



2018 Air Quality Annual Status Report (ASR)

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

June 2018

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Executive Summary: Air Quality in Our Area

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Around 40,000 deaths are attributable to exposure to outdoor air pollution. Linked to cancer, asthma, stroke and heart disease, diabetes, obesity, and changes linked to dementia¹

Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{2,3}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion⁴.

The Council has a duty to review and assess air quality within its district under Part IV of the Environment Act 1995 and this Annual Status Report has been prepared to fulfil this requirement.

Air pollutants can arise from a variety of sources, including transport and industry. Pollutant levels are assessed against health based national air quality objectives. Where the objectives are not met, Air Quality Management Areas (AQMA's) must be declared and an Action Plan put in place to improve air quality in these areas.

Air Quality in North Somerset

North Somerset is a unitary council in the West of England, bounded by the River Avon in the north, and the Mendip Hills to the south. It covers an area of approximately 145 square miles and has a population of around 210,000 people⁵.

North Somerset is strategically placed, close to the major cities of Bristol and Cardiff and with excellent transport links, including Bristol Airport, the M5 motorway, five railway stations on the main line to the south west and the Royal Portbury Dock, which has the largest entrance lock of any UK port. It is also a beautiful area with lovely countryside and 25 miles of coast attracting over 8m visitors a year. A large

¹ (<https://www.rcplondon.ac.uk/projects/outputs/every-breath-we-take-lifelong-impact-air-pollution>)

² Environmental equity, air quality, socioeconomic status and respiratory health, 2010

³ Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

⁴ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

⁵ <http://www.n-somerset.gov.uk/corporate-peer-challenge/our-area/>

part of North Somerset is classified as either green belt or an Area of Outstanding Natural Beauty.

North Somerset is classified as 'urban with significant rural' with almost 40% of residents living in rural communities or 'rural hub towns.' The largest settlement is Weston-super-Mare, which with a population of 76,000 is already the third largest settlement in the West of England and with significant expansion planned, is likely to overtake Bath during the next decade.

There are three other towns: Portishead, Clevedon and Nailsea and many villages of varied size and character.

The main air pollutant of concern locally is nitrogen dioxide (NO₂), which originates primarily from road traffic emissions.

North Somerset Council carried out monitoring for nitrogen dioxide at 26 sites across the district in 2017. The results of the monitoring for 2017, as with previous years shows that the levels of NO₂ across the district are all below the annual air quality objective of 40µg/m³. As such no air quality management areas have been declared in North Somerset. In light of this North Somerset Council has not had to introduce an Action Plan to improve air quality in the area.

Actions to Improve Air Quality

As noted above, North Somerset Council has not declared any air quality management areas within the district, therefore no formal air quality action plan is in place. However, the measures outlined in the Joint Local Transport Plan 3⁶, will help to ensure that the levels of air pollutants within North Somerset will continue to remain below the air quality objectives.

In addition North Somerset Council is participating in a scheme in conjunction with Bristol City Council, South Gloucestershire Council and Bath and North East Somerset Council to replace its fleet of passenger and light goods vehicles with electric versions. Highlights of this scheme include:

⁶ <https://s3-eu-west-1.amazonaws.com/travelwest/wp-content/uploads/2015/05/joint-local-transport-plan.pdf>

North Somerset Council

- Match funded grant from the Office of Low Emission Vehicles (OLEV) of £130,00, with the main aim to replace 20% of the Council's fleet with electric vehicles by 2021. However, greater progress has been made with the 20% target already achieved (35 Vehicles). The aim is now to convert all of the fleet by 2021.
- Improvements to the public charging network. At present there are 200 charging points in the West of England area, with 11 of those in North Somerset. The aim is to double the amount of charging points in the West of England region by 2021.
- A grant of £350,00 from OLEV for North Somerset Council to design and build the first K:Port, which is a four vehicle demonstration charging hub, offering rapid 50kW EV charging, which takes around 20-30 minutes to fully top up a car battery. It is hoped that this will be up and running by December 2018. Further details can be found at <http://www.n-somerset.gov.uk/news/electric-charging-planned-to-get-easier-in-portishead/>.
- Influencing change through policy incentives such as allowing bus lanes and high occupancy vehicle lanes to be used by electric cars and providing free on street parking where electric cars can charge.
- The Weston-super-Mare Town Centre Regeneration Supplementary Planning Document⁷ requires at least 10% of the total parking spaces at new builds to include superfast charging points with a minimum of 1 space. In addition, to future-proof car parking areas passive provision is to be included to support the provision of charging points for 40% of spaces in the longer term.
- Encouragement and promotion to our licensed private hire taxis and Hackney Carriages to convert to electric vehicles. At present there is no formal requirement within the taxi policy for the use of electric vehicles. However, we will work jointly with the licensing team to both encourage the use of electric vehicles through updating the taxi policy at its next review.
- North Somerset Council's Public health have been reviewing North Somerset against the recently published NICE guidance on air quality (Air pollution:

⁷ <http://www.n-somerset.gov.uk/wp-content/uploads/2015/12/Weston-super-Mare-Town-Centre-Regeneration-Supplementary-Planning-Document.pdf>

outdoor air quality and health, 2017). Initial findings are included in appendix F and an action plan is being developed through the North Somerset Health Protection Assurance Group

Conclusions and Priorities

The results of nitrogen dioxide monitoring in 2017, as with previous years show that the levels of NO₂ across the district are all below the annual mean air quality objective of 40 µg/m³. As such no air quality management areas have been declared in the district and no air quality action plan has been put in place.

Notwithstanding this North Somerset Council will continue to promote measures to improving air quality in the district through the Joint Local Transport Plan 3. In addition we will continue to work with colleagues in Public Health to ensure measures such as schemes to make people more active (<http://www.n-somerset.gov.uk/my-services/leisure/sport/getting-active/go4life/>) are implemented to ensure levels of nitrogen dioxide remain below the air quality objective.

Local Engagement and How to get Involved

Everyone can help to improve air quality in North Somerset Council and beyond. By making informed personal choices, particularly with regards to travel, can help to improve air quality and improve health in the process. This includes but is not limited to:

Active travel

Cycling and walking which helps to reduce air pollution whilst also improving people's health

Car sharing

Car sharing along with helping to improve air quality can have a number of other significant benefits, including reducing congestion and costs. There are a number of car share schemes in operation within North Somerset and the wider area. Further details can be found at <https://travelwest.info/drive/car-sharing>.

Use of Electric Vehicles

Electric vehicles can help to reduce emission of air pollutants, as well as having the added benefits of reducing running costs. Further information on electric vehicles can be found at <https://travelwest.info/drive/electric-vehicles>.

Eco Driving

Eco driving is a term used to describe energy efficient use of vehicles. It is a great and easy way to reduce vehicle fuel consumption from road transport so that less fuel is used to travel the same distance.

In the last decades, engine technology and performance of cars has improved rapidly, while most drivers have not adapted their driving style. Ecodriving represents a driving culture, which suits to modern engines and makes best use of advance vehicle technologies. Ecodriving offers numerous benefits, including greenhouse gas emission reductions, fuel cost saving, as well as greater safety and comfort.

Use of Public Transport

The Travelwest website (<https://travelwest.info/>) provides detailed information on public transport in the West of England, including bus and rail timetables, cycle and walking route planners and details of Park and Ride schemes in the area.

In addition to reducing air pollution from road traffic, other measures that could be considered include:

- Upgrading domestic boilers to newest and most fuel efficient condensing boilers with lowest NO_x (and carbon) emissions.
- “Clean” renewable energy generation, for example solar photovoltaics, air source heat pumps etc.
- Using DEFRA approved appliances and smokeless fuels suitable for use in a smoke control area, whether you are in a smoke control area or not⁸
- Use of appropriate fuels in woodburners/open fires⁹

⁸ (<https://smokecontrol.defra.gov.uk/appliances.php?country=england>).

⁹ (https://uk-air.defra.gov.uk/assets/documents/reports/cat07/1712041200_171010_open_fires_wood_burning_stoves_FINAL.pdf

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1 Local Air Quality Management

This report provides an overview of air quality in North Somerset Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

North Somerset Council currently does not have any AQMAs. For reference, maps of North Somerset Council's monitoring locations are available in Appendix D.

2.2 Progress and Impact of Measures to address Air Quality in North Somerset Council

Defra's appraisal of last year's ASR concluded the following:

The Report sets out the Annual Status Report, which forms part of the Review & Assessment process required under the Environment Act 1995 and subsequent Regulations.

The Local Authority has no AQMAs, and consequently there is no current air quality action plan. The report covers NO₂ monitoring data, and includes details of measures the Council is pursuing to address improvements in local air quality.

The report highlights there are no exceedances of the annual mean objective for nitrogen dioxide or any other regulated pollutant within the Borough. The highest measured concentration in 2016 was 30.4µg/m³ at Felton Primary School. This value was corrected for distance to the relevant receptor location. The overall trend for the past 5 years indicates a slight decline in concentrations of NO₂. Additional monitoring is undertaken at Bristol Airport as part of a Section 106 planning agreement linked to the expansion of the airport. Results for 2016 show that NO₂ concentrations are stable and remain below the annual mean AQ objective.

In response to comments made in respect of the 2016 ASR, the local authority has reviewed its monitoring strategy and has discontinued a number of sites where monitoring is not effective and has added additional sites in other locations within the district including at a number of schools. The results for the new monitoring locations are to be reported in the next ASR in 2018.

The local authority has indicated the steps it is taking to address PM_{2.5} emissions identifying the current Local Transport Plan (LTP3) as providing key measures for ensuring that AQ is maintained at levels below the objectives within North Somerset. There are also clear links with Public Health and confirmation that AQ is integrated into the Joint Strategic Needs Assessment.

The report also highlights the AQ measures associated with encouraging the uptake of low emission vehicles through the West of England local authority partnership which is utilising OLEV funding to increase electric vehicle charging infrastructure and replace council fleet vehicles with EVs.

On the basis of the evidence provided by the local authority the conclusions reached are acceptable for all sources and pollutants,

Following the completion of this report, North Somerset Council should submit an Annual Status Report in 2018.

As discussed in Section 2.1 above, North Somerset Council does not have any air quality management areas and as such has not had to derive an air quality action plan. However, there are a number of strategies and plans in place, which will have a beneficial impact on air quality and are discussed further below.

2.2.1 Local Air Quality Strategy

An air quality strategy was published for the four “West of England” Local Authorities (Bristol, South Gloucestershire, Bath and North East Somerset and North Somerset) in 2003 and reviewed in 2005¹⁰. Ideally, this strategy should be reviewed to ensure it remains up to date.

In summary, the objectives of the air quality strategy were to identify how North Somerset Council could assist in securing air quality improvements across the district.

The specific aims and objectives for North Somerset were as follows:

- To meet the national air quality objectives;
- To present the deterioration of air quality where it is already satisfactory;

¹⁰ (<https://www.n-somerset.gov.uk/wp-content/uploads/2015/11/air-quality-strategy.pdf>)

- To ensure North Somerset makes a contribution to the reduction of carbon dioxide emissions in line with national targets;
- To support policies such as the Local Transport Plan and North Somerset's Core Strategy; and
- To protect and enhance the environment so that plants, animals and people are free from the consequences of air pollution.

2.2.2 Joint Local Transport Plan 3

The West of England Joint Local Transport Plan 3 (JLTP3) was published in March 2011, and was written to deliver transport improvements to the four councils of Bath and North East Somerset, Bristol, South Gloucestershire and North Somerset. The JLTP3 covers the period 2001 to 2026 (<https://travelwest.info/projects/joint-local-transport-plan>).

Chapter 8.3 covers air quality and health. The JLTP3 predominantly looks to incorporate the air quality action plans for the AQMA's produced for Bristol, Bath and North East Somerset and South Gloucestershire.

Chapter 8.4 details the air quality strategy. The strategy focusses on the following:

Information, promotion awareness and alternatives

- Raising awareness of air quality issues;
- Providing information about air quality for residents and visitors, including those sensitive to high levels of pollution, such as elderly people or asthma sufferers;
- Reducing vehicle use by promoting more sustainable modes of transport;
- Encouraging use of lower emissions;
- Promotion of "eco-driving" training with focus on high mileage business users to encourage more fuel efficient driving;
- Encouraging behavioural change.

Network Management

- Urban Traffic Management and Control (UTMC) to help reduce emissions associated with stop-start driving and prioritise more efficient modes of transport such as buses;
- Relocating traffic queues away from areas where the air quality impact is likely to be detrimental;
- Work with Highways England through the Memorandum of Understanding on potential air quality improvements on the motorway and trunk road networks;
- Targets parking enforcement on key radial routes to reduce delays and congestion during peak periods;
- Using real time information to provide early warning of road works and other incidents to enable drivers to find alternative routes and help avoid local air pollution hot spots.

Signing

- Better signing to direct traffic, predominantly Heavy Goods Vehicles, onto the most appropriate routes and away from sensitive areas;
- Use of variable message and other enhanced signing for parking to reduce congestion caused by circulating traffic searching for parking spaces.

Partnership Working

- Partnership working with operators to achieve further upgrading of the bus fleet in the West of England;
- Increase the proportion of vehicles meeting the latest Euro Standards;
- Use developer contributions where appropriate and other sources of funding elements of Air Quality Action Plans;

Freight

- Work with the freight industry on ways and means of addressing the problem of Heavy Goods Vehicles emissions;
- Extend freight consolidation from Bristol to Bath to reduce the number of city centre deliveries;

- Work with the health sector on possible expansion of the consolidation centre for health deliveries;
- Undertake a Low Emission Zone feasibility study for the Bath AQMA linked to freight consolidation;
- Reduce emissions from council vehicle fleets.

Major ~Transport Schemes

- Rapid transit and enhanced bus and rail services, accompanied by improvements for pedestrians and cyclists, will provide attractive alternatives to the car, helping to reduce AQMA traffic levels.

Progress on the Joint Transport Plan can be found in the JLTP3 Progress Report 2016 (<https://travelwest.info/projects/joint-local-transport-plan>).

2.2.3 Climate Change Strategy

In 2013, North Somerset Council signed a Climate Local Agreement¹¹. In signing the agreement, North Somerset Council made a commitment to:

- Set locally owned and determined commitments and actions to reduce carbon emissions and to manage climate impacts. These will be specific, measurable and challenging;
- Publish our commitments, actions and progress, enabling local communities to hold us to account;
- Share the learning from our experiences and achievements with other Councils; and
- Regularly refresh our commitments and actions to ensure they are current and continue to reflect local priorities.

In 2018, the Council has refreshed its Climate Local Agreement. Further details can be found at <http://www.n-somerset.gov.uk/wp-content/uploads/2018/05/Climate-Local-Commitment-refresh-2018.pdf>.

¹¹ (<http://www.n-somerset.gov.uk/my-services/planning-building-control/planningpolicy/supplementary-planning-advice/guidance/climate-change/>)

2.2.4 Local Planning Policy

The Core Strategy for North Somerset was adopted in January 2017 and has a number of policies to guide development, with the principal relevant policy to air quality being CS3, Environmental Impacts and Flood risk Assessment.

Further information is available at: <http://www.n-somerset.gov.uk/wp-content/uploads/2015/11/Core-Strategy-adopted-version.pdf>.

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

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The introduction of this into local air quality management supports efforts to reduce exposure at national level and also links strongly to the public health agenda, in particular the Public Health Outcome Framework (PHOF)¹² which includes the following indicator:

- PHOF Indicator 3.01 Health Protection: Fraction of all cause adult mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter PM_{2.5}).

Estimates of mortality burden are based on modelled annual average concentrations of fine particulate matter (PM_{2.5}) originating from a human activities in each local authority area. Local data on the adult population and adult mortality rates is also used. The estimates of the fraction of mortality attributable to long-term exposure to human-made particulate air pollution range from approximately 3.0% in some local authority areas to 6 – 7% in some London boroughs.

In 2016, the most recent year for which data is available, the estimated fraction of mortality in North Somerset was 4.4%. This is below the average for England as a whole (5.3%). It is also comparable for the South West Region average of 4.5% but below the other West of England unitary authorities; South Gloucestershire (5.2%), Bristol (5.3%) and Bath and North East Somerset (4.7%).

The Council's Joint Strategic Needs Assessment (JSNA)¹³ also contains information on air quality impacts on the North Somerset population.

¹² <http://www.phoutcomes.info>

¹³ [Joint Strategic Needs Assessment](#)

North Somerset Council continues to recognise that local authorities are expected to work towards reducing emissions and concentrations of PM_{2.5} in their area.

In terms of the current situation with regard to PM_{2.5} concentrations locally, while there is no regulatory standard applied to the PM_{2.5} role for local authorities, the EU Ambient Air Quality Directive¹⁴ does however set out air quality standards for PM_{2.5}, which can act as a guide;

- Annual average EU limit value of 25µg/m³ by 2020.
- EU target value of 15% reduction in concentrations at urban background locations between 2010 and 2020.

North Somerset Council does not locally monitor for PM_{2.5} but the background maps published by DEFRA indicate that the annual average background levels of PM_{2.5} in North Somerset are 7.6 µg/m³, significantly below the EU limit value.

North Somerset Council is taking the following measures to address PM_{2.5}:

- Identifying measure that are already in place that can help reduce levels of PM_{2.5} through the implementation of the Joint Local Transport Plan, such as raising awareness of air quality issues, reducing vehicle use by more sustainable modes of transport and encouraging the use of lower emission vehicles.
- Continue to work with the Director of Public Health to promote measures to improve air quality, including promotion of active transport, implementation of measures to increase healthy, active lifestyles and ensure measures are implemented through improved urban planning e.g. improved cycle highways.
- Ensure that air quality continues to be considered as part of the Joint Strategic Needs Assessment (JSNA).

¹⁴ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32008L0050>

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

3.1 Summary of Monitoring Undertaken

This section sets out what monitoring has taken place and how it compares with the air quality objectives. Local authorities no longer have to report on the following pollutants; 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. National monitoring results are available on the DEFRA UK-Air (Air Information Resource) website¹⁵

3.1.1 Automatic Monitoring Sites

North Somerset Council does not undertake any automatic (continuous) monitoring.

3.1.2 Non-Automatic Monitoring Sites

North Somerset Council undertook non- automatic (passive) monitoring of NO₂ at 26 sites during 2017. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

Given that the all of the monitoring sites have shown that levels of NO₂ have consistently recorded levels below the air quality objective, North Somerset Council has reviewed the location of its monitoring sites in 2017. A number of sites have been discontinued and new monitoring sites established. These have focussed on other areas of the district, which have not previously been monitored, as well as outside schools adjacent to busy roads. Table 1.0 below shows the sites that have been discontinued and the new monitoring sites.

¹⁵ <https://uk-air.defra.gov.uk>

Table 3.1 Discontinued and New Monitoring Sites

Sites Discontinued	New Monitoring Sites
Long Ashton Park & Ride	Weston-super-Mare, Drove Road
Portishead, High Street	Weston-super-Mare, Mendip Green Primary School
Congresbury, Smallway	Congresbury (Station Road)
Churchill	Coxway, Clevedon
Weston-super-Mare, High Street	Pill (A369)
Weston-super-Mare, Winterstoke Road	Portishead, Wyndham Way
Banwell, The Gables	Backwell School
Banwell, East Street	Centre of Backwell

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³. Although some of the monitoring sites have been discontinued, they have been included in Table A.2 to show the trends in NO₂ annual mean concentration over the previous years.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

There have been no exceedences of the annual mean for NO₂ in 2017. Figure A.1. in Appendix A shows the trend of NO₂ over the past 5 years

3.2.2 Particulate Matter (PM₁₀)

North Somerset Council does not undertake any monitoring for PM₁₀.

3.2.3 Particulate Matter (PM_{2.5})

North Somerset Council does not undertake any monitoring for PM_{2.5}.

3.2.4 Sulphur Dioxide (SO₂)

North Somerset Council does not undertake any monitoring for SO₂.

3.2.5 Other Monitoring

3.2.5.1 Bristol Airport

Bristol Airport was granted planning permission in 2011 for the expansion of the airport to accommodate 10 million passengers per annum. As part of the planning permission, a Section 106 agreement was put in place, which amongst other things required the airport to undertake air quality monitoring in the vicinity of the airport.

In 2012, the airport installed a continuous air quality monitoring station, monitoring NO₂ and PM₁₀. The airport has also installed nine NO₂ diffusion tube monitoring locations around the airport.

Tables 3.1 and 3.2 below show the monitoring results for Bristol airport from 2012 to 2017. The monitoring locations are shown in Figure 20. The results show that the concentrations for all pollutants are below the air quality objectives.

Table 3.2 Results of Bristol Airport NO₂ Diffusion Tube Monitoring

Monitoring Location	Annual Mean					
	2012	2013	2014	2015	2016	2017
1	27	25	21	25	26	37
2	29	29	24	27	29	35
3	11	11	10	9	10	10
4	12	13	12	11	12	14
5	29	28	30	29	28	34
6	17	18	17	17	17	21
7 (co-located with continuous monitor)	21	20	16	19	20	24
8	29	29	25	27	31	38
9	21	16	15	17	18	24

Table 3.3 Continuous Monitoring Results for Bristol Airport

	Recorded Annual Mean						NO ₂ Means > 200µg/m ³					
	2012	2013	2014	2015	2016	2017	PM ₁₀ Daily Means > 50 µg/m ³					
	2012	2013	2014	2015	2016	2017	2012	2013	2014	2015	2016	2017
NO ₂	19	20	20	18	20	19	0	0	0	0	0	0
PM ₁₀	18	20	19	21	19	19	1	1	1	4	1	0

Appendix A: Monitoring Results

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
1	Weston-Super-Mare, Bedford Road	Other	332402	115984	NO2	NO	N/A	8	No	2.5
2	Weston-super-Mare, Drove Road	Roadside	332653	160764	NO2	NO	3	1	No	2.5
3	Weston-super-Mare, Herluin Way	Kerbside	334418	161261	NO2	NO	40	2	No	3
4	Weston-supre-Mare, Mendip Green Primary School	Roadside	335489	162435	NO2	NO	5	1	No	2.5
5	Weston-super-Mare, Willow Close	Roadside	337828	162769	NO2	NO	8	1.5	No	2.5
6	St Annes School	Roadside	339747	164198	NO2	NO	10	2	No	2.5
7	Congresbury (Station Road)	Kerbside	343630	163877	NO2	NO	6	1	No	2.5
8	Congresbury (The Plough))	Roadside	343914	163877	NO2	NO	18	1	No	2.5
9	Congresbury (The Cross())	Roadside	343761	163774	NO2	NO	17	1.5	No	2.5
10	Yatton High Street	Kerbside	343195	165520	NO2	NO	3	0.5	No	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
11	Coxway, Clevedon	Roadside	341578	170575	NO2	NO	4	76	No	2.5
12	Portishead, Wyndham Way	Roadside	347667	175712	NO2	NO	60	6	No	2.5
13	Portbury (Priory Road)	Roadside	349766	175441	NO2	NO	7	4	NO	2.5
14	Pill (Railway Line)	Other	352084	176273	NO2	NO	N/A	N/A	NO	2.5
15	Pill (A369)	Roadside	353159	174644	NO2	NO	15	2	No	2.5
16	Backwell (A370)	Roadside	348845	168750	NO2	NO	27	1	No	2.5
17	Downside Road (Holmllea)	Other	350920	165745	NO2	NO	N/A	20	No	2
18	Downside Road (Top 8)	Kerbside	351054	165665	NO2	NO	4	3	No	2
19	Felton Primary School	Roadside	351289	165479	NO2	NO	N/A	2	No	3
20	Bristol Airport (A38)	Roadside	350894	164716	NO2	NO	N/A	8	No	2.5
21	Banwell (East Street)	Kerbside	339973	159069	NO2	NO	6	2	No	2.5
22	Banwell (Wolvershill Road Junction)	Kerbside	339576	159222	NO2	NO	5	2	No	2.5
23	Banwell, Primary School	Roadside	339695	159173	NO2	NO	8	1	No	2.5
24	Banwell, Pedestrian Crossing	Roadside	339695	159185	NO2	NO	16	1	No	3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
25	Banwell Centre	Kerbside	339802	159151	NO2	NO	3	1	No	3
26	Banwell, Bowling Green	Other	339838	159166	NO2	NO	N/A	16	No	2.5

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
Weston-Super-Mare, Bedford Road	Other	Diffusion Tube	100	100	19	17.7	18.5	18.4	16.1
Weston-super-Mare, Drove Road	Roadside	Diffusion Tube	100	100	-	-	-	-	23.6
Weston-super-Mare, Herluin Way	Kerbside	Diffusion Tube	100	100	33.4	35.8	40.4	43	36.8
Weston-supre-Mare, Mendip Green Primary School	Roadside	Diffusion Tube	100	100	-	-	-	-	20.2
Weston-super-Mare, Willow Close	Roadside	Diffusion Tube	100	100	23.5	23.3	26.1	25.9	23.3
St Annes School	Roadside	Diffusion Tube	100	100	26.6	25.3	26.9	26.1	22.1
Congresbury, Smallway	Roadside	Diffusion Tube	100	100	29.5	28.2	30	31.8	-
Congresbury (Station Road)	Kerbside	Diffusion Tube	100	100	-	-	-	-	30.7
Congresbury (The Plough))	Roadside	Diffusion Tube	100	92	23.8	22.5	24.3	21.9	18.5
Congresbury (The Cross())	Roadside	Diffusion Tube	100	100	28	27.6	27.7	26.1	23.4
Yatton High Street	Kerbside	Diffusion Tube	100	92	23.8	20.1	20.9	20	22.6
Coxway, Clevedon	Roadside	Diffusion Tube	100	100	-	-	-	-	18.4
Portishead, Wyndham Way	Roadside	Diffusion Tube	100	100	-	-	-	-	24.7
Portbury (Priory Road)	Roadside	Diffusion Tube	100	100	24.9	22.8	23.0	23.9	20.3
Pill (Railway Line)	Other	Diffusion Tube	100	100	19.4	16.8	17	17.9	16.1
Pill (A369)	Roadside	Diffusion Tube	100	100	-	-	-	-	28
Backwell (A370)	Roadside	Diffusion Tube	100	100	-	-	-	-	22.7
Downside Road (Holmlea)	Other	Diffusion Tube	100	100	13.6	13.8	13.6	13.2	12.1
Downside Road (Top 8)	Kerbside	Diffusion Tube	100	100	27.2	25.8	28.3	29.1	23.9
Felton Primary School	Roadside	Diffusion Tube	100	100	31.3	26.4	42.8	40.7	40.7
Bristol Airport (A38)	Roadside	Diffusion Tube	100	100	21	23.8	24.1	23.5	20.8

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
Banwell (East Street)	Kerbside	Diffusion Tube	100	100	24.1	22.3	24.3	23.2	20.9
Banwell (Wolvershill Road Junction)	Kerbside	Diffusion Tube	100	100	27.6	24.9	27.4	25.3	22.2
Banwell, Primary School	Roadside	Diffusion Tube	100	100	21.1	23.1	26.4	24	22.1
Banwell, Pedestrian Crossing	Roadside	Diffusion Tube	100	100	26.9	24.9	28	26.6	22.5
Banwell Centre	Kerbside	Diffusion Tube	100	100	-	-	-	-	28.1
Banwell, Bowling Green	Other	Diffusion Tube	100	100	14.9	12.9	13.9	13.8	11.9
Long Ashton Park & Ride (A370)	Other	Diffusion Tube	100	-	20.7	18.9	20.2	22.9	-
Portishead, (High Street)	Roadside	Diffusion Tube	100	-	22.3	23.9	23.7	22.8	-
Churchill (A38)	Roadside	Diffusion Tube	100	-	29.1	26.3	28.7	27.6	-
Weston-super-Mare, High Street	Roadside	Diffusion Tube	100	-	25.9	24	25.1	25.4	-
Weston-super-Mare, Locking Road	Roadside	Diffusion Tube	100	-	29.7	26	28.9	28.5	-
Weston-super-Mare, Winterstoke Road	Roadside	Diffusion Tube	100	-	26.2	21.3	23.6	23.7	-
Banwell, The Gables	Kerbside	Diffusion Tube	100	-	27.9	26.9	30.3	29.4	-

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

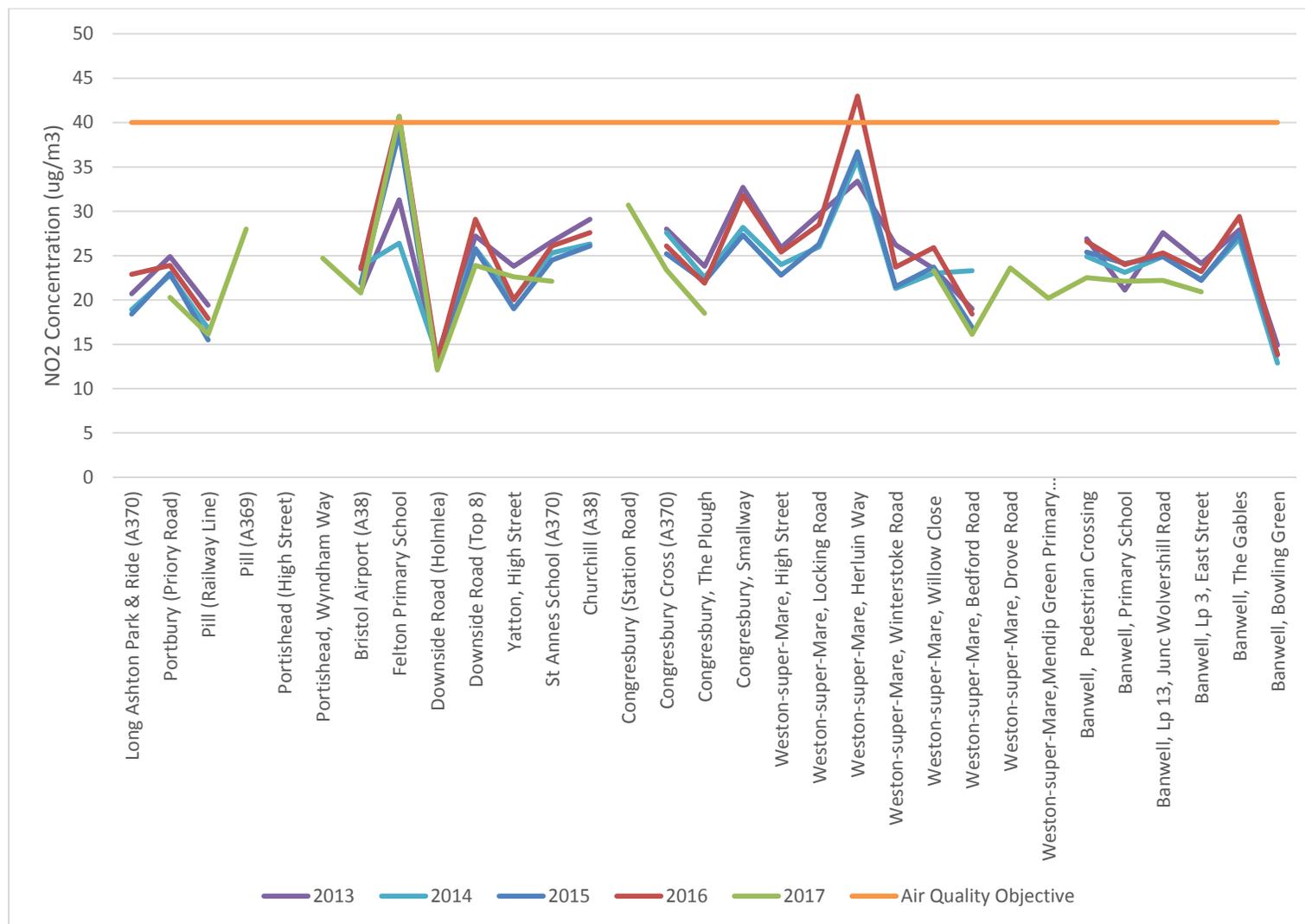
NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(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%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 – Trends in Annual Mean NO₂ Concentrations Measured at Diffusion Tube Monitoring Sites (2012 to 2016)



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.89) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
Weston-Super-Mare, Bedford Road	30.1	20.9	21.0	17.7	15.8	12.8	11.5	12.0	14.8	15.2	23.4	21.5	18.1	16.1	16.1
Weston-super-Mare, Drove Road	45.9	29.8	26.3	25.5	24.5	17.5	19.4	19.9	22.3	20.5	35.6	30.6	26.5	23.6	21.1
Weston-super-Mare, Herluin Way	62.9	38.1	45.5	39.6	36.4	34.4	28.6	36.8	40.9	37.7	46.4	49	41.4	36.8	18.3
Weston-super-Mare, Mendip Green Primary School	40.5	27.3	25.8	21.7	20.8	17.9	15	15	18.8	18	25.2	26.9	22.7	20.2	17.2
Weston-super-Mare, Willow Close	41.6	32.7	29.7	24	28.4	20.4	18	20.1	22.3	21.7	28.2	27.2	26.2	23.3	20.9
St Annes School	39.8	31.2	27.7	24.5	24	21.4	19.2	20.7	23.1	22.3	15.3	28.7	24.8	22.1	18.0
Congresbury (Station Road)	48	33.6	33.8	37.4	32.8	31	25.9	29.6	34.7	27.9	42.3	37	34.5	30.7	22.5
Congresbury (The Plough)	ns	26.3	23.6	21.4	18.6	16.8	14.8	16.3	22	17.9	25.8	25.3	20.8	18.5	12.4
Congresbury (The Cross)	41.5	28.3	26.9	26.1	22.6	19.8	21.3	20.7	24.3	22.3	32	29.4	26.3	23.4	15.2
Yatton High Street	37.2	25.6	29.3	28.1	23.6	20.5	20.5	21.6	24.5	21.9	26.2	ns	25.4	22.6	18.0
Coxway, Clevedon	33.9	28.1	23.1	22.4	20.3	13.6	12.9	14.7	19.2	15.8	21.9	21.9	20.6	18.4	17.9
Portishead, Wyndham Way	36.9	52.5	33.5	25.6	21.4	20.5	17.2	20.7	22.2	21.4	28.4	33.3	27.8	24.7	22.7
Portbury (Priory Road)	30.4	ns	29.3	23.5	20.7	16.4	15.8	20.2	19.5	18	28.9	28.5	22.8	20.3	16.3
Pill (Railway Line)	31.9	22.3	19.2	15.7	14.5	12.2	12.6	13.2	16.4	13.7	22.8	22.1	18.0	16.1	16.1
Pill (A369)	45.1	35.4	34.9	32.8	28.7	28.4	21.4	30.9	29.2	27.1	31.3	33	31.5	28.0	19.8

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (0.89) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
Backwell (A370)	42.4	31.2	26.9	21.9	21	20.6	16.6	20	24.3	20.6	30.6	29.6	25.5	22.7	14.1
Downside Road (Holmlea)	20.7	18.6	16.5	12.3	10.1	9.9	8.9	10.3	12.1	12.9	16.5	15.1	13.6	12.1	12.1
Downside Road (Top 8)	42.1	31.5	29.7	26	22.4	20.5	15.9	23.9	24.4	28.4	29.5	28.4	26.9	23.9	23.1
Felton Primary School	50.4	42.5	44.2	50.2	41.9	25.6	36.4	46.4	47.5	37.8	74.6	51.9	45.8	40.7	40.7
Bristol Airport (A38)	32.6	24	24.4	24.7	25	22.8	20.4	21	23.5	19.1	22.2	21.2	23.4	20.8	20.8
Banwell (East Street)	34.1	26	26.6	23	23.2	20.6	12	18.9	20.8	21.8	29.3	25.8	23.5	20.9	17.5
Banwell (Wolwershill Road Junction)	36.2	26.5	24.2	26.7	26.6	21	19	19.8	20.8	23.5	29.5	25.2	24.9	22.2	19.1
Banwell, Primary School	36.2	24.9	25.3	29.2	26.8	22.6	17.7	18.6	21.9	22	27.1	25.9	24.8	22.1	16.0
Banwell, Pedestrian Crossing	36	29.8	30.2	15.4	25.4	21.4	16.4	21.6	19.6	23.5	33.1	30.5	25.3	22.5	14.2
Banwell Centre	47.3	28.2	34	32.9	26.2	26.7	18.6	28.2	29.1	28.5	40.6	38.3	31.5	28.1	23.6
Banwell, Bowling Green	25.1	15.4	15.4	11.6	9	7.1	8.6	9.1	11.6	11.6	19.6	17.8	13.5	12.0	12.0
Banwell, Bowling Green	25.2	15.3	15.3	10.9	8.3	7.2	8.9	9.2	10.9	11.1	<u>21.4</u> 1	17.5	13.4	12.0	12.0
Banwell, Bowling Green	24.7	15.4	15.3	10.8	9.1	7.7	8.3	9.3	10.4	11.6	19.9	17.7	13.3	11.9	11.9

Local bias adjustment factor used

National bias adjustment factor used

Annualisation has been conducted where data capture is <75%

Where applicable, data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

The diffusion tubes are prepared and analysed in 2017 by Gradko. The tubes are prepared by the laboratory using the 20% triethanolamine (TEA) in water preparation. Gradko participates in the AIR NO₂ Proficiency Testing (PT) Scheme. For nitrogen dioxide diffusion tubes, this involves analysis of four different tubes spiked with a known amount of nitrite every three months and comparison of the results of the participating laboratories. The results for the four AIR NO₂ PT Rounds (AR018, 19, 21 and 22) during 2017 for Gradko were 100% satisfactory¹⁶.

Data Ratification and Bias Adjustment

The diffusion tube results are examined on a monthly basis to identify any spurious data and any suspect data is investigated further. Trends in monitored levels across the diffusion tube sites are compared to take into account seasonal factors, such as changing weather patterns and increased traffic flows, and to detect any local changes at the sites, such as road works. The monthly raw data is then averaged for the calendar year to give an annual mean.

While diffusion tubes provide a simple cost effective way of monitoring a wide range of locations, the accuracy of the tubes can be variable depending on the laboratory preparation, handling and analysis. To overcome this, a Bias Adjustment Factor is applied to the raw mean for the relevant monitoring period. This factor is calculated from monitoring sites where triplicate diffusion tube sites are co-located with an automatic NO_x analyser by comparing results of the two measurement methods.

Diffusion Tube Bias Adjustment Factors

National Bias Adjustment Factor

Combined bias adjustment factors from local authority co-location studies are calculated for each laboratory that analyse diffusion tubes¹⁷

The 2017 national bias adjustment factor for Gradko obtained at the time the data was compiled for this report was 0.89 (spreadsheet version 03/18).

¹⁶ <https://laqm.defra.gov.uk/assets/AIR-PT-Rounds-13-to-24-Apr-2016-Feb-2018.pdf>

¹⁷ <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

The co-location results show good tube precision (ability for a measurement to be consistently reproduced) in 2017 as detailed in the summary of Precision Results for Nitrogen Dioxide Diffusion Tube Co-Location Studies, by Laboratory¹⁸

Factor from Local Co-location Study

North Somerset council does not carry out any co-location studies

Discussion of Choice of Factor to Use

As North Somerset Council does not carry out any co-location studies, nor are there any close by, the National Bias Adjustment Factor was considered to be the most appropriate to use.

Distance Adjustment to façade

In 2017 there were no measured exceedances of the nitrogen dioxide objective.

However, where the monitoring site are set back from the relevant exposure positions, the monitoring results have been adjusted to the façade of the nearest relevant receptor using the nitrogen dioxide distance adjustment calculator¹⁹. Rather than represent the calculations for each site, the data and results from the calculator are presented in Table C.1.

¹⁸ <https://laqm.defra.gov.uk/diffusion-tubes/precision.html>

¹⁹ <https://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

Table C.1 Distance to façade correction

Site No.	Site Name	Monitor Distance to Kerb (m)	Receptor Distance to kerb (m)	Background NO ₂ 2017 (µg/m ³)	Annual mean concentrations 2017 (µg/m ³) adjusted for bias	Adjusted to façade (µg/m ³)
2	Weston-super-Mare, Drove Road	1	3	12.4	23.6	21.1
3	Weston-super-Mare, Herluin Way	2	40	10.5	36.8	18.3
4	Weston-super-Mare, Mendip Green Primary School	1	5	11.1	20.2	17.2
5	Weston-super-Mare, Willow Close	1.5	8	16.7	23.3	20.9
6	St Annes School	2	10	11.3	22.1	18.0
7	Congresbury, Station Road	1	6	8.1	30.7	22.5
8	Congresbury, The Plough	1	18	8.1	18.5	12.4
9	Congresbury, The Cross	1.5	17	8.1	23.4	15.2
10	Yatton, High Street	0.5	3	8.1	22.6	18.0
11	Coxway, Clevedon	1	4	16.0	18.4	17.9
12	Portishead, Wyndham Way	6	60	12.2	24.7	22.7
13	Portbury, Priory Road	4	7	19.2	20.3	16.3

Site No.	Site Name	Monitor Distance to Kerb (m)	Receptor Distance to kerb (m)	Background NO ₂ 2017 (µg/m ³)	Annual mean concentrations 2017 (µg/m ³) adjusted for bias	Adjusted to façade (µg/m ³)
16	Backwell (A370)	1	27	9.8	22.7	14.1
18	Downside Road (Top 8)	3	4	13.1	23.9	23.1
21	Banwell (East Street)	2	6	7.6	20.9	17.5
22	Banwell (Wolvershill Road Junction)	2	5	7.6	22.2	19.1
23	Banwell, Primary School	1	8	7.6	22.1	16.0
24	Banwell, Pedestrian Crossing	1	16	7.6	22.5	14.2
25	Banwell Centre	1	3	7.6	28.1	23.6

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

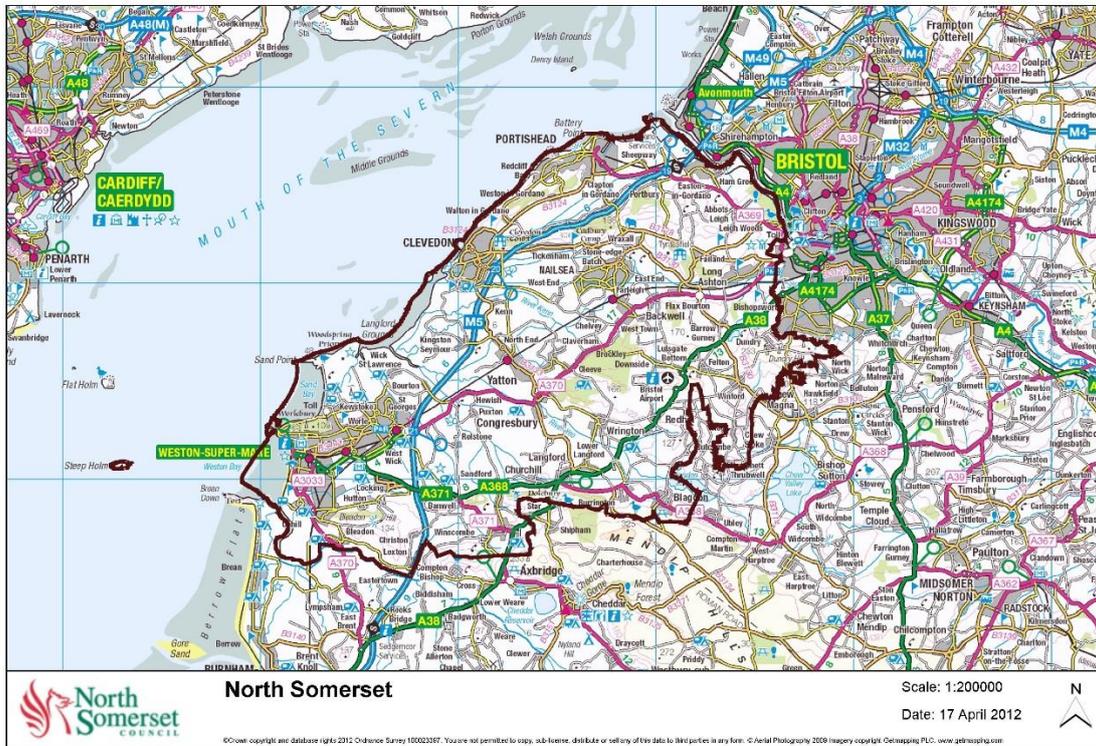


Figure 2: Map of North Somerset Area

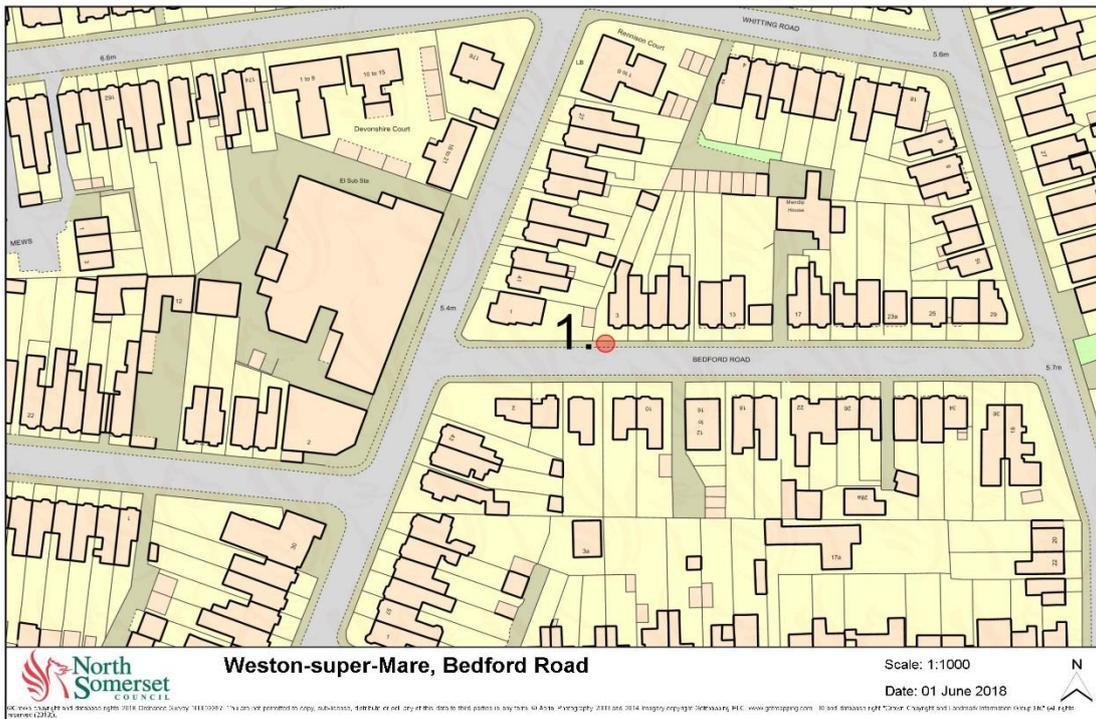


Figure 3: Weston-super-Mare, Bedford Road

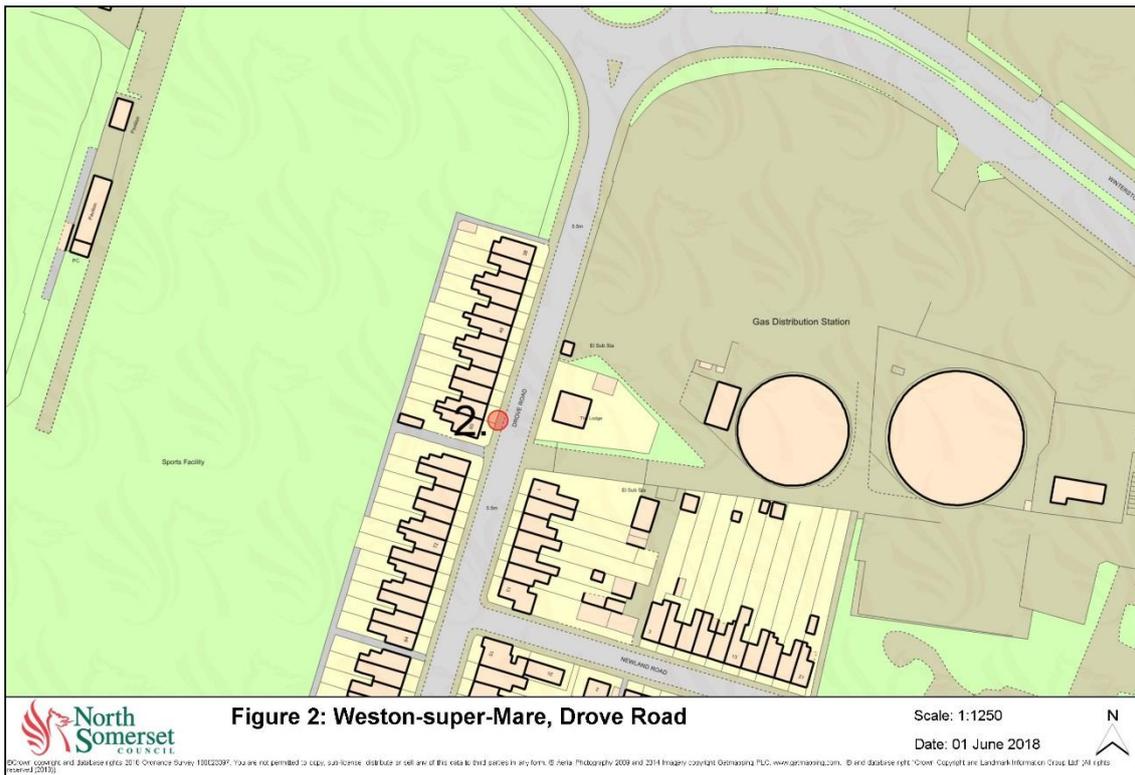


Figure 4: Weston-super-Mare, Drove Road



Figure 5: Weston-super-Mare, Herluin Way

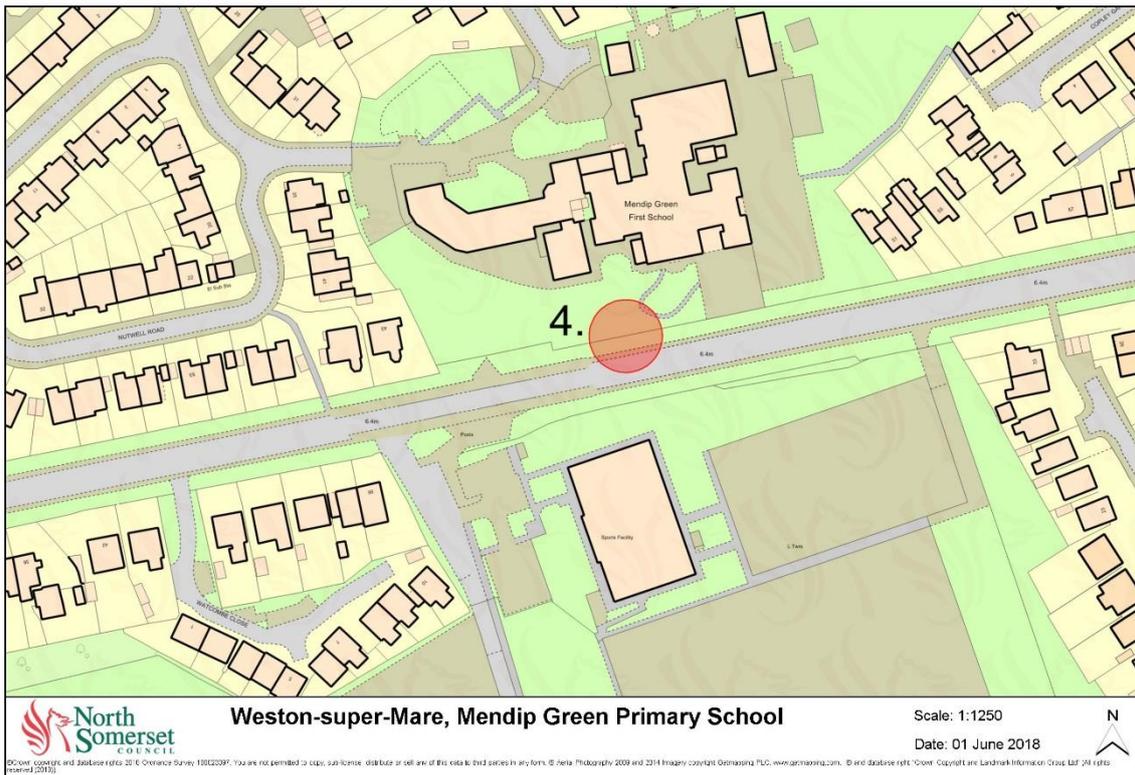


Figure 6: Weston-super-Mare, Mendip Green Primary School

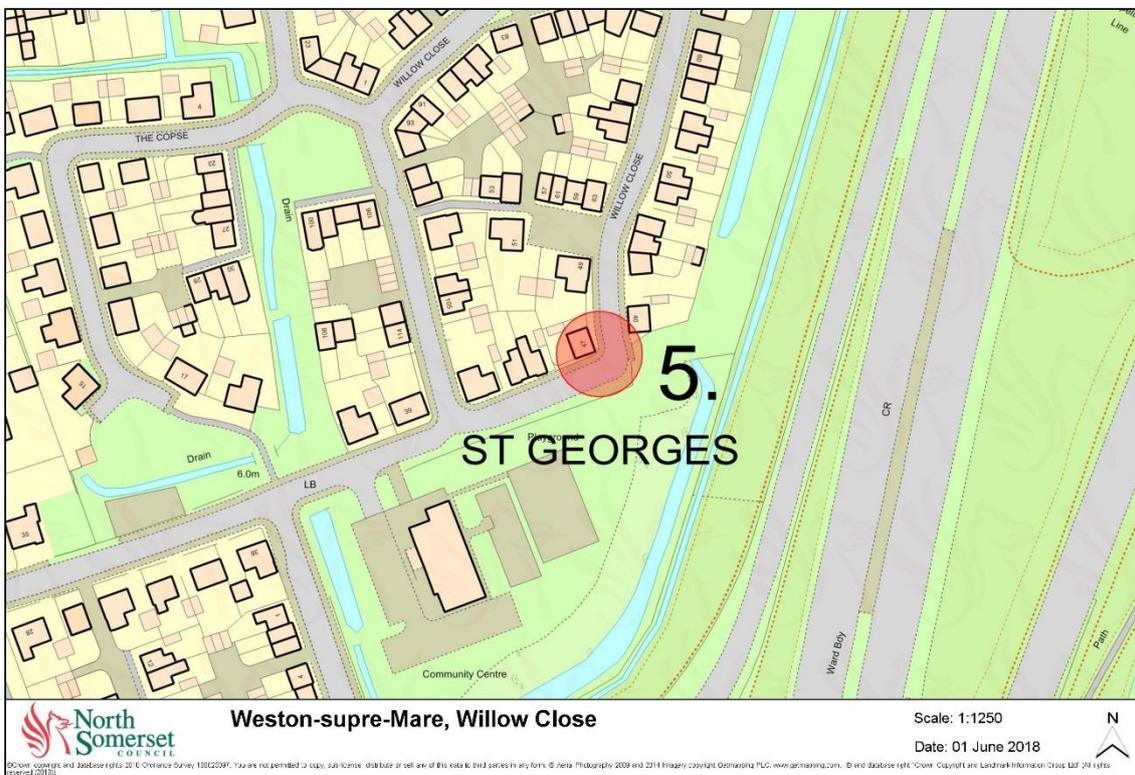


Figure 7: Weston-super-Mare, Willow Close



Figure 8: St Annes School

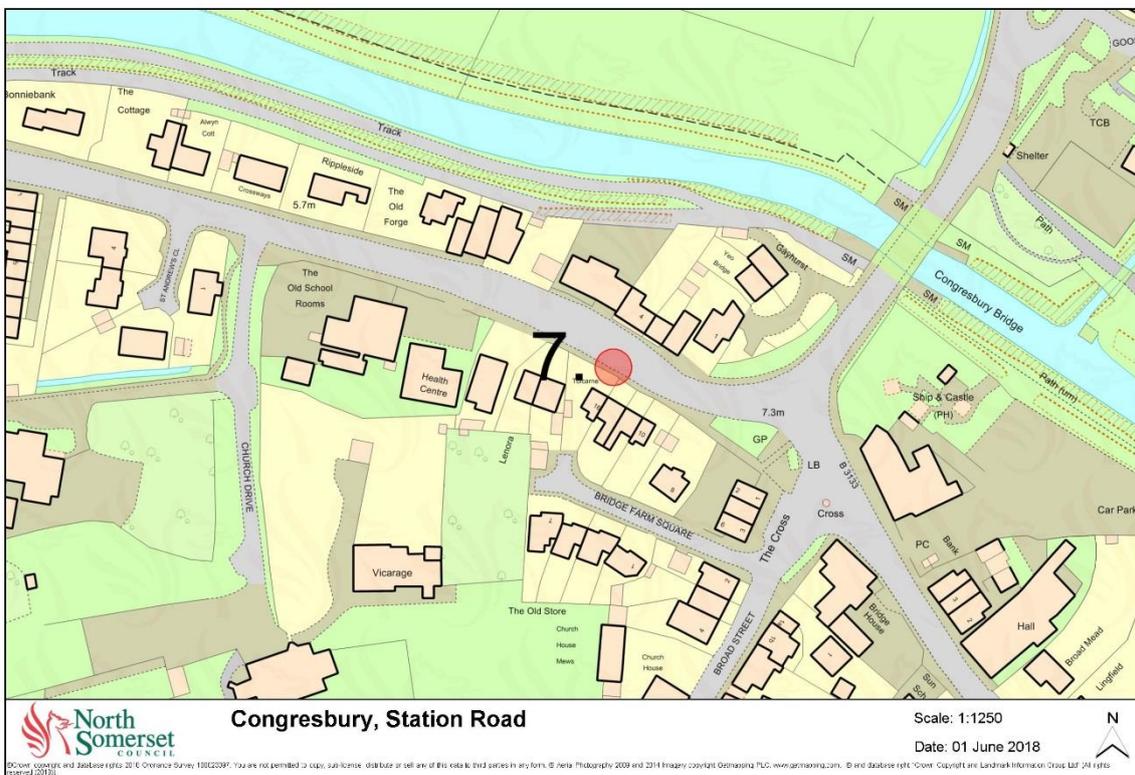


Figure 9: Congressbury, Station Road

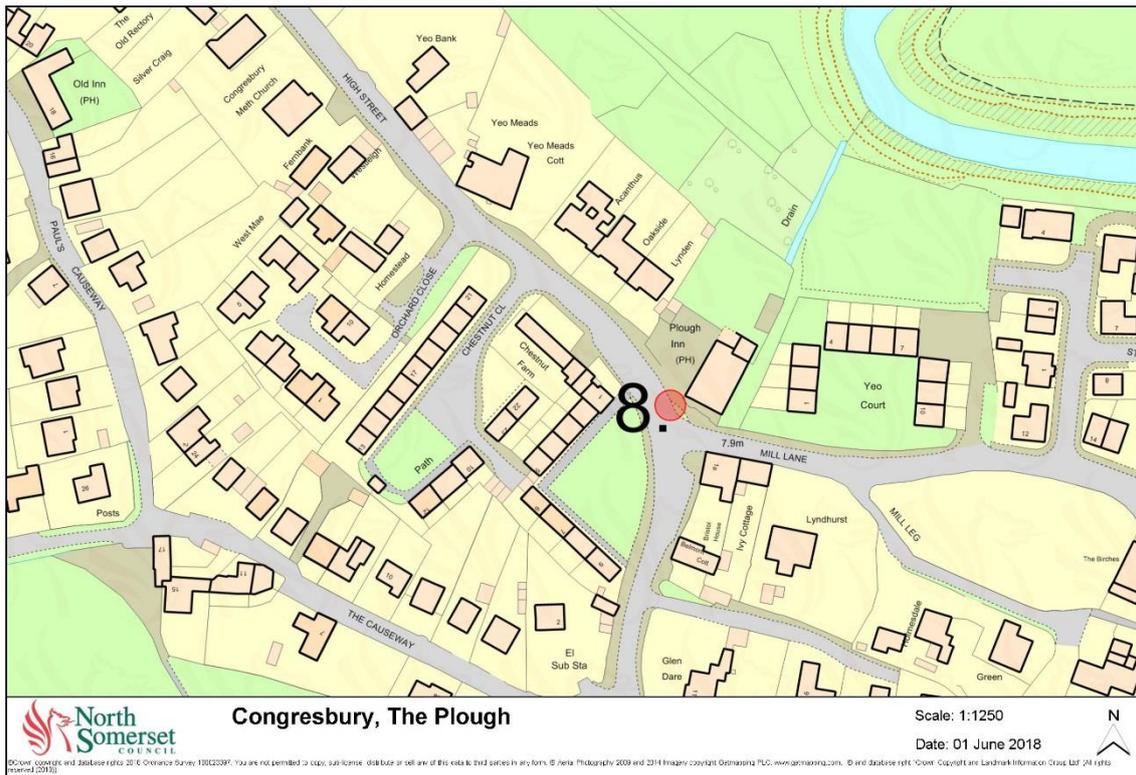


Figure 10: Congressbury, The Plough

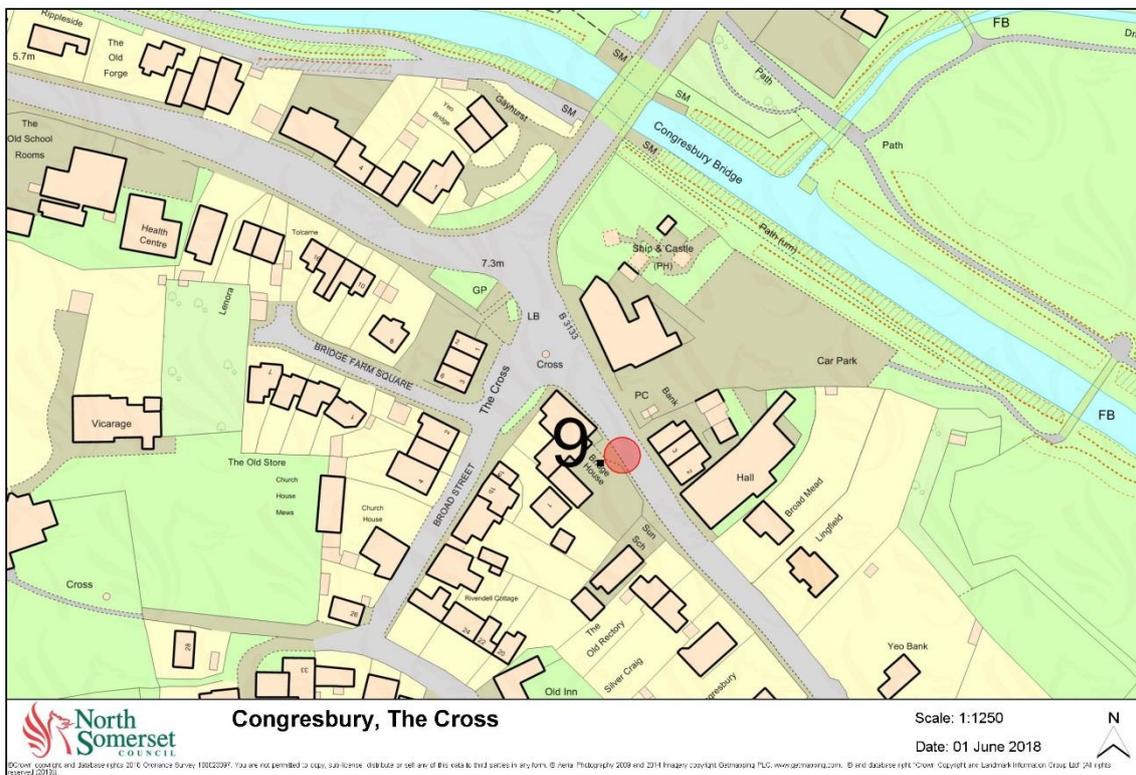


Figure 11: Congressbury, The Cross

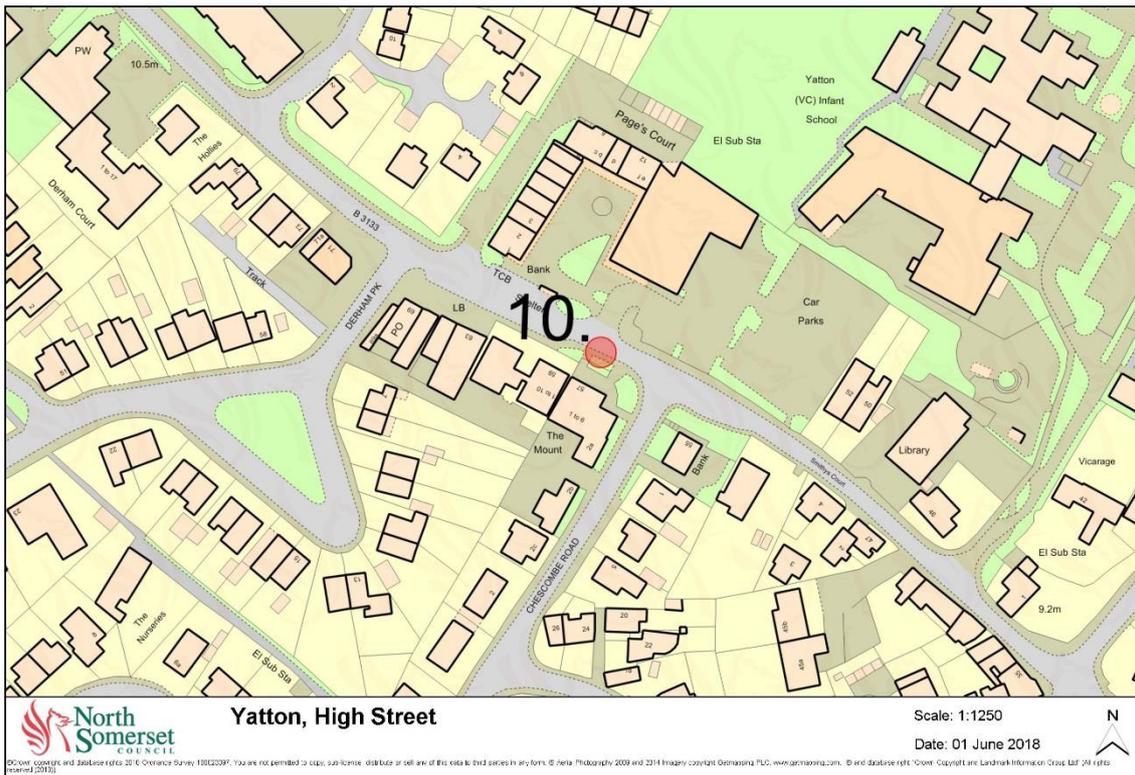


Figure 12: Yatton, High Street

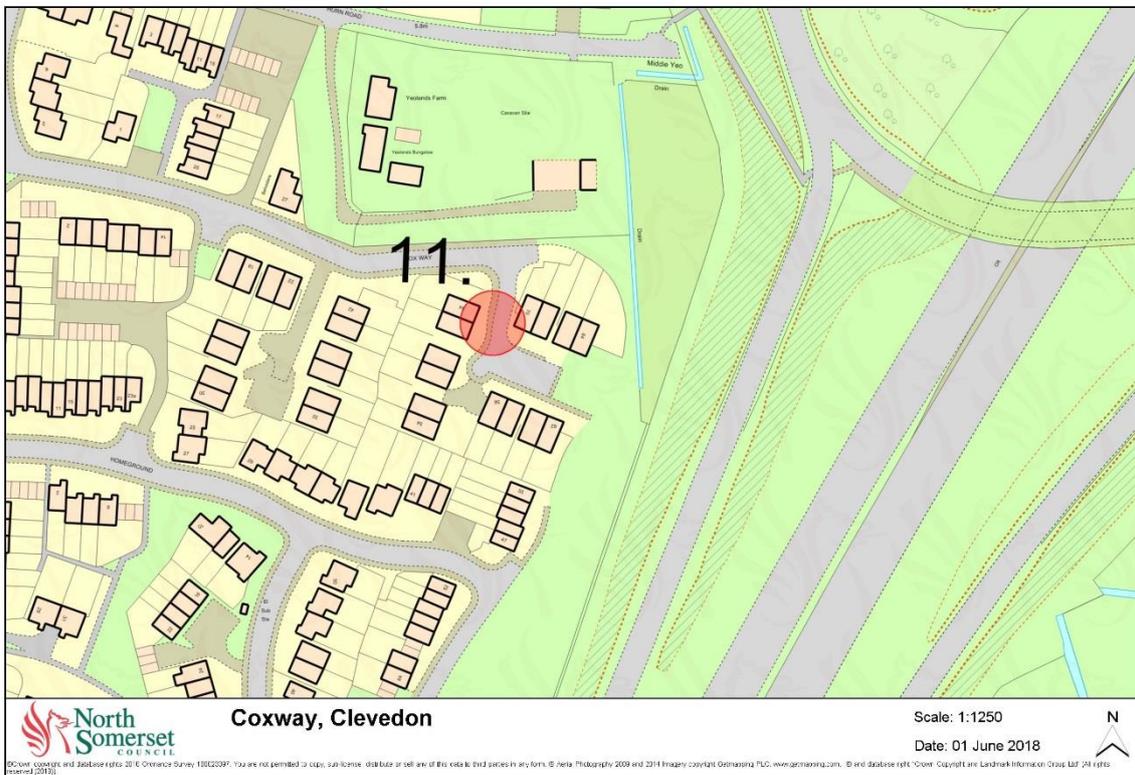


Figure 13: Coxway, Clevedon

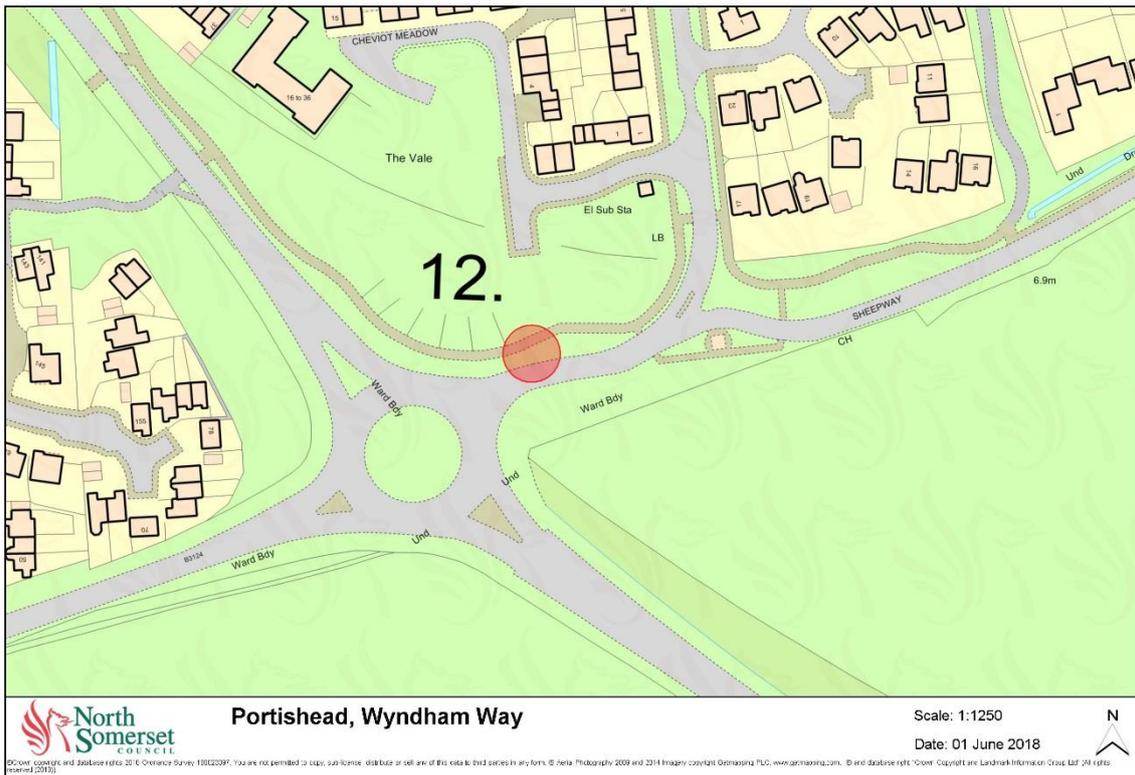


Figure 14: Portishead, Wyndham Way

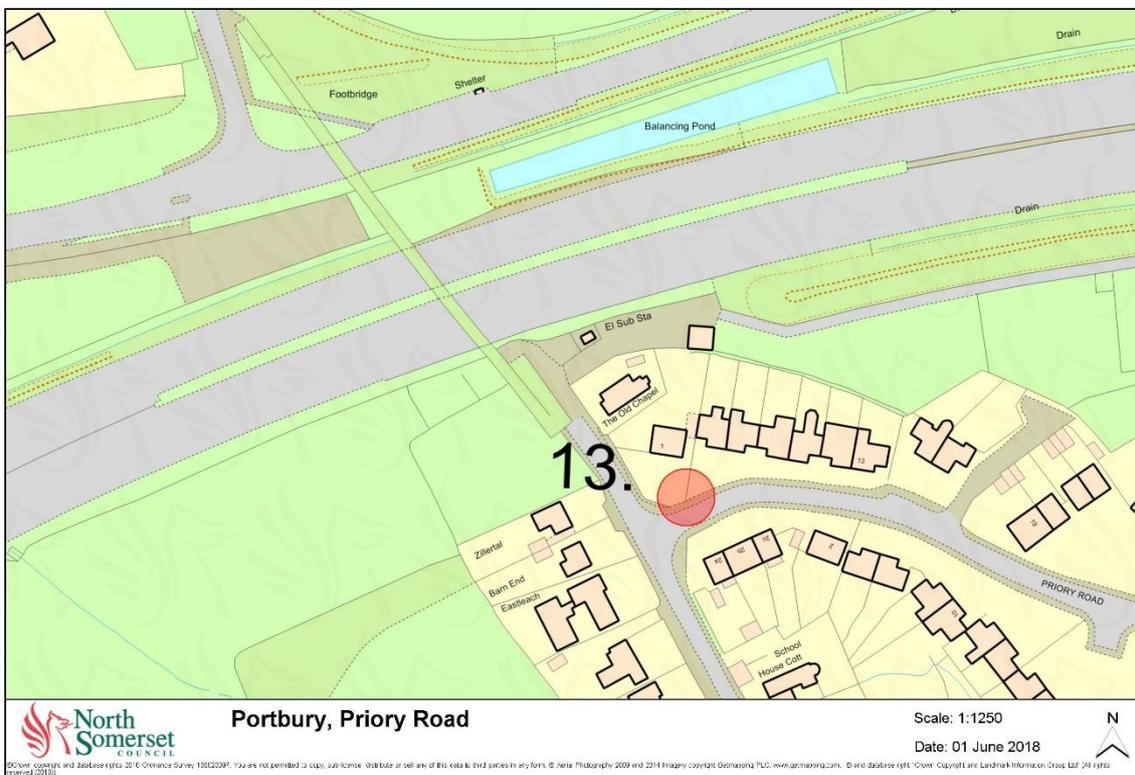


Figure 15: Portbury, Priory Road

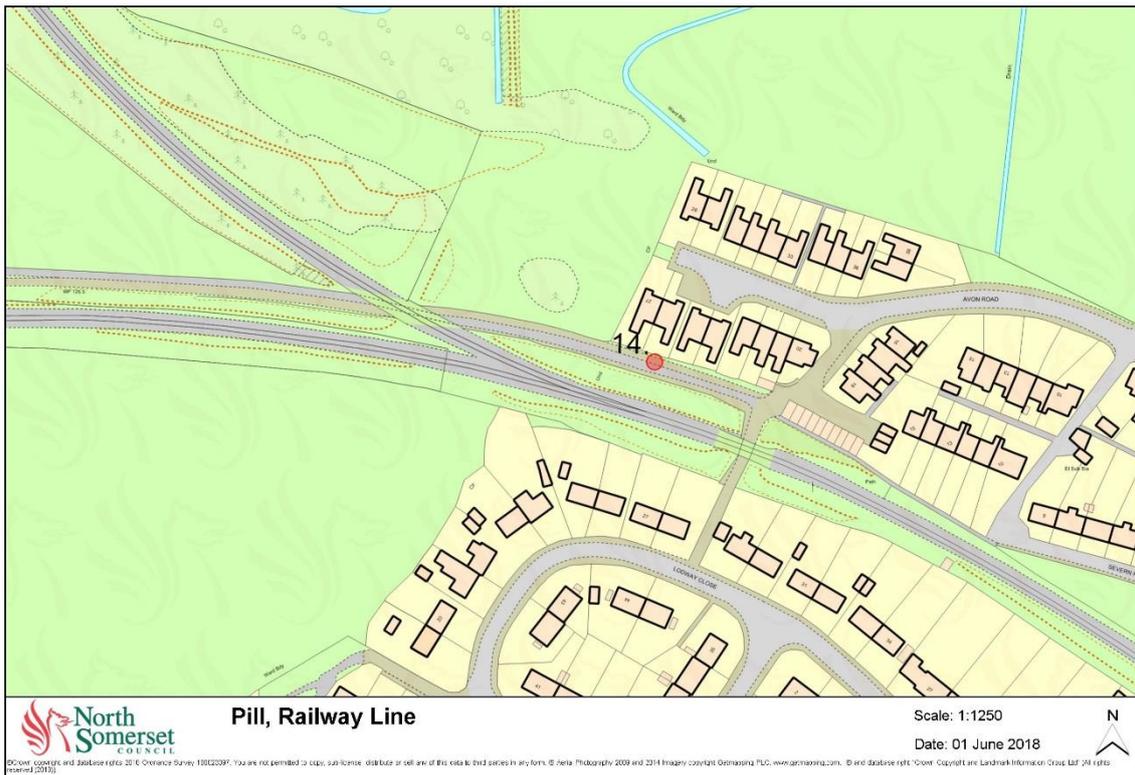


Figure 16: Pill, Railway Line

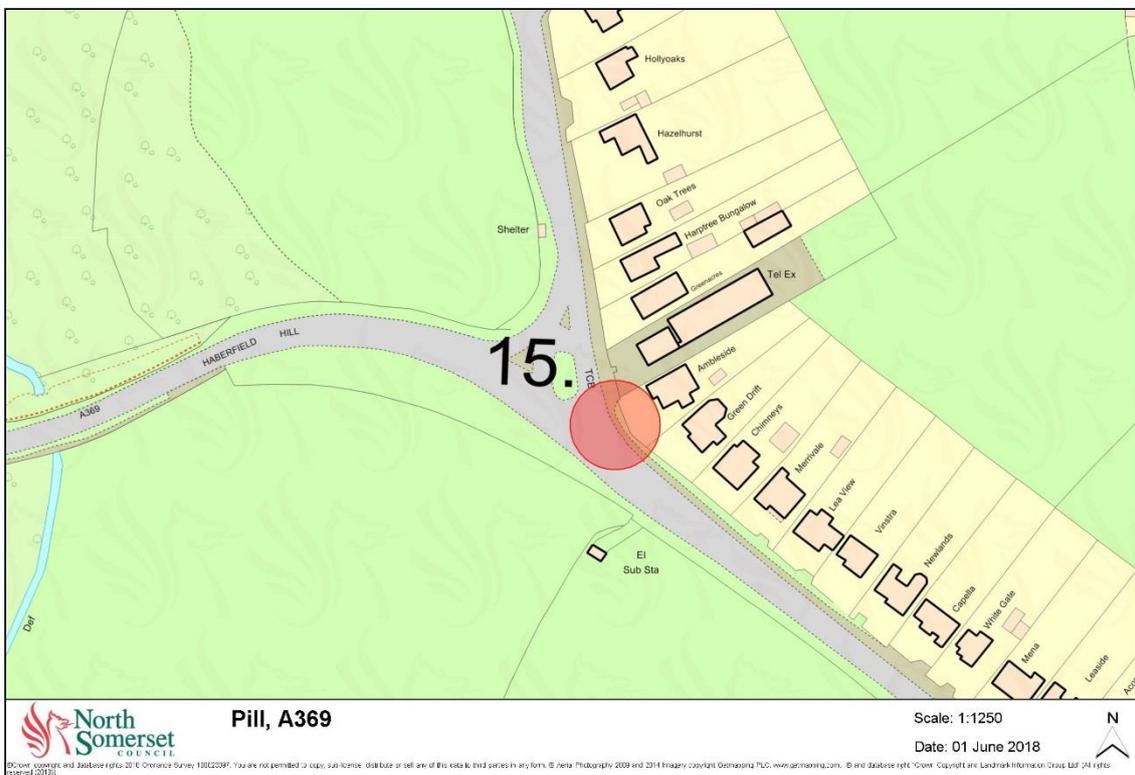


Figure 17: Pill, A369

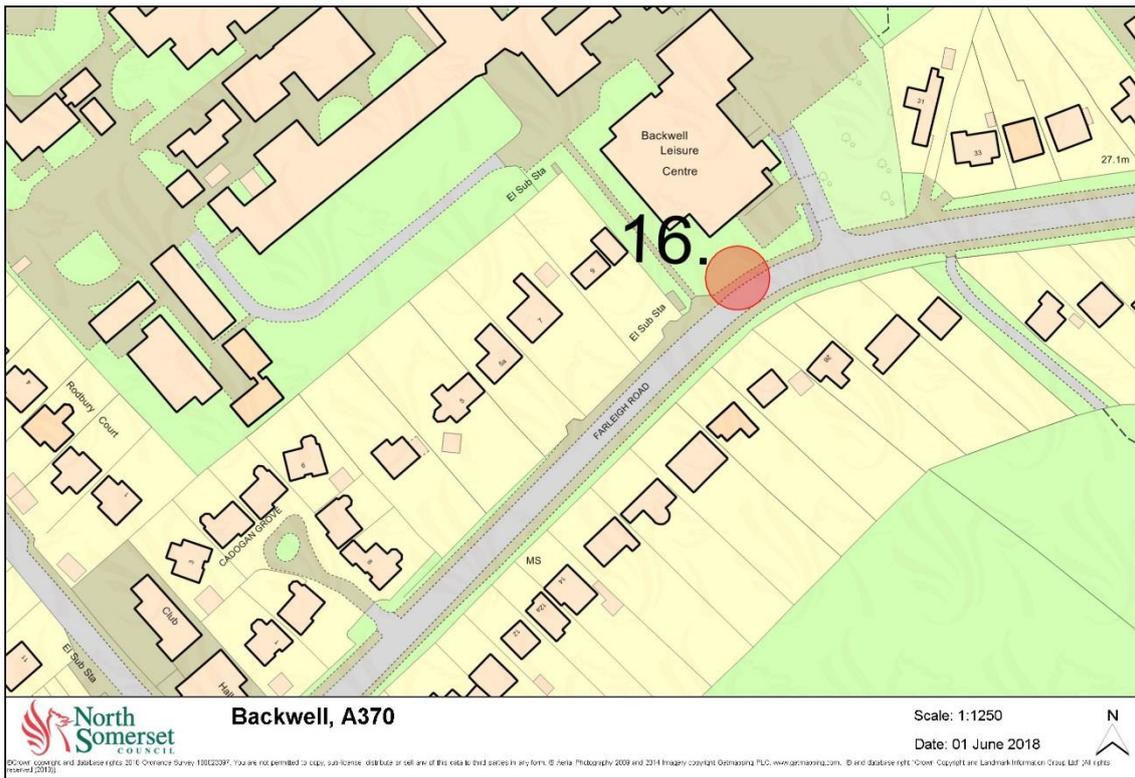


Figure 18: Backwell, A370

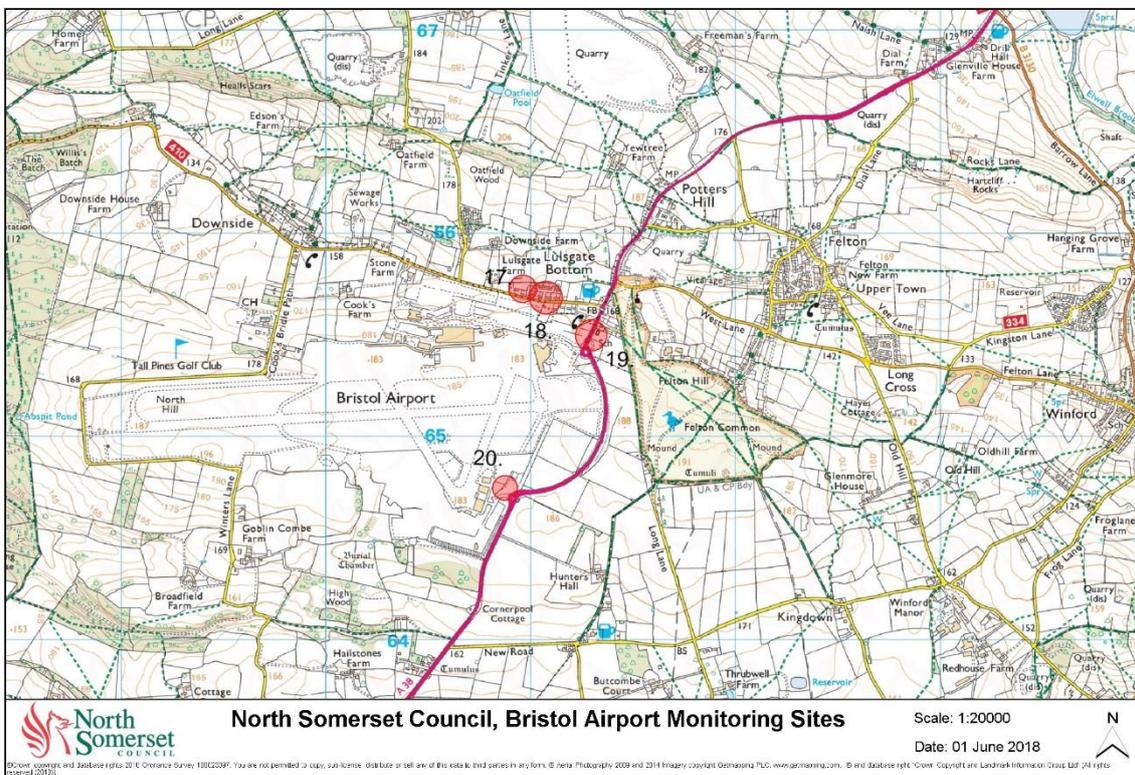


Figure 19: North Somerset Council, Bristol Airport Monitoring Sites

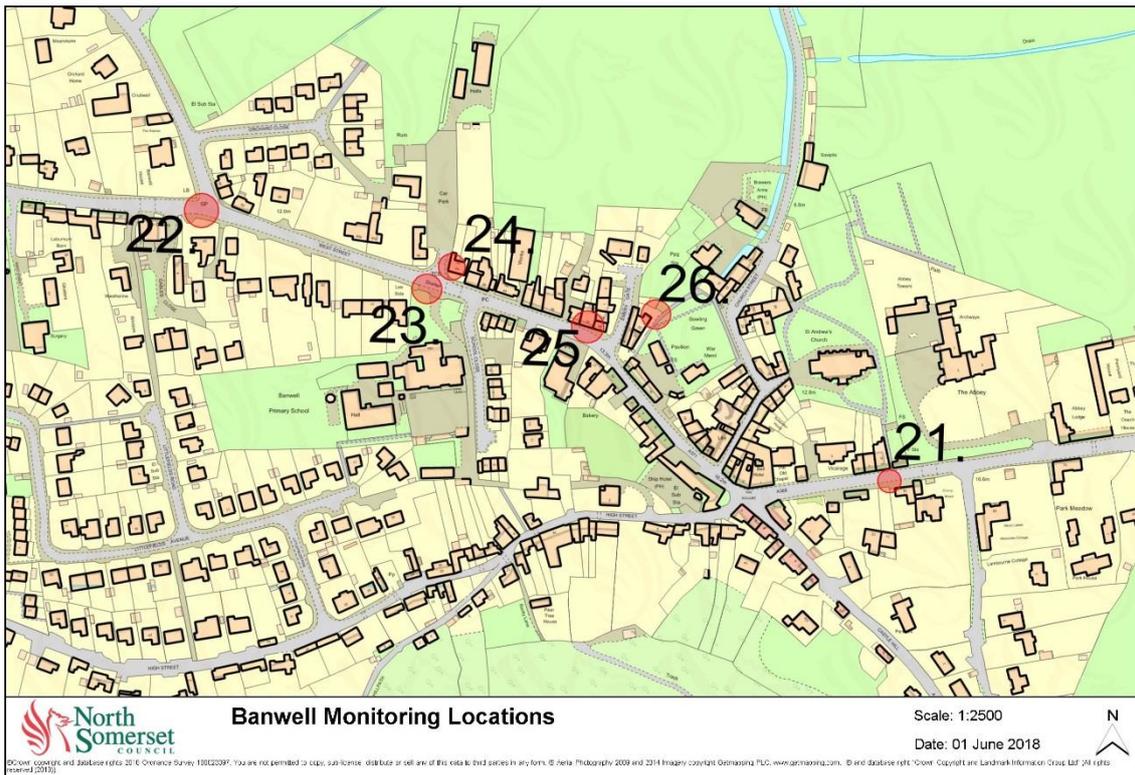


Figure 20: Banwell Monitoring Locations



Figure 21: Bristol Airport Monitoring Locations

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ²⁰	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

²⁰ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Baseline Assessment Tool for air pollution: Outdoor air quality and health (NICE public health guideline NG70)

				Number of relevant recommendations	25
				Number of recommendations met	19
				Percentage of recommendations met	76
NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
1.1 Planning					
<p>Include air pollution in 'plan making' by all tiers of local government, in line with the Department for Communities and Local Government's National Planning Policy Framework. This includes county, district and unitary authorities, as well as regional bodies and transport authorities. The Local Plan and other strategic planning processes (such as the core strategy, local transport plan, environment and health and wellbeing strategies) should include zero- and low-emission travel, for example cycling and walking (see section 1.6 and NICE's guideline on physical activity: walking and cycling). Other strategies for zero- and low-emission travel could include:</p> <ul style="list-style-type: none"> • Providing charge points for electric vehicles in workplaces, commercial developments and residential areas. • Supporting car sharing schemes or car clubs. 	1.1.1	Yes	<p>Air pollution is mentioned directly, and indirectly, throughout planning documents. For example</p> <ul style="list-style-type: none"> - Core Strategy: Policy CS3 of the core strategy, page 31, states that if developments have an adverse effect on air quality they will only be permitted if the effects are able to be mitigated to an acceptable level; Policy CS26 requires Health Impact Assessments to be produced for all large scale developments. - Site and Policies Plan: There is no reference specifically made to air quality. However, indirect references include DM 24 which refers to traffic congestion; DM 25 seeks to maintain and improve active travel; DM 26 makes a requirement for travel plans for certain developments; and DM 27 requires developments to be adequately served by buses; 	Yes	<p>Air Quality Assessments are not routinely requested. There is scope for assessments to be required but this would require a case to be made by Public Health and Environmental Health. However, Planning would be receptive if this was required</p>

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
<p>When 'plan making' consider:</p> <ul style="list-style-type: none"> • siting and designing new buildings, facilities and estates to reduce the need for motorised travel • minimising the exposure of vulnerable groups to air pollution by not siting buildings (such as schools, nurseries and care homes) in areas where pollution levels will be high • siting living accommodation away from roadsides • avoiding the creation of street and building configurations (such as deep street canyons) that encourage pollution to build up where people spend time • including landscape features such as trees and vegetation in open spaces or as 'green' walls or roofs where this does not restrict ventilation • including information in the plan about how structures such as buildings and other physical barriers will affect the distribution of air pollutants. 	1.1.2	Yes	<p>Air quality outcomes are not contained in travel plans. However, air quality is assessed by the environmental health team as per annual requirements.</p> <p>The council has made significant advances in supporting zero/low emission vehicles. Electric charging points have been installed, with additional points planned.</p> <p>Demonstrator vehicles are being purchased to promote to the public, and a demonstration charging hub is being planned. The council's low/zero emission strategy is focussed on nudging 'early adopter's to fast track the electric car revolution. Furthermore 40% of the council's fleet is now electric.</p> <p>Active travel is constrained by the fact that North Somerset is a predominantly rural county. Efforts are focussed on maintaining and extending cycleways that are segregated (e.g. Strawberry lane; Festival Way</p>	Yes	<p>Notwithstanding the constraints of the rural geography, further efforts could be made to prioritise active travel over car use, for instance through further areas designated to shared space</p>
<p>If the local plan does not address air pollution, consider developing local guidance (such as supplementary planning documents, see the Department for Communities and Local Government information on local plans) on how to design buildings and spaces to improve local air quality until the local plan is amended.</p>	1.1.3	No			

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
1.2. Development management					
<p>Consider ways to mitigate road-traffic-related air pollution. This could include:</p> <ul style="list-style-type: none"> • Taking action to reduce the number of motorised trips. For instance, by: <ul style="list-style-type: none"> - incorporating air quality outcomes in travel plans - developing local parking plans - supporting car clubs - supporting active travel (see NICE's guideline on physical activity: walking and cycling). • Supporting the use of zero- and low-emission vehicles for instance, by providing charging facilities for electric vehicles. • Managing street trees and vegetation to reduce the risk of restricting street ventilation, where this may contribute to poor air quality (for instance, by the choice of species, siting and pruning regimes). 	1.2.1	Yes	<p>Air quality outcomes are not contained in travel plans. However, air quality is assessed by the environmental health team as per annual requirements.</p> <p>The council has made significant advances in supporting zero/low emission vehicles. Electric charging points have been installed, with additional points planned. Demonstrator vehicles are being purchased to promote to the public, and a demonstration charging hub is being planned. The council's low/zero emission strategy is focussed on nudging 'early adopter's to fast track the electric car revolution. Furthermore 40% of the council's fleet is now electric. Active travel is constrained by the fact that North Somerset is a predominantly rural county. Efforts are focussed on maintaining and extending cycleways that are segregated (e.g. Strawberry lane; Festival Way</p>	Yes	<p>Notwithstanding the constraints of the rural geography, further efforts could be made to prioritise active travel over car use, for instance through further areas designated to shared space</p>
<p>In consultation with local communities, consider including air quality monitoring and measures to reduce road-traffic-related emissions in the Regulation 123 list of funding options for using the Community Infrastructure Levy (see the Planning Portal information on the Community Infrastructure Levy).</p>	1.2.2	Yes	Not currently considered	No	<p>This is something to discuss further with Environmental Health. S106 has become the Community Infrastructure Levy</p>

NICE recommendation	Guideline reference	Is the recommendation relevant?			
1.3 Clean air zones					
<p>Consider introducing a clean air zone that:</p> <ul style="list-style-type: none"> • includes restrictions or charges on certain classes of vehicle • supports zero- and low-emission travel (including active travel) • includes targets to progressively reduce pollutant levels below EU limits and aim to meet World Health Organization air quality guidelines • aims to reduce exposure to air pollution across the whole zone rather than focusing on air pollution hotspots. 	1.3.1	No	Air quality in North Somerset is currently below the required for an Air Quality Management Area		Air quality monitors are being repositioned in 2018 to ensure that current monitoring adequately reflects levels across North Somerset
Identify which classes of vehicles to restrict or charge in a clean air zone (see recommendation 1.3.1) based on an understanding of local conditions (such as local sources of road-traffic-related pollution and factors influencing dispersion). Use nationally recognised vehicle types (such as the Euro classification for diesel and petrol vehicles).	1.3.2	No			
Work across local authority boundaries to address regional air pollution and prevent migration of traffic and emissions to other communities, resulting in areas of poor air quality.	1.3.3	Yes	The West of England Partnership has enabled work across local authority boundaries by bringing the neighbouring councils (North Somerset, South Glos, Bristol and Banes) together for planning. Public health, planning, and other departments are working on a regional basis in indirect ways to address air quality.	Yes	

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
<p>Consider support for zero- and low-emission travel. This could include:</p> <ul style="list-style-type: none"> • Encouraging walking and cycling (see NICE's guideline on physical activity: walking and cycling). • Encouraging uptake of zero- and low-emission vehicles, for instance: <ul style="list-style-type: none"> - Providing electric charging points. - Encouraging public and private sector organisations to use zero- or low-emission vehicles for deliveries to retail, office, residential or other sites in the zone, particularly for the last mile of deliveries in city centres. • Developing integrated public transport networks (including park and ride schemes) based on low-emission vehicles. 	1.3.4	Yes	<p>The main focus for NSC in encouraging zero and low emission travel is through promotion and support of electric vehicles. Electric charging points have been installed, and staff the public are being encouraged to move towards zero- and low-emission vehicles.</p> <p>For info on walking and cycling see 1.6.1 below</p>	Yes	
<p>Consider taking action to reduce emissions within the clean air zone. For instance:</p> <ul style="list-style-type: none"> - Bylaws and other action to support 'no vehicle idling' areas, particularly where vulnerable groups congregate (such as outside schools, hospitals and care homes) and in areas where exposure to road-traffic-related air pollution is high. - Driver training to reduce emissions (see section 1.4). - Actions to smooth traffic flow (see section 1.5). • Action to minimise congestion caused by delivery schedules. • Using a fleet recognition scheme (such schemes help fleet operators improve efficiency by reducing fuel consumption and emissions: the system recognises operators who meet best operational standards). • Addressing emissions from public sector transport activities (see section 1.4). <p>Specifying emission standards for private hire and other licensed vehicles</p>	1.3.5	Yes	<p>There are no bylaws in place for the purpose of improving air quality.</p> <p>Training is currently provided to members of staff who wish to use council pool cars. This is reinforced through an online portal that monitors driving habits. However, there is no such training provided to the public</p> <p>Road restrictions currently focus on making traffic flow smooth rather than methods that encourage braking and accelerating</p> <p>The council's fleet is making good progress towards low and zero emission vehicles.</p>	Yes	Consider bylaws

North Somerset Council

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
Where traffic congestion is contributing to poor air quality, consider incorporating a congestion charging zone within the clean air zone.	1.3.6	No	Currently none of the 26 air quality monitors have identified air quality exceeding the annual mean objective of 40µg/m3		
Consider monitoring outside the zone to identify whether its implementation is causing problems in terms of traffic composition and flow. If so, address any issues identified. For instance, by changing the boundaries to address increased pollution at the margins of the zone or problems caused by diversion of traffic.	1.3.7	No	Air quality in North Somerset is currently below the required for an Air Quality Management Area		
Assess the impact of any proposed charges (including exemptions for zero- and low-emission vehicles) on vulnerable groups.	1.3.8	No	Air quality in North Somerset is currently below the required for an Air Quality Management Area		

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
1.4 Reducing emissions from public sector transport services and vehicle fleets					
Driver training					
Consider introducing fuel-efficient driving as part of any test carried out when appointing or re-appraising staff who drive as part of their work.	1.4.1	Yes	<p>Completion of E-Learning is a requirement for staff who use fleet cars. ELearning includes information on tyre pressure and driving in a fuel efficient way. This is followed up by monitoring of their driving efficiency which is then promoted on the pool car site.</p> <p>There is also the offer to staff to take part in a fuel efficiency driving sessions to have their driving assessed and suggestions for how to improve efficiency</p>	Yes	Currently there is no consequence of a low score in fuel efficiency other than this score being highlighted on the intranet. Instead, an email could be circulated explaining their low score and giving advice on how to improve, as a greater nudge to change behaviour.
<p>Consider training staff drivers to reduce their vehicle emissions. This could include:</p> <ul style="list-style-type: none"> • reducing rapid accelerations and decelerations, and correct gear selection to improve fuel consumption • switching off engines, if practical and safe, when parked by the roadside and when dropping off people or deliveries • vehicle maintenance, including pumping up tyres to the recommended pressure • emphasising that lower vehicle emissions will reduce both fuel costs and air pollution. 	1.4.2	Yes	<p>Completion of E-Learning is a requirement for staff who use fleet cars. ELearning includes information on tyre pressure and driving in a fuel efficient way. This is followed up by monitoring of their driving efficiency which is then promoted on the pool car site.</p> <p>There is also the offer to staff to take part in a fuel efficiency driving sessions to have their driving assessed and suggestions for how to improve efficiency</p>	Yes	

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
Consider using: <ul style="list-style-type: none"> • 'in-vehicle' elements, for instance to ensure vehicles display real-time information about current fuel efficiency, appropriate gear selection and speed • telematics technology to provide next-day information about driving style. 	1.4.3	Yes	Some cars have real time display about fuel efficiency. Telematics technology provides feedback to users.	Yes	
Consider monitoring fuel efficiency and providing feedback to drivers after training. This could include providing support from colleagues or 'buddies' to improve their driving style and rewards for those who drive efficiently (see NICE's guideline on behaviour change: individual approaches).	1.4.4	Yes	There is a system of monitoring fuel efficiency for pool cars. Feedback is reactive rather than proactive (i.e. users can see their efficiency if they take action to view their profile, but speaking to users it is clear that those with a low score do not have any proactive communication, and there is currently no consequence for drivers who are inefficient	Yes	Currently there is no consequence of a low score in fuel efficiency other than this score being highlighted on the intranet. Instead, an email could be circulated explaining their low score and giving advice on how to improve, as a greater nudge to change behaviour.
Consider monitoring the fleet's fuel consumption and evaluating the local effect on air pollutant emissions to demonstrate the benefits of training on fuel use and air quality.	1.4.5	Yes	Fuel consumption is assessed across the fleet	Yes	
Procuring public sector vehicles					
Consider making low vehicle emissions (NOx and particles) one of the criteria when making routine procurement decisions. This could include selecting low-emission vehicles, including electric vehicles.	1.4.6	Yes	CO2 of fleet has reduced from 186 18 months ago to 112. Electric vehicles are now the default for procurement.	Yes	

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
1.5 Smooth driving and speed reduction					
<p>Consider promoting a smooth driving style by using:</p> <ul style="list-style-type: none"> • speed limits and average speed technology on the roadside • real-time information to tell drivers what the current optimum driving speed is • 20 mph limits without physical measures to reduce speeds in urban areas where average speeds are already low (below around 24 mph) to avoid unnecessary accelerations and decelerations • signs that display a driver's current speed to reduce unnecessary accelerations. <p>See also recommendations 1.4.1 and 1.4.2.</p>	1.5.1	Yes	<p>Average speed technology is not used. Speed limits designed in line with government guidelines but not with air quality in mind.</p> <p>There is no real-time information to tell drivers what the current optimum speed limit is</p> <p>Limited use of 20mph speed limits. Policy is for 20mph in villages was developed last year and is slowly being rolled out, but limited to the centre of villages.</p> <p>Technology is not used to display a driver's current speed</p>	No	<p>Greater use of 20mph limits.</p> <p>Use of technology to display a driver's speed</p> <p>Average speed technology to promote slower and smoother driving</p>
<p>Where physical speed reduction measures are used to reduce road danger and injuries (20 mph zones – see NICE's guideline on unintentional injuries on the road), consider using them to encourage drivers to maintain a reduced, steady pace along the whole stretch of road, rather than road humps that may increase acceleration- and braking-related emissions.</p>	1.5.2	Yes	<p>Very little traffic calming is used and only with road safety in mind. Preference for calming methods such as narrower roads and removing lines in the road.</p>	Yes	<p>Greater use of speed reduction methods</p>
1.6 Walking and cycling					
<p>Provide support for active travel (see NICE's guideline on physical activity: walking and cycling and guideline on physical activity and the environment).</p>	1.6.1	Yes	<p>In addition to the cycle paths mentioned elsewhere, there is a team within the council who support schools, business and communities to promote active travel alongside work within marketing and communications. However, specific adherence to the NICE guidance was not known</p>	Yes	<p>A further piece of work to audit the sustainable travel team and their adherence to the NICE guidance would be useful to understand any wider areas for improvement.</p>
<p>Provide a choice of cycle routes, including routes that avoid highly polluted roads. Ideally use quiet streets or segregated routes.</p>	1.6.2	Yes	<p>There are limited routes, but there is a general preference for segregated paths rather than encouraging cyclists to use the road</p>	Yes	<p>There are limited cycle routes and further routes should be considered</p>

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
<p>Where busy roads are used consider:</p> <ul style="list-style-type: none"> • Providing as much space as possible between the cyclist and motorised vehicles. • Using dense foliage to screen cyclists from motor vehicles, without stopping air pollution from dispersing or reducing the visibility or safety of cyclists near junctions. Also take into account concerns about personal safety. • Reducing the time cyclists spend at highly polluted sites, including some junctions, where this can be done without increasing the time that other groups spend exposed to poor air quality. 	1.6.3	Yes	<p>Limited mix of cyclists and road users but this is due to the preference for cars rather than cycling. Foliage is not proactively used to screen cyclists from motor vehicles. Although there are some cycle paths in North Somerset, the challenging geography means there is a limited network in comparison to neighbouring areas.</p>	No	<p>Further opportunities to assist cyclists in busy roads could be explored to help encourage cycling, making it safe, and limit exposure</p>
1.7 Awareness raising					
<p>Base actions to raise awareness of road-traffic-related air pollution (and so change people's behaviour) on NICE's:</p> <ul style="list-style-type: none"> • guideline on behaviour change (general approaches) • guideline on behaviour change (individual approaches) • guideline on community engagement (in particular the section on a local approach to making community engagement an integral part of health and wellbeing initiatives). 	1.7.1	Yes	<p>National awareness raising Walk to school week School Travel Plans.</p> <p>Further work would be useful to explore this recommendation in more detail.</p>	Yes	<p>Consider working with employers and schools to publish live Air Quality levels as part of their corporate communication, particularly relevant for hospitals (e.g. <i>initiatives at Bath Hospital</i>)</p> <p>Use local communications across Health and Social Care to signpost to easy and user friendly local air quality checkers (e.g. http://www.bbc.co.uk/news/science-environment-42566393)</p> <p>Produce a communication</p>

					<p>campaign to stop idling at drop off hotspots (e.g. Brent Council "Spare the Air" case study: https://www.brent.gov.uk/media/16408862/7855-no-idling-toolkit-v7-with-links.pdf; TfL: https://www.allergyco-smos.co.uk/blog/tfl-stop-idling-campaign; Bath Hospital to implement "Stop when you drop" campaign incl. signs in immediate proximity of drop off zone and car stickers to increase behavioural compliance)</p>
<p>Ensure healthcare professionals are aware that information on air quality is available, what it means for patients and what actions are recommended.</p>	1.7.2	Yes	No information identified to date, though this may occur	No	<p>This recommendation needs to be explored in more detail as there may be activity meeting this recommendation. But given the breadth of different healthcare organisations this should be explored as a separate piece of work.</p> <p>Elearning could be rolled out to healthcare workers advising of links of AQ to health.</p>

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
<p>Consider providing information on air quality (using the Department for Environment, Food and Rural Affairs' Daily Air Quality Index) with weather forecasts and the pollen index. This could be provided through local, national and social media.</p>	1.7.3	Not currently considered	No	Pollen alerts could be promoted through COMS channels	Not currently considered
<p>Consider providing information on:</p> <ul style="list-style-type: none"> • How health is affected by exposure to air pollutants in the long term as well as during specific periods of poor air quality. • The impact of local pollution on air quality inside, as well as outside, a vehicle (levels of pollution are not always lower inside). • How to reduce air pollutants and people's exposure, including the need to: <ul style="list-style-type: none"> - Reduce the number of motor vehicle journeys, if possible. - Drive in a style that minimises emissions by: avoiding rapid accelerations and decelerations, restricting the time spent with an engine 'idling' and ensuring the vehicle is correctly maintained (see the Energy Saving Trust's driving advice). - Change routes to avoid highly polluted areas and adding to traffic congestion. 	1.7.4	Yes	<p>The new Go Ultra Low West (and electric vehicle scheme) is being delivered locally. Residents can hire an EV for free.</p> <p>Driving courses looking at driving style</p> <p>Local Authority has numerous initiatives based on reducing use of polluting vehicles and promoting non transport (e.g. through video conferencing) and environmental travel (e.g., through EVs).</p>	Yes	This is partially achieved. However further efforts should be made in the promoting AQ messages
<p>Consider public awareness initiatives such as car-free days or National Clean Air Day to raise awareness of air pollution.</p>	1.7.5	Yes	<p>Air quality has not previously been routinely promoted by the COMS teams. However, through the process of engaging around these guidelines the COMS team have subsequently promoted National Clean Air Day.</p> <p>Travel to work week</p>	Yes	Consider building in to the annual programme of COMS the National Clean Air Day and AQ initiatives such as car free days

NICE recommendation	Guideline reference	Is the recommendation relevant?	Current activity/evidence	Recommendation met?	Actions needed to implement recommendation or improve performance
<p>Consider giving businesses information on how they can reduce road-traffic-related air pollution and improve fuel efficiency. For example, they could:</p> <ul style="list-style-type: none"> • help their drivers develop an energy-efficient driving style (see section 1.4) • schedule deliveries to minimise congestion • encourage employees to cycle to work (see NICE's guideline on physical activity: walking and cycling). 	1.7.6	Yes	<p>Cycle to work scheme</p> <p>Business can sign up to the First Corporate Travel club to pass on discounts to employees for season tickets</p> <p>There are a range of business support packages offered under the Access fund (https://www.firstgroup.com/bristol-bath-and-west/tickets/ticket-types/corporate-travel-scheme)</p> <p>The Travelwest sustainable travel field team offer tailored support to staff to encourage non-car alternatives (https://travelwest.info/businesses/travel-roadshows)</p> <p>Businesses are encouraged to install EV charging points and match-funded grants are available (https://travelwest.info/drive/electric-vehicles/for-businesses)</p> <p>Nationally there are incentives for purchasing EV cars (https://www.goultralow.com/electric-car-savings/electric-car-grants-and-savings/)</p> <p>There are local resources to guide alternatives to driving (travel planner, betterbybike, cycle planner)</p>	Yes	

Vulnerable groups					
<p>Healthcare professionals should be aware of vulnerable groups who are particularly affected by poor outdoor air quality. When notified of poor outdoor air quality, during any contact with vulnerable groups healthcare professionals should give general advice on how to avoid contributing to levels of air pollution and raise awareness of how to minimise exposure. This could include advice to:</p> <ul style="list-style-type: none"> • Avoid or reduce strenuous activity outside, especially in highly polluted locations such as busy streets, and particularly if experiencing symptoms such as sore eyes, a cough or sore throat. • Use an asthma reliever inhaler more often, as necessary. • Close external doors and windows facing a busy street at times when traffic is heavy or congested to help stop highly polluted air getting in. <p>(See also the Department for Environment, Food and Rural Affairs' information about the Daily Air Quality Index.)</p>	1.7.7	Yes	No information identified to date, though this may occur. Further work with the NHS to what current initiatives there are on information around vulnerable groups susceptible to air quality, how to limit exposure. This recommendation may already be met	No	Need to work with healthcare to clarify if this is met

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide

References

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