Annual Progress Report (APR)

2021 Air Quality Annual Progress Report (APR) for Glasgow City Council

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

September 2021

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Executive Summary: Air Quality in Our Area

Air Quality in Glasgow

During 2020, Glasgow City Council measured concentrations of Nitrogen Dioxide (NO_2) below the Annual Mean Objective at all automatic monitoring stations within the city, including those within the City Centre Air Quality Management Area (AQMA). The annual mean objective had previously been exceeded at the Glasgow Kerbside (Hope St) monitoring station and at several locations, measured by diffusion tube, also within the City Centre AQMA. In 2020, only one diffusion tube (Hope St 1) recorded NO_2 levels marginally above the objective.

The NO_2 Hourly Mean Objective was not exceeded at any of the automatic monitoring stations in 2020. This was consistent with measurements from previous years.

Neither the Annual Mean Objective for PM_{10} nor the Daily Mean Objective for PM_{10} were exceeded at any monitoring location during 2020. All monitoring locations showed a decrease in annual mean concentrations over 2019 and no instances of days where the daily mean was above 50µg/m^3.

For Scottish Local Authorities particulates at $PM_{2.5}$ have now been prescribed in regulations with an Annual Mean Objective of 10µg/m^3 by 2020. This objective was not exceeded at any monitoring location during 2020. All monitoring locations showed a decrease in annual mean concentrations over 2019.

Significant reductions in air pollution levels were recorded at all monitoring locations in Glasgow during 2020 due to the traffic reduction arising from the Covid 19 lockdown periods. The impact of these lockdowns on air pollution is examined within this report.

Previous Air Quality Annual Progress Reports confirmed compliance with relevant Annual Mean Objectives for both Parkhead Cross and Byres Road / Dumbarton Road AQMA's. Proposals to revoke the AQMA's in place in respect of the Annual Mean Objective for NO_2 at Parkhead Cross and the Annual Mean Objective for PM_{10} at Byres Road / Dumbarton Road were approved by the Environment, Sustainability and Carbon Reduction City Policy Committee of Glasgow City Council. The amendment and revocation were formally approved by Order on 1st October 2020.

Actions to Improve Air Quality

Action Plans

In response to the implementation of the AQMA's in the city, Glasgow City Council produced Air Quality Action Plans in 2004 and 2009 introducing a range of measures aimed at reducing pollution in the city. The Action Plan is an evolving project with several measures such as vehicle idling enforcement, vehicle emission testing and initiatives towards cleaner vehicles ongoing. Other measures such as a Council workplace travel plan and city car club continue to evolve.

A new Action Plan has been prepared and is in draft form with consultation and formal adoption expected in 2022.

Low Emission Zone

The Scottish Programme for Government announced in 2017 that there would be Low Emission Zones (LEZ's) in 4 cities in Scotland. Glasgow City Council introduced Scotland's first LEZ in an area broadly equivalent to the city centre AQMA at the end of 2018.

The LEZ is being introduced in two phases, with the first phase targeting improvements in emissions arising from scheduled bus journeys going through the city centre. From December 2018 the LEZ required that 20% of bus journeys through the city centre meet the Euro VI emission standard. This target is to be increased by 20% each year, until 100% of buses are compliant by December 2022. Currently more than 60% of bus journeys through the city centre meet this emission standard due to the LEZ. The second phase of the LEZ will apply to all vehicle types and enforcement is expected to begin from the 1st June 2023.

Public and stakeholder consultation on possible LEZ options took place in February and March of 2020. The results of this were used, along with extensive option modelling, to identify the preferred LEZ scheme.

Link to Glasgow's LEZ.

https://www.glasgow.gov.uk/LEZ

Glasgow's Climate Plan

In 2019, Glasgow City Council set up a Climate Emergency Working Group, subsequently declaring a Climate Emergency in the city. In response to this, a Climate Plan has been prepared detailing a list of actions which the Council, its partners and stakeholders will take to ensure a just transition to a low carbon and resilient city. Many of the actions to move to a low carbon city have co-benefits for air quality pollutants.

Link to Glasgow's Climate Plan

https://www.glasgow.gov.uk/CHttpHandler.ashx?id=50623&p=0

City Centre Strategy / Avenues Project

The Council continues to promote and facilitate improvements in sustainable transport through investment in cycling infrastructure, such as the Avenues and City Ways projects, and easier public access to air quality information has been introduced.

Included in the Glasgow City Region City Deal funding, Glasgow City Council is investing approximately £115 million within the city centre to deliver on the Enabling Infrastructure - Integrated Public Realm (EIIPR) programme. More commonly known as the Avenues programme, this will see streetscape improvements made to the public realm, supporting a key strategic objective of the City Centre Strategy and Action Plan 2014-19: the establishment of principal Avenues throughout the city centre to form an integrated network of continuous pedestrian and cycle priority routes.

Glasgow City Council has also secured an additional £21 million from Sustrans that will enable the delivery of an additional four Avenue projects. These projects will allow the Council to deliver on a key recommendation made as part of the recent Connectivity Commission: The acceleration and expansion of the Avenues programme into other areas of the city.

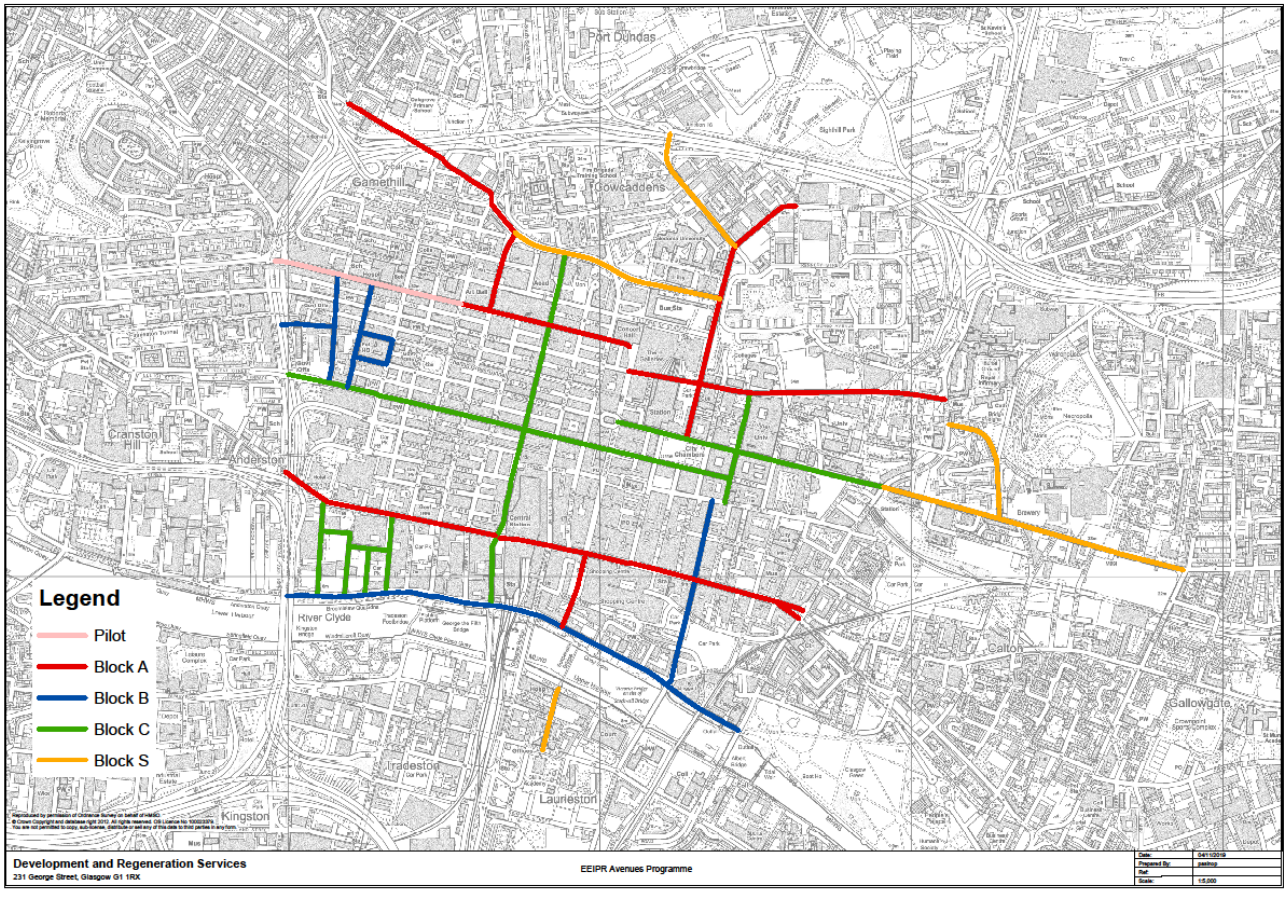
Link to City Centre Strategy and Action Plan 2014-19.

https://www.glasgow.gov.uk/article/18277/City-Centre-Centre-Strategy

Link to Avenues programme.

https://www.glasgow.gov.uk/avenues

Sauchiehall St on completion of Sauchiehall St West



EIIPR Avenues Programme

Clean Air Day

Glasgow City Council continues to support Clean Air Day, organised by Environmental Protection Scotland on behalf of the Scottish Government. Clean Air Day was significantly disrupted in 2020 due to Covid 19 and the lockdowns. Postponed from the traditional date in June to the 8th October 2020, CAD 2020 was a mostly online day of action. Previous years had seen George Square in the city taken over with a variety of activities and displays to promote air quality, but this was not possible this year. Instead, the online activities focussed on promoting personal actions to improve air quality through personal transport choices.

Glasgow Transport Strategy

Glasgow City Council is working on a new Glasgow Transport Strategy for the City in 2020/21. As part of this work there will be a set of new transport plans for the City - an overarching Glasgow Transport Strategy, a City Centre Transformation Plan, Liveable Neighbourhoods Plan and an Active Travel Strategy. This will update and replace the existing Local Transport Strategy for the City. The new transport strategy will be city-wide, and provide a framework for investment and decision-making on transport issues over the next 10 years.

A Public Conversation on Glasgow's Transport Future was held for 6 weeks in September-October 2020. The results from this major public engagement can be found on our Connecting Communities webpage. This work is informing the ongoing development of the new Glasgow Transport Strategy.

Link to Glasgow Transport Strategy

https://www.glasgow.gov.uk/transportstrategy

Link to Glasgow City Centre Transformation Plan

https://www.glasgow.gov.uk/index.aspx?articleid=27557

Link to Liveable Neighbourhoods Plan

https://www.glasgow.gov.uk/index.aspx?articleid=27062

Spaces for People

Introduced at the start of COVID-19 to suppress the spread of the virus and help manage demand on public transport, Glasgow's Spaces for People programme has delivered a significant number of temporary travel interventions across the city to ease physical distancing in public places, mainly through the provision of widened footways, road closures and segregated cycle lanes.

The majority of Spaces for People schemes will now be made permanent following consideration of an independent review which highlighted that the infrastructure can offer long-term active travel and sustainability benefits.

Link to Spaces for People

https://glasgow.gov.uk/spacesforpeople

Glasgow Bus Partnership

Glasgow Bus Partnership (GBP) brings together as a voluntary partnership the eight Glasgow City Region local authorities, Strathclyde Partnership for Transport, bus operators (through their new alliance, GlasGo) and bus passenger representative groups to address current challenges to bus travel and to improve the passenger experience for communities across the Region.

The vision of the Glasgow Bus Partnership is of a City Region where bus services form part of a network of connectivity, enhancing the opportunities and wellbeing of those who live or visit here - providing safe, affordable, enjoyable connections and reducing road congestion, noise and air pollution.

Aims of the GBP include:

- Improving bus priority mechanisms and reducing congestion to improve bus journey times and reliability
- Ensuring buses are given higher priority in any future city planning
- Improving the accuracy of real time passenger information and exploring options to introduce an integrated ticketing system

The GBP also supports the delivery of Glasgow's Low Emission Zone and brings together key partners to develop bus priority funding bids to Transport Scotland's Bus Partnership Fund.

The work of the GBP seeks to positively impact upon the affordability and accessibility of the bus network and assist with creating the conditions that will increase bus patronage. A faster, cheaper, and better-connected bus network will benefit all bus passengers across the City Region as well as the environment.

Link to Glasgow Bus Partnership

https://www.glasgow.gov.uk/glasgowbuspartnership

Local Priorities and Challenges

Glasgow's Low Emission Zone (LEZ) is an intervention directed at protecting and improving public health. While the concept was introduced in the 2009 Action Plan it is also now part of a broader approach to enhancing the amenity and attractiveness of the city centre through cleaner air.

The LEZ is intended to accelerate the pace of improvement in Glasgow's air quality and in particular to ensure that air pollution levels are reduced in the city centre. The principal source of air pollution in the city is from road traffic and detailed analysis of air pollution in the city centre has been undertaken to determine source apportionment. This identified that, on the streets with the highest level of pollution, buses (60-75%) and other diesel engine vehicles are the main source of pollution.

The LEZ is being introduced in two phases. The first phase looks to improve emissions from bus journeys going through the city centre. Such action should not only improve air quality in the city centre itself, but also have the positive effect of improving emissions in those other parts of the city on through routes.

From December 2018 the LEZ required that 20% of bus journeys through the city centre met the Euro VI emission standard. This target is to be increased by 20% each year until 100% of bus journeys are compliant. Currently a minimum of 60% of journeys through the city centre are required to be made by vehicles which meet the standard.

The second phase of the LEZ will apply to all vehicle types and is proposed to come into effect on 31st May 2022.This will begin a statutory one year grace period and enforcement will begin on 1st June 2023 (1st June 2024 for vehicles registered to residential properties within the LEZ). This will require a minimum emissions standard from vehicles of Euro 6/VI for diesel engines and Euro 4/IV for petrol engines. In these respects, Glasgow's LEZ will be one of the most ambitious in the UK with emission standards equivalent to those required by London's Ultra Low Emission Zone.

Indicative signage to raise awareness of the LEZ introduction has been installed at key city centre locations and on the main approach routes into the city centre.

Other priorities include:

- Develop and implement Glasgow's Climate Plan with a focus on those actions with local air quality co-benefits.
- Continuing to progress actions within the Air Quality Action Plans as well as to consult on and implement the new AQAP.
- Improve upon and make permanent the majority of the Spaces for People program measures.
- Continue to develop the Glasgow Transport Strategy and its related parts, the City Centre Transformation Plan, the Liveable Neighbourhoods Plan and the Active Travel Strategy.

How to Get Involved

Information relating to the LEZ, Local Air Quality Management (LAQM) and AQMA's in Glasgow is available via the Glasgow City Council website. This information includes Air Quality Action Plans, Progress Reports and Detailed Assessments.

https://www.glasgow.gov.uk/index.aspx?articleid=18863

The website also contains links to the national Air Quality in Scotland webpage where the public can access both real time and historical monitoring data in addition to registering to receive text/email alerts where poor air quality is forecast.

http://www.scottishairquality.co.uk/

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1 Local Air Quality Management

This report provides an overview of air quality in Glasgow 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 Progress Report (APR) summarises the work being undertaken by Glasgow City Council to improve air quality and any progress that has been made.

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective Concentration	Air Quality Objective Measured as	Date to be Achieved by
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen dioxide (NO_2)	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
Particulate Matter (PM_{10})	18 µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10 µg/m^3	Annual mean	31.12.2020
Sulphur dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO_2)	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m^3	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m^3	Running 8-Hour mean	31.12.2003

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 must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMAs declared by Glasgow City Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at

https://www.glasgow.gov.uk/index.aspx?articleid=18863

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
City Centre AQMA	NO_2 annual mean PM_{10} annual mean NO_2 annual mean	Glasgow	The city centre AQMA is loosely bound by the M8 motorway to the west and north (with slight protrusions at North Street and Royston Road), by High Street and Saltmarket to the east and by the river Clyde to the south. This area was declared an AQMA in 2004 in respect of the annual mean NO2 Objective. In 2007 the area covered by this AQMA was extended and declared in respect of the annual mean PM10 Objective.	Glasgow City Council Air Quality Action Plan 2009 https://www.glasgow.gov.uk/CHttpHandler.ashx?id=32447&p=0

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
			In 2012 a further extension of the AQMA was declared and the order amended in respect of the hourly mean NO2 Objective.	
Byres Road and Dumbarton Road AQMA	NO_2 annual mean	Glasgow	This AQMA extends from the junction of Byres Road and Great Western Road, south to Dumbarton Road and west along Dumbarton Road as far as Thornwood Drive roundabout. This area was declared an AQMA in 2007 in respect of the annual mean NO_2 Objective. In 2012 the area covered by this AQMA was extended northwards along Queen Margaret Drive to the junction with Oban Drive. In 2016 this AQMA was amended in respect of the annual mean PM_{10} Objective. In 2021 this AQMA was amended to revoke the annual mean PM_{10} designation.	Glasgow City Council Air Quality Action Plan 2009 https://www.glasgow.gov.uk/CHttpHandler.ashx?id=32447&p=0

Cleaner Air for Scotland

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil

Scotland's legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available on the Scottish Government's website. Progress by Glasgow City Council against relevant actions within this strategy is demonstrated below.

2.1.1 Transport – Avoiding Travel – T1

All local authorities should ensure that they have a corporate travel plan (perhaps within a carbon management plan) which is consistent with any local air quality action plan. Glasgow City Council's 2009 AQAP includes measures to promote staff travel to the workplace and GCC has produced a staff travel plan and introduced a number of measures to assist staff. The Glasgow Climate Plan includes actions to promote home working and videoconferencing reducing the need for travel.

2.1.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2

Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan to ensure that air quality considerations are covered.

Glasgow City Council has implemented an Energy and Carbon Masterplan which provided a blue print to reduce carbon dioxide emissions by 30% by 2020/21. This masterplan highlights over 30 actions to meet the reduction target focussing heavily on renewable energy power supplies and the commitment to less polluting transport modes. Links to the masterplan and Glasgow's Carbon Management Plan 2 are available at.

https://www.glasgow.gov.uk/index.aspx?articleid=17181

Glasgow's Climate Plan has been developed with many co-benefits for air quality. Many of the 59 actions within the Plan, particularly those relating to transport decarbonisation or reducing the need for travel, have positive impacts on local air quality.

Progress and Impacts of Measures to address Air Quality in Glasgow

Glasgow City Council has taken forward a number of 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. More detail on these measures can be found in the air quality Action Plan relating to each AQMA. Key completed measures are:

- At the start of 2020 >40% of the bus fleet were compliant with the LEZ standards. This rose to >60% by the end of 2020.
- LEZ scheme design options for phase 2 were developed and subject to public consultation. The results of this consultation were used to help identify a preferred scheme design.
- Billboard and bus advertising campaign to raise awareness of, and reduce unnecessary vehicle idling.
- A retrofit fund for taxis was launched, providing engine replacement to LEZ standards for older vehicles.
- Lockdown accelerated the move towards home and hybrid working, reducing the need for travel.
- Funding was provided which allowed for the replacement of 8 car club vehicles within the city centre with electric vehicles. All city centre car club vehicles are now zero emissions. An additional 10 car club parking spaces were fitted with dual EV charging stations. The additional charging point at each station is available for public use.
- 100 on street cycle racks provided with an additional 60 secure on street cycle shelters has been added within Glasgow in 2020. 10 secure cycle shelters were introduced at schools.
- 6 new Nextbike cycle hire locations were introduced along with electric bikes and associated charging facilities.
- Active travel infrastructure was introduced at 5 residential tower blocks.
- Electric vehicle charging provision continued to expand with 225 Glasgow City Council provided charging stations available.
- The Glasgow EcoStars scheme continued to expand with 251 members and 9916 vehicles part of the scheme by the end of 2020.

Glasgow City Council expects the following measures to be completed over the course of the next reporting year:

- Identification of the preferred scheme design for phase 2 of the LEZ. Consult on the design and prepare for publication and approval of the scheme by Scottish Ministers in early 2022.
- Consult on the retention of the Spaces for People measures and make these permanent where appropriate.
- Continue with progress on the Avenues project.
- Expand the walking and cycling network and associated infrastructure.
- Develop a hybrid working pattern for Council staff, reducing the need for travel.
- Further expand the electric vehicle charging network.
- Continue the Council fleet transition to zero emissions vehicles.
- Conduct a feasibility study into the introduction of a Workplace Parking Levy.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Vehicle Idling Council will expand program of vehicle idling enforcement	Public Information	Regular scheduled patrols to enforce and/or educate regarding vehicle idling.	NRS Public Health		2003 Onwards	No of complaints received re vehicle idling. No of interventions carried out by officers.	Low	Council continues to promote awareness and benefits in regard to reduction of vehicle idling via billboards and advertising campaign on PSV vehicles, around schools and bus stops. Enforcement patrols serve notice or information to drivers idling.	Ongoing	No fixed penalties issued during 2020. Enforcement patrols limited due to pandemic.
2	Vehicle Emissions Testing	Vehicle fleet efficiency	Emission Testing will now only take place during Multi Agency Days of action	NRS Public Health		2003 Onwards	No of vehicles tested.	Low	Emission testing continues in a reduced capacity. 40,000+ vehicles tested to date.	Ongoing in a limited capacity	No vehicles tested during 2020.
3	Low Emission Zone	Promoting low emission transport	Develop phase 1 of the LEZ as the	NRS Sustainable Glasgow	2015 onwards	2018 - 2024	Phase 1 – percentage bus compliance	Medium	Phase 1 compliance level to be minimum of	Phase 1 – end 2022	Compliance rate for bus journeys is >60% by end

			compliance milestones for the LEZ are met. Develop the preferred scheme design for phase 2.				with emission limits. Phase 2 – develop preferred scheme design for formal approval in 2022		60% by end 2020. Phase 2 potential scheme designs consulted on and developed with a preferred scheme to be identified in 2021.	Phase 2 – 2023/4	2020, increasing by 20% each year until 100% of bus journeys are compliant by December 2022. Phase 2 of the LEZ will apply to all vehicle types and will be enforced from June 2023. It will require a minimum emission standard of Euro VI/6 for diesel vehicles and Euro IV/4 for petrol vehicles.
4	Cleaner Taxis	Promoting low emission transport	Council will prepare an emissions strategy to reduce emissions from taxi and private hire vehicles	Licensing	2009	Ongoing	Proportion of taxis / private hire vehicles meeting LEZ emissions standards	Low / Medium	GCC have adopted licensing conditions in line with the introduction of the LEZ enforcement. GCC have removed the five year age policy for taxi applications to facilitate the replacement of vehicles with a newer	Ongoing	As part of the ongoing LEZ preparation funding of £1.09M has been provided by the Scottish Government for the conversion of older taxis from diesel to LPG, reducing emissions and meeting LEZ

									taxi which meets the required emission standard. GCC have reduced testing frequency for newer vehicles and increased testing frequency for older vehicles.		requirements . $0 taxis in Glasgow were retrofitted in year 19/20.
5	Council Workplace Travel Plan	Promoting travel alternatives	Travel plan was launched in an updated form.	Glasgow City Council		2014	Proportion of staff using public /sustainable transport options Proportion of work related journeys reduced.	Low	GCC continues to support active and sustainable transport to places of work. This includes the refresh of the cycle to work scheme with an increase in the level of funding available being increased to £1,500 to make folding and e-bikes more attainable under the scheme. Repayment period is currently 18 months to	Ongoing	Staff Travel Survey has been delayed. Pool bikes, electric bikes and EVs continue to be made available. Lockdown has accelerated progress towards hybrid working patterns.

									improve accessibility of the scheme.		
6	Car Clubs	Alternatives to private vehicle use	Improving zero emission provision within the car club	Glasgow City Council	2009	2010 onwards 2015 onwards (award of new operator contract) 2020 – increased zero emissions provision	Car club membership	Low	In 2020 funding was provided for 8 EVs to be located within the LEZ. All car club vehicles within the city centre are now EVs. Funding also provided for installation of 10 dual EV charging stations at car club spaces. The additional charging dock is available for general public use at each location.	Ongoing	
10	Air Quality Information	Public Information	The Council will provide data and information regarding current and longer term air quality monitoring on our web site	NRS Sustainable Glasgow	2009	Ongoing		Low	GCC continues to publish air quality information on the main website and promote the use of the Scottish Air Quality Database “Know & Respond” information service.	Ongoing	

									Ongoing engagement in relation to LEZ and vehicle idling		
13	Cycling Strategy	Promoting travel alternatives	Provide cycling improvements throughout the city.	Glasgow City Council	2011	Ongoing	Proportion of journeys undertaken by cycling	Low	In 2020 funding resulted in the installation of ~100 on street cycle racks, additional secure on-street cycle parking and 10 secure cycling shelters at schools. Funding was also provided for the installation of active travel infrastructure at 5 residential tower blocks. Funding for six additional locations for the Nextbike cycle hire scheme was used in 2020, including the provision of electric bikes and associated charging.		

17	Promote Greener Vehicles	Promoting low emission transport	Provide and promote electric vehicle charging provision	Glasgow City Council		Ongoing	No of EV charging points	Low	225 charging points, including significant numbers of rapid chargers, provided by GCC	Ongoing	
18	Leading by Example	Promoting low emission transport	The Council will demonstrate best practice in the operation of its vehicle fleet The Council have introduced a fleet of electric vehicles through a government backed scheme and trained staff in the efficient use of these vehicles.	Glasgow City Council		Ongoing	Proportion of fleet with zero emissions	Low	GCC have committed to decarbonising the entire fleet by 2030 with around 300 vehicles swapped out in 2020.	Ongoing - 2030	
18	Leading by Example	Promoting low emission transport	The Glasgow ECO Stars Fleet Recognition Scheme is being promoted by Glasgow City Council. The scheme is designed to raise awareness with both	Glasgow City Council	2014	Ongoing	Membership of the Glasgow ECO Stars scheme	Low	The fleet recognition scheme has been operating since September 2014 and has currently recruited 251 members encompassing approximately	Ongoing	

			public and private organisations of the important role they can play in helping to improve air quality						9916 fleet vehicles including three of the largest bus companies operating within Glasgow. Glasgow Taxi's group also joined the Glasgow Eco Stars scheme in 2018.		

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives

Summary of Monitoring Undertaken

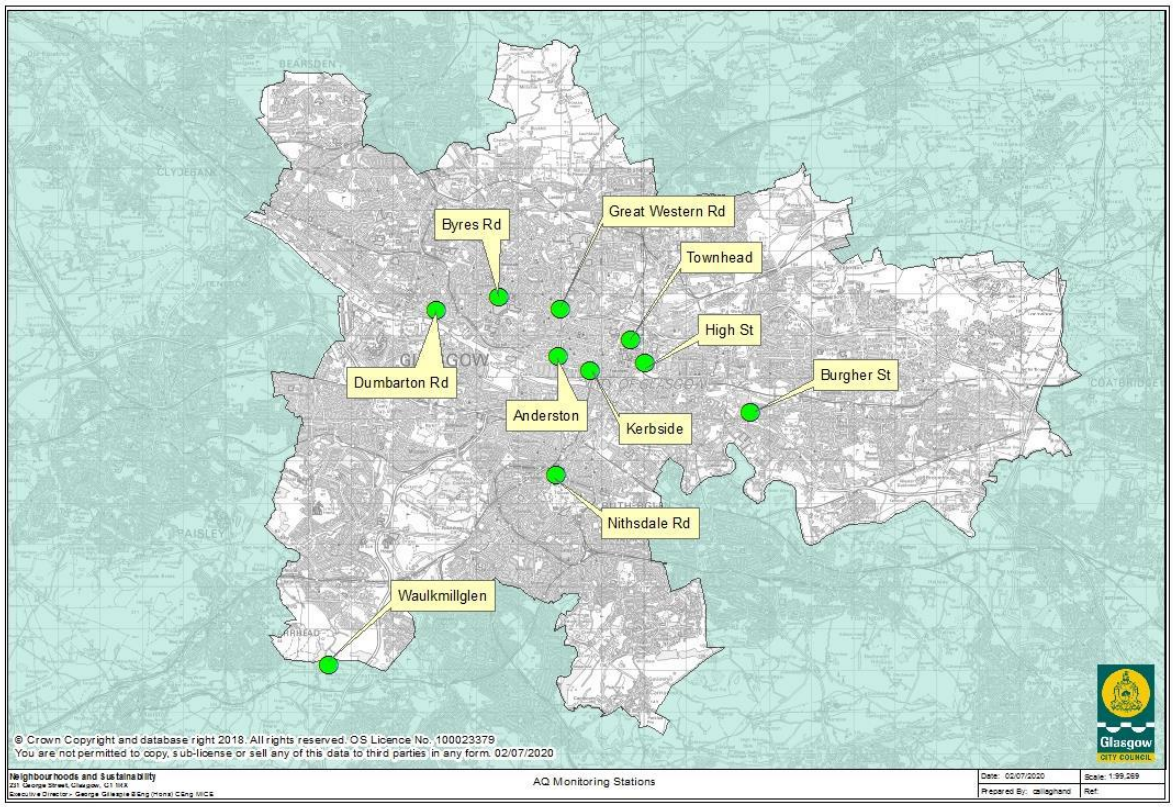
3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

Glasgow City Council undertook automatic (continuous) monitoring at 10 sites during 2020. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at http://www.scottishairquality.scot/

Maps showing the location of the monitoring sites are provided in Figure 3.1 below. Station information including pollutants monitored are shown Table A.2 in Appendix A. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

Figure 3.1 - Location of Automatic Monitoring Sites



Maps and photographs showing the location of the monitoring sites are provided at http://www.scottishairquality.co.uk/ Monitoring data from both Glasgow's network and nationally across Scotland can also be accessed at this link.

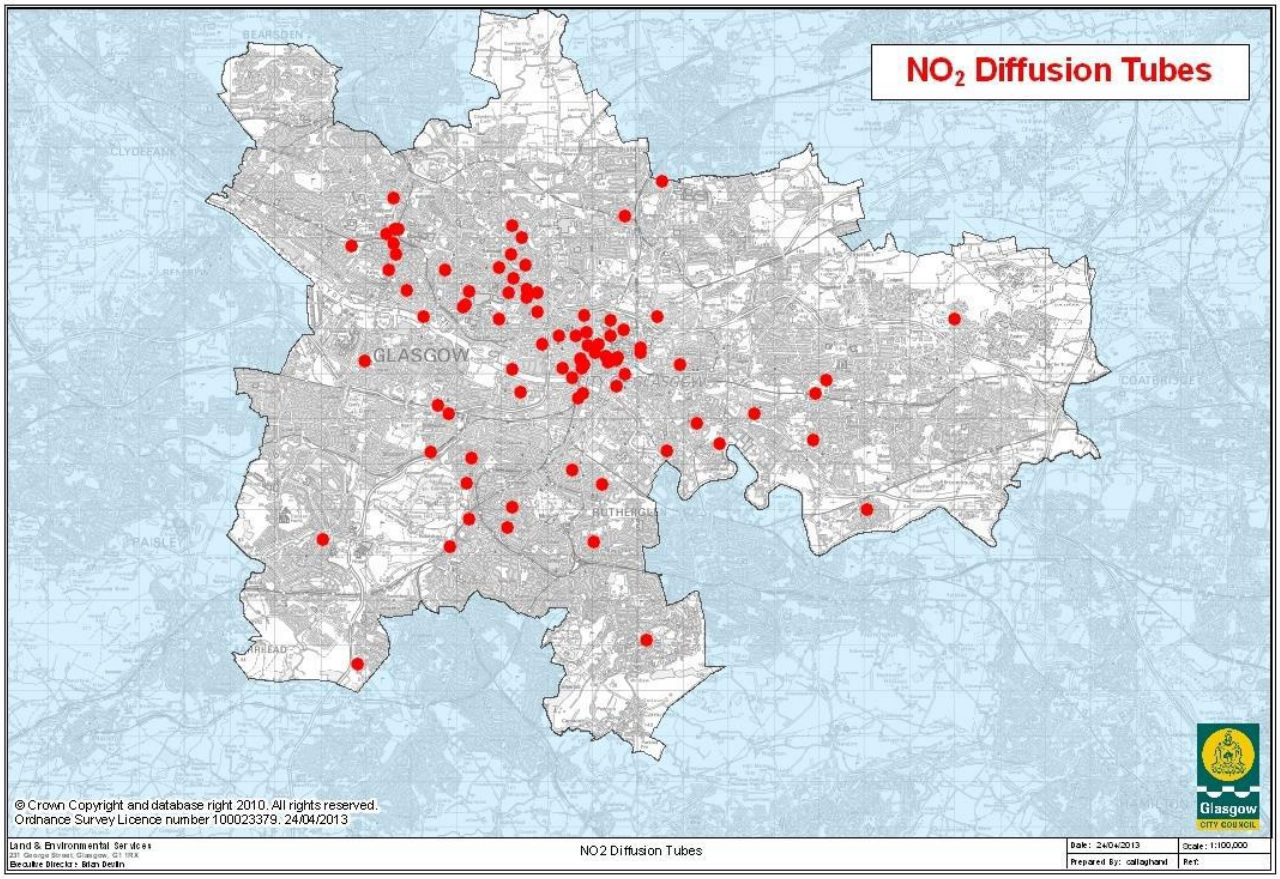
3.1.2 Non-Automatic Monitoring Sites

Glasgow City Council undertook non- automatic (passive) monitoring of NO_2 at 102 sites during 2020. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 3.2 below. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B.

Figure 3.2 - Location of Nitrogen Dioxide (NO_2) Diffusion Tubes



Individual Pollutants

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

3.1.3 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares 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.

For diffusion tubes, the full 2020 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

During 2020, Glasgow City Council measured concentrations of Nitrogen Dioxide (NO_2) below the Annual Mean Objective at all automatic monitoring stations within the city, including those within the City Centre Air Quality Management Area (AQMA). The annual mean objective had previously been exceeded at the Glasgow Kerbside (Hope St) monitoring station and at several locations, measured by diffusion tube, also within the City Centre AQMA. In 2020, only one diffusion tube (CC13) within the City Centre AQMA, recorded NO_2 levels marginally above the objective.

3.1.4 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 18µg/m^3.

Table A.6 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 seven times per year.

Neither the Annual Mean Objective for PM10 nor the Daily Mean Objective for PM10 were exceeded at any monitoring location during 2020. All monitoring locations showed a decrease in annual mean concentrations over 2019 and no instances of days where the daily mean was above 50µg/m3.

3.1.5 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five years with the air quality objective of 10µg/m^3. This objective was not exceeded at any monitoring location during 2020. All monitoring locations showed a decrease in annual mean concentrations over 2019.

3.1.6 Sulphur Dioxide (SO_2)

Sulphur dioxide monitoring has been discontinued in Glasgow following a long period of compliance with the relevant Objectives.

3.1.7 Carbon Monoxide, Lead and 1,3-Butadiene

Monitoring of these pollutants has been discontinued in Glasgow following a long period of compliance with the relevant Objectives.

3.2.6 Benzene

Table A.8 in Appendix A shows the monitored C6H6 annual mean concentrations with the air quality objective of 3.25µg/m3. The Annual Mean Objective was not exceeded at any monitoring location during 2020.

4 New Local Developments

No new local developments have been identified which require consideration in this report.

Road Traffic Sources

No new road traffic sources have been identified which require consideration in this report.

Other Transport Sources

No significant new transport sources have been identified which require consideration in this report.

Industrial Sources

No significant new industrial sources have been identified which require consideration in this report.

Commercial and Domestic Sources

No significant new commercial and domestic sources have been identified which require consideration in this report.

New Developments with Fugitive or Uncontrolled Sources

No significant new developments with fugitive or uncontrolled sources have been identified which require consideration in this report.

5 Planning Applications

There have been several planning applications for residential and commercial developments within the last year which required air quality assessments due to the introduction of new receptors or increased emissions due to additional vehicle movements. No assessments resulted in predictions of significant adverse impacts on air quality.

6 Impact of COVID-19 upon LAQM

No significant adverse impact on air quality monitoring was observed following the introduction of the national lockdown on 23rd March 2020.

All diffusion tube monitoring was completed in line with the diffusion tube calendar.

Infection control procedures were identified at a national level and relayed to Local Site Operators. These protocols were followed resulting in the continuation of LSO visits and calibrations during the lockdown period. These procedures continue to be followed and no interruption to, or adverse impact on, air quality monitoring is expected.

Glasgow City Council did not carry out any low cost monitoring during 2020 other than the use of NO_2 diffusion tubes.

The impact of Covid-19 upon air quality monitoring has therefore been minimal in Glasgow. However, the lockdown had a considerable impact on the monitored pollutant levels, particularly that of NO_2 and this is discussed in other areas of this report.

7 Conclusions and Proposed Actions

Conclusions from New Monitoring Data

During 2020, Glasgow City Council measured concentrations of Nitrogen Dioxide (NO_2) below the Annual Mean Objective at all automatic monitoring stations within the city, including those within the City Centre Air Quality Management Area (AQMA). The annual mean objective had previously been exceeded at the Glasgow Kerbside (GLA4) monitoring station and at several locations, measured by diffusion tube, also within the City Centre AQMA. In 2020, only one diffusion tube (CC13) recorded NO_2 levels marginally above the objective at 40.3µg/m^3.

The NO_2 Hourly Mean Objective was not exceeded at any of the automatic monitoring stations in 2020. This was consistent with measurements from previous years.

Neither the Annual Mean Objective for PM_{10} nor the Daily Mean Objective for PM_{10} were exceeded at any monitoring location during 2020. All monitoring locations showed a decrease in annual mean concentrations over 2019 and no instances of days where the daily mean was above 50µg/m^3.

For Scottish Local Authorities particulates at $PM_{2.5}$ have now been prescribed in regulations with an Annual Mean Objective of 10µg/m^3 by 2020. This objective was not exceeded at any monitoring location during 2020. All monitoring locations showed a decrease in annual mean concentrations over 2019.

Significant reductions in air pollution levels were recorded at all monitoring locations in Glasgow during 2020 due to the traffic reduction arising from the Covid 19 lockdown periods.

The 2 AQMAs in the city remain valid pending further periods of compliance with Objectives.

Conclusions relating to New Local Developments

No new local developments have been identified which are expected to have significant impacts on air quality in the city.

Proposed Actions

Glasgow City Council will continue to work with their partners in the Scottish Government, Transport Scotland and the Scottish Environment Protection Agency to develop phase 2 of the LEZ scheme with the aim of receiving formal acceptance of the scheme in early 2022.

The draft update of the Air Quality Action Plan will be developed and subject to consultation before official adoption.

Actions within the current AQAP will continue to be progressed.

The next Air Quality Progress Report will be produced and submitted in 2022.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
GLA4	Glasgow Kerbside	Kerbside	258708	665200	NO_2	City Centre	Chemiluminescent	0	1	3
GLKP	Glasgow Townhead	Urban Background	259675	665900	NO_2 PM_{10} $PM_{2.5}$ O_3	City Centre	Chemiluminescent FIDAS UV Photometric	0	120	3
GGWR	Glasgow Great Western Road	Roadside	258007	666649	NO_2	No	Chemiluminescent	0	5	2
GHSR	Glasgow High Street	Roadside	260013	665346	NO_2 PM_{10} $PM_{2.5}$	City Centre	Chemiluminescent FIDAS	0	3	3
GLA5	Glasgow Anderston	Urban Background	257925	665487	NO_2 PM_{10} $PM_{2.5}$	City Centre	Chemiluminescent FIDAS	0	40	3
GLA6	Glasgow Byres Road	Roadside	256526	666933	NO_2 PM_{10} $PM_{2.5}$	Byres Rd Dumbarton Rd	Chemiluminescent FIDAS	0	3	3
GL9	Glasgow Dumbarton Road	Roadside	255030	666608	NO_2 PM_{10} $PM_{2.5}$	Byres Rd Dumbarton Rd	Chemiluminescent FIDAS	0	3	2
GL6	Glasgow Burgher Street	Roadside	262550	664164	NO_2 PM_{10}	Parkhead	Chemiluminescent FDMS TEOM	0	3	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
GL2 (3)	Glasgow Nithsdale Road	Roadside	257883	662673	NO_2 PM_{10} $PM_{2.5}$	No	Chemiluminescent FIDAS	0	3	2
GLA7	Glasgow Waulkmillglen Reservoir	Rural	252461	658154	NO_2 PM_{10} $PM_{2.5}$ O_3	No	Chemiluminescent FIDAS UV Photometric	N/A	N/A	3

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.

(3) Mobile monitoring station located at Nithsdale Rd.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
CC01	George Square	Urban Background	259296	665389	NO_2	Yes	N/A	30	No	3
CC02	Union Street	Roadside	258828	665204	NO_2	Yes	0	3	No	3
CC03	Bath Street	Roadside	258374	665826	NO_2	Yes	3	3	No	2.5
CC04	Glassford Street	Roadside	259361	665252	NO_2	Yes	0	3	No	2.5
CC05	Buchanan Street	Roadside	259055	665468	NO_2	Yes	0	3	No	2.5
CC06	Castle Street	Roadside	260068	665589	NO_2	Yes	0	3	No	2.5
CC07	Hope Street 3	Kerbside	258856	665940	NO_2	Yes	N/A	1	No	2.5
CC08	Montrose Street	Roadside	259536	665313	NO_2	Yes	0	3	No	2.5
CC09	Cochrane Street	Roadside	259430	665316	NO_2	Yes	0	3	No	2.5
CC10	Renfield Street	Roadside	258896	665637	NO_2	Yes	0	3	No	2.5
CC11	George Street	Kerbside	259551	665380	NO2	Yes	N/A	1	No	2.5
CC12	North Street	Roadside	257906	665672	NO2	Yes	N/A	3	No	2.5
CC13	Hope Street1	Roadside	258730	665322	NO2	Yes	0	3	No	3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
CC14	Gordon Street	Roadside	258756	665346	NO2	Yes	N/A	3	No	3
CC15	Heilanmans Umbrella North	Roadside	258770	665120	NO2	Yes	0	3	No	3
CC16	Saltmarket	Roadside	259545	664739	NO2	Yes	0	3	No	2.5
CC17	High Street	Roadside	259732	664991	NO2	Yes	0	3	No	2.5
CC18	Dobbies Loan	Urban Background	259415	666194	NO2	Yes	0	3	No	2.5
CC20	Dundasvale Street	Urban Background	258820	666306	NO2	Yes	0	15	No	2.5
CC21	Royston Road	Roadside	260429	666264	NO2	Yes	5	3	No	2.5
CC22	St Mungo Avenue	Urban Background	259392	665866	NO_2	Yes	0	5	No	2.5
CC23	Brown Street	Roadside	258336	665122	NO_2	Yes	0	3	No	2.5
CC24	Broomielaw	Roadside	258562	664933	NO_2	Yes	N/A	3	No	2.5
CC25	McLeod Street	Urban Background	260077	665481	NO_2	Yes	0	8	No	2.5
CC26	Sauchiehall Street	Urban Background	258639	665852	NO_2	Yes	N/A	N/A	No	3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
CC28	St Mungo's PS	Roadside	259983	665834	NO_2	Yes	10	1	No	2.5
CC29	Garnetbank PS	Roadside	258240	666033	NO_2	Yes	5	1	No	2.5
GE01	Westmuir Street	Roadside	262589	664139	NO_2	Yes	0	3	No	2.5
GE02	Hillcrest Road	Roadside	265075	662001	NO_2	No	5	3	No	2.5
GE03	Main Street (Bridgeton)	Roadside	260650	663319	NO_2	No	0	5	No	2.5
GE04	Westercraigs	Urban Background	260942	665226	NO_2	No	0	15	No	2.5
GE06	Sacone SW	Urban background	263920	664569	NO2	No	0	20	No	2.5
GE07	Easterhouse	Roadside	267005	666217	NO2	No	0	5	No	2.5
GE10	Tollcross Park	Roadside	263864	663544	NO2	No	0	3	No	2.5
GE14	St Michaels Lane	Roadside	262472	664214	NO2	Yes	0	3	No	2.5
GE16	Ellismuir Road	Roadside	268413	663872	NO2	No	9	1	No	2.5
GE17	Carmyle Avenue	Roadside	264792	662418	NO2	No	0	7	No	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
GE18	Barrowfield Street	Roadside	261705	663993	NO2	No	3	1	No	2.5
GE19	Dalmarnock Station	Roadside	261013	663169	NO2	No	N/A	1	No	2.5
GN01	Springburn Road	Roadside	260541	669268	NO2	No	0	6	No	2.5
GN02	Kippen Street	Urban Background	259731	668488	NO2	No	5	3	No	2.5
GN03	Ryeside Road	Roadside	261778	668122	NO2	No	10	1	No	2.5
GS02	Bridge Street	Roadside	258702	664480	NO2	Yes	3	3	No	2.5
GS04	Haggs Road	Roadside	256295	661792	NO2	No	0	3	No	2.5
GS06	Oxford Street	Roadside	258798	664570	NO2	No	0	3	No	2.5
GS07	Dougrie Road	Roadside	260203	659128	NO2	No	N/A	3	No	2.5
GS08	Aikenhead Road	Roadside	259225	662579	NO2	No	0	6	No	2.5
GS09	Langside Primary School	Roadside	257138	661617	NO2	No	5	3	No	3
GS10	Paisley Road West	Roadside	255599	664313	NO2	No	0	3	No	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
GS11	Sutherland Avenue	Urban Background	256343	663153	NO2	No	10	5	No	2.5
GS12	Mallaig Place	Urban background	253989	665298	NO2	No	20	6	No	2.5
GS13	Govanhill Street	Roadside	258678	662901	NO2	No	3	3	No	3
GS14	Invergarrie Road	Urban Background	253821	658590	NO2	No	5	3	No	2.5
GS16	Silverburn	Roadside	253047	661349	NO2	No	0	5	No	2.5
GS18	Paisley Rd West 2	Roadside	257415	664616	NO2	No	0	3	No	2.5
GS19	Hampden	Urban Background	259038	661285	NO2	No	0	3	No	2.5
GS20	45 Clifford Street	Roadside	256262	664308	NO2	No	0	3	No	2.5
GS21	608 Scotland Street West	Roadside	256948	664270	NO2	No	0	1	No	2.5
GS22	17 Kilbride Street	Roadside	259732	663032	NO2	No	0	3	No	2.5
GS23	2 Myrtle Drive	Roadside	259246	661979	NO2	No	0	3	No	2.5
GS24	183 Crossloan Road	Roadside	254724	665407	NO2	No	0	3	No	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
GS25	234 Berryknowes Road	Urban Background	253542	664443	NO2	No	0	15	No	2.5
GS27	Battlefield Road	Roadside	258084	661642	NO2	No	0	3	No	2.5
GS28	128 Mennock Road	Roadside	259871	660618	NO2	No	0	3	No	2.5
GS30	Govan Road	Roadside	254021	665943	NO2	No	0	2	No	3
GS31	Govan Road (Hospital)	Roadside	253865	666006	NO2	No	2	2	No	2.5
GS34	1220 Govan Road	Roadside	254372	665902	NO2	No	0	2	No	3
GS35	Shieldhall Road	Roadside	253554	665176	NO2	No	0	3	No	2.5
GS36	Wallace Street	Roadside	258108	664514	NO2	No	0	3	No	2.5
GS37	Dumbreck Road	Roadside	255477	663644	NO2	No	7	1	No	2.5
GS45	Ben Glas Place	Urban Background	253609	659958	NO2	No	5	1	No	2.5
GS46	Kirriemuir Avenue	Roadside	253471	663587	NO2	No	20	1	No	2.5
GS47	1214 Paisley Road West	Roadside	254818	664109	NO2	No	10	1	No	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
GW01	Dumbarton Road	Roadside	256209	666525	NO2	Yes	3	3	No	2.5
GW02	Lawrence Street	Roadside	256295	666816	NO_2	Yes	5	2	No	3
GW04	Finnieston Street	Roadside	257235	665108	NO_2	No	N/A	3	No	2.5
GW06	Napiershall Street	Roadside	257790	666791	NO_2	No	0	4	No	2.5
GW07	Queen Margaret Drive 2	Roadside	257216	667639	NO_2	Yes	0	3	No	3
GW08	Queen Margaret Drive 3	Roadside	257012	667433	NO_2	Yes	0	3	No	3
GW09	Anniesland Cross	Roadside	254613	668886	NO_2	No	0	15	No	2.5
GW10	Balshagray Avenue	Roadside	254498	667291	NO_2	No	0	10	No	2.5
GW11	Thornwood Drive	Roadside	254903	666855	NO_2	No	0	3	No	2.5
GW12	Belmont Street	Roadside	257533	667418	NO_2	No	N/A	3	No	2.5
GW13	Glasgow Harbour	Urban Background	255287	666276	NO_2	No	0	30	No	3
GW14	Crow Road	Roadside	254640	668203	NO2	No	0	3	No	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
GW15	Hyndland Road	Roadside	255764	667297	NO2	No	0	4	No	2.5
GW16	Park Road	Roadside	257555	666896	NO2	No	0	3	No	2.5
GW18	Maryhill Road	Roadside	257243	668285	NO2	No	0	3	No	3
GW19	Scotstoun	Urban Background	253592	667771	NO2	No	0	>10	No	2.5
GW21	Milner Road	Roadside	254456	668108	NO2	No	0	3	No	2.5
GW22	Gibson Street	Roadside	257166	666787	NO2	No	0	3	No	2.5
GW26	Great Western Road	Roadside	257255	667112	NO2	No	0	3	No	2.5
GW30	South Street	Roadside	253193	667219	NO2	No	0	2	No	2.5
GW31	Harland Street	Roadside	253139	667333	NO2	No	2	3	No	2.5
GW32	Partick Bus Station	Roadside	255692	667333	NO2	Yes	0	2	No	2.5
GW33	Great George Street	Roadside	256663	667100	NO2	No	0	3	No	2.5
GW34	Blairdardie Road	Roadside	253080	670199	NO2	No	8	1	No	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	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)
GW35	Cadder Road	Roadside	257373	669164	NO2	No	10	1	No	2.5
GW36	New City Road	Urban Background	258309	666457	NO2	No	N/A	1	No	2.5
GW37	676 Dumbarton Road	Roadside	254946	666612	NO2	No	0	1	No	2.5
GW38	1545 Dumbarton Road	Roadside	252993	667615	NO2	No	0	5	No	2.5
GW39	Primrose Court	Roadside	253475	667289	NO2	No	0	13	No	2.5
CCB1	Heilanman's Umbrella North	Roadside	258770	665121	C6H6	No	0	3	No	2.5
CCB2	Hope Street	Kerbside	258738	665167	C6H6	No	3	1	No	3.5
GWB1	Ochiltree Avenue	Roadside	254839	669295	C6H6	No	3	5	No	3
GSB1	Pollokshaws Road	Roadside	255869	661185	C6H6	No	3	3	No	2.5

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GLA4	Kerbside (Kerbside)	Automatic	99	99	**65**	**59**	**61**	**56**	36
GLKP	Townhead (U Background)	Automatic	99	99	26	25	24	24	17
GGWR	Gt. Western Rd (Roadside)	Automatic	98	98	32	31	29	30	19
GHSR	High St. (Roadside)	Automatic	99	99	34	35	31	30	21
GLA5	Anderston (U Background)	Automatic	98	98	20	22	24	26	20
GLA6	Byres Rd. (Roadside)	Automatic	100	100	38	37	34	35	23
GL9	Dumbarton Rd. (Roadside)	Automatic	100	100	**45**	**43**	34	35	25
GL6	Burgher St. (Roadside)	Automatic	55	55	33	26	25	27	17
GL2	Nithsdale Rd. (Roadside)	Automatic	7	7	-	-	32	31	N/A
GLA7	Waulkmillglen (Rural)	Automatic	90	90	11	9	9	9	5
CC01	George Sq. (U Background)	Diffusion Tube	92	92	30	37	35	32	19

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CC02	Union St. (Roadside)	Diffusion Tube	92	92	**49**	**50 ***	**47**	**47**	28
CC03	Bath St. (Roadside)	Diffusion Tube	100	100	40	**42**	**41**	39	23
CC04	Glassford St. (Roadside)	Diffusion Tube	100	100	37	**41**	40	40	25
CC05	Buchanan St. (Roadside)	Diffusion Tube	100	100	39	**42**	**41**	38	24
CC06	Castle St. (Roadside)	Diffusion Tube	100	100	29	34	31	29	20
CC07	Hope St. 3 (Kerbside)	Diffusion Tube	100	100	**43**	**45**	40	40	23
CC08	Montrose St. (Roadside)	Diffusion Tube	92	92	36	36	29	28	19
CC09	Cochrane St. (Roadside)	Diffusion Tube	100	100	32	39	35	35	22
CC10	Renfield St. (Roadside)	Diffusion Tube	92	92	**46**	**51**	**45**	**42**	28
CC11	George St. (Kerbside)	Diffusion Tube	92	100	40	40	39 *	32	20
CC12	North St. (Roadside)	Diffusion Tube	92	92	23	28	30	27	21

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CC13	Hope St. 1 (Roadside)	Diffusion Tube	100	100	**65**	**68**	**63**	**56**	**40**
CC14	Gordon St. (Roadside)	Diffusion Tube	92	92	**58**	**64**	**60**	**59**	36
CC15	Heilanmans Umbrella N (Roadside)	Diffusion Tube	92	92	**60**	**54**	**48**	**52**	27
CC16	Saltmarket (Roadside)	Diffusion Tube	100	100	31	38	27	31	23
CC17	High St. (Roadside)	Diffusion Tube	92	92	**45**	**43**	40	**42**	26
CC18	Dobbies Loan (U Background)	Diffusion Tube	100	100	24	27	27	23	19
CC20	Dundasvale St. (U Background)	Diffusion Tube	100	100	29	34	30	28	21
CC21	Royston Rd. (Roadside)	Diffusion Tube	100	100	35	34	29	29	21
CC22	St. Mungo Ave. (U Background)	Diffusion Tube	100	100	29	32	27	26	20
CC23	Brown St (Roadside)	Diffusion Tube	100	100	24	27	29	24	17
CC24	Broomielaw (Roadside)	Diffusion Tube	100	100	37	**44**	39	37	23

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
CC25	McLeod St. (U Background)	Diffusion Tube	100	100	31	35	31	30	22
CC26	Sauchiehall St. (U Background)	Diffusion Tube	100	100	31	**41**	31	32	21
CC28	St Mungo's PS (Roadside)	Diffusion Tube	100	100	-	26	26	24	19
CC29	Garnetbank PS (Roadside)	Diffusion Tube	100	100	-	31	31	29	21
GE01	Westmuir St. (Roadside)	Diffusion Tube	100	100	35	36	32	32	23
GE02	Hillcrest Rd. (Roadside)	Diffusion Tube	100	100	17	20	16	16	13
GE03	Main St. Bridgeton (Roadside)	Diffusion Tube	100	100	19	20	22	20	13
GE04	Westercraigs (U Background)	Diffusion Tube	92	92	17	20	21	19	20
GE06	Sacone SW (U Background)	Diffusion Tube	100	100	15	20	20	16	14
GE07	Easterhouse (Roadside)	Diffusion Tube	100	100	17	19	16	15	12
GE10	Tollcross Park (Roadside)	Diffusion Tube	100	100	19	20	22	21	14

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GE14	St. Michaels Lane (Roadside)	Diffusion Tube	92	92	39	37	35	36	29
GE16	Ellismuir Rd. (Roadside)	Diffusion Tube	100	100	-	20	19	19	13
GE17	Carmyle Ave. (Roadside)	Diffusion Tube	100	100	-	34	32	26	19
GE18	Barrowfield St. (Roadside)	Diffusion Tube	83	83	-	21	20	15	13
GE19	Dalmarnock Station (Roadside)	Diffusion Tube	92	92	-	22	20	19	13
GN01	Springburn Rd. (Roadside)	Diffusion Tube	100	100	22	24	23	19	16
GN02	Kippen St. (U Background)	Diffusion Tube	92	92	20	22	19	19	15
GN03	Ryeside Rd. (Roadside)	Diffusion Tube	100	100	-	17	19	19	15
GS02	Bridge St. (Roadside)	Diffusion Tube	92	92	31	34	30	34	27
GS04	Haggs Rd. (Roadside)	Diffusion Tube	92	92	28	26	27	26	18
GS06	Oxford St. (Roadside)	Diffusion Tube	100	100	24	31	27	25	19

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GS07	Dougrie Rd. (Roadside)	Diffusion Tube	100	100	18	18	18	16	14
GS08	Aikenhead Rd. (Roadside)	Diffusion Tube	75	75	23	24	21	24	16
GS09	Langside PS (Roadside)	Diffusion Tube	92	92	20	15	17	16	13
GS10	Paisley Rd. West (Roadside)	Diffusion Tube	100	100	27	32	26	28	21
GS11	Sutherland Ave. (U Background)	Diffusion Tube	92	92	13	16	16	13	10
GS12	Mallaig Pl. (U Background)	Diffusion Tube	100	100	18	19	20	18	14
GS13	Govanhill St. (Roadside)	Diffusion Tube	33	33	23	26	21	23	16
GS14	Invergarrie Rd. (U Background)	Diffusion Tube	100	100	14	12	13	14	12
GS16	Silverburn (Roadside)	Diffusion Tube	92	92	19	19	21	18	12
GS18	Paisley Rd. West 2 (Roadside)	Diffusion Tube	100	100	32	36	36	36	23
GS19	Hampden (U Background)	Diffusion Tube	83	83	19	15	19	17	12

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GS20	Clifford St. (Roadside)	Diffusion Tube	100	100	27	29	29	33	19
GS21	Scotland St. West (Roadside)	Diffusion Tube	100	100	28	33	29	27	19
GS22	Kilbride St. (Roadside)	Diffusion Tube	100	100	21	25	25	22	13
GS23	Myrtle Dr. (Roadside)	Diffusion Tube	92	92	20	22	20	17	12
GS24	Crossloan Rd. (Roadside)	Diffusion Tube	67	67	23 *	26	23	22	16
GS25	Berryknowes Rd. (U Background)	Diffusion Tube	100	100	25	25	24	22	15
GS27	Battlefield Rd. (Roadside)	Diffusion Tube	100	100	29	29	26	25	17
GS28	Mennock Rd. (Roadside)	Diffusion Tube	100	100	21	24	24	21	13
GS30	Govan Rd. (Roadside)	Diffusion Tube	92	92	34	33	31	30	21
GS31	Govan Rd. Hospital (Roadside)	Diffusion Tube	100	100	35	38	32	30	22
GS34	1220 Govan Rd (Roadside)	Diffusion Tube	100	100	26	28	24	23	17

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GS35	Shieldhall Rd. (Roadside)	Diffusion Tube	100	100	25	25	23	24	14
GS36	Wallace St. (Roadside)	Diffusion Tube	100	100	-	40	36	33	21
GS37	Dumbreck Rd. (Roadside)	Diffusion Tube	100	100	-	24	27	23	16
GS45	Ben Glas Pl. (U Background)	Diffusion Tube	100	100	-	14	15	14	10
GS46	Kirriemuir Ave. (Roadside)	Diffusion Tube	100	100	-	16	16 *	14	10
GS47	1214 Paisley Rd. West (Roadside)	Diffusion Tube	100	100	-	24	23	22	18
GW01	Dumbarton Rd. (Roadside)	Diffusion Tube	100	100	30	33	33	27	31
GW02	Lawrence St. (Roadside)	Diffusion Tube	100	100	21	24	24	20	17
GW04	Finnieston St. (Roadside)	Diffusion Tube	100	100	29	29	29	26	17
GW06	Napiershall St. (Roadside)	Diffusion Tube	100	100	28	28	26	27	20
GW07	Queen Margaret Dr. 2 (Roadside)	Diffusion Tube	92	92	26	32	29	24	22

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GW08	Queen Margaret Dr. 3 (Roadside)	Diffusion Tube	83	83	30	37	32	27	21
GW09	Anniesland Cross (Roadside)	Diffusion Tube	100	100	23	27	23	26	17
GW10	Balshagray Ave. (Roadside)	Diffusion Tube	100	100	26	28	28	26	19
GW11	Thornwood Dr. (Roadside)	Diffusion Tube	100	100	19	20 *	17	16	13
GW12	Belmont St. (Roadside)	Diffusion Tube	100	100	16	21	19	16	16
GW13	Glasgow Harbour (U Background)	Diffusion Tube	100	100	24	24	23	19	16
GW14	Crow Rd. (Roadside)	Diffusion Tube	92	92	32	32	32	32	21
GW15	Hyndland Rd. (Roadside)	Diffusion Tube	83	83	21	25	24	23	16
GW16	Park Rd. (Roadside)	Diffusion Tube	100	100	27	30	29	28	19
GW18	Maryhill Rd. (Roadside)	Diffusion Tube	92	92	28 *	33	31	30	19
GW19	Scotstoun (U Background)	Diffusion Tube	83	83	19	20	22	18	14

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GW21	Milner Rd. (Roadside)	Diffusion Tube	100	100	18	18	19	18	12
GW22	Gibson St. (Roadside)	Diffusion Tube	100	100	28	33	27	28	16
GW26	Gt Western Rd. (Roadside)	Diffusion Tube	100	100	30	29	30	31	18
GW30	South St. (Roadside)	Diffusion Tube	100	100	25	27	24	22	16
GW31	Harland St. (Roadside)	Diffusion Tube	100	100	24	23	25	22	15
GW32	Partick Bus Station (Roadside)	Diffusion Tube	100	100	26	25	26	22	16
GW33	Gt George St. (Roadside)	Diffusion Tube	100	100	27	27	25	26	20
GW34	Blairdardie Rd. (Roadside)	Diffusion Tube	100	100	-	16	15	14	12
GW35	Cadder Rd. (Roadside)	Diffusion Tube	100	100	-	19	19	17	14
GW36	New City Rd. (U Background)	Diffusion Tube	100	100	-	33	31	29	23
GW37	676 Dumbarton Rd. (Roadside)	Diffusion Tube	100	100	-	-	36	32	31

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GW38	1545 Dumbarton Rd. (Roadside)	Diffusion Tube	100	100	-	-	29	30	25
GW39	Primrose Ct. (Roadside)	Diffusion Tube	92	92	-	-	22	21	18

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**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG(16) 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%).

Table A.4 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GLA4	Kerbside (Kerbside)	Automatic	99	99	4	3	2	3	0
GLKP	Townhead (U Background)	Automatic	99	99	2	0	0	0	0
GGWR	Gt. Western Rd. (Roadside)	Automatic	98	98	0	0	0	0	0
GHSR	High St. (Roadside)	Automatic	99	99	6	0	0	0	0
GLA5	Anderston (U Background)	Automatic	98	98	0	0	0(93)	0	0
GLA6	Byres Rd. (Roadside)	Automatic	100	100	2	9	0	0	0
GL9	Dumbarton Rd. (Roadside)	Automatic	100	100	3	0	0	0	0
GL6	Burgher St. (Roadside)	Automatic	55	55	0 (141)	0	0	0	1(94)
GL2	Nithsdale Road. (Roadside)	Automatic	7	7	-	-	0	0	N/A
GLA7	Waulkmillglen (Rural)	Automatic	90	90	0	0	0	0	0

Notes:

Exceedances of the NO_2 1-hour mean objective (200 µg/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%).

(3) Site GL2 was offline for the majority of 2020.

Table A.5 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GLKP	Townhead (U Background)	99	99	12	13	11	11	9
GHSR	High Street (Roadside)	99	99	13	13	14	11	9
GLA5	Anderston (U Background)	71	71	15	15	12	12	9
GLA6	Byres Road (Roadside)	100	100	12	13	14	15	11
GL9	Dumbarton Road (Roadside)	100	100	15	15	14	13	10
GL6	Burgher Street (Roadside)	51	51	16	12	13	12	11
GL2	Nithsdale Road (Roadside)	3	3	13	15	14	15	7
GLA7	Waulkmillglen (Rural)	94	94	9	11	9	9	4

Notes:

Exceedances of the PM_{10} annual mean objective of 18 µg/m^3 are shown in bold.

All means have been “annualised” as per LAQM.TG(16), 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%).

(3) Site GL2 was offline for the majority of 2020.

Table A.6 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GLKP	Townhead (U Background)	99	99	0	1	0	4	0
GHSR	High Street (Roadside)	99	99	0	0	0	1	0
GLA5	Anderston (U Background)	71	71	0(22)	0(35)	0(29)	2	0 (24)
GLA6	Byres Road (Roadside)	100	100	2	0	0	6	0
GL9	Dumbarton Road (Roadside)	100	100	0	3	0	4	0
GL6	Burgher Street (Roadside)	51	51	0(22)	0	0	2	0 (27)
GL2	Nithsdale Road (Roadside)	3	3	0	0(32)	1	5	N/A(3)
GLA7	Waulkmillglen (Rural)	94	94	0(16)	1	0	1	0

Notes:

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

If the period of valid data is less than 85%, the 98.1st 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%).

(3) Site GL2 was offline for the majority of 2020.

Table A.7 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	2016	2017	2018	2019	2020
GLKP	Townhead (U Background)	99	99	7	8	7	7	5
GHSR	High Street (Roadside)	99	99	8	7	8	6	5
GLA5	Anderston (U Background)	71	71	-	-	7	7	5
GLA6	Byres Road (Roadside)	100	100	-	-	8	9	6
GL9	Dumbarton Road (Roadside)	100	100	-	-	7	7	5
GL2	Nithsdale Road (Roadside)	3	3	-	-	8	9	7
GLA7	Waulkmillglen (Rural)	94	94	-	-	5	6	4

Notes:

Exceedances of the $PM_{2.5}$ annual mean objective of 10 µg/m^3 are shown in bold.

All means have been "annualised" as per LAQM.TG(16), 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%).

Table A.8 – Benzene 2020 Monitoring Results

Site ID	Site Type	Valid Data Capture for monitoring Period (%) (1)	Valid Data Capture 2020 (%) (2)	C6H6 Annual Mean Concentration µg/m3
CCB1	Heilanman's Umbrella North (Roadside)	83	83	0.53
CCB2	Hope St (Kerbside)	83	83	0.51
GWB1	Ochiltree Avenue (Roadside)	83	83	0.52
GSB1	Pollokshaws Rd (Roadside)	83	83	0.47

Notes:

Exceedances of the Benzene objectives are shown in bold (3.25µg/m^3 running annual mean)

Laboratory analysis was not possible in November and December 2020 due to instrument failure

Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO_2 2020 Monthly Diffusion Tube Results (µg/m^3)

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1)
CC01	-	34.4	27.9	13.2	14.8	22.7	7.3	15.5	12.7	19.3	25.0	29.6	20.2	19.4
CC02	52	57.8	46.4	15.2	18.6	23	16.3	21	9.2	23.1	37.9	-	29.1	28.0
CC03	41.8	31.4	43.1	13	12	18.1	11	27.6	5.6	29.8	29.2	28.5	24.3	23.3
CC04	44.3	41.6	34	12.4	15.3	20.2	13.8	10.2	27.3	32.8	40.6	18.9	26.0	24.9
CC05	44.7	40.7	29.6	14.3	12	20.2	13.5	14.1	15.7	30.3	27.6	35.8	24.9	23.9
CC06	38	38.5	14.5	7.6	12.9	18.2	9.3	11.9	9.4	30.4	27.6	32.6	20.9	20.1
CC07	44.6	40.3	13.5	17.7	18.6	21.4	16.3	18.1	6.7	37.7	29.4	28.6	24.4	23.4
CC08	25.9	30.1	28.3	8.3	10.4	14.7	11.3	16	-	26.4	23.8	23.7	19.9	19.1
CC09	19.9	36.8	27.7	8.8	10.3	16.9	16.1	16.3	22.9	49.4	21.8	26.9	22.8	21.9
CC10	43.1	-	45.4	10.6	14.7	22.4	19.5	27	14.7	34.2	43.3	48.7	29.4	28.2
CC11	18.6	39.6	24.8	7.7	14.2	16.5	7.7	12.1	25	30.8	27.5	-	20.4	19.6
CC12	26.4	26.2	33.5	13.8	9.7	17.3	8.9	-	21	27.7	20.9	30.3	21.4	20.6
CC13	75.3	75	59.5	22	22.7	31	13.5	24.3	53.4	39.6	44.8	43	42.0	40.3
CC14	62.2	74.4	49	22.1	-	25.4	14	34.7	11.1	43.4	43.6	36.6	37.9	36.3
CC15	24.3	50.7	44.8	16.8	16.4	24.9	13.3	15.6	8	-	56	37.9	28.1	26.9
CC16	43.3	39.5	25.9	13.5	15	17.2	12.1	10.2	10.8	36.1	26.9	36.6	23.9	23.0

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1)
CC17	41.3	45.3	38.9	15.3	-	19.9	9.8	12.8	22.5	30.6	30	30.3	27.0	25.9
CC18	26.7	32.1	29.5	7.3	12.2	13.5	9.3	11.8	15	20.8	24.2	31.5	19.5	18.7
CC20	37.5	31.1	27.6	12.8	12.4	10	7.1	13.8	24.2	25.7	28.2	26.5	21.4	20.6
CC21	16.2	41.5	29.9	11.2	15.9	18.5	17.8	12.4	28.4	30.3	28.1	17.4	22.3	21.4
CC22	32.2	34.4	25.6	10.9	11.2	14.6	7.6	22.2	15.2	27.2	19.7	28	20.7	19.9
CC23	22.6	23.9	25.2	9.2	9.2	14.9	8	24.3	13.3	18.1	21.2	19.3	17.4	16.7
CC24	16.7	39	41.2	11.4	13.9	22.8	16.4	21.2	20.1	27.1	23.9	28.1	23.5	22.5
CC25	30.7	39	44.3	13	13.2	18.7	12.8	9	7.4	29.6	27.2	33.1	23.2	22.2
CC26	43	35.2	28.3	12.4	11	17.2	8.9	13	11.3	29.6	26.3	28.8	22.1	21.2
CC28	33.4	29.9	22.9	13.5	8.2	14.3	5.7	15.3	12.3	23.3	20	33.9	19.4	18.6
CC29	38.8	30.3	32.4	13.2	9.9	15.7	6.9	18.2	22	28.4	21.5	29.5	22.2	21.3
GE01	27.4	36.3	30.6	13.9	14	17.5	17.2	11.6	24.9	31.8	32	28.5	23.8	22.9
GE02	19.6	17.2	19.8	7.7	7.5	11.5	6.2	8.3	9.7	17.5	16.1	22.1	13.6	13.1
GE03	13.3	21.9	21.5	6.4	7.8	9.4	6	7.9	14.7	20.3	17.6	18.9	13.8	13.3
GE04	19	20.9	14.8	7.3	8	-	9.2	7.6	75.4	20.4	17.3	25.7	20.5	19.7
GE06	24.5	22.5	19.9	6.5	7.9	9.4	6.6	8.8	14.1	18.3	16.5	21.2	14.7	14.1
GE07	22.3	16	14.4	6.4	7.2	9.5	5.6	6.2	10.4	18.3	14.5	15.2	12.2	11.7
GE10	21.5	23.9	19.6	8.7	7.2	10.7	7.8	11.6	8.9	18.6	8.4	28.5	14.6	14.0
GE14	36.5	41.6	42.8	20.6	14	21.7	15.3	-	18.5	40.7	17.2	62.7	30.1	28.9

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1)
GE16	17.3	18.7	21.2	5.6	5.9	10.9	3.7	10	11.8	18.5	13.8	27.2	13.7	13.2
GE17	26.5	30.6	26	11.4	11.1	19.2	10.2	11.4	15.9	26.8	17.3	32.8	19.9	19.1
GE18	24.1	19.5	18.5	7.3	7.3	10.5	5.4	8.3	-	-	12.5	17.2	13.1	12.5
GE19	21.8	20.3	18.5	8.3	10.2	11.9	8.7	11.1	13.1	19.8	14.1	-	14.3	13.8
GN01	32.9	20.5	15	6.5	11.7	14.2	6.7	12.6	15	20	19.1	21	16.3	15.6
GN02	-	29.9	6.7	15.5	9.2	14.2	6.6	8.7	14.2	20.3	23.9	25.7	15.9	15.3
GN03	23.6	24.6	19	9.7	5.1	9.8	6.4	12.8	11.8	18.7	17.2	24.8	15.3	14.7
GS02	35.1	34.2	33.1	8	-	40.3	12.7	25.7	24.4	30.7	29.5	32.8	27.9	26.7
GS04	23.9	19..6	24.9	9.6	15.6	16.7	6.2	13.8	19.8	24.8	22.8	31.5	19.1	18.3
GS06	23.2	33.9	22.4	15.7	12.2	15.9	9.1	13	17.4	21.1	22.9	28.5	19.6	18.8
GS07	27.5	18.1	13.6	6.5	7.9	16	8.2	6.6	9.7	18.1	20.7	20.1	14.4	13.8
GS08	17.2	21.7	29.4	11.2	9.4	-	-	-	12.2	20.6	20.7	25	18.6	17.9
GS09	14.9	18.3	16.2	7.5	7.8	10.1	3.8	8.7	-	15.9	13.8	26.3	13.0	12.5
GS10	31.1	30	30.5	8.3	15.3	14.8	12.9	26.5	16.7	31.8	16.6	23.2	21.5	20.6
GS11	12.3	15.8	19.2	4.1	3	-	4.3	5.4	5.5	12	13.5	22.2	10.7	10.2
GS12	18.1	20.1	22	7.9	7.8	11.7	6.8	5.5	12.7	19.2	13.9	27.9	14.5	13.9
GS13	16.6	22.8	24.5	-	-	-	-	9.5	-	-	-	-	18.4	17.6
GS14	17.6	14.1	17	6.5	10.8	14.1	5.7	4.4	10.4	14.3	12.7	20.8	12.4	11.9
GS16	-	13.9	10.8	6.8	4.4	12.5	4.4	17	9.2	19.1	12.9	23.7	12.2	11.8

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1)
GS18	41	35.8	23.7	11.4	10.8	19.4	15.1	15.8	19.8	31.3	17.2	45.2	23.9	22.9
GS19	15.8	18.6	15.1	6.1	-	7.7	4.7	4.4	-	15.7	9.7	21.7	12.0	11.5
GS20	26	28.8	28.4	8.5	9.7	8.1	6.3	13.4	14.1	27.7	31.3	34.8	19.8	19.0
GS21	27.9	33.4	33.3	10.1	10.2	9.1	14.1	15.7	17.1	24.7	19.1	18.7	19.5	18.7
GS22	15.8	24.8	2.9	10.6	6.2	11.7	8.4	8.9	14.3	21.8	16.9	17.9	13.4	12.8
GS23	12.6	17.7	14.5	10.8	3.6	11.6	-	11.6	9.1	17	9.8	20.4	12.6	12.1
GS24	19.6	23.2	21.4	8.7	-	-	10.5	15.3	11.8	22	-	-	16.6	15.9
GS25	18.9	24	21.5	10.5	9.1	14.1	7.1	15.6	13.7	20.1	14.5	19.4	15.7	15.1
GS27	23.7	28.9	20.6	11.3	8	14.3	6.6	14.6	16.3	28.2	11.8	30.5	17.9	17.2
GS28	18.3	17.6	17.7	8.8	7.7	14.2	6.9	14.5	11.5	16.6	12.1	18.8	13.7	13.2
GS30	23.7	34	35	16.2	12.5	18.9	12.7	13.7	25.2	-	16.3	32.7	21.9	21.0
GS31	15.7	38.5	28.9	17.2	13.8	18.7	17.6	13	28.2	35.3	18.6	24	22.5	21.6
GS34	25.7	27.8	18.9	10.9	8	12.8	8.7	13.1	20.8	32.2	12.6	17.6	17.4	16.7
GS35	21.6	22.8	19.1	8.4	7.8	10.4	5.3	11.8	10.8	24.9	8.5	25	14.7	14.1
GS36	19.3	48.8	21.7	14.2	14	25.4	12.6	18.1	21.9	29	19.5	22.5	22.3	21.4
GS37	25.8	21.2	21.5	7.8	10.3	18.6	9.2	15	8.3	21.6	18.7	23.9	16.8	16.2
GS45	11	11.5	13	6.3	4	10	4.8	11.3	5.9	15.8	11.9	21.5	10.6	10.2
GS46	12.2	13.3	13.1	8.6	4.2	9.8	3.4	8.5	8.8	14.3	10.4	13.1	10.0	9.6
GS47	25.3	25.6	32.7	12	6.7	13.4	7.6	16.3	15	28.4	14.3	32.8	19.2	18.4

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1)
GW01	36.7	60.5	25	12.4	12.5	17.5	11.1	13.1	26.7	32	15.7	39.3	25.2	24.2
GW02	24.9	24.4	18.5	7.8	11	12.1	6.5	10.5	15.8	25.6	24.7	29	17.6	16.9
GW04	22.4	34.8	5.6	9.9	10.3	14.1	11.3	12.3	24.8	26.6	20.3	19.1	17.6	16.9
GW06	30.3	26.7	22.2	10.3	13.6	17.6	11.4	13.8	20.5	26.4	28.9	27.3	20.8	19.9
GW07	21.2	35	24.7	9.6	12.9	-	12.6	17	23.7	27.3	26.3	38.2	22.6	21.7
GW08	24	38.2	31.9	11.7	16.4	16.7	13.2	16.2	-	-	47.2	23.7	23.9	23.0
GW09	26	37.5	30.4	8.9	5.8	14.1	6.7	10.4	19.8	27.7	18.1	1.6	17.3	16.6
GW10	26.3	23.9	21.6	11.5	16.6	20.6	7.5	15.2	14.6	25	20.6	28.2	19.3	18.5
GW11	22.7	19.5	22.7	5.5	7.5	9.7	7.9	9.1	11.9	14.2	16.9	13.2	13.4	12.9
GW12	24.6	23.1	18.1	8	7.7	13.4	10.1	9.1	19.2	20.3	22.9	20.3	16.4	15.7
GW13	31.1	23.1	18.1	8.1	9.6	10.6	7.6	11	14.8	23.1	23	25.1	17.1	16.4
GW14	-	30.7	26.3	12.2	13.3	23.8	11.1	30.6	16.3	30.6	27.2	21.2	22.1	21.2
GW15	-	21.8	19.4	9.7	7.7	15.2	8.9	19.1	-	26	15.5	19.6	16.3	15.6
GW16	25.9	30.6	30.7	12.6	9	15.1	5.8	20.2	11.2	29.1	12.8	36.6	20.0	19.2
GW18	25.5	26.5	25.5	15.2	9.5	17.1	-	13.4	18.5	34.9	14.3	21.7	20.2	19.4
GW19	25.6	21.6	-	11.2	-	7.8	5.4	9.6	13.2	18.1	12.9	20.4	14.6	14.0
GW21	21.6	20	20.5	6.7	4.9	8.3	5.2	5.4	14.7	18.9	9.3	19.6	12.9	12.4
GW22	27.2	34	22.8	7.7	9	10.6	6.4	9.8	15.3	29.6	15.9	13.9	16.9	16.2
GW26	28.3	35.7	26.8	11.4	13.5	20.7	5.8	15.3	19.2	24.7	14.6	14.6	19.2	18.4

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Bias Adjusted (1)
GW30	36	25.6	10	7.3	8.6	13	9.8	9.3	16.6	26.8	15.1	22.3	16.7	16.0
GW31	21.1	24.3	20.3	9.9	6	13.2	7.4	12.5	18.4	27.8	16.9	8.5	15.5	14.9
GW32	36.4	23.2	20.3	12.6	7.9	12.4	6.4	10.5	11.6	26.4	10.8	22.6	16.8	16.1
GW33	17.7	54.2	21.1	8.9	7.5	14.2	8.1	15.9	21.3	26.8	30	26.5	21.0	20.2
GW34	20.6	18.9	15.9	10	4.8	8.1	3.9	9.8	4.9	15.8	16.3	16.8	12.2	11.7
GW35	22.1	20.5	17.9	11.2	5.7	12.3	6.9	10.9	10.6	23.3	13.4	22	14.7	14.1
GW36	41.7	39.7	34.8	11.8	6.9	14.4	9	17	19.8	31	28	38.1	24.4	23.4
GW37	51.4	51	42.4	20.8	17.2	24.2	11.8	31.1	31.7	41.1	25.2	41.7	32.5	31.2
GW38	38.9	32.8	37	15.2	16.4	16.7	6.7	20.3	24.4	33	30.9	41.4	26.1	25.1
GW39	28.6	25.9	28.2	18	5	4.4	7.3	15.8	22.6	26.8	20.4	-	18.5	17.7

Notes:

(1) See Appendix C for details on bias adjustment

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

New or Changed Sources Identified Within Glasgow City Council During 2020

Glasgow City Council has not identified any new sources relating to air quality within the reporting year of 2020.

Additional Air Quality Works Undertaken by Glasgow City Council During 2020

Glasgow City Council has not completed any additional works within the reporting year of 2020.

QA/QC of Diffusion Tube Monitoring

Diffusion tube monitoring is carried out in accordance with the procedures contained in the guidance 'Diffusion Tubes for Ambient NO2 Monitoring: Practical Guidance for Laboratories and Users' and LAQM.TG 16

Monitoring was conducted in adherence with the 2020 Diffusion Tube Monitoring Calendar.

For 2020 all NO_2 diffusion tubes were supplied and analysed by Glasgow Scientific Services. The preparation method was 20% tri-ethanolamine in water. Glasgow Scientific Services is UKAS accredited for the analysis of diffusion tubes.

The laboratory participates in the Laboratory of the Government Chemist (LGC) AIR PT scheme. During 2020 all results submitted in 2020 were satisfactory (zscore < ±2), however the rounds between May and August were cancelled due to the pandemic.

Diffusion Tube Annualisation

Annualisation was required for 2 diffusion tube sites, GS13 and GS24 due to low data collection. Annualisation was conducted in accordance with the annualization tool methodology and the results have been expressed in the main results table. The annualization method is shown in Table C.2

Diffusion Tube Bias Adjustment Factors

Glasgow City Council have applied a national bias adjustment factor of 0.96 to the 2020 monitoring data. A summary of bias adjustment factors used by Glasgow City Council over the past five years is presented in Table C.1.

Glasgow City Council contributed results from five local co-location studies to the national factor for the laboratory analysis.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2020	National	03/21	0.96
2019	National	03/20	0.85
2018	National	06/19	0.89
2017	National	03/18	0.91
2016	National	03/17	0.97

NO_2 Fall-off with Distance from the Road

Distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure (taking the limitations of the calculator into account).

No diffusion tube NO_2 monitoring locations within Glasgow City Council required distance correction during 2020.

QA/QC of Automatic Monitoring

The 10 permanent monitoring stations in Glasgow form part of the Air Quality in Scotland monitoring network. Instruments are calibrated by the Local Site Operators (LSO) according to the specific site guidelines and audits are carried out every six months by Ricardo EAE. Glasgow City Council Public Health act as LSO for seven of the stations while Ricardo AEA act as LSO for the three stations operated as part of the UK network operated by DEFRA. These stations are GLA4, GLKP and GHSR.

All of the automatic air quality data gathered, both current and historical is independently ratified by Ricardo AEA and made available for viewing by the public at the Scottish Government funded air quality website at:

http://www.scottishairquality.co.uk

All data within this report has been fully ratified.

This webpage also provides access to the QA/QC information relevant to LAQM report requirements. The instrument UKAS calibration certification generated by the six-monthly audit programme for Glasgow's monitoring stations is available at:

http://www.scottishairquality.co.uk/laqm/certificates-calibration

Individual site statistics for each monitoring station and instrument is available at:

http://www.scottishairquality.co.uk/laqm/statistics-pdf

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

The type of PM_{10}/$PM_{2.5}$ monitors utilised within Glasgow City Council do not required the application of a correction factor.

Automatic Monitoring Annualisation

Annualisation was required for 1 automatic NO2 monitoring site, GL6, due to low data collection. Annualisation was conducted in accordance with the annualization tool methodology and the results have been expressed in the main results table. The annualization method is shown in Table C.2

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Glasgow City Council required distance correction during 2020.

Table C.2 – Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor GGWR	Annualisation Factor GHSR	Annualisation Factor GLA4	Annualisation Factor GLKP	Average Annualisation Factor	Raw Data Annual Mean	Bias Adjusted (0.96) & Annualised Annual Mean	Comments
GS13	0.9425	0.8856	0.8127	0.9031	0.8860	18.4	15.6	
GS24	1.0557	1.0103	0.9472	1.0319	1.0113	16.6	16.1	
GL6	1.2415	1.1469	1.157	1.170	1.179	14.7	17.3	Automatic site not bias adjusted

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA 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
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

- Department of the Environment, Food and Rural Affairs (2000). Part IV The Environment Act 1995, Local Air Quality Management, Technical Guidance, LAQM.TG (16).
- Glasgow City Council (2004). Local Air Quality Action Plan.
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- Scottish Government (2016). ‘Cleaner Air for Scotland - Road to a Healthier Future’.
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- Scottish Government (2021) Cleaner Air for Scotland 2
- Glasgow City Council City Centre Strategy and Action Plan 2014-19
- Glasgow City Council Strategic Plan for Cycling 2016 – 2025.
- Glasgow City Council City Centre Transport Strategy 2014 – 2024
- Glasgow City Council Energy and Carbon Masterplan
- Glasgow City Council Carbon Management Plan 2
- Glasgow’s Climate Plan