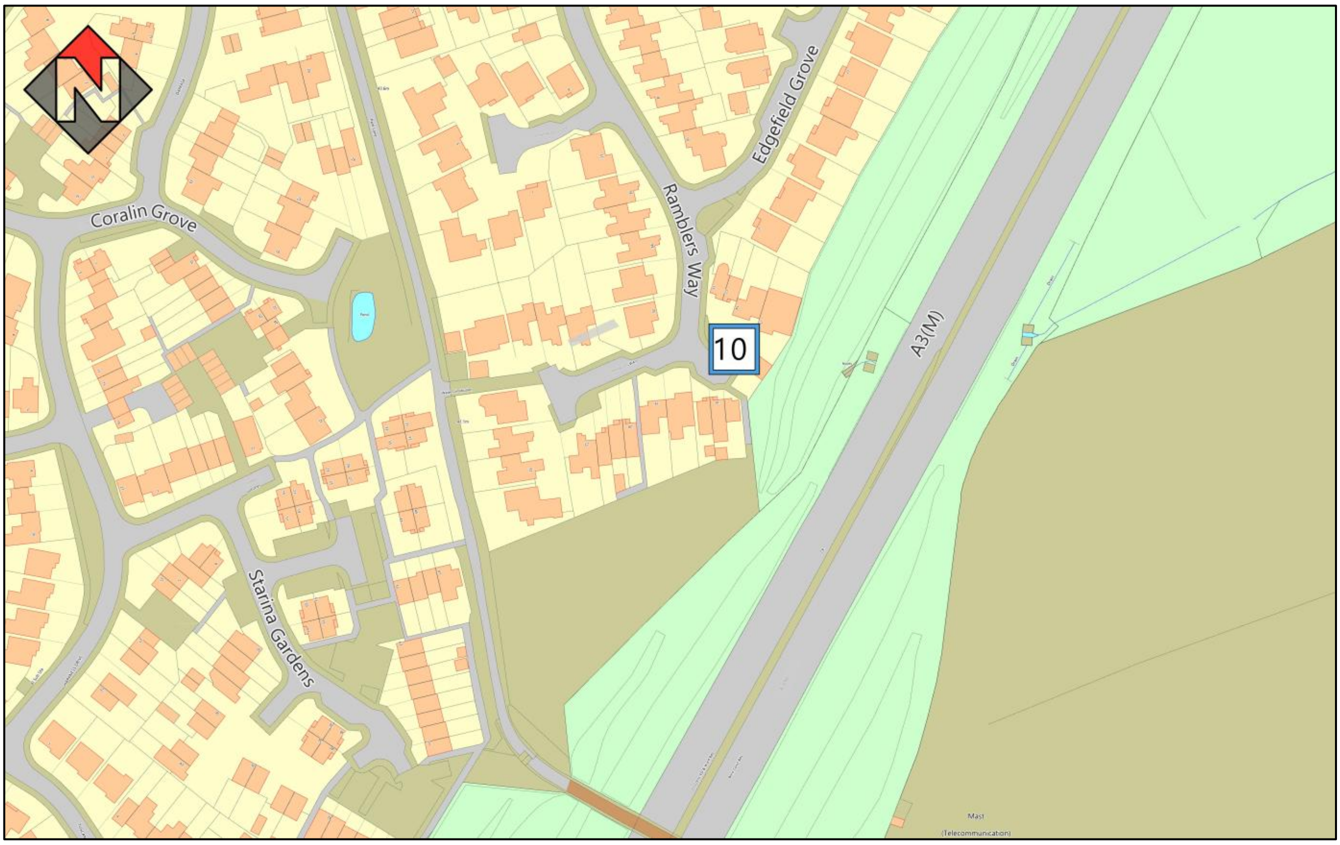

Figure D.7 – Map of Non-Automatic Monitoring Sites at Havant Centre (Civic Campus Area): Monitoring Site 14

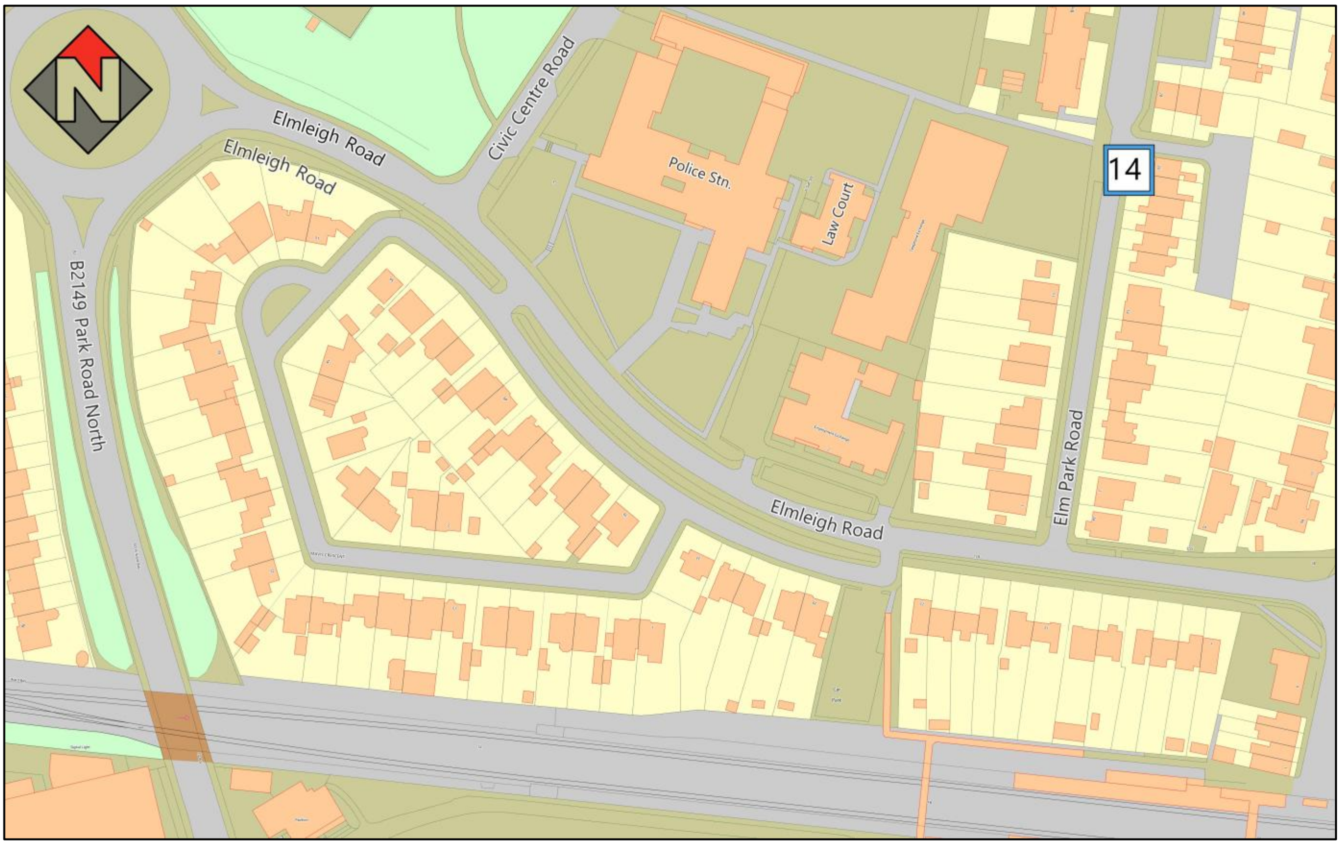

Figure D.8 – Map of Non-Automatic Monitoring Sites at Waterlooville Centre: Monitoring Sites 18

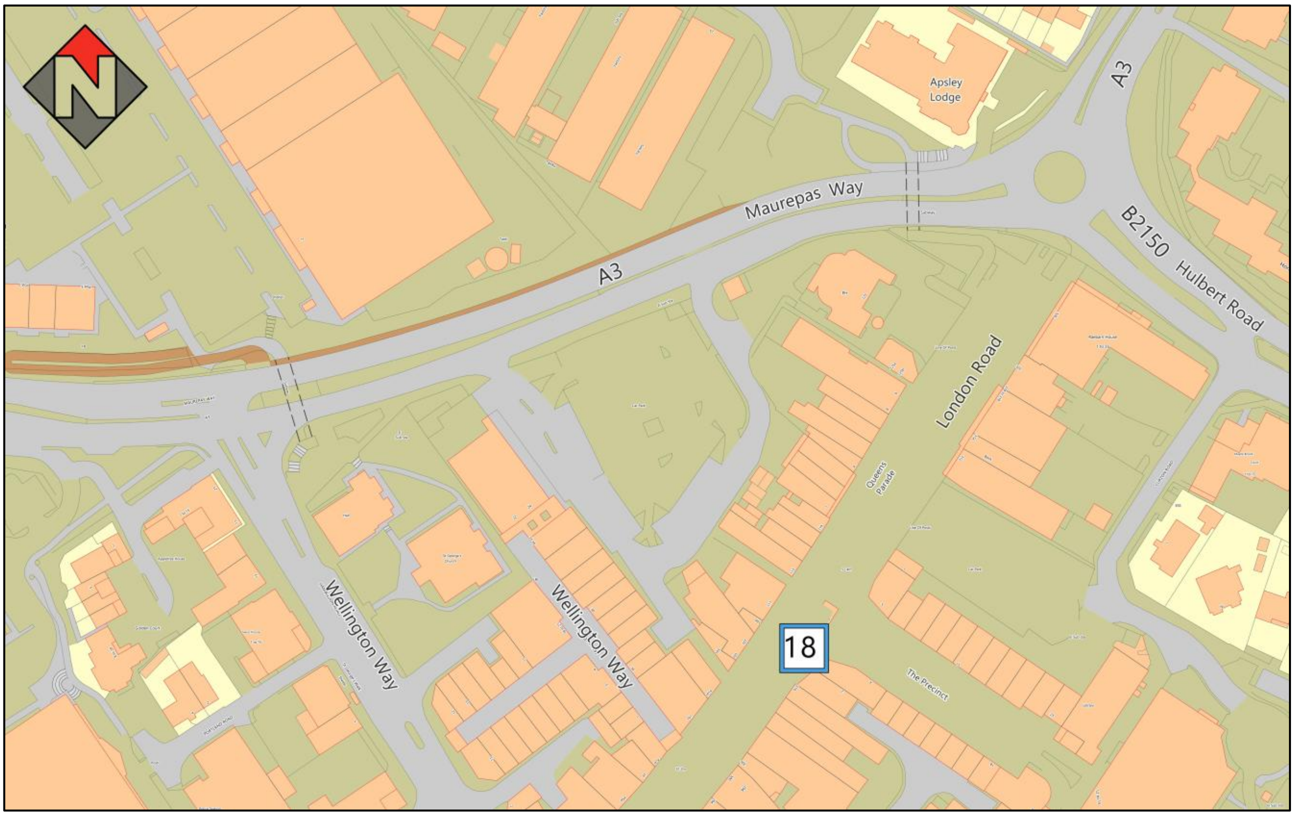

Figure D.9 – Map of Non-Automatic Monitoring Sites at Crookhorn: Monitoring Site 25B

Figure D.10 – Map of Non-Automatic Monitoring Sites at Havant Centre: Monitoring Sites 22, 27, 28

Figure D.11 – Map of Non-Automatic Monitoring Sites at Emsworth Centre: Monitoring Site 30

Figure D.12 – Map of Non-Automatic Monitoring Sites at East Havant: Monitoring Site 31

Figure D.13 – Map of Non-Automatic Monitoring Sites at Waterlooville Centre: Monitoring Sites 33 and 34

Figure D.14 – Map of Non-Automatic Monitoring Sites at Waterlooville Centre: Monitoring Site 35

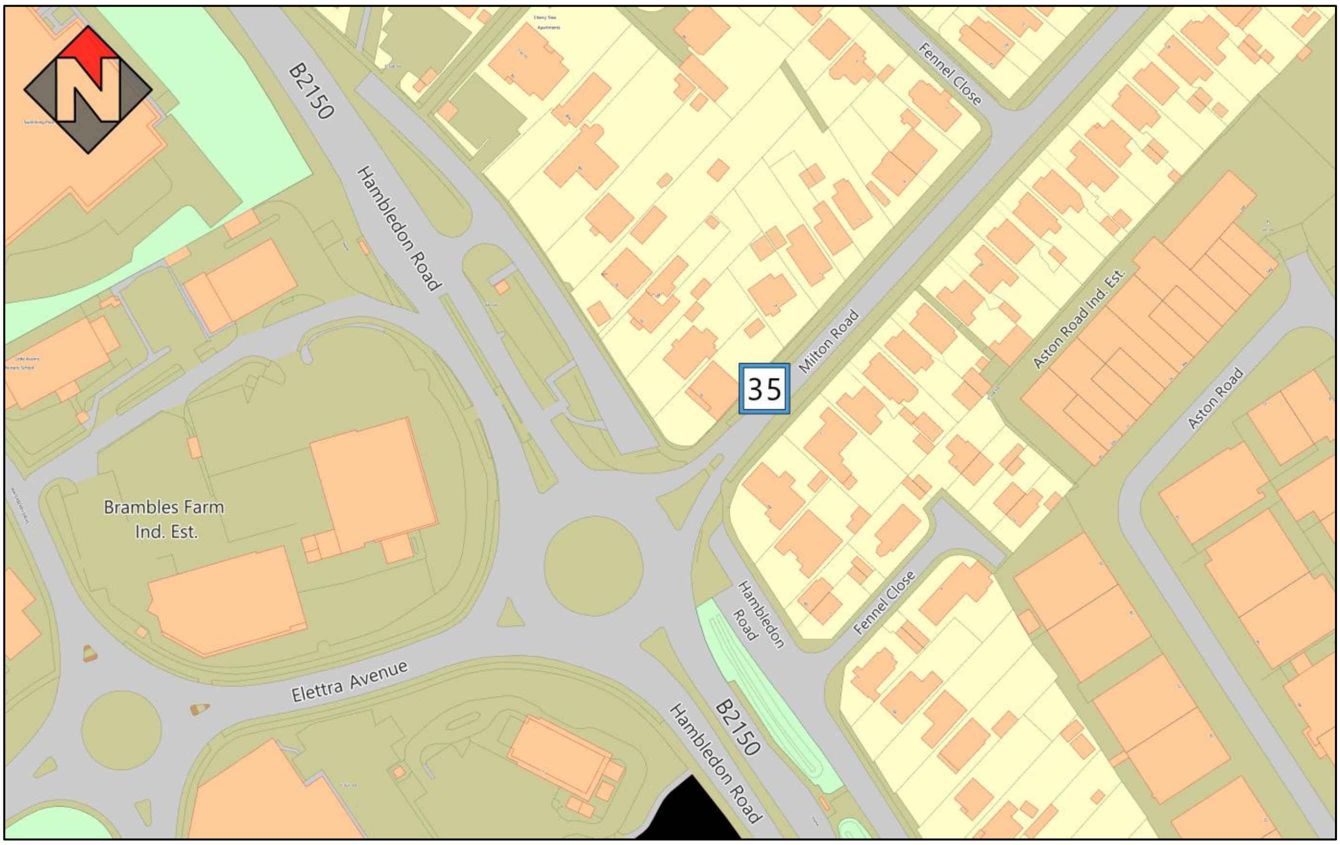

Figure D.15 – Map of Non-Automatic Monitoring Sites at Havant Centre B2149 (Civic Campus Area): Monitoring Site W10

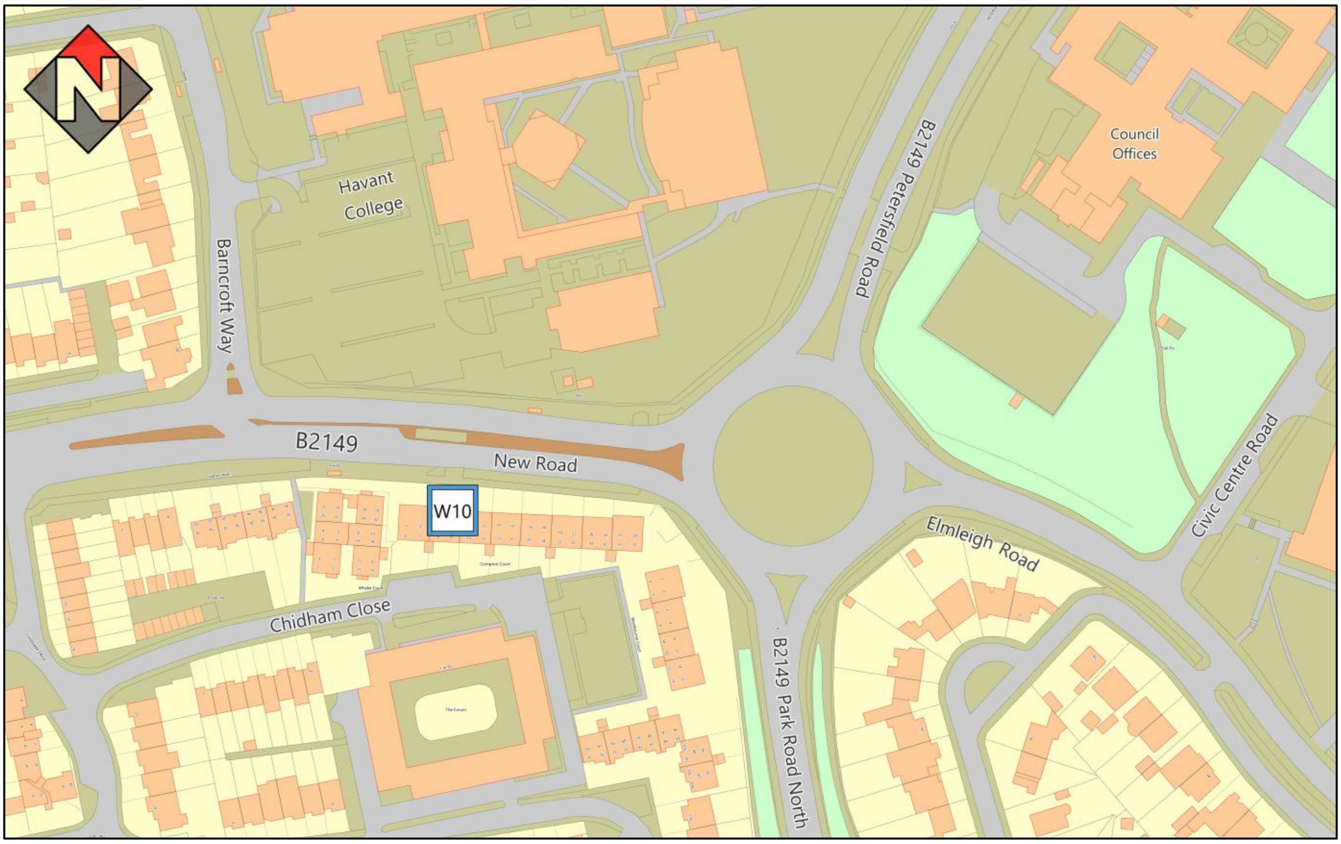

Figure D.16 – Map of TRL Triplicate Position, Non-Automatic Monitoring Site 36296_3 - A27 SRN; Pook Lane

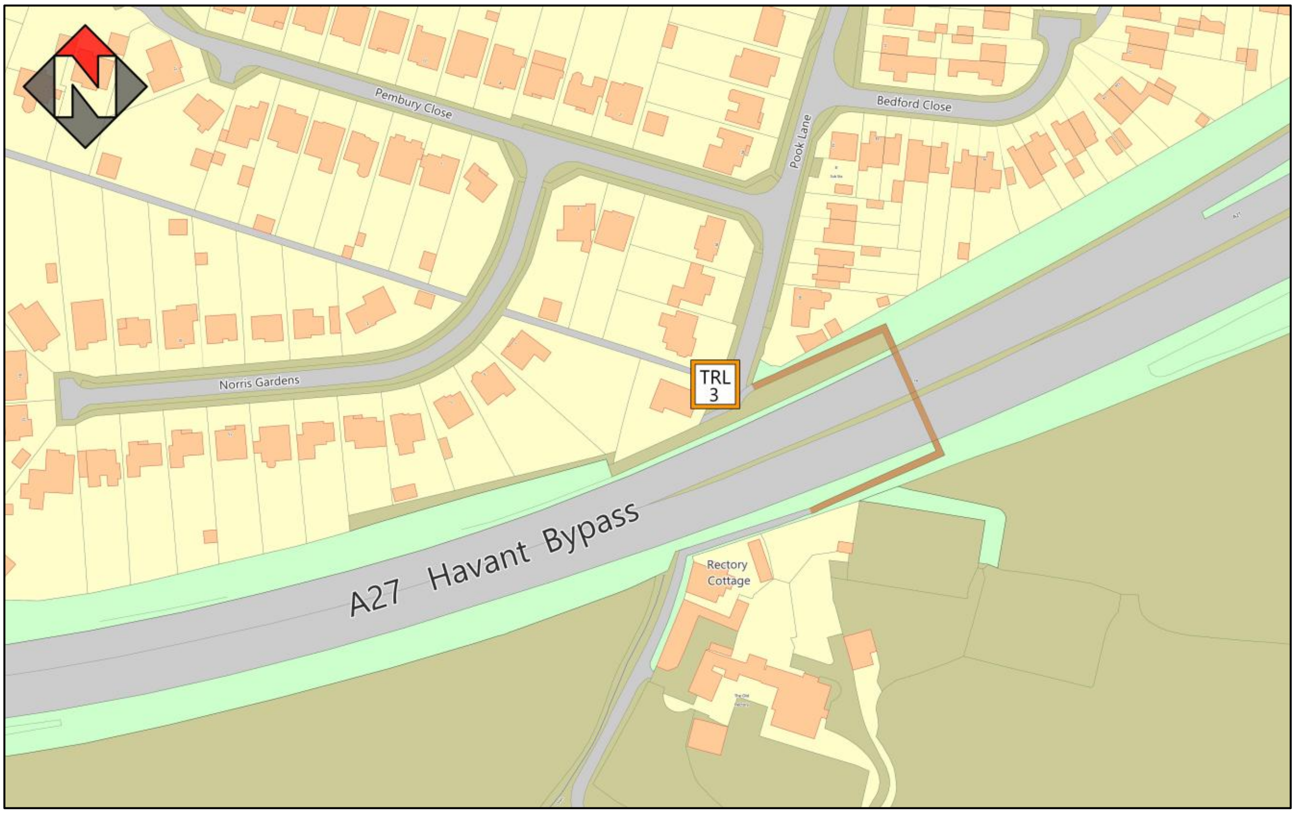

Figure D.17 – Map of Non-Automatic Monitoring Sites at Warblington School: Monitoring Sites 37 & 38

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – LAQM Air Quality Objectives in England[31]

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
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

[31] 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. **Support 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[32].

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 Carbon Literacy & smaller schemes run by charitable and not-for-profit organisations[33,34,35,36]. 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

[32] Chartered Institute of Personnel and Development. Flexible Working Task Force, 2022. Available at: https://www.cipd.org/uk/about/public-policy/public-policy-partnerships/flexible-working-taskforce/

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

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

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

[36] Carbon Literacy Project (Organisations): https://carbonliteracy.com/organisation/

emission equipment, for example low-NOx Boilers and Furnaces (Gas or Oil), or 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[37].

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.

[37] Department for Transport. Low-emission vehicles eligible for a plug-in grant, 2025. Available at: https://www.gov.uk/plug-in-vehicle-grants

Good planning can contribute to the achievement of a range of benefits for the business, including assisting attainment of carbon reduction targets, and contributing 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[38].

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[39] 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 Western Railway for journeys within the Portsmouth Area, alongside a similar discount on Southern Rail.
    b. Access to Salary-Sacrifice schemes for leasing an Electric vehicle (EVs), with benefit in kind taxation rates as low as nil-rated, depending on the vehicle. Discounts on home charger installation and service contracts are also available, alongside similar discounts on electric mopeds & motorcycles.
    c. Free or discounted membership to Car Clubs & a ride-sharing platform: 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 in some regions 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.

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

[39] Trave Green Easit NETWORK. Available at: https://www.easit.org.uk/

7. **Green the workplace:** there is growing evidence of the benefits of natural planting and air quality. Plants in leaf intercept particulate pollutants, and 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.
8. **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 that Europeans spend at least 90% of their time indoors[40], 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

[40] Defra Air Quality Expert Group Indoor Air Quality 2022

National Air Quality Strategy (NAQS), but does also include Nitrogen Oxides and Particulate Matter.

Sources of Particulate Matter within the home include cooking, tobacco smoke, candles, scented oils and incense, aerosols, and the use of wood burners. Gas combustion for cooking & heating, as well as combustion of solid fuels (e.g. wood burners) all represent sources of Nitrogen Oxides (both NO and NO_2). Properly installed gas central heating does not release pollutants within the home; however, it's external flue might represent a significant source of NO_2 to an immediate neighbour, or even to your own property via an open window or vent.

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

The websites for the National Clean Air Day[41] and #WeShareAir Campaign[42] 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 personal 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.

[41] Action for Clean Air. Clean Air Day, 2024. Available at: https://www.actionforcleanair.org.uk/campaigns/clean-air-day

[42] HUBBUB #AirWeShare. Available at: https://hubbub.org.uk/what-to-do-about-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 & it's rate of absorption - 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), 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[43]). 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 materially reduce your exposure. It is well known that (for a variety of reasons), children are more sensitive to air pollution; if walking with

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

children when the roads are busy (e.g. travelling to school), keep them on the inside and 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 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. Heavier vehicles also produce more particulates from the wearing of tyres, brake pads, and the road surface.

e. **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 during sub-optimal weather conditions (which can impact the per-charge-energy-yield of the battery). Several sources now publish handy 'true mpg' figures[44,45,46] to help you translate the manufacturers lab-test fuel efficiency figures to 'real world' driving conditions.

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

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

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

f. **Adopt a smooth driving style:** your driving style could make a substantial difference to your fuel costs and your 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 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.

g. **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.

h. **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. Where possible, choose tyres, brake discs and pads which have low particulate emissions.

i. **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[47], or talk to your school about setting up a 'Park and Stride' scheme[48] to reduce school gate congestion and unnecessary emissions where children may be exposed to significant levels of pollutants.

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[47] Living Streets. WOW – The Walk to School Challenge, 2025/26. Available at: https://www.livingstreets.org.uk/products-and-services/projects/wow

[48] Living Streets. Tackling Congestion with Park & Stride, 2025. Available at: https://www.livingstreets.org.uk/walk-to-school/park-and-stride/

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 a 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 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[49]). 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[50], and an excellent short tutorial video, alongside great advice on fuel selection and pollution reduction on the BurnRight industry website[51].
    b. **Avoid use of flueless gas fires in closed rooms**, or for excessive periods. Health and Safety Executive research[52] 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

[49] Defra. Authorised/Certified Fuels, 2025. Available at: https://smokecontrol.defra.gov.uk/fuels-php/england/

[50] Ready to Burn. Available at: https://www.readytoburn.org/

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

[52] 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://webarchive.nationalarchives.gov.uk/ukgwa/20241207093754mp_/https://www.hse.gov.uk/research/rrpdf/rr023.pdf

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; 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 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 $\mu g/m^3$ 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 open ventilation connected 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. It might also be possible to provide alternative ventilation to the affected room.

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[53] for your nearest site. HBC also offers a green waste collection service from just £42/yr[54], saving you the trips to your local HWRC.

f. **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

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

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

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.

g. **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.
    - Battery powered garden tools now provide a viable cordless alternative to petrol-engine versions. Plug-in electric e-cycles, mopeds & motorcycles are excellent alternatives to a traditional petrol scooter or moped for local trips – motorcycles with up to an 11kW motor may be ridden with just a CBT.
    - 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).
    - 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 or battery energy storage could maximise your local benefit; allowing you to use the generated energy when you need it, minimising the energy you need to purchase.

h. **"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 uncontrolled 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[55] has some great advice on cutting your energy bills, and lower bills means lower pollution.

i. **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, contributing to national emissions, and representing a significant source of 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 or 'pollution legacy' options such as nuclear.

j. **Choose a renewable energy tariff:** your choice of tariff sends a message to generators and will contribute to their strategic investment decisions. In terms of air pollution, renewable sources reduce both the primary and secondary emissions produced by traditional power stations. Nuclear power is 'clean' in respect of it's emissions to air, but 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

[55] The Energy Saving Trust. Quick tips to save energy, Updated June 2025. Available at: https://energysavingtrust.org.uk/hub/quick-tips-to-save-energy/

renewable sources is needed to adequately address both carbon and pollution issues.

k. **Support sustainable power generation projects:** official government statistics[56] show that public support for renewable energy generation is high, at 80%. This has fallen from it's peak in 2021, and the while opposition low (<10%), it is starting to grow. This is especially so in the case of on-shore wind, for carbon capture projects, and for enabling technologies such as transmission infrastructure (e.g. pylons). Voicing your support at the planning stages could improve the chances of a scheme achieving permission and contributing to our rates of clean and green energy generation.
l. **Put your savings to work & invest in sustainability:** Numerous providers now offer affordable, and in some cases, fee-free, stocks & shares ISA's which provide customers a way to invest in renewable energy generators, public infrastructure and energy-efficiency investment trusts, alongside companies in supporting industries. Many pay cash dividends with yields far in excess of interest rates available on easy-access savings accounts, and you have the benefit of knowing that your savings are contributing to driving down pollution and tackling climate change – a win-win (always use reputable providers, and seek competent independent investment advice)

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 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,

[56] Department for Business, Energy and Industrial Strategy. Energy and Climate Change Public Attitudes Tracker: Spring 2025, July 2025. Available at: https://www.gov.uk/government/statistics/desnz-public-attitudes-tracker-spring-2025

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[57], and there's some good information available on their 'Clean Air Campaign' pages[58], including national air pollution maps. Greenpeace[59] 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.

[57] Havant Friends of the Earth; https://www.havantfoe.org.uk/

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

[59] 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
AD	Attributable Deaths. An estimate of the number deaths attributable to long-term exposure to air pollution in a local area derived by multiplying the attributable fraction (AF) by the total number of annual deaths in the local area. Subject to the same caveats as described under AF.
AEI	Average Exposure Indicator. Metric used for calculating performance against the current reduction target under Part 4 of SI 2010/1001
AF	Attributable Fraction. An estimate of the proportion of local deaths attributable to long-term exposure to anthropogenic air pollution. Based upon morbidities to which air pollution is a contributory factor, but which may have other significant- (or even dominant-) causes. Represents a fractional share of this broader group, expressed as a percentage (%) of total deaths. Total deaths is usually defined on an 'all causes-' or 'all non-accidental-' basis, but where specified AF may represent a proportion of a more specific sub-group.
AMCT	Annual Mean Concentration Target. National target for annual average urban background $PM_{2.5}$ exposures, specified in Part 2 of SI 2023/96. 10 μg/m^3 , calculated nationally using an average of all 'relevant monitoring stations' where >85% capture has been achieved.
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
CRF	Concentration Response Function
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

Abbreviation	Description
EU	European Union
EV	Electric Vehicle
FDMS	Filter Dynamics Measurement System
HCC	Hampshire County Council
HGV	Heavy Goods Vehicle
HITA	Hayling Island Transport Assessment
HR	Hazard Ratio; The chance of an event (e.g. death) occurring in an exposed group, relative to that of a theoretical unexposed group, as determined by comparison of an *instantaneous* hazard risk rate between the assessed groups, usually derived from a survival analysis. In it's simplest form, HR is equivalent to Relative Risk (RR)
HWRC	Household Waste Recycling Centre
ICE	Internal Combustion Engine – traditional petrol or diesel engines of any types. Also includes LPG fuelled vehicles.
ICT	Information and communications technology
kWh	Kilowatt hour
LAQM	Local Air Quality Management
LDV	Light Duty Vehicle
LED	Light-emitting diode
LES	Low Emission Strategy
LEV	Low Emission Vehicle
LPG	Liquified Petroleum Gas
LZC	Low or Zero Carbon
NERT	National Exposure Reduction Target (Expired). Reduction target for $PM_{2.5}$ specified in Schedule 7 of SI 2010/1001, to be met my 2020. -0% to -20%, calculated nationally by comparing a rolling 3-year average against a baseline average calculated across 2009-2011.
MDF	Medium-density fibreboard
MPG	Miles per gallon
MHCLG	Ministry of Housing, Communities and Local Government
MVHR	Mechanical Ventilation with Heat Recovery
NAQS	National Air Quality Strategy
NGO	Non-governmental organization
NHS	National Health Service

Abbreviation	Description
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPPF	National Planning Policy Framework
OHID	HM Government Office for Health Improvement & Disabilities
OSB	Oriented strand board
PCC	Portsmouth City Council
PEI	Population Exposure Indicator.
PERT	Population Exposure Reduction Target. Exposure reduction target for $PM_{2.5}$ specified in Part 3 of SI 2023/96; -35%, calculated nationally using the specific method outlined in Schedule 1, comparing a rolling 3-year average against a baseline average calculated across 2019-2021.
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
RR	Relative Risk; Sometimes referred to as risk ratio. The *cumulative* incidence rate of an event (e.g. death) occurring in an exposed group, relative to that occurring within an theoretical unexposed group, usually derived from a cohort study. Similar to Hazard Ratio (can be identical). Where RR = 1, exposure has no adverse or beneficial effect. An RR >1 indicates that the risk of the outcome is increased by the exposure, a "risk factor"
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
TRL	Transport Research Laboratory
ULEV	Ultra-Low Emission Vehicle
UKHSA	UK Health Security Agency
WHO	World Health Organisation

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