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South Cambridgeshire District Council

3 September 2021

To: Chair - Councillor Pippa Heylings
Vice-Chairs – Councillors Dr. Martin Cahn and Geoff Harvey

Members of the Climate and Environment Advisory Committee – Councillors Paul Bearpark, Grenville Chamberlain, Graham Cone and Peter Fane

Substitutes: Councillors Heather Williams, Dr. Shrobona Bhattacharya, Mark Howell, Tom Bygott, Sue Ellington, Eileen Wilson and Judith Rippeth

Dear Sir / Madam

You are invited to attend the next meeting of **Climate and Environment Advisory Committee**, which will be held in **To be confirmed** at South Cambridgeshire Hall on **Monday, 13 September 2021** at **2.00 p.m.**

Yours faithfully
Liz Watts
Chief Executive

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Agenda

Pages

1. Apologies

2. Declarations of Interest

3. Minutes of the Previous Meeting **1 - 6**
To agree the minutes of the meeting held on 13 July 2021.

4. Plans for Ouse Fen and Fen Drayton Nature Reserves - Implications and Opportunities
Presentation from Hannah Phillips, RSPB Area Manager.

5. Green Homes Grants Local Authority Delivery Scheme Update **7 - 10**

6.	**Air Quality Update**	**11 - 122**
7.	**Solar Together Cambridge Update**	**123 - 130**

8. Forward Plan and Dates of Next Meetings

The Committee is asked to note that the next meeting of the Climate and Environment Committee to discuss the Local Plan will be held on the evening of Tuesday 21 September, following the meeting of Scrutiny and Overview Committee.

The Committee is in invited to postpone its meeting in November from 9 November to 23 November at 2pm as renovation work is being carried out in the Council Chamber.

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South Cambridgeshire District Council

Minutes of the Climate and Environment Advisory Committee held on Tuesday, 13 July 2021 at 2.00 p.m.

Chair: Pippa Heylings
Vice-Chair: Dr. Martin Cahn and Geoff Harvey

Committee Members in attendance:
Paul Bearpark
Mark Howell

Councillors in attendance:

Councillors Cllr Sue Ellington, Cllr Peter Fane and Cllr Bridget Smith were in attendance remotely, by invitation.

Officers:

Patrick Adams	Senior Democratic Services Officer
Emma Davies	Principal Sustainability Consultant
Emma Dyer	Project Officer - Climate and Environment
Siobhan Mellon	Development Officer - Climate and Environment
Rebecca Weymouth-Wood	Interim SSWS Waste Policy Manager

1. Apologies

Apologies were received from Councillor Graham Cone and Councillor Grenville Chamberlain. Councillor Mark Howell substituted for Councillor Graham Cone, whilst Councillor Sue Ellington attended the meeting remotely to substitute for Councillor Grenville Chamberlain.

2. Declarations of Interest

None.

3. Minutes of the Previous Meeting

The minutes of the meeting held on 14 June 2021 were agreed as a correct record.

4. Matters Arising from the Minutes

The Development Officer – Climate and Environment reported that following the item on the Chalk Streams report at the previous Committee meeting, the Council's Drainage Manager had met with Rob Mungovan, author of the report, to discuss improved management of awarded watercourses to enhance biodiversity. The Chair expressed enthusiasm for a report back to the Committee in due course on progress with this action.

5. Nature Smart Cities Business Model

Councillor Anna Oxenham from Southend-on-Sea Borough Council gave a presentation to the Committee on the aims of the Nature Smart Cities and Phil Back described its business model. It was noted that the project were looking for local authorities to volunteer from the four participating countries.

Members of the Committee made the following points:

- This was an exciting opportunity for the Council.
- As Britain had left the European Union it was unclear where funding would come from after 2023.
- The European definition of a city was different from the British definition.
- Trees planted on A14 had died due to neglect.
- Tree location and plastic cover removal needed to be better planned.
- The Council did not own much land in the District.
- To implement change, a budget and staff were required.
- It was suggested that this could be part of the OxCam arc.

Phil Back explained that green initiatives in the District had been added after the development had taken place. This project was an opportunity to create a network of cities that shared business models and promoted sustainability.

The Chair proposed and Councillor Mark Howell seconded that the Committee **Recommended** that the Council offered to pilot test this scheme.

6. Progress report on Zero Carbon Action Plan and Revised Plan with Doubling Nature Actions Added

The Development Officer – Climate and Environment presented this report, which provided both a review of the Zero Carbon Action Plan for 2020/21 and an update of the Plan, which included the actions to deliver the Doubling Nature Strategy.

The Committee noted that the Covid-19 pandemic had made certain objectives unfeasible, such as the support for repair cafés.

Committee members made the following points:

- Newly planted trees often died, so planting two trees for every one removed should be considered.
- The reduction in waste at South Cambs Hall was welcomed.
- Numbers should be provided in reports, not just percentages.
- The Cambridge Ice Rink should be considered as a taxi charging site.
- To implement this properly, a culture change will be necessary.
- It would be useful to know where financial savings were being re-invested.
- Some of the “red” projects required urgent action.
- It would be challenging for the Council to meet its doubling nature aspirations, as the authority did not manage any land.
- The support of local businesses was important.

In response to a query regarding the Council's approach regarding enforcement of energy efficiency standards in the private rented sector, the Development Officer – Climate and Environment suggested that the Environmental Health team be invited to a Committee meeting to discuss this.

It was suggested that Ermine Street Housing Ltd could pilot a scheme on this issue. In response to a query regarding Electric Vehicle Charing Infrastructure the Development Officer, Climate and Environment suggested that a report outlining current and planned action by the Greater Cambridge Partnership, the Combined Authority, and the Council be brought to a future Committee meeting for discussion.

Combined Authority
The Leader recommended that the Council work with the Cambridgeshire and Peterborough Combined Authority, as it had just adopted the Independent Climate Change Commissions recommendations.

Paperless meetings
It was noted that the Council was carrying out a pilot scheme for having paperless meetings and that the Council's paper usage had significantly reduced during the Covid-19 pandemic.

The Committee **Noted** the revised Zero Carbon Action Plan, which had been updated to include the Doubling Nature actions.

7. 2020-21 GHG Emissions Accounts

The Climate and Environment Project Officer presented this report on the Council's Greenhouse Gas emissions for 2021. It was noted that to achieve the Council's target of 75% reduction by 2030 an annual reduction of 6.25% was required and the authority was slightly behind this target. It was expected that the greening of South Cambs Hall and the electric waste collection fleet vehicles would rectify this.

Comparing with other local authorities
The Climate and Environment Project Officer explained that the Council was considering using the Local Government Association's tool for benchmarking performance against other authorities next year.

Reducing food waste
The Waste Policy, Change and Innovation Manager explained that the Council was introducing a new initiative that would encourage residents to reduce their food waste.

Reducing mileage
The Climate and Environment Project Officer explained that an officer was looking at ways of minimising the increase in travel by officers after lockdown ended. It was agreed that the Council's Travel to Work plan should be shared with members of the Committee.

Internet usage

In response to concerns about the increase in emissions from internet usage, the Climate and Environment Project Officer explained that the Council was working with Cambridge City Council to measure the emissions produced by the 3C ICT servers.

The Committee **Noted** the report.

8. Update on Grid Capacity Issues Facing Greater Cambridge

The Principal Sustainability Consultant updated the Committee on the work being carried out to address grid infrastructure capacity issues across the District.

In response to concerns expressed about the possibility of a lack of grid capacity preventing future housing developments, the Principal Sustainability Consultant explained that the Cambridgeshire and Peterborough Combined Authority were already investing on infrastructure to avoid this.

Councillor Paul Bearpark agreed to provide the Principal Sustainability Consultant with details of the use of fluorite in the installation of grid infrastructure.

The Committee **Noted** the report.

9. A428 Environmental Legacy Update

The Development Officer – Climate and Environment provided an update on attempts to secure a positive environmental legacy from the A428 Black Cat to Caxton Gibbet improvement works. She agreed to provide Committee members with the link to the online consultation on the Planning Inspector's website regarding this project.

The Chair stated that the environmental legacy for the A428 improvements needed to be better than that of the A14 and the Council needed to lobby Highways England to help ensure this. The Leader assured the Committee that the Planning Inspector had asked Highways England for information regarding their questionable figures. The three affected Cambridgeshire authorities were equally concerned about this issue and the Leader had raised this matter with the District's MP.

Councillor Mark Howell suggested that the plastic protective bags put on saplings be made of biodegradable material, or a strategy be drawn up for their removal.

The Committee **Noted** the report.

10. Six Free Trees Scheme

The Project Officer, Climate and Environment provided the Committee with details of the Council's Six Free Trees Scheme. She explained that unlike the previous scheme, the trees for this project would be bulk purchased, which would be cheaper and easier to administer. The aim was to deliver the free trees to parishes by December.

The Chair suggested that the survival of the trees should be monitored and Councillor Sue Ellington recommended that the Council replace any trees that die, free of charge.

The Committee **Noted** the report.

11. CPICC Recommendations to CaPCA - implications for SCDC

The Leader reported that the Cambridgeshire and Peterborough Combined Authority Board had approved the recommendations of the Climate Change Commission. The Combined Authority would now be allocating officer support to this. There were opportunities for the creation of wetlands in the District. Unfortunately there had been some resistance to the peat restoration project. It was noted that the Government was about to out on consultation on the OxCam Arc project.

12. Forward Plan and Date of Next Meeting

It was noted that the next meeting would be held on Monday 13 September at 2:00pm. It was noted that the following issues were on the Forward Plan:

- Presentation from RSPB Area Manager on plans and issues around Ouse Fen Nature Reserve
- Air quality update
- The Local Energy Advice Partnership
- Net Zero housing project
- Approach to energy efficiency in Private Rented Sector
- Electric Vehicle Charging Infrastructure

The Meeting ended at 4.30 p.m.

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South Cambridgeshire District Council

REPORT TO:	Climate and Environment Advisory Committee	13 September 2021
LEAD CABINET MEMBER:	Lead Cabinet Member for Climate Change	
LEAD OFFICER:	Interim Head of Shared Waste and Environment	

Green Homes Grants Local Authority Delivery Scheme Update

Executive Summary

1. The purpose of this report is to provide an update on delivery of home energy improvement measures to properties in South Cambridgeshire through the government's Green Homes Grant Local Authority Delivery scheme.

2. The report is provided to the committee for review and comment.

Details

3. There are around 67,000 homes in South Cambridgeshire. Providing heat and power for these gives rise to nearly 250,000 tonnes of CO2, accounting for around 20% of the district's carbon footprint. The Zero Carbon and Doubling Nature Action Plan 2020-25 (21-22 revision) includes seven actions to support reductions in carbon emissions from the housing sector. This report relates to Action 2.5, *Continue to work with partners, including through the Cambridgeshire Energy Partnership, to find ways of supporting and encouraging home energy work, including exploring options for funding and delivering energy efficiency projects for our residents* and Action 2.7*, work with partners to provide home surveys, advice, free insulation and other home energy measures for households in fuel poverty.* (Four of the other six actions relate to the Council's own housing stock and are reported at agenda item 7; the remaining action relates to the Cambridgeshire Solar Together scheme and is reported at agenda item 9.)

4. In August of last year, the UK Government launched its Green Homes Grant scheme to support low carbon efficiency improvements to homes. The consumer-direct element of this scheme, which provided vouchers to households towards the cost of energy improvements, was closed prematurely earlier this

year. However, the Local Authority delivery element of the scheme, which targets low income households of all tenures, continues and two further phases have been added.

Green Homes Grant Local Authority Delivery scheme 1 (LAD1)

5. In the first phase, launched 4 August last year, bids were invited from local authorities for delivery of low carbon energy improvements to low income households by the end of March 2021. The bid deadline was 1 September.

6. As with opportunities to bid for government funding for energy improvements to private sector homes over many years, the Cambridgeshire local authorities agreed a joint collaborative approach led by Cambridge City Council through the Cambridgeshire Energy Partnership, (a formal partnership operating under a Memorandum of Understanding agreed in 2013, and revised in 2018).

7. Despite efforts, the application window proved to be too short to compile a Cambridgeshire bid. However, since the original scheme was undersubscribed, a second round, LAD1b, was opened later with funding for work to be delivered by the end of September 2021. Cambridge City Council led a successful Cambridgeshire consortium bid to LAD1b for just over £2,000,000 to upgrade 278 homes, including 100 park homes in South Cambridgeshire and Huntingdonshire, (approximately 50 in each).

8. Park homes were identified as target properties in South Cambridgeshire, due to the relative ease of identifying multiple eligible households and delivering work to these in a short time-frame.

9. Delivery of the park homes element of the scheme has been delayed due to a combination of factors including delays and an extension to the 1a scheme having a knock on effect on availability of installer capacity before the LAD1b deadline of 30 September.

10. In the past couple of weeks, the deadline for LAD1b has also been extended; for LAD1b this is to 31 March 2022. There remains uncertainty as to whether the intended work to park homes can go ahead. This is because of a change in the retrofit standards (PAS2035 has become mandatory for all public funded projects), which leaves it unclear whether the intended approach to park home insulation is still permitted.

11. We are continuing to explore the possibilities and are hopeful that a way to deliver insulation work to park homes can be found. We are also looking at approaches to identifying alternative properties if this proves necessary.

Green Homes Grant Local Authority Delivery scheme 2 (LAD2)

12. Phase 2 of the LAD scheme in Cambridgeshire, to be delivered by 31 March 2022, (recently extended from 31 December), is being managed an agent, Eon, appointed by the Greater SE Energy Hub. Eon have a nominal funding allocation for each of the Cambridgeshire local authority areas, based on population and deprivation data. In South Cambridgeshire the allocation is £429,500.

13. We are working with Eon to support the identification of suitable properties/eligible households, focussing initially on properties owned by the Council, within the Ermine Street Housing portfolio, and in the Council's private leasing scheme, Shire Homes. Depending on tenure, (an average of £10,000 per property is available for owner occupied properties; but only £5,000 per property for rented properties), this will fund work to between 43 and around 86 properties.

Green Homes Grant Local Authority Delivery scheme 2 (LAD2)

14. Phase 3 of the LAD scheme was combined with a new government scheme targeting fuel poverty in off-gas grid areas, the Home Energy Upgrade 1 scheme, (HUG1) into a single Sustainable Warmth Competition for delivery by 31 December 2022. Bids from local authorities were invited by 4 August. A consortium bid for Cambridgeshire, again led by Cambridge City Council, has been made to this competition, and we wait to hear whether it has been successful. The bid is for a total of £3,676,500 for work to 398 properties across Cambridgeshire, with approximately 20%, ie 80 of these expected to be in South Cambridgeshire.

15. To be eligible for any of the above schemes, households must be in receipt of means-tested benefits or be able to provide evidence of an annual gross income below £30,000. The property must have an EPC rating of D, E, F or G. D rated properties must not comprise more than 50% of the total number of properties benefiting from the scheme.

16. Under the LAD schemes up to £10,000 is available for owner occupied properties with no contribution from the owner required. Up to £5,000 is available for rented properties with a requirement that the landlord funds at least 1/3 of the total cost of works. The HUG1 scheme (off gas grid properties only) is more generous, providing up to £15,000 per property.

17. Eligible measures are any energy efficiency and heating measures compatible with the Standard Assessment Procedure (SAP), that will help improve EPC Band D, E, F or G rated homes, with the exception of fossil fuel heating systems. This includes wall, loft and underfloor insulation as well as low carbon heat technologies and solar PV. SAP is the basis of the EPC ratings.

Identifying eligible households

18. Along with Eon, officers from the other Cambridgeshire local authorities and officers from other areas of the Council, (eg Environmental Health and Sustainble Communities), we are exploring approaches to identify eligible households in suitable properties, and where necessary, for liaising with landlords, who are required to fund at least one third the cost of any improvement.

19. An additional Project Officer has been appointed and is due to join the Climate and Environment team in November, and will be able to help with this work.

Expected carbon savings

20. Estimate carbon savings from the work will be calculated and reported in due course.

Report Author:

Siobhan Mellon, Development Officer Climate and Environment
Telephone: 01954 713395

South Cambridgeshire District Council

Report to:	Climate and Environment Advisory Committee 13 September 2021
Lead Cabinet Member:	Cllr Brian Milnes
Lead Officer:	Soraya Hashemi

Air Quality Update

Executive Summary

1. This report underpins the priorities in the current Business Plan, largely under the 'Being Green to our Core' priority. The plan contains actions:
2.

Agree and deliver our strategy and actions needed to protect and improve the air quality of our district	• Strategy and action plan revised (Quarter 1) • Air quality monitor in place to gather data at one new location (Quarter 1) • Complete a review of how and where we monitor air quality (Quarter 2)

3. The drafted Air Quality Strategy was presented to the Committee and was accepted to be presented to and approved by the Cabinet. This, however, was not proceeded due to Covid-19 Pandemic. The full Strategy is presented as Appendix A.

4. In addition, the decision for Revocation of our Air Quality Management Area (AQMA) is presented in this report and reflected in the drafted Strategy. This was supported by Defra (Department for Environment, Food & Rural Affairs) following approval of our Annual Status Report (ASR) 2020 and was reflected in detail in our Annual Status Report 2021. The Annual Status Report 2021 was submitted to Defra in June 2021 and is awaiting feedback. The full report is presented as Appendix B.

5. This report also presents an update on the review of our air quality monitoring network and presents the findings of our first Zephyr monitor installed near the Harston and Newton Community Primary School in late 2020. The full report is presented as Appendix C.

Recommendations

6. The committee is invited to review the reports and comment on the updates provided.

Details

7. It is recognised that Members consider air quality a high priority as part of the council's green to our core. As such, a new Air Quality Strategy has been drafted and will be presented for approval to the Cabinet. This Strategy outlines a new approach to monitor and improve the air quality across the district and to ensure both the new and existing communities are considered to benefit a better air quality district wide.

8. The drafted Air Quality Strategy was previously presented to the Committee and was accepted to be presented to and approved by the Cabinet. This, however, was not proceeded due to Covid-19 Pandemic.

9. The drafted Strategy presented as Appendix A includes the update on revocation of our Air Quality Management Area (AQMA) which was supported by Defra (Department for Environment, Food & Rural Affairs) in approval of our annual report in 2020. This was also discussed in detail in our 2021 annual report which is presented as Appendix B.

10. Air Quality Management Areas (AQMA) are locations where levels of air pollution above the human health thresholds are considered likely. South Cambridgeshire has declared one in 2008. However, none of the pollutants monitored within our AQMA, i.e. Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}), have reached a level above the human health thresholds since 2014.

11. If the local authority has 5 years of data that supports that the air quality limit has not been exceeded, the AQMA should be revoked. Defra (Department for Environment, Food & Rural Affairs) has recommended that we revoke our AQMA.

12. A review of the existing monitoring network has been completed aiming to identify the likely hot spots as the result of major developments in the district. In early 2021, work has started to update the monitoring network to reflect this review, including the relocation of some existing monitoring equipments and the procurement of new automatic continuous monitors. The new automatic monitors are aimed to be in place and operational by end of December 2021.

13. A hotspot monitoring initiative is underway using a new technology known as Sensors (Zephyr). These are portable monitors that run on solar power and can be deployed on lampposts. These indicative real-time monitors will let the Council to test the reliability of alternative technologies for air quality monitoring and conduct short term studies in different areas of concern such as schools.

14. The first Zephyr was installed in Harston village near the Harston and Newton Community Primary School in late 2020. A minimum of six months data was collected for the Harston study and the results show that no levels of pollution above human health thresholds are recorded near the school. A full report of this study is presented in Appendix C.

15. Another two Zephyrs have been purchased since and been installed at different schools. It is intended that for each study area a report will be published similar to the Harston report and be presented to the committee once completed.

16. A new data portal is been set up for the Zephyrs enabling the public to access real-time data from these monitors. We are working with the provider to resolve some minor issues before releasing it on our website.

Alignment with Council Priority Areas

Being green to our core

17. See paragraph 1.

Appendices

Appendix A: Air Quality Strategy 2021
Appendix B: Annual Status Report 2021
Appendix C: Harston Zephyr Study 2021

Report Author:

Soraya Hashemi – Scientific Officer Air Quality
Telephone: 01954 713640

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South Cambridgeshire District Council

Air Quality Strategy

2021

Executive Summary

South Cambridgeshire District Council (SCDC) is a rural district where the background pollution levels are generally lower than that in urban areas. SCDC encompasses Cambridge City and has a good road and rail links with London and the South-East with M11, A11 and A14 corridors passing through the district and attracting a high volume of traffic on daily basis.

Whilst undergoing a significant growth, from multiple small developments to actual new towns in different parts of the district, South Cambs faces a potential risk to its local air quality from the cumulative impact of these developments. Therefore, a need for a robust air quality strategy to set out a new approach to monitor and improve the air quality was acknowledged.

Section 82 of the Environment Act 1995 provides that every local authority shall review the air quality within its area, both at the present time and the likely future air quality. Section 83 requires local authorities to designate an Air Quality Management Area (AQMA) where air quality objectives are not being achieved, or are not likely to be achieved, as set out in the Air Quality (England) Regulations 2000. Once the area has been designated, Section 84 requires the local authority to develop an Action Plan detailing remedial measures to tackle the problem within the AQMA[1].

SCDC has revoked its only AQMA along the A14 between Bar Hill (to the North-West of Cambridge) and Milton (to the North-East) interchange, in 2021[2]. Whilst we continue to monitor air quality along the A14, our focus and resources will shift towards identifying new hotspots and begin to actively monitor and improve air quality across the district where both existing and future communities will benefit.

Furthermore, we consider a close partnership with our neighbouring Local Authorities essential to go beyond our boundaries and improve air quality on a bigger scale. The ongoing partnership between SCDC and Cambridge City will ensure a better alliance in future policies to improve air quality.

Air Quality in SCDC is generally good and we need it to stay that way for the health of our current and future residents. With our forecast levels of growth it is imperative that we take a strategic approach to considering air quality. This strategy outlines our three areas of focussed actions to ensure our air quality is maintained or improved as summarised here;

- Focus Area A: future growth and development
    a) Influencing the planning policies such as Local Plans and Supplementary Planning Document to consider air quality requirement in line with the most up to date guidance and best practices
    b) Work in close partnership with other authorities to deliver aligned requirements in improving air quality
- Focus Area B: the monitoring network
    a) Regularly review and update the monitoring network to reflect the ongoing growth across the district
- Focus Area C: existing communities
    a) Consider existing sensitive areas to air pollution for monitoring i.e. schools
    b) Actively engage with the public in improving air quality
    c) Assisting the choices they make for sustainable travel, lower polluting vehicles, environmental friendly ways of heating their homes, etc

[1] LAQM PG (16)
[2] The decision to revoke the AQMA was supported by the Department for Environment, Food and Rural Affairs (Defra) following a long term evidence of monitoring data consistently below the national objective since 2014. Details available in Annual Status Reports on South Cambs website.

1 National Clean Air Strategy

Local authorities have a duty under the Environment Act 1995 to review and assess local air quality within their areas, against a set of health-based objectives for specific air pollutants. In addition to these formal obligations for Local Air Quality Management (LAQM), local authorities are encouraged by Defra (Department for Environment, Food and Rural Affairs) to draft and implement a local air quality strategy[3].

SCDC operates a monitoring network including Automatic Monitoring Stations (AMS) and NO_2 diffusion tubes (passive monitoring) within the District. The monitoring results are available in our annual status reports to Defra and are available on our website[4].

Defra (Department for Environment, Food and Rural Affairs) has published a new national strategy in 2019[5]. The strategy covers a broad range of issues to improve air quality, ranging from farming, shipping, transport and even household emissions such as those associated with cleaning products.

The national strategy emphasises the link with public health and engaging with other stakeholders to strategically drive improvements. It also refers to good practise in relation to Low Emissions Strategies which highlights what can be achieved when local government shows commitment and leadership to tackle air pollution.

The SCDC strategy aligns with the national strategy and recommends actions to consider and improve air quality district wide for both existing and future communities.

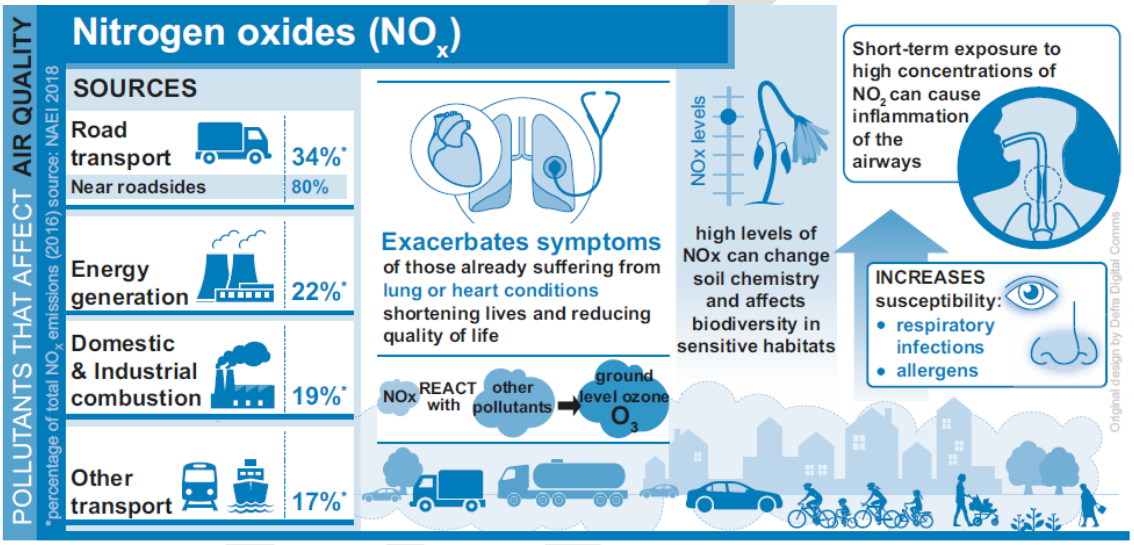
[3] Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents
[4] https://www.scambs.gov.uk/environment/pollution/air-pollution/local-air-quality-management/
[5] https://www.gov.uk/government/publications/clean-air-strategy-2019

2 Public Health

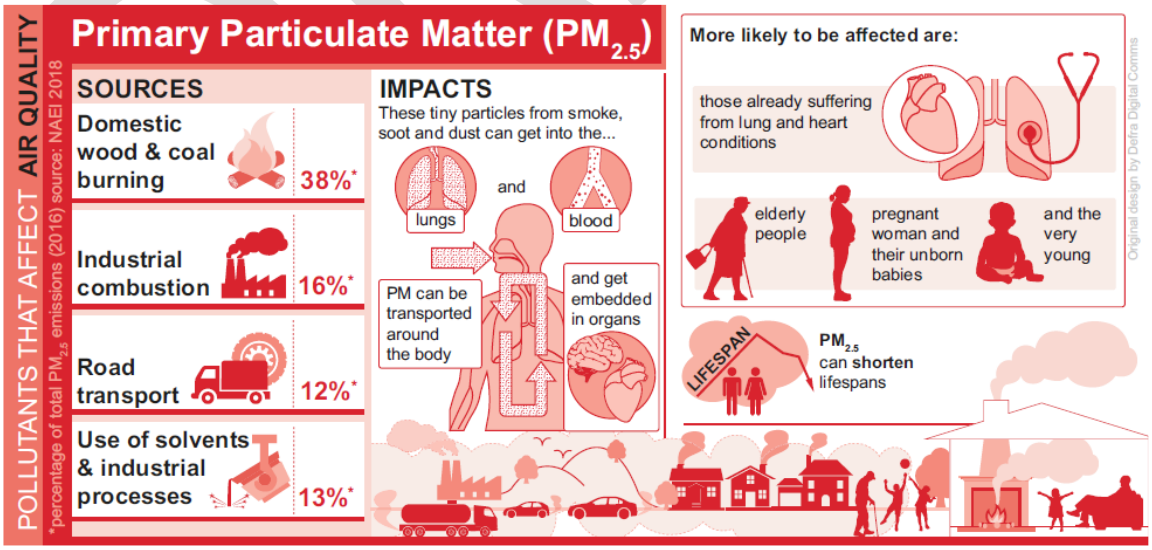
Air pollution is associated with several adverse health impacts and is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions.

There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas. There is clear evidence that $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less) has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases[6,7,8].

Health Impacts from NO_x[9]



Health Impacts from $PM_{2.5}$



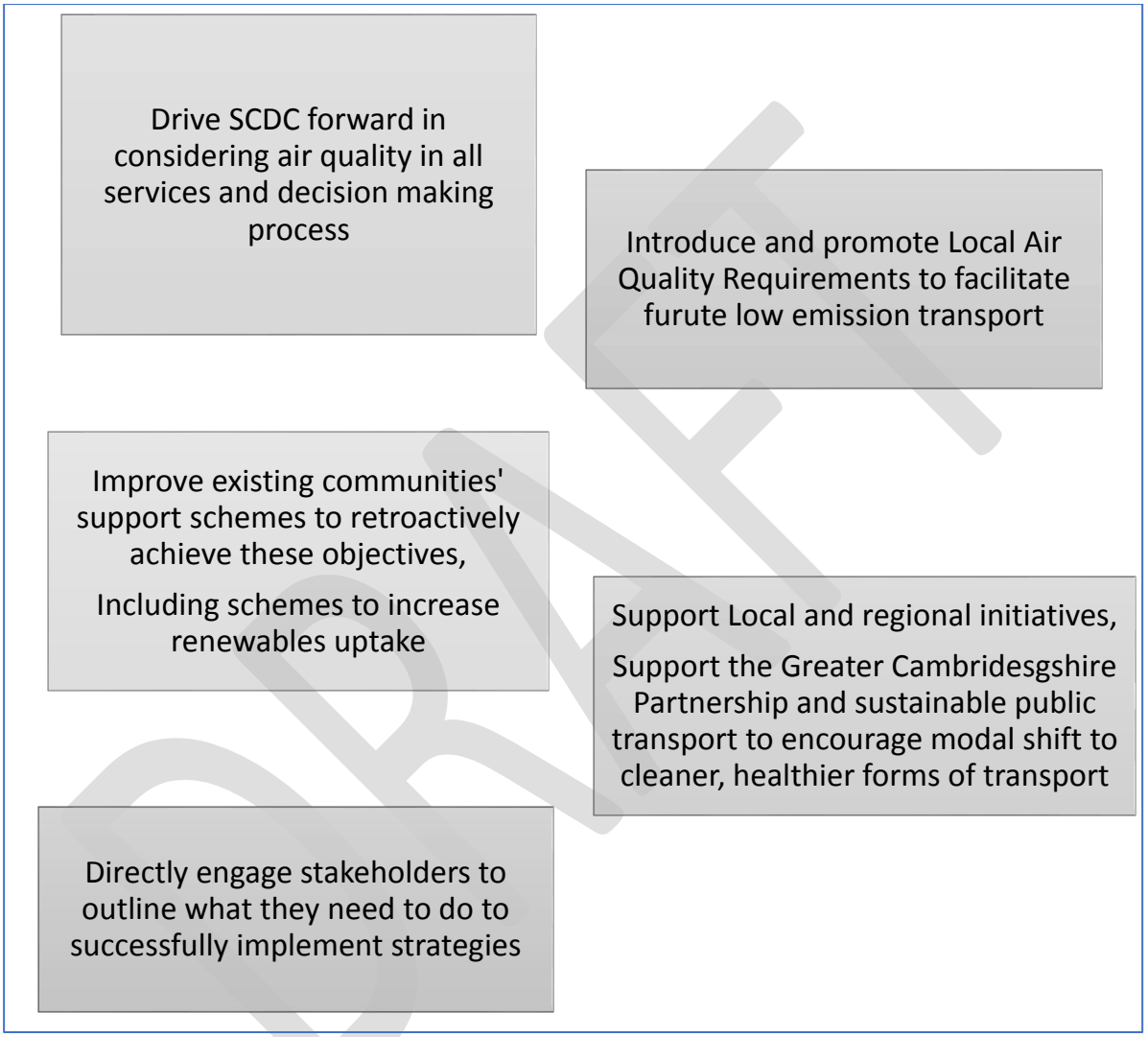
Local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$.

[6] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[7] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[8] The Cambridgeshire Transport and Health - Air Pollution, 2015
[9] Defra Clean Air Strategy 2018

3 The Ambitions

South Cambridgeshire District Council wish to improve the air quality for all its residents whilst supporting the growth across the district. Our ambition is to consider air quality in all aspects of our services and in line with our 'Being Green to our Core' priorities.

The ambitions



The Council is aware that it cannot achieve the objective of this strategy working in isolation. Working with other stakeholders, including Cambridge City Council and other neighbouring authorities, public health professionals, developers and transport planners is recognised as a key requirement to facilitate the effective implementation of any measures to improve air quality

The key actions to maintain or improve good air quality across the district are described further in the following section.

4 Focus Areas and Actions

Air Quality in SCDC is good and we need it to stay that way for the health of our current and future residents. With our forecast levels of growth it is imperative that we take a strategic approach to considering air quality. This strategy outlines our three areas of focussed actions to ensure our air quality is maintained or improved.

These actions will be kept under review and will be updated for furthering the strategy in the future.

4.1 Focus Area A. Growth and future developments

The challenge of maintaining good air quality in the wider district is to minimise the cumulative impacts from all new developments.

Most of the new developments, when subject to air quality modelling and assessment, do not identify any significant exceedances of national air quality objectives. Therefore, it is often difficult to deliver improvements or mitigate impacts to air quality where local planning policies do not categorically state what measures will be required if no significant impact is anticipated.

As such, efforts have been made to ensure that the impacts from new developments are considered and minimised at outset as much as possible.

- SCDC Local Plan (2018) includes a comprehensive policy on air quality CS/12 and recognises the link between air pollution and transport. This has been reflected in transport policy TI/2 which subjects the major developments with significant transport implications to a site based Low Emission Strategy (LES) seeking implementation of low emission measures and facilitating sustainable transport to minimise the impact on local air quality.
- This strategy introduces a list of Local Air quality Requirements for future developments through the planning system. The requirements range from improving sustainable and low emission transport to facilitating schemes and infrastructure for behavioural change. These are mainly achieved through site based Low Emission Strategies for major developments and aim to support the developers with clear information in the future. These requirements are outlined in Append A. The listed requirements are not exhaustive and should be subject to update with policies current to any future Local Plan.
- Detailed Local Air Quality Requirements were also included in the Sustainable Design and Construction Supplementary Planning Document (SPD) adopted in January 2020.

4.2 Focus Area B. The monitoring network

Future developments in SCDC are to be largely residential and reliant on road-based transport for travel and commuting to the city, London and the surrounding area. Majority of the growth is associated with significant developments such as Northstowe to the North West of Cambridge, Waterbeach New Town to the North East of Cambridge, Bourn Airfield and Cambourne West to the West of Cambridge.

Given the scale of the future developments and their potential to introduce new hotspots where air quality could be an issue, the need for a more robust and up to date monitoring network across the district has been acknowledged.

To ensure that the ongoing growth across the district is reflected and covered by our monitoring network at any time, the monitoring network will:

1) Be subject to regular review and update
2) Include new technologies and alternatives to traditional monitors enabling the Council to conduct short term and hotspot monitoring

4.3 Focus Area C. Existing communities

Our communities should be considered in all opportunities to benefit from an improved air quality. This could be achieved through a range of actions big or small such as provision of significant infrastructure to facilitate the uptake of low emission vehicles to daily practical measures which in turn lead to improved air quality.

Future focused actions to consider for communities are:

1) Engagement with the schools to promote policies and helpful information through
    a. National and regional campaigns such as Clean Air Day
    b. Promotion of none idling policy during collection and drop off
2) Reduce the use of solid fuel stoves and open fires – domestic burning is now the single biggest source of particulate matter pollution in the UK (greater than traffic and industry)
3) Reduce domestic burning i.e. use of solid fuel stoves and open fires
4) Dust control during construction of major developments
5) Close partnership with local businesses to reduce emissions
6) Support local initiatives to promote awareness on air quality

Some of the daily measures you can take to help improve air quality in SCDC include:

- If you are burning wood or coal ensure any fuel used meets the new standards of moisture content and emissions – more information is available at https://woodsure.co.uk/are-you-ready-to-burn/
- Switch it off – don't leave your car engine idling if you are stationary e.g. waiting to pick someone up, in a traffic jam or waiting at level crossings.
- When driving, use techniques that help you use less fuel, like driving more slowly and smoothly .
    . You could use 10% less fuel by following the tips on the AA website http://www.theaa.com/motoring_advice/fuels-and-environment/drive-smart.html.
    a. Switching your engine off when stationary, this will not only reduce your emissions of air pollution but will save fuel and therefore money too!
- Minimise car use wherever possible:
    . Avoid using your car for short trips (under 2 miles) – short trips are very polluting as modern engines needs to reach a very high temperature to work efficiently; on short trips it won't reach that temperature.
    a. For short journeys try cycling or walking more often – this helps you stay healthy and saves you money in fuels costs.
    b. For longer journeys consider public transport options.
    c. Use journey-planning apps such as MyBusTrip or MotionMap for travel by bus, train, walking and cycling.
- Consider making your next vehicle an electric vehicle.

- Join a car club or car-share regularly.
- Consider working at home where possible – the first Covid-19 lockdown showed widespread improvements in the air quality as the amount people travelled reduced.
- Use less energy at home – consider a smart meter to monitor usage and be aware of boiler standards.
- Opt for 'green energy' tariffs where available or switch to renewable sources of heating or power.
- Improve indoor air quality by ensuring adequate ventilation through opening windows, especially when cooking or cleaning, as these activities produce pollutants.
- Make your children aware of the impact that day to day activities have on air quality.

Further information about air quality in SCDC are included in our annual status reports and the details of our monitoring network are available to public on our website[10]. You could share your views and concerns via email address air.quality@scambs.gov.uk and follow our Facebook page[11] for general updates and news.

[10] https://www.scambs.gov.uk/environment/pollution/air-pollution/local-air-quality-management/
[11] https://www.facebook.com/SouthCambridgeshireDistrictCouncil/

Appendix A

Local Air Quality Requirements in SCDC

This strategy introduces a list of Local Air quality Requirements for future developments through the planning system.

The requirements range from improving sustainable and low emission transport to facilitating schemes and infrastructure for behavioural change.

These are mainly achieved through site based Low Emission Strategies for major developments and aim to support the developers with clear information in the future. These requirements are outlined in table A.1 and A.2

The requirements are not exhaustive and should be subject to update with policies current to any future Local Plans.

Table A.1: Local Air Quality Requirements and Sustainable Transport Measures

CATEGORY	MEASURES
Electric and Low Emission Vehicles Uptake	
Residential developments	1. Charging Point (standard or fast where possible) for all private and allocated parking spaces 2. Charging Point (Fast or Rapid where possible) for every 10 communal parking spaces
Commercial Developments	1. 1 Rapid Charging Point/station Per 1000m^2 of floorspace or per 20 parking spaces or 2. Allocated fast Charging Point for 50% of proposed parking spaces
Supporting Infrastructure	1. Provision of infrastructure to facilitate additional charging points 2. Support for other Low Emission technologies is welcome and considered on site-by-site basis
Behavioural Change and Travel Plan	
Modal Shift Facilities and Incentives	1. Phasing of the cycling/pedestrian infrastructure 2. Membership for Car Share and Car Hire schemes 3. Subsidised Bus and Rail Pass 4. Discount Vouchers/arrangements for shops (local) to assist with cycling uptake i.e. purchase, servicing, repairs and training 5. Promoting non-idling 6. Electric Shuttles, or other low emission alternative, to local facilities i.e. schools & public transport hubs (funded long-term) 7. Sheltered bus stops 8. Provision of Car Share Scheme 9. Provision of a Car Club Scheme 10. Provision of Bike-sharing schemes 11. Secure bike storage facilities (site wide) 12. Sufficient bike storage within housing and apartment blocks 13. Parking enforcement for non-allocated spaces 14. Personalised Active Travel Plans
Parking Provision (In line with cycle parking requirements set out in policy TI/3)	
Parking Allocation and Facilities	1. Non-idling policy 2. Priority Parking Bays for Low Emission Vehicles (with provision of Charging Points)

CATEGORY	MEASURES
	3. Priority Parking Bays for Car Share Schemes 4. Secure and sheltered parking area for cycles 5. Provision of charging points for electric bikes and provision for off-gauge bikes
Public Transport	
Support for Sustainable and Low Emission Public Transport	1. Participation in district wide public transport schemes 2. Contributions for sustainable transport infrastructure enhancement, such as new guided busways, cycle routes, train stations etc. 3. Contributions for Low Emission Buses or Retro-fitting the existing fleet (serving the area of the development) 4. Participation in Greater Cambridgeshire Partnerships projects near the development 5. Sheltered bus stops 6. Local Shuttles to public transport hubs
Offsetting Emissions	
Financial contributions	Appropriate mitigation contributions can be calculated using Defra's damage cost approach guide. Offsetting should be a last resort and will be considered on site-by-site basis.

Table A.2: Additional measures in improving air quality

CATEGORY	MEASURES
Renewable and low carbon energy	At least 10% of the buildings carbon emissions through the use of on-site renewable and/or low carbon energy
Combined Heat and Power (CHP) – emissions standards Gas boiler efficiency	Any gas fired CHP should meet an emissions standard of: • Spark ignition engine: less than less than 150 mgNO_x/Nm^3 • Compression ignition engine: less than 400 mgNO_x/Nm^3 • Gas turbine: less than 50 mgNO_x/Nm^3 A low NOx boiler would meet a dry NOx emission rating of 40mg NOx /kWh
Biomass boilers	A standalone checklist should be obtained from Environmental Services for all biomass boilers
Optimised design	New development should be designed to minimise public exposure to pollution sources by • Locating habitable rooms away from busy roads • Avoiding building configuration along busy roads that inhibits effective pollution dispersion (street canyons), • Considering the proximity of sensitive receptors such as schools to busy roads. Introducing green infrastructures and barriers to reduce pollutants
Construction standards	Many measures to enhance the sustainability and energy efficiency of the built environment also have the additional benefit of delivering mutually beneficial air quality objectives. Construction standards such as BREEAM and Home Quality Mark (HQM) include consideration of air quality. While not specifically required by policy in the South Cambridgeshire Local Plan (2018), use of these construction standards is fully supported.
Building ventilation	The preference should be for buildings to be naturally ventilated wherever possible. Sealed fascia's with active ventilation or active air filtration should only be used in cases where other options are not available, for example in areas around AQMA's or areas that could suffer from excessive noise. Care must be taken in designing such systems that the thermal comfort of building users can be guaranteed, with consideration given to future climate scenarios. Note that this should not preclude mechanical extract systems in bathrooms and kitchens, and the Council would be supportive of the use of Mechanical Ventilation with Heat Recovery (MVHR) to supplement natural ventilation, where systems are correctly specified, installed and maintained.
Construction Phase	

CATEGORY	MEASURES
Construction dust monitoring	Monitoring will be requested on a site by site basis. In line with best practice guidance (see further guidance below).
Construction vehicles	Any diesel-powered machines used on, or otherwise serving the site, must be run on ultra-low sulphur diesel (also known as ULSD 'cleaner diesel' or 'green diesel'). "Ultra-low sulphur diesel" means fuel meeting the specification within BS EN 590.
Construction road layout	Using design measures including speed restrictions and traffic management.
Construction Environmental Management Plan (CEMP)	A CEMP will cover impacts to air quality mainly associated with dust and odour. The CEMP will also cover more general environmental health issues such as noise and light pollution. Site activities include plant emissions – measures could include switch-off policy, plant maintenance and alternative fuel use.

Glossary of Terms

Abbreviation	Description
LAQM	Local Air Quality Management
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
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'
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
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
SO_2	Sulphur Dioxide

References

1. Air Quality Expert's Group, Fine Particulate Matter ($PM_{2.5}$) in the United Kingdom (2012)
2. Air Quality Regulations 2000 and (Amendment) regulations (2002)
3. Air Quality Action Plan for the Cambridgeshire Growth Areas (2010) South Cambridgeshire District Council, Huntingdonshire District Council, Cambridge City Council
4. Deriving NO_2 from NO_x for Air Quality Assessments of Roads – Updated to 2006 Air Quality Consultants
5. Local Air Quality Management, Policy Guidance LAQM. PG (16) (2016) Department for Environment, Food and Rural Affairs (Defra)
6. Local Air Quality Management, Technical Guidance LAQM. TG (16) (2016) Department for Environment, Food and Rural Affairs (Defra)
7. Local transport Plan (LTP) 3: 2011 – 2026, Cambridgeshire County Council (2011)
8. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2000) Department for Environment, Food and Rural Affairs (DEFRA)
9. The Detailed Assessment of Nitrogen Dioxide along the A14 Corridor (2006) South Cambridgeshire District Council
10. The Detailed Assessment of PM_{10} along the A14 Corridor (2007), South Cambridgeshire District Council
11. The Further Assessment of Nitrogen Dioxide and PM_{10} along the A14 Corridor (2008) South Cambridgeshire District Council

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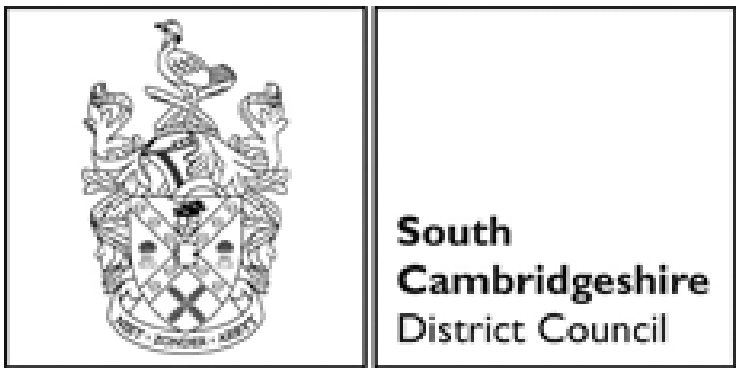

2021 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June 2021

Information	South Cambridgeshire District Council Details
Local Authority Officer(s)	Soraya Hashemi Dan McClure
Department	Environmental Health
Signed off by	Lesley Beevers (Environmental Health Service Manager)
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Report Reference Number	SCDC 2021 ASR
Date	June 2021

Executive Summary: Air Quality in Our Area

Air Quality in South Cambridgeshire

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

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

South Cambridgeshire is a rural district which enjoys generally good air quality. The area has good rail and road links with London and the South-East, including the A14 and M11/A11 corridors. The demand for housing is therefore very high, with future developments mainly to be residential and often reliant on road-based transport for travel to Cambridge City, London and the surrounding area. As such, the district is undergoing significant growth with major developments to keep up with the increase in demand for housing, including Northstowe (10,000 dwellings) to the North West of Cambridge, Waterbeach Barracks (6000-10,000 dwellings) to the North East of Cambridge, Bourn Airfield and Cambourne West to the West of Cambridge. Air quality impacts in the district are primarily related to the areas of growth and the major roads running through the district.

South Cambridgeshire District Council (SCDC) declared an Air Quality Management Area (AQMA) along the A14 between Bar Hill and Milton in 2008 for exceedance of the annual mean Nitrogen Dioxide (NO_2) and 24-hour Particulate Matter (PM_{10}) objectives. Pollution levels have been monitored through a network of Diffusion Tubes and Automatic Monitors

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

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

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

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

since. A trend of decreasing monitored concentrations has been recorded within the AQMA, with no exceedances above the objective levels for any pollutant since 2014. Therefore, as reported in the 2020 ASR and as supported by Defra, we propose to revoke this AQMA. This process was delayed by Covid-19, but will be progressed over the next year. The supporting evidence for this decision is discussed in Section 0.

Actions to Improve Air Quality

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

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

The key actions undertaken or underway to monitor and improve air quality are summarised here:

- A review of the existing monitoring network has been completed, focusing on the areas of major development in the district. In early 2021, work has started to update the monitoring network to reflect this review, including planning the relocating of some diffusion tubes to more relevant locations, the procurement of new automatic continuous monitors and the purchase of additional indicative real-time Zephyr monitors. Details of this will be provided in the 2022 Annual Status Report.
- A hotspot monitoring initiative is underway using indicative real-time monitors (Zephyrs), enabling the Council to test the reliability of alternative technologies for air quality monitoring and conduct targeted studies, such as the first monitoring air quality near schools. The first monitor has been in place in Harston near Harston and Newton Community Primary School since late 2020, with data to be made

[5] Defra. Clean Air Strategy, 2019

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

available via a report after a minimum of 6-months operation. A further two monitors were purchased for deployment in 2021.

- A new Air Quality Strategy has been completed and will be presented for an approval process. The Strategy outlines a new approach to monitor and improve the air quality across the district and to ensure both the new and existing communities are considered to benefit a better air quality district wide. The adoption of this was delayed by Covid-19 and local election but will be progressed in 2021.
- Detailed air quality requirements were included in the Sustainable Design & Construction Supplementary Planning Document (SPD) adopted in January 2020. The requirements range from improving sustainable and low emission transport to facilitating schemes and infrastructure for behavioural change.
- A new monitor was installed at Orchard Park School near the A14 in late 2019. The aim of this initiative is to monitor the actual levels of exposure for sensitive receptors near major roads. This has been operating in the 2020 reporting year and data is reported on.

Further consideration has been given to air quality and its improvement across the district, in line with the Council's key objective to 'Being green to our core'[7]. The supporting actions are summarised here:

- Our Zero Carbon Action Plan 2020-25 outlines the actions we are taking to reduce carbon emissions from our own estate and operations by 45% on a 2018-19 baseline by 2025 and how we are supporting the district to reach net zero[8]. This will include the replacement of our diesel refuse fleet with low carbon vehicles; our first electric refuse vehicle was purchased in 2020 and is in operation. In addition to the electric option the service is also investigating other options such as hydrogen as the solution to reducing our CO_2 impact to the environment.
- Our Zero Carbon Communities Grant[9],scheme funds community initiatives to improve sustainability. Seventeen projects were awarded a total of just under £100,000 in 2019-20 including five schemes to encourage cycling.

[7] Being green to our core https://www.scambs.gov.uk/your-council-and-democracy/performance-and-plans/our-business-plan/

[8] Zero Carbon Strategy https://www.scambs.gov.uk/climate-change/zero-carbon-strategy/

[9] Zero Carbon Communities Grant https://www.scambs.gov.uk/community-development/grants/zero-carbon-communities-grant/.

- We have installed electric vehicle charging points at our Waterbeach depot. We are currently working on a major retrofit project at our main office, South Cambridgeshire Hall. This will largely replace the need for gas, as heating will be provided from a ground source heat pump. Electric vehicle charge points powered by solar panels will be installed as part of this project.

Conclusions and Priorities

The review of the monitoring data in 2020 has identified the following:

- No exceedances of any of the national air quality objectives were reported at any of the monitoring locations.
- A decrease in concentrations was seen at all monitoring locations.
- There were again no exceedances of any objectives at any of the sites in the AQMA, therefore it is proposed to revoke the AQMA.
- Covid-19 impacted the changeovers of the diffusion tubes during the lockdown in 2020, resulting in low data capture for the tubes. However, there was sufficient data to allow annualisation of the diffusion tubes.
- Data capture was generally good for the automatic continuous monitors.
- No new sources of pollution have been identified.
- A review of the existing monitoring network has been completed and work to update the monitoring network to reflect this is underway.

Local Engagement and How to get Involved

Previous Annual Status Reports and details on air quality monitoring are available on our website[10] and you can share your views via our email address air.quality@scambs.gov.uk and follow our Facebook page[11] for general updates and news. The website contains a link to live data from our continuous monitor locations and a link to data from the Zephyr monitors is due to go live soon. Ways you can help to improve air quality in South Cambridgeshire include:

- Minimise car use wherever possible:

[10] https://www.scambs.gov.uk/environment/pollution/air-pollution/local-air-quality-management/

[11] https://www.facebook.com/SouthCambridgeshireDistrictCouncil/

  - Avoid using your car for short trips (under 2 miles) – short trips are very polluting as modern engines needs to reach a very high temperature to work efficiently; on short trips it won't reach that temperature.
  - For short journeys try cycling or walking more often – this helps you stay healthy and saves you money in fuels costs.
  - For longer journeys consider public transport options.
  - Use journey-planning apps such as MyBusTrip or MotionMap for travel by bus, train, walking and cycling.
- Switch it off – don't leave your car engine idling if you are stationary e.g. waiting to pick someone up, in a traffic jam or waiting at level crossings.
- When driving, use techniques that help you use less fuel, like driving more slowly and smoothly.
  - You could use 10% less fuel by following the tips on the AA website http://www.theaa.com/motoring_advice/fuels-and-environment/drive-smart.html.
  - Like switching your engine off when stationary, this will not only reduce your emissions of air pollution but will save fuel and therefore money too!
- Consider making your next vehicle an electric vehicle.
- Join a car club or car-share regularly.
- Consider working at home where possible – the first Covid-19 lockdown showed widespread improvements in the air quality as the amount people travelled reduced.
- Use less energy at home – consider a smart meter to monitor usage and be aware of boiler standards.
- Opt for 'green energy' tariffs where available or switch to renewable sources of heating or power.
- Reduce the use of solid fuel stoves and open fires – domestic burning is now the single biggest source of particulate matter pollution in the UK (greater than traffic and industry).
  - If you are burning wood or coal ensure any fuel used meets the new standards of moisture content and emissions – more information is available at https://woodsure.co.uk/are-you-ready-to-burn/
- Improve indoor air quality by ensuring adequate ventilation through opening windows, especially when cooking or cleaning, as these activities produce pollutants.
- Make your children aware of the impact that day to day activities have on air quality.

Table of Contents

Figures

Tables

1 Local Air Quality Management

This report provides an overview of air quality in South Cambridgeshire during 2020. 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 South Cambridgeshire District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

Air Quality Management Areas

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

A summary of AQMAs declared by South Cambridgeshire District Council can be found in Table 2.1. The table presents a description of the one AQMA that is currently designated within South Cambridgeshire. Appendix D: Map(s) of Monitoring Locations and AQMAs provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designation are as follows:

- NO_2 annual mean;
- PM_{10} 24-hour mean;

We propose to revoke AQMA 1 following consistent compliance with the national objectives at all monitoring sites in the AQMA since 2014 and the completion of the A14 improvement works by Highways England. This was proposed, and supported by Defra, in the 2020 ASR however the process was delayed by the Covid-19 pandemic. Monitoring will continue in the AQMA following its revocation. The data from all diffusion tube locations within the AQMA since 2012 is shown in

Figure 2.1, and that from the automatic continuous monitors is shown in Figure 2.2.

Figure 2.1 - Diffusion Tubes within AQMA

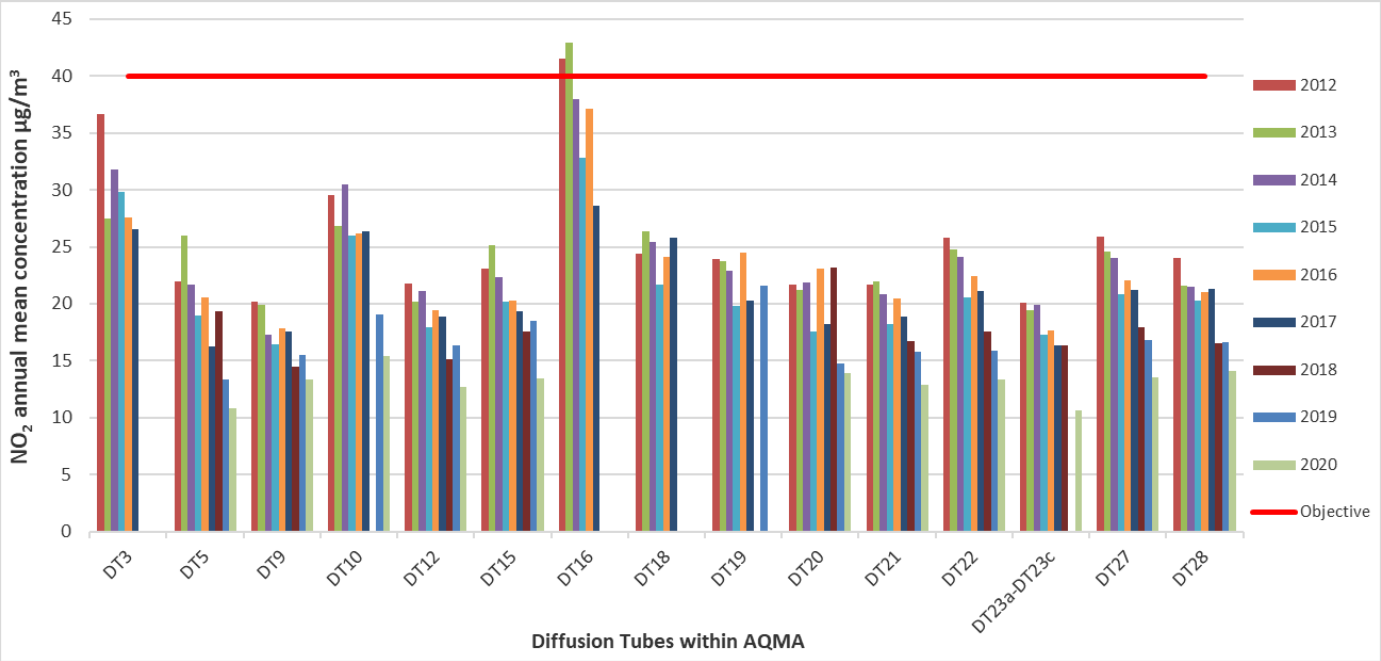


Figure 2.2 - Automatic monitoring sites within AQMA

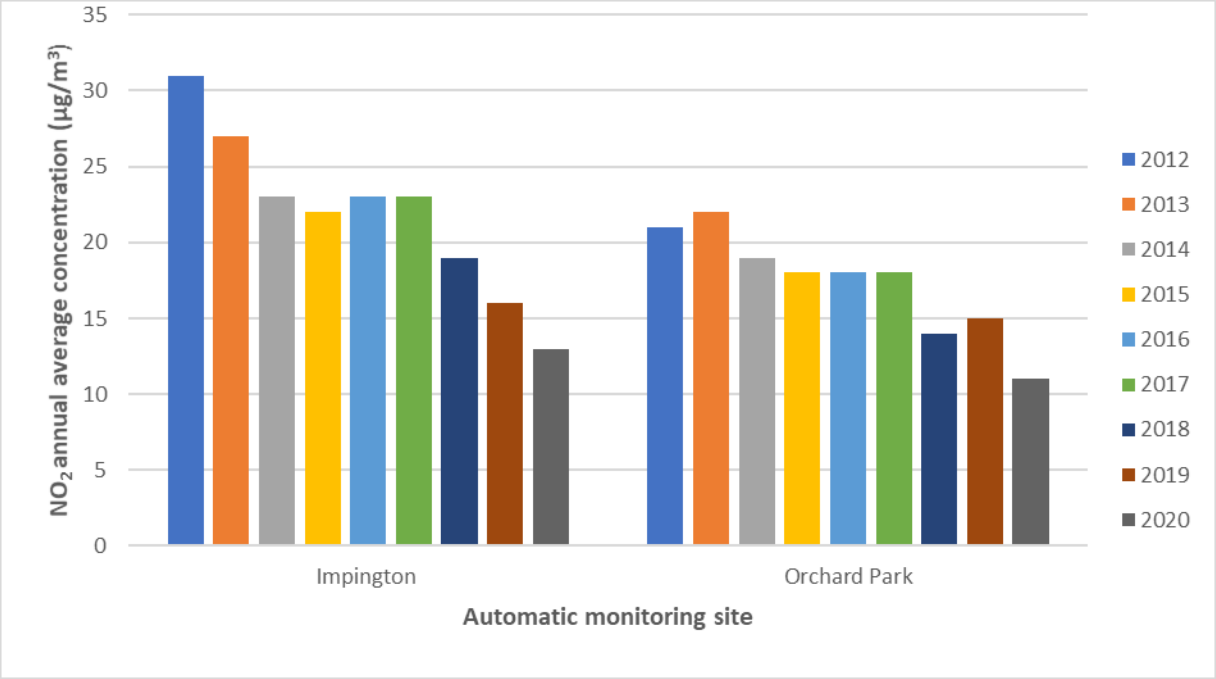

35
30
25
20
15
10
5
0
NO2 annual average concentration (µg/m3)
2012
2013
2014
2015
2016
2017
2018
2019
2020
Impington
Orchard Park
Automatic monitoring site

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
AQMA 1	2008	NO_2 Annual Mean	Area along A14 between Bar Hill and Milton	YES	42 µg/m^3	15.4 µg/m^3	Air Quality Action Plan for Cambridgeshire Growth Areas, 2009	https://www.scambs.gov.uk/media/7295/aqma.pdf
AQMA 1	2008	PM_{10} 24 Hour Mean	Area along A14 between Bar Hill and Milton	YES	52 exceedances	0 exceedances	Air Quality Action Plan for Cambridgeshire Growth Areas, 2009	https://www.scambs.gov.uk/media/7295/aqma.pdf

☒ **South Cambridgeshire District Council confirm the information on UK-Air regarding their AQMA(s) is up to date.**

☒ **South Cambridgeshire District Council confirm that all current AQAPs have been submitted to Defra.**

Progress and Impact of Measures to address Air Quality in South Cambridgeshire

Defra's appraisal of last year's ASR concluded the Council provided a thorough report. It was noted that it is only necessary to present results of the monitoring sites where data is available for the reporting year in question and that a comparison of South Cambridgeshire's public health outcomes framework/fraction of mortality attributable to $PM_{2.5}$ emissions with neighbouring authorities and England would be encouraged. These points have been addressed for this year's report.

South Cambridgeshire District Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. 6 measures are included within Table 2.2, with the type of measure and the progress South Cambridgeshire District Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Additional measures completed in 2020 include:

- A review of the existing monitoring network has been completed, focusing on the areas of major development in the district. In early 2021, work has started to update the monitoring network to reflect this review, including planning the relocating of some diffusion tubes to more relevant locations, the procurement of new automatic continuous monitors and the purchase of additional indicative real-time Zephyr monitors. Details of this will be provided in the 2022 Annual Status Report.
- Hotspot monitoring initiative has been started using indicative real-time monitors (Zephyrs), enabling the Council to test the reliability of alternative technologies for air quality monitoring and conduct targeted studies, such as the first monitoring air quality near schools. The first monitor has been in place in Harston near Harston and Newton Community Primary School since late 2020, with data to be made available via a report after a minimum of 6-months operation. A further two monitors were purchased for deployment in 2021. Further details will be provided in the 2022 Annual Status Report.
- A new Air Quality Strategy with emphasis on improving air quality district wide and beyond any existing Air Quality Management Areas has been prepared and is due

to go through an approval process. The adoption of this was delayed by Covid-19 and local election but will be progressed in 2021.

- Detailed air quality requirements were included in the Sustainable Design & Construction Supplementary Planning Document (SPD) adopted in January 2020. The requirements range from improving sustainable and low emission transport to facilitating schemes and infrastructure for behavioural change.

As reported in Section 2.1 above, South Cambridgeshire District Council intends to revoke the AQMA following 7 years of sustained compliance with the objectives. South Cambridgeshire District Council will continue to implement actions to improve air quality in the district following the revocation of the AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Low Emission Strategies	Policy Guidance and Development Control	Low Emissions Strategy	2019	2020	SCDC Environmental Health, GCP Planning Department	Developer contributions	N/A	N/A	N/A	Implementation	N/A	To be confirmed – May involve ratio of PPs issued with LES	In progress/ongoing - Low Emission Strategies required as per Local Plan and Supplementary Planning Document	
2	Guided Bus Way	Transport Planning and Infrastructure	Bus route improvements	2009	2011	Cambridgeshire County Council (CCC)	CCC	N/A	N/A	N/A	Completed	N/A	N/A	Completed	
3	A14 improvement - Junction 31-32 (EB & WB)	Traffic Management	Strategic highway improvements	2015	2015	CCC	CCC	N/A	N/A	N/A	Completed	N/A		Completed Autumn 2015	
4	A14/M11 re-alignment	Traffic Management	Strategic highway improvements	2016	2020	CCC/Highways England	CCC/Highways England	N/A	N/A	N/A	Completed	N/A	Central gov/Highways England Commitment	Completed 2020	
5	Policy Guidance and Development Control	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	2016	SCDC		N/A	N/A	N/A	Completed	N/A		SPD or Developers Guide for Low Emission Strategy measures	
6	City Deal	Transport Planning & Infrastructure and Promoting Travel Alternatives	Bus route improvements & Promotion of cycling/Sustainable Transport	2015	2015- 2030	CCC/Cambridge City Council	CCC/Cambridge City Council	N/A	N/A	N/A	Implementation	N/A	Connect existing and new residential and employment areas with high quality public transport networks, including new orbital bus routes around Cambridge & comprehensive network of pedestrian and cycle route.	Continually ongoing Proposed scheme for making bus, cycle and walking journeys more convenient and safer from Northstowe announced.	Tranche 1 schemes by 2019

$PM_{2.5}$ – 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.

South Cambridgeshire District Council undertakes monitoring for $PM_{2.5}$ at two sites, one roadside site at Girton and one urban background site at Orchard Park. In 2020, these measured annual mean concentrations of 10 and 13 µg/m^3 respectively. This represents a decrease in concentration compared to 2019 at the Girton site. This was the first year data was available at the Orchard Park site.

Public Health England (PHE) reports the health impacts of Particulate Matter ($PM_{2.5}$) through the fraction of mortality attributable to particulate air pollution. This was reported as 5.4% for Cambridgeshire in 2019[12]. This is very similar to the East of England regional average of 5.5%, which is slightly above the national average for England of 5.1%.

The Council has participated in publicity campaigns both by Defra and locally highlighting the impacts of wood burning stoves on local air quality, which is now recognised as the biggest source of small particulate matter, providing information about what type of wood to burn and how to burn it efficiently[13]. In addition, Greater Cambridgeshire Partnership (GCP) is working on a network of twelve separate routes into Cambridge from surrounding towns and villages to increase the level of safe cycling and walking and to reduce traffic congestion[14]. Cambridgeshire County Council (CCC) elected members have also noted the impacts of poor air quality and have passed a resolution to work with different councils and other public bodies more collaboratively across Cambridgeshire. South Cambridgeshire District Council has also purchased indicative real-time zephyr monitors

[12] Public Health Outcomes Framework (PHOF), Fraction of all-cause mortality attributable to particulate air pollution https://fingertips.phe.org.uk/profile/public-health-outcomes-framework/data#page/3/gid/1000043/pat/6/par/E12000006/ati/102/are/E10000003/iid/30101/age/230/sex/4/iid2/30101/age2/230/sex2/4/cid/4/tbm/1/page-options/cin-ci-1_car-do-0_car-ao-0

[13] Wood Burning Stoves https://www.scambs.gov.uk/media/3392/defra_-_open_fires_wood-burning_stoves_1.pdf

[14] Greenways Project https://www.greatercambridge.org.uk/transport/transport-projects/greenways/

for targeted hotspot monitoring, including for $PM_{2.5}$. The first monitor was installed in Harston near Harston and Newton Community Primary School in late 2020, with data to be made available via a report after a minimum of 6-months operation. A further two monitors were purchased for deployment in 2021.

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

This section sets out the monitoring undertaken within 2020 by South Cambridgeshire District Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2016 and 2020 to allow monitoring trends to be identified and discussed.

Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

South Cambridgeshire District Council undertook automatic (continuous) monitoring at 3 sites during 2020. The Automatic Monitoring Stations at Girton and Impington sites are representative of nearby receptors. The Orchard Park monitor is a background site located within the school grounds. Both Orchard Park and Impington site are located within the Air Quality Management Area for NO_2 and PM_{10}. Table A.1 in Appendix A shows the details of the automatic monitoring sites. The https://scambs-airquality.ricardo-aea.com/ page presents automatic monitoring results for South Cambridgeshire District Council, with automatic monitoring results also available through the UK-Air website .

NO_2 data capture was 98% for the Impington and Orchard Park sites and 99% for the Girton site. PM_{10} data capture was 92% for Orchard Park, 95% for Girton and 73% for Impington site. $PM_{2.5}$ data capture was 74% at Orchard Park and 87% at Girton. As a result, the Impington PM_{10} data and Orchard Park $PM_{2.5}$ data were annualised.

The monitoring results show that:

- No exceedances of the annual mean objective for NO_2 or PM_{10} were recorded
- No exceedances of annual mean objective for $PM_{2.5}$ were recorded
- The hourly mean objective for NO_2 hourly mean was achieved at all sites
- The daily mean objective for PM_{10} was achieved at all sites

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

South Cambridgeshire District Council undertook non-automatic (i.e. passive) monitoring of NO_2 at 31 sites during 2020, two of which were triplicate sites. This included two new or reinstated sites. A review of the Council monitoring network is underway and any changes in monitoring sites as a result of this will be reflected in the 2022 ASR. Table A.2 in Appendix A presents the details of the non-automatic sites. Data capture was low as a result of the Covid-19 lockdown impacting tube changeovers, therefore data from all sites was annualised. More details on the impact of Covid-19 can be found in Appendix F. The monitoring results showed no exceedance of any long-term or short-term objective at any monitoring site. A trend of decreasing concentrations from 2019 to 2020 was seen at every monitoring location.

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.

Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, annualisation (where the annual mean data capture is below 75% and greater than 33%), and distance correction. Further details on adjustments are provided in Appendix C.

3.1.3 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40 µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

g) Trends in Annual Mean NO_2 Concentrations – Automatic Monitoring Sites

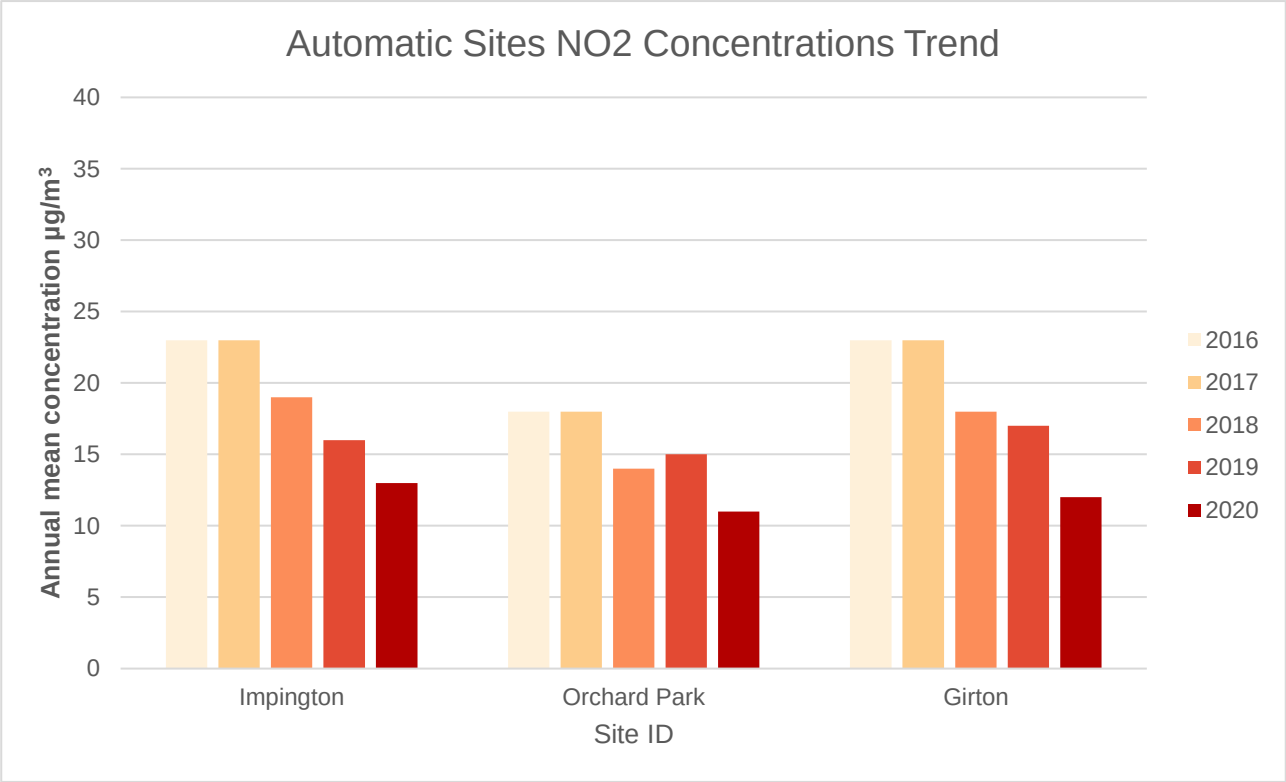


Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200 µg/m^3, not to be exceeded more than 18 times per year.

There were no exceedances of any of the air quality objectives for NO_2 at any monitoring site in 2020. The maximum annual concentration measured in 2020 was 20.2 µg/m^3, recorded at DT14, Water Lane, Histon. A review of the diffusion tube monitoring network is underway and the network will be updated to reflect this. A procurement process for additional automatic monitoring locations is also underway, to be completed in late 2021. A trend of decreasing concentrations was observed at all monitoring sites. This continues the general trend observed of decreasing concentrations in the district over the last five years. As detailed in Section 2.1, above, it is proposed to revoke the AQMA in South Cambridgeshire.

3.1.4 Particulate Matter (PM_{10})

Table A.6 in Appendix A: Monitoring Results compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 40µg/m^3.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

There were no exceedances of any of the air quality objectives for PM_{10} at any monitoring site in 2020. The maximum annual concentration measured in 2020 was 15 µg/m^3, recorded at Impington. A procurement process for additional automatic monitoring locations is underway, to be completed in late 2021. A trend of decreasing concentrations was observed at all monitoring sites. As detailed in Section 2.1, above, it is proposed to revoke the AQMA in South Cambridgeshire.

3.1.5 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A presents the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years.

Annual mean concentrations of 13 and 10 µg/m^3 were measured at Orchard Park and Girton respectively. This represents a decrease in concentration at Girton from 2019,

matching the trend seen for other pollutants across the district. This was the first year of monitoring for $PM_{2.5}$ at Orchard Park.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
IMP	Impington (A14)	Roadside	543739	261625	NO_2, PM_{10}	YES	Chemiluminescent; BAM	12	2	2
ORCH	Orchard Park Primary School (A14)	Urban Background	544558	261579	NO_2, PM_{10}, $PM_{2.5}$	YES	Chemiluminescent; BAM	1	N/A	2
GIRT	Girton	Roadside	542676	260667	NO_2, PM_{10}, $PM_{2.6}$	NO	Chemiluminescent; BAM	5	5	2

Notes:

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

(2) N/A if not applicable

Table A.2 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT1	The Coppice, Impington	Urban Background	544230	262048	NO2	N	7.0	0.5	No	2.0
DT2	The Gables, High Street, Histon	Roadside	543770	263678	NO2	N	1.0	1.0	No	2.0
DT-28N	73 Cambridge Road, Milton	Roadside	547436	262295	NO2	N	15.0	2.0	No	2.0
DT4	96 High Street, Sawston	Urban Background	548600	249136	NO2	N	5.0	1.0	No	2.0
DT5	Rhadegund Farm Cottage, Bar Hill, A14	Roadside	538744	263640	NO2	Y	1.0	18.0	No	2.0
DT-6N	22 High Street, Linton	Roadside	555942	246680	NO2	N	1.0	2.0	No	2.0
DT7	20 High Street, Tadlow	Roadside	528131	247399	NO2	N	10.0	1.0	No	2.0
DT-8N	47 High Street, Harston	Roadside	542555	251001	NO2	N	5.0	2.0	No	2.0
DT9	3 Garner Close, Milton	Urban Background	547452	263175	NO2	N	5.0	1.0	No	2.0
DT10	1A Weavers Field, opp. Co-op, Girton	Urban Background	542537	261467	NO2	Y	20.0	1.0	No	2.0
DT11	Heath House, A505, Thriplow	Urban Background	544034	244585	NO2	N	15.0	2.0	No	2.0
DT12	Lone Tree Avenue, Impington	Roadside	544119	261862	NO2	Y	7.0	1.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT13	1 Brook Close, Histon	Urban Background	543955	263588	NO2	N	2.0	1.0	No	2.0
DT14	22 Water Lane, Histon	Roadside	544050	263306	NO2	N	2.0	2.0	No	2.0
DT15	72 Cambridge Road, Impington	Urban Background	544243	261819	NO2	Y	7.0	1.0	No	2.0
DT17	5 Mill Lane, Sawston	Roadside	248545	249366	NO2	N	6.0	1.0	No	2.0
DT-32N	Banworth Lodge, Ely Road, A10	Roadside	548742	264698	NO2	N	8.0	7.0	No	2.0
DT20	Chieftain Way, Orchard Park	Roadside	544828	261738	NO2	Y	4.0	0.5	No	2.0
DT21	Neal Drive, Orchard Park	Roadside	545056	261784	NO2	Y	7.0	0.5	No	2.0
DT22	Flack End, Orchard Park	Roadside	545435	261906	NO2	Y	7.0	35.0	No	2.0
DT23a, DT23b, DT23c	Orchard Park Primary School	Urban Background	544557	216571	NO2	Y	1.0	50.0	Yes	2.0
DT26	Co-op, High Street, Histon	Roadside	543768	263708	NO2	N	1.0	4.5	No	2.0
DT27	Engledow Drive, Orchard Park	Urban Background	545259	261873	NO2	Y	2.0	4.5	No	2.0
DT28	22 Topper Street, Orchard Park	Roadside	545169	261764	NO2	Y	4.0	0.5	No	2.0
DT29	Church Lane, Little Abington	Urban Background	552961	249251	NO2	N	14.0	2.0	No	2.0

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
DT-30N	63 Denny End Road,Waterbeach	Roadside	549154	266006	NO2	N	7.0	2.0	No	2.0
DT-LN1	Old Railway Tavern, Station Road	Roadside	539847	268169	NO2	N	5.0	2.0	No	2.0
DT-LN2	75 High Street, Longstanton	Roadside	539570	266842	NO2	N	2.0	2.0	No	2.0
DT-LN3	1 Rampton Drift, Longstanton	Roadside	540553	266869	NO2	N	17.0	1.0	No	2.0
DT-LN4	37 Longstanton Road, Oakington	Roadside	540963	264474	NO2	N	5.0	1.0	No	2.0
DT-LN5a, DT-LN5b, DT-LN5c	Longstanton bypass	Roadside	539614	267484	NO2	N	60.0	1.0	No	2.0

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
IMP	543739	261625	Roadside	98.26	98.26	23	23	19	16	13
ORCH	544558	261579	Urban Background	98.11	98.11	18	18	14	15	11
GIRT	542676	260667	Roadside	98.88	98.88	23	23	18	17	12

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.**

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

Notes:

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

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

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
DT1	544230	262048	Urban Background	49.2	49.2	21.3	17.2	14.7	14.7	11.4
DT2	543770	263678	Roadside	44.2	44.2	27.8	27.4	27.1	27.2	19.7
DT-28N	547436	262295	Roadside	58.3	58.3			22.8	23.0	18.8
DT4	548600	249136	Urban Background	52.2	52.2	26.6	26.1	24.7	23.0	16.5
DT5	538744	263640	Roadside	52.2	52.2	20.6	16.2	19.4	13.4	10.8
DT-6N	555942	246680	Roadside	52.2	52.2			20.2	21.0	15.1
DT7	528131	247399	Roadside	52.2	52.2	11.8	12.1	8.6	10.2	8.5
DT-8N	542555	251001	Roadside	52.2	52.2			17.3	15.3	12.3
DT9	547452	263175	Urban Background	58.3	58.3	17.8	17.5	14.4	15.5	13.3
DT10	542537	261467	Urban Background	42.8	42.8	26.2	26.3	25.8	19.0	15.4
DT11	544034	244585	Urban Background	36.5	36.5	26.0	24.6	24.9	22.5	15.0
DT12	544119	261862	Roadside	58.3	58.3	19.4	18.8	15.1	16.3	12.7
DT13	543955	263588	Urban Background	52.2	52.2	19.2	18.5	17.2	16.3	11.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2020 (%) [2]	2016	2017	2018	2019	2020
DT14	544050	263306	Roadside	52.2	52.2	27.0	26.4	23.6	22.3	20.2
DT15	544243	261819	Urban Background	58.3	58.3	20.3	19.4	17.5	18.5	13.4
DT17	248545	249366	Roadside	44.5	44.5	16.4	14.1	13.1	13.8	10.4
DT-32N	548742	264698	Roadside	48.3	48.3			23.4	21.6	19.0
DT20	544828	261738	Roadside	44.5	44.5	23.1	18.2	23.2	14.7	13.9
DT21	545056	261784	Roadside	58.3	58.3	20.5	18.8	16.7	15.8	12.9
DT22	545435	261906	Roadside	58.3	58.3	22.4	21.2	17.5	15.9	13.3
DT23a, DT23b, DT23c	544557	216571	Urban Background	44.5	44.5	17.7	16.3	16.3		10.6
DT26	543768	263708	Roadside	52.2	52.2	19.7	18.9	17.8	17.1	13.2
DT27	545259	261873	Urban Background	42.3	34.5	22.1	21.2	17.9	16.8	13.5
DT28	545169	261764	Roadside	44.5	44.5	21.0	21.3	16.6	16.7	14.1
DT29	552961	249251	Urban Background	52.2	52.2	12.5	11.0	10.0	10.9	8.4
DT-30N	549154	266006	Roadside	44.5	44.5			16.0		12.2
DT-LN1	539847	268169	Roadside	58.3	58.3	22.7	18.5	18.6	17.4	13.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
DT-LN2	539570	266842	Roadside	48.3	48.3	16.9	16.6	14.5	14.6	11.9
DT-LN3	540553	266869	Roadside	58.3	58.3	13.2	12.7	11.8	11.1	9.0
DT-LN4	540963	264474	Roadside	58.3	58.3	15.2	14.6	12.1		9.9
DT-LN5a, DT-LN5b, DT-LN5c	539614	267484	Roadside	52.2	52.2	26.1	26.8	24.3	23.5	16.3

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.**

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

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

Notes:

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

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

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

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

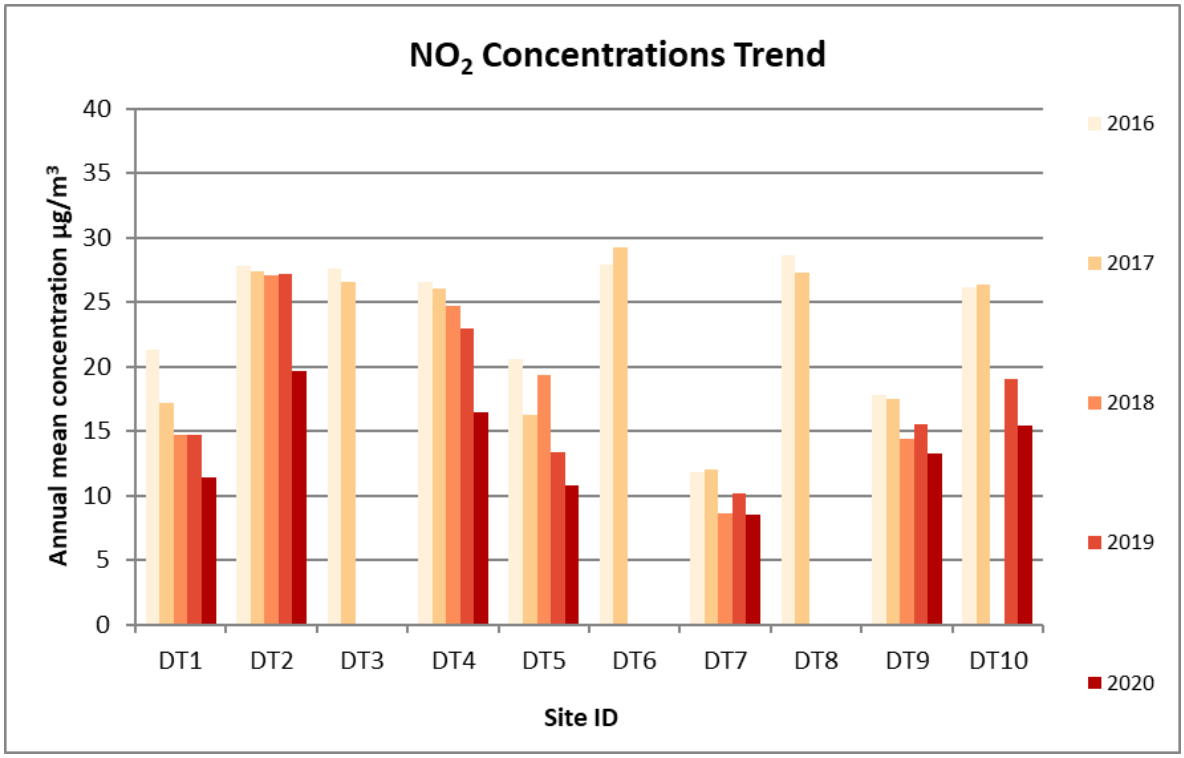
Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

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

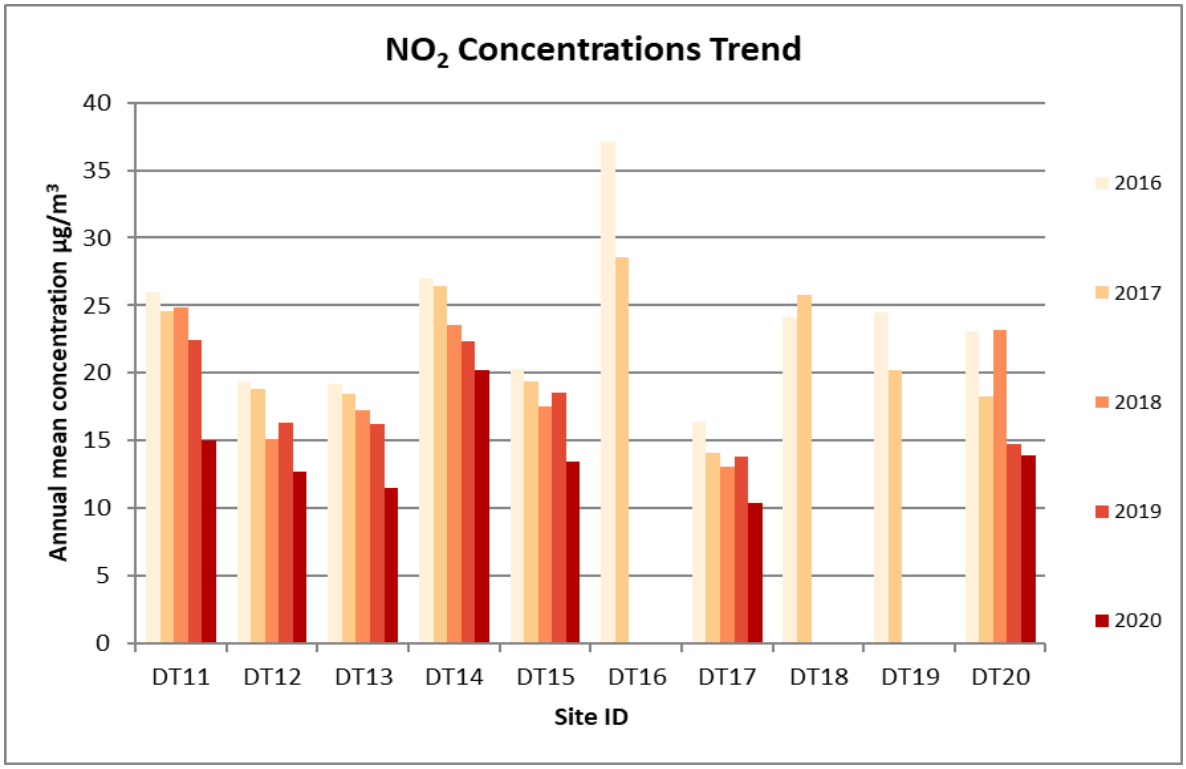
(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.1 – Trends in Annual Mean NO_2 Concentrations

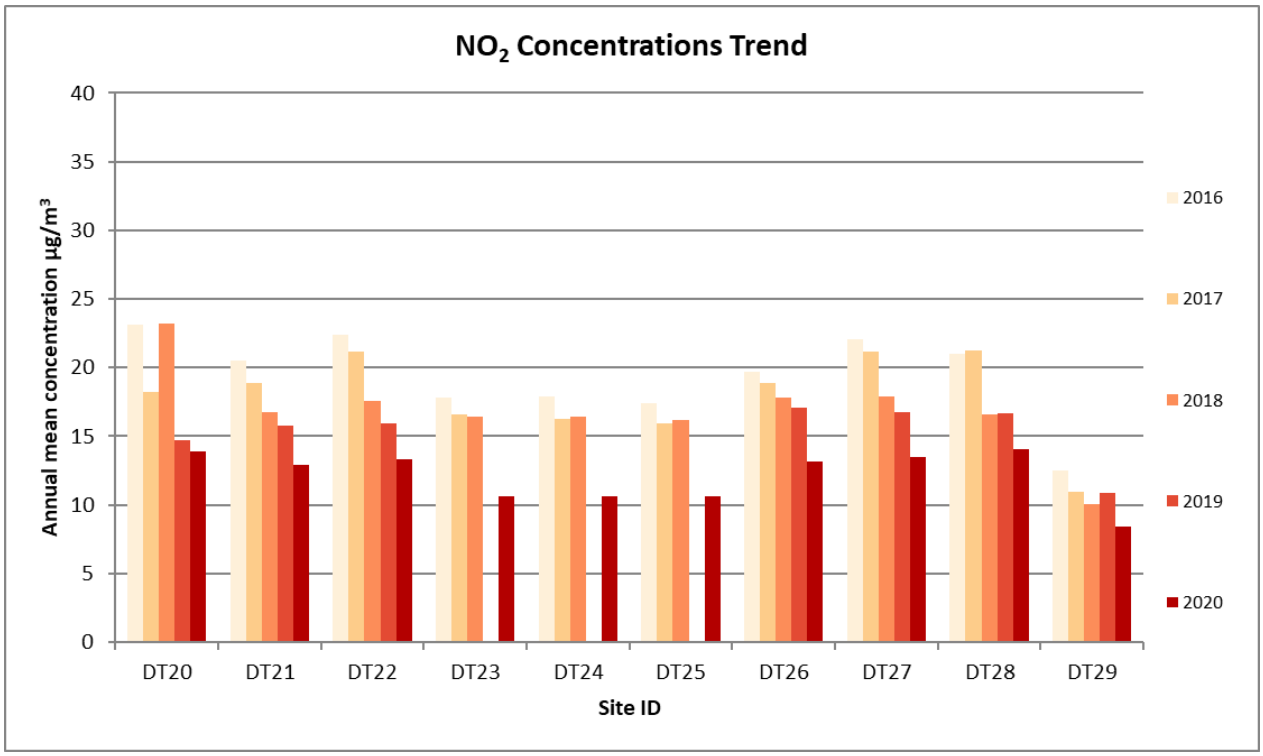
a) Trends in Annual Mean NO_2 Concentrations – DT1-10



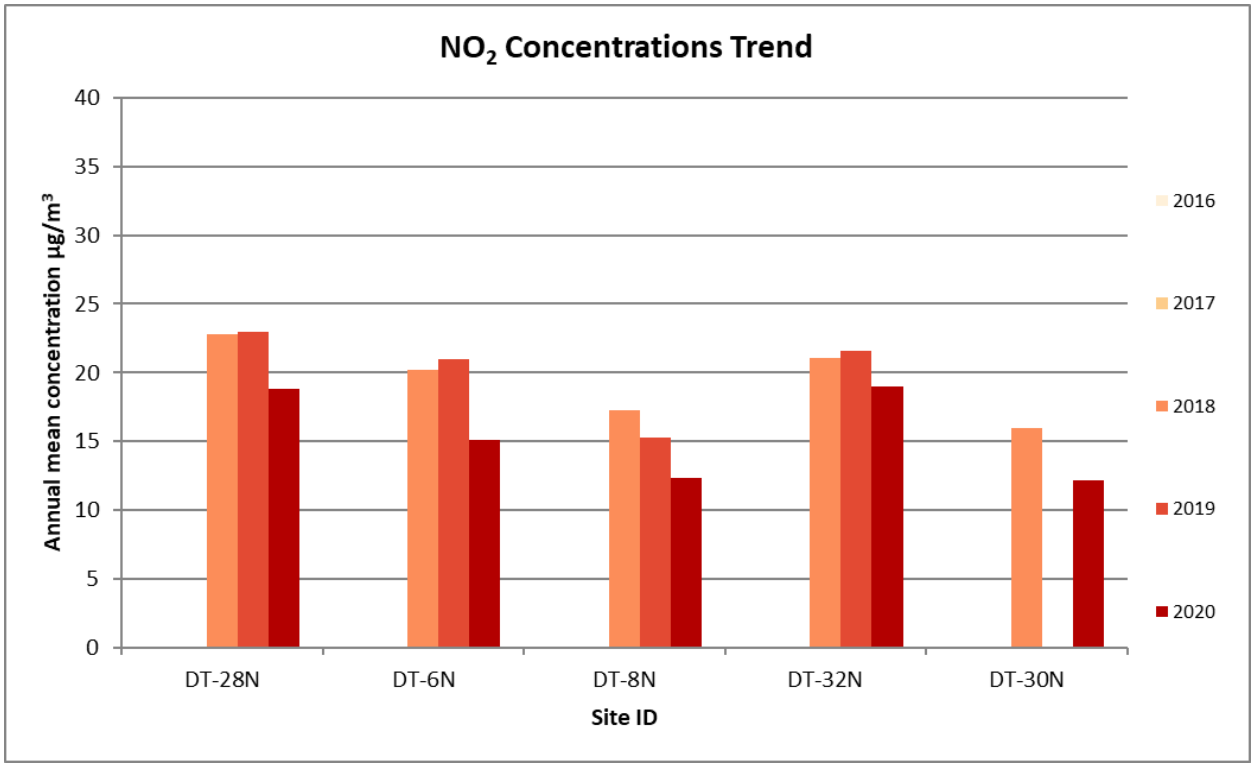
b) Trends in Annual Mean NO_2 Concentrations – DT11-20



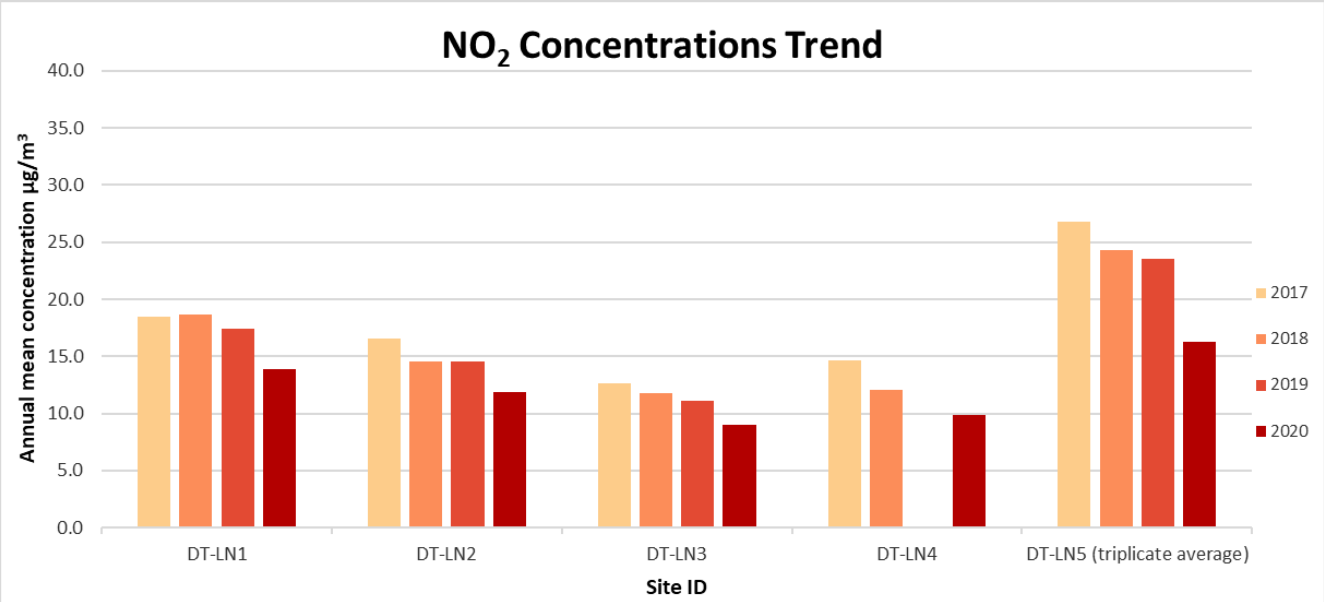
c) Trends in Annual Mean NO_2 Concentrations – DT20-29



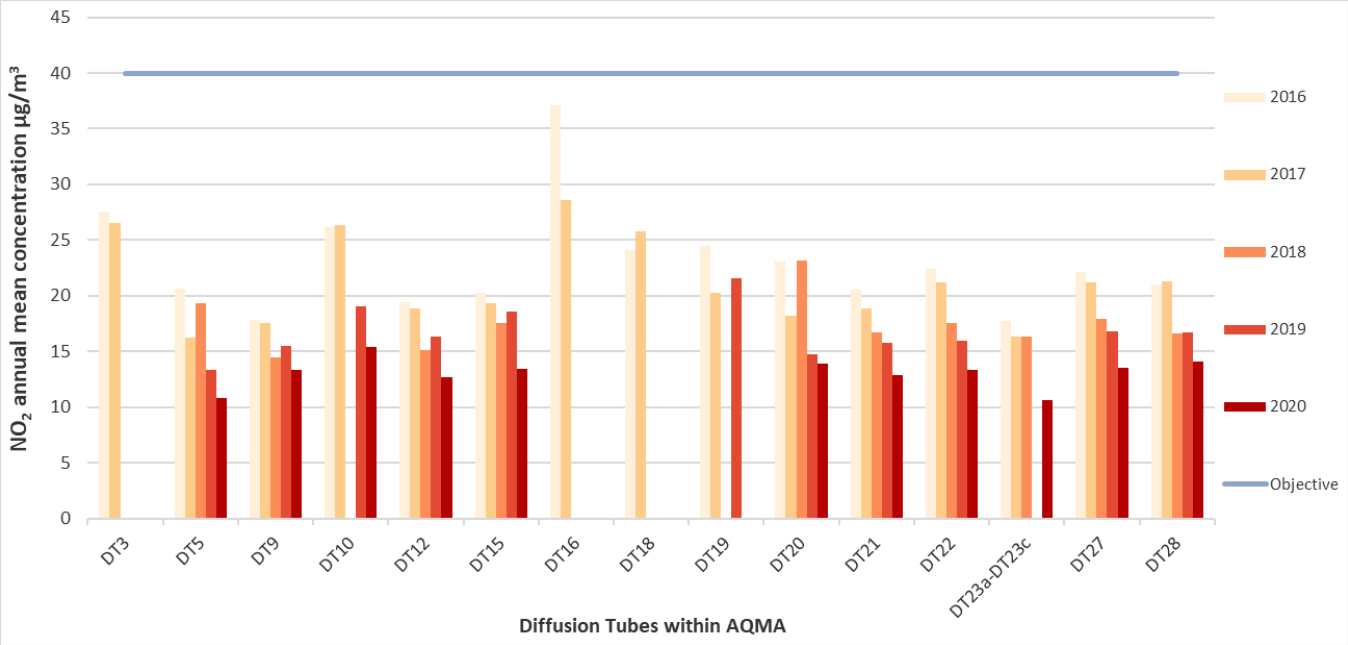
d) Trends in Annual Mean NO_2 Concentrations – DT28N, 6N, 8N, 32N and 30N



e) Trends in Annual Mean NO_2 Concentrations – Northstowe Diffusion Tubes



f) Trends in Annual Mean NO_2 Concentrations – All Diffusion Tubes in AQMA



g) Trends in Annual Mean NO_2 Concentrations – Automatic Monitoring Sites

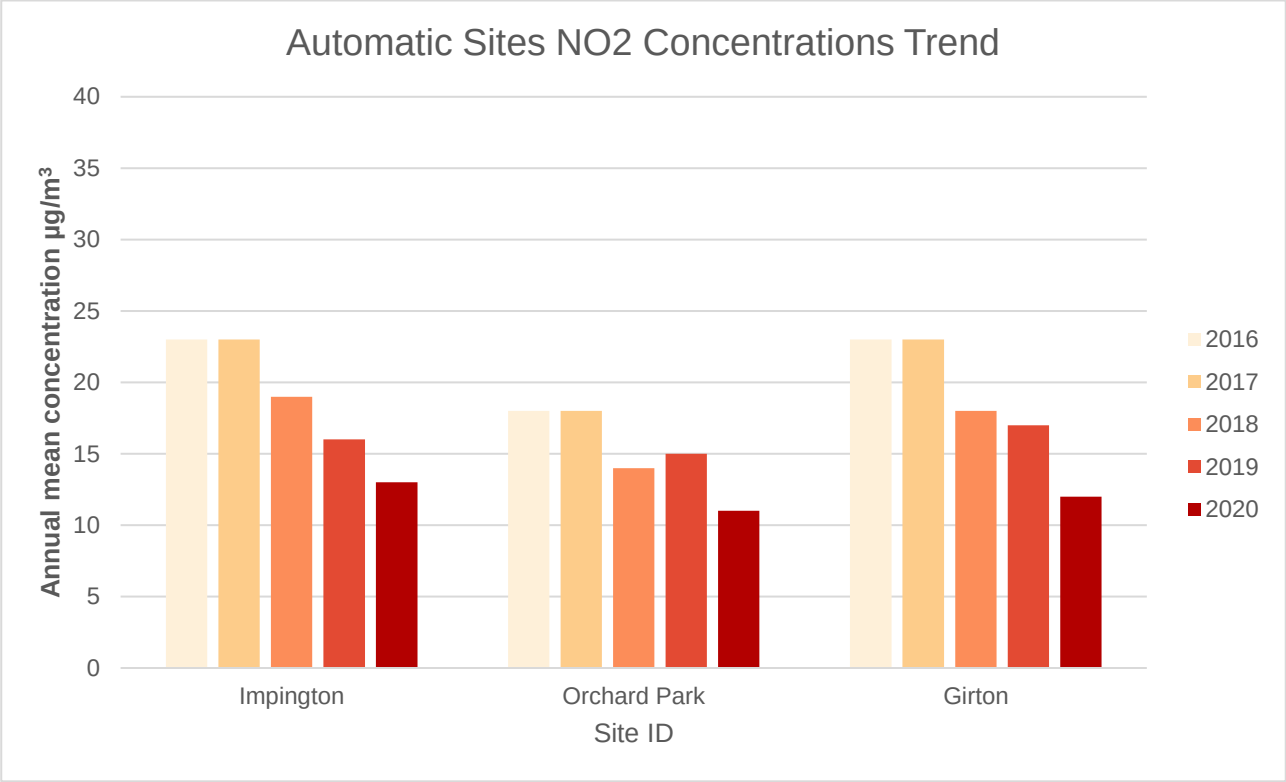


Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
IMP	543739	261625	Roadside	98.26	98.26	0	0	0	0	0
ORCH	544558	261579	Urban Background	98.11	98.11	0	0	0	0	0
GIRT	542676	260667	Roadside	98.88	98.88	0	0	0	0	0

Notes:

Results are presented as the number of 1-hour periods where concentrations greater than 200µg/m^3 have been recorded.

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

(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%).

Table A.6 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
IMP	543739	261625	Roadside	73.28	73.28	17	16	17	16	15
ORCH	544558	261579	Urban Background	91.67	91.67	16	14	14	14	12
GIRT	542676	260667	Roadside	95.4	95.4	17	17	17	17	14

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16**

Notes:

The annual mean concentrations are presented as $\mu g/m^3$.

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold**.

All means have been "annualised" as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.2 – Trends in Annual Mean PM_{10} Concentrations

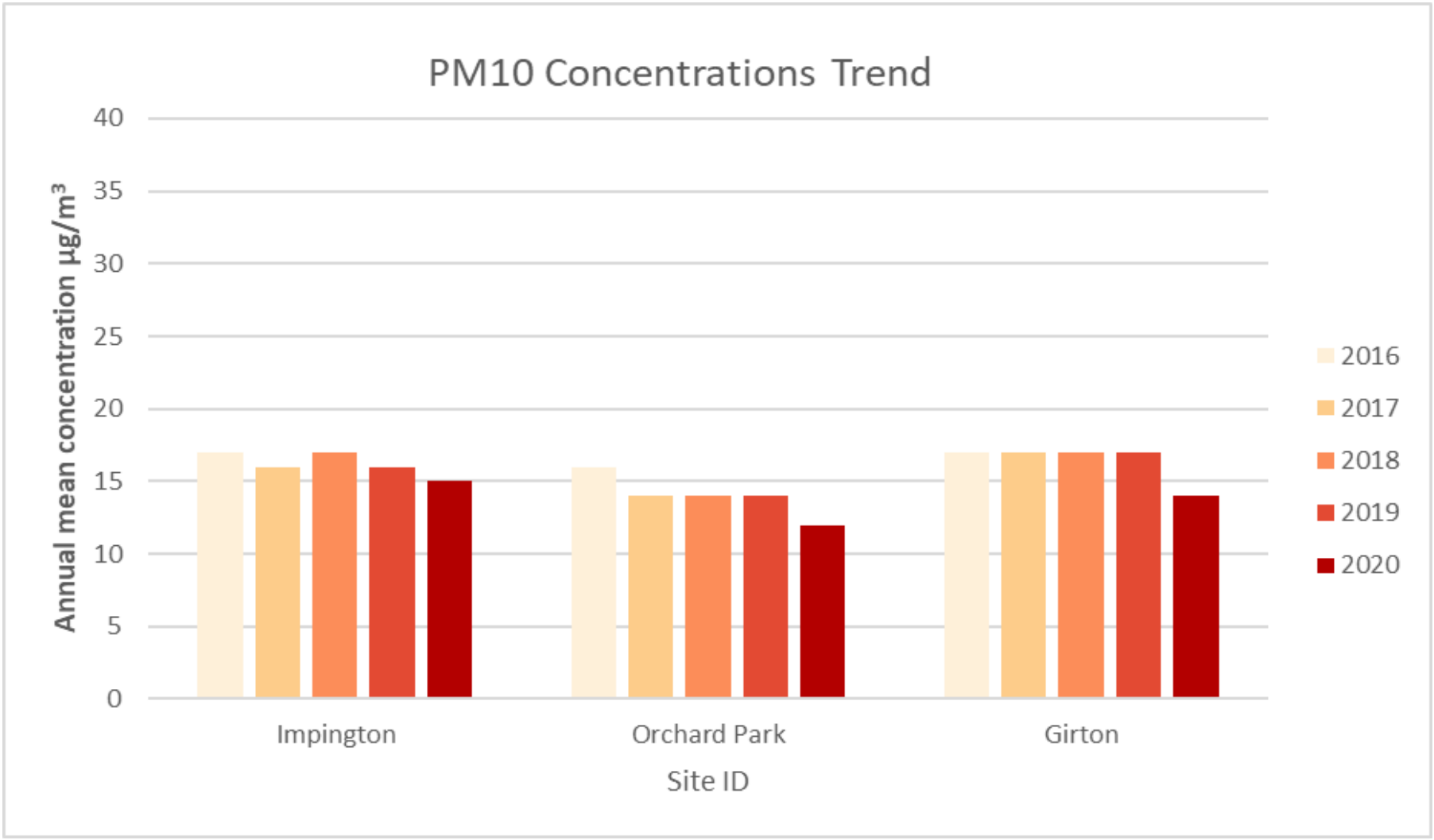


Table A.7 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
IMP	543739	261625	Roadside	73.28	73.28	1	2	1	2	0 (22)
ORCH	544558	261579	Urban Background	91.67	91.67	1	1	1	1	0
GIRT	542676	260667	Roadside	95.4	95.4	1	1	1	3	0

Notes:

Results are presented as the number of 24-hour periods where daily mean concentrations greater than 50µg/m^3 have been recorded.

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

(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%).

Table A.8 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
ORCH	544558	261579	Urban Background	73.85	73.85	-	-	-	-	13
GIRT	542676	260667	Roadside	86.77	86.77	13	11	11	11	10

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.**

Notes:

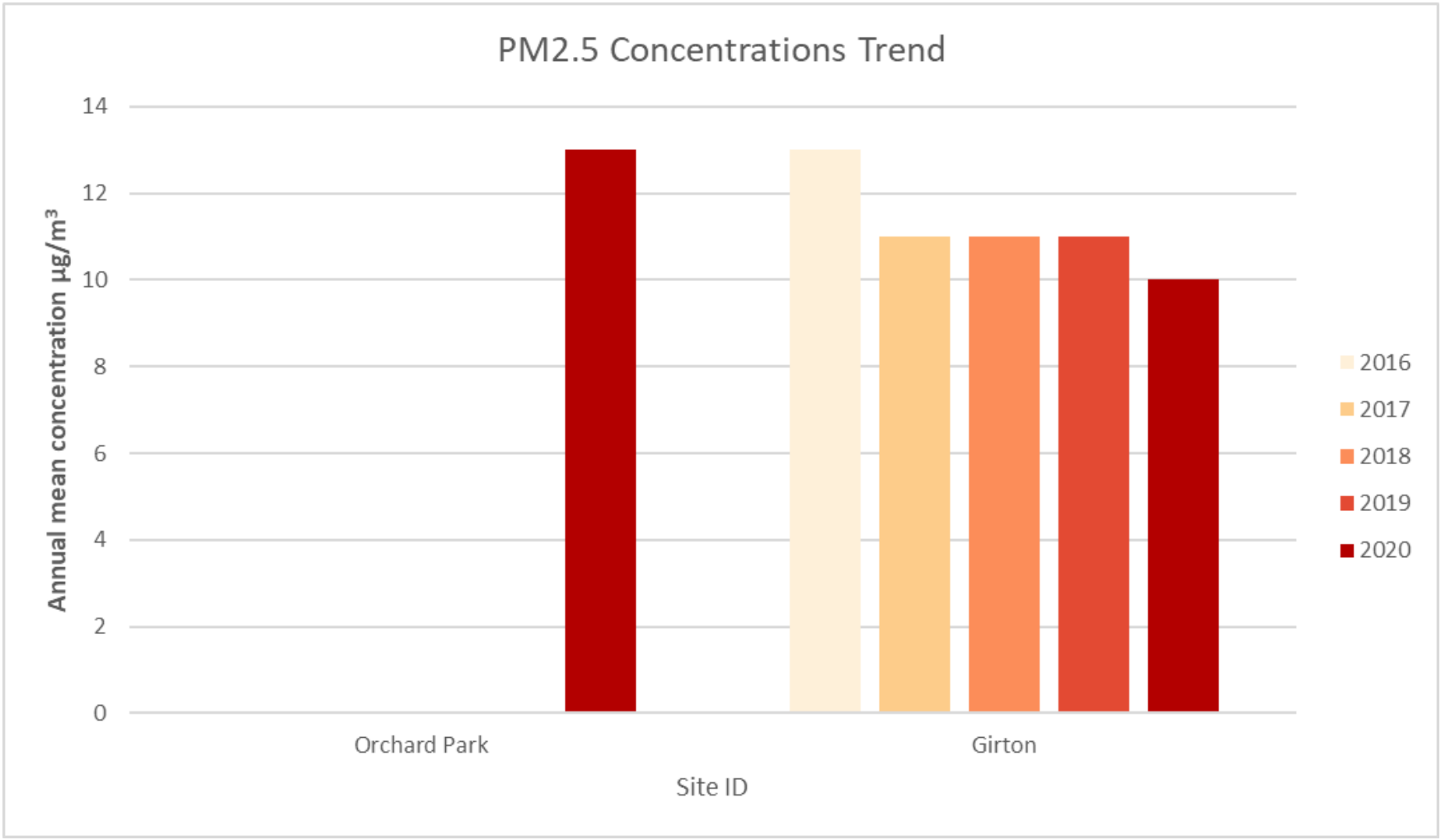
The annual mean concentrations are presented as $\mu g/m^3$.

All means have been “annualised” as per LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

Figure A.3 – Trends in Annual Mean $PM_{2.5}$ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT1	544230	262048	25.1	19.8						11.2	12.3		22.3	19.8	18.2	11.4	-	
DT2	543770	263678	42.8							24.7		26.0	36.9	33.7	32.4	19.7	-	
DT-28N	547436	262295	40.0	31.3						16.2	18.5	30.4	35.7	30.8	28.6	18.8	-	
DT4	548600	249136	31.8							19.9	24.0	23.1	29.2	27.7	25.8	16.5	-	
DT5	538744	263640	16.5							15.9	16.2	13.6	20.7	18.9	16.9	10.8	-	
DT-6N	555942	246680	28.8							17.7	19.8	23.4	25.4	27.0	23.6	15.1	-	
DT7	528131	247399	18.2							6.9	8.0	10.4	21.4	16.2	13.4	8.5	-	
DT-8N	542555	251001	20.2							14.3	16.3	18.0	26.8	20.6	19.2	12.3	-	
DT9	547452	263175	30.1	19.2						10.3	14.7	17.5	27.9	23.4	20.2	13.3	-	
DT10	542537	261467	28.6								21.2	23.1	33.3	26.4	26.4	15.4	-	
DT11	544034	244585								18.3	19.4	21.6		17.3	19.1	15.0	-	
DT12	544119	261862	27.9	16.7						12.6	13.6	16.7	25.6	23.1	19.4	12.7	-	
DT13	543955	263588	25.1							11.5	15.0	15.2	25.0	18.1	18.0	11.5	-	
DT14	544050	263306	63.4							17.5	20.0	25.1	35.0	33.0	31.6	20.2	-	
DT15	544243	261819	29.5	20.8						13.4	13.6	17.7	25.9	23.1	20.4	13.4	-	
DT17	248545	249366								10.0	11.8	14.1	22.6	17.3	15.1	10.4	-	
DT-32N	548742	264698	37.0	30.6						23.1	20.2	24.2	30.3		27.2	19.0	-	
DT20	544828	261738								12.6	18.2	19.2	28.9	23.2	20.3	13.9	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.77)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
DT21	545056	261784	26.1	16.3						11.5	15.6	16.1	29.2	23.5	19.7	12.9	-	
DT22	545435	261906	29.5	19.8						13.0	15.2	16.7	24.2	24.2	20.2	13.3	-	
DT23a	544557	216571								10.5	12.8	14.1	22.2	18.8	-	-	-	Triplicate Site with DT23a, DT23b and DT23c - Annual data provided for DT23c only
DT23b	544557	216571								10.1	12.4	13.3	22.8	19.7	-	-	-	Triplicate Site with DT23a, DT23b and DT23c - Annual data provided for DT23c only
DT23c	544557	216571								9.9	11.6	13.0	20.7	19.7	15.4	10.6	-	Triplicate Site with DT23a, DT23b and DT23c - Annual data provided for DT23c only
DT26	543768	263708	24.9							13.7	16.2	19.3	26.5	23.9	20.6	13.2	-	
DT27	545259	261873								14.7	18.0	18.5	20.0		17.7	13.5	-	
DT28	545169	261764								12.6	18.3	18.4	29.6	24.6	20.6	14.1	-	
DT29	552961	249251	17.9							7.6	9.3	9.2	17.3	17.6	13.1	8.4	-	
DT-30N	549154	266006								10.1	15.6	16.0	25.7	22.0	17.8	12.2	-	
DT-LN1	539847	268169	26.4	15.9						15.9	18.7	19.0	29.3	23.1	21.2	13.9	-	
DT-LN2	539570	266842	26.0	16.1						11.1	13.0	13.7	24.5		17.1	11.9	-	
DT-LN3	540553	266869	21.9	11.3						7.4	9.6	10.1	19.4	17.0	13.7	9.0	-	
DT-LN4	540963	264474	23.5	13.1						8.6	10.4	10.6	20.4	19.2	15.0	9.9	-	
DT-LN5a	539614	267484	24.1							24.6	27.2	24.2	29.7	24.8	-	-	-	Triplicate Site with DT-LN5a, DT-LN5b and DT-LN5c - Annual data provided for DT-LN5c only
DT-LN5b	539614	267484	24.9							25.9	25.2	22.1	28.9	24.5	-	-	-	Triplicate Site with DT-LN5a, DT-LN5b and DT-LN5c - Annual data provided for DT-LN5c only
DT-LN5c	539614	267484	21.1							25.4	28.2	24.7	28.3	26.6	25.5	16.3	-	Triplicate Site with DT-LN5a, DT-LN5b and DT-LN5c - Annual data provided for DT-LN5c only

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

☒ **Annualisation has been conducted where data capture is <75% and >33% in line with LAQM.TG16.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

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

☒ **South Cambridgeshire District Council confirm that all 2020 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

Notes:

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

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

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within South Cambridgeshire During 2020

South Cambridgeshire District Council has not identified any new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken by South Cambridgeshire District Council During 2020

South Cambridgeshire District Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

NO_2 monitoring was undertaken at 31 sites within the district using passive diffusion tubes. The tubes were supplied and processed by SOCOTEC Didcot, who supplied the following information. 'The samples have been analysed in accordance with SOCOTEC's standard operating procedure ANU/SOP/1015. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance.' The tubes were prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection. Please note:

(i) As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11°C, the reported values have been adjusted to 20°C to allow for direct comparison with EU limits.

(ii) The reported results have not been bias adjusted.

This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. Any further calculations and assessments requiring exposure details and conditions fall outside the scope of our

accreditation. In the AIR PT inter-comparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a Satisfactory laboratory.'

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 33%. Due to Covid-19 impacting the changeover of diffusion tubes data capture was between 33% and 75% for all diffusion tube sites in 2020 and therefore all sites were annualised. Annualisation was carried out using the Diffusion Tube Data Processing Tool, with details provided in Table C.2.1.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG16 provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

South Cambridgeshire District Council have applied a national bias adjustment factor of 0.77 to the 2020 monitoring data. A summary of bias adjustment factors used by South Cambridgeshire District Council over the past five years is presented in Table C.1.

The national bias adjustment factor was used due to no local co-location studies being available in 2020 that meet the criteria for applying a local bias adjustment factor over a national factor, as per Box 7.11 of LAQM.TG16.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/21

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

This spreadsheet will be updated at the end of June 2021

LAQM Helpdesk Website

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

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

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List. If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List. If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List. If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

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

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2020	R	East Suffolk Council	12	30	25	19.6%	G	**0.84**
SOCOTEC Didcot	50% TEA in acetone	2020	UB	Canterbury City Council	10	13	10	28.1%	G	**0.78**
SOCOTEC Didcot	50% TEA in acetone	2020	R	Canterbury City Council	9	26	20	29.6%	G	**0.77**
SOCOTEC Didcot	50% TEA in acetone	2020	UB	Kingston upon Hull City Council	12	24	18	34.8%	G	**0.74**
SOCOTEC Didcot	50% TEA in acetone	2020	R	Ipswich Borough Council	12	27	21	28.5%	G	**0.78**
SOCOTEC Didcot	50% TEA in acetone	2020	R	Ipswich Borough Council	12	36	26	36.3%	G	**0.73**
SOCOTEC Didcot	50% TEA in acetone	2020	R	Thanet District Council	9	20	17	21.2%	G	**0.83**
SOCOTEC Didcot	50% TEA in acetone	2020	R	Medway Council	12	26	18	41.7%	G	**0.71**
SOCOTEC Didcot	50% TEA in acetone	2020	B	Medway Council	11	20	10	96.3%	G	**0.51**
SOCOTEC Didcot	50% TEA in acetone	2020	B	Gravesham Borough Council	12	23	22	5.6%	G	**0.95**
SOCOTEC Didcot	50% TEA in acetone	2020	B	Gravesham Borough Council	12	27	24	16.1%	G	**0.86**
SOCOTEC Didcot	50% TEA in acetone	2020	R	Monmouthshire County Concil	10	32	24	35.3%	G	**0.74**
SOCOTEC Didcot	50% TEA in acetone	2020	UI	North Lincolnshire Council	13	18	14	26.6%	G	**0.79**
SOCOTEC Didcot	50% TEA in acetone	2020	R	City of York Council	12	24	19	29.0%	G	**0.78**
SOCOTEC Didcot	50% TEA in acetone	2020	R	City of York Council	11	22	17	34.3%	G	**0.74**
SOCOTEC Didcot	50% TEA in acetone	2020	R	City of York Council	12	33	23	40.4%	G	**0.71**
SOCOTEC Didcot	50% TEA in acetone	2020	R	Cambridge City Council	10	30	20	47.6%	G	**0.68**
SOCOTEC Didcot	50% TEA in acetone	2020	R	Wrexham County Borough Council	9	17	13	26.6%	G	**0.79**
SOCOTEC Didcot	50% TEA in acetone	2020	KS	Marylebone Road Intercomparison	11	59	43	38.0%	G	**0.72**
Socotec Didcot	50% TEA in acetone	2020	R	Horsham District Council	10	23	23	2.2%	G	**0.98**
Socotec Didcot	50% TEA in acetone	2020	R	Horsham District Council	12	22	19	18.6%	G	**0.84**
Socotec Didcot	50% TEA in acetone	2020	R	Horsham District Council	9	25	18	42.0%	G	**0.70**
SOCOTEC Didcot	50% TEA in acetone	2020		**Overall Factor[3] (22 studies)**				**Use**		**0.77**

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.77
2019	National	03/20	0.75
2018	National	-	0.76
2017	National	-	0.77
2016	National	-	0.77

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO_2 monitoring locations within South Cambridgeshire required distance correction during 2020.

QA/QC of Automatic Monitoring

South Cambridgeshire District Council is a member of the Calibration Club, operated by AEAT now Ricardo – AEA. All NOx analysers are chemiluminescence analysers. All particulate matter analysers are BAMs. In line with current guidance, BAM data is multiplied by 1.3 to give the gravimetric equivalent. QA/QC of automatic monitoring data is carried out by Ricardo. Tri-annual audits of the monitoring stations are carried out by Ricardo. Services of all the three AQ monitoring stations i.e. Impington, Girton and Orchard Park are carried out bi-annually by the appointed Equipment Support Unit (ESU) – ACOEM (Air Monitors). The sites are manually calibrated on a monthly basis by a Council Officer serving as Local Site Operative (LSO). The output from the calibrations is forwarded to Ricardo – AEA for QA/QC and ratification purposes. The monitoring data in the ASR has been ratified. Live and historic data is available at https://scambs-airquality.ricardo-aea.com/.

Automatic Monitoring Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 33%. Annualisation was required for Impington PM_{10} data and Orchard Park $PM_{2.5}$ data due to data capture of 73.28% and 73.85% respectively. Details are provided in Table C.2.2.

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

No automatic NO_2 monitoring locations within South Cambridgeshire required distance correction during 2020.

Table C.2.1 – Diffusion Tube Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Orchard Park	Annualisation Factor Wicken Fen	Annualisation Factor Northampton Spring Park	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT1	0.8237	0.8229	0.7885		0.8117	18.2	14.8	
DT2	0.8093	0.7857	0.7705		0.7885	32.4	25.5	
DT-28N	0.8646	0.8722	0.8185		0.8518	28.6	24.4	
DT4	0.8487	0.8393	0.8035		0.8305	25.8	21.4	
DT5	0.8487	0.8393	0.8035		0.8305	16.9	14.1	
DT-6N	0.8487	0.8393	0.8035		0.8305	23.6	19.6	
DT7	0.8487	0.8393	0.8035		0.8305	13.4	11.1	
DT-8N	0.8487	0.8393	0.8035		0.8305	19.2	16.0	
DT9	0.8646	0.8722	0.8185		0.8518	20.2	17.2	
DT10	0.7714	0.7657	0.7311		0.7561	26.4	20.0	
DT11	1.0397	1.0695	0.9421		1.0171	19.1	19.4	
DT12	0.8646	0.8722	0.8185		0.8518	19.4	16.5	
DT13	0.8487	0.8393	0.8035		0.8305	18.0	15.0	
DT14	0.8487	0.8393	0.8035		0.8305	31.6	26.3	

Site ID	Annualisation Factor Orchard Park	Annualisation Factor Wicken Fen	Annualisation Factor Northampton Spring Park	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT15	0.8646	0.8722	0.8185		0.8518	20.4	17.4	
DT17	0.9227	0.9094	0.8447		0.8922	15.1	13.4	
DT-32N	0.9138	0.9291	0.8730		0.9053	27.2	24.6	
DT20	0.9227	0.9094	0.8447		0.8922	20.3	18.1	
DT21	0.8646	0.8722	0.8185		0.8518	19.7	16.8	
DT22	0.8646	0.8722	0.8185		0.8518	20.2	17.2	
DT23a	0.9227	0.9094	0.8447		0.8922	-	-	*Triplicate Site with DT23a, DT23b and DT23c - Annual data provided for DT23c only*
DT23b	0.9227	0.9094	0.8447		0.8922	-	-	*Triplicate Site with DT23a, DT23b and DT23c - Annual data provided for DT23c only*
DT23c	0.9227	0.9094	0.8447		0.8922	15.4	13.7	*Triplicate Site with DT23a, DT23b and DT23c - Annual data provided for DT23c only*
DT26	0.8487	0.8393	0.8035		0.8305	20.6	17.1	
DT27	1.0260	1.0122	0.9379		0.9921	17.7	17.6	
DT28	0.9227	0.9094	0.8447		0.8922	20.6	18.3	
DT29	0.8487	0.8393	0.8035		0.8305	13.1	10.8	
DT-30N	0.9227	0.9094	0.8447		0.8922	17.8	15.9	
DT-LN1	0.8646	0.8722	0.8185		0.8518	21.2	18.1	

Site ID	Annualisation Factor Orchard Park	Annualisation Factor Wicken Fen	Annualisation Factor Northampton Spring Park	Annualisation Factor	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
DT-LN2	0.9138	0.9291	0.8730		0.9053	17.1	15.5	
DT-LN3	0.8646	0.8722	0.8185		0.8518	13.7	11.7	
DT-LN4	0.8646	0.8722	0.8185		0.8518	15.0	12.8	
DT-LN5a	0.8487	0.8393	0.8035		0.8305	-	-	*Triplicate Site with DT-LN5a, DT-LN5b and DT-LN5c - Annual data provided for DT-LN5c only*
DT-LN5b	0.8487	0.8393	0.8035		0.8305	-	-	*Triplicate Site with DT-LN5a, DT-LN5b and DT-LN5c - Annual data provided for DT-LN5c only*
DT-LN5c	0.8487	0.8393	0.8035		0.8305	25.5	21.2	*Triplicate Site with DT-LN5a, DT-LN5b and DT-LN5c - Annual data provided for DT-LN5c only*

Table C.3.2a – Automatic Monitoring Annualisation Summary – Impington PM_{10} (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Orchard Park	Annualisation Factor Norwich	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
Impington (PM_{10})	1.05	1.10	1.08	14.0	15.1	*Rounded to 15 for reporting purposes to match other continuous monitors*

Table C.4.2b – Automatic Monitoring Annualisation Summary – Orchard Park $PM_{2.5}$ (concentrations presented in µg/m^3)

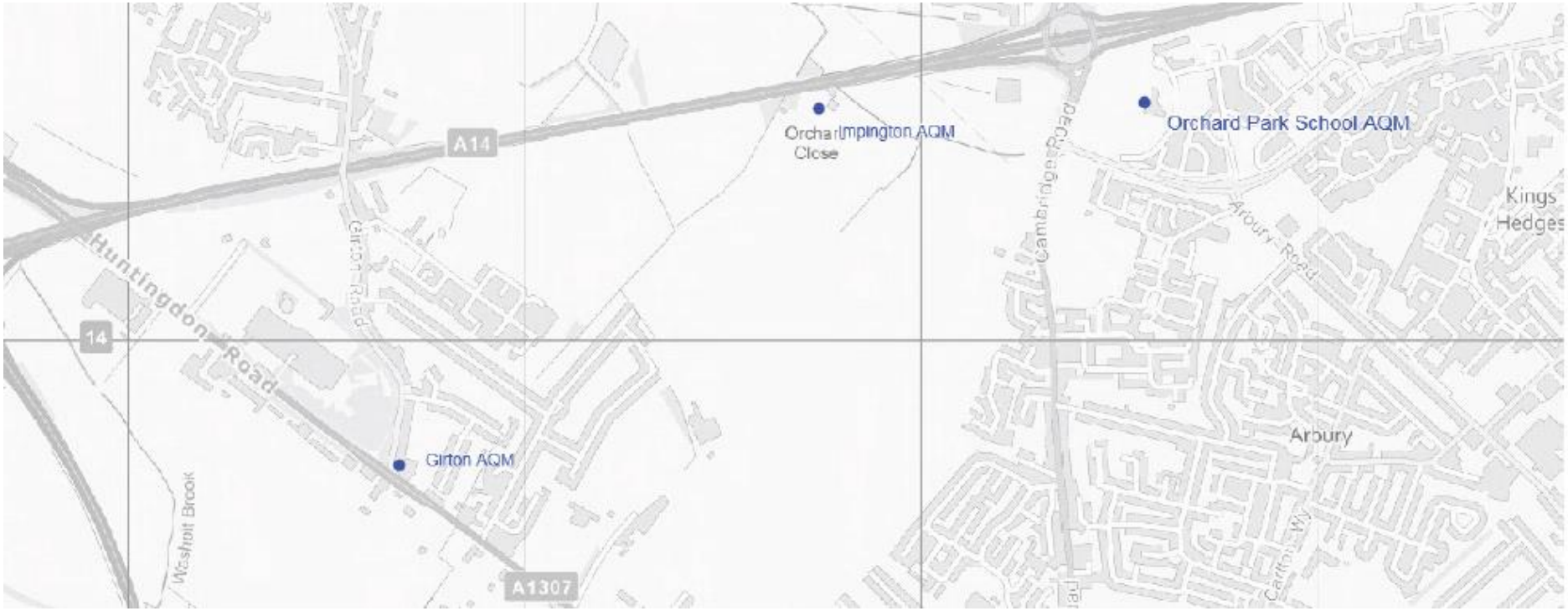
Site ID	Annualisation Factor Northampton Spring Park	Annualisation Factor Norwich	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
Orchard Park ($PM_{2.5}$)	1.01	1.02	1.01	12.5	12.6	*Rounded to 13 for reporting purposes to match other continuous monitors*

Table C.5.3 – Automatic Monitoring Annualisation Example Calculation – Orchard Park $PM_{2.5}$ (concentrations presented in µg/m^3)

Background Site	Annual Mean (Am)	Period Mean (Pm)	Ratio Am/Pm
Northampton Spring Park	10.32	10.25	1.01
Norwich Lakenfields	8.29	8.13	1.02
Average factor:			1.01

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

Figure D.1 – Map of Automatic Monitoring Sites



Note: Impington and Orchard Park sites are located in the AQMA.

Figure D.2 – AQMA

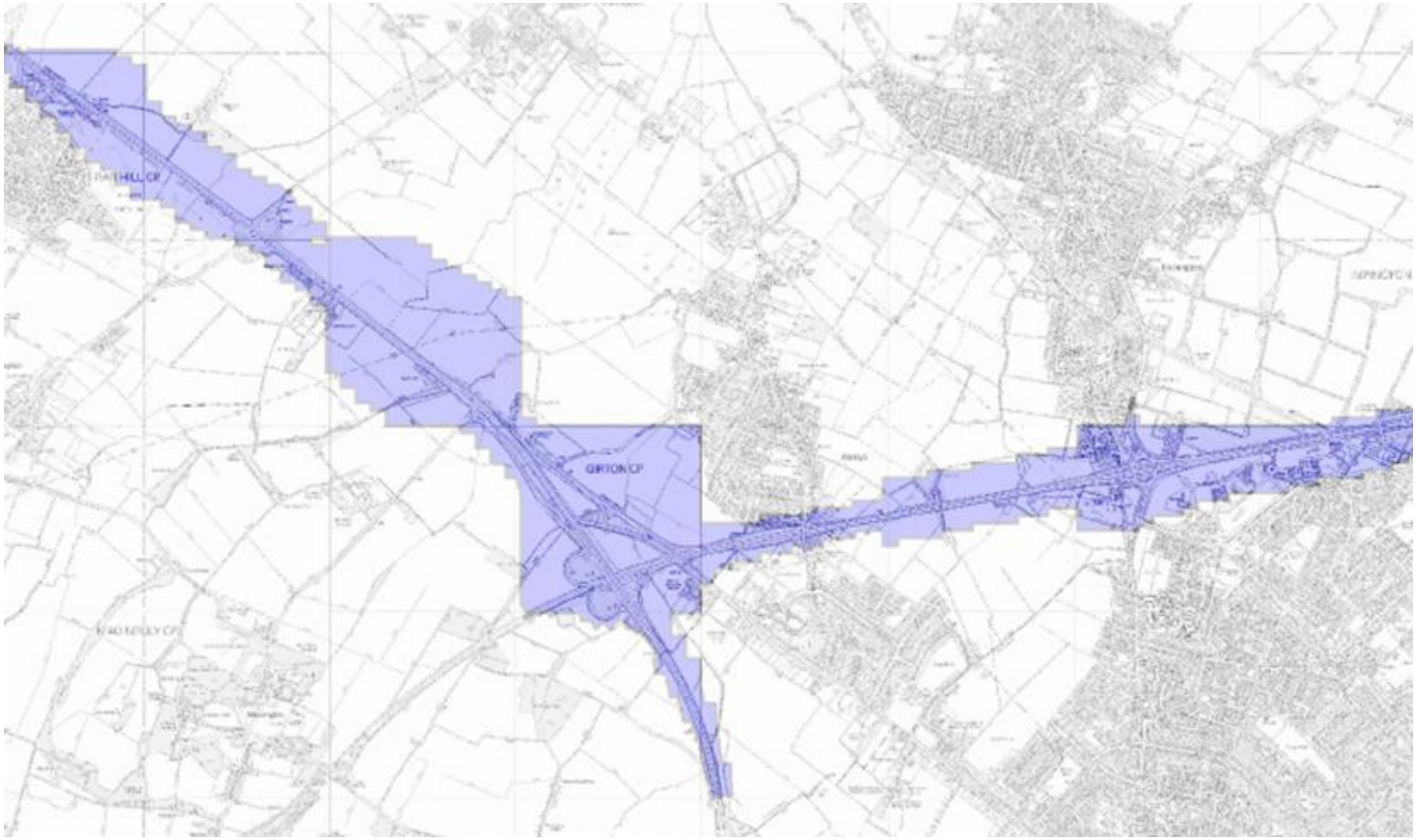
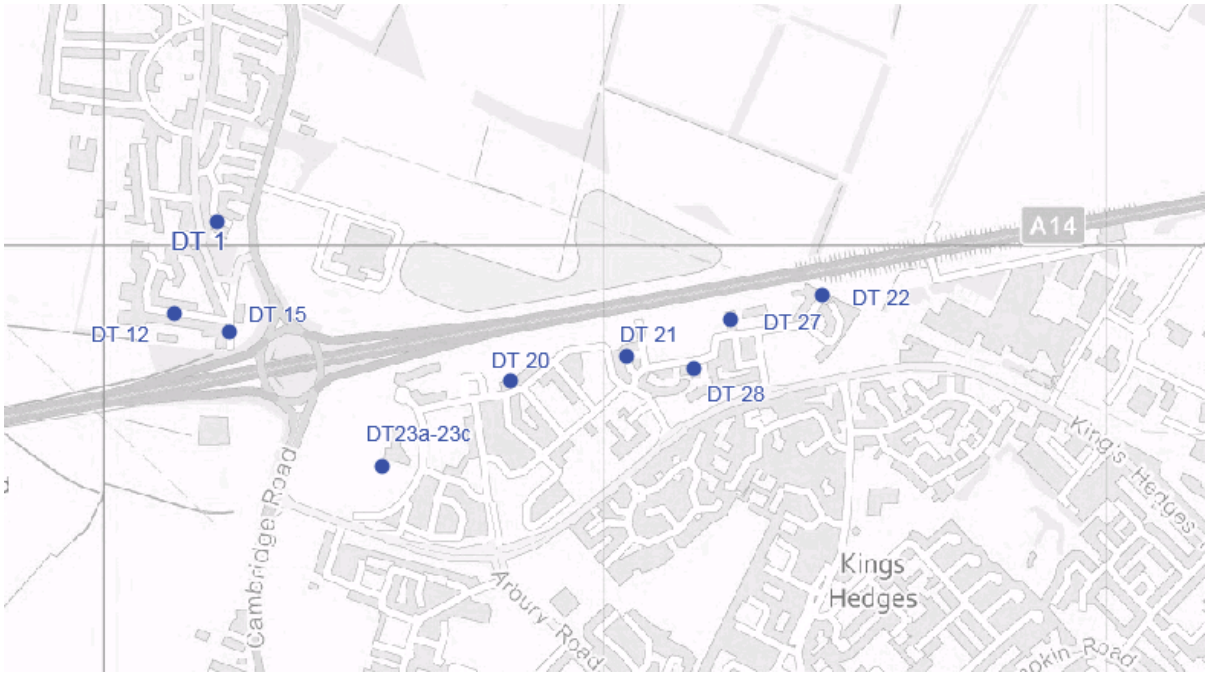
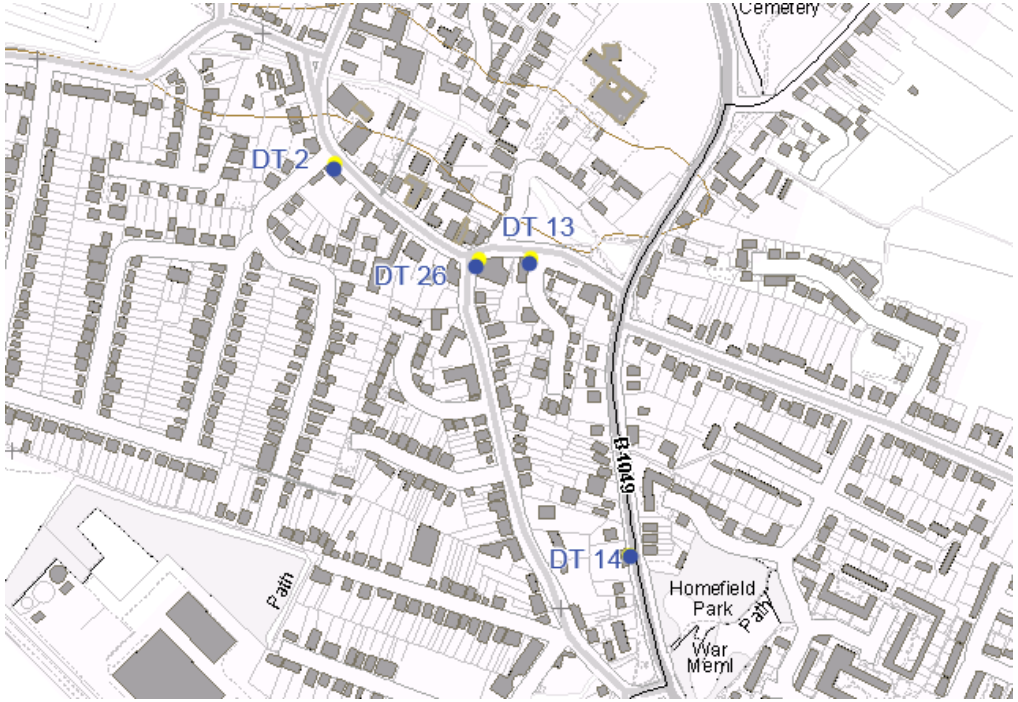


Figure D.3 – Map of Non-Automatic Monitoring Site

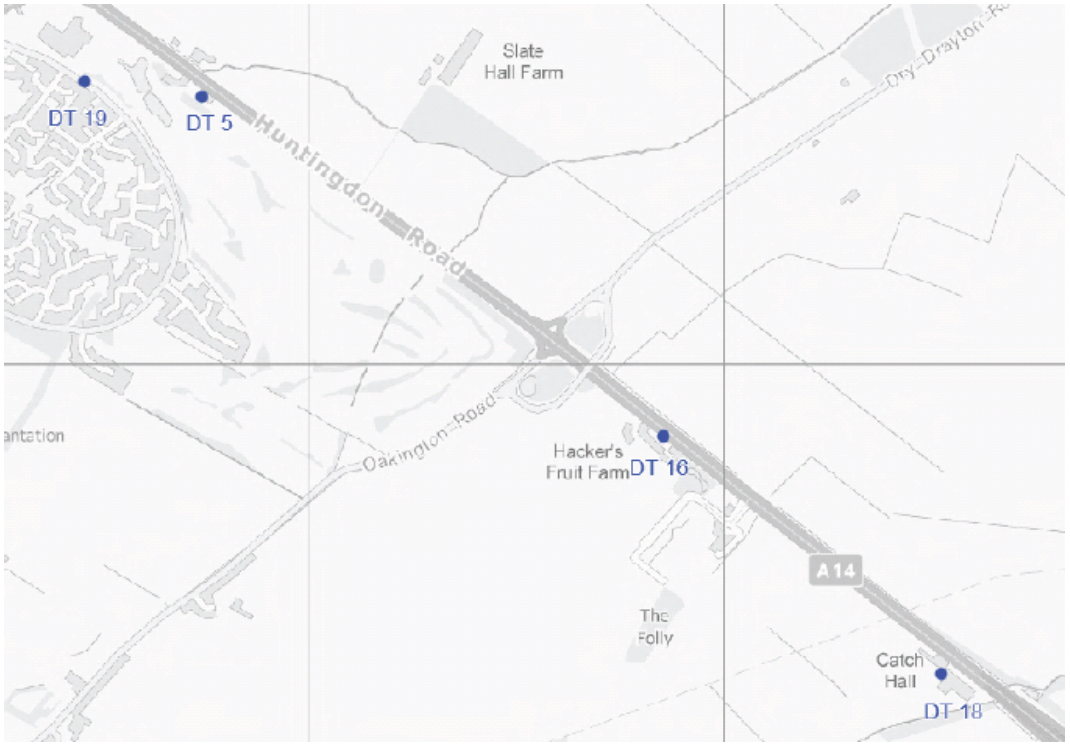
Diffusion Tube Locations – Orchard Park and Impington (all in AQMA)



Diffusion Tube Locations – Histon



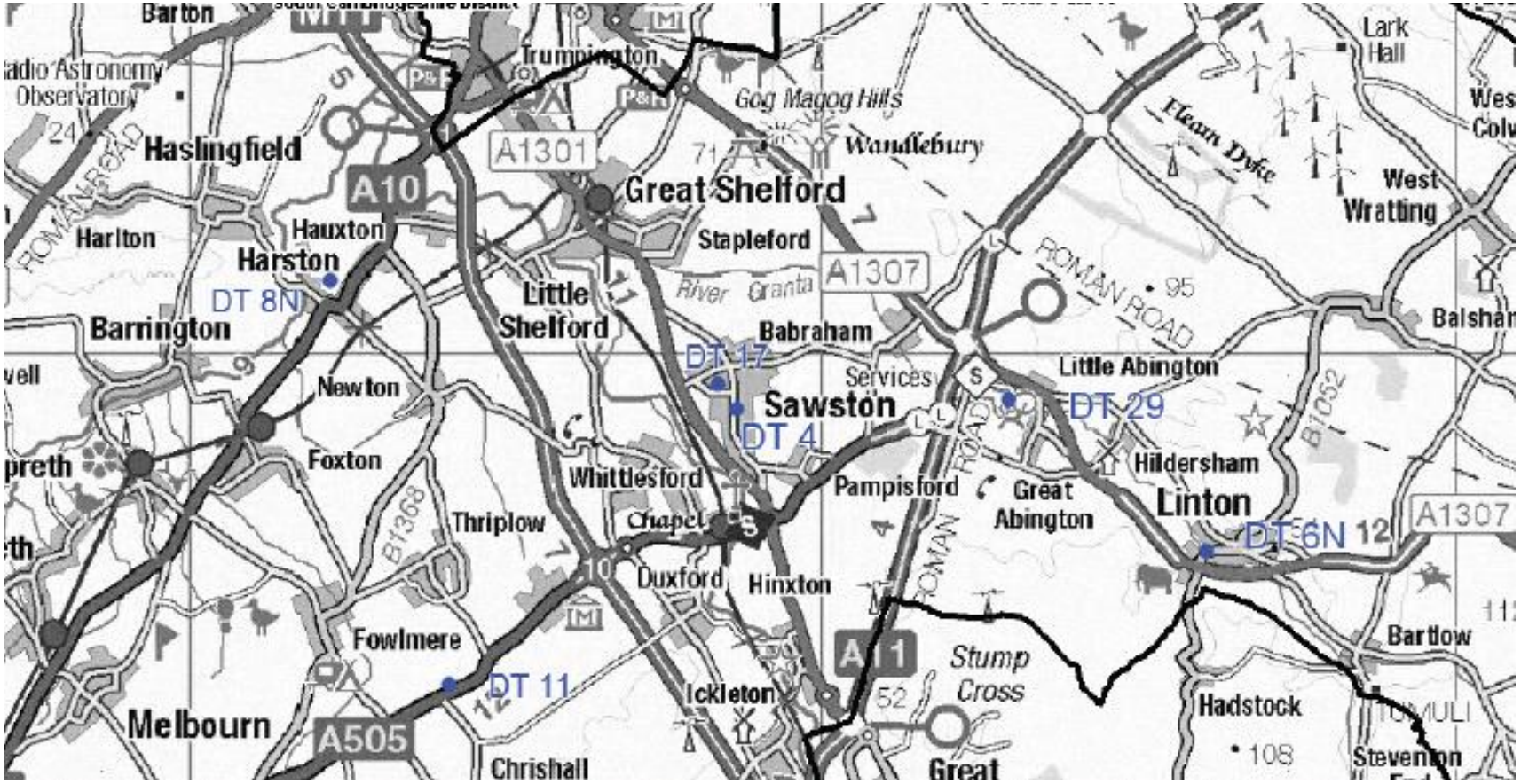
Diffusion Tube Locations – Bar Hill & A14 (in AQMA)



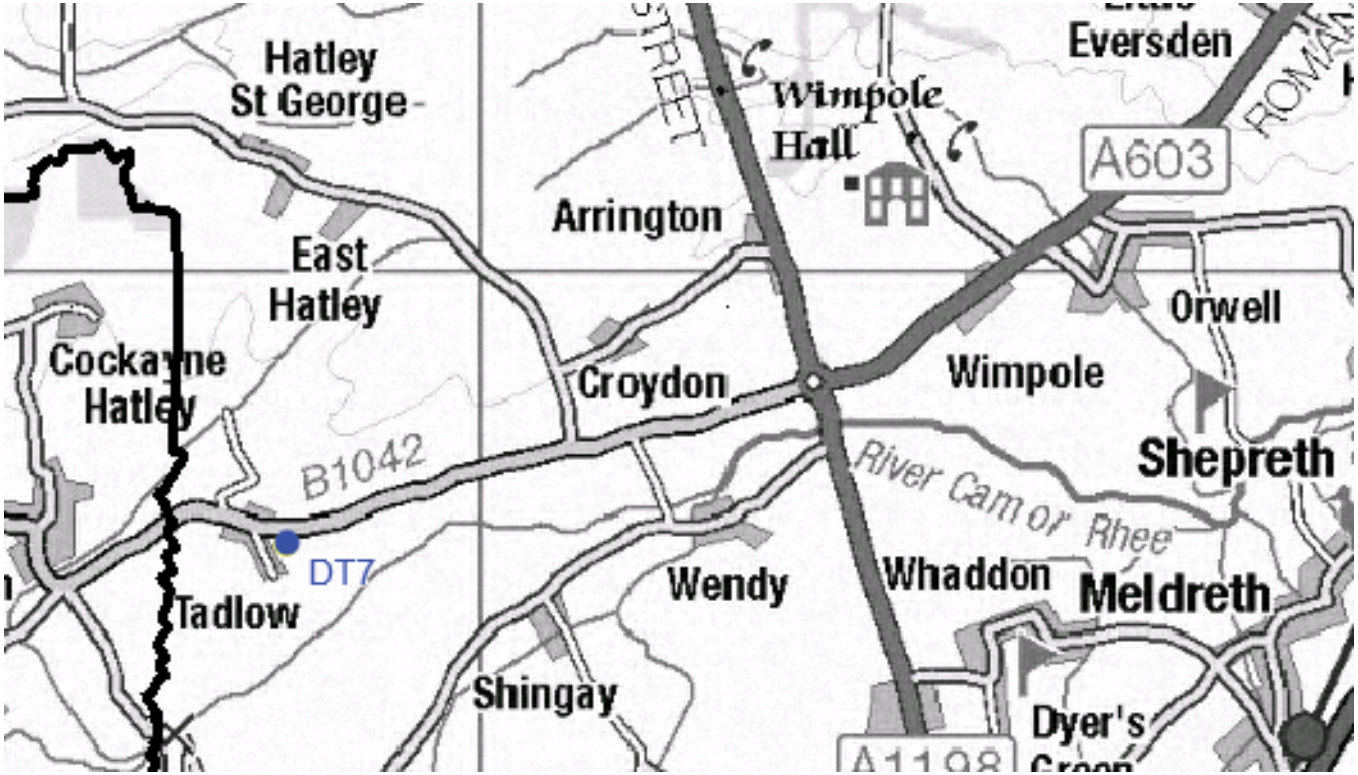
Diffusion Tube Locations – Waterbeach & A10

Diffusion Tube Locations – Milton

Diffusion Tube Locations – South of District



Diffusion Tube Locations – Tadlow



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[15]

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

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

Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO_2) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data[16] suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO_x), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)[17] has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO_2 annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which

[16] Prime Minister's Office, COVID-19 briefing on the 31st of May 2020

[17] Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

represents an absolute reduction of between 10 to 20µg/m^3 if expressed relative to annual mean averages. During this period, changes in $PM_{2.5}$ concentrations were less marked than those of NO_2. $PM_{2.5}$ concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that $PM_{2.5}$ concentrations during the initial lockdown period are of the order 2 to 5µg/m^3 lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

Impacts of COVID-19 on Air Quality within South Cambridgeshire

Ricardo Energy and Environment provided a report on the COVID-19 Lockdown Effects on Air Quality in South Cambridgeshire. As seen in Figures F.1 – F.3 (extracted from report), below, it shows a clear decrease in monthly NO_2 concentrations compared to both 2019 concentrations and modelled 'business as usual' 2020 concentrations which would have been expected. This is particularly noticeable during the first Lockdown in Spring–Summer 2020.

Figure F.1 – Annual average NO_2 concentrations for all continuous monitor sites comparing 2020, 2019 and 2020 measured concentrations and 2020 'Business As Usual' modelled concentrations.

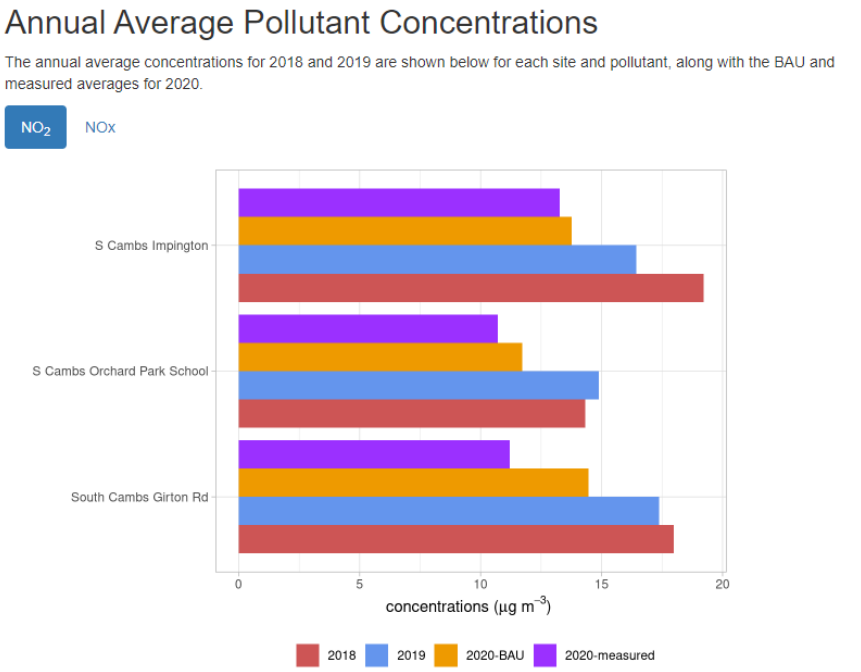
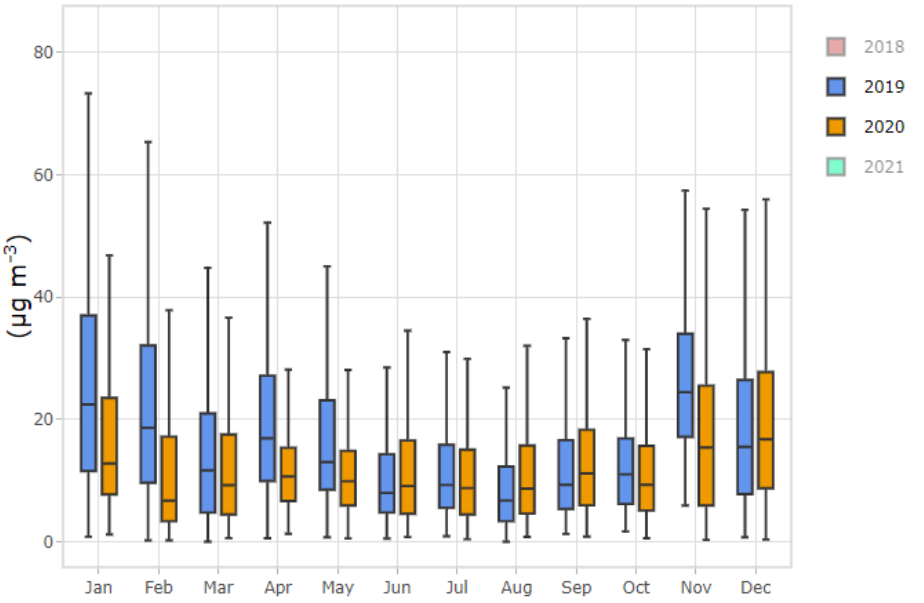


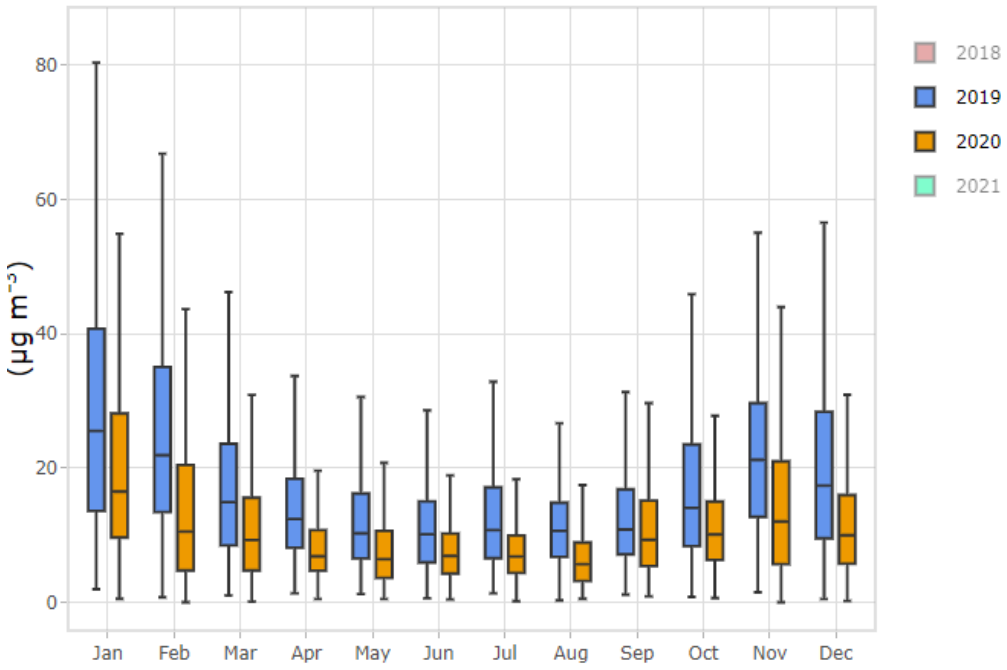
Figure F.1 shows that the annual average concentration was lower than both the 2019 measured concentrations and modelled 'business as usual' 2020 concentrations at all sites. This was particularly noticeable at the Girton Road Site, which is along a main road into Cambridge which is a common commuter route into the city. This site was therefore likely to be significantly impacted by the lockdowns and people working from home.

Figure F.2 – Measured monthly average NO_2 concentrations for 2019 and 2020

a) Impington



b) Girton Road



c) Orchard Park

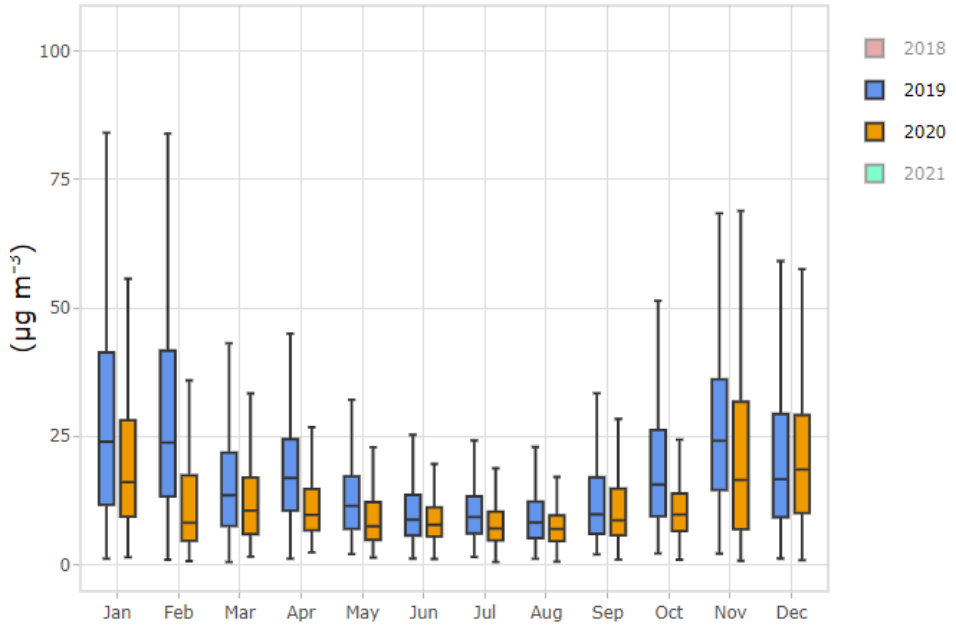
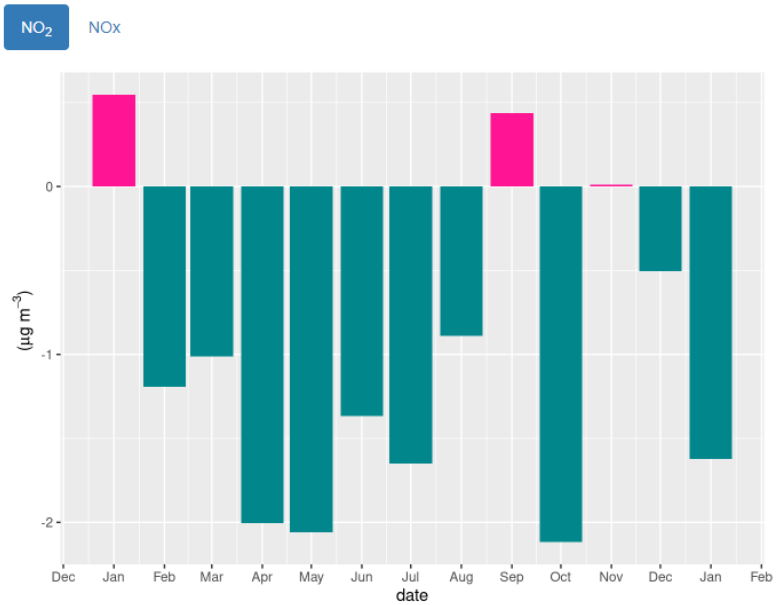


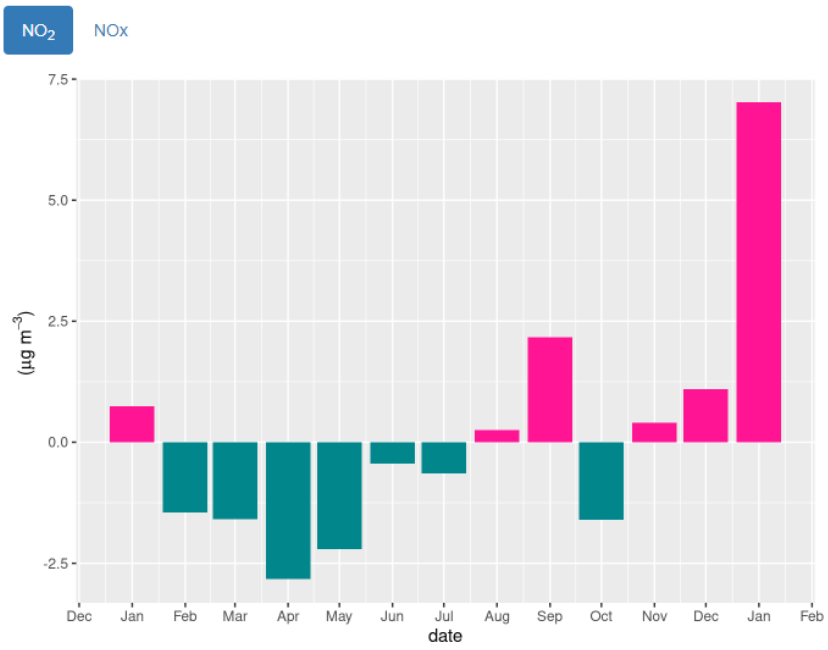
Figure F.2 shows that for almost all months at all sites the measured NO_2 concentrations were lower in 2020 than 2019. This can largely be attributed to the impacts of Covid-19, however the generally lower concentrations also seen in other months suggests that concentrations continue to fall generally.

Figure F.3 – Difference between measured monthly average and modelled 'business as usual' NO_2 concentrations for 2020 (pink bar represents measurements greater than modelled concentrations and green bars represent measurements lower than modelled concentrations)

a) Orchard Park



b) Impington



c) Girton

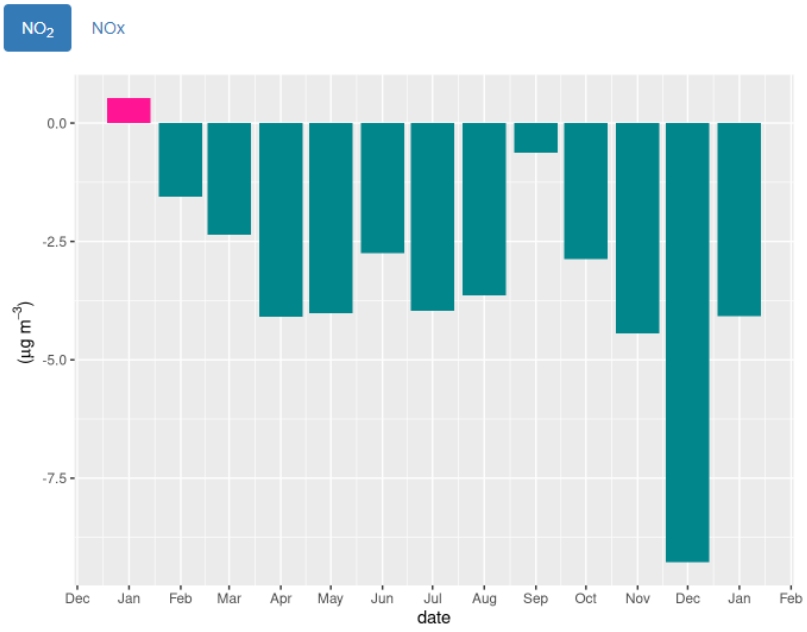


Figure F.3 shows that for all sites the measured concentration was lower than the modelled 2020 ‘business as usual’ concentration for the majority of months, especially during the lockdown period, as a result of Covid-19. Figure F.3a shows that the magnitude of change was lower at the Orchard Park site than the roadside sites, as would be expected at a background site which experiences less impact from road traffic. The sustained measured concentrations below the modelled business as usual concentrations (c) at the Girton Road site (along a common commuter route into Cambridge) could reflect

a sustained trend towards working from home, whereas the Impington site is by the A14 major road which could be more likely to have seen a return towards 'normal' traffic levels.

The full report can be viewed at: https://www.airqualityengland.co.uk/assets/reports/316/SouthCambridge_report_covid_analysis.html

Opportunities Presented by COVID-19 upon LAQM within South Cambridgeshire

No LAQM related opportunities have arisen as a consequence of COVID-19 within South Cambridgeshire.

Challenges and Constraints Imposed by COVID-19 upon LAQM within South Cambridgeshire

The main challenging impact of Covid-19 related to the changeover of diffusion tubes, particularly during the first lockdown. A combination of access issues, and staff availability due to shielding and resourcing focuses resulted in no diffusion tube changeovers or data for the period March – July 2020. This resulted in all sites having data capture below 75%, therefore all sites required annualisation for 2020. Data capture ranged from 36.5% to 58.3% making this a **Small–Medium Impact** as per the LAQM Impact Matrix provided within Table F 1.

In addition, there were impacts on actions, such as delays to the revocation of the AQMA and cabinet approval and publication of the new Air Quality Strategy, which had been anticipated to happen in 2020, due to a shift in focus to Covid-19. It is anticipated that these will be progressed during 2021. This is a **Small–Medium Impact.**

The impacts as presented above are aligned with the criteria as defined in Table F 1, with professional judgement considered as part of their application.

Table F 1 – Impact Matrix

Category	Impact Rating: None	Impact Rating: Small	Impact Rating: Medium	Impact Rating: High
Automatic Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Automatic Monitoring – QA/QC Regime	Adherence to requirements as defined in LAQM.TG16	Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes	Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved	Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved
Passive Monitoring – Data Capture (%)	More than 75% data capture	50 to 75% data capture	25 to 50% data capture	Less than 25% data capture
Passive Monitoring – Bias Adjustment Factor	Bias adjustment undertaken as normal	<25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)	25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)	>50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime
Passive Monitoring – Adherence to Changeover Dates	Defra diffusion tube exposure calendar adhered to	Tubes left out for two exposure periods	Tubes left out for three exposure periods	Tubes left out for more than three exposure periods
Passive Monitoring – Storage of Tubes	Tubes stored in accordance with laboratory guidance and analysed promptly.	Tubes stored for longer than normal but adhering to laboratory guidance	Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date	Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used
AQAP – Measure Implementation	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP
AQAP – New AQAP Development	Unaffected	Short delay (<6 months) in development of a new AQAP, but is on-going	Long delay (>6 months) in development of a new AQAP, but is on-going	No progression in development of a new AQAP

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	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 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

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG16. May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Cambridgeshire County Council - The Local transport Plan 3 (2011 – 2031)
- Air Quality Regulations 2000 and (Amendment) regulations 2002
- Air Quality Action Plan for the Cambridgeshire Growth Areas (2010)
- Deriving NO_2 from NO_x for Air Quality Assessments of Roads – Updated to 2006
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2000)
- The SCDC Detailed Assessment of Nitrogen Dioxide along the A14 Corridor (2006)
- The SCDC Detailed Assessment of PM_{10} along the A14 Corridor (2008)
- The SCDC Further Assessment of NO_2 and PM_{10} along the A14 Corridor (2008)

South Cambridgeshire District Council

Short term air quality in Harston

August 2021

Executive Summary

Air quality was monitored in Harston using new Zephyr monitoring technology in the period January – June 2021. Harston was selected as a pilot monitoring location due to local concerns about traffic and the nearby travel hub development, and monitoring was carried out outside Harston and Newton Community Primary School, as it is recognised that children are among the most vulnerable to the impacts of air pollution. It was found that concentrations of the main pollutants of concern, nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$), were comfortably below the national objectives for annual mean concentrations and there were no exceedances of the short-term objectives, representing good air quality. This is in line with long-term concentrations measured across the South Cambridgeshire district and reflects the rural nature of the area. South Cambridgeshire residents can help to improve local air quality through actions such as reducing idling of car engines and increasing walking and cycling where possible. This report can be read alongside the yearly Air Quality Annual Status Report (ASR) and future reports of other localised studies, which will be available on our website.

Glossary

Annualisation – a calculation process used to estimate an average concentration for a full year from a shorter period.

Annual mean – the average concentration across a full calendar year.

AQMA – Air Quality Management Area – an area where air pollutant concentrations exceed or are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives.

Continuous monitor/monitoring station – instruments which measure air pollution all the time and therefore can give a concentration attributed to a specific time.

Diffusion tube – Small plastic tube containing a metal mesh which is coated with a chemical that absorbs nitrogen dioxide. This is exposed to the air in a fixed location for a known amount of time, usually a month, and then sent to a lab for analysis. This provides an average concentration for the time it is exposed.

Nitrogen dioxide (NO_2) – a gas predominantly formed following the burning of fossil fuels, which can cause irritation of the airways and exacerbate symptoms of other conditions.

Particulate matter ($PM_{2.5}$ and PM_{10}) – the number refers to the size of the particulates in micrometres (one millionth of a metre) – a mix of solid particles and liquid droplets of various sizes and composition, the smallest of which can get into the blood and be transported around the body.

Real-time monitoring – see also continuous monitoring – monitoring which takes place at regular intervals all the time and therefore can give a concentration attributed to a specific time.

$\mu g/m^3$ – micrograms per cubic metre, the standard units of measurement of air pollutants including nitrogen dioxide and particulate matter.

Zephyr – a type of relatively compact and lightweight air pollution sensors that measure harmful gases and particle matter in real-time.

Update on pilot Zephyr monitor in Harston

Introduction

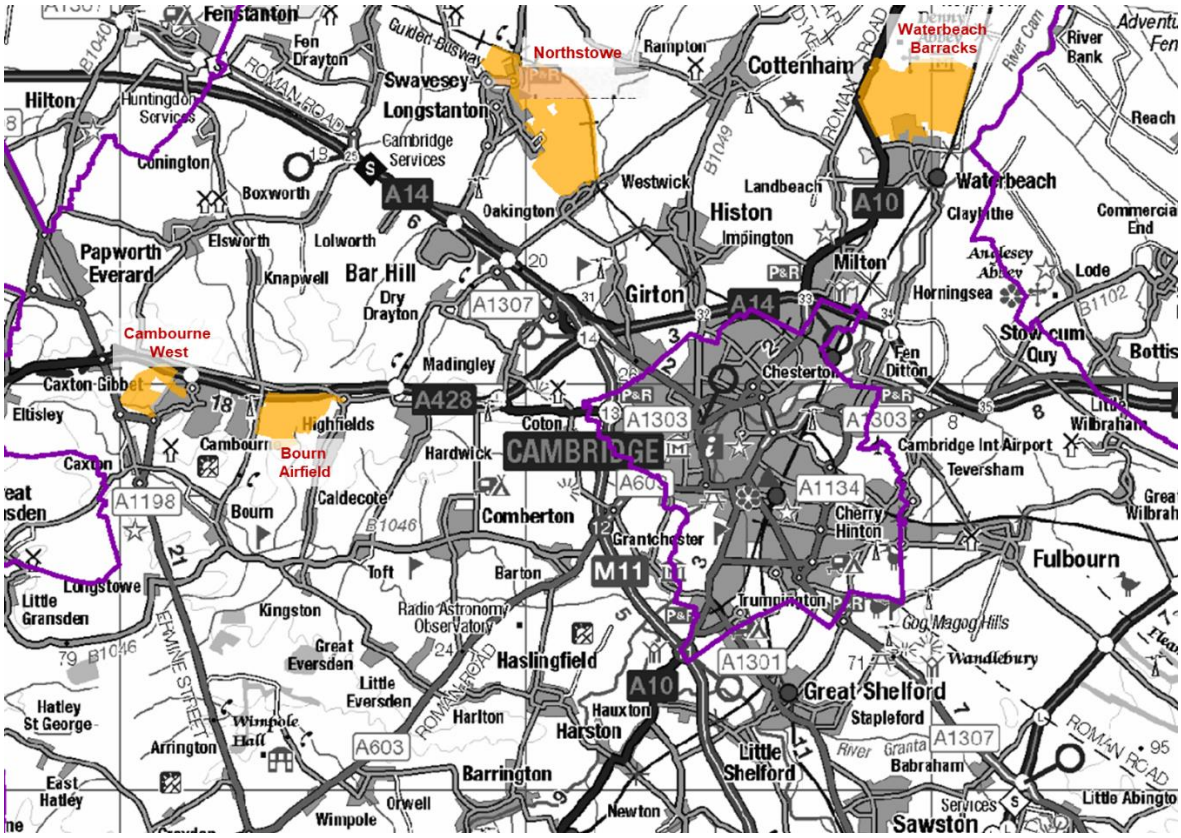
Purpose of this report

This is a report to provide an update on the short-term air quality monitoring pilot study in Harston using new Zephyr monitoring technology. Monitoring was carried out in the period January – June 2021. The study was designed to be a short-term study monitoring air quality outside Harston and Newton Community Primary School following concerns about traffic and the nearby travel hub development, whilst also acting as a pilot scheme to test new air quality monitoring equipment. It also serves to create additional local awareness of air quality in our area and enable people to make informed choices around how they can impact on improving air quality in their area.

Air Quality in South Cambridgeshire

South Cambridgeshire is a rural district which enjoys generally good air quality, with both short-term and long-term pollution levels below the national objectives at all monitored locations. This means we benefit from cleaner air to breathe and less pollution related health problems. The area is undergoing significant growth with major developments to keep up with the increase in demand for housing, including Northstowe (10,000 dwellings), Waterbeach Barracks (6000-10,000 dwellings), Bourn Airfield and Cambourne West, shown in Figure 1. Air quality impacts in the district are mainly related to these areas of growth and the major roads running through the district, including the A14 and M11/A11 corridors, and therefore this remains an important issue.

Figure 1 – Location of Major Development sites in South Cambridgeshire



Air quality is an important topic as air pollution can impact our health, particularly effecting the most vulnerable, including children and those with underlying conditions. Air quality is monitored across the district using a network of diffusion tubes and continuous monitoring stations, which provide accurate air quality measurements in real-time, in addition to the new Zephyr monitors to be used for short term monitoring. For more information and detail on the importance of air quality and air quality in South Cambridgeshire, please refer to Appendix 1 – Air Quality Frequently Asked Questions or visit our website. Additionally, ideas on how anyone can play a role in improving local air quality can be found in Appendix 2 – How to get Involved with Local Air Quality.

The 'Zephyr' Air Quality Sensor

Zephyr monitors are compact and lightweight air pollution sensors that measure harmful gases and particle matter in real-time, including the main pollutants of

concern (NO_2 and PM_{10} and $PM_{2.5}$ particulate matter). They can run off internal batteries or be powered by a solar panel and can therefore be fixed in a specific location, mostly commonly a lamp post, or used as a mobile monitor. The sensors provide detailed air quality measurements in real-time to help identify pollution hotspots at a localised level, for example busy junctions. Other potential studies include investigating air quality around school and looking into the impacts of wood burning stoves. Zephyr sensors can be used in isolation individually or deployed as a network of sensors across a wider area to build up a more detailed picture.[1]

The data from a Zephyr sensor cannot be treated with the same confidence as that from one of our continuous monitor stations, where the data is 'ratified' after checks, however it has been shown to provide accurate indicative measurements and is therefore appropriate for a wide range of studies, including this.

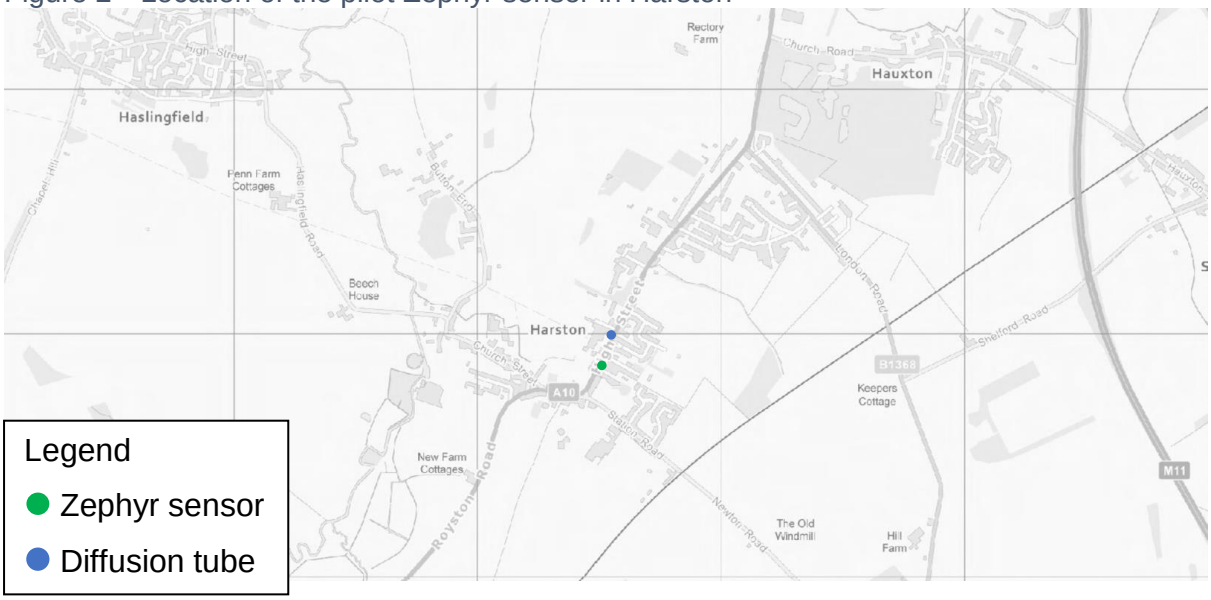
Monitoring Location

Harston was selected as a pilot location for the Zephyr sensor due to local ongoing development and infrastructure projects, such as the nearby travel hub site. The instrument is located near to Harston & Newton Community Primary School to additionally contribute to a council study looking into air quality around schools.

The monitor is located on the High Street of Harston, close to Harston and Newton Community Primary School and is measuring the main pollutants of concern, nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$), among others. The location of the Zephyr can be seen on Figure 2, below, as well as the location of the diffusion tube located in Harston (DT8N). One of the main reasons for selecting a primary school as the location is that children are amongst the most vulnerable to the effects of air pollution, which was reflected by the theme of Clean Air Day in 2021 of 'protect our children's health from air pollution'[2]. This is due to children's airways and respiratory systems being less developed than an adult's and because they breathe more rapidly than adults.

[1] https://www.earthsense.co.uk/zephyr
[2] https://www.cleanairday.org.uk/

Figure 2 - Location of the pilot Zephyr sensor in Harston



Monitoring Data and Comparison with Objectives

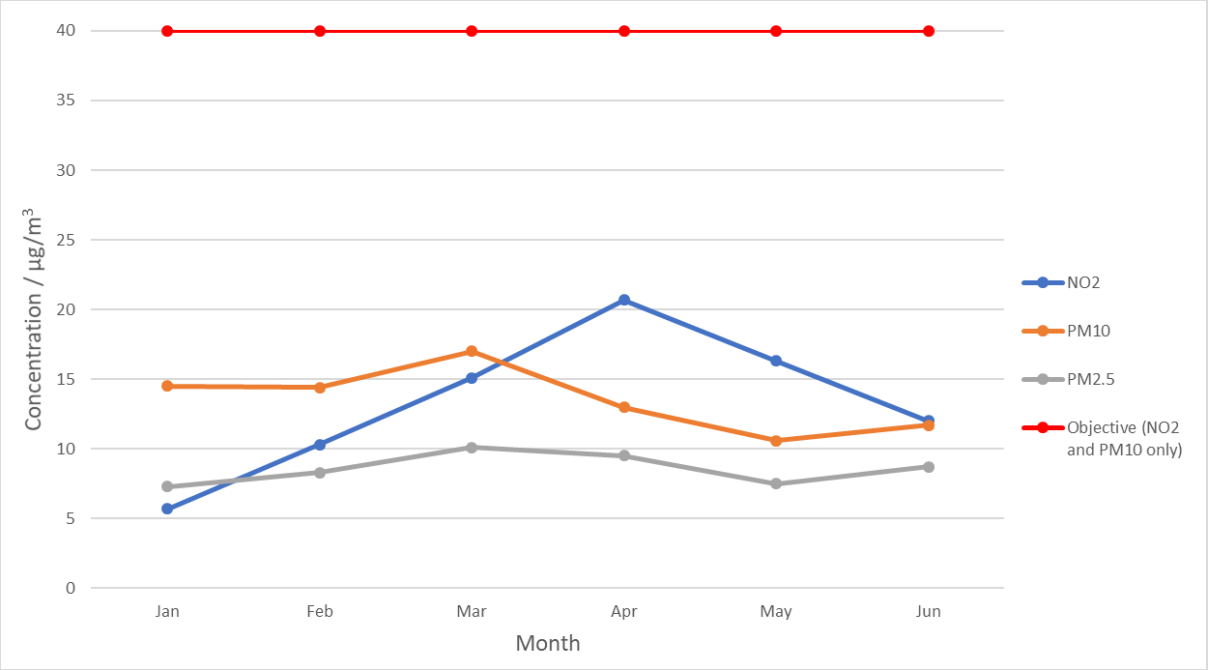
The average monthly concentrations measured in the period January to June 2021 are shown in Table 1, below, with the annual mean objective shown for information. This data is also represented in Figure 3. Data was also recorded for the month of December, however due to an issue with the instrument power for a significant period of this month there was an extended 'settling in' period, meaning large sections of the NO_2 data were invalid. This was confirmed as invalid by comparison to the particulate matter measurements, data from the diffusion tubes in Harston in December and the data from other continuous monitor locations in the district in the same time period. Consequently, it was decided not to include the December data in the report, as per the Defra guidance in Technical Guidance TG16[3], and extend the study until the end of June so a full 6 months of data would be recorded and available.

Table 1 – Zephyr Air Quality data – monthly average concentrations

Month	Pollutant monthly average concentration / µg/m^3		
	NO_2	PM_{10}	$PM_{2.5}$
January 2021	5.7	14.5	7.3
February 2021	10.3	14.4	8.3
March 2021	15.1	17.0	10.1
April 2021	20.7	13.0	9.5
May 2021	16.3	10.6	7.5
June 2021	12.0	11.7	8.7
Objective (annual mean)	40	40	N/A

[3] Defra Local Air Quality Management (LAQM) Technical Guidance TG(16), 2018, https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf

Figure 3 – Zephyr Air Quality data – monthly average concentrations and national annual mean objective



With the exception of NO_2 data around January, which was lower than seen elsewhere, the data and trends recorded by the Harston Zephyr are generally consistent with those seen at other monitoring locations across the district. This suggests that overall there can be confidence in the data collected, although there may be a longer 'settling in' period for the NO_2 sensor. Due to this it could be worth considering monitoring at the same location in the future.

In addition, the average concentrations of each pollutant for the whole six-month period January – June were calculated and then 'annualised' to give estimated annual mean concentrations to allow better comparison to the annual mean objectives. Annualisation is a calculation process used to estimate an average concentration for a full year from a shorter period, such as the 6 months in this study. This is done to avoid the annual average being influenced by short-term events or seasonal changes, such as one day of high pollution like bonfire night or pollution concentrations often being higher in the winter than the summer. The data was annualised using 2020 data from a range of continuous monitoring background site and is shown in Table 2, below. Full annualisation details are available in Appendix 3 – Annualisation of short-term data. The annual mean NO_2 concentration measured at

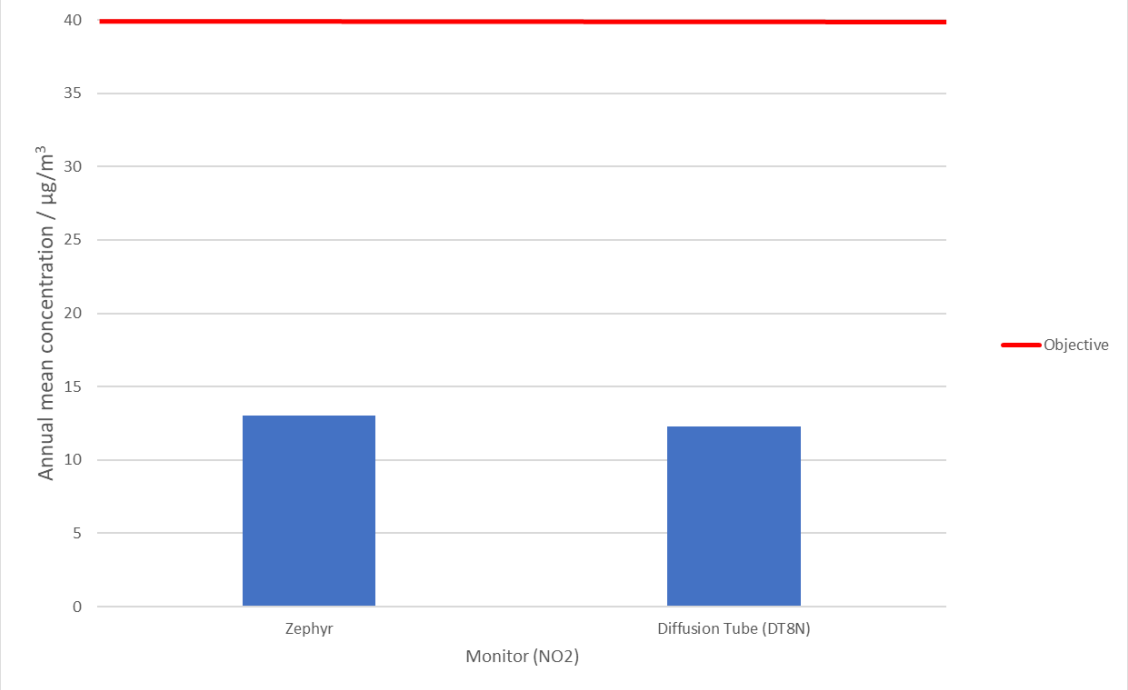
the diffusion tube (DT8N) located in Harston for 2020 was also included for comparison.

Table 2 – Zephyr Air Quality Data – annualised annual mean concentrations

	Pollutant monthly average concentration / µg/m^3		
	NO_2	PM_{10}	$PM_{2.5}$
Measured data average Jan-June	13.4	13.6	8.6
Annualisation factor	0.97	0.96	0.94
Annualised annual mean – Harston Zephyr	**13.0**	**13.0**	**8.1**
DT8N (2020)	12.3	N/A	N/A
Objective (annual mean)	40	40	N/A

As shown in Table 1 and Table 2, the long-term annual mean concentrations of the main pollutants of concern at the Harston Zephyr are significantly below the national objectives. For NO_2 this is supported by the data from the diffusion tube in 2020. The NO_2 data is shown in also displayed on Figure 4, below.

Figure 4 – NO_2 annual mean concentrations after annualisation and annual mean objective



The Zephyr also allows measurements of the short-term concentrations of pollutants, which are studied through 1-hour means for NO_2 and 24-hour means for PM_{10}. These are presented and compared to the national objectives in Table 3, below. The short-term objectives are presented as hourly/daily concentrations that should not be exceeded more than a certain number of times in a year. There is currently no short-term objective for $PM_{2.5}$.

Table 3 – Zephyr Air Quality data – short-term average concentrations

Month	Number of exceedances of short-term objective	
	NO_2 1-hour mean	PM_{10} 24-hour mean
January 2021	0	0
February 2021	0	0
March 2021	0	0
April 2021	0	0
May 2021	0	0
June 2021	0	0
Objective	200 µg/m^3*	50 µg/m^3**

*Not to be exceeded more than 18 times a year

**Not to be exceeded more than 35 times per year

As shown in Table 3, there were no exceedances of the short-term objectives for NO_2 or PM_{10}. The relevant maximum short-term concentrations of the pollutants were also recorded. For NO_2 the maximum 1-hour concentration measured during the six-month period was 76.6 µg/m^3, which occurred during the evening rush hour on a weekday in March; this is well under the 200 µg/m^3 threshold. For PM_{10}, the maximum 24-hour concentration recorded was 49.1 µg/m^3, below the 50 µg/m^3 objective which should not be exceeded more than 35 times. This was the only 24-

hour average above 45 µg/m^3, with only one additional 24-hour period above 40 µg/m^3, which occurred the day before.

Summary

The data measured by the Zephyr real-time monitor in the period January – June 2021 shows that the air quality in Harston remains good, with estimated annual mean concentrations (as well as the measured monthly averages) of all the main pollutants of concern well below the national objectives, and no exceedances of the short-term national objectives. In general, the data from the Zephyr was consistent with that from the rest of the monitoring sites in the district during the monitoring period, which provides confidence in the instrument and data collected. This also matches the general patterns seen across the South Cambridgeshire district of good air quality. However, due to the importance of air quality and its links to health, it remains important to both monitor air quality across the district and take actions to improve air quality in our area. Ideas on how to play a role in improving local air quality can be found in Appendix 2 – How to get Involved with Local Air Quality.

Appendix 1 – Air Quality Frequently Asked Questions

Why is air quality important?

There are a number of reasons air quality is important. In particular, polluted air is the biggest environmental threat to health in the UK. It is linked to up to 36,000 deaths per year from long-term exposure[4]. The main impacts of poor air quality are contributing to heart and lung conditions, but air quality has also been linked to a wide range of issues[5]. Air pollution also particularly effects the most vulnerable, including children and older people and those with existing lung and heart conditions. Air quality also strongly links to climate change, as many of the causes of the issues are the same, such as the burning of fossil fuels. This means that actions taken to improve air quality also helps prevent climate change.

How does the Council monitor air quality?

South Cambridgeshire District Council operates a monitoring network of over 30 locations across the district, made up of diffusion tubes and three continuous monitoring sites, which measure air quality accurately in real-time. This existing monitoring network allows the long-term monitoring of trends and changes in air quality across the district. Live data from the three continuous monitoring stations are available at https://scambs-airquality.ricardo-aea.com/. In addition, the Council has purchased three Zephyr air quality sensors which provide real-time measurements for the main pollutants of concern from a single monitor. These can be used for shorter-term monitoring to identify hotspots of pollution or be used in a range of targeted studies to complement our existing monitoring network. The first of these instruments was installed in Harston, with subsequent monitors installed in Cambourne and Northstowe.

[4] Defra. Air quality appraisal: damage cost guidance, July 2020
[5] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

What else does the Council do around air quality?

As well as monitoring air quality, the Council acts to improve air quality through its Green to the Core focus, including an air quality strategy designed to go beyond simply meeting the national objectives, Zero Carbon Community Grants to fund community initiatives to improve sustainability, such as encouraging and enabling cycling which in turn helps air quality, and by considering air quality during the planning process[6,7]. Ideas on how anyone can play a role in improving local air quality can be found in Appendix 2 – How to get Involved with Local Air Quality.

What are the main pollutants of concern?

The main pollutants of concern are:

- Nitrogen Dioxide (NO_2) – a gas predominantly formed following the burning of fossil fuels, which can cause irritation of the airways and exacerbate symptoms of other conditions
- Particulate Matter (PM_{10} and $PM_{2.5}$), where the number refers to the size of the particulates in micrometres – a mix of solid particles and liquid droplets of various sizes and composition, the smallest of which can get into the blood and be transported around the body[8]

What are the air quality objectives?

For these pollutants national objective levels have been set which must be achieved by local authorities, otherwise an Air Quality Management Area (AQMA) must be declared for the objective which is being exceeded. Objectives have been set for both long-term concentrations (measured as annual means) and short-term concentrations (hourly means for NO_2 and daily means for PM_{10}). South Cambridgeshire District Council currently has one AQMA, along the A14 between Bar Hill and Milton, which was declared in 2008 for NO_2 annual mean and PM_{10} 24-hour mean. It is proposed to revoke this AQMA in 2021 due to sustained compliance

[6] Being green to our core https://www.scambs.gov.uk/your-council-and-democracy/performance-and-plans/our-business-plan/
[7] Zero Carbon Communities Grant https://www.scambs.gov.uk/community-development/grants/zero-carbon-communities-grant/.
[8] Defra, Clean Air Strategy, 2019

with the relevant objectives in line with Defra guidance and the Council's constitution. The Air Quality Objectives for England are set out in Table 4. In addition, local authorities are expected to work towards reducing emissions and concentrations of $PM_{2.5}$ (particulate matter with a diameter of 2.5 µm or less), although there is currently no legal objective.

Table 4 – Air Quality Objectives in England

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

If air pollution is a result of vehicles utilising the A14, how can local residents change this?

There are a number of way local residents can have an impact on air quality through everyday actions, such as those mentioned in **Error! Not a valid bookmark self-reference.**. Many of these are very small changes that can add up to a big impact.

Appendix 2 – How to get Involved with Local Air Quality

Annual reports and details on air quality monitoring are available on our website, https://www.scambs.gov.uk/environment/pollution/air-pollution/local-air-quality-management/, and you can share your views via our email address, air.quality@scambs.gov.uk.

Although air quality in the South Cambridgeshire District is generally good, with concentrations below the objectives, there are actions we can all take to improve it further. Ways you can help to improve air quality in South Cambs include:

- Minimise car use wherever possible:
    - Avoid using your car for short trips (under 2 miles) - short trips are very polluting as modern engines needs to reach a very high temperature to work efficiently; on short trips it won't reach that temperature.
    - For short journeys try cycling or walking more often – this helps you stay healthy and saves you money in fuels costs.
    - For longer journeys consider public transport options.
    - Use journey-planning apps such as MyBusTrip or MotionMap for travel by bus, train, walking and cycling.
- Switch it off – don't leave your car engine idling if you are stationary e.g. waiting to pick someone up, in a traffic jam or waiting at level crossings.
- When driving, use techniques that help you use less fuel, like driving more slowly and smoothly.
    - You could use 10% less fuel by following the tips on the AA website http://www.theaa.com/motoring_advice/fuels-and-environment/drive-smart.html.
    - Like switching your engine off when stationary, this will not only reduce your emissions of air pollution but will save fuel and therefore money too!
- Consider making your next vehicle an electric vehicle.
- Join a car club or car-share regularly.
- Consider working at home where possible – the first Covid-19 lockdown showed widespread improvements in the air quality as the amount people travelled reduced.

- Use less energy at home – consider a smart meter to monitor usage and be aware of boiler standards.
- Opt for ‘green energy’ tariffs where available or switch to renewable sources of heating or power.
- Reduce the use of solid fuel stoves and open fires – domestic burning is now the single biggest source of particulate matter pollution in the UK (greater than traffic and industry).
    - If you are burning wood or coal ensure any fuel used meets the new standards of moisture content and emissions – more information is available at https://woodsure.co.uk/are-you-ready-to-burn/
- Make your children aware of the impact that day to day activities have on air quality.

Appendix 3 – Annualisation of short-term data

Annualisation is a calculation process used to estimate an average concentration for a full year from a shorter period, such as the 6 months in this study. Annualisation ratios are worked out as a ratio of the average concentration in a full year (annual mean (Am)) to the average in the actual monitoring period measured (period mean (Pm)), using data from background continuous sites. The average concentration from the Zephyr data during the monitoring period is then multiplied by that ratio to give an estimate of the average concentration at the Zephyr for a full year.

The data from the period January to June 2021 was annualised according to the process set out in box 7.9 of Defra's Local Air Quality Management Technical Guidance (TG16). Continuous monitoring background sites were used for the annualisation calculations. Full year data for 2021 is not yet available therefore 2020 data was used for the annual mean concentrations.

NO_2:

Background Site	Annual mean (Am)	Period mean (Pm)	Ratio (Am/Pm)
Orchard Park	10.6	11.4	0.93
Wicken Fen	6.7	6.2	1.08
Northampton Spring Park	9.3	10.6	0.88
Norwich Lakenfields	9.8	9.9	0.99
Average ratio	-	-	0.97

PM_{10}:

Background Site	Annual mean (Am)	Period mean (Pm)	Ratio (Am/Pm)
Orchard Park	12.2	12.3	0.99
Norwich Lakenfields	12.8	13.9	0.92
Average ratio	-	-	0.96

$PM_{2.5}$:

Background Site	Annual mean (Am)	Period mean (Pm)	Ratio (Am/Pm)
Orchard Park	12.5	12.8	0.98
Northampton Spring Park	10.3	11.0	0.94
Norwich Lakenfields	8.3	9.2	0.90
Average ratio	-	-	0.94

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South Cambridgeshire District Council

REPORT TO:	Climate & Environment Advisory Committee	13 September 2021
LEAD CABINET MEMBER:	Lead Cabinet Member for Climate Change	
LEAD OFFICER:	Interim Head of Shared Waste Services and Environment	

Solar Together Cambridgeshire Update

1. This report provides the committee with details of progress in delivering Solar Together Cambridgeshire - the solar pv group-buying scheme led by Cambridgeshire County Council in partnership with Cambridgeshire councils.

2. It is provided to the committee for review and comment.

Details

3. The Council are participating in delivery of a group buying scheme for solar pv panels and battery storage systems, which launched last autumn and is led by Cambridgeshire County Council, in partnership with Dutch group-buying company, iChoosr. Details of the operation of the scheme and the background to its establishment in Cambridgeshire were provided in the report to CEAC on 20 June 2020.

4. The scheme contributes towards the delivery of the Council's Zero Carbon Strategy by increasing local generation of electricity through solar pv and reducing reliance on grid electricity. It also provides significant benefit to residents by providing an easy, good-value route to high quality solar pv installations.

5. The Council's role in the scheme has been to promote it including via a direct mailing to targeted households and social media by Members working with the Communications team.

6. Households interested in purchasing solar pv and/or battery installations through the scheme were invited to register online. They were then provided with an offer with an indicative price for their installation, to be confirmed at survey.

7. The scheme attracted a high level of interest in South Cambridgeshire, which translated into 605 acceptances of the provisional offers. As expected, a proportion of households withdrew following the survey for a variety of reasons including unexpected issues or costs. As of 31 August, 105 households in South Cambridgeshire had withdrawn, leaving 500 households expected to continue to completion.

8. Delivery of the scheme has been affected by challenges to supply chains and workforces caused by Covid-19 and Brexit which have caused the expected completion date to be put back to the end of October. (Completion was originally intended by 31 May). Other than this delivery is proceeding well with high levels of reported customer satisfaction and very few complaints. Further details can be found on the August report from iChoosr at Appendix 1.

9. The table at Appendix 2 gives details of progress in Cambridgeshire as reported by the installer company and provided by iChoosr at 31 August 2021. Due to reporting delays the figures in the table may lag behind the situation on the ground.

10. The scheme was entered into by the Council on the expectation that it would be cost-neutral, with a minimum of 133 installations expected and a small commission on each installation covering the cost of promotion. With installations now expected to total around 500, income from the scheme will exceed costs.

Plans for a second scheme

11. Cambridgeshire County Council have indicated that they are intending to proceed with a second scheme to be launched later this year. We have accepted their offer to participate as before.

Background Papers

Report to CEAC 20 June 2020

https://scambs.moderngov.co.uk/documents/s117025/200630%20CEAC%20Solar%20Together%20Cambridgeshire.pdf

Appendices

1 Solar Together Cambridgeshire Progress Report August 2021

2 Solar Together Cambridgeshire Progress Report with district breakdown

Report Author:

Siobhan Mellon – Development Officer, Climate and Environment
Telephone: (01954) 713395

SOLAR TOGETHER CAMBRIDGESHIRE 2020

Solar Together Cambridgeshire Progress Report August 21

As we approach the 600th installation, we are pleased to share with you the latest progress report on Solar Together Cambridgeshire 2020, which covers:

- Market context
- Installation phase progress & forecast
- Post-Acceptance drop-out (cancellations)
- Customer queries & complaints
- Customer Satisfaction

Market Context:

As restrictions in the UK have relaxed there has been an increase in the number of people receiving notifications to self-isolate. This surge in isolation requirements has had an impact on the entire UK workforce and therefore of course, on the delivery of Solar Together activities including scaffolding and installation teams.

The Greenscape Energy office was temporarily shut down in July with all office-based team members working from home, although they have now returned at limited capacity.

UK-wide issues in the supply chain persist into August. A combination of Brexit, the international impact of Covid and the issues in the Suez Canal earlier in the year have resulted in an unprecedented delay in international shipping, with current port-to-port time for the delivery of materials more than double the norm.

The installer has strong relationships with its supply chain partners and is working closely with them to mitigate the effects of these market conditions, but delays to deliveries are resulting in reduced stock of key components.

The combination of isolation requirements and reduced stock has resulted in a slowdown of bookings for the end of July and August.

Installation Phase Progress & Forecast:

All surveys for Solar Together Cambridgeshire are complete.

566 installations have been completed in Cambridgeshire with a further 52 installations booked for the coming weeks. As outlined above, the bookings for August have been reduced compared to expectations.

Please see below for a breakdown by district:

	Install Booked	Install Complete	Still To Book Install
Cambridge City	7	92	105
East Cambridgeshire	3	104	44
Fenland	0	33	13
Huntingdonshire	10	82	110
Peterborough		1	
South Cambridgeshire	32	254	267
Total	52	566	538

538 customers have been surveyed but not yet booked for install. The Greenscape team is working to book these customers for appointments over the end of this month and into September.

Greenscape is also keeping in regular contact with these customers to keep them up to date of progress and where they are in the process.

The installations delivered for Solar Together Cambridgeshire so far total over 2 MW, and over 450 tonnes of year 1 carbon reduction.

The scheme is on track to deliver over 900 installations and more than 4MW of installed solar capacity in Cambridgeshire.

Post-Acceptance Drop-Out:

Drop-out is still below our benchmark.

279 customers have been cancelled after acceptance, giving a current drop-out rate of 19% compared to an expectation of 25%.

Customer Queries & Complaints:

We continue to monitor customer satisfaction with the scheme as well as any complaints or technical queries that come into our help desk.

To date we have seen just 10 complaints come into our help desk relating to Solar Together Cambridgeshire.

As well as our own helpdesk, the installer also has a customer service team dealing with customer queries relating to the scheme.

Greenscape's team handles approximately 20-25 calls per week across all their iChoosr projects (Cambridgeshire, Suffolk & Norfolk).

Approximately 85% of the calls are focussed on technical support and are generally resolved through remote and phone support. Approximately 20% of calls result in an on-site visit when the issues cannot be fixed over the phone.

The remaining 15% of calls are more general in nature and will be around issues such as scaffolding, or in some rare occasions damage to property such as broken tiles.

Greenscape's internal SLA is that all customers who call in with any issue or complaint are responded to on the same day they make contact, they aim to resolve any non-urgent issues within 1 week, in the event that a serious issue was escalated, a management site visit would take pace.

Customer Satisfaction:

We monitor customer satisfaction through a post-installation survey.

Overall satisfaction with the winning installer is currently high, with an average score of 8/10.

Satisfaction with Covid-safe working protocol is also high with an average score of 4.4/5.

We ask customers how likely they are to recommend the installer to their friends or family in order to calculate a Net Promoter Score (NPS).

The NPS for Greenscape in Cambridgeshire is an extremely positive 32 meaning they have a high number of promoters.

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Cambridgeshire Solar Together

Progress with scheme delivery at 31 August 2021, as reported by iChoosr

	# Accepted	# Installations	% Installed	# Post-survey drop-out	# Panels installed	Total KW installed	Installed Co2 reduction Kg	Total investment	# Battery installed	Total kWh installed battery
South Cambridgeshire District Council	605	231	38%	105	3,123	1,062	209,516	1,697,750	174	1,042
Cambridge City Council	271	92	34%	83	1,073	365	76,354	625,141	67	386
Huntingdonshire District Council	225	64	28%	40	937	319	60,612	497,654	50	323
East Cambridgeshire District Council	181	88	49%	41	1,151	391	82,850	643,999	66	405
Fenland District Council	50	31	62%	9	477	162	27,599	213,926	18	112
Cambridgeshire County Council	3	1	33%	2	15	5	903	8,531	1	7
Grand Total	1,335	507	38%	280	6,776	2,304	457,834	3,687,000	376	2,275

Note: most households registered through their respective district. The three which registered directly with Cambridgeshire County Council are reported accordingly.

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