2019 Air Quality Annual Status Report (ASR)

Executive Summary

September 2019

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. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Air pollution can arise from many sources, including transport, industry and commercial and domestic heating, especially solid fuel burning. Pollutant levels are assessed against health-based national air quality objectives. Where the objectives are not met, Air Quality Management Areas (AQMAs) must be declared and an Action Plan put in place to improve the air quality.

Air Quality in South Gloucestershire

South Gloucestershire lies to the north and east of the city of Bristol with the River Severn forming the western boundary and the Cotswold Escarpment to the eastern edge. The area is a diverse mix of urban and rural areas, including major residential, industrial and commercial developments. The major junction of the M4 and M5 motorways is within South Gloucestershire.

The 2018 mid-year population estimate for South Gloucestershire is 282,600[4] which represents a 15% increase since the 2001 census (245,600). 87% of the population live in urban areas, largely in the built up areas immediately adjoining Bristol and the towns of Yate and Thornbury. The remaining 13% live in the more rural areas of South Gloucestershire. The total population is projected to increase to 335,200 in 2041[5]. With the population projected to continue rising, managing future development and providing vital transport infrastructure is a key challenge.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013
[4] Source: Office for National Statistics (ONS) Mid-year estimates 2018 https://www.southglos.gov.uk/council-and-democracy/census/key-facts-and-figures/
[5] Source: ONS 2016 subnational population projections 2018 https://www.southglos.gov.uk/council-and-democracy/census/key-facts-and-figures/

The main air pollutant of concern locally is nitrogen dioxide (NO_2), which mostly arises from road traffic (34%, rising to 80% near roadsides)[6]. Particulate matter is also a pollutant of concern with recent research indicating that there are no safe levels of this pollutant[7]. Sources of particulate matter (PM_{10} and $PM_{2.5}$ which are described by the particle size) include domestic wood and coal burning (38%), industrial combustion (16%) and road transport (12%)[8].

While the air quality in South Gloucestershire is generally good, in some places the air quality does not meet the annual mean objective for nitrogen dioxide (40 µg/m^3).

Air Quality Management Areas

There are three AQMAs currently declared in South Gloucestershire in relation to the annual mean objective for nitrogen dioxide:

- Staple Hill – in the centre around the Broad Street/ High Street/ Soundwell Road/ Victoria Street crossroads and the High Street/ Acacia Road/ Pendennis Road crossroads.
- Kingswood – Warmley – from the Bristol/ South Gloucestershire boundary in Kingswood along the A420 to the junction with Goldney Avenue in Warmley.
- Cribbs Causeway – adjacent to the M5 Junction 17 roundabout (however this AQMA is in the process of being revoked).

Full details of these AQMAs are included in Table 2.1 of the report and maps are available in Appendix E. Further information on the AQMAs are available on the Council website at www.southglos.gov.uk/airquality and on the Defra website at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=238.

Trends in monitored concentrations

In 2018, South Gloucestershire Council had 106 nitrogen dioxide monitoring sites, including the Yate automatic site, which also monitors particulate matter (PM_{10}).

The key outcomes from the monitoring are:

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf
[7] https://laqm.defra.gov.uk/assets/63091defraairqualityguide9web.pdf
[8] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

- Nitrogen dioxide levels decreased across the majority (85%) of the monitoring sites compared to 2017, including at the Yate automatic station and in the Kingswood – Warmley and Staple Hill AQMAs.
- There was one location where the nitrogen dioxide annual mean objective was not met (i.e. exceeded) in South Gloucestershire in 2018, compared to three exceedances in 2017 and eleven in 2016.
- The single exceedance was within the Kingswood – Warmley AQMA (Site 146 Kingswood Hill Street – 40.8 µg/m^3). In comparison, there were two exceedances in 2017 and five in 2016 within the AQMA. Nitrogen dioxide concentrations decreased at 90% of the monitoring sites in this AQMA.
- There were no exceedances of the nitrogen dioxide annual mean objective in the Staple Hill AQMA, compared to one exceeding site in 2017 and five in 2016, and concentrations decreased at 94% of the monitoring sites within this AQMA.
- There were again no exceedances of the nitrogen dioxide annual mean objective in the Cribbs Causeway AQMA, with monitored concentrations well below the objective (25.2 µg/m^3), continuing a declining trend.
- There were no exceedances of the nitrogen dioxide annual mean objective outside of the AQMAs where there is relevant exposure (i.e. public exposure for the averaging period of the objective, so in this case, a calendar year).
- At the Yate automatic monitoring site, nitrogen dioxide concentrations were well below the annual mean objective with a decrease to 20 µg/m^3 from 23 µg/m^3 in 2017, continuing the overall declining trend at this site. There were also no exceedances of the 1-hour mean (200 µg/m^3 not to be exceeded more than 18 times a year), continuing compliance with this objective.
- Particulate matter (PM_{10}) is also monitored at the Yate Automatic site and in 2018, the annual mean PM_{10} was 13 µg/m^3; a decrease from 14 µg/m^3 in 2017. Overall, the trends in annual mean PM_{10} concentrations at Yate have been slowly declining since 2010. The 24-hour mean objective (50 µg/m^3 not to be exceeded more than 35 times a year) was also not exceeded.

- Overall, the decreasing trend across the majority of the monitoring sites in South Gloucestershire mirrors the national declining trend[9]. However, pollutant concentrations can vary significantly from year to year due to a number of factors, in particular the meteorological conditions, which can affect pollutant dispersion.

The monitoring results and trends in the data are discussed fully in Chapter 3 of the report and trend graphs are available in Appendix A.

Pollutant sources

The following sources of pollution were considered as part of the review of air quality for this report, as detailed in the Defra Local Air Quality Management Technical Guidance (LAQM.TG16)[10].

- Road Traffic Sources
- Non-Road transport Sources
- Industrial Sources
- Commercial and Domestic Sources
- Fugitive and Uncontrolled Sources

No new major sources of emissions were identified. Full details are provided in Appendix D of the report.

How the Council works to manage local air quality

South Gloucestershire Council is a unitary authority and Planning, Transport and Environmental Health are all within the same Directorate (Environment and Community Services) enabling close working between these teams. This has particularly allowed close working between Environmental Health, with their responsibilities for local air quality management and the Strategic Transport and Environment Policy Team, who currently lead on air quality action plan development and implementation. Furthermore, there is a close working relationship with the Public Health Team, and their work on the built environment recognises the importance of aligning spatial planning and transport work with its associated impacts on air quality and health.

[9] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/796887/Air_Quality_Statistics_in_the_UK_1987_to_2018.pdf

[10] http://laqm.defra.gov.uk/technical-guidance/

Work continues on the development of a council-wide approach to air quality, bringing together services which have an interest and/or impact on air quality, such as Public Health, Environmental Health, Transport Policy, Spatial Planning, Development Control, Street Care and Highways and Strategic Communications. This steering group will be jointly lead by the Director of Environmental and Community Services and the Director of Public Health and will also cover the Council's work on Climate Change to ensure there is a joined up approach across the two work areas, which are closely interlinked with often the same sources and interventions. It is anticipated that a council–wide Clean Air Strategy will result to complement the Council's existing Climate Change Strategy[11].

South Gloucestershire works closely with other neighbouring authorities in the West of England (Bath and North East Somerset, Bristol City and North Somerset Councils), particularly with regard to regional strategic work areas such as transport and planning, for example on Joint Local Transport Plans (the current JLTP3 and the emerging JLTP4[12]) and the Travel West[13] brand which acknowledges commuters do not think in terms of Council boundaries.

The West of England Combined Authority (WECA) was established in 2017, with its constituent councils being Bath and North East Somerset, Bristol and South Gloucestershire. Its aim is to deliver economic growth for the region and address some of the challenges, such as transport, housing, productivity and skills. Crucially, WECA have powers over spending, previously held by central government, to improve the region's transport, housing, adult education and skills. WECA continue to also work closely with North Somerset Council.

Actions to Improve Air Quality

Key completed measures to improve air quality are:

- Under the second round of the Clean Bus Technology Fund, First Bus and CT Plus have retrofitted 70 buses with emissions-reducing technology, 13 of which operate within the SGC AQMAs. A further 12 First Bus vehicles are currently having new Euro VI engines fitted. Funding has been awarded for an extension to this project under which a further 166 buses across the West of

[11] https://www.southglos.gov.uk//documents/Climate-Change-Strategy-201823-Final-sgc-signed-v1.pdf
[12] https://travelwest.info/projects/joint-local-transport-plan
[13] https://travelwest.info/

England will be retrofitted with emissions-reducing technology by August 2020.

- A £4.79m Office for Low Emission Vehicles (OLEV) funding grant was awarded to the four West of England local authorities and First Bus in August 2017. To date this funding has delivered 21 bio-methane powered buses, and the related re-fuelling infrastructure at one depot, with the remaining funding set to deliver a further 35 buses together with re-fuelling infrastructure at a second depot. The new buses will contribute to reducing air pollution levels across the West of England area, including the Staple Hill AQMA.
- Entire fleet of Council pool cars switched to electric in 2017, with OLEV funding secured to switch 20% of other fleet vehicles to electric by 2021.
- Access funding secured to 2020, to enable the continuation of school, business and community travel planning measures to promote sustainable travel choices.
- The local transport capital programme 2016/17 approved a wider parking management review of the extended Kingswood - Warmley AQMA. A scheme implementing recommendations from the review to address parking issues along A420 Hill Street/Deanery Road was installed in 2018 and a scheme in Warmley is scheduled to be completed in 2019/20.

Full details of progress in implementing the existing Air Quality Action Plan for Kingswood and Staple Hill are contained in Section 2.2 of the report.

Other actions being progressed on a wider West of England basis aimed at reducing traffic congestion and improving air quality include:

- Metrobus - a new express bus service which began operating in 2018[14]
- Cribbs Patchway Metrobus Extension[15] - an extension of the Metrobus network in South Gloucestershire
- MetroWest[16] – improved rail services and infrastructure
- Cycle Ambition Fund – improvements to cycling and walking networks

[14] https://travelwest.info/metrobus
[15] https://beta.southglos.gov.uk/cribbs-patchway-metrobus-extension/
[16] https://travelwest.info/projects/metrowest

- GoUltraLowWest[17] - a grant funded project by Office for Low Emission Vehicles (OLEV) for the promotion of electric vehicles
- Joint Local Transport Plan (JLTP3) covering the period 2011 - 2026, is being updated to produce a new Joint Local Transport Plan (JLTP4) to take strategic transport planning beyond 2026 through to 2036. A greater emphasis will be placed on air quality in the JLTP4.

Further information on these actions is also provided in Section 2.2 of the report.

Hambrook Air Quality Action

Further to the Government's UK Air Quality Plan[18] for nitrogen dioxide published in July 2017, South Gloucestershire Council was mandated by the Government in February 2018 to undertake a Targeted Feasibility Study. The study was required to identify possible actions that could be taken to reduce roadside nitrogen dioxide levels to meet the annual mean EU limit value of 40 µg/m^3 on the A4174 Ring Road between the Bromley Heath and M32 Junction 1 roundabouts in the shortest time possible. The EU limit value applies where there is public access, so includes pedestrian and cycle paths, whereas the national (UK) air quality objectives apply where there is "relevant exposure", i.e. where the public are present for the averaging period of the objective, a calendar year in this case.

The study concluded that it would be possible to bring forward compliance on this section of the A4174 if certain traffic management measures were put in place at the A4174 Hambrook junction. The outcome of the study was approved by the Joint Air Quality Unit (JAQU); a new joint unit formed between Defra and the Department for Transport (DfT) and funding was provided for the scheme.

The following measures were implemented through an Experimental Traffic Order (ETO) on 11 August 2019:

- Removal of the right turn facility onto the B4058 from the westbound carriageway of the A4174 ring road
- Removal of the straight on movement for the B4058 northbound from Frenchay

[17] https://travelwest.info/drive/electric-vehicles/go-ultra-low-west
[18] https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017

- Removal of the right turn facility from the B4058 from Frenchay onto the A4174
- Removal the westbound bus lane on the A4174 through the junction to the M32 traffic signals

An ETO allows a trial which can be in place for a period up to 18 months, during which time consideration is given to making the measures permanent. Orders are subject to a statutory process which allows the public to comment formally and provide feedback. The consultation, which runs until 11 February 2020, is available on the Council website at: https://consultations.southglos.gov.uk/consult.ti/PT.6296_Hambrook_E.T.O/consultationHome

Further information about the scheme is available on the Council's website at https://www.southglos.gov.uk/transport-and-streets/streets/roads-road-works/major-roadworks/hambrook-air-quality-action/

South Gloucestershire Council also continue to engage with Bristol City Council and Bath and North East Somerset Council on their Clean Air Plans and share progress on our mandated JAQU projects, though meetings organised by the West of England Combined Authority (WECA). Further information about the Bristol Clean Air Plan is available on the Clean Air for Bristol website[19] and for the Bath Clean Air Plan, on the Bath Breathes website[20].

Conclusions and Priorities

Declining trends in nitrogen dioxide levels and only one exceedance of the annual mean objective within the AQMAs shows an improving picture of air quality in South Gloucestershire in 2018.

The Kingswood – Warmley AQMA is still required as the single exceedance is within this AQMA. While there were no exceedances within the Staple Hill AQMA, two sites were "borderline" (within 10% of the annual mean objective i.e. greater than 36 µg/m^3).

Defra advice is that AQMAs should remain in place until several years of data below 10% of the objective (36 µg/m^3) is collected which can support revocation, as annual

[19] https://www.cleanairforbristol.org/
[20] http://www.bathnes.gov.uk/bath-breathes-2021

mean pollutant concentrations can vary from year to year due to a number of factors, most notably meteorological conditions. So monitoring will continue and the situation reviewed before revocation of the Staple Hill AQMA can be considered.

There were again no exceedances of the nitrogen dioxide annual mean objective in the Cribbs Causeway AQMA, and monitored concentrations were well below the objective at the façade of the single residential property within the AQMA. There has been sustained compliance with the objective where there is relevant exposure for nine years (2010 -2018 inclusive) which confirms the case for the formal revocation of the AQMA.

South Gloucestershire Council's priorities for the coming year are to:

- Complete the JAQU directed experimental scheme for the A4174 Hambrook junction to bring forward compliance with the annual mean NO_2 EU limit value, to consider the effectiveness of the scheme, and decide whether to make the measures permanent.
- Progress the review and update of the Air Quality Action Plan for Kingswood and Staple Hill to incorporate the extension of the Kingswood AQMA to Warmley. Progress on this has been limited in 2018/19 due to the resource impact of work on the JAQU mandated feasibility study, and implementation of the subsequent A4174 Hambrook Air Quality Action scheme.
- Proceed with the formal revocation of the Cribbs Causeway AQMA.
- Continue to develop the Clean Air Strategy to enable a council wide approach to air quality.

However, the Council faces major challenges at a time of significant pressure on public finances, particularly in relation to local government funding, which could impact on delivering air quality improvements.

There is significant pressure on transport systems within South Gloucestershire, due to the sheer level of travel demand generated by the current population and people coming into the area on a daily basis to work, shop and for leisure reasons. These pressures are shown through traffic congestion on the road network and capacity problems on local rail services.

The need for further housing growth within the West of England region also presents significant challenges. A joint approach to planning and transport across the region is essential to ensure that future growth decisions are made with an understanding of the necessary transport investment needed to achieve sustainable communities.

Local Engagement and How to get Involved

What you can do to reduce air pollution

There are lots of steps that everyone can take to improve air quality. By making informed personal choices, particularly around how we travel and heat our homes, we can help improve air quality and improve our own health in the process.

To reduce pollution when travelling:

- Swap some trips in the car for walking, cycling or taking a bus or train, this not only reduces air pollution but also improves your health and wellbeing.
- Consider sharing lifts which will save you money on fuel as well as reducing the number of cars on the road.
- Travel outside peak hours and/or work from home if possible, to save time spent in traffic and use less fuel, reducing emissions while saving time and money.
- If you are thinking of changing your vehicle, try switching to a less polluting type of vehicle as indicated below and opt for the cleanest vehicle you feasibly can.

    - Electric vehicles — Lowest emissions
    - Petrol hybrid
    - Gas or petrol
    - Diesel hybrid
    - Diesel — Highest Emissions

    

    Emissions can vary depending on make and model and some perform better than others when the emissions in real world driving conditions are compared to the required Euro standards for vehicles. To check the emissions of your

vehicle or a vehicle that you are considering purchasing, there is an online vehicle checker[21] on the Mayor of London/ London Assembly website.

- Visit the Travel West[22] website for live information on public transport, traffic reports, routes and journey planning for walkers and cyclists, electric vehicle charge points and other information that simplifies travel choices.

To help reduce pollution from domestic heating:

- Consider a boiler upgrade to the newest and most efficient gas condensing boiler with lowest NO_x (and carbon) emissions, especially if the boiler is more than 10 years old. In many cases, the long-term savings made with a more efficient boiler will cover the outlay.
- Switch energy supplier to a renewable energy supplier. They sometimes work out cheaper and the way the energy is generated is less polluting.
- Consider installing "clean" renewable energy generation, for example via solar photovoltaics.
- Avoid solid fuel burners, such as stoves or fireplaces. If you already own one and choose to use it, make sure you follow the "Open fires and wood-burning stoves" advice leaflet[23] by using the right fuel on an efficient and well-maintained appliance. Some of South Gloucestershire is covered by a Smoke Control Area[24] which allows only approved appliances and fuels to be used.
- However, should you still plan to install a stove, then the lowest emission stoves currently on the market are those that are 'Ecodesign Ready'. These will meet the future EU standards for all new stoves in the UK set to be introduced in 2022.

There are decisions we can all make to reduce air pollution. Relatively small changes all add up, and if everyone contributes, it can make a big difference overall.

Further information is available on our website www.southglos.gov.uk/airquality.

[21] https://www.london.gov.uk/what-we-do/environment/pollution-and-air-quality/cleaning-londons-vehicles
[22] https://travelwest.info/
[23] https://consult.defra.gov.uk/airquality/domestic-burning-of-wood-and-coal/supporting_documents/open%20fires%20wood%20burning%20stoves%20%20guideA4update12Oct.pdf
[24] https://www.southglos.gov.uk/environment-and-planning/pollution/pollution-control-clean-air-act-approval/smoke-control-areas/