Annual Progress Report (APR)

THE CITY OF EDINBURGH COUNCIL

2019 Air Quality Annual Progress Report (APR) for
City of Edinburgh Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

October 2019

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Executive Summary: Air Quality in Our Area

Air Quality in Edinburgh

The City of Edinburgh Council has declared six Air Quality Management Areas (AQMAs), five for the pollutant nitrogen dioxide (NO_2) and one for fine particulates (PM_{10}). A map of the AQMAs are available online at; https://edinburghcouncil.maps.arcgis.com/apps/webappviewer/index.html?id=dc93485b492947d0b2182c75aca4c554

An AQMA is required when a pollutant fails to meet air quality standards which are set by the Scottish and UK Governments. Road traffic is by far the greatest contributor to the high concentrations of NO_2 in the city. However, the AQMA at Salamander Street declared for PM_{10} exceedances is due to other sources as well as traffic. Emissions from industrial and fugitive sources from operations in and around Leith Docks are a contributory factor.

Monitoring Data

The Council monitored nitrogen dioxide (NO_2) at eight automatic monitoring stations and 139 non-automatic monitoring locations across the City throughout 2018, as a part of the Local Air Quality Management statutory obligations. The results show that many of the locations are within the prescribed legal standards however, there are several locations within the Central, St John's Road and Glasgow Road Air Quality Management Areas (AQMAs) where breaches of the annual mean exist. Therefore, these AQMAs remain valid. Concentrations in St John's Road AQMA met the hourly mean objective for the third year in a row, and therefore an amendment to this AQMA to remove the hourly mean element will be considered in due course. In 2018 the St John's Road automatic monitoring station reported a significant reduction in concentrations from the previous year, likely due to Lothian Buses' local bus fleet along this corridor becoming Euro VI in 2018. There is one location in the Central AQMA at West Port, where it is estimated that the hourly mean objective continues to be breached.

The results also show that for the second consecutive year since the declaration of the Great Junction Street and Inverleith Row AQMAs there are no breaches of NO_2 objectives. Monitoring is being increased in and around these areas, in order to

consider whether revoking the AQMAs would be appropriate in the future, following evidence of sustained improvements in air quality in these locations.

There is one lamppost site out with the AQMAs on Queensferry Road where $N0_2$ concentrations continue to exceed the annual mean objective, despite levels being well below the objective at nearby façade locations. Additional monitoring has been introduced at an adjacent site, the exact location having been selected because SEPA modelling expects concentrations to be similar here to the exceeding site.

Long-term trends of NO_2 and PM_{10} show concentrations are generally decreasing.

PM_{10} data from all monitoring locations in 2018 meets the UK National Objectives, however concentrations at Queensferry Road and Salamander Street station show breaches of the Scottish objectives.

Queensferry Road data was affected by demolition and construction work on adjacent land in 2017 and 2018.

Salamander Street AQMA for PM_{10}, declared in January 2017, remains valid.

Actions to Improve Air Quality

Progress on Actions in the Current NO_2 Air Quality Action Plan

The current NO_2 Air Quality Action Plan (2008) is being revised. The main actions in the current Plan and Local Transport Strategy to improve air quality are based on;

- promoting cleaner transport, especially buses via a voluntary means,
- adoption of a fleet recognition efficiency scheme for reducing emissions from road freight vehicles,
- improving traffic flow and easing congestion by use of intelligent traffic signalling, and;
- promoting modal shift away from car use by means of an Active Travel Action Plan, provision of Park and Rides, controlled parking and priority parking zones.

Progress with existing actions is on-going.

Promoting Cleaner Transport

Generally, the bus companies operating in Edinburgh continue to improve their fleet, however it is recognised that substantial financial support is needed to deliver continued improvement.

Lothian Buses, the largest bus service provider in the city, continues to be committed to reducing the emissions from their fleet and to invest in low emission vehicles as part of their fleet replacement strategy. Currently 82% of the main bus fleet is Euro V (vehicle emission standard) or better. Their Bus 2020 strategy will see the whole fleet Euro V and better in 2020. The bus company deploys its highest Euro Standard vehicles (Euro V and VI) on high frequency services and those routes which transit AQMAs, e.g. Airlink 100 and Service 22 which both pass through the Central and St John's Road AQMAs and Great Junction Street AQMA respectively.

All other major bus and coach companies operating in Edinburgh are committed to reducing emissions from their fleets by continuing to improve their vehicles' Euro emission standards through their fleet replacement and upgrade strategies.

Leading by example the proportion of the Council's fleet Euro 6/VI and above, continues to increase - from 33% to 46% between 2018 and 2019. The number of electric vehicles in the fleet is now 33. Transport Scotland's Switched On Fleets fund will be utilised this year for medium-term contract hire of 17 electric vehicles (EVs).

Adoption of a Fleet Recognition Efficiency Scheme

ECO Stars is a voluntary, free to join fleet recognition scheme that provides bespoke guidance on environmental best practice to operators of goods vehicles, buses, coaches and other fleets, whose fleets regularly serve the Edinburgh area.

The scheme was launched in January 2012 and to date 241 operators have joined with a total of 9,254 vehicles. Most members are freight/goods vehicle operators (100), followed by passenger transport (33), waste and recycling (10) and public-sector fleets (2).

Intelligent Traffic Signalling

Improving traffic flow and reducing vehicle idling times are also measures which help to improve air quality. Two different types of traffic management systems are installed in the City;

- Split Cycle Offset Optimisation Technique (SCOOT) systems are automatically responsive to traffic flows and demand and therefore help ease congestion by providing more effective control of traffic signals. SCOOT infrastructure is in place on many road networks in the city. However, due to ongoing utility works and road improvements, many of the inductive loops have been damaged and require repair and in several locations the system requires validation. This work is ongoing. Equipment has been installed at the following junctions - Lothian Road/ Fountainbridge and West Port/Lady Lawson Street. This however, will initially be run on fixed time until timing options have been explored further. Air Quality Action Plan Grant funding will assist with SCOOT development in Cowgate, Bridges, London Road and Inverleith Row. In 2019, Gorgie Road, Chesser Avenue and Balgreen Road became fully operational.
- MOVA (Microprocessor Optimised Vehicle Actuation) was installed at the Newbridge Roundabout (Glasgow Road AQMA) in April 2016 and resulted in significant reductions in waiting time on the A8 westbound corridor. Subsequently, NO_2 concentrations measured at the junction showed some improvement, however concentrations continue to be above the legal objective. Transport Scotland have received complaints about queuing on the M9 slip, leading to the Newbridge roundabout and consideration has been given to alternations to the roundabout. Air quality would have to be a major factor in any changes.

Promoting Modal Shift from Car Use

The Council is in the process of developing a new Active Travel Action Plan, the current plan having last been updated in 2016. Smarter Choices, Smarter Places funding has been utilised to recruit a travel planning officer who will be responsible for implementing the new travel plan. The current plan has set targets of 35% of all Edinburgh adult residents' trips being made by walking and 10% by bicycle by 2020, with the aim to bring health benefits and encourage modal shift away from car use.

Smarter Choices, Smarter Places funding has also enabled the Council to co-ordinate workplace travel planning activity in large work place sites in the city since August 2015. Fifty-nine organisations have participated in the programme in the last

three years. This has involved travel advice road show events offering travel planning and incentives for individuals to travel actively and sustainably; and providing support and advice to businesses to organise initiatives in their own workplaces.

The City of Edinburgh Council has several Park and Ride (P&R) locations around the periphery of the city boundary and is also served by P&Rs in East Lothian, Midlothian and Fife. The current number of spaces available has the potential to reduce the two-way daily work commuter traffic by 11,280 vehicles. Land has been acquired at Hermiston for development of the P&R extension which would more than double its capacity; funding has yet to be allocated for this.

Controlled Parking Zones (CPZs) and Priority Parking Zones (PPZs) within the city have been used by the Council across the city to deter commuter travel. The introduction of new and extensions to existing CPZs or PPZs are kept under regular review by the Council and a strategic review of parking is currently underway.

Other Measures and Actions to Improve Air Quality

Low Emission Zones

The Scottish Government has committed to work with Scotland's four biggest cities to introduce Low Emission Zones (LEZs) by 2020.

The City of Edinburgh Council has agreed to progress an LEZ scheme in conjunction with the development of a new local transport strategy (City Mobility Plan (CMP)) and Edinburgh City Centre Transformation (CCT) programme. In autumn 2018 the Council consulted on 'Connecting our City, Transforming our Places', a prospectus incorporating these strategies. The prospectus set out a number of ideas for improving the city including the introduction of a city centre and city-wide LEZ. At the time, The Scottish Environment Protection Agency (SEPA) published their initial report under the Cleaner Air for Scotland National Modelling Framework (NMF), 'Air Quality Evidence Report – Edinburgh', which aims to support the development of the Edinburgh LEZ scheme[5]. The report detailed the modelling methods used in the assessment work as well as the model performance, initial results, source apportionment work and scenario testing. It focuses on Nitrogen Dioxide (NO_2), recognising that Particulate Matter (PM) modelling will be included in further work.

The main findings indicated that NO_2 emission reductions of between 50 to 75% may be required on 2016 baseline modelled concentrations in order to meet the 40 ug/m^3 limit value.

Between May and July 2019, the Council consulted on proposals for a LEZ including a city centre zone boundary applying to all vehicle types and a city-wide boundary applying to commercial vehicles (buses, coaches, taxi and private hire, light and heavy goods vehicles). Work is ongoing in respect to the full impact of the scheme and in particular the resultant emission reductions. The next stage of LEZ development will consider what changes should be made to proposed scheme taking into account feedback from consultation and a new 2019 modelling evidence base.

Funding to support the development and implementation of LEZs is being made available from the Scottish Government on a year-to-year basis.

Funding to support the introduction of LEZs across different fleets is also being developed. Transport Scotland will continue to provide funding to bus companies for the Bus Emissions Abatement Retrofit Programme (BEAR). A LEZ Support Fund is to be made available to specific cohorts of both commercial and private vehicle owners affected by the introduction of LEZs in Scotland.

Further information about Scotland's LEZs can be accessed at the Scottish Government's Low Emission Zone website: https://www.lowemissionzones.scot/

Edinburgh City Centre Transformation Programme

In September 2019 the Council approved *Edinburgh's City Centre Transformation* - an ambitious plan for a people-focused Capital City Centre, which seeks to improve community, economic and cultural life. It outlines a programme to enhance public spaces to better support life in the city, by prioritising movement on foot, by bike and by public transport. The Council will therefore need to undergo a re-evaluation of traffic management priorities in the City Centre, while also taking cognisance of the development of the LEZ and the emerging City Mobility Plan.

http://www.edinburgh.gov.uk/CET/info/6/about/12/about

Edinburgh's Open Streets

'Open Streets' is the name given to the Council's programme of monthly street closures, that aim to help people experience the city in a quieter, more people-focussed environment, while helping the Council to monitor congestion, and travel

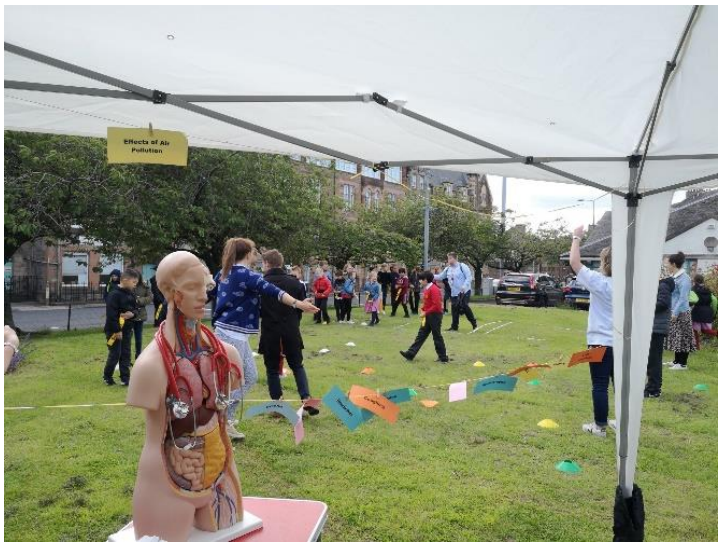
behaviours, to inform future plans. The programme launched in May 2019 and will run until December 2020, supported by funding from Sustran's, Places for People programme.

https://www.edinburgh.gov.uk/connectingplaces/info/9/consultation/20/open_streets_consultation

Clean Air Day 20th June 2019

Clean Air Day is a national annual campaign which aims to raise awareness of air pollution, its harm to health and actions which everyone can take to improve air quality. This year the Council hosted an event in Deaconess Gardens at St Leonards for pupils from Sciennes, Preston Street and Royal Mile primary schools with assistance from NHS Lothian. The children explored the site's air quality monitoring station to find out what happens to air samples and there were demonstrations about how human biology is affected by poor air quality. Pupils wrote pledges to make healthier and less polluting travel choices, were asked their views on Edinburgh's proposed Low Emission Zone and enjoyed a game of tag with an air quality related theme.

The Council also assisted SEPA in the delivery of an air quality banner competition in which 11 primary schools across the city took part. Banners were produced from the winning entries and displayed at the school gates in time for Clean Air Day.



Clean Air Day 2019 schools' event

Electric Vehicle Charging

In December 2017, the Council approved Edinburgh's first Electric Vehicle (EV) Action Plan, with the key purpose of developing a strategic and co-ordinated approach to electric vehicle charging hubs. This is to encourage the uptake of EVs, while reducing carbon emissions, improving air quality and unlocking wider economic benefits. Since then the Council has approved a Business Case for the installation of on-street EV charging infrastructure which will involve the installation of 66 on-street charging points across the City to strengthen the existing network. Plug-in (electric) vehicle use is steadily increasing in Edinburgh. The installation of on-street EV charging infrastructure is planned for 2020, funding for the initial phase of the work being provided by Transport Scotland.

Residents' Parking Permit Surcharge for Diesel Vehicles

Following a consultation exercise ran between October 2017 and January 2018, The Council will introduce a surcharge on residents' permits for diesel-fuelled vehicles, with a view to encouraging owners to consider the impact of their vehicle choice, on both the wider-environment and local air quality. The new surcharge will come into force with new permits holders or existing permit holders changing to diesel vehicles, but omit those who currently own a diesel car, to compensate for purchases that were made in good faith at a time when diesel vehicles were incentivised.

Conditions for Taxis and Private Hire Cars

The conditions for taxis and private hire cars (PHC) licences have been altered to help improve air quality. Emissions reduction is expected through the introduction of an age limitation and vehicle engine (emission) policy. As of 1 April 2020, any new licensed taxi or PHC vehicle (or a replacement vehicle under an existing taxi/PHC licence) will require to be Euro 6 engine standard.

Local Priorities and Challenges

Continuing economic growth in the city and wider region presents a challenge for air quality. Population growth has inevitable demand for all modes of transport and supported infrastructure.

The Council is preparing a new Local Development Plan for Edinburgh called the City Plan 2030, which will set out policies and proposals for development in Edinburgh between 2020 and 2030. The first stage of preparing the Plan is to consult on changes through the main issues report, 'Choices for City Plan 2030'. This will set out the changes the Council wishes to make in the next plan and how views will be gathered on these. Responses to the 'Choices' will help preparation of the new Plan which will be published in summer 2020.
Alignment with local air quality management and developing local and national air quality strategies will be crucial to ensuring sustainable economic growth.

Priorities for the Council in terms of air quality in 2019/20 will be:

- **Revision to the current NO_2 Air Quality Action Plan** (last revised 2008). This is being developed in conjunction with the City Mobility Plan (new Local Transport Strategy) and the review of the Cleaner Air for Scotland Strategy.
- **Progressing the LEZ.** The Council will continue to work with the Scottish Government to develop a proposed scheme for an LEZ, which is to be in place by the end of 2020. Work will continue with SEPA and Transport Scotland to fully assess the implications of such a scheme, under the National Low Emission Framework and the National Modelling Framework. A preferred LEZ scheme will be finalised, as set out in the provisions of the forthcoming Transport (Scotland) Bill and associated Regulations.
- **Finalise Draft Salamander Street Air Quality Action Plan** for PM_{10} in conjunction with SEPA, Forth Ports and relevant stakeholders to ensure levels are brought in line with the legal objectives. The challenge will be to ensure the downward trend in PM_{10} concentrations in the area can be sustained, as new residential development is proposed in and around the area**.** Progress has been slower than expected due to prioritisation of LEZ development work. New equipment measuring particulates (PM_{10} and $PM_{2.5}$) has been installed on the western edge of the AQMA to increase spatial monitoring coverage**.**

Further local priorities are summarised below: -

- Continue to work with Lothian Buses to improve fleet standard,
- Continue ECO Stars scheme,

- Continue the roll out of telematics across the Council Fleet, following its early integration into the high-polluting Refuse Collection Vehicles,
- Complete outstanding SCOOT development and repair work,
- Commence installation of on-street electric vehicle charging infrastructure to strengthen the existing network,
- Continue support for the Active Travel Action Plan
- Undertake the Real-World Emissions Driving Study to support the National Modelling Framework and provide local insight to help inform Action Planning.

How to Get Involved

Individual decisions can make a big difference to improving air quality for example, rethinking your journey to lower your pollution footprint.

Further information on how you can help improve air quality can be found by clicking on the link below:

http://www.scottishairquality.scot/what-can-i-do/

QuietRoutes are Edinburgh's walking and cycling routes, which avoid the busy main roads. The link below directs you to the route maps:

http://www.edinburgh.gov.uk/info/20087/cycling_and_walking/1475/explore_quietroutes

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1. Local Air Quality Management

This report provides an overview of air quality in Edinburgh during 2018. 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) is summarises the work being undertaken by the City of Edinburgh 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		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	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
	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
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	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
Lead	0.25 µg/m^3	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives. A summary of AQMAs declared by the City of Edinburgh Council can be found in Table 2.1.

Further information related to declared AQMAs, including maps of AQMA boundaries are available online at http://www.edinburgh.gov.uk/airquality. The AQMAs can also be viewed on the Council's air quality monitoring network map at the following link: https://edinburghcouncil.maps.arcgis.com/apps/webappviewer/index.html?id=dc93485b492947d0b2182c75aca4c554

Edinburgh has declared six AQMAs in total, five are due to road traffic sources of nitrogen dioxide and one is related to different sources of particles (PM_{10}) including industrial and fugitive emissions, road traffic and re-suspended road dust.

Table 2.1 – Description of Declared Air Quality Management Areas

Central AQMA	**Declared 31/12/2000**
Includes area of city centre and main arterial routes leading into the centre. Exceedances mostly in locations where there are street canyons, high percentage of bus movements and congested traffic. Residential properties at basement, ground, first, second, third, and fourth level, 2 – 4 metres from road edge. Busy shopping areas include Princes Street, George Street, Dalry/Gorgie Rd, Leith Walk, North Bridge, West Port, Grassmarket, London Road and Easter Road. Upwards road gradient Leith Walk, North Bridge (south bound) and West Port. **Source of pollutant** – traffic.	
Pollutant	**Amendments**
NO_2	**09/03/2009** Extended to include West Port – Amended to cover hourly breach as well as annual breach of NO_2 air quality objective. **26/04/2013** Extended to include Gorgie Road / Chesser, Grassmarket/Cowgate and London Road/Easter Road **2015** Extended to include Angle Park Terrace and Clerk Street/Nicolson Street areas
	Continued overleaf/…

St John's Road AQMA	Declared 31/12/2006
Part of the A8 route at Corstorphine area. Residential properties at ground, first, second, third and fourth floor level within 2m of kerb edge. Street canyon effect in part. Busy shopping area. Congested flat road with high percentage of bus movements. **Source of pollutant** – traffic.	
Pollutant	**Amendments**
NO_2	**09/03/2009** Amended to cover hourly breach as well as annual breach of NO_2.

Great Junction Street AQMA	Declared 09/03/2009
The full length of road to the depth of the building facades, including the Ferry Road Junction area. Residential properties at first, second, third and fourth floor level. Street canyon, congested traffic and busy shopping area. Receptors close to road edge. High percentage of bus movements. **Source of pollutant** - traffic	
Pollutant	**Amendments**
NO_2	**26/04/2013** Extended to include Bernard Street, Commercial Street and North Junction Street.

Glasgow Road AQMA	Declared 26/04/2013
Part length of A8, between Newbridge Roundabout and Ratho Station, to the depth of the building facades. **Source of pollutant** – traffic.	
Pollutant	
NO_2	

Inverleith Row AQMA	Declared 26/04/2013
The road comprising the junction of Inverleith Row and Ferry Road, to the depth of building facades. **Source of pollutant** – traffic.	
Pollutant	
NO_2	

Salamander Street AQMA	Declared 20/01/2017
A section of the A199 including Salamander Street, Baltic Street, Bernard Street, and part of Seafield Road; an area to the north east as far as the East Sands of Leith and south of Baltic Street, extending to Queen Charlotte Street and Links Place **Source of pollutant** industrial, fugitive emissions, traffic, re-suspended road dust	
Pollutant	
PM_{10}	

2.2 Progress and Impact of Measures to address Air Quality in Edinburgh

The City of Edinburgh Council has taken forward a number of measures during the current reporting year of 2018/2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.18.

More details on these measures can be found in the following Air Quality Action Plans (AQAPs):

Action Plan for Area Designated 31st December 2000 (July 2003)[1] and Air Quality Action Plan (Revised 2008)
http://www.edinburgh.gov.uk//download/downloads/id/321/air_quality_action_plan

The City of Edinburgh Council's, 'Transport 2030 Vision', provides an overarching 20-year strategy for the future development of transport in Edinburgh from 2010. Its ambition is 'to make Edinburgh's transport system one of the most environmentally friendly, healthiest and most accessible in northern Europe'. This document provides the framework which shaped the current Local Transport Strategy 2014-2019.

http://www.edinburgh.gov.uk//download/downloads/id/355/transport_2030_vision

There are several key policies identified in Edinburgh's Local Transport Strategy 2014 to 2019 (LTS) which contributed towards improving air quality. The Council's existing 5-year local transport strategy is due to be replaced by a 'City Mobility Plan' (CMP), that will cover a 10-year period to 2030 and determine the strategic direction for mobility, set objectives, and inform related priorities, resources, and investment. The draft City Mobility Plan will be presented to the Council's Transport and Environment Committee in December 2019 for public consultation.
http://www.edinburgh.gov.uk/download/downloads/id/3525/local_transport_strategy

Other significant policy issues are contained in separate action plans and policies;

- Active Travel Action Plan (2016 Refresh)
  http://www.edinburgh.gov.uk/downloads/file/7316/active_travel_action_plan_2016_refresh
- Public and Accessible Transport Action Plan
  http://www.edinburgh.gov.uk//download/downloads/id/357/public_and_accessible_transport_action_plan

- The Council also has an Action Plan 2012-2014 for a Sustainable Edinburgh 2020 and a Sustainable Energy Action Plan 2015 (see section 2.3 below). http://www.edinburgh.gov.uk//download/downloads/id/1632/sustainable_edinburgh_2020_action_plan_2012-20144
- Scotland's low emission strategy, Cleaner Air for Scotland (CAFS) was launched in November 2015 by the Scottish Government, aiming to deliver more effective and efficient policy direction and guidance to achieve reduction in emissions by 2020. A review of the strategy was announced late 2018, to consider the progress of the CAFS Strategy to date, assess the current state of Scotland's air quality and possible future trajectories, identify evidence and activity gaps and finally, provide advice and recommendations on priorities for further action. On 29th August 2019, the independent Chair for the review, Professor Gemmell Campbell published a set of recommendations, following reports by expert working groups relating to health & environment, transport, placemaking and agriculture, industrial & domestic emissions. A consultation process is currently underway on the recommendations, with the Scottish Government aiming to publish a revised CAFS strategy in 2020. http://www.scottishairquality.co.uk/assets/documents/news/Cleaner_Air_for_Scotland_Nov_2015.pdf
- A key element of the current CAFS strategy is the National Low Emissions Framework (NLEF), which was published in January 2019. The NLEF provides a methodology for local authorities to undertake air quality assessment to inform decisions on transport related actions to improve air quality, where transport is identified as the key contributor to local air quality problems. It is designed to support and build on the work already being done through Air Quality Action Planning, incorporating elements of the CAFS strategy into the Local Air Quality Management (LAQM) regime. Completion of NLEF screening assessments is a component of the 2017/18 Programme for Government (PfG) commitment that Scottish Government will 'with local authorities, introduce Low Emission Zones (LEZs) into Scotland's four biggest cities between 2018 and 2020, and into all other Air Quality Management Areas (AQMAs) by 2023 where the NLEF appraisals advocate such mitigation'. Given that the commitment is to ensure an LEZ in Edinburgh, the

screening process is not necessary. The Council continues to work in close partnership with Scottish Environment Protection Agency (SEPA), Transport Scotland and the Scottish Government to assist in the work of the National Modelling Framework (NMF) which is also a key element in CAFS. The NMF aims to provide the quantitative evidence for assessment of criteria for the NLEF and LEZs in particular. https://www.gov.scot/publications/national-low-emission-framework/

- In September 2019 the Council approved *Edinburgh's City Centre Transformation* - an ambitious plan for a people-focused Capital City Centre, which seeks to "improve community, economic and cultural life". It outlines a programme to enhance public spaces to better support life in the city, by prioritising movement on foot, by bike and by public transport. Across the City Centre, the plan aims to deliver:
    - A walkable City Centre with a pedestrian priority zone and a network of connected, high-quality, car-free streets,
    - High-quality streets and public spaces,
    - A connected network of new segregated and safe cycle routes,
    - Improved public transport journey times, a free city centre hopper bus and public transport interchanges making it easier to switch between rail, bus, tram, taxi, bike and walking routes,
    - An accessible City Centre where people of all ages and abilities can explore with lifts, shop mobility and wayfinding, and;
    - Reallocation of space through a significant reduction of on-street parking.

  The Council will therefore need to undergo a re-evaluation of traffic management priorities in the City Centre, while also taking cognisance of the development of the Low Emission Zone and the emerging City Mobility Plan.

  http://www.edinburgh.gov.uk/CET/info/6/about/12/about

- 'Open Streets' is the name given to the Council's programme of monthly street closures, that aim to help people experience the city in a quieter, more people-focussed environment, while helping the Council to monitor congestion, and

travel behaviours, to inform future plans. The programme launched in May 2019 and will run until December 2020, supported by funding from Sustran's, Places for People programme. https://www.edinburgh.gov.uk/connectingplaces/info/9/consultation/20/open_streets_consultation

- The conditions for taxis and private hire cars licences have been altered to help improve air quality. Emissions reduction is expected through the introduction of an age limitation and vehicle engine (emission) policy. As of 1 April 2020, any new licensed taxi or PHC vehicle (or a replacement vehicle under an existing taxi/PHC licence) will require to be Euro 6 engine standard.

2.2.1 Completed measures

Key completed measures from the AQAP and LTS are set out below including outcomes if known.

Transport Planning and Infrastructure Projects

Tramline 1

The Trams operate from Edinburgh Airport to a temporary stop at York Place in the city centre, becoming operational on 30th May 2014. Passenger journeys have increased each financial year since 2014/15. See Table 2.2.

Table 2.2 Annual Trams Passenger Numbers

Year relates to financial year	Passenger journeys
April 2014 to March 2015*	4.1 million
April 2015 to March 2016	5.3 million
April 2016 to March 2017	5.8 million
April 2017 to March 2018	6.8 million
April 2018 to March 2019	7.5 million

* Incomplete year as Edinburgh Tram became operational at the end of May 2014.
Data obtained from Department of Transport light rail and tram statistics.

The final business case for the Trams extension from York Place to Newhaven/Leith was approved by the Council in March 2019, to ensure completion of the original Line 1a. Construction is due to start in Autumn 2019 with passenger services anticipated in 2023. Annual forecast demand for the existing system is 8.7 million passenger

journeys for 2023. This compares with observed demand of 7.5 million in 2018/19. With the extension, the overall demand almost doubles to 15.7 million in 2023.

Rail Improvements

In recent years, new rail lines have been constructed which serve the Edinburgh area. It is anticipated that air quality benefits to the city are being delivered due to commuter model shift from road to rail.

Airdrie- Bathgate- Edinburgh rail links

The above new rail line became operational in 2010.

Newcraighall - Portobello - Edinburgh- Fife rail links

Edinburgh to Newcraighall rail link became operational in 2002. In 2013, an additional platform at Brunstane (Portobello/Joppa) was constructed.

Borders rail link

The thirty-mile rail-link between Galashiels in the Scottish Borders to Edinburgh Waverley Station was reinstated and became operational in September 2015.

Edinburgh Glasgow Improvement Programme (EGIP)

EGIP is a comprehensive package of improvements to Scotland's railway infrastructure that includes modernisation and upgrades to key junctions and infrastructure, as well as widespread electrification of the Scottish rail network. So far, the project has resulted in a new railway station and interchange at Gogar, called the Edinburgh Gateway station, which opened on 1 December 2016. It is a rail interchange with Edinburgh Trams and therefore an important link to Edinburgh Airport. Platforms at Waverley Station in the city centre have also been extended to accommodate longer trains as a part of the EGIP, in preparation for future growth in capacity.

Alternatives to private vehicle use

Park and Ride (P&R)

The City of Edinburgh Council has several Park and Ride locations around the periphery of the city boundary, and is also served by Park and Rides in East Lothian, Midlothian and Fife as shown in Table 2.3. The current number of spaces available

has the potential to reduce the two-way daily work commuter traffic by 11,280 vehicles if operated at maximum capacity.

Newcraighall and Wallyford also have rail accessibility and Ingliston is connected to Edinburgh Trams service. There has been a 10% increase in usage at Ingliston between 2017 and 2018, while at Hermiston usage dropped slightly over the same period. Details are shown in Table 2.4. Straiton continues to average around 30,000 cars per year. Usage for the other park and ride sites was not known at time of reporting.

Land has been acquired at Hermiston for development of the P&R extension, however funding has yet to be allocated. This would more than double the capacity.

Table 2.3 – Park and Ride sites serving Edinburgh.

Park and Ride Site	Total Number of Parking Spaces
Hermiston	450
Ingliston*	1082
Wallyford, East Lothian**	321
Newcraighall, East Lothian**	565
Sheriffhall, Midlothian	561
Straiton, Midlothian	600
Ferrytoll, Fife	1040
Halbeath, Fife	1021
Total	**5640**

* Trams accessible ** Rail connections also accessible

Table 2.4 – Ingliston and Hermiston Park and Ride usage

	2012	2013	2014	2015	2016	2017	2018
Ingliston	79,740	105,155	119,834	195,587	227,231	255,952	284,640
Hermiston	N/A	N/A	N/A	N/A	103,055	103,690	101,856

N/A - Not available

Traffic Management

Newbridge Roundabout (Glasgow Road AQMA)

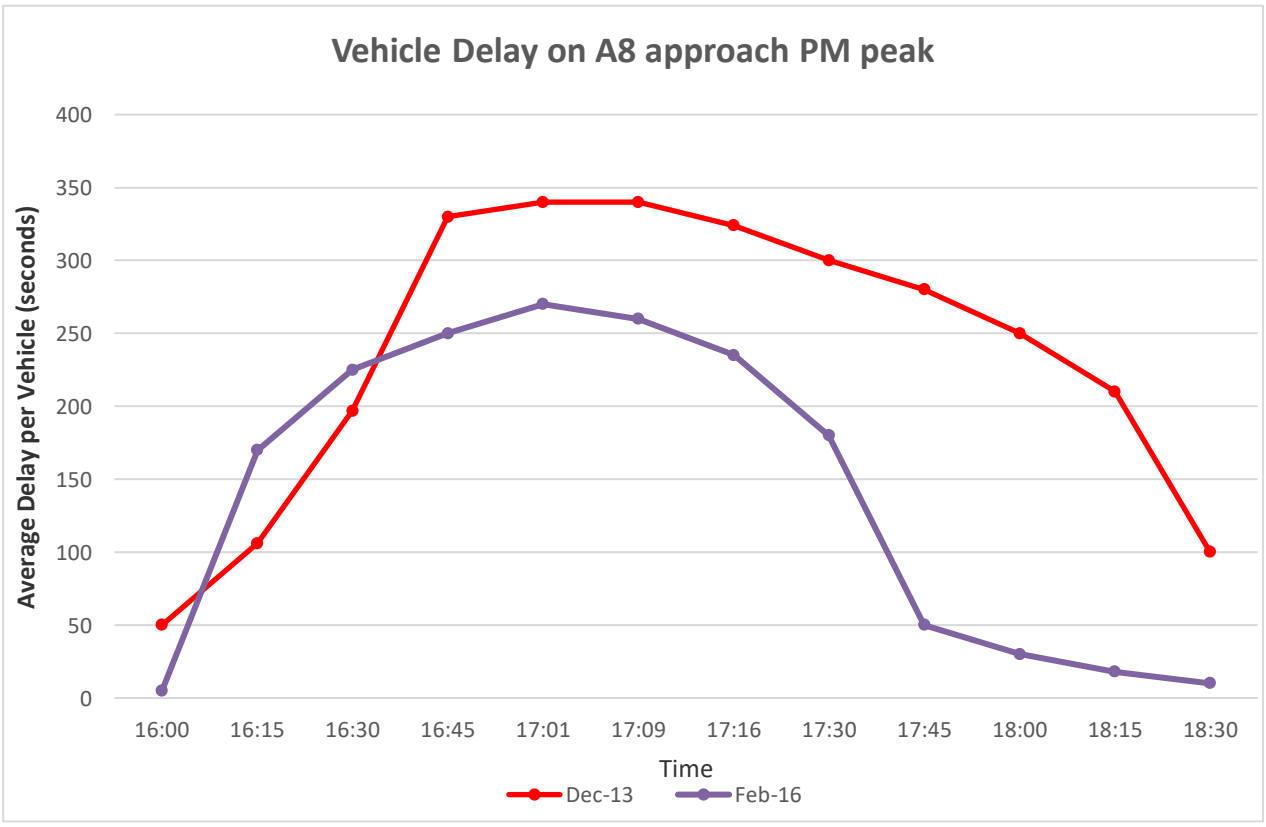
The ‘non-cable linked fixed- time’ traffic signalling which controlled Newbridge Roundabout was replaced in 2015 with a Microprocessor Optimised Vehicle

Actuation (MOVA) system, following a feasibility study which looked at a few options[2]. The modelled emission reductions for NOx, PM_{10} and CO_2 were as follows for the afternoon peak period, 47%, 29% and 43%. The vehicle queue length for the pm afternoon period on the A8 approach was estimated to reduce from 790m to 72m.

This system became fully operational in February 2016.

Vehicle time delays were assessed pre-and post-installation of MOVA. Results show that there has been a significant reduction in waiting time on the A8 westbound corridor. For example, an average of 4 minutes and 10 seconds' delay per vehicle is saved between 17:45 to 18:00, thereby leading to reduced idling and less and stop/start events.[3] A graph illustrating the average delay per vehicle pre-and post MOVA is shown in Figure 2.1.

Figure 2.1 – Average delay per vehicle (westbound pm peak) on A8 Glasgow Road



Nitrogen dioxide concentrations increased at a site on the westbound carriageway in 2018 - site ID16, 39µg/m^3, compared to 35µg/m^3 in 2017. Data capture was very poor at the adjacent site, so an annual mean calculation was not possible. On the east bound carriageway concentrations were mixed in terms of comparisons from the

previous year, however results continue to show an exceedance of the annual mean objective (Site ID58 45µg/m^3) within the AQMA.

Historically, Transport Scotland have received complaints about queuing on the M9 slip, leading to the Newbridge roundabout and consideration has been given to alternations to the roundabout. Air quality would have to be a major factor in any changes, as concentrations remain above the legal objective.

Reduction of speed limits, 20mph zones

The City of Edinburgh Council has introduced a 20mph speed limit across the city, covering the city centre, main shopping streets and residential areas while retaining a strategic network of roads at 30mph and 40mph. The scheme has been introduced primarily for road safety purposes, however it is also anticipated to improve travelling conditions across the city for walking and cycling, which will encourage modal shift.

There is uncertainty with respect to any direct improvements it will have on air quality. The project monitoring framework will take cognisance of (LAQM) pollution concentration trends analysis.

Vehicle Fleet Efficiency

Driver training and ECO driving aids

The Council obtained Scottish Government air quality grant funding in 2010/2011 to trial a telematics system and assess the delivery of fuel efficiencies through improved vehicle and driver management. The trial was carried out on a collaborative basis with the system provider Masternaut (Cybit) UK Ltd. Fifteen vehicles which operate within AQMAs were selected for the trial. The analysis report showed overall positive outcomes as summarised in Table 2.5.[4]

Table 2.5 – Changes observed following Eco- Driving instruction

Parameter measured between Benchmark and Go live	Percentage Change
Decrease in average miles	30.5%
Reduction in average idling time	26.5%
Reduction in harsh events	18.5%
Improvement in MPG	4.3%
Reduction in average weekly fuel litres	4.1%
Reduction in CO_2 output	4.2%

The Council plans to install a telematics system in all Council vehicles with a view to providing data which would enable effective management of the fleet, and contribute to the Council's wider aims of air quality improvement and carbon reduction targets. Installation on the HGV fleet is currently underway. The full Waste fleet is to be completed in Autumn 2019. This was targeted first as it is the heaviest fleet in terms of fuel usage and emissions.

The Council proposes to address engine idling, reduce size of the fleet, and determine the potential for alternative fuel vehicles, such as electric or dual hybrid systems, with the information gained from the telematics data.

2.2.2 Ongoing measures

Vehicle Fleet Efficiency

Promoting low emission public transport

All bus companies operating in Edinburgh continue to improve their fleet, but it has not been possible to achieve the draft Voluntary Emissions Reduction Partnership (VERP) target of 100% Euro 5 by October 2015. It is recognised that substantial financial support is needed to deliver continuing improvement.

Scottish Government provide funding to support the roll out of low emission buses via the Scottish Green Bus Fund, whereby grants are given for up to 80% of the price differential between a low emission vehicle and its diesel equivalent. The Bus Service Operators Grant also incentives use of Low Carbon Vehicles (LCV) by allowing an added payment (per kilometre). This was revised in 2019 with more of an incentive for buses with greater emission savings and zero emission capability.

To support the delivery of Scotland's Low Emission Zones (LEZs), Transport Scotland devised the Bus Emissions Abatement Retrofit (BEAR) programme which allows for buses/coaches to be fitted with CVRAS (Clean Vehicle Retrofit Accreditation Scheme) retrofit technology to improve vehicle emissions to Euro VI standard or better.

In 2017/18 BEAR Phase 1 scheme awarded £1.6 million funding for 42 buses to be converted. £7.89 million was allocated to the delivery of BEAR Phase 2 in 2018/19, with seven applicants awarded funding to retrofit 84 vehicles. The details of the

Phase 3 (2019/20) scheme has yet to be agreed, however there is a total of £8.857 million funding available.

Lothian Buses

Lothian Buses are the main service provider in the urban areas of Edinburgh with a total of 736 vehicles in service. Significant improvements have been achieved since 2006 with the assistance of Scottish Government funding shown in Table 2.6. The yearly improvement is illustrated in Table 2.7.

In 2019, Lothian Buses launched 36 new tri-axel, Euro VI, double deck buses which accommodate more passengers, as part of their Bus 2020 strategy, which will see the whole fleet Euro V and better in 2020. Currently, 18% of the fleet is Euro III. Euro IV standard buses have been eradicated from the fleet. 36 buses are to be retrofitted from Euro V to Euro VI before the end of 2019 (supported by BEAR funding).

Table 2.6 – Number of older vehicles retrofitted and new buses purchased

Technology	2011	2012	2013	2014	2015	2016	2017	2018	2019
Retro-fit SCRT Euro III to Euro V/VI (EEV)	43 (A)								
Retro-fit SCTR Euro V to Euro VI									36*
Hybrid double deck vehicles. Euro V	15 (B)								
Hybrid single deck vehicles. Euro V		10 (C)							
Double deck EEV	60 (D)								
Single deck EEV		5 (D)							
Euro IV to V: engine management alterations				26 (D)	49 (D)				
Double deck vehicles. Euro V								54	
Hybrid single deck vehicles. Euro VI			20 (E)	20 (F)					
Hybrid double deck vehicles. Euro VI					20 (G)	20(H)			
Single deck vehicles Euro VI							15(D)		

Technology	2011	2012	2013	2014	2015	2016	2017	2018	2019
Double deck vehicles Euro VI				25 (D)		55 (D)	45(D)		
Tri-axle double deck Euro VI									36
Electric single deck vehicles							6(I)		
Plaxton coaches Euro VI									14

KEY: A Lothian Buses contributed to total cost of £500,000 (Lothian Buses £243,000, CEC £50,000 and Scottish Government £207,000)

B Total cost £5M (Scottish Government £1M Green Bus Fund (1)

C Total cost £2.65M (Scottish Government £750,000 Green Bus Fund (2)

D Lothian Buses self-funding

E Scottish Government £1.5M Green Bus Fund (3)

F Scottish Government £1.05M Green Bus Fund (4)

G Scottish Government £1.5M Green Bus Fund (5)

H Scottish Government £1.5M Green Bus Fund (6)

I Scottish Government £1M Green Bus Fund (7)

* To be delivered in 2019

Table 2.7– Euro Standard of service bus fleet (Lothian Buses 2006 to 2019)

Euro Standard	Base 2006	Oct 2011	Aug 2012	May 2013	May 2014	Mar. 2015	May 2016	Mar. 2017	Aug 2018	Aug 2019
Pre-Euro	63 10%	0	0	0	0	0	0	0	0	0
Euro I	33 5%	0	0	0	0	0	0	0	0	0
Euro II	202 32%	7 1%	12 2%	0	0	0	0	0	4 0.5%	0
Euro III	317 52%	257 43%	254 42%	251 41%	273 43%	233 36%	222 33%	228 31%	170 21%	139 18%
Euro IV	0	79 13%	81 13%	81 13%	75 12%	55 9%	6 1%	6 1%	7 1%	0
Euro V	0	141 23%	141 23%	141 23%	147 23%	186 29%	258 39%	258 36%	287 35%	228 32.8%
EEV (V/VI)	0	117 20%	117 19%	142 23%	146 23%	104 16%	85 13%	85 11%	94 12%	108 10.9%
Euro VI	0	0	0	0	1 <1%	65 10%	97 14%	151 21%	249 30%	255 37.5%

Euro Standard	Base 2006	Oct 2011	Aug 2012	May 2013	May 2014	Mar. 2015	May 2016	Mar. 2017	Aug 2018	Aug 2019
Electric	0	0	0	0	0	0	0	0	6 1%	6 0.8%
Total	**615**	**601**	**605**	**615**	**642**	**643**	**668**	**728**	**817**	**736**

Data provided by Lothian Buses, August 2019

As part of a £6.5 million investment in 2016, all Euro II City Tour buses were replaced with 30 Euro VI vehicles. See Table 2.8. The new buses are also quieter and therefore beneficial with respect to noise pollution. In 2018 Euro II buses were introduced to the fleet to provide service for private hire and bespoke, special events and a further 6 buses were added to the fleet in 2019. These are of an improved Euro V standard, Euro V EEV.

Table 2.8 – Euro Standard of City Tour Bus fleet (Lothian Buses) 2010 to 2019

Euro Standard	Oct 2011	Aug 2012	May 2013	May 2014	Mar 2015	Sept 2016	Mar 2017	Aug 2018	Aug 2019
Pre-Euro	0	0	0	0	0	0	0	0	0
Euro I	0	0	0	0	0	0	0	0	0
Euro II	45	38	38	44	44	0	0	4	3
Euro III	0	1	1	1	1	0	0	0	0
Euro IV	0	0	0	0	0	0	0	0	0
Euro V	1	1	1	2	2	0	0	0	0
Euro V EEV	0	0	0	0	0	0	0	0	6
Euro VI	0	0	0	0	0	30	30	30	30
Total	**46**	**40**	**40**	**47**	**47**	**30**	**30**	**34**	**39**

Data provided by Lothian Buses, August 2019

Lothian Buses deploy their highest Euro standard vehicles on high-frequency services and those routes which transit AQMAs e.g. Airlink100 and service 22 which both pass through the Central AQMA and St John's Road or Great Junction Street AQMAs, respectively. The deployment of Euro V standard buses or better in AQMAs is shown in Table 2.9.

Table 2.9 – Deployment of Euro V standard or better Lothian Buses in AQMAs

Service Number	Euro Standard
Central AQMA	
4, 5, 10, 14, 19, 23, 27, 29, 37, 41, 47, 49, x15	Euro V double deck
1	Euro V hybrid single deck / Electric

Service Number	Euro Standard
31	Euro V double deck and Euro VI double deck
30, 12, 24, 36	Euro VI hybrid single deck
34	Euro VI hybrid double deck
Skylink 300 (Airport)	Euro VI hybrid double deck and Euro VI double deck
3, 7, 8, 11, 16, 22, 26, 33, Airlink100 (Airport)	Euro VI double deck
Tour Bus fleet	Euro VI double deck
St John's Road AQMA	
31	Euro V double deck and Euro VI double deck
Airlink100	Euro VI double deck
12	Euro VI hybrid single deck
26	Euro VI double deck
Great Junction St AQMA	
10, 14, 49	Euro V double deck
12, 36	Euro VI hybrid single deck
34	Euro VI hybrid double deck
Skylink 200	Euro VI hybrid double deck and Euro VI double deck
7, 11, 16, 22	Euro VI double deck
Majestic Tour	Euro VI double deck
Inverleith Row AQMA	
14, 23, 27	Euro V double deck
8	Euro VI double deck
Majestic Tour	Euro VI double deck
Inverleith Row AQMA	
8	Euro VI double deck
21	Euro V double deck
23, 27	Euro V EEV

Data provided by Lothian Buses, August 2019

Lothian Buses continue to be committed to reducing the emissions from their fleet and to invest in low emission vehicles as part of their fleet replacement strategy. Currently 82% of the main bus fleet is Euro V or better.

Lothian Motorcoaches was launched in June 2018 and sits alongside the Edinburgh Bus Tour operation, offering bespoke day tours as well as private hire services. There is currently a fleet of 35 coaches, of which 83% are also Euro V or better. These vehicles operate from a new depot at Newbridge.

New Lothian Country Bus services are serving the West Lothian region, including Livingston, Bathgate and Broxburn, while new services from Queensferry provide a direct link to Edinburgh City Centre.

First Scotland East

First Scotland East has a total of 113 buses available to operate in the Edinburgh area, from Livingston and Falkirk bases. There are two frequent services which use the A8 corridor and therefore go through the Glasgow Road, St John's Road and Central AQMAs, whereby the less frequent airport service passes through the Glasgow Road AQMA only. The new tour bus service operates wholly in the Central AQMA, as does the 24/25 Services, which passes through from the south west of the City. The fleet standard is shown in Table 2.10.

Table 2.10 – First Scotland East fleet in Edinburgh (2011-2019)

Euro Standard	2011	2013	2014	2015	2017	2019
Euro I	23 7%	0	0	0	0	0
Euro II	149 45%	0	0	0	0	4 4%
Euro III	116 35%	75 69%	53 52%	84 54%	0	16 14%
Euro IV	33 10%	24 22%	31 30%	32 21%	43 27%	23 20%
Euro V	9 3%	10 9%	18 18%	37 24%	65 42%	25 22%
Euro VI	0	0	0	0	48 31%	45 40%
Total vehicles	**330**	**109**	**102**	**153**	**156**	**113**

Data provided by First Scotland East, August 2019

The fleet has reduced overall and the number of Euro IV and V vehicles more than halved. Although there are three fewer Euro VI buses than in 2017 and Euro II and III

vehicles have been introduced into the fleet, First Bus is committed to reducing emissions from their fleet as a part of their fleet replacement and upgrade strategies.

Stagecoach East Scotland

There are 84 buses in the Stagecoach East Scotland fleet operating on services into Edinburgh. The majority of these buses pass through the Queensferry Road corridor into the City Centre (and Central AQMA), while the JET Airport Service from Fife, goes through the Glasgow Road AQMA.

In November 2017, a fleet renewal of the JET service, brought all of the buses up to Euro VI standard. Euro IV buses were eradicated from the fleet in 2018. The current Euro class status of the Stagecoach East Scotland fleet operating in Edinburgh is shown in Table 2.11.

Table 2.11. Stagecoach East Scotland fleet operating in Edinburgh (2011-2019)

Euro Standard	2012	2013	2014	2015	2016	2017	2018	2019
Euro I	0	0	0	0	0	0	0	0
Euro II	2 5%	0	0	0	0	0	0	0
Euro III	4 10%	4 10%	8 14%	5 9%	0	0	0	0
Euro IV	27 69%	27 64%	33 59%	34 59%	10 17%	10 17%	0	0
Euro V	6 15%	11 26%	15 27%	19 33%	38 63%	34 56%	30 42%	36 43%
Euro VI	0	0	0	0	12 20%	16 27%	41 58%	48 57%
Total	**39**	**42**	**56**	**58**	**60**	**60**	**71**	**84**

Data provided by Stagecoach, September 2019

Citylink

Citylink operate several ‘inter-city’ type coach services between destinations across Scotland. The services are subcontracted to a range of different bus operators, consequently many of the vehicles are not directly owned by Citylink.

All services into Edinburgh pass through the Glasgow Road AQMA, St Johns Road AQMA or Central AQMA.

The status of the vehicles Citylink operate into Edinburgh is shown in Table 2.12. Euro III and IV vehicles have been eradicated from the fleet and the company has plans to ensure all of the vehicles operating on the 900 (Glasgow to Edinburgh) and AIR (airport) services are replaced. This will reduce the number of Euro V vehicles from 19 to 11.

Table 2.12 – Citylink fleet in Edinburgh, 2015, 2016 and 2019,

Euro Standard	May 2015	July 2016	Oct. 2019
Euro I	0	0	0
Euro II	0	0	0
Euro III	2 (4%)	1 (2%)	0
Euro IV	0	6 (12%)	0
Euro V	43 (92%)	37 (72%)	19 (37%)
Euro VI	2 (4%)	7 (14%)	32 (63%)
Total	**47**	**51**	**51**

Data supplied by Citylink October 2019.

Fleet efficiency recognition schemes

The freight sector has been a more demanding group for local authorities to co-ordinate. A key action for the Scottish Government and Transport Scotland under CAfS is to encourage Freight Quality Partnerships to extend their activities to consider the environmental impact of freight transport; and encourage local authorities with AQMAs to create a Freight Quality Partnership.

To persuade road freight operators to voluntarily reduce their emissions, the Council became a partner in an EU-funded project, ECO Stars Europe, through which the ECO Stars Edinburgh scheme was established.

This is a voluntary, free to join fleet recognition scheme that provides bespoke guidance on environmental best practice to operators of goods vehicles, buses and coaches, whose fleets regularly serve Edinburgh area.

The scheme was launched in January 2012 and to date 241 operators have joined with a total of 9,254 vehicles. Most members are freight/goods vehicle operators (100), followed by passenger transport (33), waste and recycling (10) and public-sector fleets (2). Ninety-six members fleets are ancillary to the main use of their business.

Progress made with ECO Stars Edinburgh is detailed in Table 2.13.

Table 2.13 - ECO Stars Edinburgh Scheme – Progress from 2012 to 2019

Year	Number of vehicles	Number of operators
2012 (May)	1,684	14
2013 (May)	2,900	35
2014 (May)	3,525	51
2015 (June)	5,048	84
2016 (August)	6,089	129
2017 (May)	7,061	154
2018 (August)	8,001	200
2019 (August)	9,254	241

Additional funding has been secured to continue the scheme during 2019/20 from the Scottish Government Air Quality Action Plan grant.

Council Fleet

The Council is committed to leading by example through the acquisition of lower emission vehicles for its own fleet, as set out in Policy ENV2 of the Local Transport Strategy 2014 to 2019. The degree of ongoing fleet improvement is set out below.

Table 2.14 - Improvement in City of Edinburgh Council fleet 2003 to 2019

Euro Standard	2003	2013	2014	2015	2016	2017	2018	2019
Pre-Euro	12 1%	0	0	0	0	0	0	0
Euro 1/I	96 12%	0	0	0	0	0	0	0
Euro 2/II	374 45%	0	0	0	0	0	0	0
Euro 3/III	338 41%	38 4%	44 5%	44 5%	21 2%	15 2%	14 2%	12 1%
Euro 4/IV	12 1%	476 50%	476 49%	183 19%	238 26%	217 25%	221 24%	188 19%
Euro 5/V	0	430 45%	440 45%	708 73%	532 58%	497 56%	376 42%	337 34%
Euro 6/VI	0	0	0	10 1%	104 11%	128 15%	267 30%	433 43%
Electric	0	10 1%	11 1%	27 3%	27 3%	25 3%	25 3%	33 3%
Total	**832**	**954**	**971**	**971**	**921**	**882**	**903**	**1003**

The proportion of Council's fleet Euro 6/VI and above, continues to increase - from 33% to 46% between 2018 and 2019. The number of electric vehicles in the fleet is now 33. Transport Scotland's Switched On Fleets fund will be utilised this year for medium-term contract hire of 17 electric vehicles (EVs). Further part-funding is being sought for the purchase of new EVs, with aspirations for the car fleet being fully electric by the end of the 2019/20 financial year.

Funding has also been secured to purchase an electric 15-tonne mechanical Street Sweeper. The Council is the first in Scotland to have one of these, which will enter service before the end of 2019.

Promoting Low Emission Transport

Managing traffic emissions via mandatory Low Emission Zone

The Transport (Scotland) Bill was introduced to the Scottish Parliament in June 2018 and is currently progressing through the parliamentary process. This will provide legislation that enables the creation and civil enforcement of low emission zones in Scotland. The Bill will allow the government to set consistent national standards for a number of key aspects of low emission zones (LEZs) including emissions, penalties, certain exemptions and parameters for grace periods. Local authorities will then have the powers to create, enforce, operate or revoke a LEZ in their areas. The Bill is progressing through Parliament, with Stage 3 completed on 10 October 2019. Transport Scotland is developing regulations that will set out much of the detail informing how LEZs will operate. Transport Scotland has advised that consultation on the content of the Regulations will be underway from the Autumn 2019, with development of the Regulations continuing into 2020.

The Scottish Government has committed to work with Scotland's four biggest cities Glasgow, Edinburgh, Aberdeen and Dundee, to introduce LEZs in those cities by 2020. The City of Edinburgh Council has agreed to progress an LEZ scheme in conjunction with the development of the local transport strategy (City Mobility Plan (CMP)) and Edinburgh City Centre Transformation (CCT) programme. In autumn 2018 the Council consulted on 'Connecting our City, Transforming our Places', a prospectus incorporating these strategies. The prospectus set out a number of ideas for improving the city including the introduction of a city centre and city-wide LEZ. At the time, SEPA also published their initial report under the Cleaner Air for Scotland

National Modelling Framework (NMF), 'Air Quality Evidence Report – Edinburgh', which aims to support the development of the LEZ scheme. The report detailed the modelling methods used in the assessment work as well as the model performance, initial results, source apportionment work and scenario testing. A link to the report can be found here; Interim Report . The report focus' on Nitrogen Dioxide (NO_2), recognising that Particulate Matter (PM) modelling will be included in further work. The main findings indicated that NO_2 emission reductions of between 50 to 75% may be required on 2016 baseline modelled concentrations in order to meet the 40 µg/m^3 limit value.

The traffic data that informed this work was collected in a mass city wide traffic survey in November 2016. This traffic data collection was undertaken again in June 2019 and as a part of the ongoing work under the NMF, this data will now be used for further assessment work. Early results of the June 2019 traffic survey are available and indicate an encouraging trend in vehicle emission standards, most notably in Light Goods Vehicle (LGV) and bus fleet, as shown in the Table 2.15 below.

Table 2.15 Summary of Automatic Number Plate Recognition (ANPR) Traffic Survey data (City-Wide) in Edinburgh in 2016 and 2019.

	Percentage compliancy* of the different vehicle types				
Date	Cars	LGV	Taxi	HGV	Bus
November 2016	60.6	6.8	19.1	37.4	18
June 2019	68	41.2	43.6	64.4	50

**Compliancy is based on the likely Transport (Scotland) Bill, emission standards of Euro 4 Petrol and Euro 6/VI diesel or better*

Between May and July 2019, the Council consulted on proposals for a LEZ including a city centre zone boundary applying to all vehicle types and a city-wide boundary applying to commercial vehicles (buses, coaches, taxi and private hire, light and heavy goods vehicles). Work is ongoing in respect to the full impact of the scheme and in particular the resultant emission reductions. The next stage of LEZ development will consider what changes should be made to the proposed scheme taking into account feedback from consultation and the 2019 modelling evidence base.

The Council will also commission a Real-World Driving Emission study to support elements of the National Modelling Framework and provide local insight to help inform Action Planning, in general.

Funding to support the implementation of LEZs is being made from the Scottish Government on a year to year basis.

To support the introduction of LEZ's across the different fleets there are other funding streams being developed. As mentioned previously the BEAR, Transport Scotland's Bus Emissions Abatement Retrofit Programme is to announce another phase of funding for buses, and for other vehicle owners there is to be a Low Emission Zone Support Fund that will target specific cohorts of both commercial and private vehicle owners affected by the introduction of LEZs in Scotland.

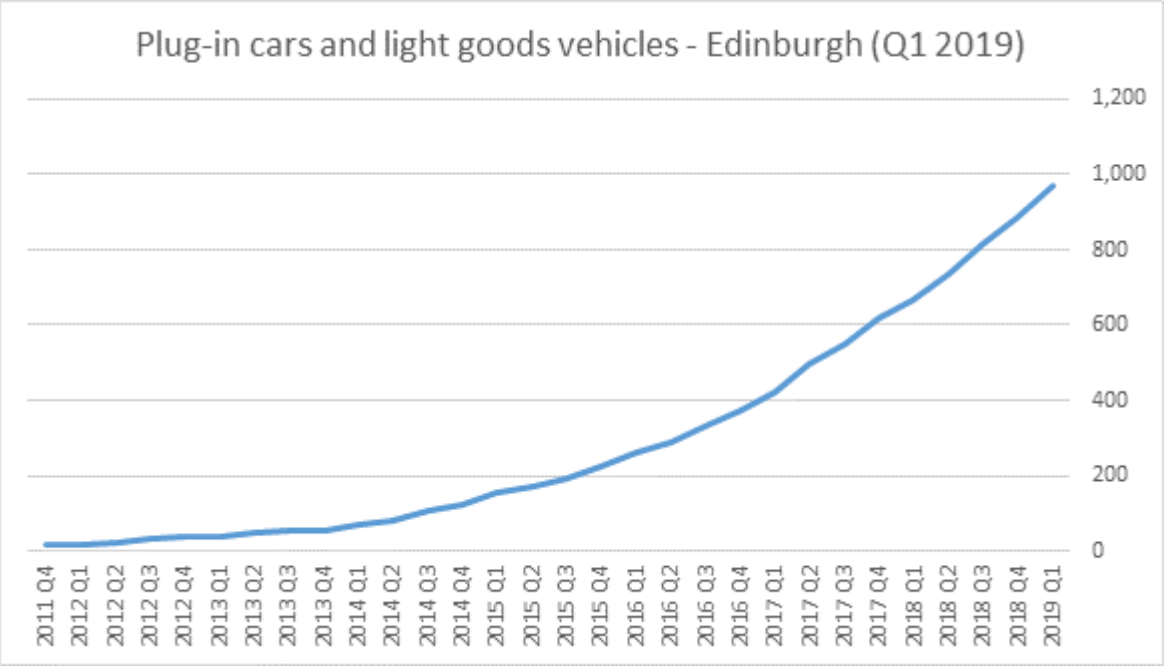
Promotion of electric vehicle charging infrastructure

In December 2017, the Council approved Edinburgh's first Electric Vehicle (EV) Action Plan, with the key purpose of developing a strategic and co-ordinated approach to charging hubs. This was to encourage the uptake of EVs, while reducing carbon emissions, improving air quality and unlocking wider economic benefits.

More recently, the Council approved a Business Case for the installation of on-street EV charging infrastructure and developed a detailed project plan, which identified specific locations for the installation of 66 on-street charging points (including 32 fast chargers, nine rapid chargers and 24 slow chargers) across the City, to strengthen the existing network. The chargers will be installed between January 2020 and December 2020. Funding for the first phase of work up to 2020 has been secured from Transport Scotland via a £2.2m grant. A number of issues such as the specific type of infrastructure, tariff, charging and enforcement regimes require further development.

The Department of Transport's vehicle licensing statistics show that plug-in (electric) vehicles are steadily increasing in Edinburgh (see Figure 2.2). At the end of 2011 there were just 9 plug-in vehicles registered in Edinburgh as of the end of March 2019 there were almost 1,000 vehicles registered in the city.

Figure 2.2 - Cumulative number of electric and plug in hybrids vehicles licensed each quarter in Edinburgh from 2011 to 2019



The Council has previously administered Transport Scotland's Switched on Fleets grant on behalf of the Edinburgh Community Planning Partners. Over the financial year 2016-17 there were a total of eight plug-in vehicles procured by four organisations. In 2017-18 another eight vehicles were procured by three organisations and in 2018-19 a total of 23 plug-in vehicles are earmarked for five organisations. As mentioned above, in 2019/20 the Council has received funding to assist improvement in the electric car fleet, as well as to trial an electric Street Sweeper.

Additionally, Transport Scotland's 'Charge Place Scotland' grant which provides grant funding for EV charging infrastructure has been also administered by the Council. Over the financial year 2017-18, the Council installed two additional 50kW Rapid charging units and one 22kW Fast charging unit. A further six charging units (12 charging points) were upgraded with new more innovative charging units across six sites which included the University of Edinburgh and Queen Margaret University sites.

Funding has been obtained from the Air Quality Action Plan Grant to assist in the development of EV charging infrastructure on the Council's own estate in 2019/20.

Along with the steady increase in plug-in vehicles in Edinburgh, the number of charging sessions and kWh used continues to increase year on year. The following graphs reveal the continued year on year growth of charging infrastructure usage

since 2014. The data is drawn from the Charge Place Scotland back office and covers most of the charging infrastructure within the Council's estate. The actual statistics will be higher than what is represented here, as many sites in the city with charging infrastructure will be operated independently by the host site. The Council also has no data on the number of charging units installed by residents or businesses who have private access to their own off-street parking.

Figure 2.3 Power (kWh) used per month 2014-2019

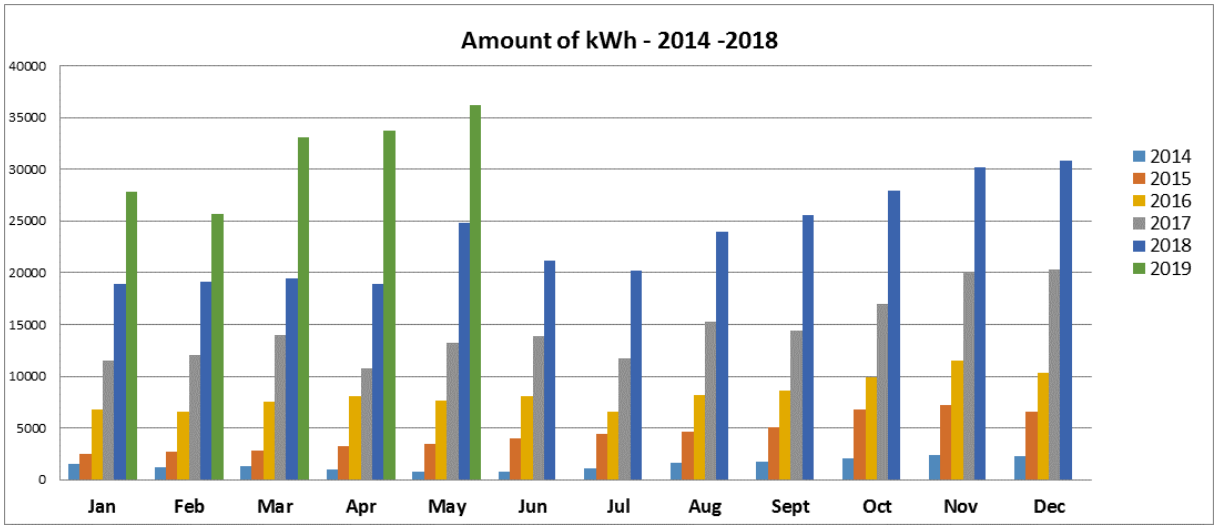
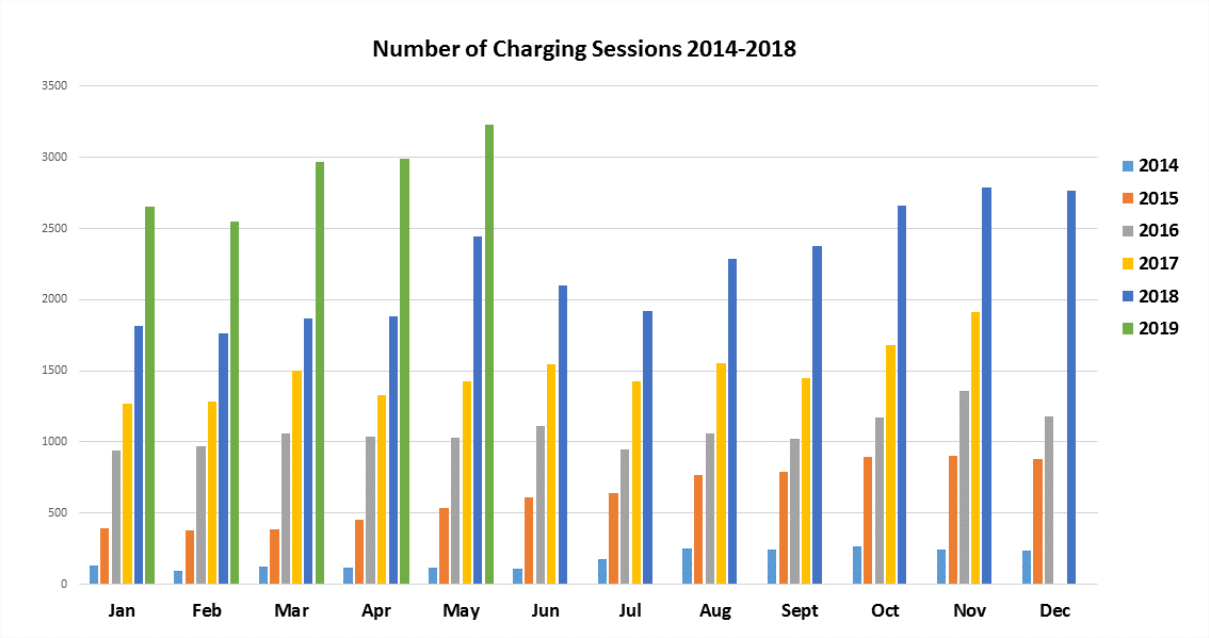


Figure 2.4 Number of charging sessions per month 2014-2019



In association with InnovateUK, the Council will participate in a project considering the benefits and costs of wireless electric vehicle charging. The project overall will bring together logistics modelling expertise from Heriot-Watt University (HWU) and low carbon and vehicle technology, energy infrastructure and commercial knowledge from Flexible Power Systems (FPS), while the Council will function as the vehicle user, with two dedicated vehicles.

Traffic Management

Urban Traffic Control Systems (SCOOT)

Improving traffic flow and reducing idling time are measures which help to improve air quality. Split Cycle Offset Optimisation Technique (SCOOT) systems are automatically responsive to traffic flows and demand and therefore help ease congestion by providing more effective control of traffic signals.

SCOOT infrastructure is in place on many road networks in the city. However, due to ongoing utility works and road improvements, many of the inductive loops have been damaged and require repair and in several locations the system requires validation. This work is ongoing.

Equipment has been installed at the following junctions Lothian Road/ Fountainbridge and West Port/Lady Lawson Street. This however, will initially be run on fixed time until timing options have been explored further.

Air Quality Action Plan Grant funding will assist with SCOOT development in Cowgate, Bridges, London Road and Inverleith Row. In 2019, Gorgie Road, Chesser Avenue and Balgreen Road became fully operational.

Current SCOOT status for the AQMAs is detailed in Table 2.16.

SCOOT systems outwith AQMAs have been installed in the following areas:

- Morningside Road (Holy Corner to Comiston Road and Greenbank Crescent)
- Ferry Road/Pilton Drive
- Pilton Drive/Morrisons
- Ferry Road/East Fettes Avenue
- Dalkeith Road/ East Preston Street to Prestonfield
- Portobello High Street junctions from Fishwives' Causeway to Bellfield Street
- A90 Craigleith to Barnton – Part installed. Target for completion – end of 2019. Funded by section 75 Developer Contributions.
- Chesser Avenue (New Mart Road) to Inglis Green Road (Sainsbury's)
- Causewayside, Hope Park Terrace to Ratcliffe Terrace

Table 2.16 SCOOT status in AQMAs 2019

SCOOT Status	Locations
Central AQMA	
Fully operational	Gorgie Road, Chesser Avenue, Balgreen Road
Operational - Some loop damage noted which is programmed for repair in 2019	Gorgie Road, Westfield Avenue, Robertson Avenue
Fully operational	Ardmillan Triangle (Gorgie / Dalry, Angle Park, Slateford)
Infrastructure installed, but loop repairs and re-validation required. Bridges – majority of loops repaired during resurfacing. Remaining ones to be re-cut and	Bridges, Nicholson Street, Clerk Street/ South Clerk Street

SCOOT Status	Locations
revalidated. Pedestrian crossings will also be linked during daytime hours. Target 2020 Q1	
Temporary traffic management arrangements used during the closure of Leith Street are removed. Following on from this, loops will be repaired and revalidated. Target 2020 Q1	London Road - Easter Road to Marionville Road plus Abbeymount
Provisional approval given for grant funding, to be tendered and installed – Target 2020 Q2	London Road – Meadowbank to Jock's Lodge
Scheme is on hold due to East West Cycle project. New options will be devised during design phase.	Roseburn
Unlikely to be re-installed due to Tram priority.	Haymarket, Princes Street, Queen Street and Leith Walk
Equipment installed and timings are being refined.	West Port
Provisional approval given for grant funding, to be tendered and installed. Target 2020 Q2	Cowgate, St Mary's Street, High Street
St John's Road AQMA	
Infrastructure installed. Cabling work, configuration and revalidation required. Expected completion – End of 2019	St Johns Road, Corstorphine Manse Road / St Johns Road
Great Junction Street AQMA	
Fully operational	Bernard Street, Salamander Street, Seafield Road
Inverleith Row/ Ferry Road junction	
Infrastructure installed. Loop repairs and validation required. Extended to include neighbouring junction. Target – End of 2019	Inverleith Row (Goldenacre) / Ferry Road and Ferry Road / Granton Road

Other Action Plan Initiatives

Controlled Parking Zones

Controlled Parking Zones (CPZs) enable on-road parking spaces to be used by residents and therefore reduce opportunity for car commuting into the city centre.

The boundary of the Council's CPZ was substantially extended in 2006-2007 and covers the central core of the city.

An alternative form of parking control, a Priority Parking Zone (PPZ) was trialled in the south-central area of the city during 2010. The operational times of the PPZ were aligned with peak travel periods and, as with the CPZs, aims to deter commuter travel. The trial delivered positive outcomes and has been made permanent. Thus, several new areas in the city have been designated PPZs. The areas are shown in Table 2.17.

Table 2.17 - Priority Parking Zones within City of Edinburgh Council

Code	Area	Implementation Date
B1	South Grange /Newington	September 2011
B2	South Morningside	March 2013
B3	Arboretum/Kinnear/Inverleith	March 2013
B4	Craigleith	November 2013
B5	Blinkbonny	March 2014
B6	Netherliberton/Blackford	March 2014
B7	Priestfield	November 2014
B8	Craiglockhart	November 2014
B9	Murrayfield	May 2015
B10	Telford	April 2017

Introduction of new and extensions to existing CPZs or PPZs are kept under regular review by the Council and a strategic review of parking is currently underway. This aims to determine parking pressures across the city and inform a citywide strategy for addressing parking pressures in areas where they have become a problem. The locations of residential CPZs and PPZs can be downloaded from the following link: http://www.edinburgh.gov.uk/info/20083/parking_permits/577/parking_permit_map

The Council also operates a tiered pricing scheme for residential parking permits based on CO_2 emissions and engine size. Work undertaken for 2015 Air Quality Action Plan Progress Report showed that there had been an element of behaviour change with residents moving towards the purchase of smaller engine vehicles producing less CO_2.[6] A recent review of the parking pricing strategy has proposed a change to the pricing structure (from a five-tiered system, to seven) on the basis that

this would protect and reward the owners of the smaller, low CO_2 emission-engine vehicles.

Also as a part of the pricing review, the Council ran a consultation between October 2017 and January 2018 on the possible introduction of a surcharge on parking permits issued to diesel vehicles. The Council received a huge response to the consultation with 5,412 responses to the online questionnaire, with over 98% living within the city. Overall the majority (88%) of respondents recognise the impact air quality has on their health and agree (82%) that it is important to tackle air pollution. Nearly half (47%) agreed that the Council should charge more for permits issued to the most polluting vehicles.

The Council will now introduce a surcharge on residents' permits for diesel-fuelled vehicles, with a view to encouraging owners to consider the impact of their vehicle choice, on both the wider-environment and local air quality. The new surcharge will come into force with new permits holders or existing permit holders changing to diesel vehicles, but omit those who currently own a diesel car, to compensate for purchases that were made in good faith at a time when diesel vehicles were incentivised.

Progress on the following measures has been slower than expected:

- Publication of the Draft PM_{10} Salamander Street Air Quality Action Plan due prioritisation of LEZ development work,
- Revision of the Air Quality Action Plan for NO_2 due to the need for co-development with the City Mobility Plan and the review of the Cleaner Air for Scotland Strategy, and;
- No current commitment for financial support for the expansion of Hermiston Park and Ride.

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

- Continue to work with Lothian Bus to improve fleet standard,
- Continue ECO Stars scheme,

- Continue the roll out of telematics across the Council Fleet, following its early integration into the high-polluting Refuse Collection Vehicles,
- Complete outstanding SCOOT development and repair work,
- Begin installation of on-street electric vehicle charging infrastructure to strengthen the existing network,
- Continue support for Active Travel Action Plan,
- Finalise a Draft PM_{10} Salamander Street Air Quality Action Plan with relevant Stakeholders for public consultation in 2020,
- Revise the existing NO_2 Air Quality Action Plan, in conjunction with the developing City Mobility Plan (new Local Transport Strategy) and the review of the Cleaner Air for Scotland Strategy,
- Continue on-going development work with SEPA, Transport Scotland and partners to fully assess the implications of a proposed Low Emission Scheme in Edinburgh under the National Low Emission Framework and the National Modelling Framework, and;
- Finalise a preferred LEZ scheme for Edinburgh, for statutory consultation, as set out in the provisions of the forthcoming Transport (Scotland) Bill.

- **Table 2.18 – 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	Promoting low emission public transport	Vehicle fleet efficiency	Reduce bus emissions via voluntary agreements with bus companies	CEC	2009 - 2011	Euro IV by 2012 Euro V by 2015 Formal agreement not reached due to being onerous in absence of financial support		NOx Central 59% St John's 48% Gt Junction St 61%	TTR study Completed **Lothian Bus** Main Service EIII = 18% EV = 33% EEV =11% EVI = 38% Electric = 1% **736 vehicles** Tour EII = 8% EEV = 15% EVI = 78% **39 vehicles** **First Bus** EII = 4% EIII = 14% EIV = 20% EV = 22% EVI = 40% **113 vehicles** **Stagecoach** EV = 43% EVI = 57% **84 vehicles**	On going	LB bus aim to be Euro V or better by 2020 LB Tour fleet 4 Euro II bespoke service buses not operating regularly in the City. LB and Stagecoach have eradicated Euro IVs from their fleets.

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
1a	Implementation of an LEZ	Promoting Low emission transport	Manage bus emissions and potentially emissions from other vehicle classes	CEC in conjunction with Scottish Government, Transport Scotland and SEPA		Programme for Government commitment for LEZ to be in place by 2020		Will be determined by outcomes of NMF and NLEF under CAFS Interim SEPA Report, based on 2016 modelled data indicates 50-75% NO2 reduction required in Central AQMA.	New legislation Transport (Scotland) Bill being progressed by Scottish Government. Public consultation undertaken in respect to a proposed City Centre and City-Wide LEZ May to July 2019	Finalised LEZ scheme to undergo statutory consultation in 2020 with scheme to be in place by the end of that year.	Transport (Scotland) Bill to be enacted by the end of 2019 and relevant regulations available thereafter.
2	Fleet efficiency and recognition Scheme ECOSTARS	Vehicle Fleet Efficiency	Manage road freight emissions	CEC in conjunction with TRL	2010-2011	2011 to date	Recruitment figures		Sept 2019 241 operators and 9,254 vehicles registered	Ongoing	Additional funding secured for 2019/20
3	Cleaner council vehicles	Vehicle Fleet Efficiency	Improve emissions by ensuring highest standard for vehicle replacement	CEC, Fleet		2003		Not quantified	August 2018 E3/III = 1% E4/IV = 19% E5/V = 34% E6/VI = 43% Electric = 3% Total 1003	Ongoing	

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
3a	ECO driver training and ECO driving aids	Vehicle Fleet Efficiency	Council vehicle trial telematics system	CEC, Fleet	2018		Reduction in idling and fuel consumption	Not quantified	Council approved installation of a Telematics system for all council vehicles	Trial completed Roll out of telematics underway First phase (heavy vehicles) & full waste fleet complete Autumn 2019	
4	Bus based Park and Rides Rail based Park and Rides * Tram based Park and Rides**	Alternative to private vehicle use Modal shift	Reduce emissions by easing congestion at peak travel times	CEC			Usage	Not quantified	Ferrytoll (1040) Ingliston** (1082) Straiton (600) N'craighall* (565) Sheriffhall (561) Hermiston (450) Wallyford* (321) Halbeath (1021	Land secured at Hermiston Lasswade Hermiston Gait for future expansion	Require funding to enable expansion

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
5	Differential parking	Promoting low emission vehicles	Aimed at smaller engines and low CO_2 emission vehicles Diesel-surcharge on resident's car parking permits	CEC				Not quantified			Requires adoption of low emission vehicles NOx and PM_{10}
6	Controlled Parking Zones Priority Parking Zones PPZ	Traffic Management	Discourage car commuting into city centre	CEC				Not quantified	Several CPZ in city centre One new PPZ introduced Total 10 PPZs surrounding city centre	0ngoing	Strategic Parking Review underway
7	Tramline 1	Transport Planning and Infrastructure	Zero emissions at source. Encourage modal shift from car use	CEC/ TFE		Line 1 May 2014 Line 1a from Autumn 2019	Passenger growth	Not quantified	7.5 m Passengers 2018/19	Completed	Business case for completion of Line 1a (extension to Newhaven/ Leith) agreed at Council March 2019
8	New rail line stations; 1 Aidrie - Bathgate 2 New Craighall 3 Borders 4 Gogar	Transport Planning and Infrastructure	Modal shift to reduce road traffic entering Edinburgh	Transport for Scotland			Passenger numbers	Not quantified	Completed 1 2010 2 2002 3 Sept 2015 4 2016	All Completed	Passenger growth recorded

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
9	New cycle networks	Transport Planning and Infrastructure	Part of CECs Active Travel Action Plan	CEC/ Sustrans/ NHS Lothian	2010	2016 (updated)		Not quantified		On going	
9a	Promoting travel alternatives	Promotion of cycling and walking	CECs Active Travel Action Plan Encourage modal shift away from car	CEC/ Sustrans/ NHS Lothian	Ongoing			Not quantified		On going	
10a	Urban traffic control systems - SCOOT	Traffic Management	Reduce waiting times and stop/starts	CEC Transport	Ongoing			Not quantified	No. of schemes across City. New area; Cowgate/St Mary's St, London Rd/M'Bank Fully operational 2019; Gorgie /Chesser /Balgreen	On going	New schemes to be finalised. Many existing schemes need repairing and re-validating
10b	Urban traffic Control systems – MOVA at Newbridge	Traffic Management	Reduce idling time	CEC transport	2014	Mar 2016	Reduced NO_2 concentrations and idling times	44% NOx 26% PM_{10} 40% CO_2	Completed April 2016	Completed	Delay time reduced on Westbound A8 pm. Measured NO_2 at junction reduced 2016. Slight increase 2017.
11	20mph speed limits across the City	Traffic Management	To assist improving cycle and walking uptake by making roads safer	CEC	2015	31/07/2016 commenced		Not quantified		2018	2018 Fully implemented

2.3 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 at http://www.gov.scot/Publications/2015/11/5671/17. Progress by the City of Edinburgh Council against relevant actions within this strategy is demonstrated below.

2.3.1 Transport – Avoiding travel (T1)

All local authorities should ensure that they have a corporate travel plan which is consistent with any Air Quality Action Plan. The City of Edinburgh Council is in the process of developing a new travel plan. Smarter Choices, Smarter Places funding has been utilised to recruit a travel planning officer who will be responsible for implementing the new travel plan.

Smarter Choices, Smarter Places funding has also enabled the Council to co-ordinate workplace travel planning activity in large work place sites in the city since August 2015. Transport planning consultants at SWECO have been delivering this on the Council's behalf throughout 2017/18 and 2018/19. This has involved: arranging travel advice road-show events at each site offering travel planning for individuals, arranging challenge-style initiatives to offer incentives to individuals to travel actively and sustainably, and supporting businesses with advice for organising travel planning initiatives for their workplace site. Through this project, the Council has collected mode share survey data for each employer. Cumulatively, 59 different organisations have participated in the programme in the last three years. This does not include any independent organisations who may have signed up solely to participate in the challenges. The Council will continue to offer support to large workplaces, as well as offering travel planning to individuals working for the Council.

Complementary to this, the Council has also received funding to continue work with schools and community travel planning, which can include public events, road safety education, travel packs for social housing and major events travel planning.

2.3.2 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.

The City of Edinburgh Council has a Sustainable Energy Action Plan (SEAP). This was launched in 2015 with the aim of reducing carbon emissions across the city by 42% by 2020. The vision is that Edinburgh will transform its energy use by reducing demand and encouraging local generation. These benefits will also help to improve air quality, alleviate fuel poverty, and create local jobs and more sustainable communities.

The SEAP is currently being delivered through five programme areas. These are energy efficiency, district heating, renewables, resource efficiency and sustainable transport. One of the SEAPs key outcomes will be to reduce levels of air pollution, aligning with the City's Air Quality Action Plan. Many of the key carbon reduction actions currently underway in the SEAP will have a positive impact on air quality. These include increasing the amount of electric vehicle charging infrastructure in Edinburgh; the energy retrofit of many non-domestic and domestic properties across the city; and the installation of renewable heat technologies such as air source and ground source heat pump systems.

2.3.3 Transport – Active Travel (T3)

The Council produced an Active Travel Action Plan (ATAP) in 2010, which was updated in 2016 and is due a further review in 2020. The Plan aims to deliver significant increases in the number of pedestrian and cycling journeys travelled within Edinburgh. The ATAP as well as bringing health benefits will assist in encouraging modal shift away from car use. The plan has set targets of 35% of all Edinburgh adult residents' trips being made by walking and 10% by bicycle by 2020.

A core element of the plan is the development of the 'QuietRoutes' cycle network which will enable people to travel around the city on safe routes away from the busier roads. Several major and smaller cycling and pedestrian schemes have been delivered and additional schemes are in progress. The active travel improvements programme for 2018-19, showing routes which are being designed and improved during this financial year, can be downloaded;

http://www.edinburgh.gov.uk/info/20087/cycling_and_walking/1791/cycling_and_walking_projects/5

Cycling has become a more attractive travel option due to bold measures such as the new segregated path on Buccleuch Street. This is a key link in Edinburgh's walking and cycling network and the National Cycle Network, forming a single route from the Meadows to the Innocent Railway Tunnel in Holyrood Park. This then follows an old railway route to Duddingston, Brunstane and Musselburgh, creating a major cycling corridor in the south east of the city providing the opportunity to travel this route by bike, without having to dismount or negotiate busy junctions. New crossings have been created to permit cycling, and an alleyway at Gifford park was opened up, flanked by two community murals, to provide a safe and attractive route for people to make every day journeys on foot and by bike.

Segregated cycle lanes offer real protection from traffic. Being serious about road safety and encouraging more people to travel by bike makes this kind of facility crucial. As a result, further roadside segregated cycle paths are being constructed on large sections of Leith Walk. The success of these routes will hopefully continue this momentum of rolling out safer, more accessible schemes further and faster across the city.

To monitor levels of walking and cycling over time, there are cycle and pedestrian counters across the city. Progress of ATAP actions have been reviewed in 2013 and 2015. Increases in active travel for cycling and walking are shown below in an extract from the Plan (Table 2.19).

Table 2.19 – ATAP progress for cycling and walking

Activity	2011 Data	2014/15 Data	2020 Target
Cycling			
% of all Edinburgh residents' trips	-	3%[b]	10%
% of trips to work by Edinburgh residents	4.9%[a]	7.3%[b]	15%
Walking			
% of all Edinburgh residents' trips	-	32%[b]	35%
% of trips to work by Edinburgh residents	18.2%[a]	20%[b]	21%
School cycling training			
% of P6/P7 children provided with on-road cycle training	-	63%	72%

[a] 2011 Census [b] Scottish Household Survey 2015 and Edinburgh Bike Life report

Analysis of travel to work data indicates that in most parts of Edinburgh walking mode share could be increased by 10% to 20%.

The City of Edinburgh Council is currently working towards improvements to bike life in the City in the following ways:

- Connecting missing links between key trip generators and sections of the QuietRoutes Network to create a safe, convenient, and seamless network;
- Planned upgrades to the city's existing QuietRoutes Network will continue to make cycling without mixing with busy traffic a realistic travel choice,
- Committed 10% of the Roads and Transportation budget in to cycling and walking,
- Increase modal shift towards walking and cycling - developing a city that is attractive and safe for people on bikes, whatever their age or ability,
- Complete the City Centre West to East Link (CCWEL) - the extensive network of routes is missing a vital link along its west-east axis across the city centre, and;
- Collaborating with Sustrans in developing projects for cycle network infrastructure which aims to rebalance streets for people, especially in West Edinburgh and the City Centre, with plans to transform some of the most car dominated parts of the city into safe and attractive places for pedestrians and cyclists.

3. Air Quality Monitoring Data and Comparison with Air Quality Objectives

3.1 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.

The City of Edinburgh Council undertook automatic (continuous) monitoring at 8 sites during 2018. Table A.1 in Appendix A shows the details of the sites (including historic). National monitoring results at the point of measurement are available at http://www.scottishairquality.scot/

Maps showing the location of the monitoring sites (including historic) are provided at the following link https://edinburghcouncil.maps.arcgis.com/apps/webappviewer/index.html?id=dc93485b492947d0b2182c75aca4c554

Further details on how the monitors are calibrated and how the data has been adjusted and distance corrected, where necessary, are included in Appendix C.

In conjunction with DEFRA, the local authority set up a new site on Nicolson Street in December 2017, which currently measures Nitrogen Dioxide (NO_2). This forms part of the UK Automatic Urban and Rural Network and the first full year of data is published in this report. A FIDAS particulate monitor is due to be installed at this site to monitor particulates by the end of 2019. A FIDAS particulate monitor was installed in December 2018 at a new site in Tower Street to monitor PM_{10} and $PM_{2.5}$. This is in response to the establishment of the Salamander Street AQMA. The first full year of data will be published in the Annual Progress Report 2020. The Currie High School station was upgraded to a permanent unit in 2019 in close proximity to its original site. The Queensferry Road FDMS analyser failed in December 2018, so the opportunity has been taken to upgrade the cabinet and replace the unit with a FIDAS.

A programme of NO_x and PM (TEOM) analyser replacements is underway, supported by the Scottish Government Local Air Quality Management Funding Support.

3.1.2 Non-Automatic Monitoring Sites

The City of Edinburgh Council undertook non- automatic (passive) monitoring of NO_2 at 139 sites during 2018. Table A.2 in Appendix A shows the details of the sites.

A map showing the city-wide spatial coverage of the monitoring sites is provided at the following link (Note – look at 'site code' not 'tube number');
https://edinburghcouncil.maps.arcgis.com/apps/webappviewer/index.html?id=dc93485b492947d0b2182c75aca4c554

Further details on Quality Assurance/Quality Control (QA/QC), bias adjustment and distance corrections for the diffusion tubes are included in Appendices C and D.

New monitoring was established at the following sites in 2018 following a review of the network and to help with the development of a local air quality model by SEPA as part of the National Modelling Framework (NMF).

ID11a	Lanark Road	ID33b	Queen Street
ID80f	Gorgie Road	ID80g	Gorgie Road
ID80h	Wardlaw Street		

Monitoring was rationalised at St John's Road and ceased at two sites (IDSJ2 and IDSJ3) where concentrations have been well below the annual objective since monitoring commenced in 2014.

A review of the distances used for the fall off with distance calculator was undertaken for the Roseburn Terrace site ID22a following residents' concern over use of the loading bay in front of the site. Although traffic restrictions prevent peak time loading/parking, it is accepted that often in practice the traffic flows adjacent to the loading/parking space, even when restrictions apply. Therefore, it was concluded appropriate to use a nominal kerb calculation at this site and thus the annual mean concentration of NO_2 for 2017 has been recalculated and is estimated to be 39$\mu g/m^3$. Details of the new distances used in the recalculation are in Table A.2 in Appendix A.

A review of annualisation process for 2017 diffusion tube data has resulted in a change in the value of annual mean concentrations at those locations which required an annualisation calculation to be applied. There has been no significant change in the reported concentrations, (which have been bias-adjusted and distance-corrected, where appropriate) except for two sites – London Road/Earlston Place (Site ID67) which since recalculation exceeds the objective but is in keeping with previous years;

and North Bridge -South (ID27) which now falls below the objective for the year 2017. The amended results are included in Table A.3, and recalculations for those sites requiring annualisation in Appendix E.

The PDT network was further expanded in January 2019 which again will provide additional data for the review and assessment of air quality as well as for the NMF local model development.

3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, annualised and bias-corrected. Results also indicate exposure at relevant receptors, so in some cases the data is distance corrected. Further details on these adjustments and calculations are provided in Appendix C and D.

Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2018 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 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

There was good data capture from all automatic stations this year. Nicolson Street having its first full year of monitoring data available.

Monitoring results show St John's Road and Nicolson Street both breached the annual objective for NO_2, with annual mean concentrations of 43µg/m^3 and 47 µg/m^3 respectively, Nicolson Street data having been distance corrected to represent relevant exposure. There were only two hours in the year period at St John's Road automatic site where the concentration was greater than 200 µg/m^3 which means the hourly-mean objective at this site was met. Nicolson Street did not have any incidences of hourly concentrations being greater than 200 µg/m^3.

All other automatic monitoring stations meet the Scottish and UK Air Quality Objectives.

The Queensferry Road station data showed 3 hours in the year period where the average concentration was greater than 200 µg/m^3. However the annual mean objective was met with a concentration of 39 µg/m^3 (again after distance correction).

At all other Roadside locations concentrations continued to remain well below the objectives – Gorgie Road : 28 µg/m^3; Salamander Street:25 µg/m^3 and Glasgow Road:26 µg/m^3. All existing sites either saw a reduction in concentrations from the previous year or remained static. St John's Road saw a large reduction in concentrations from the previous year, by 10 µg/m^3. Lothian Buses' local bus fleet along this corridor became Euro VI in 2018.

Analysis of the **non-automatic monitoring** (PDT) results shows the annual mean objective continues to be exceeded at locations within the Central and Glasgow Road AQMAs, therefore they remain valid. Annual mean objectives were met in the St John's Road AQMA for the first time, however the exceedance at the St John's Road automatic site means this AQMA still remains valid.

Exceedances of the annual mean objectives in the Central AQMA are noted at the following locations: Grassmarket (ID37a), London Road/Earlston Place (ID67), London Road/East Norton Place (ID81), Nicolson Street (ID35 and EDNS), Queen Street/North David Street (ID33), South Bridge (ID144), Torphichen Place (ID3b and ID3), West Port ((ID28d and ID28b). In the Central AQMA there was one location (ID28b, West Port) where the annualised data suggests a breach of the hourly mean objective for NO_2, the result being 65 µg/m^3 There was only 7 month's valid data captured at this site over the year.

In the Glasgow Road AQMA at Newbridge there was a breach of the annual objective (ID58) and a location where levels were at the objective (ID15).

The annual mean objective has been met for the second consecutive year at all monitoring points in both the Inverleith Row and Great Junction Street AQMAs.

There was one location where the annual mean objective was breached out with the AQMAs, at Queensferry Road (ID64). Monitoring is undertaken at a lamp-post in this location and the NO_2 Fall off with Distance Calculator is used to estimate concentrations at the residential property. However, alternative monitoring is undertaken at the façades of the residential properties – ID63, ID64a and ID64b. At

these relevant receptors the concentrations are as follows; 34 µg/m^3,30 µg/m^3 and 32 µg/m^3 respectively – all well within the annual mean objective. The reasons for the differences are being investigated. SEPA Computer Fluid Dynamic Modelling has indicated that concentrations are higher at this lamppost location and along the kerb to the west compared to that at the facades when the wind is blowing from the southwest and northeast, which are the two most common wind directions.

Unfortunately monitoring data from the nearby automatic station has not been able to assist with this investigation because 2018 concentrations have been influenced by boarding in place immediately behind the station, erected at the boundary of a construction site. Further to that data capture for 2017 was poor.

A New PDT site has been established in January 2019 to the west of the location to increase monitoring data in the area. The first full year of data will be published in the Annual Progress Report 2020.

The Council has decided that it would not be appropriate to declare an AQMA in this location at this time until investigations have concluded.

Concentrations at the following locations indicate potential exceedances in the annual objectives: Glasgow Road (ID16 and ID15a), St John's Road (ID1d), Roseburn Terrace (ID22a), Angle Park Terrace (ID76b), Angle Park/Harrison Road (ID76), Dundee Street/Yeaman Place (ID79d), Gorgie Road Delhaig (ID80), Slateford Road (ID77b), Bernard Street (ID29c), Easter Road (ID25), Great Junction Street (ID30 and ID30c), Leith Walk/McDonald Road (ID20), London Road/Easter Road (ID46), London Road (ID69 and ID70), Clerk Street (ID138), Cowgate (ID48f, ID48a and ID48e), Grassmarket (ID37b), Nicolson Street (ID136), North Bridge –South (ID27), Princes Street (ID47 and ID24), Shandwick Place (SH1), West Maitland Street (ID2) and West Port (ID28c).

Monitoring will continue at all these locations.

The first full year of monitoring data was obtained for the new 2018 sites. The results at all these locations showed levels below the annual mean objective: Lanark Road (ID11a):33 µg/m^3, Wardlaw Street (ID80h):28 µg/m^3, Gorgie Road (ID80f):35 µg/m^3, Gorgie Road, distance corrected for relevant exposure (ID80g):35 µg/m^3 and Queen

Street (ID33b):35 µg/m^3. The Leith Walk/McDonald Road site, ID20, established at its new location in October 2017 was just below the objective at 39 µg/m^3.

Trends

Trend analysis has been undertaken at all the automatic monitoring locations which have five or more years of valid data. Queensferry Road station did not have sufficient data in 2017 to make an assessment for this year; however it has been included in the trend analysis.

Graphs are shown in Appendix A – Figures A.3a to A.3h. Table 3.1 summarises the trend analysis.

Table 3.1 Summary of Annual Mean Nitrogen Dioxide trends measured at Automatic (Continuous) Monitoring Sites

Monitoring Location	Site Type	Trend in Annual Mean NO_2 (Years)	Concentrations of NO_2
St Leonard's	Urban background	(2004 to 2018) ↘	Slightly decreasing
Currie	Suburban	(2010 to 2018) ↘	Slightly decreasing
Gorgie Road	Roadside	(1999 to 2018) ↘	Slightly decreasing
Salamander St.	Roadside	(2009 to 2018) ↘	Slightly decreasing
Queensferry Rd	Roadside	(2011 to 2018,) ↗	Slightly increasing
St John's Road	Kerbside	(2007 to 2018) ↓	Decreasing
Glasgow Road	Roadside	(2012 to 2018) ↘	Slightly decreasing

Trend analysis of the annual mean nitrogen-dioxide concentrations at most sites shows there is a slight decrease, namely at; St Leonard's, Currie, Gorgie Road, Salamander Street and Glasgow Road.

The downward trend remains more defined at St John's Road in respect to annual mean concentrations. Similarly, the trend of the number of hourly exceedances at St John's Road is significantly downward.

A substantially elevated annual mean concentration in 2018 at Queensferry Road has resulted in a slightly increasing trend here. The high value explained by boarding in position behind the station during construction work is expected to reduce with the boarding being removed.

Trend analysis with passive duiffusion tubes located within the AQMAs was also undertaken - a summary is shown in Table 3.2. Data used in the analysis as well as

graphs for each AQMA is shown in Appendix A – Tables A.5a to A.5e and Figures A.4a to A.4e. Data was corrected using the relevant bias adjustment factor for each year and taken from the point of measurement (not distance corrected).

Table 3.2 Summary of Annual Mean Nitrogen Dioxide Passive Diffusion Tube Trends within the AQMAs

AQMA	Trend in Annual Mean NO_2 (Years Included)	Concentrations of NO_2
Central AQMA	(2008 to 2018) ↓	Decreasing
Great Junction Street AQMA	(2008 to 2018) ↓	Decreasing
St John's Road AQMA	(2008 to 2018) ↓	Decreasing
Glasgow Road AQMA	(2009 to 2018) ↓	Decreasing
Inverleith Row AQMA	(2011 to 2018) ↘	Slightly decreasing

There is a general trend of decreasing NO_2 concentrations observed within all the AQMAs from the passive diffusion tube data. This trend is less defined at Inverleith Row where concentrations have been just above, at or slightly below the objective over the past three years. The general downward trend is in keeping with the national trend of NO_2 pollution showing long-term improvement at urban background and roadside locations. It is thought that significant improvement in the St John's AQMA is due to the deployment of predominantly Euro VI buses along that corridor.

3.2.1 Particulate Matter (PM_{10})

Table A.6 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 18µg/m^3.

Table A.7 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 7 times per year.

There was good data capture for at sites in 2018, ranging from 91 to 99%.

PM_{10} data from all monitoring locations in 2018 meets the UK National Objectives.

Data from Queensferry Road (25µg/m^3) show a breach of the annual mean Scottish objective. The daily mean objective was not breached, however the 50µg/m^3 24-hour concentration was exceeded 4 times throughout the year.

The annual concentration at this site has been higher than expected for the last two years, most likely due to the fact that the land adjacent to the station became a temporary demolition and construction site in October 2017 for the development of a 60-bed care home. The care home was completed and opened in February 2019.

The Detailed Assessment for Particles 2016[7] concluded an AQMA was not required for this site. Due to the temporary nature of the current elevated levels, declaration of an AQMA will not be required at this location.

Data from Salamander Street shows a breach of the annual mean Scottish Objective. TEOM data was corrected to provide a gravimetric equivalent using Edinburgh's local gravimetric factor. Results show an annual mean concentration of 20 µg/m^3. VCM (Volatile Correct Methodology) corrected TEOM data from the station shows an annual mean concentration of 19µg/m^3. With the annual mean objective continuing to be breached at this site calculated using both of the above methods, the Salamander Street AQMA, declared in January 2017, remains valid.

The Council is currently in the process of developing an Action Plan in conjunction with SEPA, Forth Ports and relevant stakeholders. Due to resourcing issues this work has progressed slower than anticipated. The draft Air Quality Action Plan will be published for public consultation in 2020.

In the meantime, a new FIDAS particulate monitor was installed within the AQMA at the opposing (western) boundary to the Salamander Street monitoring station on Tower Street. This unit commenced monitoring PM_{10} and $PM_{2.5}$ in October 2018. The first full year's monitoring data will be available for publishing in the Annual Progress Report 2020.

In addition, SEPA have confirmed that the Pollution Prevention and Control (PPC) permit for the concrete batching plant on Bath Road has now been surrendered in full, so this activity is no longer permitted there.

All other sites, both background and kerbside, are well below the objective (Currie, 9 µg/m^3, St Leonard's 11 µg/m^3 and St John's Road 13 µg/m^3).

Trends

In 2018 there were four monitoring sites with five or more full year's data which is required in order to undertake trend analysis.

The non-volatile fraction of the FDMS data for years 2004 to 2018 at St Leonard's is used to ensure a consistent approach as the TEOM instrument was replaced with a FDMS unit in 2008. It should be noted that data capture has been poor for several year periods (2009, 2012, 2014 to 2017). At Currie volatile corrected (VCM) TEOM

data was used for the analysis. At Salamander Street and Glasgow Road un-corrected TEOM data was used.

Trend lines have been drawn using an Excel simple regression statistical program and graphs are shown in Appendix A - Figures A.5a to A.5e. Below is a summary.

Table 3.3 Summary of PM_{10} Annual Mean Trend Data

Monitoring Location (Type)	Trend in annual mean PM_{10} (years)	Concentrations of PM_{10}
St Leonard's (Urban background)	(2004 to 2018) ↘	Slightly decreasing
Currie (Suburban)	(2010 to 2018) ↘	Slightly decreasing
Queensferry Road (Roadside)	(2011 to 2018) ↗	Slightly increasing
Salamander St (Roadside/Fugitive)	(2010 to 2018) ↓	Decreasing
Glasgow Road (Roadside)	(2013 to 2018) ↔	Flat/Stable

PM_{10} trends from measured data at the urban background and suburban sites in Edinburgh shows a slight downward trend (slight decrease in concentrations with time). There is more of a defined downward trend at Salamander Street in the PM_{10} AQMA, which is generally affected by industrial, fugitive and road sources. As previously discussed there are changes to potential sources in the vicinity of this site, not least the relocation of a cement batching plant, which are likely to have resulted in this trend. Further work with the Salamander Street Air Quality Action Plan will consider the analysis and take steps to ensure that the downward trend is continued, particularly as there is new residential development proposed for the area.

Glasgow Road, a roadside monitoring site, is showing a flattening trend as the annual mean concentrations have not changed significantly since monitoring began in 2013.

Previously the trend at Queensferry Road has been downward, however the step-increase in the 2017 and 2018 concentrations (due to the demolition/construction works on the adjacent land), has had an impact on the trend which is now slightly increasing. This is expected to be temporary, and monitoring will continue.

3.2.2 Particulate Matter ($PM_{2.5}$)

Table A.8a in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years with the Scottish air quality objective of 10µg/m^3. The two sites – the urban background site at St Leonards and the roadside

site at St John's Road- both had annual mean concentrations of 6 µg/m^3 for 2018, well below the legal objective.

Trend analysis has been carried out for monitoring at St Leonards over the past 9 years using Excel simple regression statistical program and a graph is shown in Appendix A, Figure A.6. It shows that there is a general downward trend (decreasing concentrations) at this site.

Estimations of $PM_{2.5}$ from PM_{10} data at all other relevant monitoring stations was undertaken using the nationally derived factor correction ratio of 0.7 and the Scottish factor of 0.63[8]. Results are described in Table A.7b. It shows there are potential exceedances at all roadside monitoring locations in Edinburgh. However, Scottish Local Authorities are not required to declare Air Quality Management Areas (AQMAs) until robust measured data becomes available from future $PM_{2.5}$ monitoring networks.

3.2.3 Sulphur Dioxide (SO_2)

Table A.9 in Appendix A compares the ratified continuous monitored SO_2 concentrations for year 2018 with the air quality objectives for SO_2. There were no exceedances in any of the objectives, which is consistent with previous years.

3.2.4 Other Pollutants Monitored

The following pollutants were also monitored in the City at the urban background (AURN) site at St Leonard's in 2018. The data is presented in Appendix A. The UK Government and Devolved Administrations are responsible for the review and assessment of these pollutants.

3.2.5.1 Ozone (O_3)

Table A.10 in Appendix A presents the ratified continuous monitored Ozone Concentrations from 2014 to 2018 with the air quality objectives. The Air Quality Strategy Objective for 2005 for Ozone Daily maximum 8 hour running mean > 100 µg/m^3 on more than 10 days has not been met in 2018. There were 13 occurrences where the daily maximum 8 hour running mean was greater than 100 µg/m^3. There were 88 exceedances of the 8-hour running mean > 100 µg/m^3.

3.2.5.2 Polycyclic Aromatic Hydrocarbons (PAHs)

There are many different PAHs; however, a component used as a marker, is benzo (a) pyrene (BaP). The concentration monitored at St Leonard's complies with the UK Objective in 2018. Monitoring is undertaken using a Digitel sampler. Concentrations since 2009 are shown Table A.11.

4. New Local Developments

4.1 Road Traffic Sources

Planning applications can be found on the Council's website here; http://www.edinburgh.gov.uk/info/20067/planning_applications ; using reference numbers detailed below with each case.

Planning permission was minded-to-grant (subject to legal agreement) for a residential development of 334 flats, two commercial units and car parking (94 spaces) at Ocean Drive, Leith (19/02/778/FUL). This was an intensification of the residential element of a similar proposal for this site that was given planning permission in December 2018. The local air quality impact was considered with the application in-part. The site is in close proximity to the Salamander Street AQMA for PM_{10} (addressed below section 4.5) and the Great Junction Street AQMA for NO_2. The applicant did not submit an air quality impact assessment to predict the impact of the development on the NO_2 AQMA. Environmental Health considered the scale of the proposed development's parking provision, therefore problematic, due to the potential for adverse traffic impacts, on the nearby AQMA. The main source of this pollutant is traffic generation and there is scope for the development to introduce a significant number of vehicles onto the network. The site is well served by public transport and well located in terms of amenity, leisure and employment. It is also noted that existing neighbouring cars parks are underutilised. The applicant did not fully consider the full range of possible mitigation measures.

A renewed application for 19 affordable residential properties also obtained planning permission. This time on appeal from the Scottish Government (14/02232/FUL). Initially, the proposal was considered contrary to Edinburgh City Local Plan Policy Env22 in respect of Pollution and Air, Water and Soil Quantity as, by virtue of its siting and its proximity to the West Approach Road. Future occupiers would be exposed to unacceptable levels of poor air quality to the detriment of their amenity. The propose mitigation measures presented by the applicant included a restriction on additional car parking provision and the installation of a mechanical ventilation system to the new residential building. The implication with the latter is that occupiers of the proposed development will have to decide whether to have their windows open or not, which Environmental Health felt negated the spirit of planning policy to protect

public health, in addition issues around the inability to control this aspect of development. In conclusion, the reporter found that “air quality here cannot be expected to be as satisfactory as in suburban locations” and so, having regard to previous applications on the site, agreed that the mitigation measures could be controlled through a condition on a planning permission, and that this would be the appropriate way forward. The Local Authority will have to consider future monitoring of nitrogen dioxide at these properties.

Planning permission was minded-to-grant (subject to legal agreement) for up to 220 new dwellings, with commercial space and associated external amenity areas in Bonnington (17/05742/PPP). The Great Junction Street AQMA is 400m north of the site and the Central AQMA 1km to the south. Due to the size and density of the development the applicant was requested to consider the potential impacts the development may have on the local air quality taking into account any other developments in the area, by way of an air quality statement. In conclusion, the applicant showed a willingness to progress with forms of mitigation measures and keep parking numbers to a minimum. Taking account of the industrial nature of the current use of the site, this was deemed appropriate.

4.2 Other Transport Sources

Passenger numbers at Edinburgh Airport grew by 6.8% to 7,020,199 in the first six-month period in 2019, compared to the same period in 2018. 1,413,612 passengers passed through the terminal in June 2019 – making it the busiest June ever and third busiest month on record. The first half of 2019 also saw the completion of the ‘FastPark’, a digital self-service parking product, that represents a significant investment in at-terminal parking capacity, as the first phase of the Car Parking Futures project.

Edinburgh Airport’s application for airspace change was rejected by Civil Aviation Authority (CAA) in October 2018 however a Statement of Need to the CAA has now been submitted, ‘explaining an improved airspace with the correct flight paths and technology will ensure [the] airport can meet existing and future demand by increasing the capacity of its runways and allow flights to depart with fewer delays and environmental impacts’ (Edinburgh Airport, Half Year Update, 2019).

Although, the airport has been subject to a screening assessment in previous rounds of Review and Assessment, in conjunction with consultants, Ricardo Energy & Environment,

the airport continues to commission regular studies to investigate whether the objectives for NO_2 concentrations are met.

A repeat, six-month air quality monitoring survey was undertaken between December 2017 and June 2018 and the findings shared with the Council. It was estimated annual mean NO_2 concentrations above 40µg/m^3 were measured at two sites – the multi-storey car-park taxi rank and drop off area - with annual NO_2 concentrations of 48.5µg/m^3 and 44.2µg/m^3, respectively. These sites are not considered relevant exposure when comparing to the statutory annual mean objective and therefore, this objective is not likely to have been breached at any location during 2017/2018. Additionally, it was considered that the hourly NO_2 objective of no more than 18 exceedances of 200µg/m^3 in a year, is not likely to have been exceeded at any location.

Rail

The east coast mainline rail services at the Craigentinny and Portobello maintenance and servicing depots have multiple facilities including train washing (external), internal cleaning, fuelling and servicing and also provides major engineering and maintenance functions. Craigentinny has an extensive maintenance shed for heavy repair and engineering work, multiple cleaning roads / sidings, servicing roads, two train wash systems and storage, as well as welfare and administration buildings. Train movements and subsequent positioning moves within the depot tend to be variable depending on the daily operational requirements and use of rolling stock. Currently the depot is managed and operated by Hitachi Rail and due to its location on part of the network that is electrified, there is a mixture of diesel and electric powered rail services utilise the depot. A programme of diesel train replacement with electric locomotives is underway, which the introduction of Azuma IEP Class 800 rolling stock and Hitachi AT800 electric trains. This is expected to have a positive impact on air quality. Air Quality monitoring is however undertaken on a periodic basis at the depot. Between June and September 2018, a short-term, automatic monitoring study considered PM, NO_2 and sulphur dioxide concentrations. A draft report is currently under consideration.

LAQM screening criteria were re-applied to operations at the Slateford rail maintenance depot, operated by Network Rail, in light of complaints from members of the public and the development of new residential properties in close proximity to the site. Although locomotives are regularly stationary at the depot (with additional

seasonal work), the nearest residential properties are 20m to the boundary of the site and over twice that to any idling locomotive activity. It is determined therefore, that there is no risk to the relevant sulphur dioxide air quality objective being breached.

4.3 Industrial Sources

The Aggregate Industries cement batching plant (and associated stockpiling) on Bath Road, was relocated to Ocean Drive at the end of 2015. There were reductions in the PM_{10} concentrations in the area in 2016, likely to be attributable to this action. SEPA have now confirmed that the permit for this process has been surrendered, as of 12th December 2017. The Council has requested that should there be any applications for similar processes in the area, that it is consulted.

PM_{10} monitoring which was undertaken at Gogarburn Poultry Farm by SEPA on behalf of the Council and Scottish Government, concluded that the air quality objectives would not be breached at the worst-case location previously identified by the screening tool.[9] These findings were reported in the Council's Detailed Assessment of Particles 2016[7].

SEPA have advised that there were no new, proposed or significantly changed industrial installations for which an air quality assessment has been carried out. Nor have any of the existing industrial installations increased emissions substantially or new relevant exposure have been introduced nearby.

SEPA have also advised that there have been no new or major changes to fuel storage depots storing petrol, petrol stations or poultry farms.

4.4 Commercial and Domestic Sources

The City of Edinburgh Council issued Interim Planning Policy (2010) that discourages the installation of commercial biomass combustion installations in the city.

Combined Heat and Power (gas) units are now commonly installed in new developments. Planning applicants are advised to submit a chimney height application if they are installing any CHP or heating that is bigger than 366Kw output. This will ensure they comply with the Clean Air Act and provide the Council with upfront details on the height of the proposed flue/chimney. It should be noted that the

applicants don't always take this advice on board. However, an informative is normally attached to any planning permission given to ensure this is carried out.

If a new or proposed CHP/energy plant is bigger than 1MW (accumulative) the Council will request that the plant be fitted with secondary abatement technology.

The primary CHP plant at the University of Edinburgh's Pleasance site comprises a single, internal combustion, spark ignition engine with an electrical power output of 1.5MWe and two 9MWth boilers supplying district heating and electric networks serving nearly 20 academic and student accommodation buildings. The installation does not include any NO_x abatement technology, having been approved, installed and part-operational in 2013. Initial screening[9] of the plant indicates a contribution from the CHP at the nearest receptor in excess of 70μgm^{-3}. Although it is recognised the screening tool errs on the side of caution by considering the impact based on ground level release. Edinburgh University are continuing to consider options for the engine operation, particularly whether it can operate to a low NOx specification. The Council commenced monitoring of NO_2, in January 2017 by installing a number of passive diffusion sites in the Pleasance area at St John's Hill and Viewcraig Gardens. Results in both 2017 and 2018, show that concentration are in keeping with general background levels in the area. At the start of 2019 these tubes were relocated to nearby locations, the results of which will be published in the next Annual Progress Report.

Planning permission (18/10304/FUL) was obtained by the Royal Botanic Gardens of Edinburgh (RBGE), to develop a plant health suite and sustainable energy centre at the main site on Inverleith Gardens South. The site borders residential properties to the south and east and the Inverleith Row Air Quality Management Area, declared due to exceedances of the air quality objectives for nitrogen dioxide, is situated less than 100 metres away. The energy centre will include a ground source heat pump, a combined heat and power plant and boilers to meet the heat and electrical requirements of the Botanic Gardens. The design intent of the system is to maximise the use of the ground source heat pump and the combined heat and power unit. The Air Quality Impact assessment considered the potential effects of construction of the development and the impact of emissions from the combined heat and power plant and boilers associated with the proposed energy centre on local air quality concentrations. Flue gas recirculation and a catalytic converter are to be included in

the design of the boiler plant and combined heat and power plant respectively. The assessment concluded that in relation to the energy centre, it is predicted that the plant as designed will have a negligible to slightly beneficial (compared to existing) effect on air quality.

The Pollution Prevention and Control (Scotland) Regulations 2012 were amended in December 2017 to transpose the requirements of the Medium Combustion Plant Directive (MCPD –Directive (EU) 2015/2193 of 25 November 2015 on the limitation of emissions of certain pollutants into the air from medium combustion plants). The purpose of the MCPD is to improve air quality. All combustion plant between 1 and 50 MW (net rated thermal input) will have to register or have a permit from SEPA. The Council's informal policy is to ensure require secondary abatement technology is incorporated into any plant above 1MW (accumulate assessment).

SEPA have reported no new or significantly changes CHP or Biomass plants with the Council's administrative area over the past year.

Smoke Control Orders cover the entire City of Edinburgh Council area. There are currently no areas where significant coal burning takes place.

4.5 New Developments with Fugitive or Uncontrolled Sources

SEPA have reported that there are no new or significantly changed landfill sites, quarries, unmade haulage roads on industrial sites or waste transfer stations within the local authority's boundary over the past year.

New residential development has been introduced in the Salamander Street AQMA declared for exceedances of PM_{10} originating from a range of source including fugitive emissions, industrial, and traffic. The 1.41-hectare site off Bath Road in the centre of the AQMA was given planning permission to construct 212 new flats comprising both private and affordable housing. Concerns were raised regarding air quality and noise pollution however on balance, given the wider benefits of the proposal subject to the inclusion of appropriate conditions, the application was deemed acceptable. The applicant's air quality impact assessment included analysis of automatic monitoring of PM_{10} which was undertaken for a period of three months. The results differ with those obtained by the local authority, from the nearby Salamander Street air quality monitoring station, which forms part of the Scottish Air

Quality Database. In any case, the applicant proposed mitigation by means of mechanical ventilation and filtration. Although the filters would have to be changed regularly and properly maintained, it is not deemed possible to control this element of the applications. Environmental Health recommended against the application in this regard, however making the overall assessment to the application, consideration was also given to the appeal decision at 2 Ocean Drive (14/05127/FUL), reported in the 2018 Annual Progress Report.

As mentioned in section 4.1 above, further proposals for residential properties on Ocean Drive, Leith (19/02778/FUL) for 344 residential flats and 2 commercial units were given planning permission (subject to legal agreement). An Air Quality Impact Assessment in support of the application included an assessment relating to PM_{10}, and the potential of impact from nearby fugitive and industrial activities, particularly from Leith Docks. The site is close to two AQMAs, the Great Junction Street AQMA (NO_2) and the PM_{10} Salamander Street AQMA. In terms of particle pollution, the applicant undertook monitoring over a period of three months which indicated no risk to the annual mean objective being breached. The local authority already anticipates having to undertake future particulate matter monitoring in the area, due to residential development permitted for an adjacent site. Note, the scope of the City-Wide Detailed Assessment for Particles[7] that led to the declaration of the AQMA did not consider the application site (or the adjacent site), as there were no relevant receptors.

5. Planning Applications

Continuing economic growth in the city and wider region presents a challenge for air quality. Population growth has inevitable demand for all modes of transport and supported infrastructure.

The Council is preparing a new Local Development Plan for Edinburgh called the City Plan 2030, which will set out policies and proposals for development in Edinburgh between 2020 and 2030. The first stage of preparing the Plan is to consult on changes through a main issues report, called 'Choices for City Plan 2030'. This document will set out the changes the Council wishes to make in the next plan and how views will be gathered on these. Responses to the Choices will help preparation of the new Plan which will be published in summer 2020.

Engagement on topics such as housing development, local and regional transport, employment space etc, with relevant industry/development sectors and community representatives has begun.

Alignment with local air quality management and developing local and national air quality strategies will be crucial to ensuring a sustainable economic growth.

In terms of the existing Local Development Plan, Supplementary Planning Guidance published in August 2018 sets out the Council's approach to the assessment of infrastructure requirements associated with new development and a framework for the collection of developer contributions. The transport improvements identified by the studies and set out in the current LDP Action Programme include;

- the delivery of Edinburgh tram;
- access to bus services and park and ride facilities;
- improvements to the public realm and other pedestrian and cycle actions; and,
- traffic management, including junction improvements.

The guidance aimed to ensure developers make a fair and realistic contribution to the delivery of necessary infrastructure provision and improvement associated with development.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

Analysis of the monitoring results for **Nitrogen Dioxide (NO_2)** shows the annual mean objective continues to be exceeded in locations within the current AQMAs covering Central Edinburgh, St John's Road and Glasgow Road (Newbridge). These AQMAs therefore remain valid. See summary Table 6.1 below.

Table 6.1 Summary of the locations where 2018 monitoring results are at or exceed the annual mean Nitrogen Dioxide Objective

Site ID	Site address	In AQMA (NO_2)?	Data Capture	Annual mean concentration µg/m^3 (Bias adjusted 0.9)
37a*	Grassmarket 41	**Y Central**	79	**56**
67	London Rd/Earlston Pl	**Y Central**	92	**42**
81	London Rd/E. Norton Pl	**Y Central**	92	**43**
70	London Rd/Wolseley Ter	**Y Central**	92	**40**
135	Nicolson Street 69	**Y Central**	83	**43**
ID11	Nicolson Street (Auto)	**Y Central**	100	**47**
27	North Bridge – South	**Y Central**	83	**40**
47	Princes Street Eastbound	**Y Central**	92	**40**
33	Queen St/North David St	**Y Central**	92	**42**
SH1	Shandwick Place Hostel	**Y Central**	58	**40**
144	South Bridge 59	**Y Central**	67	**41**
3b	Torphichen Place 1	**Y Central**	92	**43**
3	Torphichen Place CH	**Y Central**	83	**43**
28d	West Port 42	**Y Central**	92	**51**
28b	West Port 62	**Y Central**	58	**65**
15	Glasgow Rd Newbridge	**Y Glasgow Rd**	92	**40**
58*	Glasgow Rd Newbridge	**Y Glasgow Rd**	92	**45**
1d	St John's Road 131	**Y St John's Rd**	100	**40**
ID5	St John's Road (Auto)	**Y St John's Rd**	99	**43**
64	Queensferry Road 550	**No**	92	**41**

* Duplicate passive diffusion tube result

The annual objective was breached at one distance- corrected monitoring site (ID64, 550 Queensferry Road) out with current AQMAs where for the second consecutive ye the concentration was just above the objective. SEPA modelling has been undertaken to try to understand why higher concentrations are recorded here compared with those concentrations monitored exactly at the facades on this stretch

of road, which are consistently lower. The modelling has shown a tendency for higher concentrations of NO_2 at this lamppost location and along the kerb to the west compared to that at the facades when the wind is blowing from the south west and north east, which are the two most common wind directions at this location.

Investigations into the exceedance at the one monitoring point will continue and additional monitoring in the area has been employed since January 2019. At the present time the Council has decided it would not be appropriate to declare an AQMA until investigations have concluded.

Concentrations measured at the automatic site on Queensferry Road are significantly higher than previous years. This suggests a temporary elevation in levels which were likely caused by the temporary boarding in position from October 2017 to June 2018, immediately behind the monitoring station throughout the duration of demolition and construction of an adjacent care home. Provisional data for 2019 suggest concentrations similar to those prior to 2018. An increase is likewise apparent in PM_{10} measurements at this site which again correlates with activities on the development site.

There is one location in the Central AQMA at West Port (ID28b) where the annual mean of NO_2 from passive diffusion tube monitoring exceeds 60 µg/m^3, indicating a potential exceedence of the hourly mean objective at this point, and confirming the AQMA remains valid.

There are no breaches of the hourly mean objective in the St John's Road AQMA in 2018. This has been the case since 2016. Consideration will be given to amending the AQMA to remove the hourly mean element, particularly in light of the improvements in the annual mean concentrations.

The results also show that for the second consecutive year since the declaration of the Great Junction Street and Inverleith Row AQMAs there are no breaches of NO_2 objectives within these AQMAs. Monitoring will continue in these areas in order to consider whether revoking the AQMAs would be appropriate in the future.

There is a general trend of decreasing NO_2 concentrations observed within all the AQMAs from the passive diffusion tube data. In general there is also a downward

trend in annual mean concentrations at all the automatic monitoring sites (with the exception of Queensferry Road).

PM_{10} data from all monitoring locations in 2018 meets the UK National Objectives, however concentrations at Queensferry Road and Salamander Street station show breaches of the Scottish annual objectives.

At Queensferry Road data has been temporarily being affected by the demolition and construction work on adjacent land, associated with the development of a 60-bed care-home. The care home was completed in time for its opening in February 2019.

Due to the temporary nature of elevated levels in recent years declaration of an AQMA will not be required at this location, following the Detailed Assessment for Particles 2016[7].

At Salamander Street, which is within the PM_{10} AQMA the levels are just above the objective. They have reduced since 2010 and are showing a downward trend, likely due to changes in industrial and fugitive sources in the vicinity of this site.

The Salamander Street AQMA, declared in January 2017, remains valid. Work ongoing to devise an Air Quality Action Plan will need to consider how the downward trend is sustained, as there is residential development proposed for the area. The Action Plan, being developed in conjunction with SEPA, Forth Ports and relevant stakeholders will be published for consultation in early 2020.

PM_{10} and $PM_{2.5}$ long term trends from measured data across all sites generally show a decrease in concentrations with time, as shown in Appendix 4, although at Glasgow Road concentrations are more stable.

6.2 Conclusions relating to New Local Developments

The air quality impact of cumulative development, especially large proposals with associated car-parking, is a concern for the Council, in terms of air quality impact and the risk of increasing roadside NO_2 concentrations. The assessment of New Local Developments highlights a number of traffic-generating developments in densely populated areas in Edinburgh North. Additionally, new sensitive receptors (especially

residential) may also be subject to levels of pollution from existing and proposed neighbouring uses, especially in the vicinity of industrial and fugitive sources of PM_{10}.

New sensitive receptors are also proposed adjacent to sources of NO_2.

The Council will need to consider long term monitoring of NO_2 and particles in areas where new residential exposure will be introduced.

In terms of SEPA regulated processes, the Council has requested that should there be any applications for permitted processes within the Salamander Street AQMA, that it is consulted.

The east coast mainline rail services at the Craigentinny and Portobello maintenance and servicing depots have recently revised their monitoring regime. Further updates will be provided annually.

The Council has begun preparing a new Local Development Plan for Edinburgh called the City Plan 2030. This will set out policies and proposals for development in Edinburgh between 2020 and 2030. Engagement on topics such as housing development and local and regional transport, employment space, retail and leisure, with relevant industry/development sectors and community representatives is underway. Alignment with local air quality management and developing local and national air quality strategies will be crucial to ensuring a sustainable economic growth. The City Plan 2030 will be published in Summer 2020.

6.3 Proposed Actions

The NO_2 objectives in the Great Junction Street and Inverleith Row AQMAs have been met for the second consecutive year. There is the potential to revoke these AQMAs once further evidence is provided that the levels are continuing to consistently meet the objectives and are likely to do so. Consequently, the Council will increase monitoring in these areas for this purpose.

The failure of the particle monitor (FDMS) at Queensferry Road station in December 2018 has led to its replacement with a new FIDAS whilst the station was upgraded with new housing in October 2019. The funding earmarked for establishing a particle monitor (FIDAS) in Nicolson Street was redirected to safeguard particle monitoring at

Queensferry Road. A FIDAS monitor will also be installed at the Nicolson Street station to begin $PM_{2.5}$ and PM_{10} monitoring in 2020.

Monitoring data from 2018 has identified exceedances in the Scottish annual mean PM_{10} objective at Queensferry Road automatic site which is not in an existing AQMA. This is the second consecutive year of exceedance; however, the time period correlates with the timetable of construction and demolition activities occurring on land adjacent to the monitoring site. The development was completed in February 2019. Monitoring will continue in order for recent data reflecting the local situation post-construction to be gathered and assessed.

Modelling work undertaken by SEPA has been used to help explain the discrepancy in NO_2 concentrations between façade sites and a lamppost site on Queensferry Road. As a result, new monitoring site has been established in January 2019 to west of these sites, in a location which has been predicted by the model to reflect concentrations at the pre-existing lamppost site.

Transport Scotland has provided funding to set up additional passive diffusion tube sites within the network to provide additional data for local modelling work as part of the CAFS National Modelling Framework. Following a review of sites in December 2018, additional locations were selected, and tubes first deployed in January 2019. This new source of data will also be utilised for increased monitoring in the AQMAs with a view to future revocations and/or boundary changes.

The PM_{10} annual objective continues to be breached in the Salamander Street AQMA. The Air Quality Action Plan will be produced for this with relevant stakeholders.

The revision to the existing NO_2 Air Quality Action Plan (2008) will commence, in conjunction with the developing City Mobility Plan (new Local Transport Strategy) and the review of the Cleaner Air for Scotland Strategy.

The Council will work with SEPA, Transport Scotland and Scottish Government to develop a LEZ proposed scheme to be in place in the City by the end of 2020.

Progress with existing and new actions is on-going and covered in detailed in Table 2.18 within this report. The following summary details several key action plan measures and additional measures which will continue to be taken forward during 2019/2020**:**

- Continue to work with Lothian Bus to improve fleet standard,
- Continue ECO Stars scheme,
- Continue the roll out of telematics across the Council Fleet, following its early integration into the high-polluting Refuse Collection Vehicles,
- Complete outstanding SCOOT development and repair work,
- Begin installation of on-street electric vehicle charging infrastructure to strengthen the existing network,
- Continue support for Active Travel Action Plan,
- Finalise a draft Air Quality Action Plan for Salamander Street with relevant Stakeholders.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name[3]	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Monitoring Technique	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Inlet Height (m)
ID1	**Queen Street***	Roadside	324826	674078	NO_2 PM_{10}	Y(NO_2)	Chemiluminescent TEOM	0	5.2	2.87
ID2	**Haymarket***	Roadside	323896	673197	NO_2 PM_{10}	Y(NO_2)	Chemiluminescent TEOM	7	9.2	N/A
ID3	**Roseburn***	Roadside	322939	673233	NO_2 PM_{10}	Y(NO_2)	Chemiluminescent TEOM	4.9	7.6	n/a
ID4	**Gorgie Road**	Roadside	323121	672314	NO_2	Y(NO_2)	Chemiluminescent	0	2.5	2.63
ID5	**St. John's Road**	Kerbside	320101	672907	NO_2 PM_{10} $PM_{2.5}$	Y(NO_2)	Chemiluminescent FIDAS 200 FIDAS 200	0	0.5	1.98
ID6	**Currie High School**	Suburban	317595	667909	NO_2 PM_{10}	N	Chemiluminescent TEOM	N/A	N/A	3.59 3.24
ID7	**St. Leonard's**	Urban Background (AURN)	326265	673129	NO_2 PM_{10} $PM_{2.5}$	N	Chemiluminescent FDMS FDMS	N/A	35	3.4m 3.2m 3.1m

Site ID	Site Name[3]	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Monitoring Technique	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Inlet Height (m)
					O_3 CO SO_2 PAH		UV absorp IR absorp UV absorp Digitalsamp			3.4 3.4 3.4 3.4
ID8	**Salamander Street**	Roadside	327615	676333	NO_2 PM_{10}	Y(PM_{10})	Chemiluminescent TEOM	0	2.13	2.86
ID9	**Queensferry Road**	Roadside	318736	674930	NO_2 PM_{10}	N	Chemiluminescent TEOM/FDMS	6.5	1.7	2.96
ID1	**Glasgow Road**	Roadside	313103	672663	NO_2 PM_{10}	Y(NO_2)	Chemiluminescent TEOM	0	6	2.84
ED NS	**Nicolson Street**	Roadside	326151	673041	NO_2	Y(NO_2)	Chemiluminescent	2.2	2.9[i]	1.97

(1) 0 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) * Historic sites

i. Distance to nominal kerb, due to parking bay/parking restrictions/cycle lane in front of monitoring location.

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?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
13a	**Deanhaugh/Raeburn Place**	Roadside	324533	674655	NO_2	No	0	2	No
57	**Glasgow Road 158**	Roadside	318185	672756	NO_2	No	8.5	3.6	No
16a	**Glasgow Road 68 facade**	Roadside	313028	672629	NO_2	Yes	0	6.2	No
16	**Glasgow Road 68**	Roadside	313028	672633	NO_2	Yes	4.4	1.8	No
15a	**Glasgow Road 9**	Roadside	312702	672675	NO_2	Yes	0	7.5	No
58	**Glasgow Road Newbridge**	Roadside	312693	672670	NO_2	Yes	5.2	2.8	No
15	**Glasgow Road Newbridge**	Roadside	312664	672672	NO_2	Yes	3.8	4.0	No
56	**Glasgow Road /Drumbrae**	Roadside	319212	672921	NO_2	No	4.6	2.6	No
16b	**Glasgow Road/Ratho Station 94**	Roadside	313211	672612	NO_2	Yes	0	2.9	No
143a	**Hamilton Place Library**	Roadside	324699	674651	NO_2	No	0 play area	2.1m	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
41	**Hillview Terrace**	Background	320081	673232	NO_2	No	N/A	1.0	No
55c	**Inverleith Row/Montague**	Roadside	324686	675941	NO_2	Yes	1.1	4.3[ii]	No
55	**Inverleith Row/Ferry Road**	Roadside	324638	675993	NO_2	Yes	0	4.7	No
63	**Queensferry Road 544**	Roadside	318723	674963	NO_2	No	0	13.6	No
64	**Queensferry Road 550**	Roadside	318698	674955	NO_2	No	9.2	1.5	No
64b	**Queensferry Road 550 Facade**	Roadside	318701	674964	NO_2	No	0	11	No
64a	**Queensferry Road 552**	Roadside	318698	674964	NO_2	No	0	10.5	No
62	**Queensferry Road 561**	Roadside	318810	674903	NO_2	No	0	16.9	No
40	**Queensferry Rd/Hillhouse Rd**	Roadside	322144	674497	NO_2	No	0	2.0	No
22a	**Roseburn Terrace** [vi]	Kerbside	322984	673189	NO_2	Yes	1.7	2.5[ii]	No
23	**Roseburn Terrace**	Kerbside	323007	673198	NO_2	Yes	2.3	0.2	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
1d	**St John's Road 131**	Roadside	320096	672907	NO_2	Yes	0	2.1	No
SJ2[iii]	**St John's Road 63**	Kerbside	320436	672830	NO_2	Yes	9.15	0.37	No
SJ3[iii]	**St John's Road 81**	Roadside	320316	672857	NO_2	Yes	14.48	1.15	No
1b	**St John's Road IR**	Roadside	320154	672911	NO_2	Yes	0	2.0	No
1	**St John's Road SB**	Kerbside	320122	672917	NO_2	Yes	1.8	0.5	No
SJ1	**St John's Road/Kaimes Rd**	Kerbside	320571	672809	NO_2	Yes	2.3	0.3	No
39	**St John's Road/Victor Park**	Roadside	319677	672991	NO_2	Yes	4.2	1.6	No
14	**Trinity Crescent**	Roadside	324896	676991	NO_2	No	4.0	2.0	No
	SOUTH WEST								
76c	**Angle Park Terrace 25**	Roadside	323587	672360	NO_2	Yes	0	4.8	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
76b	**Angle Park Terrace 74**	Roadside	323527	672285	NO_2	Yes	0	2.1	No
76	**Angle Park/Harrison Road**	Roadside	323498	672263	NO_2	Yes	0	2.2	No
76a	**Ardmillan Terrace 22**	Roadside	323487	672287	NO_2	Yes	0	2.2	No
80e	**Balgreen Road / Library**	Roadside	322110	672268	NO_2	No	0 [Play area]	2.0	No
4a	**Calder Road**	Roadside	318894	670493	NO_2	No	5	12.0	No
79d	**Dundee Street/Yeaman Place**	Roadside	323926	672550	NO_2	Yes	0	2.3	No
79a	**Fountainbridge 103**	Roadside	324731	672984	NO_2	No	0	2.2	No
79	**Fountainbridge/Tollcross**	Roadside	324682	672939	NO_2	No	0	3.3	No
80	**Gorgie Road / Delhaig**	Roadside	321967	671666	NO_2	Yes	0	2.6	No
18	**Gorgie Road 8**	Roadside	323477	672476	NO_2	Yes	0	2.4	No
80c	**Gorgie Road 87**	Roadside	323265	672394	NO_2	Yes	0	2.5	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
80f	**Gorgie Road 160**[i]	Roadside	323141	672345	NO_2	Yes	0	3.2	No
80g	**Gorgie Road 173**[i]	Kerbside	323083	672311	NO_2	Yes	2.9	1.8[ii]	No
80b	**Gorgie Road 549**	Roadside	321724	671557	NO_2	Yes	0	2.5	No
80a	**Gorgie Road Glen Lea**	Roadside	322381	671950	NO_2	Yes	0	2.6	No
5	**Gorgie Road/Murieston Road**	Kerbside	323484	672478	NO_2	Yes	4.9	0.3	No
76d	**Henderson Terrace**	Roadside	323632	672449	NO_2	Yes	0	1.8	No
11a	**Lanark Road 425**[i]	Roadside	326151	673041	NO_2	No	0	2.6	No
11	**Lanark Road 610**	Roadside	319527	668420	NO_2	No	3.7	1.5	No
77a	**Slateford Road 51**	Roadside	323167	672009	NO_2	Yes	0	2.3	No
77b	**Slateford Road 93/95**	Roadside	322999	671876	NO_2	Yes	0	2.6	No
77	**Slateford Road 97**	Roadside	322960	671846	NO_2	Yes	0	2.7	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
80h	**Wardlaw Street 2**[i]	Roadside	323065	672295	NO_2	Yes	0	5	No
	NORTH EAST								
29a	**Bernard Street/Kings Chambers**	Roadside	327137	676529	NO_2	Yes	0	2.1	No
29c	**Bernard Street/PS**	Roadside	327135	676515	NO_2	Yes	0	2.1	No
29	**Bernard Street/CA**	Roadside	327148	676507	NO_2	Yes	0	2.2	No
43	**Broughton Road**	Roadside	325513	675134	NO_2	No	0	2.0	No
9d	**Commercial Street**	Roadside	326477	676759	NO_2	Yes	0	2.6	No
9	**Commercial Street 88**	Roadside	326879	676626	NO_2	Yes	0	2.6	No
9a	**Commercial St/Portland Pl**	Roadside	326430	676754	NO_2	Yes	3.9	1.5	No
30f	**Duke Street**	Roadside	327106	675816	NO_2	No	0	2.2	No
25c	**Easter Road 105/109**	Roadside	326958	674770	NO_2	Yes	0	3.3	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
25e	**Easter Road 198**	Roadside	326999	674940	NO_2	Yes	0	4.0	No
25d	**Easter Road/Bothwick**	Roadside	326974	674780	NO_2	Yes	0	2.8	No
25	**Easter Road/CH Shop**	Roadside	326934	674503	NO_2	Yes	0	2.3	No
25b	**Easter Road/Rossie Place**	Roadside	326950	674624	NO_2	Yes	0	3.3	No
53	**Ferry Road/Bowhill Terrace 6**	Roadside	324726	676004	NO_2	Yes	1.6	4.6[ii]	No
45d	**Ferry Road/North Junction Street**	Roadside	326503	674436	NO_2	Yes	0	3.1	No
30b	**Great Junction Street 137**	Roadside	326740	676138	NO_2	Yes	0	2.9	No
30c	**Great Junction Street 14**	Roadside	326925	675949	NO_2	Yes	0	2.8	No
30e	**Great Junction Street/CG**	Roadside	326845	676015	NO_2	Yes	0	2.7	No
30	**Great Junction Street/FV**	Roadside	326884	675997	NO_2	Yes	0	2.8	No
30d	**Great Junction Street/WC**	Roadside	326757	676144	NO_2	Yes	0	2.8	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
21	**Leith Walk/Brunswick Road**	Roadside	326413	674899	NO_2	Yes	0	4.5	No
20	**Leith Walk/McDonald Road**	Roadside	326361	674882	NO_2	Yes	3.1	1.2	No
66	**London Road/Cadzow Place**	Roadside	327468	674362	NO_2	Yes	0	5.7[ii]	No
67	**London Road/Earlston Place**	Roadside	327190	674433	NO_2	Yes	0	2.7	No
81	**London Rd/East Norton Place**	Roadside	326980	674446	NO_2	Yes	0	2.5	No
46	**London Road/Easter Road**	Roadside	326944	674472	NO_2	Yes	0	5.6	No
68	**Parsons Green Terrace**	Roadside	328042	674179	NO_2	Yes	0	2.7	No
69	**London Road/Wolseley Place**	Roadside	328272	674143	NO_2	Yes	0	2.62	No
70	**London Road/Wolseley Terrace**	Roadside	328337	674129	NO_2	Yes	0	4.6	No
32	**Niddrie Mains Road 28**	Kerbside	328889	671649	NO_2	No	4.7	2.6[ii]	No
9c	**North Junction Street**	Roadside	326448	676710	NO_2	Yes	2.1	2.7	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
71	**Portobello High Street 185**	Roadside	330533	673850	NO_2	No	0	3.0	No
73d	**Portobello Road/Ramsay F**	Roadside	329917	674388	NO_2	No	0	3.7	No
51c	**Salamander Street/Baltic Street**	Roadside	327476	676418	NO_2	No	0	2.3	No
72	**Seafield Road East 10**	Roadside	329993	674457	NO_2	No	0	4.5	No
	SOUTH EAST								
44	**Broughton Street**	Roadside	325918	674430	NO_2	No	0	3.4	No
6a	**Bruntsfield Place 210**	Roadside	324495	672035	NO_2	No	0	2.8	No
138	**Clerk Street 15**	Roadside	326229	672789	NO_2	Yes	0	4.4[ii]	No
151	**Comiston Road**	Roadside	324367	670473	NO_2	No	0	2.7	No
48f	**Cowgate/50 St Mary's Stre**	Roadside	326198	673587	NO_2	No	0	2.6	No
48c	**Cowgate Blackfriars**	Roadside	326047	673519	NO_2	Yes	0	2.4	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
48a	**Cowgate/Blair Street**	Roadside	325929	673490	NO_2	Yes	0	3.2	No
48	**Cowgate/Guthrie Street**	Roadside	325881	673471	NO_2	Yes	0	4.5	No
48e	**Cowgatehead 2**	Roadside	325537	673405	NO_2	Yes	0	1.9	No
150	**Drum Street**	Roadside	329281	668615	NO_2	No	0	1.5	No
74f	**George Street 112**	Roadside	324880	673891	NO_2	Yes	0	6.8	No
37a	**Grassmarket 41**	Roadside	325401	673340	NO_2	Yes	0	3.4	No
37b	**Grassmarket 75**	Roadside	325471	673369	NO_2	Yes	0	5.0	No
37c	**Grassmarket/Thompsons Court**	Background	325397	673377	NO_2	Yes	0	22.8[ii]	No
75e	**Great Stuart Street 9**	Roadside	324476	673967	NO_2	No	0	9.4[ii]	No
HT1	**Haymarket Terrace (North)**	Roadside	323985	673219	NO_2	Yes	0	3.7	No
HT2	**Haymarket Terrace (South**	Kerbside	323787	673212	NO_2	Yes	1.75	0.5	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
10	**Home Street**	Roadside	324904	672906	NO_2	No	0	2	No
140	**Hope Park Terrace/Clerk Street**	Roadside	326323	672596	NO_2	Yes	3.5	1.3	No
17a	**Hope Park Terrace/VS**	Roadside	326312	672614	NO_2	Yes	0	5	No
149a	**Howden Hall Road 79**	Roadside	327383	668079	NO_2	No	0	4.5	No
34	**India Street**	Background	324790	674341	NO_2	No	N/A	2.5[ii]	No
74g	**Leith Street 35**	Roadside	325897	674051	NO_2	Yes	0	3.65	No
152	**Mayfield Road**	Roadside	326640	671384	NO_2	No	0	3.7	No
38	**Melville Drive**	Roadside	325141	672733	NO_2	No	10.0	2.8	No
42	**Midmar Drive**	Background	325105	670511	NO_2	No	N/A	1.4	No
8	**Morningside Road**	Roadside	324542	671167	NO_2	No	0	3.7	No
49	**Morrison Street**	Roadside	324167	673249	NO_2	Yes	2.4	2.2	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
135	**Nicolson Street 69**	Roadside	326112	673115	NO_2	Yes	0	2.8	No
136	**Nicolson Street 92**	Roadside	326164	673054	NO_2	Yes	0	5.7[ii]	No
27	**North Bridge – South**	Roadside	325944	673670	NO_2	Yes	0	3.5	No
47	**Princes Street (Eastbound)**	Roadside	325049	673791	NO_2	Yes	6.5	9.0	No
24	**Princes Street/Mound**	Kerbside	325397	673869	NO_2	Yes	10.2	1.0	No
33b	**Queen Street 66**[i]	Roadside	324837	674053	NO_2	Yes	0	7	No
33a	**Queen Street/Weymss Place**	Roadside	324817	674077	NO_2	Yes	0	6.0	No
33	**Queen Street/Hanover Street**	Roadside	325467	674229	NO_2	Yes	0	6.5	No
SH1	**Shandwick Place**	Roadside	324513	673556	NO_2	Yes	0	2.5	No
144	**South Bridge 59**	Roadside	326020	673370	NO_2	Yes	0	2.3	No
142	**South Clerk Street 41a**	Roadside	326367	672554	NO_2	Yes	0	2.0	No

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) [1]	Distance to kerb of nearest road (m) [2]	Tube collocated with a Continuous Analyser?
141	**South Clerk Street 84**	Roadside	326383	672472	NO_2	Yes	0	2.6	No
75d	**St Colme Street 4**	Roadside	324646	674025	NO_2	No	0	6.2	No
153	**St John's Hill**	Roadside	326374	673474	NO_2	No	0	1.7	No
3b	**Torphichen Place 1**	Roadside	324277	673309	NO_2	Yes	0	4.8	No
3	**Torphichen Place CH**	Roadside	324258	673295	NO_2	Yes	0	2.3	No
154	**Viewcraig Gardens No.7**	Roadside	326418	673511	NO_2	No	0	10	No
2	**West Maitland Street**	Kerbside	324193	673346	NO_2	Yes	5.2	0.5	No
28d	**West Port 42**	Roadside	325203	673250	NO_2	Yes	0	2.7	No
28b	**West Port 62**	Roadside	325166	673242	NO_2	Yes	0	1.4	No
28c	**West Port Opposite 50**	Roadside	325184	673261	NO_2	Yes	0	3.0	No
36	**York Place**	Roadside	325828	674362	NO_2	Yes	2.7	5.5	No

(1) 0 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.

Distance to relevant exposure not applicable (N/A) where passive diffusion tube represents background concentrations.

i. New sites in 2018
ii. Distance to nominal kerb, due to parking bay/parking restrictions/cycle lane in front of monitoring location.
iii. Sites discontinued in 201

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
ID1	**Queen Street** Roadside	Automatic	N/A	N/A	26	27	24[b]	N/A	N/A
ID4	**Gorgie Road** Roadside	Automatic	N/A	100	34	32	33	30	28
ID5	**St John's Road** Kerbside	Automatic	N/A	99	**59**	**65**	**53**	**53**	**43**
ID6	**Currie** Suburban	Automatic	N/A	90	7	7	7	6	8
ID7	**St Leonard's** Urban Background	Automatic	N/A	97	22 [b]	N/A	23 [b]	20	18
ID8	**Salamander St** Roadside	Automatic	N/A	97	27	28	27	25	25
ID9	**Queensferry Rd** Roadside	Automatic	N/A	99	46 (36)	41 (33)	42 (32)	N/A	52(39)
ID10	**Glasgow Road** Roadside	Automatic	N/A	99	27	26	28	26	26
ID11	**Nicolson Street** Kerbside	Automatic	N/A	100	N/A	N/A	N/A	N/A	51(**47**)
NORTH WEST									
13a	Deanhaugh/Raeburn Place	Diffusion Tube	N/A	92	-	-	26	23[$]	26
57	Glasgow Road 158	Diffusion Tube	N/A	92	33	33	32	32	31

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
16a	Glasgow Road 68 facade	Diffusion Tube	N/A	33	36	34	36	30$	N/A
16	Glasgow Road 68	Diffusion Tube	N/A	83	**40**	**40**	37	35	39
15a	Glasgow Road 9	Diffusion Tube	N/A	92	34	39	33	35	38
58*	Glasgow Rd Newbridge	Diffusion Tube	N/A	92	**45**	**45**	**41**	**44**	**45**
15	Glasgow Rd Newbridge	Diffusion Tube	N/A	92	37	**40**	**40**	**41**	**40**
56	Glasgow Rd /Drumbrae	Diffusion Tube	N/A	83	29	26	28	27	28
143a	Hamilton Place Libra	Diffusion Tube	N/A	100	35	29	33	28	27
41	Hillview Terrace	Diffusion Tube	N/A	92	18	19	20	17	18
55c	Inverleith Row/Montague	Diffusion Tube	N/A	92	29	25	28	23	24
55*	Inverleith Row/Ferry Rd	Diffusion Tube	N/A	100	**40**	**41**	**41**	**40**	34
63	Queensferry Road 544	Diffusion Tube	N/A	92	23	27	24	27	25
64	Queensferry Road 550	Diffusion Tube	N/A	92	**47**	**48**	**44**	**41**	**41**
64b	Queensferry Road 550 F	Diffusion Tube	N/A	92	-	36	31	32	32

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
64a	Queensferry Road 552	Diffusion Tube	N/A	92	30	30	29	30	30
62	Queensferry Road 561	Diffusion Tube	N/A	75	19	19	20	18	21
40	Queensf'y Rd/Hillhouse	Diffusion Tube	N/A	83	32	32	32	28	30
23	Roseburn Terrace	Diffusion Tube	N/A	83	37	32	32	29$	30
22a	Roseburn Terrace	Diffusion Tube	N/A	100	-	-	-	39*	39
1d	St John's Road 131	Diffusion Tube	N/A	100	**48**	**46**	**45**	**42**	**40**
SJ3	St John's Road 81	Diffusion Tube	N/A	N/A	27	27	25	25	-
SJ2	St John's Road 63	Diffusion Tube	N/A	N/A	25	23	22	21	-
1b	St John's Road IR	Diffusion Tube	N/A	100	37	33	36	29	28
1	St John's Road SB	Diffusion Tube	N/A	100	34	31	32	28	26
SJ1	St John's Rd/Kaimes Rd	Diffusion Tube	N/A	75	31	28	27	28	26
39	St John's Road/Victor Pk	Diffusion Tube	N/A	100	32	30	30	30	28
14	Trinity Crescent	Diffusion Tube	N/A	100	25	22	21	21	22

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
SOUTH WEST									
76c	Angle Park Terrace 25	Diffusion Tube	N/A	83	30	30	30	30	30
76b	Angle Park Terrace 74	Diffusion Tube	N/A	75	**41**	**46**	**44**	39	**40**
76	Angle Pk/Harrison Rd	Diffusion Tube	N/A	75	**41**	38	**43**	35	37
76a	Ardmillan Terrace 22	Diffusion Tube	N/A	92	27	27	31	29	28
80e	Balgreen Road / Library	Diffusion Tube	N/A	83	32	34	33	32	31
4a	Calder Road	Diffusion Tube	N/A	75	26	25	28	N/A	23
79d	Dundee St/Yeaman Pl	Diffusion Tube	N/A	92	**41**	**42**	39	38	**40**
79a	Fountainbridge 103	Diffusion Tube	N/A	58	34	31	36	31	29
79	Fountainbridge/Toll cross	Diffusion Tube	N/A	83	34	30	36	25$	28
80	Gorgie Road Delhaig	Diffusion Tube	N/A	75	37	33	38	34	37
18	Gorgie Road 8	Diffusion Tube	N/A	100	**42**	37	38	35	35
80c	Gorgie Road 87	Diffusion Tube	N/A	75	N/A	34	34	35$	34

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
80f	Gorgie Road 160	Diffusion Tube	N/A	83	-	-	-	-	35
80g	Gorgie Road 173	Diffusion Tube	N/A	83	-	-	-	-	35
80b	Gorgie Road 549	Diffusion Tube	N/A	33	31	28	32	28	N/A
80a	Gorgie Road / Glen Lea	Diffusion Tube	N/A	92	31	27	31	29	27
5	Gorgie Rd/Murieston Rd	Diffusion Tube	N/A	92	35	34	33	33	32
76d	Henderson Terrace	Diffusion Tube	N/A	92	32	32	33	28	33
11a	Lanark Road 425	Diffusion Tube	100	50	-	-	-	-	33
11	Lanark Road 610	Diffusion Tube	N/A	83	19	20	20	18	18
77a	Slateford Road 51	Diffusion Tube	N/A	92	35	35	36	31	32
77b	Slateford Road 93/95	Diffusion Tube	N/A	92	38	38	36	33	36
77	Slateford Road 97	Diffusion Tube	N/A	75	37	38	34	29	35
80h	Wardlaw Street 2	Diffusion Tube	N/A	100	-	-	-	-	28

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
NORTH EAST									
29a	Bernard Street	Diffusion Tube	N/A	92	34	34	37	27	31
29c*	Bernard Street/PS	Diffusion Tube	N/A	96	39	**40**	39	36	37
29	Bernard Street/CA	Diffusion Tube	N/A	92	31	32	33	32	30
43	Broughton Road	Diffusion Tube	N/A	92	35	32	34	32	34
9d	Commercial Street	Diffusion Tube	N/A	100	**42**	36	**42**	36	35
9	Commercial Street 88	Diffusion Tube	N/A	100	30	29	32	26	29
9a	Commercial St/Portland Pl	Diffusion Tube	N/A	92	35	36	33	30	31
30f	Duke Street	Diffusion Tube	N/A	67	-	**40**	38	35	35
25c	Easter Road 105/109	Diffusion Tube	N/A	83	29	31	33	31	33
25e	Easter Road 198	Diffusion Tube	N/A	83	31	24	27	24	28
25d	Easter Road/Bothwick	Diffusion Tube	N/A	92	30	30	32	29	38
25	Easter Road/CH Shop	Diffusion Tube	N/A	92	39	**40**	**46**	38$	37

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
25b	Easter Rd/Rossie Place	Diffusion Tube	N/A	92	31	31	35	30$	32
53	Ferry Rd/Bowhill Terr	Diffusion Tube	N/A	100	33	35	33	33	30
45d	Ferry Rd/North J St	Diffusion Tube	N/A	100	34	37	33	33	32
30b	Gt Junction Street 137	Diffusion Tube	N/A	83	33	38	33	33	32
30c	Gt Junction Street 14	Diffusion Tube	N/A	92	37	34	**40**	34	37
30e	Gt Junction Street/CG	Diffusion Tube	N/A	83	33	32	34	N/A	34
30	Great Junction St/FV	Diffusion Tube	N/A	83	N/A	33	**42**	32	37
30d	Gt Junction Street/WC	Diffusion Tube	N/A	92	34	30	33	33$	32
21	Leith Walk/Brunswick Rd	Diffusion Tube	N/A	33	33	33	**40**	38$	N/A
20	Leith Walk/McDonald Rd	Diffusion Tube	N/A	67	32	33	**40**	N/A	39
66	London Rd/Cadzow Pl	Diffusion Tube	N/A	67	31	32	32	31	28
67	London Rd/Earlston Pl	Diffusion Tube	N/A	83	39	**42**	**41**	**42**$	**42**
81	London Rd/E. Norton Pl	Diffusion Tube	N/A	92	**43**	**50**	**57**	**41**	**43**

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
46	London Rd/Easter Rd	Diffusion Tube	N/A	83	38	37	39	**40**	37
68	Parsons Green Terrace	Diffusion Tube	N/A	83	28	31	31	30	33
69	London Rd/Wolseley Pl	Diffusion Tube	N/A	92	**42**	**43**	38	37	38
70	London Rd/Wolseley Terr	Diffusion Tube	N/A	92	38	**44**	**40**	38	**40**
32	Niddrie Mains Road 28	Diffusion Tube	N/A	75	28	28	25	25	24
9c	North Junction Street	Diffusion Tube	N/A	83	30	29	31	30$	27
71	Portobello High St 185	Diffusion Tube	N/A	83	32	31	31	29	29
73d	Portobello Rd/Ramsay F	Diffusion Tube	N/A	92	35	38	36	31	34
51c	Salamander St/Baltic St	Diffusion Tube	N/A	100	30	32	31	32	31
72	Seafield Road East 10	Diffusion Tube	N/A	92	33	30	33	28	31
SOUTH EAST									
44	Broughton Street	Diffusion Tube	N/A	92	31	30	33	36	30
6a	Bruntsfield Place 210	Diffusion Tube	N/A	83	32	30	32	31	31

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
138	Clerk Street 15	Diffusion Tube	N/A	83	38	37	39	**41**	37
151	Comiston Road	Diffusion Tube	N/A	151	-	-	-	25	25
48f	Cowgate/50 St Mary'	Diffusion Tube	N/A	58	37	37	38	34	39
48c	Cowgate Blackfriars	Diffusion Tube	N/A	83	34	**41**	**40**	**41**	34
48a	Cowgate/Blair Street	Diffusion Tube	N/A	83	36	34	37	27$	36
48	Cowgate/Guthrie Street	Diffusion Tube	N/A	83	33	33	38	33	33
48e	Cowgatehead 2	Diffusion Tube	N/A	83	35	**44**	**41**	**43**$	37
150	Drum Street	Diffusion Tube	N/A	83	-	27	29	25	25
74f	George Street 112	Diffusion Tube	N/A	92	30	26	31	30	30
37a*	Grassmarket 41	Diffusion Tube	N/A	79	**40**	**43**	**53**	**50**	**56**
37b	Grassmarket 75	Diffusion Tube	N/A	75	35	36	37	34	37
37c	Grassmarket/Thompsons	Diffusion Tube	N/A	83	25	27	28	26	26
75e	Great Stuart Street 9	Diffusion Tube	N/A	92	23	24	24	22	24

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
HT1	Haymarket Terrace (North)	Diffusion Tube	N/A	83	-	37	**42**	**41**	31
HT2	Haymarket Terrace (South)	Diffusion Tube	N/A	58	-	39	39	39$	35
10	Home Street	Diffusion Tube	N/A	83	27	30	37	38	38
140	Hope Pk Terrace/Clerk St	Diffusion Tube	N/A	75	32	32	31	30	29
17a	Hope Park Terrace	Diffusion Tube	N/A	83	35	36	34	32	31
149a	Howden Hall Road 79	Diffusion Tube	N/A	92	-	30	33	29	33
34	India Street	Diffusion Tube	N/A	100	20	20	21	20	19
74g	Leith Street 35	Diffusion Tube	N/A	58	-	**49**	**59**	N/A	N/A
152	Mayfield Road	Diffusion Tube	N/A	83	-	-	-	26	28
38	Melville Drive	Diffusion Tube	N/A	83	23	24	23	23	23
42	Midmar Drive	Diffusion Tube	N/A	92	13	15	17	15	15
8	Morningside Road	Diffusion Tube	N/A	83	23	24	26	23	25
49	Morrison Street	Diffusion Tube	N/A	83	36	35	39	36	35

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
135	Nicolson Street 69	Diffusion Tube	N/A	83	**43**	**46**	**46**	**44**	**43**
136	Nicolson Street 92	Diffusion Tube	N/A	83	39	35	38	32	37
27	North Bridge – South	Diffusion Tube	N/A	83	**48**	N/A	**53**	37$	**40**
47	Princes Street Eastbound	Diffusion Tube	N/A	92	**50**	**42**	**48**	**43**	**40**
24	Princes Street/Mound	Diffusion Tube	N/A	67	N/A	**42**	**41**	**54$**	**40**
33b	Queen Street 66	Diffusion Tube	N/A	92	-	-	-	-	35
33a	Queen Street/Weymss Pl	Diffusion Tube	N/A	83	-	-	-	29	33
33	Queen St/North David St	Diffusion Tube	N/A	92	N/A	N/A	39	**40**	**42**
SH1	Shandwick Place	Diffusion Tube	N/A	58	-	39	36	N/A	**40**
144	South Bridge 59	Diffusion Tube	N/A	67	**47**	**44**	**50**	**43**	**41**
142	South Clerk Street 41a	Diffusion Tube	N/A	83	36	34	37	33	35
141	South Clerk Street 84	Diffusion Tube	N/A	92	38	**40**	36	38	37
75d	St Colme Street 4	Diffusion Tube	N/A	92	27	26	29	25	27

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014 Bias Adjustment Factor= 0.74	2015 Bias Adjustment Factor=0.76	2016 Bias Adjustment Factor = 0.77	2017 Bias Adjustment Factor = 0.82	2018 Bias Adjustment Factor = 0.9
153	St John's Hill	Diffusion Tube	N/A	92	-	-	-	17	17
3b	Torphichen Place 1	Diffusion Tube	N/A	92	**45**	**42**	**44**	**41**	**43**
3	Torphichen Place CH	Diffusion Tube	N/A	83	**43**	**45**	**50**	**42**	**43**
154	Viewcraig Gardens	Diffusion Tube	N/A	83	-	-	-	19	20
2	West Maitland Street	Diffusion Tube	N/A	92	**43**	**42**	**42**	39	39
28d	West Port 42	Diffusion Tube	N/A	92	**51**	**52**	**51**	**47**	**51**
28b	West Port 62	Diffusion Tube	N/A	58	**56**	**58**	**59**	N/A	**65**
28c	West Port Opposite 50	Diffusion Tube	N/A	92	N/A	**46**	**44**	36$	38
36	York Place	Diffusion Tube	N/A	36	33	35	32	35	31

Notes: Exceedances of the NO_2 annual mean objective of $40\mu g/m^3$ are shown in bold and red.

Concentrations at the objective ($40\mu g/m^3$) are shown in bold black.

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

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

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

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%, except where data capture was very poor and sporadic. See Appendix C for details.

Yellow coloured cells indicate data that is distance corrected. See Appendix D for detail of calculations.

* Concentration is the result of duplicate tubes (2018)

$ Recalculated result following a review of the annualisation process for 2017 diffusion tube data

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2014	2015	2016	2017	2018
ID1	**Queen St** Roadside	Automatic	N/A	N/A	0	0	N/A	N/A	N/A
ID3	**Roseburn** Roadside	Automatic	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ID4	**Gorgie Road** Roadside	Automatic	N/A	100	0	0	0	0	0
ID5	**St John's Road** Roadside	Automatic	N/A	99	1	**42** (224)	5	1	2
ID6	**Currie** Suburban	Automatic	N/A	90	0	0	0	0	0
ID7	**St Leonard's** Urban Background	Automatic	N/A	97	0 (69)	0	0 (73)	0	0
ID8	**Salamander St** Roadside	Automatic	N/A	97	0	0	0	0	0
ID9	**Queensferry Rd** Roadside	Automatic	N/A	99	0	0	0 (142)	3 (159)	3
ID10	**Glasgow Road** Roadside	Automatic	N/A	99	0	0	0	0	0
EDNS	**Nicolson Street Kerbside**	Automatic	N/A	100	-	-	-	-	0

Notes: 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 and red.

(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) If the period of valid data is less than 90%, the 99.8th percentile of 1-hour means is provided in brackets.

Figure A.3a Trend in Automatically Measured Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) at St Leonard's

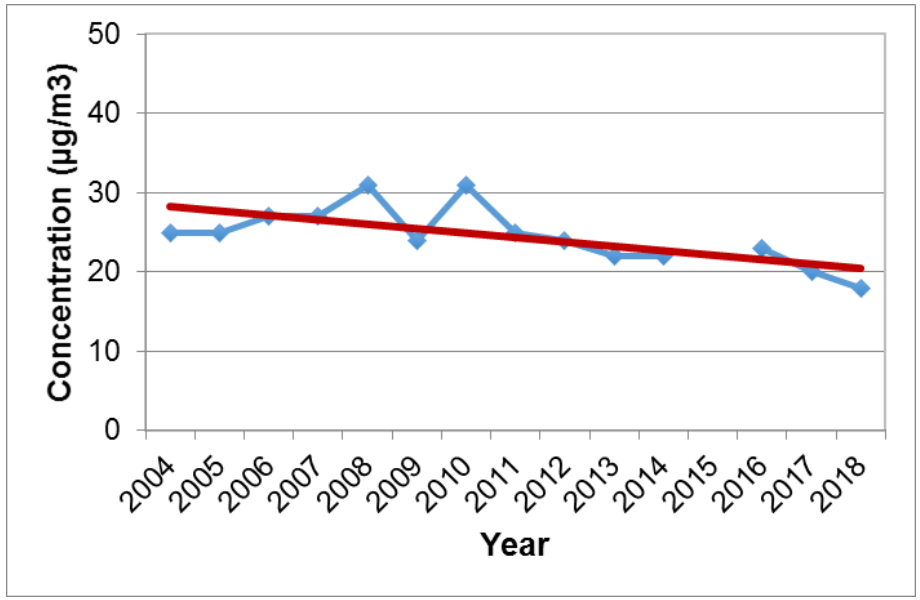


Figure A.3b Trend in Automatically Measured Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) at Gorgie Road

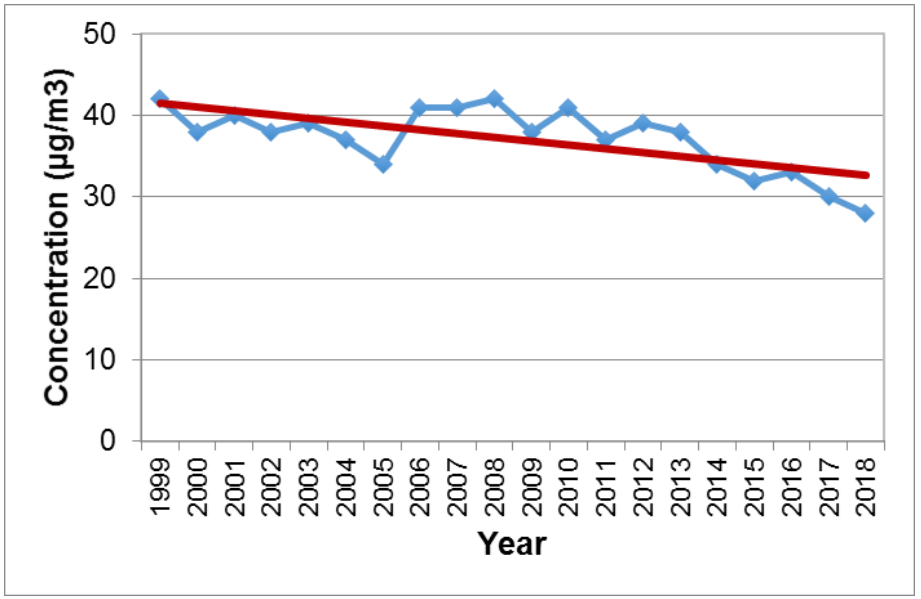


Figure A.3c Trend in Automatically Measured Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) at Salamander Street

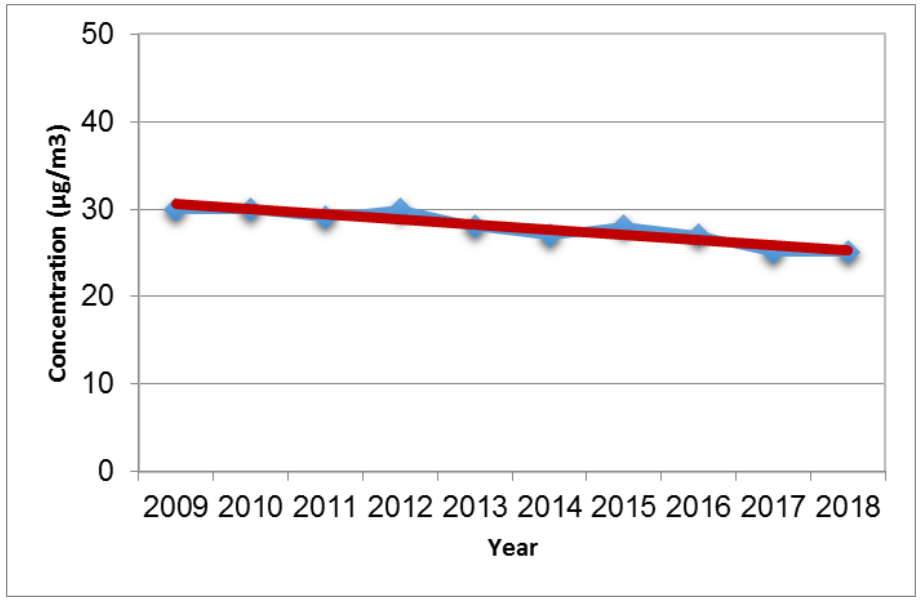


Figure A.3d Trend in Automatically Measured Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) at Currie

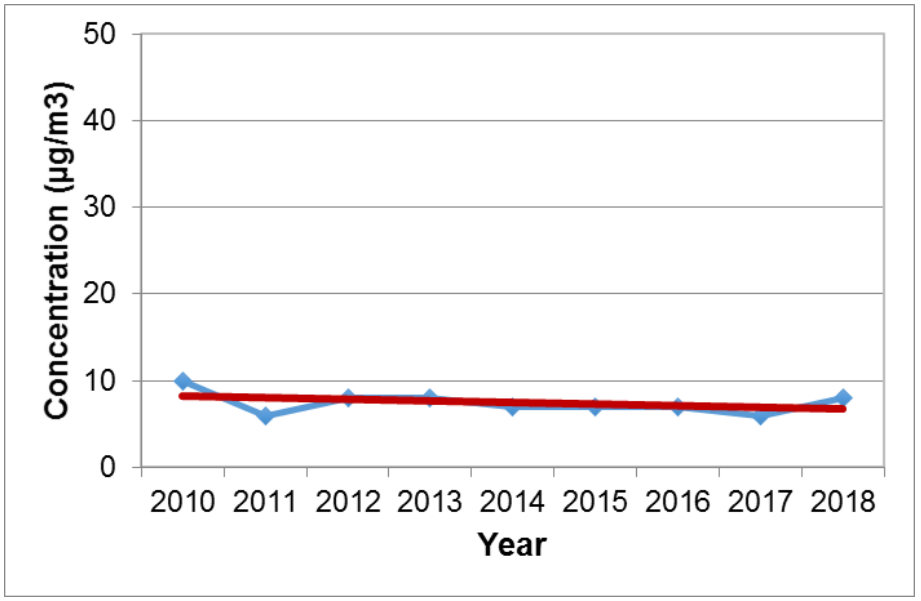


Figure A.3e Trend in Automatically Measured Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) at St John's Road

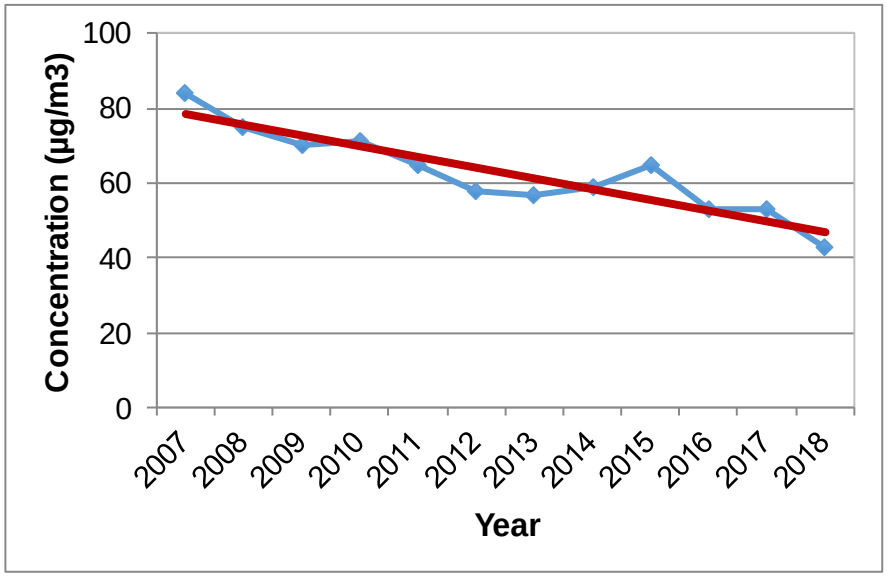


Figure A.3f Trend in the Number of Exceedances of the Hourly Mean Objective for Nitrogen Dioxide at St John's Road

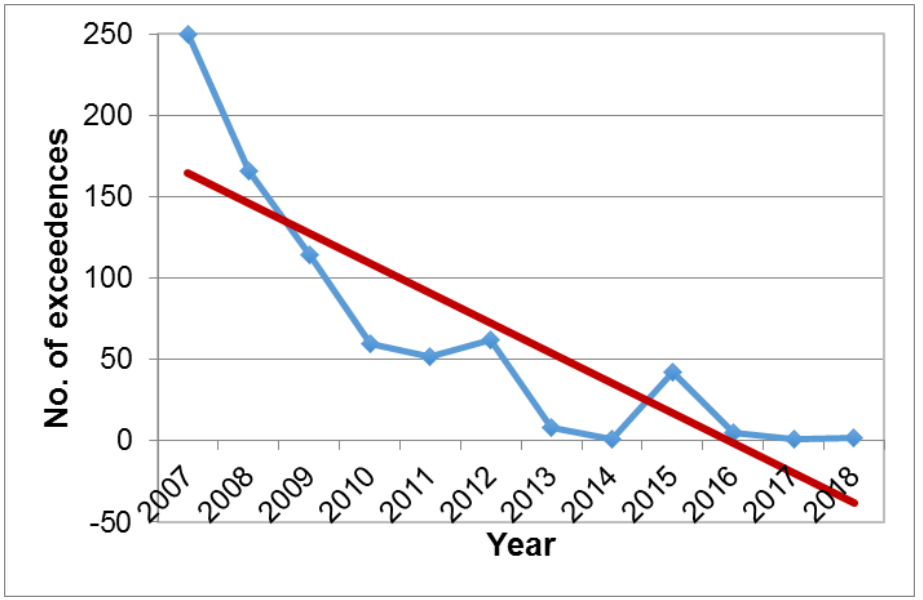


Figure A.3g Trend in Automatically Measured Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) at Glasgow Road

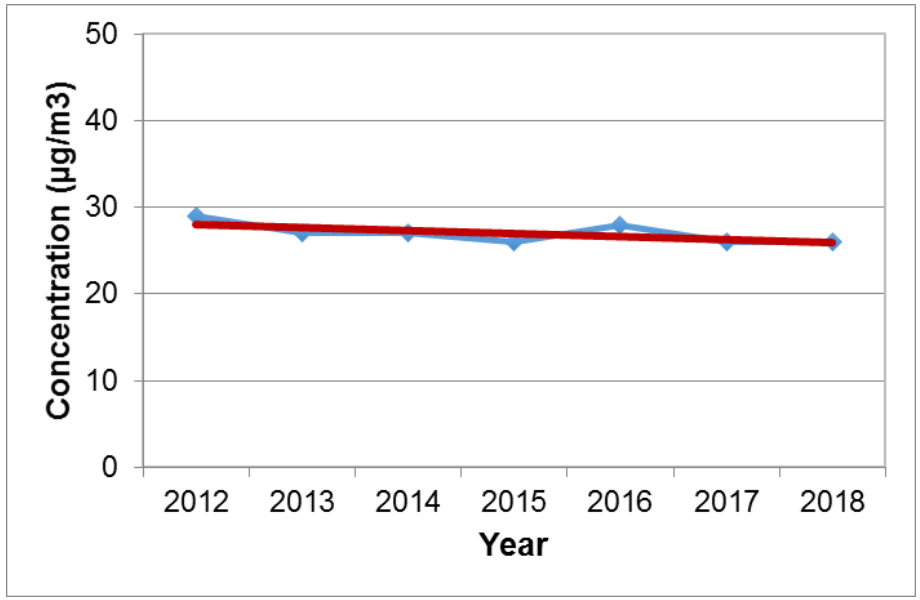


Figure A.3h Trend in Automatically Measured Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) at Queensferry Road

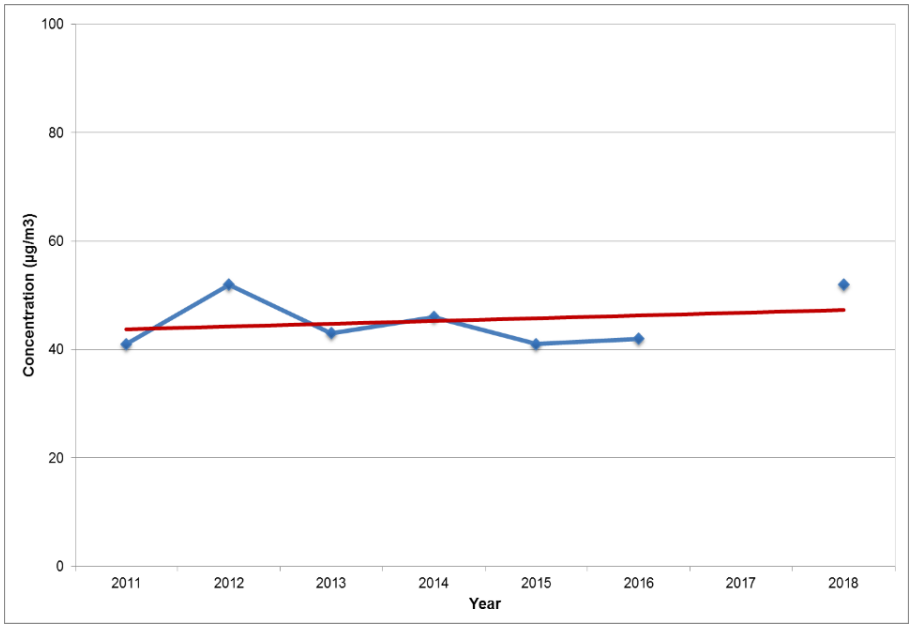


Figure A.4a Trend in Average Passive Diffusion Tube Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) in the Central AQMA

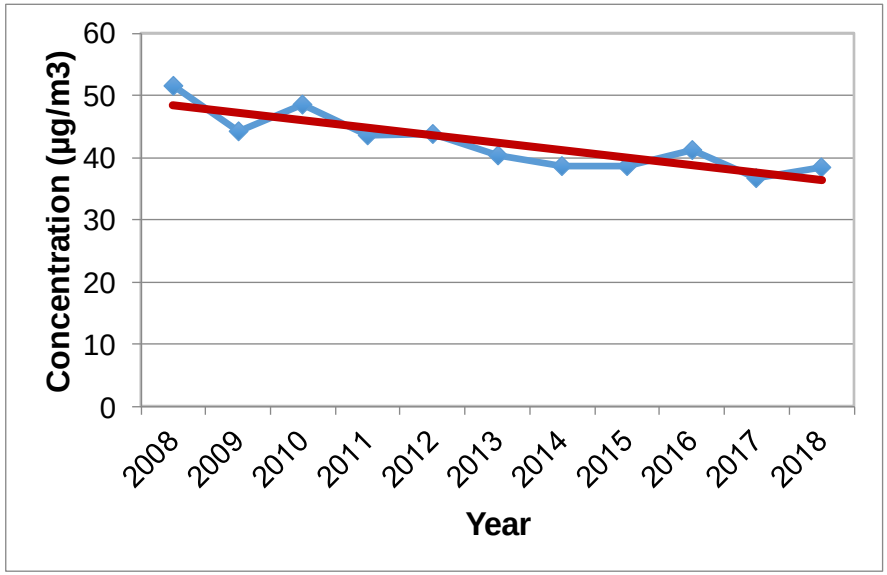


Figure A.4b Trend in Average Passive Diffusion Tube Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) in the Glasgow Road AQMA

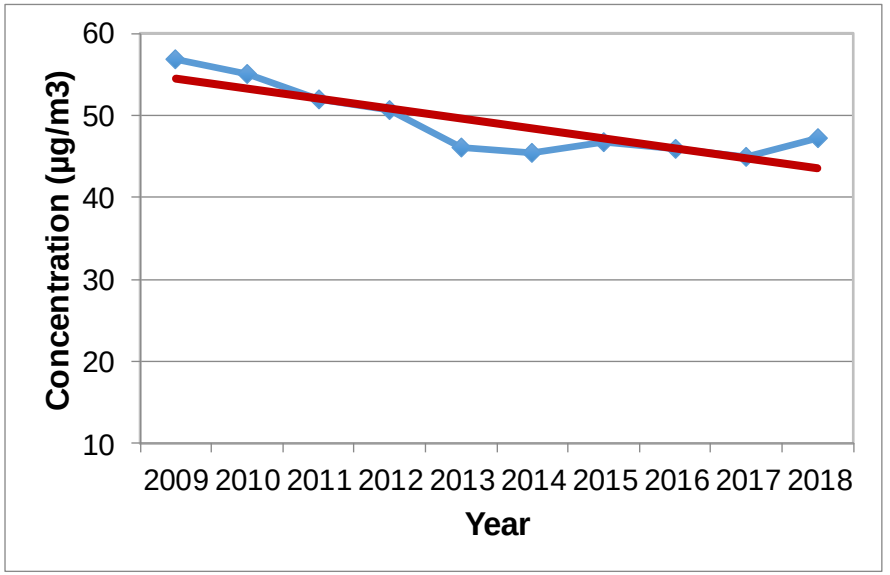


Figure A.4c Trend in Average Passive Diffusion Tube Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) in the Inverleith Row AQMA

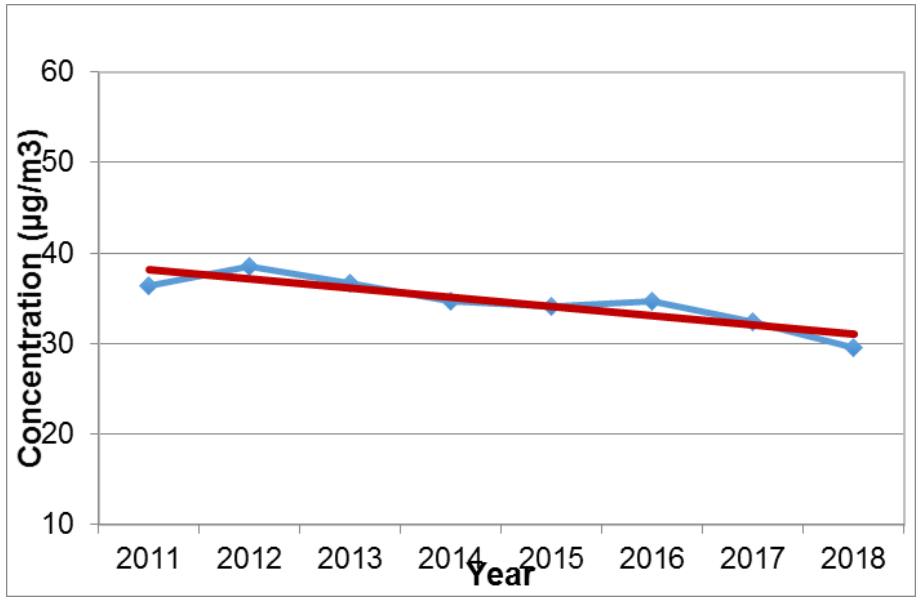


Figure A.4d Trend in Average Passive Diffusion Tube Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) in the Great Junction Street AQMA

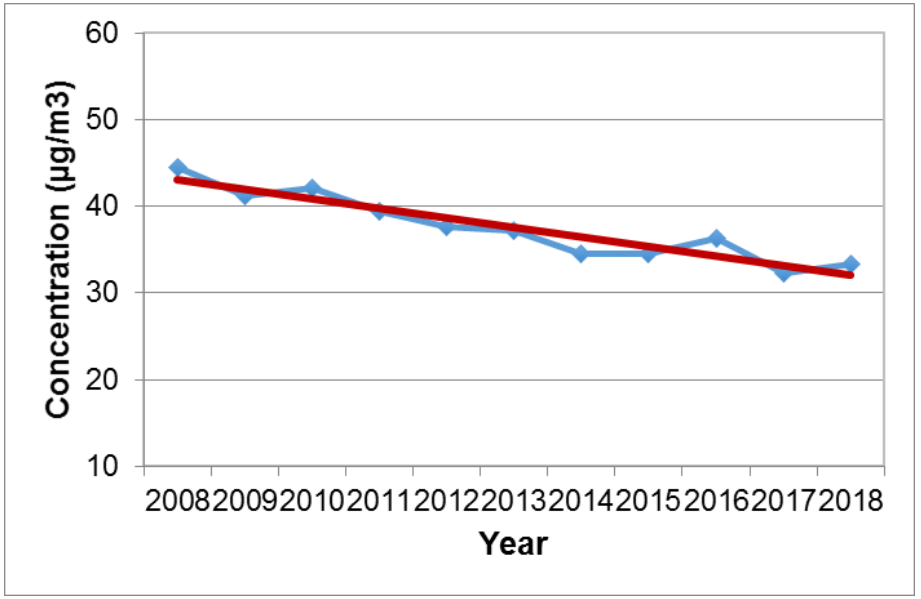


Figure A.4e Trend in Average Passive Diffusion Tube Annual Mean Nitrogen Dioxide Concentrations (µg/m^3) in the St John's Road AQMA

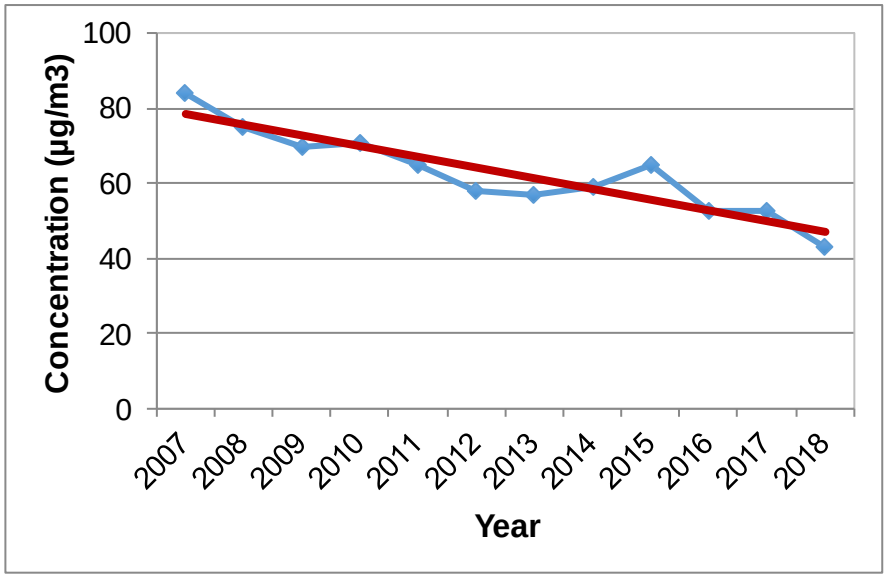


Table A.5a Data used to establish the trend of annual mean concentrations of nitrogen dioxide at passive diffusion tube sites within the Central AQMA

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PDT 2	N/A	56.8	73.4	73.2	50.5	N/A	58.8	51	54.3	48.7	49.5
PDT 3	58.2	26.3	55.6	55.1	48	43	43	45	49.6	41.8	43.2
PDT 5	N/A	58.2	60.1	54.3	51.9	48.5	43.3	42	44	42.7	42
PDT 18	51.5	45	54.5	48.2	49	45	42	37	38.3	35.3	34.8
PDT 20	53.1	36.8	38.1	N/A	35	34	32	33	39.7	N/A	45.3
PDT 21	N/A	40	40.7	35.8	38.8	36.2	35.1	35	40.3	37.9	N/A
PDT 23	N/A	47.5	58.2	41.4	45.1	41.2	45.7	37	39.7	34.3	37.1
PDT 24	N/A	46.2	73	N/A	49.7	59.9	N/A	54	56.7	54.2	52.7
PDT 25	58.2	50.8	49.7	43.6	45	41	39	40	45.7	37.9	37.1
PDT 27	52.3	48.4	49.4	48.7	52	47	48	N/A	53	37.4	40.4
PDT 36	N/A	39.2	41.1	36.9	43.1	29.1	34.1	36	33.6	34.6	31.9
PDT 46	52.3	43.4	46.2	40.4	46	38	38	37	39.3	39.7	37.4
PDT 47	N/A	31.6	47.5	39	N/A	41	41.1	38	40.8	38.1	35.5
PDT 48	46.6	39.8	46.2	40.2	40	38	33	33	37.7	32.7	32.9
PDT 49	N/A	48.2	54.5	53.5	50.8	46.8	39.3	36	41.7	38.1	37
PDT 66	N/A	43	40.5	N/A	36	34	31	33	31.5	31.1	28.1
PDT 67	N/A	47.9	51.3	45.5	46	46	39	42	40.5	42.1	41.7
PDT 68	N/A	30.4	36.6	31.5	33	29	28	31	30.9	30.2	32.7
PDT 69	N/A	56.2	50.6	50.4	42	40	42	43	39.3	36.5	37.8
PDT 70	N/A	47.3	46.1	42.4	41	44	38	44	40	38.2	40.1
PDT 76	N/A	N/A	52.9	44.4	48	41	41	38	43.4	34.6	37.1
PDT 77	N/A	N/A	47.6	38.1	43	40	37	38	33.9	29	34.5
PDT 80	N/A	N/A	47.4	42.2	42	44	37	33	38	34.2	36.5

PDT 81	N/A	N/A	N/A	51.2	46	44	43	50	56.7	40.9	42.6
PDT 17a	N/A	38.8	43.4	37.4	39	36	35	36	34.4	31.9	31.2
PDT 25b	44.9	38.8	39.1	35.8	35	34	31	31	34.7	29.9	31.8
PDT 25c	43.8	38	37.7	41	41	37	29	31	33.1	30.5	32.6
PDT 25d	40.8	37.3	37.1	32.7	34	30	30	30	32.3	29	28.1
PDT 25e	37.3	34.1	34.2	32	33	27	31	25	27.4	23.9	28.4
PDT 28b	72.5	66.7	62.4	57	61	52	56	58	58.9	N/A	64.9
PDT 28c	51.5	43.5	41.5	39	N/A	39	N/A	46	43.5	35.9	38.3
PDT 28d	66.6	60.2	54.9	55.2	60	58	51	52	50.8	46.9	51.4
PDT 37a	42.3	40.5	60	42	43	44	40	42	54.1	56.5	56.3
PDT 37b	N/A	N/A	N/A	37.1	39	37	35	36	36.7	34.1	37.1
PDT 48a	N/A	N/A	37.7	31.4	40	35	36	34	37.4	27.6	35.6
PDT 74f	N/A	N/A	43.4	44.7	47	34	30	26	30.8	30.4	30.3
Mean	**51.5**	**44.2**	**48.6**	**43.7**	**43.9**	**40.4**	**38.6**	**38.6**	**41.2**	**36.7**	**38**

Table A.5b Data used to establish the trend of annual mean concentrations of NO_2 at passive diffusion tube sites within the Glasgow Road AQMA

	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PDT 16	57.3	54.7	50.9	54.8	44.9	45.6	46	44.8	39.6	46
PDT 58	61.8	65	59.3	54.8	52	51.9	51.3	49	50.9	52
PDT 15	51.4	45.7	45.9	42.5	41.4	38.6	42.8	44	44.4	43.7
Mean	**56.8**	**55.1**	**52**	**50.7**	**46.1**	**45.4**	**46.7**	**45.9**	**45**	**47.2**

Table A.5c Data used to establish the trend of annual mean concentrations of NO_2 at passive diffusion tube sites within the Inverleith Row AQMA.

	2011	2012	2013	2014	2015	2016	2017	2018
PDT 55	43.8	46	43	40	41	40.5	39.5	34.3
PDT 55c	28.6	32.7	31.3	29.3	24.9	29.2	23.4	23.6
PDT 53	36.9	36.8	35.5	34.5	36.4	34.2	34.4	30.8
Mean	**36.4**	**38.5**	**36.6**	**34.6**	**34.1**	**34.6**	**32.4**	**29.6**

Table A.5d Data used to establish the trend of annual mean concentrations of NO_2 at passive diffusion tube sites within the Great Junction Street AQMA.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PDT 29	45.3	45.1	43.7	38.9	37	36	31	32	33.2	32.1	29.8
PDT 29a	48	42	44.6	41.9	40	38	34	34	37.2	27.4	31.1
PDT 29c	53.4	48.2	49.4	44.6	44	42	39	40	41.6	35.9	36.5
PDT 9	40.4	31.6	36.7	31.2	35	32	30	29	32	26.3	29.1
PDT 9a	N/A	N/A	45.5	46.2	44	41	41	42	39.8	35.1	36.5
PDT 45d	42.4	40.9	38.3	39.6	37	34	34	37	33.2	33.2	32
PDT 30b	38.4	38.5	39.9	40	38	36	33	38	32.8	32.8	31.7
PDT 30c	50.2	42.6	44.1	38.4	38	39	37	34	40.3	34.2	37.1
PDT 30d	39	37.1	39.9	33.8	38	34	34	30	33	33	31.2
PDT 30e	43.1	41.9	38.7	41.2	37	36	33	32	34	N/A	33.9
PDT 30	44.6	44.1	41.8	39.1	38	41	N/A	33	42.1	31.7	36.9
Mean	**44.5**	**41.2**	**42.1**	**39.5**	**38.7**	**37.2**	**34.6**	**34.6**	**36.3**	**32.2**	**33.3**

Table A.5e Data used to establish the trend of annual mean concentrations of NO_2 at passive diffusion tube sites within the St John's Road AQMA.

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
PDT 1	50	43	47	39	43	42	39	35	37.3	32.2	29.2
PDT 1b	48.8	44.2	43.5	38.4	44	41	37	33	36.1	28.5	27.7
PDT 1d	84.9	57.8	58.8	56.3	52	52	48	46	45.1	42	40.1
Mean	**61.2**	**48.3**	**49.8**	**44.6**	**46.3**	**45**	**41.3**	**38**	**39.5**	**34.2**	**32.3**

Table A.6 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} Annual Mean Concentration (µg/m^3) (3)				
				2014	2015	2016	2017	2018
ID1	**Queen Street** (TEOM) Roadside	N/A	N/A	17 (VCM) 16 (1.14) **97%**	15 (VCM) 16 (1.14) **98%**	N/A **49%**	N/A	N/A
ID5	**St John's Road** (FIDAS) Kerbside	N/A	99	N/A	N/A	N/A	12 **100%**	13
ID6	**Currie** (TEOM) Suburban	N/A	97	11 (VCM) 10 (1.14) **98%**	9 (VCM) 10 (1.14) **77%**	9 (VCM) 10 (1.14) **98%**	8 (VCM) 8 (1.14) **82%**	9 (VCM) 9 (1.14)
ID7	**St Leonard's** (FDMS) Urban BG	N/A	93	13 **71%**	10 **93%**	11 **79%**	10 **85%**	11
ID8	**Salamander St** (TEOM) Roadside	N/A	93	**21** (VCM) **21** (1.14) **98%**	**20** (VCM) **22** (1.14) **90%**	17 (VCM) **18** (1.14) **98%**	17(VCM) **19** (1.14) **96%**	**19**(VCM) **20**(1.14)
ID9	**Queensferry Road** (FDMS) Roadside	N/A	91	**19** **68%**	16 **87%**	**19** **78%**	**22** **85%**	**25**
ID10	**Glasgow Road** (TEOM) Roadside	N/A	98	16 (VCM) 16 (1.14) **98%**	15 (VCM) 16 (1.14) **97%**	15 (VCM) 17 (1.14) **85%**	15(VCM) 16 (1.14) **94%**	15(VCM) 16(1.14)

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

(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) 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.

Data from St Leonard's had a new correction method applied in 2015.

Data not annualised due to sporadic nature. N/A – No or insufficient data for assessment.

Table A.7 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2014	2015	2016	2017	2018
ID1	**Queen Street** (TEOM) **Roadside**	N/A	N/A	1	2	N/A	N/A	N/A
ID5	**St John's Road** (FIDAS) **Kerbside**	N/A	99	N/A	N/A	N/A	1	1
ID6	**Currie** (TEOM) **Suburban**	N/A	97	0	0(23) [a]	0	0	0
ID7	**St Leonard's** (FDMS) **Urban Background**	N/A	93	0(32) [a]	0(31) [a]	0 (29)	0	0
ID8	**Salamander St** (TEOM) **Roadside**	N/A	93	5	**8**	0	0	3
ID9	**Queensferry Road** (FDMS) **Roadside**	N/A	91	1(38) [a]	1(39) [a]	0(40)	**8**	4
ID10	**Glasgow Road** (TEOM) **Roadside**	N/A	98	0	1	0	0	0

Notes: Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 7 times/year) are shown in bold red.

(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%).

[a] if data capture for full calendar year is less than 90%, the 98.08th percentile of 24-hour means is in brackets (expressed in µg/m^3).

Figure A.5a Trend in Automatically Measured Annual Mean PM_{10} Concentrations (Non-Volatile µg/m^3) at St Leonard's

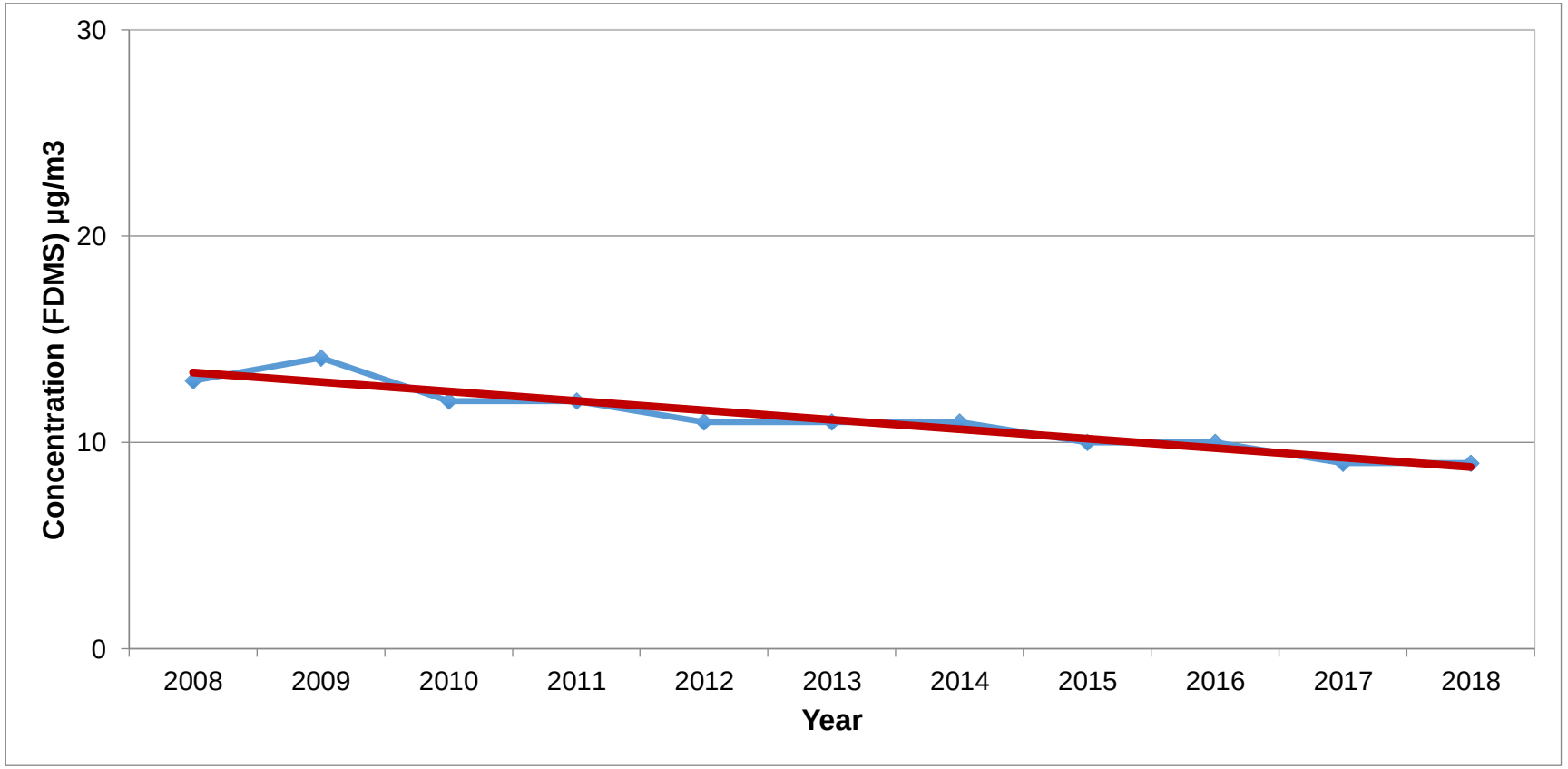


Figure A.5b Trend in Automatically Measured Annual Mean PM_{10} Concentrations ($\mu g/m^3$) at Currie

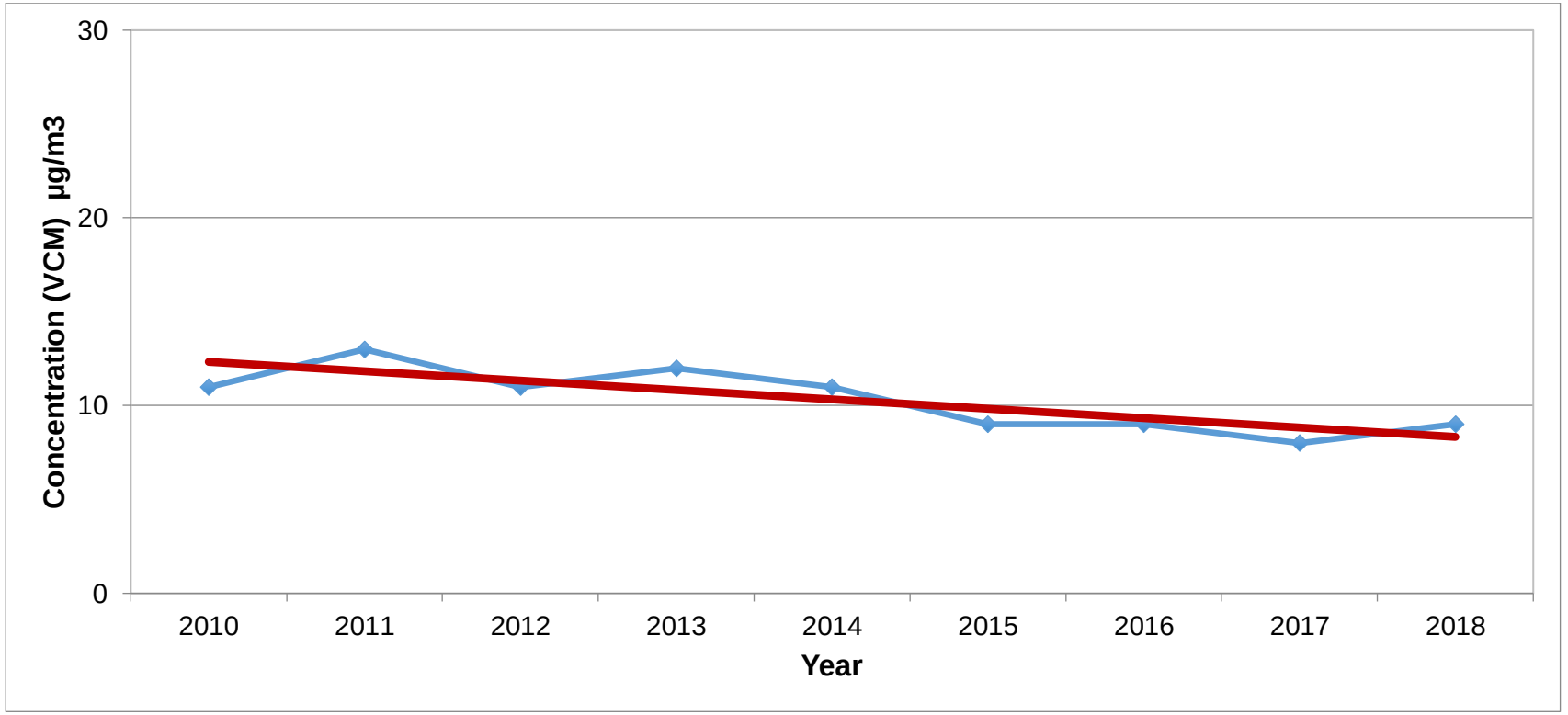


Figure A.5c Trend in Automatically Measured Annual Mean PM_{10} Concentrations ($\mu g/m^3$) at Salamander Street

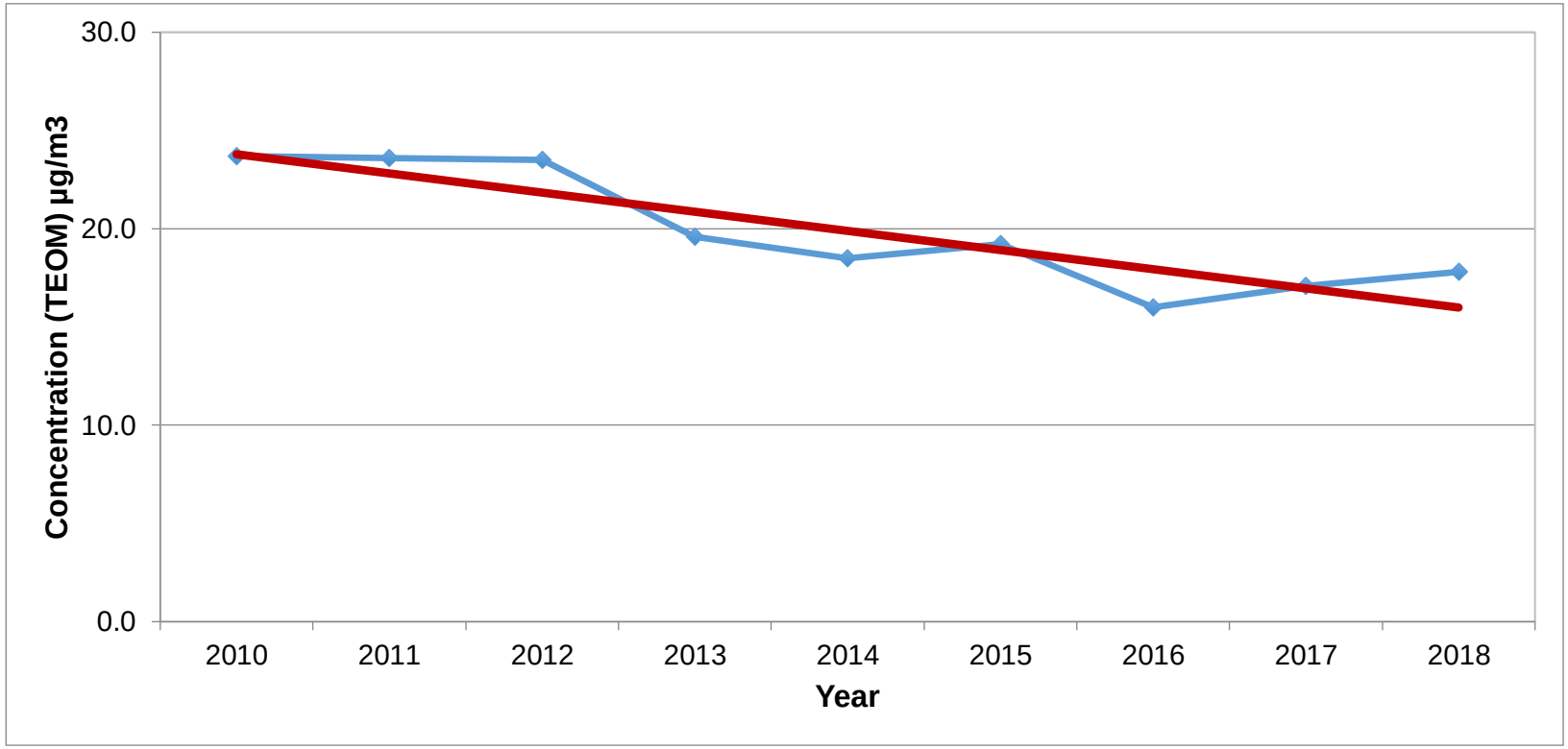


Figure A.5d Trend in Automatically Measured Annual Mean PM_{10} Concentrations ($\mu g/m^3$) at Queensferry Road

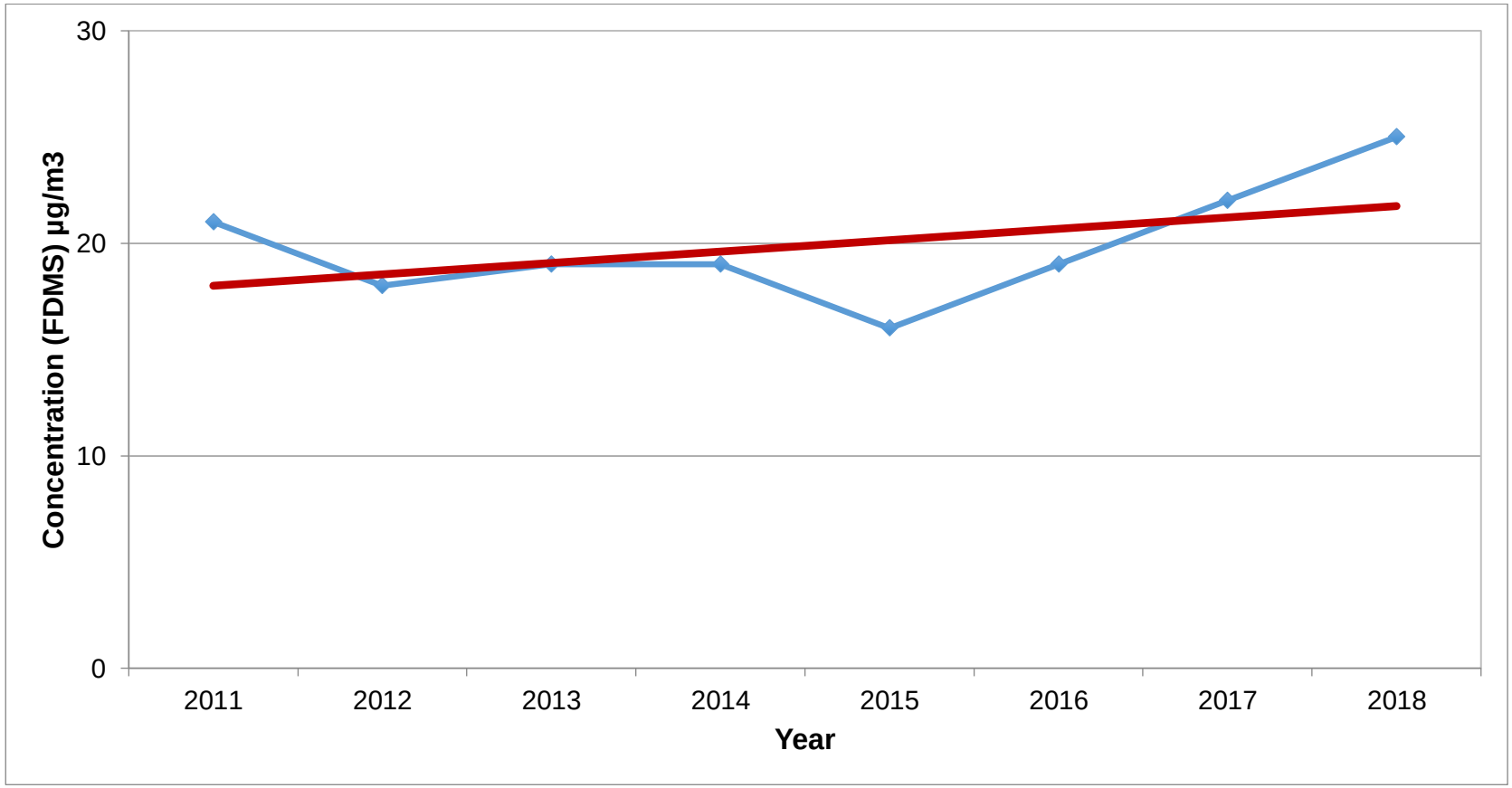


Figure A.5e Trend in Automatically Measured Annual Mean PM_{10} Concentrations ($\mu g/m^3$) at Glasgow Road

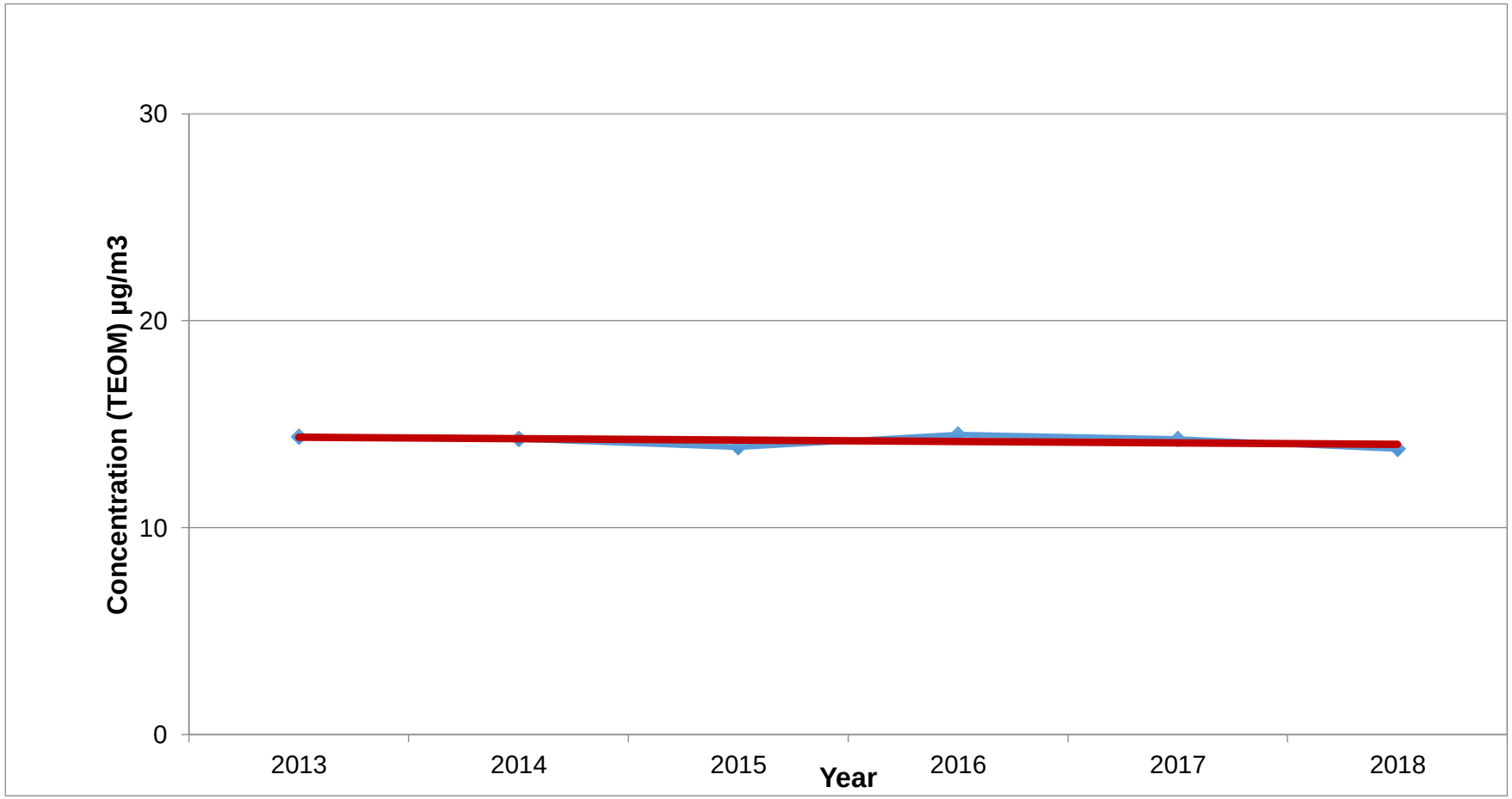


Table A.8a – Annual Mean $PM_{2.5}$ Monitoring Results – Measured Concentrations

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3) (3)				
				2014	2015	2016	2017	2018
ID5- St John's Road	(FIDAS) **Kerbside**	-	99	N/A	N/A	N/A	6 (100%)	6
ID7- St Leonard's	(TEOM FDMS) **Urban Background**	-	93	*9 (65%)*	6 (86%)	6 (92%)	7 (95%)	6

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

Data capture in brackets (%) for measured data. Italic text indicates poor the PM_{10} data capture.

(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) 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.

Figure A.6 Trend in Automatically Measured Annual Mean $PM_{2.5}$ Concentrations (µg/m^3) at St Leonard's

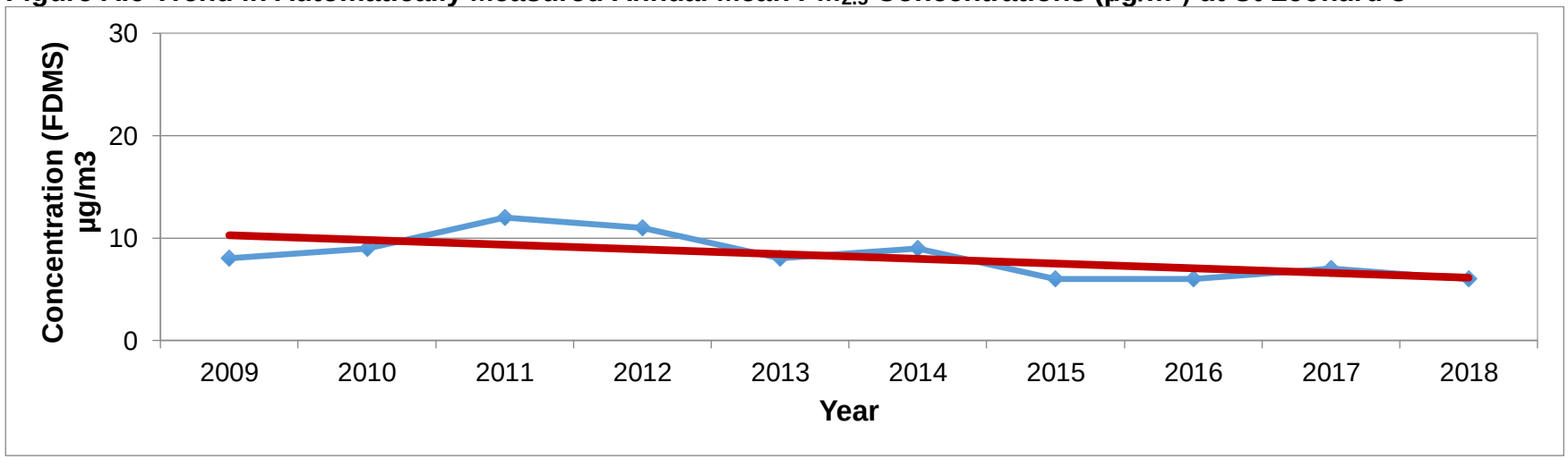


Table A.8b – Annual Mean $PM_{2.5}$ Monitoring Results – Estimations from PM_{10} Measured Data using the UK & Scottish Factors

Site ID	Site Type		$PM_{2.5}$ Annual Mean Concentration (µg/m³) (3)				
			2014	2015	2016	2017	2018
ID6 - Currie	Suburban (TEOM)	National factor 0.7	8 (VCM) 7 (1.14)	*6 (VCM)* *7 (1.14)*	*6 (VCM)* *7 (1.14)*	6 (VCM) 6 (1.14)	6 (VCM) 6 (1.14)
		Scottish factor 0.63	7 (VCM) 6 (1.14)	*6* (VCM) 6 (1.14)	*6* (VCM) 6 (1.14)	5 (VCM) 5 (1.14)	6 (VCM) 6 (1.14)
ID8 - Salamander St	Roadside (TEOM)	National factor 0.7	**15** (VCM) **15** (1.14)	**14** (VCM) **15** (1.14)	**12** (VCM) **13** (1.14)	**12** (VCM) **13** (1.14)	**13** (VCM) **14** (1.14)
		Scottish factor 0.63	**13** (VCM) **13** (1.14)	**13** (VCM) **14** (1.14)	**11** (VCM) **11** (1.14)	**11** (VCM) **12** (1.14)	**12** (VCM) **13** (1.14)
ID9 - Queensferry Rd	Roadside (TEOM FDMS)	National factor 0.7	***13***	**11**	**13**	**15**	**18**
		Scottish factor 0.63	***12***	**10**	**12**	**14**	**16**
ID10 - Glasgow Road	Roadside (TEOM)	National factor 0.7	**11** (VCM) **11** (1.14)	**11** (VCM) **11** (1.14)	**11** (VCM) **12** (1.14)	**11** (VCM) **11** (1.14)	**11** (VCM) **11** (1.14)
		Scottish factor 0.63	**10** (VCM) **10** (1.14)	9 (VCM) **10** (1.14)	9 (VCM) **11** (1.14)	9 (VCM) **10** (1.14)	9 (VCM) **10** (1.14)

(1) Estimation of $PM_{2.5}$ concentrations from PM_{10} Measurements using national factor (0.7) – Yellow

(2) Estimation of $PM_{2.5}$ concentrations from PM_{10} Measurements using Scottish Factor 0.63 – Blue

(3) Potential exceedances of the $PM_{2.5}$ annual mean objective of 10µg/m³ are shown in bold red, annual mean of 10µg/m³ are shown in bold b

Table A.9 – SO_2 Monitoring Results

Site ID	Site Type	Valid Data Capture for monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	Number of Exceedances (percentile in bracket) (3)		
				15-minute Objective (266 µg/m^3)	1-hour Objective (350 µg/m^3)	24-hour Objective (125 µg/m^3)
ID7	**St Leonard's** Urban Background	-	93	0	0	0

Notes: Exceedances of the SO_2 objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

(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) If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

Table A.10– Number of Ozone exceedances at St Leonard's

St Leonard's (Urban Background)	**2014**	**2015**	**2016**	**2017**	**2018**
Data Capture[(a)] %	*72*	98	97	98	98
No. of exceedances in daily maximum 8-hour running mean > 100 µg/m^3 (air quality strategy standard for 2005)	*6*	3	3	2	**13**
No of exceedances in 8 hourly running mean> 100 µg/m^3 (air quality standard)	*42*	14	43	4	88
Air quality strategy objective for 2005 daily maximum 8-hour running mean > 100 µg/m^3 on more than 10 days	*N/A[(b)]*	Not Exceeded	Not Exceeded	Not Exceeded	**Exceeded**

Notes: Exceedances of the O_3 objective are shown in red and bold

(a) data capture for the full calendar year
Italic; poor data capture

(b) data capture below 85%; for a strict comparison against the objectives there must be a data capture of 85% or greater throughout the calendar year.

Table A.11 – PAH (B(a)P) Monitoring at St Leonard's

St Leonard's Urban Background	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Annual Concentration (ngm^{-3})	0.131	0.129	0.099	0.109	0.084	*0.058*	0.073	0.077	0.047	0.078

Notes: Concentrations shown are not time-weighted

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.2 – NO_2 Monthly Diffusion Tube Results for 2018

Site address	Site ID	NO_2 Mean Concentrations (µg/m^3)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
NORTH WEST LOCALITY															
Deanhaugh St/Raeburn Pl	**13a**	33.4	35.2	37.3	32.6	16.9	23.9	24.6	23.5	22.9	30.4	M	37.6	28.9	26.0
Glasgow Road 158	**57**	42.6	61.2	9.1	36.2	41.5	36.5	44.1	28.4	43.0	50.0	40.6	39.3	42.1	37.9
Glasgow Road 68/ Façade	**16a**	M	M	M	M	44.4	M	M	29.9	26.2	42.0	M	M	n/a	
Glasgow Road 68/adj	**16**	35.0	66.5	64.3	13.7	53.8	52.9	49.3	47.8	36.2	54.4	139.2	51.2	51.1	46.0
Glasgow Road Facade/9	**15a**	41.2	45.3	26.2	M	35.0	35.4	41.6	42.0	39.7	51.2	55.7	53.4	42.4	38.1
Glasgow Road Newbridge	**58**	47.6	59.3	39.5	15.6	58.0	55.0	59.7	53.9	55.4	68.8	66.7	59.1	56.6	50.9
Glasgow Road Newbridge	**58**	41.6	55.3	44.0	19.1	55.0	54.2	58.2	57.8	62.0	72.5	76.9	71.9	59.0	53.1
Glasgow Road Newbridge	**15**	44.0	50.9	36.5	17.3	44.5	41.8	54.0	43.1	46.7	59.2	66.9	46.0	48.5	43.7
Glasgow Road/Drumbrae	**56**	36.7	47.1	28.5	33.5	35.3	M	30.2	M	26.4	34.2	41.2	40.9	35.4	31.9
Hamilton Place/Stockbridge	**143a**	28.1	45.3	29.7	29.6	16.5	26.0	26.3	27.1	28.1	35.6	35.6	31.8	30.0	27.0
Hillview Terrace	**41**	33.6	31.2	14.7	M	11.9	15.6	13.8	15.3	15.4	19.2	25.1	23.1	19.9	17.9
Inverleith Row/Montague	**55c**	25.4	36.8	18.2	27.7	30.3	29.8	26.4	22.5	18.1	25.8	M	34.5	26.9	24.2
Inverleith Row/Ferry Road	**55**	45.7	53.1	34.0	37.0	36.1	34.1	35.1	40.9	37.3	42.9	41.9	43.0	40.1	36.1

Site address	Site ID	NO_2 Mean Concentrations (µg/m^3)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
Inverleith Row/Ferry Road	**55**	41.9	51.1	35.8	34.3	30.5	43.0	35.7	39.4	37.6	42.0	44.4	43.0	39.9	32.5
Queensferry Road 544	**63**	31.4	28.8	21.8	15.6	21.6	20.2	23.9	29.9	29.6	34.1	30.8	35.3	27.9	25.1
Queensferry Road 550	**64**	60.4	69.0	52.9	24.3	61.4	63.1	66.9	74.9	68.3	80.4	72.6	91.5	69.2	62.3
Queensferry Road 550F	**64b**	43.4	50.2	29.4	15.0	27.4	22.5	28.9	32.0	31.4	41.3	35.6	50.3	35.7	32.1
Queensferry Road 552	**64a**	33.1	41.3	27.2	21.8	33.2	26.7	28.1	29.8	29.2	36.0	40.0	40.8	33.2	29.9
Queensferry Road 561	**62**	26.1	25.9	25.6	14.7	21.1	1.7	5.9	17.3	17.4	24.5	26.5	26.2	23.4	21.1
Queensferry Road/Hillhouse	**40**	32.5	45.0	31.6	26.9	46.5	34.7	28.4	25.7	21.2	35.6	M	36.3	33.8	30.4
Roseburn Terrace	**23**	30.2	56.5	45.8	49.6	28.4	48.7	43.1	M	M	32.7	56.5	19.8	41.1	37.0
Roseburn Terrace Wbound	**22a**	57.4	64.1	39.4	42.1	22.9	41.3	43.7	45.5	43.6	51.8	51.4	60.0	46.9	42.2
St John's Road 131	**1d**	45.4	52.6	33.2	32.6	44.4	39.9	45.7	41.8	45.4	53.8	47.5	51.8	44.5	40.1
St John's Road IR	**1b**	36.5	46.8	29.8	33.8	16.8	34.2	31.3	26.9	26.6	32.4	39.1	14.8	30.8	27.7
St John's Road SB	**1**	33.9	44.3	30.4	33.9	16.7	42.2	33.0	30.0	27.1	37.3	39.4	20.5	32.4	29.2
St John's Road/Kaimes Road	**SJ1**	35.4	50.9	37.4	39.9	12.2	34.8	M	31.5	29.0	M	M	42.2	34.8	31.3
St John's Road/Victor Park	**39**	35.3	48.4	25.5	31.3	33.5	35.1	34.9	32.6	33.0	43.8	34.2	35.7	35.3	31.8
Trinity Crescent	**14**	36.8	35.6	32.7	20.9	14.2	17.8	19.1	22.4	23.9	28.2	33.7	30.6	26.3	23.7

Site address	Site ID	NO_2 Mean Concentrations (µg/m^3)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
SOUTH WEST LOCALITY															
Angle Park Terrace 25	**76c**	32.0	42.6	15.0	9.4	28.7	26.9	M	29.4	27.0	37.1	31.4	44.3	33.3	29.7
Angle Park Terrace 74	**76b**	43.0	49.3	M	23.7	45.3	38.4	38.7	41.9	M	48.5	41.6	46.9	43.7	39.3
Angle Park Ter/Harrison Rd	**76**	36.5	55.1	46.1	24.2	M	43.4	39.5	34.0	30.3	38.8	83.1	46.7	41.2	37.1
Ardmillan Terrace 22	**76a**	31.0	43.6	30.3	10.9	37.1	26.4	22.8	24.9	21.8	31.6	37.2	39.3	31.5	28.4
Balgreen Rd/Library	**80e**	37.0	47.2	25.7	35.7	33.1	M	32.1	31.8	34.2	41.2	29.3	M	34.7	31.2
Calder Road	**4a**	23.6	33.1	22.7	10.1	29.9	29.7	23.4	25.8	18.6	M	101.2	27.7	26.1	23.5
Dundee Street/Yeaman Pl	**79d**	38.7	54.6	35.0	10.9	48.4	39.3	40.1	44.0	37.3	46.3	47.4	53.7	44.1	39.7
Fountainbridge 103	**79a**	31.8	44.9	M	17.2	7.8	M	M	30.9	26.3	35.1	36.9	37.4	32.4[a]	29.2
Fountainbridge/Tollcross	**79**	33.4	39.7	31.1	15.2	37.3	26.2	31.6	27.7	22.9	36.3	13.5	39.3	31.6	28.4
Gorgie Road – Delhaigh	**80**	38.7	50.7	37.1	M	41.3	M	39.5	34.6	36.7	38.1	M	48.3	40.6	36.5
Gorgie Road 8	**18**	38.1	47.9	40.0	29.8	44.8	35.1	37.1	35.9	33.3	37.4	40.1	43.6	38.6	34.8
Gorgie Road 87	**80c**	38.0	50.0	34.4	37.0	39.3	32.9	32.8	36.3	35.0	M	M	M	37.3	33.6
Gorgie Road 160	**80f**	37.0	47.1	36.5	43.1	M	41.9	1.4	33.3	32.5	37.6	39.1	34.8	38.3	34.5
Gorgie Road 173	**80g**	42.7	64.4	35.1	43.7	45.6	M	M	36.0	34.7	48.4	44.2	35.1	43.0	38.7
Gorgie Road 549	**80b**	M	M	25.4	M	M	M	28.0	M	28.8	34.8	M	M	N/A	
Gorgie Road/Glen Lea	**80a**	31.6	31.7	33.3	M	34.4	29.5	28.2	26.7	13.2	30.7	39.2	30.8	29.9	26.9

Site address	Site ID	NO_2 Mean Concentrations (µg/m^3)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
Gorgie Road/Murieston Road	**5**	50.9	50.1	38.1	17.0	50.6	45.4	47.0	44.6	48.9	39.4	52.2	46.3	46.7	42.0
Henderson Terrace	**76d**	43.9	45.9	31.6	9.6	35.4	34.5	35.6	32.0	27.0	38.5	38.7	43.5	37.0	33.3
Lanark Road 425	**11a**	-	-	-	-	-	-	33.6	34.7	29.3	37.2	38.4	38.7	36.4[a]	32.8
Lanark Road 610	**11**	23.3	30.9	19.3	21.5	22.5	23.4	17.3	18.9	20.1	24.6	91.2	24.4	22.5	20.3
Slateford Road 51	**77a**	33.8	46.0	28.2	11.5	33.3	27.2	31.8	28.3	26.5	43.9	42.4	43.4	35.0	31.5
Slateford Road 93/95	**77b**	35.0	47.3	33.1	37.0	41.3	37.2	30.1	36.0	28.8	43.9	61.3	41.2	39.6	35.6
Slateford Road 97	**77**	34.9	44.3	34.0	M	42.5	41.0	28.1	30.1	M	37.5	52.9	41.9	38.3	34.5
Wardlaw Street No2	**80h**	34.4	48.3	27.1	33.3	30.0	22.9	27.4	19.5	28.2	35.3	34.3	32.5	31.1	28.0
NORTH EAST LOCALITY															
Bernard Street/ K.Chambers	**29a**	31.2	41.2	17.0	39.3	27.5	30.3	34.2	27.7	25.1	39.2	40.5	44.3	34.6	31.1
Bernard Street/PS	**29c**	42.6	46.8	45.4	41.0	37.4	28.5	36.4	M	30.5	47.8	52.8	56.1	42.3	38.1
Bernard Street/PS	**29c**	39.3	60.1	44.2	40.3	13.4	31.7	36.1	35.5	42.4	50.0	48.2	46.1	40.6	36.5
Bernard Street/Sainsburys	**29**	25.9	54.5	30.6	26.0	20.1	26.3	32.0	32.0	30.5	40.4	10.1	45.9	33.1	29.8
Broughton Road	**43**	42.3	51.3	6.6	34.6	22.0	28.1	33.6	31.9	33.9	35.7	48.5	48.5	37.3	33.6
Commercial Street	**9d**	30.0	45.9	23.8	46.8	40.0	44.7	40.3	35.4	32.5	44.8	48.7	36.6	39.1	35.2
Commercial Street 88	**9**	34.0	38.1	33.7	36.3	36.0	31.9	32.2	26.0	22.4	32.6	37.9	26.9	32.3	29.1

Site address	Site ID	NO_2 Mean Concentrations (µg/m^3)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
Commercial St/Portland Pl	**9a**	35.8	45.3	39.1	37.8	M	37.6	37.5	41.3	40.1	43.7	44.0	44.6	40.6	36.5
Duke Street	**30f**	27.5	48.2	36.7	17.2	38.5	M	33.6	41.8	37.8	14.2	49.5	M	38.8[a]	34.9
Easter Road 105/109	**25c**	41.2	53.8	26.3	13.2	29.4	22.1	26.1	41.7	33.2	41.7	40.8	47.0	36.2	32.6
Easter Road 198	**25e**	30.7	43.8	27.1	15.6	35.7	M	25.3	23.5	24.6	30.2	39.4	35.4	31.6	28.4
Easter Road/Bothwick	**25d**	27.4	39.0	28.9	9.5	37.4	29.0	27.1	27.6	24.2	33.5	37.1	32.1	31.2	28.1
Easter Road/CH shop	**25**	47.4	55.4	39.4	21.3	54.5	23.2	40.3	37.0	32.6	35.1	47.0	41.2	41.2	37.1
Easter Road/Rossie Place	**25b**	36.8	50.2	36.8	24.5	40.0	26.1	30.3	29.3	24.0	36.5	40.8	37.4	35.3	31.8
Ferry Road/ 6 Bowhill Terr	**53**	37.1	54.0	29.5	30.5	9.8	27.0	33.3	39.6	37.5	38.6	31.4	42.4	34.2	30.8
Ferry Road/Nt Junction St	**45d**	40.9	42.2	31.4	39.6	19.1	31.6	34.3	34.2	40.4	45.7	43.6	24.4	35.6	32.0
Great Junction Street 137	**30b**	24.5	40.7	31.0	21.4	33.7	24.5	33.4	M	37.1	45.5	41.2	40.2	35.2	31.7
Great Junction Street 14	**30c**	36.7	41.1	40.4	18.5	49.4	42.6	40.7	30.5	30.4	42.9	53.7	44.5	41.2	37.1
Great Junction Street/Pirrie	**30e**	33.2	M	33.3	12.0	42.9	35.8	37.4	33.5	32.1	38.7	44.4	46.1	37.7	33.9
Great Junction Street/FV	**30**	38.4	37.7	38.1	M	52.2	36.9	38.4	34.8	M	40.5	54.9	38.5	41.0	36.9
Great Junction Street No.137	**30d**	29.9	35.3	34.8	20.8	42.3	30.7	35.2	31.5	26.8	37.6	35.9	42.2	34.7	31.2
Leith Walk/Brunswick Road	**21**	M	48.2	45.2	17.2	M	36.4	M	M	42.5	M	M	M	N/A	-
Leith Walk/McDonald Road	**20**	48.7	50.4	42.7	M	M	42.5	44.8	47.4	49.2	50.6	M	M	50.3[a]	45.3
London Road/Cadzow Place	**66**	30.9	43.2	30.1	27.6	39.6	M	32.8	<1.0	27.9	18.5	33.3	31.0	31.2[a]	28.1

Site address	Site ID	NO_2 Mean Concentrations (µg/m^3)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
London Road/Earlston Place	**67**	46.7	56.2	43.9	19.1	53.9	50.5	M	39.7	43.1	44.7	51.1	33.3	46.3	41.7
London Road/East Norton Pl	**81**	57.8	67.7	43.9	14.8	37.8	36.1	41.2	40.9	44.2	52.8	52.0	45.6	47.3	42.6
London Road/junct Easter Rd	**46**	46.7	38.1	34.1	16.0	50.7	44.0	M	36.2	39.3	43.6	37.2	45.2	41.5	37.4
London Rd/Parson's Green	**68**	45.3	47.0	29.9	9.0	37.8	29.1	30.7	32.2	35.9	37.6	M	37.4	36.3	32.7
London Road/Wolseley Place	**69**	53.7	44.0	34.5	35.8	36.1	32.6	37.9	37.1	36.9	43.7	46.7	51.1	41.3	37.8
London Road/Wolseley Terr	**70**	43.1	42.3	31.5	42.3	37.7	30.4	40.2	60.8	44.9	67.4	40.0	52.1	44.6	40.1
Niddrie Mains Road 28	**32**	30.9	43.5	23.4	14.1	30.7	20.8	33.4	30.9	29.8	37.7	34.3	39.2	31.2	28.1
North Junction St No.4	**9c**	43.9	45.2	24.4	31.4	16.3	M	<1.0	24.2	25.4	32.0	33.4	39.0	31.5	28.4
Portobello High Street W 185	**71**	42.7	35.3	25.2	15.1	25.7	22.4	30.7	29.5	30.0	32.6	38.6	46.9	32.7	29.4
Portobello Rd/Ramsay Inst	**73d**	33.5	44.4	27.0	14.6	35.2	28.0	33.4	39.9	29.9	43.6	54.7	43.0	37.5	33.8
Salamander Street/Baltic St	**51c**	43.6	54.4	29.9	32.0	18.4	21.4	27.6	18.6	37.3	45.6	37.9	43.0	34.1	30.7
Seafield Road East 10	**72**	33.1	40.1	34.1	28.4	49.9	29.1	35.6	29.0	19.9	33.4	38.8	38.7	34.7	31.2
SOUTH EAST LOCALITY															
Broughton Street	**44**	33.7	35.5	30.3	32.9	15.4	1.5	32.9	39.0	25.4	33.7	46.7	42.5	33.5	30.2
Bruntsfield Place 210	**6a**	38.1	38.1	26.0	18.0	38.9	M	29.7	32.9	25.1	35.4	41.3	38.2	34.4	31.0

Site address	Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
Clerk Street 15	**138**	44.6	41.6	32.6	18.4	41.5	32.4	35.0	41.7	41.4	51.4	M	42.7	40.5	36.5
Comiston Road No.116	**151**	27.1	34.8	21.6	M	M	17.8	26.9	26.3	24.2	29.9	28.9	35.9	27.3	24.6
Cowgate/ 50 St Mary's St	**48f**	34.9	48.8	M	17.6	45.7	42.9	34.8	36.8	28.4	M	15.1	M	42.8[a]	38.5
Cowgate/Blackfriars	**48c**	37.8	14.6	36.8	15.0	43.2	31.6	M	44.7	47.6	47.1	27.6	47.0	37.8	34.0
Cowgate/Blair Street	**48a**	42.3	37.3	32.5	20.5	41.2	40.1	32.1	M	24.4	34.3	44.5	67.2	39.6	35.6
Cowgate/Guthrie Street	**48**	38.4	40.5	36.6	22.3	41.4	32.5	M	32.2	33.1	40.2	21.9	48.1	36.5	32.9
Cowgatehead 2	**48e**	34.4	M	33.3	36.1	48.4	42.9	40.2	43.7	38.1	46.4	44.0	M	41.3	37.2
Drum Street	**150**	32.0	31.2	25.8	14.3	31.5	27.6	M	20.2	22.9	30.3	31.9	27.0	28.0	25.2
George Street 112	**74f**	34.4	31.5	34.4	7.9	30.0	25.8	26.2	34.9	22.7	38.1	47.5	45.4	33.7	30.3
Grassmarket 41	**37a**	M	67.6	62.1	50.4	53.0	48.2	37.7	70.2	37.3	97.5	38.9	114.0	62.7	56.4
Grassmarket 41	**37a**	M	62.0	78.0	49.9	51.7	46.5	50.8	76.7	38.1	101.7	55.1	M	62.3	56.1
Grassmarket 75	**37b**	32.2	45.2	M	19.1	46.6	40.5	M	38.9	35.5	46.3	50.7	34.8	41.2	37.1
Grassmarket/Thomsons Ct	**37c**	26.9	39.9	24.4	13.8	29.9	26.0	25.0	27.0	25.8	29.7	31.8	M	28.6	25.7
Gt Stuart Street 9	**75e**	27.2	37.3	25.2	6.9	21.9	17.5	22.1	24.5	20.1	30.4	35.4	33.8	26.9	24.2
Haymarket Terrace North	**HT1**	38.9	37.8	34.5	M	16.6	31.4	31.0	39.0	36.2	44.7	M	38.2	34.8	31.3
Haymarket Terrace South	**HT2**	54.0	57.3	M	M	M	44.0	44.2	44.8	M	52.2	59.7	41.7	45.4[a]	40.9
Home Street/Tollcross	**10**	52.4	47.8	13.5	12.0	30.4	38.2	37.9	40.7	39.1	45.6	43.2	41.7	41.7	37.6

Site address	Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
Hope Park Terrace/Clerk St	**140**	50.0	36.8	32.4	10.3	M	76.3	36.7	33.1	29.2	36.0	42.2	26.8	35.9	32.3
Hope Park Terrace/VS	**17a**	44.4	30.0	32.3	14.9	37.2	35.9	32.8	30.1	31.7	M	34.7	37.7	34.7	31.2
Howden Hall Road 79	**149a**	42.5	51.3	34.1	17.8	40.5	33.6	31.0	31.3	26.2	35.9	39.9	32.9	36.3	32.7
India Street	**34**	17.7	37.0	20.8	25.4	10.9	11.9	16.8	14.9	17.3	27.6	32.2	23.7	21.4	19.3
Leith Street	**74g**	38.0	51.1	M	50.5	M	35.1	39.5	M	M	54.5	M	41.3	N/A	-
Mayfield Road No.90	**152**	38.0	34.0	24.7	14.4	25.5	22.2	25.7	28.1	30.5	35.0	33.5	44.0	31.6	28.4
Melville Drive	**38**	25.9	36.3	23.5	8.3	22.8	3.6	20.5	31.7	32.7	34.3	26.5	31.7	28.6	25.7
Midmar Drive	**42**	26.4	23.8	13.1	4.3	15.3	11.6	12.3	13.7	13.5	17.8	18.2	22.5	17.1	15.4
Morningside Road	**8**	32.1	34.2	25.2	14.0	M	27.7	24.0	21.1	18.9	27.6	34.6	30.6	27.6	24.8
Morrison Street	**49**	36.6	47.3	46.8	13.0	51.7	M	37.0	32.5	37.7	45.9	40.8	34.9	41.1	37.0
Nicolson Street 69	**135**	54.0	47.3	34.5	36.4	45.9	44.2	44.3	52.7	48.6	50.6	M	56.2	47.8	43.0
Nicolson Street 92	**136**	44.4	52.6	31.0	33.4	39.4	38.8	39.2	M	29.2	50.8	47.3	39.7	41.2	37.1
North Bridge South	**27**	37.2	42.3	42.7	37.7	50.8	54.0	45.4	45.7	M	39.7	46.6	44.1	44.9	40.4
Princes Street (Eastbound)	**47**	40.5	37.9	38.4	23.6	43.4	43.0	39.5	37.0	35.6	39.4	34.2	44.6	39.4	35.5
Princes Street/Mound	**24**	70.7	58.4	47.8	20.8	56.1	M	M	M	68.3	70.5	68.9	67.9	58.5[a]	52.7
Queen Street No 66	**33b**	47.7	51.9	28.0	37.9	36.2	27.9	33.7	32.8	28.2	38.3	51.5	49.9	38.7	34.8
Queen Street/Albyn Pl	**33a**	30.0	34.7	40.8	M	M	32.3	34.9	35.2	31.7	39.2	40.4	48.5	36.8	33.1

Site address	Site ID	NO_2 Mean Concentrations (µg/m^3)													
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
														Raw Data	Bias Adjusted (1)
Queen Street/North David St	**33**	51.6	51.2	35.2	11.3	56.6	47.0	43.5	41.0	39.7	48.8	50.6	50.2	46.9	42.2
Shandwick Place Hostel	**SH1**	43.0	43.1	51.6	16.4	60.4	40.9	M	M	36.1	M	M	50.0	44.1[a]	39.7
South Bridge 59	**144**	41.5	45.5	M	19.8	49.4	43.8	M	49.0	M	52.7	53.0	55.2	45.4[a]	40.9
South Clerk Street 41a	**142**	48.5	M	33.9	8.5	39.9	40.7	37.3	35.6	32.6	39.0	38.2	42.3	38.8	34.9
South Clerk Street 84	**141**	52.0	58.8	32.9	9.2	31.0	27.0	39.5	39.0	37.5	47.1	42.4	49.5	41.5	37.4
St Colme Street/4	**75d**	28.9	39.2	27.2	29.5	33.8	30.1	26.6	15.2	18.7	30.6	39.2	34.4	29.4	26.5
St John's Hill No.16	**153**	19.7	25.8	14.6	8.5	12.8	12.8	14.7	17.2	19.6	24.3	16.9	29.9	18.9	17.0
Torphicen Place 1	**3b**	50.1	58.6	46.0	15.2	54.3	47.6	46.1	40.5	42.0	43.9	57.8	39.0	47.8	43.0
Torphichen Place	**3**	35.0	60.0	36.7	31.4	50.0	48.4	48.8	49.3	49.6	M	56.2	45.7	48.0	43.2
Viewcraig Gardens No.7	**154**	24.8	29.5	15.0	11.2	14.0	14.8	18.8	7.3	23.7	25.0	24.7	29.2	22.0	19.8
West Maitland Street	**2**	49.0	63.9	46.4	27.8	57.0	57.8	54.6	53.5	59.8	60.0	52.4	50.1	55.0	49.5
West Port 42	**28d**	47.5	69.8	48.3	42.6	60.3	M	52.9	63.1	58.2	59.5	46.0	65.7	57.1	51.4
West Port 62	**28b**	52.9	64.6	57.9	21.0	62.6	66.5	61.6	74.3	59.3	M	M	M	72.1[a]	64.9
West Port Opp 50	**28c**	37.8	53.4	35.2	23.9	42.9	49.2	40.5	41.9	41.2	44.3	37.3	45.0	42.6	38.3
York Place	**36**	44.7	25.2	13.7	29.0	41.8	33.2	34.9	32.7	30.8	43.8	29.3	37.4	35.4	31.9

(1) See Appendix C for details on bias adjustment

M – Tube missing on collection. N/A – Not Applicable: data not used. Data in **red** – problematic data removed from the data set.

Raw data annualised ([a]) where data capture below 75%. See details in Appendix C

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

C1 Nitrogen Dioxide (NO_2) Diffusion Tube Bias Adjustment Factors

Edinburgh Scientific Services supply and analyse the passive diffusion tubes. The tubes are made of acrylic and the laboratory uses 50% v/v Triethanolamine (TEA) in acetone for the adsorbent; the grids are dipped into this solution and allowed to dry before insertion into the tube. The tubes are exposed for 4 or 5-week periods, in accordance with the recommended calendar supplied by DEFRA. The method has remained unchanged during the monitoring periods.

The annual mean data from the historical local co-location studies always show that passive diffusion samplers over read the real-time analysers by average factors from 0.74 to 0.91. See Tables C1a and C1b.

Between 2011 and 2015 the bias was calculated using a combination of local factors and the factors contained in the National Bias Database, with sites which are also analysed by Edinburgh Scientific Services. This followed a step change in the bias factor in 2011. A manual approximate orthogonal regression calculation was undertaken to combine the bias factors. The procedure for this calculation was updated with the revised technical guidance in 2016.

Table C1a Historical bias data used in previous reports 2001 - 2008

Site	Type	2001	2002	2003	2004	2005	2006	2007	2008
Currie	Suburban	N/A	N/A	N/A	0.91	N/A	N/A	N/A	N/A
Gorgie	Roadside	N/A	N/A	N/A	N/A	0.86	N/A	0.91	0.94
Haymarket	Roadside	0.93	N/A	N/A	0.88	0.93	0.91	0.92	0.87
Leith Walk	Roadside	0.89	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Queen St	Roadside	0.91	0.91	0.91	0.90	0.84	0.83	0.85	0.81
Roseburn	Roadside	N/A	N/A	N/A	N/A	0.92	N/A	N/A	0.91
St John's Rd.	Kerbside	N/A	N/A	N/A	N/A	N/A	N/A	0.93	0.86
Mean		**0.91**	**0.91**	**0.91**	**0.89**	**0.89**	**0.87**	**0.90**	**0.88**

Table C1b Historical bias data used in previous reports 2009 - 2017

Site	Type	2009	2010	2011	2012	2013	2014	2015	2016	2017
Glasgow Rd	Roadside	N/A	N/A	N/A	N/A	0.64	0.67	0.6	0.69	0.63
Gorgie	Roadside	N/A	N/A	0.87	0.86	0.87	0.85	0.86	0.83	0.89
Qns'ferry Rd	Roadside	N/A	N/A	0.66	0.71	0.71	0.69	0.66	0.67	N/A
Queen St	Roadside	0.83	0.84	0.69	0.65	0.7	0.64	0.7	N/A	N/A
Salamander	Roadside	N/A	0.79	0.77	0.80	0.78	0.77	0.8	0.76	0.81
Roseburn	Roadside	0.82	0.85	N/A	N/A	N/A	N/A	N/A	N/A	N/A
St.John's Rd	Kerbside	0.92	0.92	0.79	0.74	0.77	0.82	0.94	0.83	0.88
Mean		**0.86**	**0.85**	0.76	0.75	0.75	0.73	0.74	0.75	0.79
Combined Mean[1]				**0.81**	**0.76**	**0.75**	**0.74**	**0.76**	**0.77**	**0.82**

Edinburgh co-locates triplicate tubes on the sampler head cages at roadside and kerbside monitoring stations. Data from five sites were considered for the co-location study 2018. The details and factors are shown in Table C2. Generally, the passive diffusion tubes give higher concentrations than the real-time analysers over an annual period.

Table C2 Bias Factors 2018 Data

Site	Type	Analyser Mean [2]	DC [3] (%) Analyser	PDT [4] Mean	PDT* Precision	Periods	Bias Factor A	Bias B (%)
Glasgow Road	Roadside	26	99	35	7	10	0.73	36
Gorgie Road	Roadside	28	100	32	8	12	0.88	14
Queensferry Rd	Roadside	52	99	55	6	11	0.94	6
Salamander St	Roadside	25	97	27	7	12	0.93	7
St John's Road	Kerbside	43	99	47	8	12	0.92	9

In 2018 the overall precision of triplicate tubes was good. So too was the overall data capture. Usual checks were carried out with respect to the automated and passive diffusion tube data to assess the reliability of the bias factor. Edinburgh Scientific

[1] An approximate orthogonal regression calculation was undertaken with the National Bias database data.
[2] Concentrations match sampling period not calendar year.
[3] DC - Data Capture (for periods used).
[4] PDT – Passive Diffusion Tube.

Services laboratory scored satisfactory in the AIR/WASP NO_2 proficiency testing scheme throughout the year.

An annual mean bias factor of 0.87 from the local co-location studies was calculated as per Table C3, below – **Mean Local Bias**.

Table C3 Calculation of Local and Combined Bias Factors

	Bias A	Bias B	Calculation	Bias
Local Bias				
Glasgow Road	0.73	36%		
Gorgie Road	0.88	14%		
Queensferry Road	0.94	6%		
Salamander Street	0.93	7%		
St John's Road	0.92	9%		
Mean Local Bias		**14.4**	0.144+1.00=1.144	
			1/1.144 =	**0.87**
National Bias				
Marylebone Road	0.99	0.9%		
Stirling	0.92	8.1%		
Mean Combined Bias		**11.6**	0.116+1 = 1.116	
			1/1.116=	**0.90**

At the time of assessment there was two other studies available on the National Diffusion Tube Bias Adjustment Factor Spreadsheet, for Edinburgh Scientific Services (Marylebone Inter-comparison and Stirling). These studies were similar in nature to those in Edinburgh in so far that there were kerbside and roadside locations (respectively) and they used the same tube preparation method. The overall precision was good in both studies.

In keeping with the methodology of combining the local studies with those available on the national database since 2011, a manual approximate orthogonal regression calculation was undertaken which resulted in a bias adjustment factor of 0.90. Details of the calculation are also shown in Table C3 - **Mean Combined Bias**. This combined factor was chosen as the most appropriate factor to use with 2018 data. This combined factor was chosen as the most appropriate of the two because it represents the worse-case scenario when applied to the data. This also means the

same methodology is consistent with previous years. The national bias factor as of June 2019 was 0.96.

C2 QA/QC of Automatic Monitoring

All monitoring stations are subject to an independent audit and stringent QA/QC procedures which are undertaken by Ricardo on behalf of DEFRA and the Scottish Government. This agreement commenced in 2007 (2013 for Currie). Nevertheless, all data, including calibration data, is scrutinised daily by the Council (Monday to Friday) by visual examination, to see if they contained unusual measurements. Any data which was suspicious (e.g. large spikes) is flagged to undergo further checks.

Staff competence

Officers are trained as local site operators in relation to the management of the stations and undertake the necessary calibrations and basic maintenance. Shadow training is carried out where appropriate during 6-monthly audits.

Calibration procedures

The two ML 9841 B NO_x analysers (located at Glasgow Road and Salamander Street) perform a daily auto-calibration. Warning limits are set at +/- 5 % on the software program.

All sites including those listed above are visited fortnightly, apart from the National Network site of St Leonards which is visited monthly, and manual calibration checks are carried out using certified NO gas at approximately 500ppb plus a zero check. All cylinders are replaced at 12 to 18-month intervals. Nitric Oxide cylinders were supplied by Air Liquide UK prior to September 2012 and thereafter, by BOC.

Details of manual calibration checks and precision and accuracy of instruments can be made available on request.

Servicing

All instruments are serviced and recalibrated every six months by the appropriate supplier. The service contracts include a support package for software and replacement parts, plus any necessary call outs to the sites.

The TEOM heads on the automatic PM_{10} units are cleaned monthly and filters are changed when necessary in accordance with the instrument manual at a frequency of no less than every two months.

Filters are changed on the FIDAS instruments every 6 months. Servicing follows 6 monthly audits by Ricardo.

During all visits to the monitoring stations, actions taken and activities noted adjacent to the site are recorded in the site log book.

C3 QA/QC of NO_2 Diffusion Tube Monitoring

Sampling staff at Scientific Services Laboratory, City of Edinburgh Council are trained to fulfil the requirements associated with passive diffusion tube samplers. The tubes are also supplied and analysed by the laboratory. It is UKAS accredited for this task and participates in the independent AIR-PT scheme, operated by LGC Standards and supported by the Health and Safety Laboratory, with yearly assessment against agreed performance criteria. AIR-PT combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL Workplace Analysis Scheme for Proficiency (WASP). The lab's performance was rated as being satisfactory over the rolling five rounds prior to the end of 2018.

NO_2 diffusion tube monitoring is conducted in accordance with the quality requirements contained in the UK NO_2 Survey Instruction Manual for local/unitary authorities and Technical Guidance LAQM.TG (16). The kerbside diffusion tubes are located within 1 metre of the kerb edge, roadside locations are greater than 1 metre from the road edge or at the façade of residential property. The tubes are attached to

sign posts / lampposts using plastic spacer holders at a height of approximately 2m above ground level.

Three diffusion tubes from each monthly batch are used as blanks. These tubes are not exposed and are stored in a refrigerator during the exposure period. They are analysed along with the appropriate batch of exposed tubes. The purpose of blanks is to determine whether NO_2 contamination occurred during tube preparation.

All passive diffusion tube monitoring data shown in this report has been corrected for diffusion tube bias in accordance with LAQM TG (16). The monthly exposed passive diffusion tubes in Edinburgh generally over-reads real-time analysers. Pre-2011 this was by a factor range of 0.85 to 0.91, which were derived from local co-location studies. There was then a step change in the studies and results have since ranged from 0.74 to 0.90, using a combined calculation with national bias factors. In 2018 the bias adjustment factor is 0.9.

C4 Short-term to Long-term Data adjustment for NO_2

Data from St Leonards, Currie and Bush Estate (Midlothian) monitoring sites was used to estimate annual nitrogen dioxide concentrations from short term measurements. The data capture for all these sites was within acceptable limits for the purpose. The Bush Estate is part of national Automatic Urban and Rural Network (AURN) and located within the required distance to Edinburgh.

Non-Automatic Monitoring (Passive Diffusion Tubes)

Where passive diffusion tubes have less than 75% data capture for the annual period, the same annualisation calculation is undertaken. See tables below for details. Note; annual mean concentrations from the automatic sites varies as timings/dates are coordinated to the relevant passive diffusion tube exposure dates.

Site ID No. HT2				
Measured Mean Value (M) = 49.4				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.33	5.66	0.94
St Leonards	Urban Background	18.21	19.74	0.92
Currie	Suburban	8.15	8.99	0.91
			Average Ratio (R)	0.92
Adjusted Mean (M x R) = 45.4				

Site ID No. SH1				
Measured Mean Value (M) = 46.4				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.33	5.68	0.94
St Leonards	Urban Background	18.21	19.97	0.91
Currie	Suburban	8.15	8.07	1.01
			Average Ratio (R)	0.95
Adjusted Mean (M x R) = 44.1				

Site ID No. 24				
Measured Mean Value (M) = 63.6				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.33	5.91	0.90
St Leonards	Urban Background	18.21	20.61	0.88
Currie	Suburban	8.15	8.44	0.97
			Average Ratio (R)	0.92
Adjusted Mean (M x R) = 58.5				

Site ID No. 20				
Measured Mean Value (M) = 47.0				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.33	4.83	1.10
St Leonards	Urban Background	18.21	17.58	1.04
Currie	Suburban	8.15	7.52	1.08
			Average Ratio (R)	1.07
Adjusted Mean (M x R) = 50.3				

Site ID No. 66				
Measured Mean Value (M) = 33.6				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.33	5.85	0.91
St Leonards	Urban Background	18.21	19.84	0.92
Currie	Suburban	8.15	8.53	0.95
			Average Ratio (R)	0.93
Adjusted Mean (M x R) = 31.2				

Site ID No. 30f				
Measured Mean Value (M) = 39.2				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.33	5.46	0.98
St Leonards	Urban Background	18.21	17.84	1.02
Currie	Suburban	8.15	8.39	0.97
			Average Ratio (R)	0.99
Adjusted Mean (M x R) = 38.8				

Site ID No. 144				
Measured Mean Value (M) = 48.8				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.34	5.75	0.93
St Leonards	Urban Background	18.28	19.81	0.92
Currie	Suburban	8.17	8.75	0.93
			Average Ratio (R)	0.93
Adjusted Mean (M x R) = 45.4				

Site ID No. 48f				
Measured Mean Value (M) = 38.9				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.34	4.70	1.14
St Leonards	Urban Background	18.28	16.68	1.10
Currie	Suburban	8.17	7.59	1.08
			Average Ratio (R)	1.10
Adjusted Mean (M x R) = 42.8				

Site ID No. 28b				
Measured Mean Value (M) = 63.8				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.34	4.65	1.15
St Leonards	Urban Background	18.28	15.84	1.15
Currie	Suburban	8.17	7.44	1.10
			Average Ratio (R)	1.13
Adjusted Mean (M x R) = 72.1				

Site ID No. 79a				
Measured Mean Value (M) = 34.8				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.34	5.40	0.99
St Leonards	Urban Background	18.28	21.07	0.87
Currie	Suburban	8.17	8.69	0.94
			Average Ratio (R)	0.93
Adjusted Mean (M x R) = 32.4				

Site ID No. 11				
Measured Mean Value (M) = 35.3				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	5.34	4.70	1.14
St Leonards	Urban Background	18.28	18.50	0.99
Currie	Suburban	8.17	8.47	0.96
			Average Ratio (R)	1.03
Adjusted Mean (M x R) = 36.4				

C5 PM Monitoring Adjustment

Ricardo-AEA Ltd provided Volatile Correction Model (VCM) corrected Tapered Element Oscillating Microbalance (TEOM) data to the Council under the Scottish Air Quality Database project for the Salamander Street and Glasgow Road automatic monitoring stations. In 2013 this included the Currie station for the first time. PM FIDAS data from the newly established St John's Road automatic particle monitoring is also provided by Ricardo and corrected in accordance with the relevant technical guidance.

TEOM data was also corrected to provide a gravimetric equivalent using Edinburgh's local gravimetric factor, 1.14. This factor was derived from undertaking a co-location study with a Partisol unit and TEOM instrument in Detailed Assessment Report 2004.

Appendix D: Nitrogen Dioxide Fall-Off with Distance Calculations

NO_2 Fall-Off with Distance Calculator (V4.2, released March 2018) was used to undertake the following calculations

SITE NO.	1	2	4a	5	9a	9c	11	14	15	16	20	22a*
How far from kerb was measurement made (m)	0.5	0.5	12.0	0.3	1.5	2.7	1.5	2.0	4.0	1.8	1.2	2.5
How far from kerb is receptor in metres (m)	2.3	5.7	17.0	5.2	5.4	4.8	5.2	6.0	7.8	6.2	4.3	4.2
Local background concentration of NO_2	16.3	25.5	22.9	21.2	17.6	17.6	12.8	15.5	24	21.5	21.5	16.6
Annual mean bias corrected value	29.2	49.5	23.5	42	36.5	28.4	20.3	23.7	43.7	46	45.3	42.2
Result; Predicted annual mean at receptor	**25.7**	**39.2**	**23.4**	**32.4**	**31.2**	**26.8**	**18.3**	**21.6**	**40**	**39.1**	**38.9**	**38.9**

SITE NO.	23	24	32	36	38	39	47	49	53	55c	56	57
How far from kerb was measurement made (m)	0.2	1.0	2.6	5.5	2.8	1.6	9.0	2.2	4.6	4.3	2.6	3.6
How far from kerb is receptor in metres (m)	2.5	11.2	7.3	8.2	12.8	5.8	2.5	4.6	6.2	5.4	7.2	12.1
Local background concentration of NO_2	19	25.8	13.1	22.2	18.7	16.9	25.7	25.5	15.5	15.5	16.9	16.1
Annual mean bias corrected value	37	52.7	28.1	31.9	25.7	31.8	35.5	37	30.8	24.2	31.9	37.9
Result; Predicted annual mean at receptor	**30.1**	**39.6**	**24.2**	**30.7**	**23**	**27.5**	**40**	**35**	**29.5**	**23.6**	**28.1**	**30.7**

*Recalculated at this site following 2019 review, resulting in decision to use the nominal kerb for the kerb distance

SITE NO.	58	58	64	80g	140	SJ1	HT2	ID9	ID11
How far from kerb was measurement made (m)	2.8	2.8	1.5	1.8	1.3	0.3	0.5	1.7	2.9
How far from kerb is receptor in metres (m)	8.0	8.0	10.7	4.7	4.8	2.5	2.3	8.2	5.1
Local Background concentration of NO_2	24	24	13.9	21.2	19.7	16.3	19	13.9	22
Annual mean bias corrected value	50.9	53.1	62.3	38.7	32.3	31.3	40.9	52.2	50.9
Result; Predicted annual mean at receptor	**43.7**	**45.3**	**41.4**	**34.9**	**28.8**	**26**	**35**	**38.6**	**46.7**

Appendix E: Revised Calculations for Annualisation of 2017 Passive Diffusion Tube Data

Site ID No. 9c				
Measured Mean Value (M) = 41.5				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.92	0.95
St Leonards	Urban Background	19.71	22.42	0.88
Currie	Suburban	6.33	6.52	0.97
			Average Ratio (R)	0.93
Adjusted Mean (M x R) = 38.6				

Site ID No. 13a				
Measured Mean Value (M) = 30.6				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	5.01	0.94
St Leonards	Urban Background	19.71	22.21	0.89
Currie	Suburban	6.33	6.68	0.95
			Average Ratio (R)	0.93
Adjusted Mean (M x R) = 28.5				

Site ID No. 16a				
Measured Mean Value (M) = 37.1				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.84	0.97
St Leonards	Urban Background	19.64	19.57	1.00
Currie	Suburban	6.31	6.49	0.97
			Average Ratio (R)	0.98
Adjusted Mean (M x R) = 36.6				

Site ID No. 21				
Measured Mean Value (M) = 42.4				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.24	1.10
St Leonards	Urban Background	19.71	20.03	0.97
Currie	Suburban	6.33	5.43	1.17
			Average Ratio (R)	1.08
Adjusted Mean (M x R) = 45.8				

Site ID No. 23				
Measured Mean Value (M) = 40.2				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.36	1.08
St Leonards	Urban Background	19.71	21.25	0.93
Currie	Suburban	6.33	5.73	1.10
			Average Ratio (R)	1.04
Adjusted Mean (M x R) = 41.8				

Site ID No. 24				
Measured Mean Value (M) = 69.6				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.89	0.96
St Leonards	Urban Background	19.64	21.27	0.92
Currie	Suburban	6.31	6.43	0.98
			Average Ratio (R)	0.95
Adjusted Mean (M x R) = 66.12				

Site ID No. 25				
Measured Mean Value (M) = 45.3				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.49	1.04
St Leonards	Urban Background	19.71	20.34	0.97
Currie	Suburban	6.33	6.00	1.06
			Average Ratio (R)	1.02
Adjusted Mean (M x R) = 46.2				

Site ID No. 25b				
Measured Mean Value (M) = 36.9				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.65	1.01
St Leonards	Urban Background	19.71	21.15	0.93
Currie	Suburban	6.33	6.13	1.03
			Average Ratio (R)	0.99
Adjusted Mean (M x R) = 36.5				

Site ID No. 27				
Measured Mean Value (M) = 48.5				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	5.04	0.93
St Leonards	Urban Background	19.64	21.61	0.91
Currie	Suburban	6.31	6.46	0.98
			Average Ratio (R)	0.94
Adjusted Mean (M x R) = 45.6				

Site ID No. 28c				
Measured Mean Value (M) = 42.5				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.42	1.06
St Leonards	Urban Background	19.64	21.2	0.93
Currie	Suburban	6.31	5.73	1.10
			Average Ratio (R)	1.03
Adjusted Mean (M x R) = 43.8				

Site ID No. 30d				
Measured Mean Value (M) = 41.1				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.75	1.01
St Leonards	Urban Background	19.71	21.00	0.94
Currie	Suburban	6.33	6.22	1.02
			Average Ratio (R)	0.99
Adjusted Mean (M x R) = 41.0				

Site ID No. 48a				
Measured Mean Value (M) = 37.3				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	5.37	0.87
St Leonards	Urban Background	19.64	21.40	0.92
Currie	Suburban	6.31	7.07	0.89
			Average Ratio (R)	0.89
Adjusted Mean (M x R) = 33.2				

Site ID No. 48e				
Measured Mean Value (M) = 54.8				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.94	0.95
St Leonards	Urban Background	19.64	20.17	0.97
Currie	Suburban	6.31	6.88	0.92
			Average Ratio (R)	0.95
Adjusted Mean (M x R) = 52.1				

Site ID No. 67				
Measured Mean Value (M) = 45.1				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.07	1.15
St Leonards	Urban Background	19.71	18.31	1.08
Currie	Suburban	6.33	5.38	1.18
			Average Ratio (R)	1.14
Adjusted Mean (M x R) = 51.4				

Site ID No. 79				
Measured Mean Value (M) = 31.5				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.82	0.98
St Leonards	Urban Background	19.64	19.36	1.01
Currie	Suburban	6.31	6.70	0.94
			Average Ratio (R)	0.98
Adjusted Mean (M x R) = 30.9				

Site ID No. 80c				
Measured Mean Value (M) = 36.5				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.82	1.18
St Leonards	Urban Background	19.71	19.36	1.13
Currie	Suburban	6.33	6.70	1.21
			Average Ratio (R)	1.18
Adjusted Mean (M x R) = 43.1				

Site ID No. HT2				
Measured Mean Value (M) = 51.0				
Site	**Site Type**	**Annual Mean (AM) µg/m^3**	**Period Mean (PM) µg/m^3**	**Ratio AM/PM**
Bush	Rural background	4.69	4.16	1.13
St Leonards	Urban Background	19.64	18.60	1.06
Currie	Suburban	6.31	5.67	1.12
			Average Ratio (R)	1.10
Adjusted Mean (M x R) = 56.1				

Glossary of Terms

Abbreviation	Description
APR	Air quality Annual Progress Report
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
ATAP	The Council's Active Travel Action Plan
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
BaP	Benzo(a)pyrene
BEAR	Transport Scotland's funded Bus Abatement Retrofit Programme
CAFS	Cleaner Air For Scotland – The Road to a Healthier Future; Scottish Government's national low emission strategy
CCT	Edinburgh's City Centre Transformation strategy
CCWEL	Edinburgh's City Centre West to East Link –a new cycle route linking the Roseburn path to Leith Walk via the City Centre
CMP	City Mobility Plan – Edinburgh's new local transport strategy
CPZ	Controlled Parking Zone
Defra	Department for Environment, Food and Rural Affairs
EV	Electric Vehicle
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
LEZ	Low Emission Zone
MOVA	Microprocessor Optimised Vehicle Activation – traffic flow management system

NMF	National Modelling Framework
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PAHs	Polycyclic Aromatic Hydrocarbons
PDT	Passive Diffusion Tube
PHC	Private Hire Car
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
PPZ	Priority Parking Zone
P&R	Park and Ride
QA/QC	Quality Assurance and Quality Control
SEPA	The Scottish Environment Protection Agency
SO_2	Sulphur Dioxide
SCOOT	Split Cycle Offset Optimisation Technique- traffic flow management system

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