

Annual Progress Report (APR)



2020 Air Quality Annual Progress Report (APR) for
Aberdeen City Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

June 2020

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Executive Summary: Air Quality in Our Area

Air Quality in Aberdeen City

The Annual Progress Report has been undertaken to fulfil Aberdeen City Council's duty to annually review and assess air quality. The report provides the latest monitoring results and discusses the implications for air quality management in Aberdeen.

The main pollutants of concern in Aberdeen City are nitrogen dioxide (NO₂) and particulate matter (PM₁₀), related to road traffic emissions.

In 2019 NO₂ levels monitored across the city were marginally lower than previous years and trends suggest NO₂ levels are decreasing. In particular, there were no exceedances of NO₂ objective levels in the Wellington Road AQMA and the Anderson Drive AQMA. This is the first time this has occurred since monitoring began in 2009.

Monitoring in the City Centre AQMA suggest that pockets of exceedance remain along Union Street, King Street and Market Street area.

Nitrogen dioxide levels at monitoring locations outside the AQMAs remain well below the annual mean objective, except for monitoring located at Skene Square where levels continue to be just below the threshold of the annual mean objective

There were no exceedances of the NO₂ one hour objective at any of the monitoring locations.

There were no exceedances of the annual or 24 hour mean PM₁₀ objectives.

There were no exceedances of the PM_{2.5} annual mean objective.

City wide traffic counts were undertaken in September 2019 to indicate the reduction in traffic flows along key corridors following the opening of the Aberdeen Western Peripheral Route.

While the AWPR has reduced traffic in the City Centre and key corridors, the traffic reductions from the new route, combined with other proposed traffic interventions, are unlikely to be enough to bring NO₂ emissions to within acceptable levels without further interventions.

Aberdeen City Council aims to declare a Low Emission Zone (LEZ) in 2021. A stage 2 LEZ feasibility study is currently being undertaken. It is anticipated the outcome, including recommendations for options to take forward for public consultation, will be reported to committee in Spring 2020.

Actions to Improve Air Quality

Several exciting events were held in Aberdeen in 2019. Officers from the Council were present to promote the Cleaner Air for Aberdeen message, by giving advice on sustainable transport and active travel.

The first event was the Cycle Tour Series professional road race in May 2019 which was held in the city centre. This was a lively and well attended event with lots of interaction from keen cyclists of all ages.



On 20 June 2019, St Nicholas Street in Aberdeen was the venue for a very successful Clean Air Day. The event was attended by GetAbout, First Bus, Ricardo, Aberdeen City Council, Aberdeenshire Council, Co-Wheels, Environment Protection Scotland and very importantly pupils from Hanover School. Street artists were on hand to assist in the distribution of free spider plants to members of the public who made a pledge regarding what they planned to do to achieve Cleaner Air for Aberdeen.



On 22 June 2019 the Evolution event, promoting electric vehicles, was held outside Marischal College on Broad Street. The event had a large display of electric vehicles with dedicated experts on hand to talk to visitors about this innovative technology. Test drives were also available.



In town without my car on 15 September was the last main event of the year. The Environmental Health team were again on hand to give advice about sustainable transport, active travel and information about how air quality is monitored across

Aberdeen. Many interesting discussions took place and visitors to our information stand were keen to learn about what the team's work involves.

Low Emission Zone

- Planning for Aberdeen's Low Emission Zone (LEZ) continues with the completion of the Aberdeen National Modelling Framework (NMF) air quality model and the Aberdeen City Centre Paramics traffic model, both updated to a 2019 base, to allow for the testing of LEZ options;
- Consultants SYSTRA have been appointed to undertake the National Low Emission Framework (NLEF) appraisal process, with the interim NLEF Stage 2 report due in spring 2020. Following a process of option generation, sifting and appraisal, six options remain which will be subject to detailed traffic modelling and public and stakeholder consultation during 2020 with a view to identifying a preferred LEZ option for Council and Ministerial approval in early 2021.

Active Travel

- Strategic and local walking and cycle networks continue to grow. Most projects identified in the original Aberdeen Active Travel Action Plan (2017) are now in the delivery pipeline, therefore consultation on a second plan to inform future priorities took place in early 2020. The second Active Travel Action Plan will be reported to Committee in October 2020;
- An Origin and Destination study, to better understand where journeys of up to 10km which start or finish in Aberdeen City are taking place, is now complete, with the outcomes being used to support future infrastructure planning and prioritisation.
- The Council adopted a Sustainable Urban Mobility Plan (SUMP) in December 2019 which identifies a range of measures to make the city centre a safer and more welcoming place for walking and cycling, expanding upon the transport aspects of the Aberdeen City Centre Masterplan (CCMP). Phase 1 of the SUMP will be delivered during 2020/21;
- Delivery of the CCMP continues with Stage 1 of the Schoolhill public realm enhancement scheme completed in 2019 and work underway to rejuvenate

Union Terrace Gardens, with improved facilities for walking and cycling a key focus;

- A number of transport corridor studies are underway, which aim to identify opportunities to improve walking, cycling and public transport conditions on key routes to and from the city centre, including the A956 Wellington Road, the A944/B9119 Westhill to Aberdeen corridor, and the A90/A92 Ellon to Aberdeen corridor;
- Improvements to pedestrian wayfinding are taking place in the city centre and at other key trip attractors;
- A cycle signage audit has commenced to identify deficiencies and potential opportunities in relation to cycle route signage, with the findings to be developed into an action plan of improvements;
- An appraisal of options for a bicycle rental scheme has taken place, with the Council now working to appoint a supplier during 2020/21;
- With funding support from Transport Scotland, the Council and Nestrans has launched an e-cargo bike trial amongst city centre businesses, the aim of which is to allow businesses to trial cargo bikes for deliveries in the hope that they experience benefits over the use of vans and are encouraged to switch to bicycles as a permanent solution;
- Various promotional and awareness-raising activities have taken place to support infrastructure improvements, including public, school and workplace events, and wide advertising campaigns.

Public Transport

- The North East Bus Alliance continues to operate successfully and has completed its State of the Network report and Bus Action Plan. Opportunities to address bus journey time variability and reliability are now being looked at via a prioritised programme of corridor studies. It is anticipated that the outcomes of these studies will inform applications to the Scottish Government's recently announced bus prioritisation fund, to assist with delivery;

- Efforts continue to promote the Grasshopper multi-operator bus ticket and to make it more attractive to users, with opportunities for e-tickets now being explored;
- Both main bus operators in the City now also offer contactless payment using a debit or credit card, with First Aberdeen operating a 'tap and cap' system, ensuring the best value daily fares for users;
- Dualling of the railway line between Aberdeen and Inverurie has been completed, allowing an improved (in terms of both frequency and capacity) rail service between Inverurie and Montrose to come into effect from December 2019. This forms Phase 1 of the Aberdeen to Inverness rail improvement project and will be further enhanced by the re-opening of Kintore station in 2020.

Clean Vehicles

- The Aberdeen Car Club has continued to expand, with more electric and hydrogen vehicles added to the fleet. It now has 27 alternatively (electric or hydrogen) fuelled vehicles and 10 petrol hybrid vehicles as part of the fleet of 48 vehicles.
- The electric vehicle (EV) charging network has continued to expand, with more charging points located at various locations throughout the City.
- An EV Framework is now in development to guide future EV strategy and locations of charge points.

Locking in the Benefits of the Aberdeen Western Peripheral Route (AWPR)

- Aberdeen City Council approved a revised Roads Hierarchy, comprising a revised network of priority and secondary routes, reflecting the changes arising from the opening of the AWPR and the aspirations of the CCMP. ACC is now taking forward a programme of road reclassifications to reflect the new hierarchy, which includes declassifying most roads in the city centre to reflect the city centre's status as a destination rather than a through-route for traffic. The aim is to encourage traffic onto appropriate routes in preference to less appropriate alternatives, thus reducing the impacts of traffic on vulnerable areas and communities;

- New strategic road signage is now being installed throughout the city to reflect the opening of the AWPR and the revised Roads Hierarchy;
- The outcomes of the Strategic Car Parking Review are being developed into a revised Car Parking Framework for Aberdeen, considering how car parking policy can be better aligned with the Roads Hierarchy, CCMP and SUMP. Key recommendations are due to be reported in October 2020.

Local Priorities and Challenges

- Ensure key areas of the city are adapted to allow for a return of economic activity while enabling necessary social distancing.
- Continue to appraise LEZ options and move towards identifying a preferred option for Council and Ministerial approval.
- Continue with the programme of transport corridor studies to ensure ACC can take advantage of national bus priority infrastructure funding once this is available.
- Continue to implement the revised Roads Hierarchy in the form of road reclassifications, signage improvements, junction changes and traffic management interventions.
- Finalise the refresh of the Aberdeen Active Travel Action Plan.
- Commence public engagement on future Car Parking and Electric Vehicle Frameworks and gain endorsement for the outcomes of these pieces of work, with a view to moving towards delivery.
- Continue to work with partners to encourage behaviour change and modal shift, including a greater shift towards low carbon and shared vehicles.
- Promotion and marketing of revised local rail timetables enabled by the Aberdeen to Inverurie track duelling and the reopening of Kintore Station.

How to Get Involved

Further information on the Local Transport Strategy, Action Plan and Active Travel Action Plan is available at the following web sites:

<https://www.aberdeencity.gov.uk/services/roads-transport-and-parking/local-transport-strategy>

City Centre Masterplan:

<https://www.aberdeencity.gov.uk/services/strategy-performance-and-statistics/city-centre-masterplan>

Further information on the schemes Aberdeen City Council has been delivering on Air Quality Action Plan and Local Transport Strategy actions over previous years can be found on best practice pages on the Energy Saving Trust and Paths for All websites:

Car Club

<https://www.energysavingtrust.org.uk/sites/default/files/Aberdeen%20City%20Council.pdf>

In Town Without My Car Day

<https://www.pathsforall.org.uk/mediaLibrary/other/english/73319.pdf>

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Aberdeen City	i
Actions to Improve Air Quality	ii
Local Priorities and Challenges	vii
How to Get Involved	viii
https://www.pathsforall.org.uk/mediaLibrary/other/english/73319.pdf	viii
1. Local Air Quality Management	12
2. Actions to Improve Air Quality	14
2.1 Air Quality Management Areas	14
2.2 Cleaner Air for Scotland	15
2.2.1 Transport – Avoiding travel – T1	15
2.2.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2	15
2.3 National Low Emission Framework (NLEF) Stage 1 Screening Appraisal for Aberdeen City Council	16
2.4 Progress and Impact of Measures to address Air Quality in Aberdeen City	17
3. Air Quality Monitoring Data and Comparison with Air Quality Objectives	49
3.1 Summary of Monitoring Undertaken	49
3.1.1 Automatic Monitoring Sites	49
3.1.2 Non-Automatic Monitoring Sites	50
3.2 Individual pollutants	50
3.2.1 Nitrogen Dioxide (NO ₂)	51
3.2.2 Particulate Matter (PM ₁₀)	54
3.2.3 Particulate Matter (PM _{2.5})	55
3.2.4 Sulphur Dioxide (SO ₂)	55
3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene	56
4. New Local Developments	57
4.1 Road Traffic Sources	57
4.2 Other Transport Sources	59
4.3 Industrial Sources	59
4.4 Commercial and Domestic Sources	60
4.5 New Developments with Fugitive or Uncontrolled Sources	61
5. Planning Applications	62

6. Conclusions and Proposed Actions.....	64
6.1 Conclusions from New Monitoring Data.....	64
6.2 Conclusions relating to New Local Developments	65
6.3 Proposed Actions	65
Appendix A: Monitoring Results	66
Appendix B: Full Monthly Diffusion Tube Results for 2019.....	98
Appendix C: Supporting Technical Information / Air Quality Monitoring	
Data QA/QC	101
Glossary of Terms	112
References	113

List of Tables

Table 1.1 – Summary of Air Quality Objectives in Scotland	13
Table 2.1 – Declared Air Quality Management Areas.....	14
Table 2.2 – Progress on Measures to Improve Air Quality	23
Table A.1 – Details of Automatic Monitoring Sites.....	66
Table A.2 – Details of Non-Automatic Monitoring Sites	67
Table A.3 – Annual Mean NO ₂ Monitoring Results.....	81
Table A.4 – 1-Hour Mean NO ₂ Monitoring Results	92
Table A.5 – Annual Mean PM ₁₀ Monitoring Results.....	93
Table A.6 – 24-Hour Mean PM ₁₀ Monitoring Results.....	96
Table A.7 – Annual Mean PM _{2.5} Monitoring Results	97
Table B.1 – NO ₂ Monthly Diffusion Tube Results for 2019	98

List of Figures

Figure 1: City South Automatic monitoring site and diffusion tube locations 2019.....	75
Figure 2: City Centre East Automatic monitoring site and diffusion tube locations 2019.....	76
Figure 3: City Centre West Automatic monitoring site and diffusion tube locations 2019.....	77
Figure 4: City Centre North Automatic monitoring site and diffusion tube locations 2019.....	78
Figure 5: City North Automatic monitoring site and diffusion tube locations 2019	79
Figure 6: Dyce Automatic monitoring site and diffusion tube locations 2019	80
Figure 7: Trend in NO ₂ Annual Mean Concentration (µg/m ³) Continuous Monitoring Sites 2015 – 2019.....	89
Figure 8: De-seasonalised NO ₂ trends for the period 2015 to 2019	90
Figure 9: Trend in NO ₂ Annual Mean Concentration (µg/m ³) Diffusion Tubes exceeding objective	91
Figure 10: Trend in PM ₁₀ Annual Mean Concentration (µg/m ³) Continuous Monitoring Sites 2015 - 2019.....	94
Figure 11: De-seasonalised PM ₁₀ trends for the period 2015 to 2019	95

1. Local Air Quality Management

This report provides an overview of air quality in Aberdeen City Council during 2019. 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 the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Progress Report (APR) summarises the work being undertaken by Aberdeen City Council to improve air quality and any progress that has been made.

Table 1.1 – Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		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 (AQMA) 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 AQMA declared by Aberdeen City Council can be found in **Error! Not a valid bookmark self-reference..** Further information related to declared or revoked AQMA, including maps of AQMA boundaries are available online at <https://uk-air.defra.gov.uk/aqma/maps>.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
City Centre	<ul style="list-style-type: none"> • NO₂ annual mean • PM₁₀ annual mean & 24 hour mean 	Aberdeen	Declared 2001, extended in 2003. PM ₁₀ included in 2005 & 2011. Amended 2018. An area encompassing several properties Union St, King St, Market St, Holburn St and Victoria Road.	Air Quality Action Plan 2011
Anderson Drive	<ul style="list-style-type: none"> • NO₂ annual mean • PM₁₀ annual mean 	Aberdeen	Declared in 2008, amended 2011 and 2018. Pockets of exceedances at residential properties along Anderson Drive and Auchmill Road.	Air Quality Action Plan 2011
Wellington Road	<ul style="list-style-type: none"> • NO₂ annual mean • PM₁₀ annual mean & 24 hour mean 	Aberdeen	Declared 2008. Residential properties along Wellington Road (Queen Elizabeth II Bridge to Balnagask Rd)	Air Quality Action Plan 2011

2.2 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 <https://www.gov.scot/Publications/2015/11/5671/17>. Progress by Aberdeen City council against relevant actions within this strategy is demonstrated below.

2.2.1 Transport – Avoiding travel – T1

All local authorities should ensure that they have a corporate travel plan (perhaps within a carbon management plan) which is consistent with any local air quality action plan.

Aberdeen City Council has had a Council Travel Plan since 2001. It is currently being reviewed with an updated plan expected in the autumn of 2020. Staff have access to pages on the Council Intranet which provide information about travel choices to work. As part of its travel plan, the council undertakes a biannual staff travel survey to identify how staff usually travel to work. The most recent survey was in November 2018 when 824 responses were received, and the next survey is due to take place in 2020. The data will be used to inform the Travel Plan update.

2.2.2 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 (SEAP) to ensure that air quality considerations are covered. Aberdeen City Council has developed its own SEAP, Powering Aberdeen: Aberdeen's Sustainable Energy Action Plan. The plan was approved at Full Council on 6 October 2016. Details are available at:

[Aberdeen's Sustainable Energy Action Plan](#)

2.3 National Low Emission Framework (NLEF) Stage 1 Screening Appraisal for Aberdeen City Council

The NLEF¹, which is now part of the review and assessment process for LAQM reporting in Scotland, contributes to the Cleaner Air for Scotland strategy by aiming to improve local air quality in areas where air quality objectives are exceeded, or likely to be exceeded, primarily due to emissions from transport.

The NLEF is directly linked to Air Quality Action Planning (AQAP) for local authorities with Air Quality Management Areas (AQMAs) and will help to identify actions to improve local air quality within AQMAs.

Aberdeen City Council is currently undertaking a Stage 2 Low Emission feasibility study and aims to declare a LEZ during 2021. There is therefore no requirement for the authority to undertake a Stage 1 Screening Appraisal.

With support from Scottish Government funding, Aberdeen City Council commissioned the consultant SYSTRA to undertake a low Emission feasibility study in the City and recommend potential LEZ options for stakeholder consultation.

Further traffic surveys were completed in September 2019 to determine the impact of the Aberdeen Western Peripheral Route on traffic flows on key arterial routes throughout Aberdeen. The data was subsequently used by SEPA to update the air quality model and predict the traffic flow changes on air quality. Various high level traffic scenarios suggest that, while the AWPR reduced traffic in the City Centre and key corridors, the traffic reductions from the new route, combined with other proposed traffic interventions, are unlikely to be sufficient to bring NO₂ emissions to within acceptable levels without further interventions, such as the introduction of a LEZ.

The Council received the interim NLEF Stage 2 report in April 2020 and will soon undertake detailed air quality and traffic modelling of the options to determine their impacts. Public and stakeholder engagement on the options will also take place in 2020. It is hoped to move towards identifying a preferred option in late 2020, early 2021 for Councillor and Ministerial approval. The interim Stage 2 report is currently being refined with the aim to commence a stakeholder consultation in spring/early summer 2020. Road traffic and air quality modelling will be undertaken to predict the

¹ <https://www.gov.scot/publications/national-low-emission-framework/pages/2/>
LAQM Annual Progress Report 2020

implications of these options both on traffic flows and air quality within and adjacent to the LEZ options.

Engagement with local bus operators commenced in 2019 to progress actions that will reduce emissions from buses, the greatest contributor to the raised pollutions in the majority of city centre streets, in advance of the introduction of any all vehicle LEZ. In February 2020 Committee approval was given to apply to the Transport Commissioner for a Traffic Regulation Condition that, if granted, would require 25% of public vehicles to be Euro 6 compliant by 31 December 2020.

The Air Quality Action Plan 2011 will be reviewed and updated once the LEZ is defined.

2.4 Progress and Impact of Measures to address Air Quality in Aberdeen City

Aberdeen City Council has taken forward several measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2. More detail on these measures can be found in the air quality Action Plan relating to each AQMA. Key completed measures are:

Action 1: Modal Shift and Influencing Travel Choice

- Increase bus use:
 - Completion of the North East Bus Alliance State of the Network Report and Bus Action Plan which is now feeding into a series of corridor improvement studies;
 - Continued expansion, development and promotion of the Grasshopper multi-operator ticket and contactless payments on buses, making bus use simpler and more convenient;
- Improve Cycling and Walking Provision:
 - Continued expansion and improvement of pedestrian, cycle and Core Path networks;

- Development and adoption of Sustainable Urban Mobility Plan (SUMP) which identifies a range of measures to make the city centre a safer and more welcoming place for walking and cycling;
- Updating of the Aberdeen cycle map;
- Conclusion of an Origin and Destination study, to better understand where journeys of up to 10km which start or finish in Aberdeen City, to inform future infrastructure planning and prioritisation;
- Conclusion of an options appraisal examining the feasibility and optimum form of a bicycle rental scheme in Aberdeen;
- Launch of an e-cargo bike trial scheme to allow city centre businesses to borrow cargo bikes for deliveries and hopefully see the benefits over the use of vans, thus encouraging long-term behaviour change.
- Travel Plans:
 - Continued engagement with businesses in the North Dee and South Dee areas of Aberdeen and the replication of this approach in Dyce to encourage and enable more sustainable travel choices.
- Improve public awareness of air quality issues:
 - Public events and bike doctor sessions have taken place throughout the year, often tying in with national and European campaigns such as Bike Week, European Mobility Week and the Sustrans Workplace Challenge;
 - The Cycle Tour Series professional road racing event in the city centre in May 2019 also raised the profile of cycling;
 - Bike roadshow events were delivered to schools and workplaces throughout Bike Week, European Mobility Week and Climate Week, while several schools are engaged with the Travel Tracker active travel promotion scheme;
 - An I Bike officer continues to work to deliver targeted and intensive cycling training and promotion to schools in several Associated Schools group (ASG) clusters;

- A marketing campaign to promote the Aberdeen City and Aberdeenshire sustainable transport brand, Getabout, has continued, with radio and TV advertising, bus back advertising.
- Car Clubs/Pool Car Schemes:
 - The Aberdeen Car Club has continued to expand, with more electric and hydrogen vehicles added to the fleet.
- Rail Improvements:
 - Dualling of the railway line between Aberdeen and Inverurie has been completed, allowing an improved (in terms of both frequency and capacity) rail service between Inverurie and Montrose to come into effect from December 2019. This forms Phase 1 of the Aberdeen to Inverness rail improvement project and will be further enhanced by the re-opening of Kintore station in 2020.

Action 2: Lower Emissions and Cleaner Vehicles

- Green Vehicle procurement & Fuel/ Charging Infrastructure
 - The electric vehicle charging network has continued to expand, with more charging points located at various locations throughout the City.
- Low Emission Zone
 - Planning for Aberdeen's LEZ continues with the completion of the Aberdeen NMF air quality model and the Aberdeen City Centre Paramics traffic model, both updated to a 2019 base, to allow for the testing of LEZ options;
 - Consultants SYSTRA have been appointed to undertake the NLEF appraisal process, with the interim NLEF Stage 2 report received in spring 2020.

Action 3: Road Infrastructure

- Pedestrianisation
 - Schoolhill Public Realm Enhancement Stage 1 complete, enhancing the sense of place in this area of the city centre;

- Adoption of Sustainable Urban Mobility Plan, setting out future walking and cycling infrastructure priorities.
- Road Infrastructure
 - Planning application for Berryden Corridor Improvement Scheme submitted, a key enabler of the City Centre Masterplan.

Action 4: Traffic Management

- Freight and Commercial Vehicle Access
 - Regional Freight Distribution Strategy developed to improve freight movements within Aberdeen and the surrounding region, and present options for improving 'last mile' distribution to reduce the environmental and social impact of freight activities;
 - Revised network of preferred freight routes agreed for communication to drivers and fleet operators.

Action 5: Planning and Policies

- Produce Supplementary Planning Guidance
 - SG on Transport and Accessibility and Air Quality developed alongside Aberdeen Local Development Plan 2017
- Integration of policies of AQAP with Local Transport Strategy (LTS) and Regional Transport Strategy (RTS)
 - Second National Transport Strategy (NTS2) published in 2020, with a renewed emphasis on climate change and air quality;
 - Engagement to inform a draft revision of the RTS has taken place.
- Road Hierarchy
 - Aberdeen City Council approved a revised Roads Hierarchy, comprising a revised network of priority and secondary routes, reflecting the changes arising from the opening of the AWPR and the aspirations of the CCMP. ACC is now taking forward a programme of road reclassifications to reflect the new hierarchy, which includes declassifying many roads in the city centre to reflect the city centre's

status as a destination rather than a through-route for traffic. The aim is to encourage traffic onto appropriate routes in preference to less appropriate alternatives, thus reducing the impacts of traffic on vulnerable areas and communities;

- New strategic road signage has been installed throughout the city to reflect preferred traffic routeing following the opening of the AWPR and the revised Roads Hierarchy;
- A Sustainable Urban Mobility Plan has been adopted, expanding upon the city centre elements of the Roads Hierarchy.
- Car Parking Policies:
 - The outcomes of the Strategic Car Parking Review were reported to Committee, with an instruction to develop the outcomes into a Car Parking Strategy for Aberdeen, the aim of which is to better align car parking policy with the aspirations of the CCMP, Roads Hierarchy and LEZ.

Progress on the following measures has been slower than expected:

- Bike hire scheme – the initial tendering exercise proved unsuccessful although the Council hopes to appoint a supplier during 2020/21.
- Freight Consolidation Centre – initial research has suggested this would have to be private sector-led to be commercially viable, and there has been little interest from private companies to date.

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

- Completion of a number of corridor improvement studies which will identify measures to improve conditions for active travel and public transport on routes identified as priority routes in the revised roads hierarchy - A956 Wellington Road, the A944/B9119 Westhill to Aberdeen corridor and the A90/A92 Ellon to Aberdeen corridor.
- Adoption of a revised Aberdeen Active Travel Action Plan to set future infrastructure priorities;

- Walking and cycling infrastructure – further measures to improve walking and cycling networks, including improved pedestrian wayfinding;
- Completion of cycle signage audit and action plan to identify improvements to cycle signage to increase awareness and usage of the network;
- Development of a revised Council Travel Plan to support employees to travel to and from work as sustainably as possible;
- Continued participation in European Mobility Week and Bike Week and other events, and continued working with partners to develop the Getabout brand to raise awareness of transport and air quality matters in the city;
- Further expansion of the Aberdeen Car Club as a low-emission alternative to private vehicle ownership;
- Further expansion of the electric vehicle charging network to encourage and enable low-emission vehicle ownership and use;
- Completion of an Electric Vehicle Framework for Aberdeen to guide future infrastructure planning and prioritisation;
- The re-opening of Kintore Station, offering a sustainable transport solution for Aberdeenshire residents travelling to and from the City;
- Identification of a preferred option for a LEZ in Aberdeen;
- Delivery of Phase 1 of the Sustainable Urban Mobility Plan which should see a safer and more welcoming environment develop for people walking and cycling in the city centre;
- Adoption of a revised RTS with work underway to deliver a revised LTS;
- Completion of the road reclassification exercise to reflect the revised North East Roads Hierarchy, a key aim of which is to reduce the volume of through traffic in the city centre and protect communities from the negative impacts of traffic;
- Adoption of a revised Car Parking Framework for Aberdeen to ensure car parking policies better align with the City Centre Masterplan, Roads Hierarchy and LEZ.

Table 2.2 – Progress on Measures to Improve Air Quality

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 MODAL SHIFT AND INFLUENCING TRAVEL CHOICE											
1.1a	Increase bus use	Alternatives to private vehicle use	Delivery of standards and targets agreed by Bus Quality Partnership	North East of Scotland Bus Alliance	2010	Ongoing	Proportion of people not working from home travelling to work by bus (Scottish Household Survey, Aberdeen City Voice)	Not quantifiable	<p>In 2018, the North East Bus Alliance (replacing the former Local Authority Bus Operator Forum (LABOF)) was established with a revised Terms of Reference and Quality Partnership Agreement. The Alliance comprises Nestrans, Aberdeen City Council, Aberdeenshire Council, First in Aberdeen, Stagecoach North Scotland, Bains Coaches and a representative of Bus Users Scotland.</p> <p>A State of the Network review has been undertaken and a subsequent Bus Action Plan developed, with a key focus on identifying areas where buses experience delays and inconsistent journey times as a result of congestion or other traffic management issues. Options for addressing these are now being looked at in detail via several transport corridor studies which have public transport efficiency as a key outcome.</p>	Ongoing	

Aberdeen City Council

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
1.1b			Increase corridors covered by BPIP (currently voluntary)	North East of Scotland Bus Alliance	2010	Ongoing	Proportion of people not working from home travelling to work by bus (Scottish Household Survey, Aberdeen City Voice)	Not quantifiable	<p>In the context of the revised Roads Hierarchy, several transport corridors are being reviewed to identify and appraise options for improving conditions for active and sustainable transport. These corridors have been prioritised with agreement from the Bus Alliance.</p> <p>The first of these, the A944/B9119 Westhill to Aberdeen (western approach) study, commenced in late 2019, with outcomes expected in autumn 2020.</p> <p>The second study, from the north of Aberdeen (A90 Ellon) to Garthdee (south of the city) via the city centre will be launching imminently.</p> <p>Although pre-dating the Roads Hierarchy and the formation of the Bus Alliance, the A956 Wellington Road Multimodal Corridor STAG (Scottish Transport Appraisal Guidance) appraisal is due to be complete in October 2020. Part of Wellington Road is an AQMA. it is hoped any measures recommended for implementation on this corridor will have air quality benefits.</p>	Ongoing	It is anticipated that the outcomes of these studies will inform Business Cases and funding applications to enable the delivery of the improvements identified – the Scottish Government recently announced a £500 million funding pot for bus priority infrastructure which offers a likely mechanism for delivery of the public transport elements.

Aberdeen City Council

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
1.1b cont..									Work has already taken place on the A96 corridor (part of which falls within the Anderson Drive AQMA) as part of the CIVITAS PORTIS programme, encompassing improved waiting conditions and information provision, including electronic timetable information, at bus stops. The A96 is likely to be the next corridor to get the full option appraisal treatment.		
1.1c			Integrated Ticketing	North East of Scotland Bus Alliance / Transport Scotland	No defined start date	Ongoing		Not quantifiable	<p>Both First and Stagecoach offer contactless payment on buses. First Aberdeen has introduced 'tap and cap', with fares capped at the most favourable daily rate to offer better value to the customer.</p> <p>The multi-operator Grasshopper ticket for North East Scotland continues to be promoted, and there is ambition to improve the Grasshopper offering by exploring opportunities for smart and mobile ticketing as well as contactless ticket options and new ticket types. Work is currently ongoing to develop an online retail solution for purchasing Grasshopper tickets, due to be launched in 2020.</p>	Ongoing	A local transport smartphone app is currently in development. User engagement / co-design work has highlighted that it may be useful / attractive to deploy Rail & Bus ticket fulfilment features and a secure payment gateway / e - wallet on this platform, so these features will be investigated.

Aberdeen City Council

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
1.2a	Improve Cycling & Walking Provision	Alternatives to private vehicle use	Core Paths Plan	ACC	Ongoing	Ongoing	Proportion of individual s walking and cycling (Scottish Household Survey, Aberdeen City Voice)	Not quantifiable	Various routes continue to be upgraded and installed. This includes the recently completed Farburn Bridge, part of CP6, for use by all non-motorised users. Project scoping has begun to commission a survey of all Core Paths and Aspirational Core Paths, in partnership with Nestrans and Aberdeenshire Council.	Ongoing	Once this network survey has been completed it will provide the baseline information required to carry out a full Core Paths Plan Review.
1.2b			Cycling Strategy/ Active Travel Action Plan	ACC	2014-2016	Ongoing	Proportion of individual s walking and cycling (Scottish Household Survey, Aberdeen City Voice)	Not quantifiable	The first Active Travel Action Plan was adopted in 2017, with most projects identified now being taken forward to delivery phase. A refresh of the Active Travel Action Plan is now underway. Public engagement took place early in 2020 and the revised Plan will be reported to the Council in October 2020.	Ongoing.	Once adopted, work will commence on delivering the key priorities identified in the plan

Aberdeen City Council

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
1.3a	Travel Plans	Promoting travel alternatives	Existing Organisations	ACC & Nestrans	2015-16	2016 onwards	No. organisation adopting TPs; No. employees covered by TPs, progress of travel plans in study area (North Dee, South Dee and Dyce)	Not quantifiable	Travel planning work being undertaken in the North Dee, South Dee and Dyce areas of Aberdeen as part of Civitas Portis EU funded project. Engagement activities, travel surveys and site audits undertaken, resulting in the development of action plans for each area.	2020	Funding now to be sought to deliver the interventions identified in the Action Plans.
1.3b			New Developments	ACC	2014-16	2016 onwards	N/A	Not quantifiable	Guidance for new developments contained in Transport and Accessibility Supplementary Guidance to the 2017 Aberdeen Local Development Plan.	Ongoing	Work is now underway on the 2022 Local Development Plan
1.3c			Council	ACC	Ongoing	2003 onwards	% of Council staff using sustainable modes to travel to work (CTP Surveys)	Not quantifiable	Biannual staff surveys undertaken. A refresh of the Plan will take place in 2020.	Ongoing	Next survey to be undertaken in 2020

Aberdeen City Council

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
1.4a	Improve public awareness of air quality issues	Public information	Use of Variable Messaging System (VMS)	ACC & Transport Scotland	Ongoing	Ongoing	N/A	Not quantifiable	There have been 9 new Variable Messaging Signs (VMS) installed on routes on approach to the AWPR which are under Council control.	Ongoing	Discussions still ongoing about Council linking to VMS on AWPR
1.4b			ACC Website Improvements	ACC	2011	Ongoing	N/A	Not quantifiable		Ongoing	
1.4c			'Airtext' Alert Service	ACC			No. of service users	Not quantifiable			

Aberdeen City Council

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
1.4d			Undertake air quality and sustainable travel events with Getabout Partnership	Get About	Ongoing	Ongoing	Events taking place	Not quantifiable	<p>Events have taken place throughout the year, often tying in with national and European campaigns such as Bike Week and European Mobility Week.</p> <p>The Tour Series, a cycling event that took place in the city centre in May 2019 helped to raise the profile of cycling in the city. Officers from the Council were present offering information about sustainable transport to members of the public and offering a bike tagging service.</p> <p>Council officers were also present at In Town Without My Car Day 2019, a road closure event that took place in Aberdeen City centre.</p> <p>Aberdeen City will host stages of The Tour of Britain Cycling event over the next few years, with Council staff in attendance.</p> <p>The Big Cycle event at Middleton Park Primary School was supported by Aberdeen City Council in September 2019.</p> <p>Getabout Bicycle Roadshow events were delivered to schools throughout Bike Week, European Mobility Week and Climate Week.</p>	Ongoing	Linked to Smarter Choices, Smarter Places (SCSP) Programme. 2020/21 SCSP funding secured.

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
1.4e			Information and Marketing Initiatives	ACC/Getabout	Ongoing	Ongoing	N/A	Not quantifiable	<p>An I Bike officer currently promotes the uptake of active travel in schools in the Bridge of Don Academy, Oldmachar Academy, Northfield Academy and Aberdeen Grammar School Associated School Groups. cycle training project aimed at P6 & P7 pupils that cannot currently cycle has been taking place in Aberdeen City schools since 2018. The cycle training project is being run by Adventure Aberdeen.</p> <p>A marketing campaign to promote the Aberdeen City and Aberdeenshire sustainable transport brand, Getabout, was undertaken in 2019/20. The Getabout marketing campaign included radio and TV advertising, bus backs and a marketing event in the Bon Accord Shopping Centre.</p> <p>The Living Streets Travel Tracker project is currently running in several Aberdeen City schools. The project allows children to record their journey to school and to collect points depending on how sustainably they travelled. An updated version of the Aberdeen City Cycle map was published in January 2020.</p> <p>Two series of Aberdeen City walking trail maps have now been designed. A third walking trail map series will be developed in 2020/21.</p>	On going	Linked to Smarter Choices, Smarter Places (SCSP) Programme. 2020/21 SCSP funding secured.

Aberdeen City Council

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
1.5a	Car Clubs / Carpool Schemes	Promoting low emission transport	General Public	ACC	2011	Ongoing	Car Club members hip figures. Number of Car Club vehicles available.	Estimate 0 – 1 µg/m3	The Aberdeen Car Club has continued to expand, with more electric and hydrogen vehicles added to the fleet. It now has 27 alternatively (electric or hydrogen) fuelled vehicles and 10 petrol hybrid vehicles as part of its fleet of 48 vehicles, 41 of which are available for public use. There were 2,254 members as of end March 2020	Ongoing	Recent additions include Pittodrie Street, Osprey Housing Association at Bucksburn and Tanfield Road funded through Developer Contributions .
1.5b			Corporate	ACC	2011	Ongoing	Number of Car Club vehicles available.	Estimate 0 – 1 µg/m3	10 vehicles available for the Council to utilise, (7 on fully exclusive use and 3 shared with public) on exclusive use and another two exclusive by RGU University.	Ongoing	

Aberdeen City Council

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
1.6a	Rail Improvements	Alternatives to private vehicle use	Local rail improvements	Transport Scotland/ Nestrans	Ongoing	Ongoing	Number of stations in the North East. Travel to work by rail mode share (Census)	Estimate 0 – 1 µg/m3	Aberdeen to Inverurie track dualling was completed in 2019, allowing a higher frequency and higher capacity local rail service to be delivered between Inverurie and Montrose via Aberdeen.	Ongoing	Further improvements will be realised by the re-opening of Kintore Station due in 2020. City Region Deal Strategic Transport Appraisal is considering the requirement for future rail stations in the north east.
1.6b			Infrastructure improvements	Transport Scotland/ Nestrans	Ongoing	Ongoing	Studies and infrastructure delivered	Not quantifiable	Wider Aberdeen to Inverness rail improvement project ongoing. As part of the Aberdeen City Region Deal, options for reducing rail journey times between Aberdeen and the Central Belt are being investigated.	Ongoing	
1.7	Rail Freight	Freight and delivery management	Modal Shift from road to rail	Nestrans	Ongoing	Ongoing	N/A	Not quantifiable	New rail freight strategy for Scotland launched in 2016	Ongoing	

To.	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
2 LOWER EMISSIONS AND CLEANER VEHICLES											
2.1a	Green Vehicle procurement & Fuel/ Charging Infrastructure	Promote low emission transport	Council Fleet	ACC	Ongoing	Ongoing	% of clean vehicles in Council's fleet	Not quantifiable	EVs continue to form part of the Council fleet. Working with Co-wheels, who provide managed pool car to the Council, to continue to green the fleet. The Hydrogen Refuelling Station at Kittybrewster has been upgraded to 700 bar allowing it to refuel cars as well as buses	Ongoing	Continued investment in both hydrogen and EV infrastructure by the Council. Taking part in European project to introduce hydrogen vehicles to Council fleet.
2.1b			QBP	North East Bus Alliance	Ongoing	Ongoing	% of clean buses in local fleet	Currently being quantified via NLEF appraisal	Initial hydrogen bus project has come to an end. Another 15 hydrogen buses are due to be delivered during 2020.	Ongoing	Further improvements required to ensure compliance with proposed LEZ.

To.	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
2 LOWER EMISSIONS AND CLEANER VEHICLES											
2.1c			Increase electric vehicle charging points	ACC	Ongoing	Ongoing	Number of charge points available.	Not quantifiable	<p>The electric vehicle charging network has continued to expand, with more charging points located at various locations throughout the City.</p> <p>The Proposed Aberdeen Local Development Plan 2020 was approved in March 2020.</p> <p>Within the Proposed Plan, policy T3 makes provision for alternative fuel vehicle infrastructure. The ratios and requirements for electrical vehicle charging will be set out in Aberdeen Planning Guidance: Transport and Accessibility. The Aberdeen Planning Guidance will take account of the finding of the Electric Vehicle Strategy which is currently being developed. The Planning Guidance will be subject to a separate consultation process and will be adopted under the Aberdeen Local Development Plan 2022.</p>	Ongoing	Under-taken through the SGs/ Transport Scotland and Energy Saving Trust Grants

To.	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
2 LOWER EMISSIONS AND CLEANER VEHICLES											
2.2a	Emissions Testing & Idling Enforcement	Public information	Roadside Emission Testing	ACC	Ongoing	Ongoing	No. of tests / fails	Not quantifiable			
2.2b			Idling Vehicles	ACC			No. cautions	Not quantifiable			
2.3a	Taxis	Vehicle fleet efficiency	Non-idling signs	ACC	Ongoing	On hold	Spatial coverage of signs	Not quantifiable		Ongoing	
2.3b			Licensing vehicle inspections, emissions restrictions	ACC			Fleet emissions profile improvement	Not quantifiable			

To.	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
2 LOWER EMISSIONS AND CLEANER VEHICLES											
2.4	Low Emission Zone	Environmental Permits	Low Emission Zone	ACC	2011	Ongoing	Air quality improvement within LEZ area	TBC through NMF and NLEF	<p>A project group, comprising representatives of various Aberdeen City Council teams, and partners has been established to guide the process of identifying and testing options for a LEZ.</p> <p>Consultants SYTRA were appointed in 2019 to lead on the delivery of a revised city centre traffic model and LEZ option identification and appraisal.</p> <p>The base city centre traffic and air quality models were completed in 2020.</p> <p>The interim NLEF report is complete, identifying several options to be taken forward for detailed modelling and consultation.</p>	Ongoing	Detailed option modelling and consultation to take place during 2020.

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
3 ROAD INFRASTRUCTURE											
3.1	Pedestrian-isation	Transport planning and infrastructure	Union Street and Broad Street	ACC	2008-2015	From 2016	N/A	TBC	<p>City Centre Masterplan and Sustainable Urban Mobility Plan approved.</p> <p>Part-pedestrianisation of Broad Street complete.</p> <p>Schoolhill Public Realm Enhancement Stage 1 complete</p>	2017	<p>Part of overall City Centre master-plan proposals.</p> <p>Union Street now proposed as bus priority rather than pedestrianised.</p> <p>Options will be further looked at as part of LEZ proposals.</p>

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
3 ROAD INFRASTRUCTURE											
3.2a	Road Building / Junction Alterations	Transport planning and infrastructure	Aberdeen Western Peripheral Route	AWPR Managing Agent	2008	2015-2019	Monitoring data from permanent traffic counters on Anderson Drive, Market Street and Wellington Road	0 – 1 µg/m ³ for PM ₁₀ and NO ₂ (Market St and Anderson Dr)	Final section opened in Feb 2019	Open 2019	Trunk Road
3.2b			Haudagain Improvements	Transport Scotland	2012-2019	2019-2021	Delivery of scheme	TBC	Construction underway	2021	

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
4 TRAFFIC MANAGEMENT											
4.1	Intelligent Transport System (ITS)	Traffic management	To reduce city centre congestion	ACC	Ongoing	Ongoing	Predicted traffic flow impacts; air quality modelling; Monitoring data when operational; LTS monitoring data	Not quantifiable	Bluetooth monitoring installed on A96 corridor linking the Park & Choose to the city centre. There have been 9 new Variable Messaging Signs (VMS) installed on routes on approach to the AWPR which are under Council control.	On going	Linked to Civitas Portis proposal
4.2	High Occupancy Vehicle (HOV) Lane	Traffic management	Stonehaven Road	ACC	2011	Ongoing	N/A	Not quantifiable	Feasibility study complete. Option will be revisited as part of future south of the city corridor study.	Subject to implementation of A90 south P and R	

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
4 TRAFFIC MANAGEMENT											
4.3a	Freight and Commercial Vehicle Access	Freight and delivery management	HGV Priority Measures	ACC	Ongoing	Ongoing	N/A	Not quantifiable	Options for combined bus and freight lanes contained within the Wellington Road Multimodal Corridor Study.	Ongoing	The need for HGV priority measures will be considered within subsequent road corridor studies.
4.3b			Commercial Delivery Strategy (routing, timing, idling control)	Netstrans	2015	Ongoing	N/A	Not quantifiable	Regional Freight Distribution Strategy adopted. Revised freight route maps and app-based solution in development for communicating to operators and drivers	Ongoing	
4.3c			Freight Consolidation Centre	Nestrans	Ongoing	Ongoing	Delivery of study	Not quantifiable	Research to date has suggested such a venture would have to be private sector led but has garnered little interest so far.	TBC	

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 PLANNING AND POLICIES											
5.1a	Produce Supplementary Planning Guidance	Policy guidance and development control	Improve Development Control	ACC	Ongoing	Ongoing	Database of permitted development	Not quantifiable	SGs for Transport and Accessibility, Air Quality and Noise. adopted as part of Aberdeen Local Development Plan (2017). New developments now 'master-planned' and consider layout of the development for ped/ cycle/ public transport movements first.	Ongoing	Work now taking place on Aberdeen Local Development Plan 2022,
5.1b			Section 75 monetary contributions	ACC	Ongoing	Ongoing	Database of contributions and what they have funded.	Not quantifiable	Contributions sought for sustainable transport improvements: core paths, car club, public transport infrastructure and pedestrian safety improvements such as pedestrian crossings, etc.	Ongoing	
5.1c			Construction Code of Practice	ACC			Database of developments signing CCoP	Not quantifiable			

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 PLANNING AND POLICIES											
5.2	Integration of AQAP with LTS and RTS	Policy guidance and development control		ACC and Nestrans	2013-15	2016-21	N/A	Not quantifiable	LTS adopted in January 2016. Air quality and noise embedded within the LTS with specific objectives and actions to improve	2021	Revised RTS currently being developed, with revised LTS to follow in 2021.
5.3	Integration of AQAP with Health and Transport Action Plan (HTAP)	Policy guidance and development control	Highlight Health Impacts	ACC / NHS	Ongoing	Ongoing	N/A	Not quantifiable	HTAP agreed and Steering Group/Board being refreshed	Ongoing	

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 PLANNING AND POLICIES											
5.4	Road Hierarchy	Transport planning and infrastructure	Reclassify Union St / Denburn (requires TRO)	ACC	2015-19	2019-2021	N/A	Not quantifiable	<p>A revised Roads Hierarchy was approved by Elected Members in June 2019.</p> <p>A series of road reclassifications are now being taken forward. This will be enhanced by signage changes and junction improvements to reinforce the revised hierarchy, and improvements to the revised network of priority and secondary corridors to achieve a more efficient movement of people and goods, with emphasis on walking, cycling and public transport.</p>	2030	

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 PLANNING AND POLICIES											
5.5a	Car Parking Policies	Policy guidance and development control	Low Emission Vehicle Parking Incentives	ACC	Ongoing	Ongoing	No. of low emissions permits as proportion of total	Not quantifiable	Being considered as one of the measures within a revised Car Parking Framework to be reported to Elected Members in October 2020.	Ongoing	
5.5b			Limit car parking for new developments	ACC	2013	Ongoing	N/A	Not quantifiable	Revised parking standards included in Local Development Plan 2017 and associated Transport and Accessibility Supplementary Guidance. City Centre Masterplan proposes zero parking for new office developments.	Ongoing	Will be reviewed as part of the developing Car Parking Framework and Local Development Plan 2022.

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 PLANNING AND POLICIES											
5.5c			Development of Local and Regional Car Parking Policies	ACC & Nestrans	Ongoing	Ongoing	N/A	Not quantifiable	<p>Regional Car parking Strategy adopted 2012.</p> <p>Revised parking standards included in Aberdeen Local Development Plan 2017 and Transport and Accessibility Supplementary Guidance.</p> <p>Strategic car Parking Review is complete with the outcomes being developed into a revised Car Parking Framework for Aberdeen to be reported in October 2020.</p>	Ongoing	

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 PLANNING AND POLICIES											
5.6a	National Lobbying	Transport planning and infrastructure	Incentives/ funding/tax breaks for Low Emission Initiatives	ACC	2011	Ongoing	N/A	Not quantifiable	Grants for home and workplace charging facilities are available through Home Energy Scotland. The Council implemented a charge point tariff of £0.19 per kWh from May 2020 with a connection fee of £0.38 and no minimum charge or overstay penalty. Users are still expected to pay parking charges where they apply (with the exception of the rapid chargers at two pay and display car parks – Gallowgate and Broomhill Road – where users get their parking for free whilst charging if they stay with the vehicle.	Ongoing	As part of the Main Issues Report for the next iteration of the Aberdeen Local Development Plan, members of the public were asked to give their views on the 12 Main Issues identified, one of which is Electric Vehicle Charging Infrastructure (Main Issue number 5). The feedback will then be used to inform the Council's future approach to planning for electric vehicles
5.6b			Shipping Emissions Reductions	ACC	2011	Ongoing	N/A	Not quantifiable	No work being undertaken currently	Ongoing	

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 PLANNING AND POLICIES											
5.6c			HGV/Bus Scrappage schemes	ACC	2011	Ongoing	N/A	Not quantifiable	Several bus replacement and/or retrofit schemes are being funded by Transport Scotland to support LEZ development.	Ongoing	

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
6 NON-TRANSPORT MEASURES											
6.1	Control Biomass Installations	Policy guidance and development control	Enforce new developments to only install 'cleanest' biomass boilers	ACC	2012	Ongoing	Database of appliances installed	Not quantifiable			
6.2	Industry Permitting	Environmental permits		ACC and SEPA			N/A	Not quantifiable			
6.3	Tree Planting	Promoting low emission plants	Pro-active planting of tree species with a positive air quality impact and avoid planting varieties that may have detrimental air quality impact	ACC			N/A	Not quantifiable	Policies contained within ALDP Supplementary Guidance (2016) robust policy to achieve this as part of development		
6.4	Shipping	Freight and delivery management	Consider actions available at Aberdeen Harbour	ACC & Aberdeen Harbour			Pollutant monitoring	Not quantifiable	Work being undertaken as part of Civitas Portis project with Aberdeen Harbour		

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.

Aberdeen City Council undertook automatic (continuous) monitoring at 6 sites during 2019. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at www.scottishairquality.scot.

Maps showing the location of the monitoring sites are provided in Appendix A Figure 1 to 6.

Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

The Union Street and Market Street continuous monitoring sites are on busy city centre roads and are representative of population exposure for NO₂, PM₁₀ and PM_{2.5}. Union Street is the city's main shopping street with shops on the ground level and commercial premises and flats on the 1st, 2nd and 3rd floors. Almost all the city's bus routes pass along at least part of Union Street and the inside lane of both sides of the road are designated bus lanes.

Market Street is adjacent to Aberdeen Harbour and has a high proportion of HGV's travelling between the north-east of Scotland, the Harbour and locations to the south of Aberdeen. The street is used by pedestrians travelling to the city centre from residential properties to the south of the river Dee, visiting the Union Square retail park and people working around the Harbour area. There are a small number of 1st, 2nd and 3rd floor flats. Emissions from Aberdeen Harbour also contribute to the pollution on Market Street.

The Anderson Drive site is 4m from the kerb and is not representative of population exposure as residential properties are set back 10-20m from the kerb. Similarly, the site at Wellington Road is around 3-4m closer to the kerb than residential properties

in the area. The nearest properties are 10m from the King Street site, however the location is typical of flatted properties close to the kerb at other locations on King Street. Errol Place is representative of typical residential properties close to the city centre but not adjacent to a major road and provides urban background data.

The automatic monitoring sites at Union Street, Market Street, Wellington Road and Anderson Drive are located within AQMAs.

The King Street site is not located within an AQMA but is relatively close to the City Centre in an area of high traffic flow.

3.1.2 Non-Automatic Monitoring Sites

Aberdeen City Council undertook non- automatic (passive) monitoring of NO₂ at 72 sites during 2019. Table A.2 in Appendix A shows the details of the sites.

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

Diffusion tubes on Market Street, Union Street and the majority of those on Holburn Street and King Street within the city centre are at building façade and are representative of population exposure. Some of the tubes out with the city centre are at roadside locations with the façade of the nearest relevant property 5-20m back from the roadside. Procedures within LAQM.TG 16 have been used to estimate the concentration at the nearest receptor where appropriate.

Maps showing the location of the monitoring sites are provided in Appendix A Figure 1 to 6. Locations can also be view at <https://data.aberdeencity.gov.uk/dataset/air-quality-diffusion-tubes1>

3.2 Individual pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2019 dataset of monthly mean values is provided in Appendix B.

Table C.2 in Appendix C details the annualisation of diffusion tubes that did not have a data capture greater than 75%.

Table C.3 in Appendix C details diffusion tube concentrations which were adjusted to location of relevant population exposure (building façade) using the LAQM 'distance to receptor' calculation.

For diffusion tubes, the full 2019 dataset of monthly mean values is provided in Appendix B.

All automatic monitoring site data in 2019 was comparable to 2017 and 2018 levels. Generally, NO₂ levels monitored across the city in 2019 were marginally lower than previous years. Concentrations at all automatic sites continue to be below the annual mean air quality objective of 40 µg/m³. The trend in NO₂ levels over the last 5 years is shown in Figure 7. NO₂ levels have been decreasing since 2015. NO₂ levels at all automatic monitoring have been below the objective level since 2018. Figure 8 provides the statistical significance of NO₂ trend levels declining over the last 5 years at each automatic monitoring site. The data has been de-seasonalised to remove the influence of seasonal cycles.

Automatic monitoring of NO₂ at Anderson Drive required to be annualised due to poor data capture, caused by equipment breakdown. Details of the annualisation process are in Appendix C.

In relation to diffusion tubes, duplicate and triplicate tube monitoring locations were assessed for precision using the precision accuracy bias spread sheet available on the SAQD website. Adjustments made, due to poor precision, are detailed in Table C.1, Appendix C.

There were three monitoring locations removed in 2019 (DT3, DT69 and DT76) as access to these location was no longer possible. NO₂ levels monitored at these locations were well below the objective level. There were four new monitoring

locations in 2019 (DT86 to DT89). DT86 and DT87 are new monitoring locations in the area of the Haudagain improvement works. DT88 and DT89 are new background monitoring locations in the city centre harbour area to assist in the verification of the National modelling framework.

Diffusion tubes DT27 and DT87 have been annualised due to poor data capture. Details of the annualisation process are in Appendix C.

NO₂ levels recorded at the diffusion tube locations are comparable with 2017/18. Monitoring locations are at areas of relevant exposure except where indicated. Appendix C details diffusion tube concentrations at the nearest receptors using the calculation to façade process described in LAQM.TG (16). There were no exceedances of the objective level where concentrations have been calculated to façade.

Diffusion tubes located along Union Street suggest exceedances of the objective throughout this area of the city centre AQMA continue. Levels recorded in these locations are also comparable to levels recorded in 2017/18.

Although the automatic site at Market Street, which is located within the city centre AQMA, recorded a level below the annual mean objective, diffusion tubes DT9 and DT10 located in the Market Street area continue to record levels above the objective, suggesting exceedances of the annual mean continues at more congested or enclosed areas. Diffusion tube location, DT82, at Virginia Street recorded marginally lower levels compared to 2018 but continues to exceed the objective level. DT16 located at Trinity Quay, continued to record an annual mean level just below the objective.

The King Street continuous monitor is outside the city centre AQMA and measured concentrations continue to be well below the annual mean objective. Diffusion tube DT11, at 105 King Street and within the AQMA, exceeded the objective level. This diffusion tube is close to the busy junction with East and West North Street and indicates there is a pocket of exceedance in this area.

Diffusion tube DT33 at East North Street measured NO₂ levels below the objective for the first time since monitoring in that location began in 2007.

Within the Wellington Road AQMA the annual mean levels recorded at the Wellington Road automatic site and the 2 diffusion tube locations (DT7, DT36) continued to be

below the annual mean objective. Diffusion tube DT37 located on Wellington Road just outside of the AQMA is also well below the objective.

There were no exceedances of the annual mean objective recorded in the Anderson Drive AQMA. The diffusion tube DT39 located at the Haudagain roundabout measured NO₂ levels below the objective for the first time since monitoring at that location began in 2009. The opening of the AWPR may have contributed to the improvement.

Whilst there are diffusion tube monitoring locations in the AQMAs that continue to exceed the objective level, the general trend appears to be an improvement in air quality across the City. Figure 9 in Appendix A, shows the trend of improving air quality at the diffusion tube locations where concentrations have exceeded the objective level over the last 5 years.

Nitrogen dioxide levels at monitoring locations outside the AQMAs remain well below the annual mean objective. Data for Tube DT73 located at Skene Square suggest levels continue to be just below the threshold of the annual mean objective. Major infrastructure works proposed for the Skene Street/Berryden area are discussed in section 4.1.

Figure 9: Trend in NO₂ Annual Mean Concentration (µg/m³) Diffusion Tubes exceeding objective

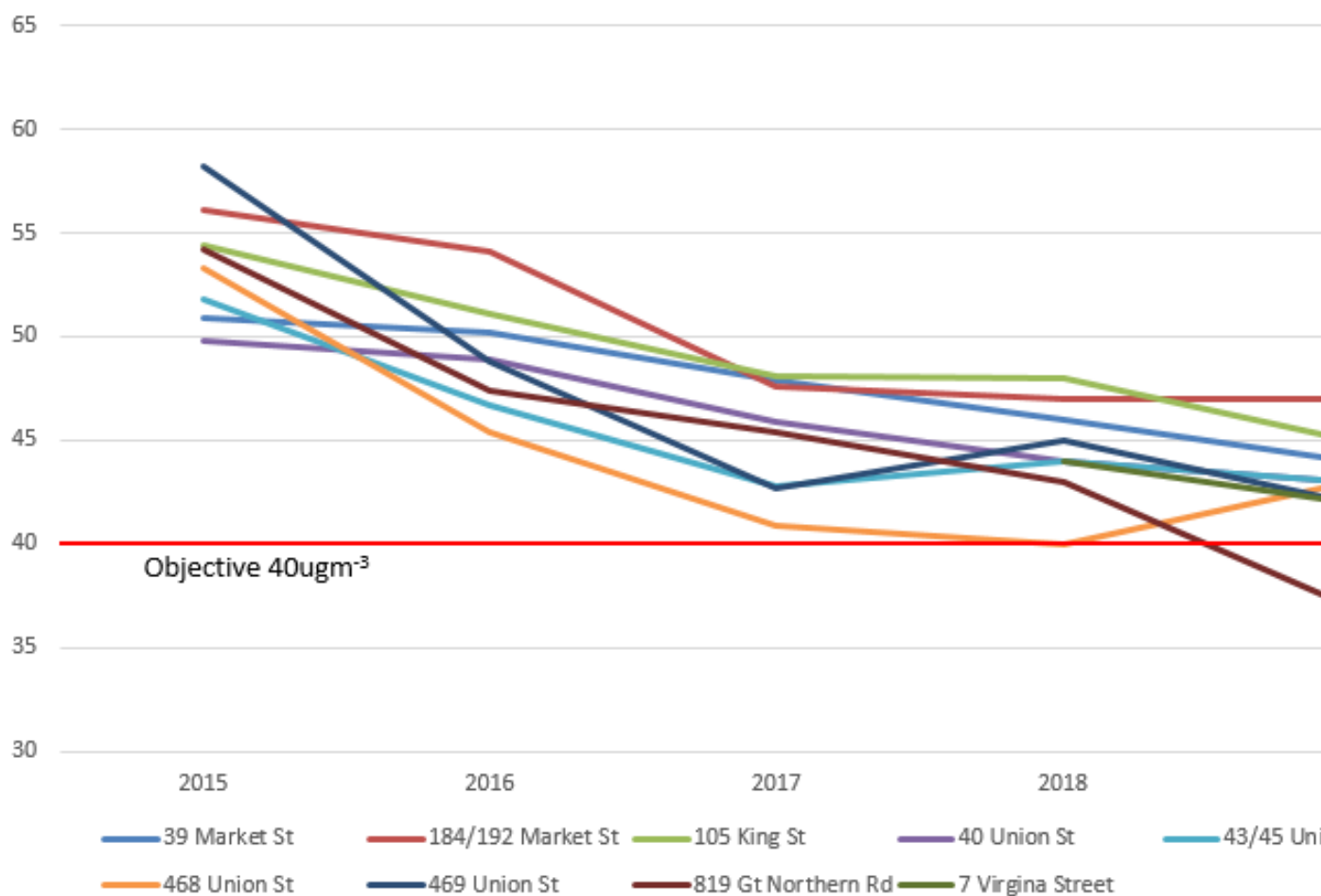


Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

There were no exceedances of the hourly mean objective at any automatic or diffusion tube sites in 2019. The hourly mean has not been exceeded at any automatic sites in the last 5 years

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 18µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 7 times per year.

Figure 10 in Appendix A provides the trend in annual means measured at each site since 2015. The Union Street Monitoring site data for PM₁₀ and PM_{2.5} was annualised due to poor data capture over the year. Details of the annualisation

process are provided in Appendix C. Figure 11 provides the statistical significance of PM₁₀ trend levels over the last 5 years at each automatic monitoring site. The data has been de-seasonalised to remove the influence of seasonal cycles. The trend at Erroll Place suggests that background urban levels have remained stable over the last 5 years. All the roadside monitoring sites show an improving trend in PM₁₀ levels.

The 24-Hour Mean PM₁₀ Monitoring Results are detailed in Table A.6. There have been no exceedances of the objective at any monitoring site since 2016. The episodes that did exceed 50µg/m³ in 24 hours occurred towards the end of February and April. The weather was dry with strong easterly winds at these times and the elevated levels may have been caused by transboundary pollution episodes.

A mobile monitoring device was purchased in 2019. The unit has the capability to monitor PM₁₀ and PM_{2.5} simultaneously. Plans are currently being developed to use the device as part of a primary school education initiative about air quality and also to measure particulate concentrations at possible hot spots across the City.

3.2.3 Particulate Matter (PM_{2.5})

Table A.7 in Appendix A compares the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past 5 years with the air quality objective of 10µg/m³

There are 5 continuous monitoring sites measuring PM_{2.5} levels in Aberdeen City.

No exceedances of the annual mean were recorded at any of the continuous monitoring sites. No exceedances of the objective have been recorded at any site since 2016.

3.2.4 Sulphur Dioxide (SO₂)

No monitoring of sulphur dioxide was carried out in 2019 as previous assessments did not predict a likelihood of exceedance of the objectives and there has been no significant change in local emissions.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

No monitoring of Carbon Monoxide, Lead and 1,3-Butadiene was carried out in 2019 as previous assessments did not predict a likelihood of exceedances of the objectives and there has been no significant change in local emissions.

4. New Local Developments

4.1 Road Traffic Sources

4.1.1 Aberdeen Western Peripheral Route (AWPR)

The AWPR fully opened to traffic in 2019. The Craibstone to Stonehaven and Charleston sections of the AWPR opened at the end of 2018 and the Craibstone to Parkhill section in February 2019. The detrunking of the existing A90 Anderson Drive and the phasing in of “locking in the benefits” commenced upon the AWPR opening.

City wide traffic counts were undertaken in September 2019 to indicate the reduction in traffic flows along key corridors. As expected, the largest reduction in vehicle flow was along the Anderson Drive corridor with a 16-19% reduction between Anderson Drive and the Bridge of Dee. This corridor previously acted as an inner ring road connecting destinations in the northeast to the south of the City. King Street and Wellington Road also experienced significant reductions (14% and 10% respectively) as traffic diverted onto the new route. There was only a 1.7% reduction on Union Street indicating most of the non-public transport traffic at this location is to destinations within the City or cross-city journeys.

The traffic counts have been used to update the air quality modelling and scenario testing of LEZ options in support of the LEZ feasibility study.

4.1.2 Berryden Road and South College Street Improvements

The improvements include the widening of existing roads and creation of a new road, providing a more direct link between the City Centre and the north of the city. Applications for planning permission and other necessary consents have been logged with the Planning Authority. The scheme is subject to a Compulsory Purchase Order (CPO) to acquire the land necessary to deliver the project which is now with the DEPA for consideration. The timescale for this process is a matter for Scottish Ministers and it is anticipated it could take 1-2 years to resolve.

Construction is expected to take 2 years and will not begin until the CPO has been completed.

The improvements include the duelling of Berryden Road and provide a more direct link between the City Centre and the Third Don Crossing.

It is anticipated that the proposed junction improvements will reduce congestion in this area and improve air quality, however these benefits may be offset by an increase in traffic flow. An air quality assessment undertaken in 2017 predicted the scheme would not lead to exceedances of the air quality objectives outside the existing AQMAs. However, it is likely the assessment will be updated in 2019/20 to take account of the most recent monitoring data and proposed traffic counts.

4.1.3 A90/A96 Haudagain Improvements

Construction works commenced on the site in 2019. The improvements will create a new dual carriageway link road to the southwest of the Haudagain roundabout and improve traffic flow and air quality. The DMRB Environmental Statement details that there are no predicted exceedances of the annual mean NO₂ or PM₁₀ levels with the scheme in place and concludes that there will be no significant impact on local air quality as a result of the proposed scheme.

4.1.4 Wellington Road Improvements

A broad range of options to improve traffic management and flow on Wellington Road, including the section within the AQMA were reviewed during 2017. Council approval was subsequently granted to proceed to a Stage 1 STAG assessment (Strategic Transport Analysis Guide) the outcome of which was reported to the Council in 2018. The Stage 1 STAG report generated 8 options for progression to a Stage 2 assessment.. Should the Council subsequently approve improvement measures, it is likely to be several years before major infrastructure works are implemented. Options include road widening within the Wellington Road AQMA adjacent to the former HM Craiginches prison site which has recently been developed for residential accommodation. While road widening is likely to improve

traffic flow, the works may bring the road closer to residential properties. An air quality assessment will be carried out as part of the options appraisal process.

4.1.5 Roads Hierarchy Review

The Aberdeen City Council Regional transport network has undergone a period of transformational change in recent years, with the opening of the Diamond Bridge, Dyce Drive link road, Craibstone Park and Ride and the AWPR. Further infrastructure measures including the Berryden Corridor and Haudagain upgrade will be implemented over the next few years. As a result of these measures, the Council and local partners commenced a roads hierarchy review in 2018.

The review report was approved by the Aberdeen City Council's Growth and Resources Committee in June 2019. The reclassification of key routes support the effective and efficient distribution and management of traffic around the City and facilitate the delivery of the transport elements of the City Centre Masterplan. Key principles include the direction of all through and peripheral traffic from the City Centre to the AWPR and hence support air quality improvement in the City Centre.

4.2 Other Transport Sources

Other transport sources include:

- Airports.
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.
- Ports for shipping.

There were no new other transport sources in Aberdeen City in 2019.

4.3 Industrial Sources

Industrial sources include:

- **Industrial installations:** new or proposed installations for which an air quality assessment has been carried out.

- **Industrial installations:** existing installations where emissions have increased substantially, or new relevant exposure has been introduced.
- **Industrial installations:** new or significantly changed installations with no previous air quality assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.
- Poultry farms.

The Scottish Environmental Protection Agency have advised there is no regulated process that has increased its emissions to air by more than 30% in 2019.

The PPC Regulations were amended in December 2017 to transpose the requirements of the Medium Combustion Plant Directive (MCPD). This will likely result in several new Permits across the region. Currently there are 2 sites in Aberdeen City located at Nigg sewage treatment works and the new P&J Live arena.

The Energy from Waste Plant currently being constructed in East Tullos Industrial Estate will be regulated under a PPC Part A Permit. This is being assessed by SEPA.

4.4 Commercial and Domestic Sources

Commercial and domestic sources include:

- Biomass combustion plant – individual installations.
- Areas where the combined impact of several biomass combustion sources may be relevant.
- Areas where domestic solid fuel burning may be relevant.
- Combined Heat and Power (CHP) plant.

There were no new commercial and domestic sources in Aberdeen City in 2019.

4.5 New Developments with Fugitive or Uncontrolled Sources

This section relates potential fugitive or uncontrolled particulate matter from the following new sources:

New Source in 2019	Detail
Landfill sites	No new sources in 2019
Quarries	No new sources in 2019
Unmade haulage roads on industrial sites	No new sources in 2019
Other potential sources of fugitive particulate matter emissions.	No new sources in 2019

5. Planning Applications

This section details any major planning applications under consideration that might affect air quality.

Planning permission for a new Energy from Waste (EfW) plant was granted in April 2016 and construction commenced in 2019. The new facility will be in the East Tullos industrial estate on the site of an existing waste collection and recycling facility. The nearest housing is located approximately 250m from the site with Tullos primary school approximately 300m from the site.

SEPA will be responsible for the regulation of emissions from the facility under the Pollution Prevention and Control (Scotland) Regulations 2012 (PPC). A PPC permit application was submitted by the developer in 2019. An air quality assessment, including dispersion modelling of the sea haar associated with the proximity of the site to the east coast and East Tullos Hill to the south, was included as part of the Environmental Impact Assessment. The assessment of the operational phase demonstrated that, providing measures required by any permit granted are adhered to, there would low or effectively zero risk to human health. NO₂ and PM₁₀ levels in the vicinity of the site are low and there would be not risk of exceedance of the air quality objectives due to emissions from the plant operation.

The site is, however, approximately 300m from the Wellington Road AQMA and concerns were raised regarding a potential increase in pollution levels in this area from additional traffic movements. There will be approximately 614 HGV movements (307 in and 307 out) per week during operation, however the majority would be via the AWPR and the coastal road where existing pollution levels are low. An estimated additional 22 HGV and 11 LGV movements per day were predicted on the northern section of Wellington Road and within the AQMA. This number of movements was considered to have no significant impact on air quality in the local area.

Although the construction phase will result in a maximum of 100 HGV movements per day (50 in and 50 out), again the majority would be via the AWPR and away from areas of population exposure. Additionally, the high level of additional traffic

movements will be for a limited period. A vehicle compound for construction traffic, a traffic management regime and control of operational hours during the construction phase were required as part of the planning process. A dust management plan was also requested as part of the construction phase environmental controls.

Although the air quality assessment did not indicate any risk of exceedance of any air quality objectives, the local community raised several concerns. Background monitoring of NO₂ concentrations is therefore being carried out in the surrounding areas of relevant population exposure. Monthly meetings have also been arranged by the developer with representation from the local councillor, local community, SEPA and relevant council officers to discuss and resolve any concerns that arise during the construction phase. Similar meetings are likely with the operator once the facility is operational.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

The NO₂ annual mean levels recorded across the city are comparable to the levels recorded in 2017 and 2018. Trends in NO₂ levels suggest that air quality continues to improve across the City.

Data from all continuous automatic monitoring sites was below the NO₂ annual mean objective of 40mg/m³. However, diffusion tubes in the city centre suggest there are pockets of areas that continue to exceed the annual mean objective, although trends over the last 5 years suggest continued improvement.

No exceedances of the NO₂ objective were measured in the Anderson Drive AQMA and Wellington Road AQMAs or outside of any AQMA.

The King Street (roadside) and Errol Place (background) continuous monitor locations are outside of the city centre AQMA and levels continue to be well below the annual mean objective.

There were no exceedances of the NO₂ one hour mean objective at any of the automatic sites. Diffusion tube data also recorded no sites with an annual mean >60ugm⁻³ suggesting exceedances of the 1 hour objective were unlikely across the city.

The annual mean and 24 hour PM₁₀ objectives were met at all monitoring locations and the concentrations at measurement locations across the city are comparable to 2017 and 2018.

No exceedances of the PM_{2.5} annual mean were recorded at the 5 continuous monitoring sites.

The 3 AQMAs in the City remain valid for NO₂ and PM₁₀ annual means.

New monitoring data has not identified a need for any other changes to the existing AQMAs.

6.2 Conclusions relating to New Local Developments

The Aberdeen Western Peripheral Route fully opened to traffic in 2019, providing a more direct route from locations to the north and northeast of Aberdeen to locations to the south of the city. The new route has removed significant traffic volumes on several main arterial roads, including the Anderson Drive and Wellington Road AQMAs and will have contributed to reduced pollution levels in these areas. Other key road infrastructure measures are also being progressed to help improve traffic flow, reduce congestion and improve air quality.

Construction has also commenced on a new Energy from Waste facility in the south of Aberdeen. Air quality in the vicinity of the site is good and dispersion modelling predicted there would be no significant impact on air quality due to plant emissions. Although close to the Wellington Road AQMA, vehicle movements both during the construction and operational phase will be via the AWPR and coastal route and there will be no significant increase in traffic movements in the AWPR and hence no impact on air quality.

6.3 Proposed Actions

1. Take forward an air quality education initiative in local primary schools using a mobile particulate monitor to allow children to collect data and analyse the results.
2. Complete stage 2 of the LEZ feasibility study and undertake a public and stakeholder consultation of options generated.
3. Apply to the Traffic Commissioner for a Traffic Regulation Condition to reduce emissions from bus services as Phase 1 of Aberdeen's LEZ
4. Complete the air quality and traffic modelling of the impacts of the LEZ options with a final preferred option established by end 2020.
5. Continued implementation of the Actions within the Air Quality Action Plan 2011.
6. Submit the next air quality progress report.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
CM1	Errol Place	Urban Background	X394397	Y807392	PM ₁₀ , PM _{2.5} , O ₃ , NO ₂ (NO, NO _x)	N	TEOM FDMS/FIDAS ⁽³⁾ Chemiluminescence	N/A	N/A	3
CM2	Union Street	Roadside	X393656	Y805967	PM ₁₀ , PM _{2.5} NO ₂ (NO, NO _x)	Y	Dichotomous Monitor FDMS Chemiluminescence	2	2m	2.5
CM3	Market Street	Roadside	X394560	Y805677	PM ₁₀ , PM _{2.5} NO ₂ (NO, NO _x)	Y	Fidas 200 Chemiluminescence	0	2m	1.5
CM4	Anderson Drive	Roadside	X392506	Y804186	PM ₁₀ , NO ₂ (NO, NO _x)	Y	TEOM Chemiluminescence	10	6m	1.5
CM5	Wellington Road	Roadside	X394395	Y804779	PM ₁₀ , PM _{2.5} NO ₂ (NO, NO _x)	Y	Fidas 200 Chemiluminescence	5	4m	1.5
CM6	King Street	Roadside	X394333	Y808770	PM ₁₀ , PM _{2.5} , NO ₂ (NO, NO _x)	N	BAM, Fidas 200 Chemiluminescence	10	3m	1.5

(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) PM₁₀ : FDMS TEOM (no correction) (01/01/2019 to 07/11/2019), FIDAS (07/11/2019 to 31/12/2019) PM₂₅ : FDMS TEOM (no correction) (01/01/2019 to 07/11/2019), FDMS TEOM (no correction) (07/11/2019 to 31/12/2019)

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?
DT2	885 Gt Northern Rd	Roadside	391149	809164	NO ₂	Y	11	3	N
DT4	38 Ellon Rd	Roadside	394652	809714	NO ₂	N	7	3	N
DT5	520 King St	Roadside	394236	808066	NO ₂	N	9	0.1	N
DT6	86 Victoria Rd, Torry	Roadside	394764	805197	NO ₂	N	0	3	N
DT7	Wellington Rd//Kerloch Pl	Roadside	394411	804407	NO ₂	Y	0	3	N
DT8	107 Anderson Dr	Roadside	392337	804340	NO ₂	Y	14	3	N
DT9	39 Market St	Roadside	394264	806146	NO ₂	Y	0	3	N
DT10	184/192 Market St	Roadside	394530	805708	NO ₂	Y	0	3	N
DT11	105 King St	Roadside	394406	806637	NO ₂	Y	0	3	N

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?
DT12	40 Union St	Roadside	394285	806285	NO ₂	Y	0	3	N
DT13	Music Hall, Union St	Roadside	393777	806030	NO ₂	Y	0	6	N
DT14	Dyce Prim, Gordon Ter	Urban background	389046	812794	NO ₂	N	(N/A)	N/A	N
DT15	Northfield swimming pool	Urban background	390801	808132	NO ₂	N	(N/A)	N/A	N
DT16	1 Trinity Quay	Roadside	394336	806097	NO ₂	Y	0	5	N
DT17	43/45 Union St	Roadside	394273	806255	NO ₂	Y	0	3	N
DT18	14 Holburn St	Roadside	393305	805734	NO ₂	Y	0	3	N
DT19	468 Union St	Roadside	393386	805826	NO ₂	Y	0	3	N
DT20	212 King St	Roadside	394400	806842	NO ₂	N	0	4	N
DT21	26 King St	Roadside	394449	806453	NO ₂	Y	0	4	N
DT22	104 King St	Roadside	394425	806634	NO ₂	Y	0	4	N

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?
DT24	40 Auchmill Rd	Roadside	389930	809603	NO ₂	N	0	3	N
DT25	21 Holburn St	Roadside	393332	805748	NO ₂	Y	0	3	N
DT26	147 Holburn St	Roadside	393214	805367	NO ₂	N	0	3	N
DT27	80 Holburn St	Roadside	393233	805565	NO ₂	Y	0	3	N
DT28	61 Holburn St	Roadside	393275	805624	NO ₂	Y	5	3	N
DT29	469 Union St	Roadside	393400	805811	NO ₂	Y	0	3	N
DT30	335 Union St	Roadside	393619	805919	NO ₂	Y	0	5	N
DT33	16 East North St	Roadside	394505	806531	NO ₂	Y	0	4	N
DT34	404 King Street	Roadside	394317	807527	NO ₂	N	0	9	N
DT36	115 Menzies Rd/Wellington Rd	Roadside	394403	804799	NO ₂	Y	14	4	N
DT37	137 Wellington Road	Roadside	394697	803735	NO ₂	N	17	14	N

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?
DT39	819 Gt Northern Rd	Roadside	391293	809136	NO2	Y	0	3	N
DT40	852 Fullerton Ct (facade)	Facade	391353	809158	NO2	Y	0	7	N
DT41	852 Fullerton Ct (roadside)	Roadside	391352	809151	NO2	Y	7	0.1	N
DT45	111 S Anderson Dr	Facade	392311	804349	NO2	Y	0	13	N
DT46	West North Street	Roadside	394277	806671	NO2	Y	0	4	N
DT47	Powis Terrace	Roadside	393368	807511	NO2	N	5	0.1	N
DT48	139 Gt. Northern Road	Roadside	393088	808232	NO2	N	10	0.1	N
DT49	142 Gt. Northern Road	Roadside	392969	808460	NO ₂	N	11	3	N
DT50	St. Machar Dr/Dunbar St.	Roadside	394015	808483	NO ₂	N	6	0.1	N
DT54	36 - 38 School Road	Roadside	394358	808434	NO ₂	N	14	2	N
DT55	Ellon Rd/Balgownie Crescent	Roadside	394629	809740	NO ₂	N	9	2	N

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?
DT56	59 Fairview Drive	Urban Background	392239	810163	NO ₂	N	N/A	N/A	N
DT57	Park Place/Constitution St	Roadside	394628	806692	NO ₂	N	16	0.1	N
DT58	47 Tillydrone Av	Roadside	393584	808729	NO ₂	N	8	4	N
DT59	735 Gt. Western Rd	Facade	391525	809080	NO ₂	N	0	8	N
DT60	Anderson Drive/Beech Rd	Roadside	391287	807683	NO ₂	Y	N/A	0.1	N
DT62	35 Chestnut Row	Urban Background	392903	807302	NO ₂	N	N/A	N/A	N
DT63	93 Berryden Road	Roadside	393034	807392	NO ₂	N	11	2	N
DT64	102 Picktillum Place	Urban Background	393025	807828	NO ₂	N	N/A	N/A	N
DT65	90 Tillydrone Av	Roadside	393331	809073	NO ₂	N	8	3	N
DT66	10 Meadow Place	Roadside	393120	809284	NO ₂	N	3	3	N
DT67	37 Inverurie Rd	Roadside	389756	809583	NO ₂	N	6	3	N

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?
DT70	Kirkhill Place Tullos Primary	Urban Background	395476	804452	NO ₂	N	N/A	N/A	N
DT71	Tullos Hill	Urban Background	39543	803410	NO ₂	N	N/A	N/A	N
DT72	North Loirston Souter Head Road Cove Allotments	Urban Background	394988	801940	NO ₂	N	N/A	N/A	N
DT73	61 Skene Square	Facade	393458	806768	NO ₂	N	0	6	N
DT74	5 Caroline Place	Roadside	393350	806922	NO ₂	N	5	3	N
DT75	Pentland Close	Urban Background	395964	805132	NO ₂	N	N/A	N/A	N
DT77	27 Skene Square	Roadside	393524	806701	NO ₂	N	0	5	N
DT78	42 Leslie Road	Roadside	393025	808297	NO ₂	N	0	6	N
DT79	67 Leslie Road	Roadside	393029	808327	NO ₂	N	3	6	N
DT80	27 Rosemount Place	Roadside	393410	806674	NO ₂	N	0	4	N

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?
DT81	131 Rosemount Place	Roadside	393044	806537	NO ₂	N	0	2	N
DT82	7 Virginia Street	Roadside	394466	806248	NO ₂	Y	0	8	N
DT83	Wellington Road Altens Round about (North)	Roadside	394574	802078	NO ₂	N	0	3	N
DT84	Wellington Road Altens Round about (South)	Roadside	394489	801970	NO ₂	N	0	3	N
DT85	Tullos Place	Background	395216	804724	NO ₂	N	N/A	N/A	N
DT86	21 Manor Av	Roadside	391330	808904	NO ₂	N	10	0.1	N
DT87	535 North Anderson Dr	Roadside	391441	808892	NO ₂	Y	8	3	N
DT88	31 St Clement St	Roadside	395118	806164	NO ₂	N	0	1	N
DT89	Pocra Quay	Background	395837	805706	NO ₂	N	N/A	N/A	N
CL1	Errol Place	Background	394397	807392	NO ₂	N	N/A	N/A	Y

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?
CL2	Union Street	Roadside	393656	805967	NO ₂	Y	2	2	Y
CL3	Market Street	Roadside	394560	805677	NO ₂	Y	0	2	Y
CL4	Anderson Drive	Roadside	392506	804186	NO ₂	Y	10	6	Y
CL5	Wellington Road	Roadside	394395	804779	NO ₂	Y	5	4	Y
CL6	King Street	Roadside	394333	808770	NO ₂	N	10	3	Y

(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.

Figure 1: City South Automatic monitoring site and diffusion tube locations 2019

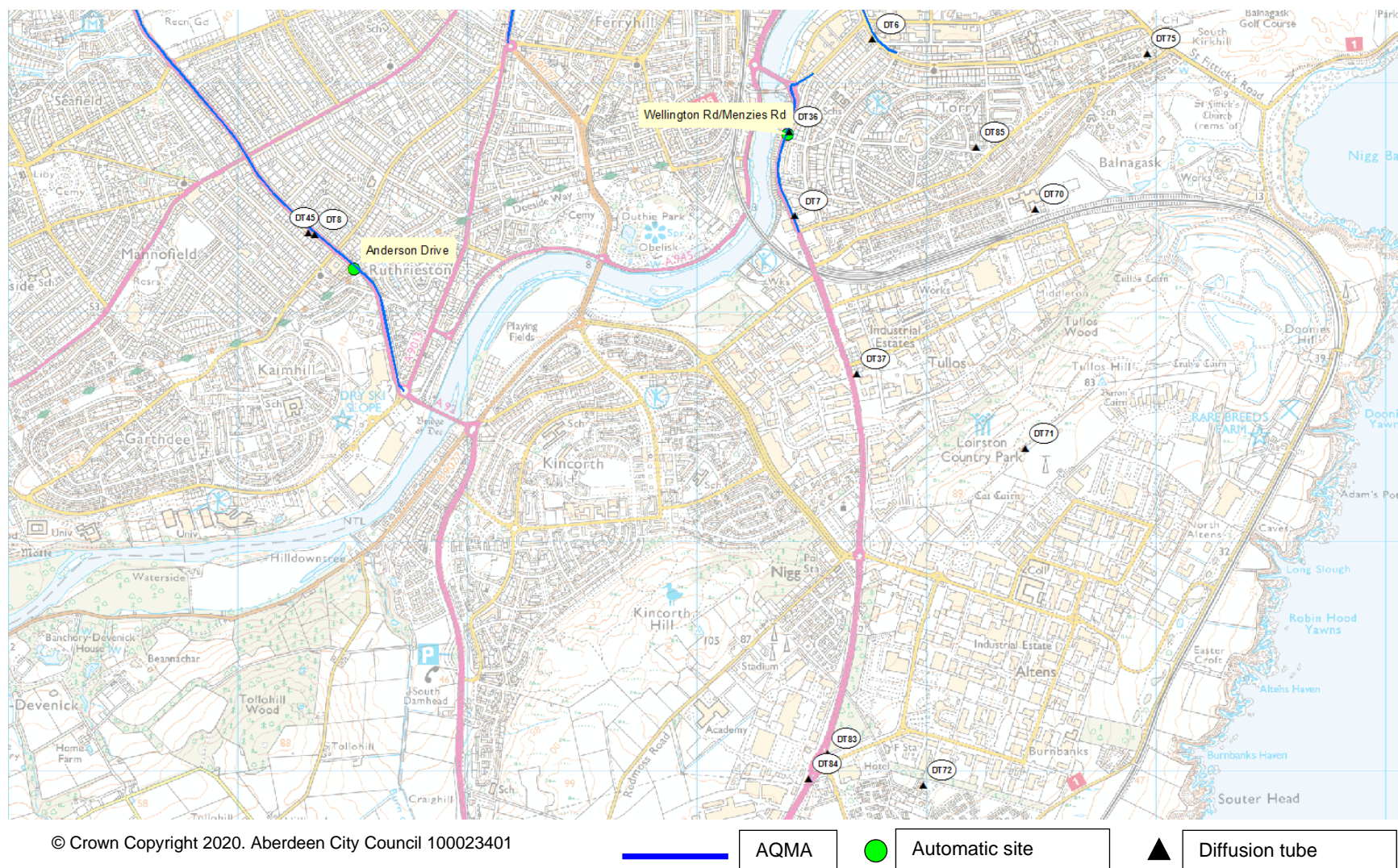
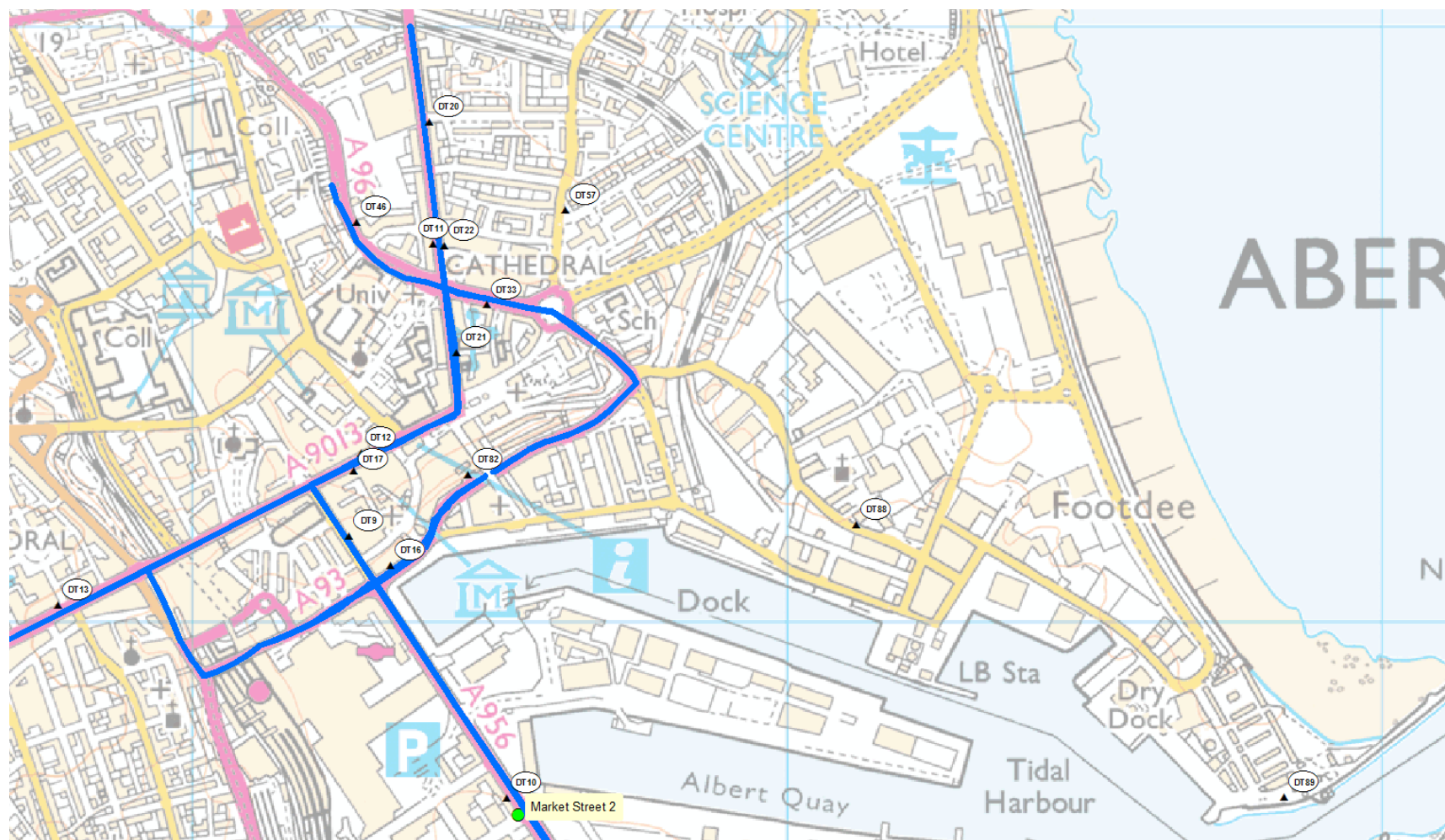


Figure 2: City Centre East Automatic monitoring site and diffusion tube locations 2019



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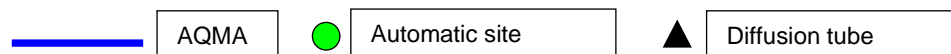


Figure 3: City Centre West Automatic monitoring site and diffusion tube locations 2019

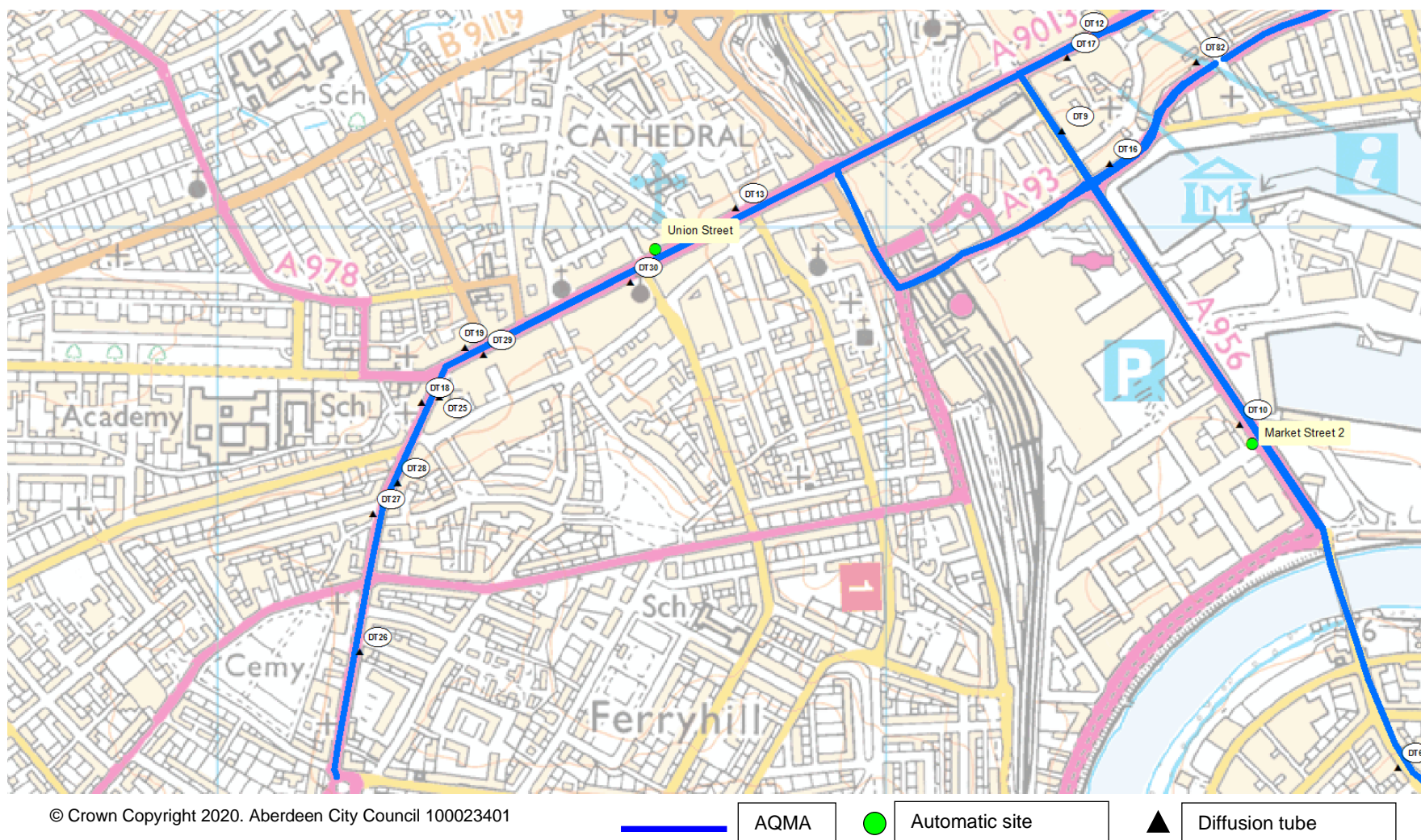


Figure 4: City Centre North Automatic monitoring site and diffusion tube locations 2019

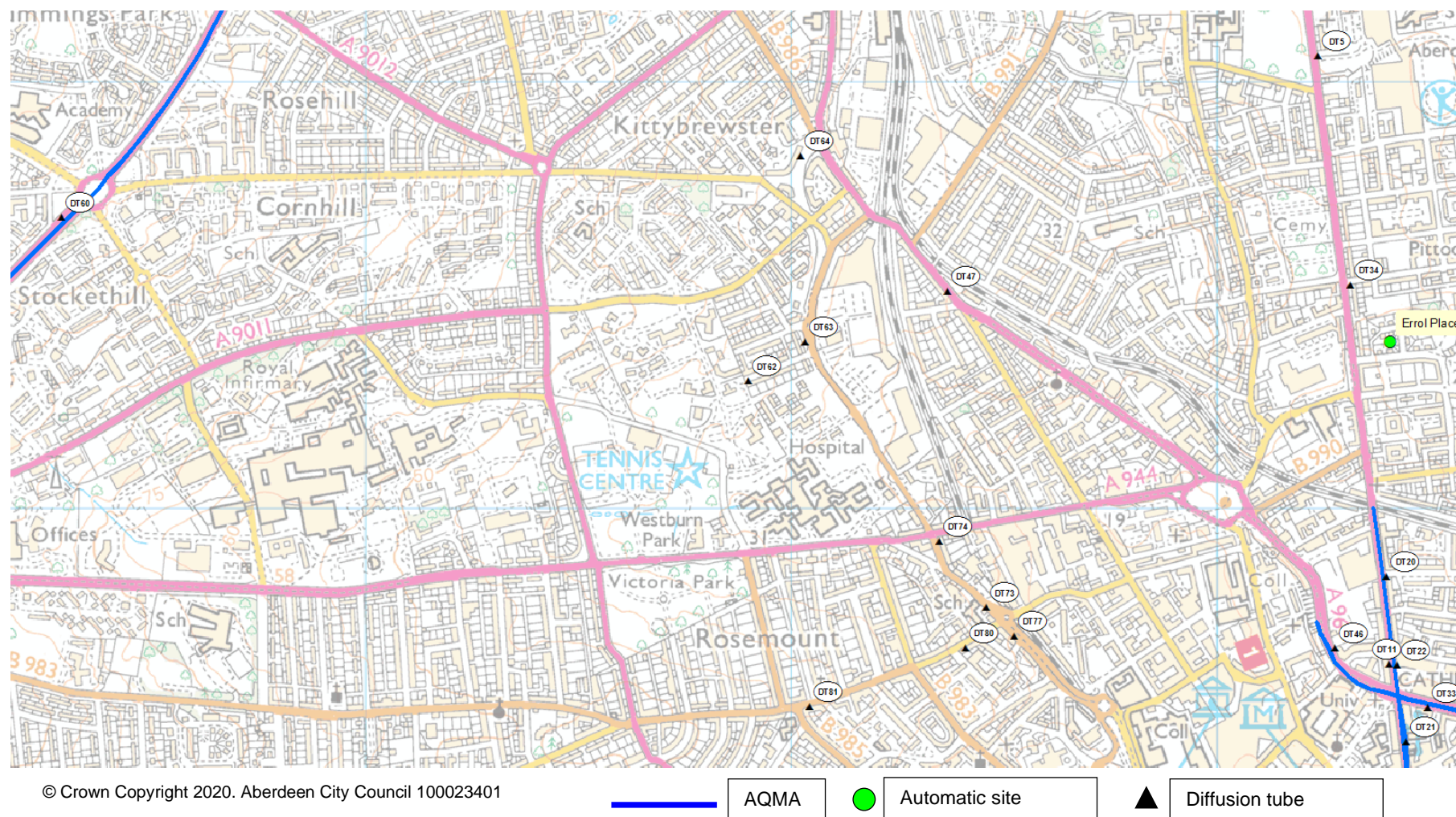


Figure 5: City North Automatic monitoring site and diffusion tube locations 2019

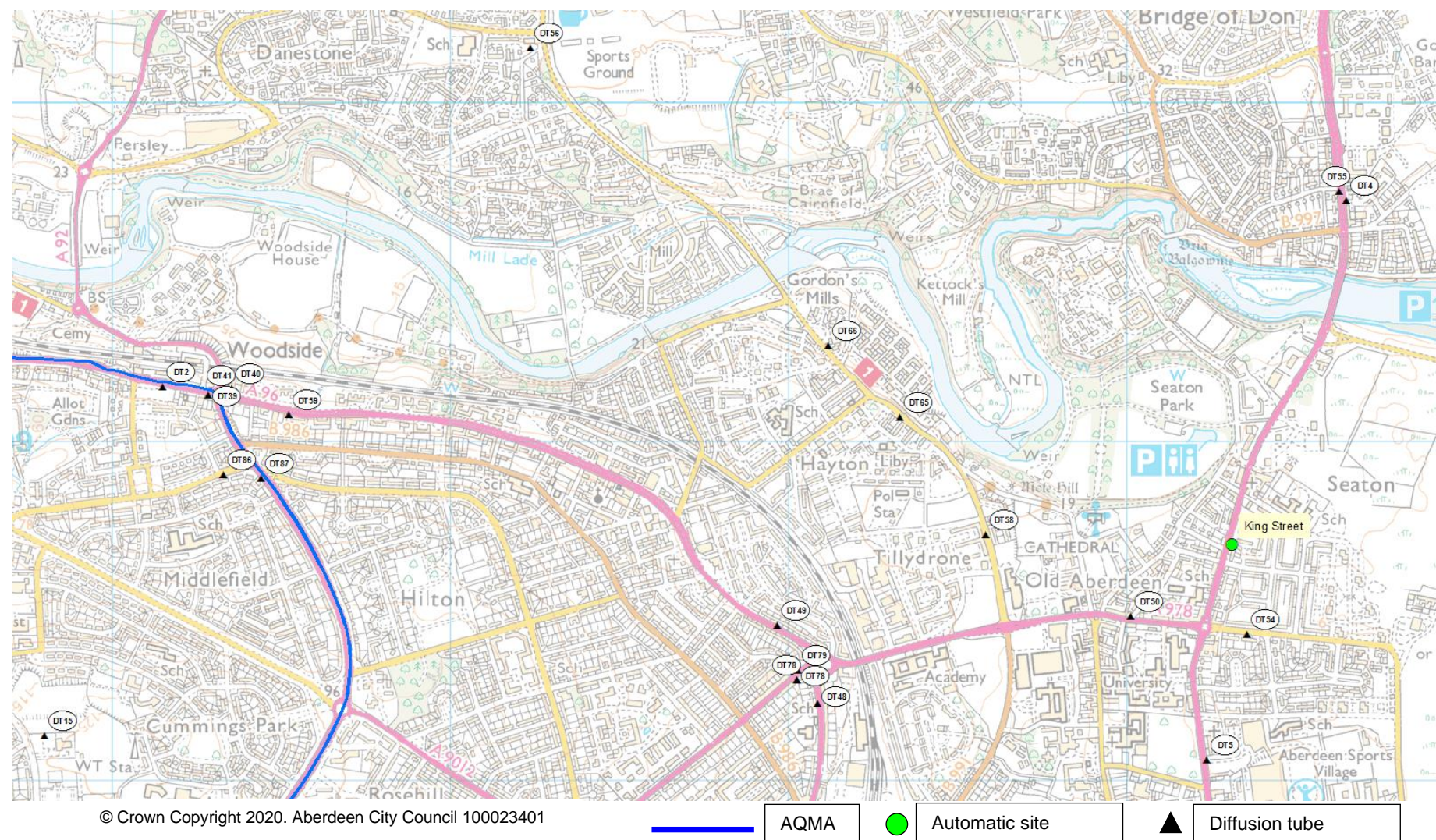


Figure 6: Dyce Automatic monitoring site and diffusion tube locations 2019

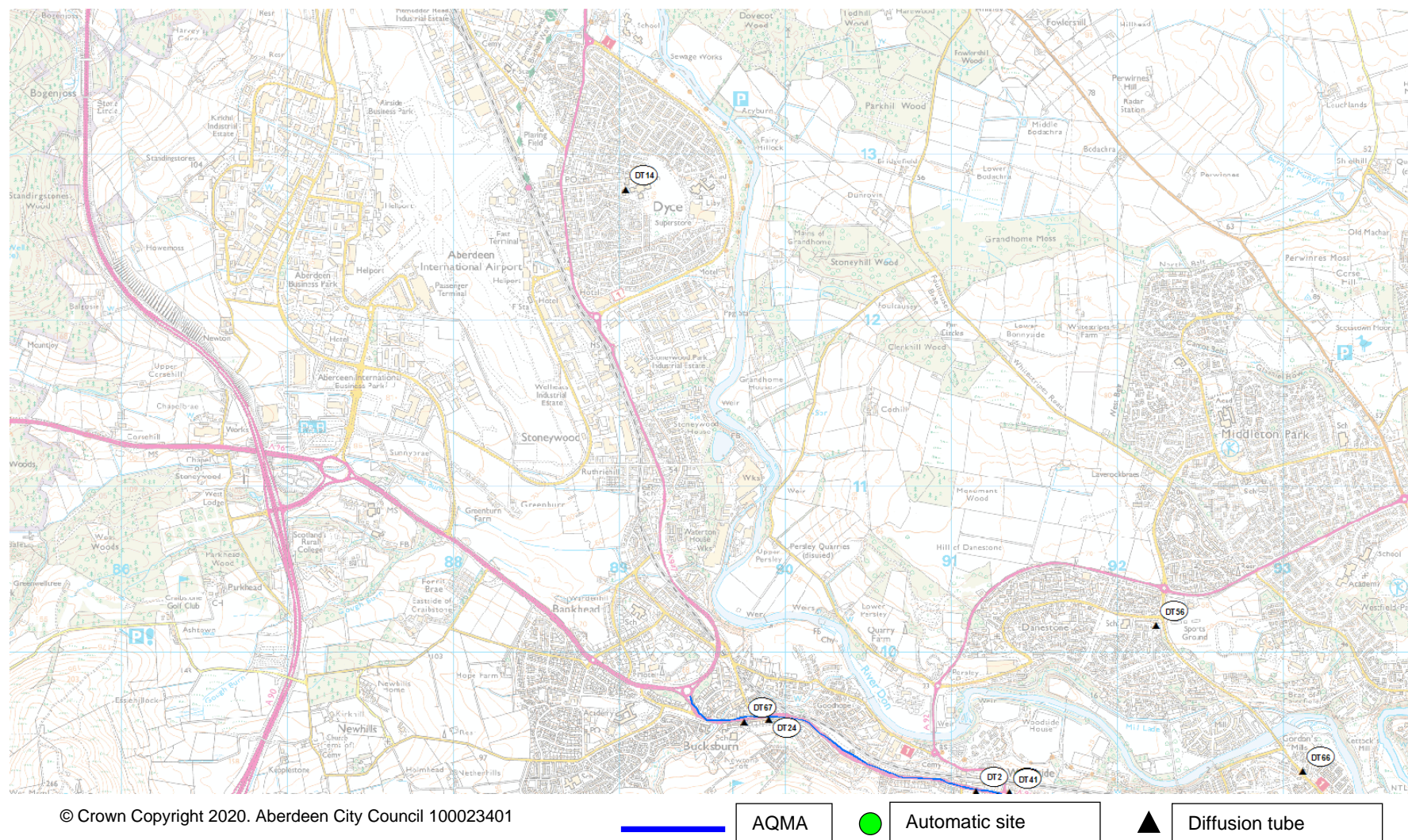


Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
CM1	Background	Automatic		97	23	21	22	20	17
CM2	Roadside	Automatic		99	46	43	40	38	36
CM3	Roadside	Automatic		99	36	35	31	33	32
CM4	Roadside	Automatic		55	22	21	19	17	21
CM5	Roadside	Automatic		99	40	46	39	39	35
CM6	Roadside	Automatic		95	28	28	23	22	20
DT2 ⁽⁴⁾	Roadside	Diffusion Tube		100	44	44	40	37	29
DT4 ⁽⁴⁾	Roadside	Diffusion Tube		100	41	37	33	29	27
DT5 ⁽⁴⁾	Roadside	Diffusion Tube		100	35	33	31	47	47
DT6	Roadside	Diffusion Tube		92	31.3	32.5	27.8	28	30

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DT7	Roadside	Diffusion Tube		100	37.5	37.4	33.2	32	31
DT8 ⁽⁴⁾	Roadside	Diffusion Tube		100	45	54	48	48	39
DT9	Roadside	Diffusion Tube		92	50.9	50.2	47.9	46	44
DT10	Roadside	Diffusion Tube		100	56.1	54.1	47.6	47	47
DT11	Roadside	Diffusion Tube		100	54.4	51.1	48.1	48	45
DT12	Roadside	Diffusion Tube		100	49.8	48.9	45.9	44	43
DT13	Roadside	Diffusion Tube		100	41.0	40.9	N/A	N/A	35
DT14	Urban background	Diffusion Tube		100	10.0	9.6	10.1	10	8
DT15	Urban background	Diffusion Tube		100	13.4	12.1	13.0	11	9
DT16	Roadside	Diffusion Tube		83	45.4	43.8	37.4	37	39
DT17	Roadside	Diffusion Tube		100	51.8	46.7	42.8	44	43

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DT18	Roadside	Diffusion Tube		100	50.2	48.5	41.6	39	39
DT19	Roadside	Diffusion Tube		100	53.3	45.4	40.9	40	43
DT20	Roadside	Diffusion Tube		92	34.9	32.1	30.8	30	27
DT21	Roadside	Diffusion Tube		92	34.9	44.1	41.6	34	33
DT22	Roadside	Diffusion Tube		100	44.1	39.3	36.2	36	34
DT24	Roadside	Diffusion Tube		100	28.8	31.6	28.0	24	21
DT25	Roadside	Diffusion Tube		92	50.3	42.8	37.1	37	35
DT26	Roadside	Diffusion Tube		100	28.7	26.6	23.8	24	23
DT27	Roadside	Diffusion Tube		33	28.3	28.7	24.6	25	30
DT28 ⁽⁴⁾	Roadside	Diffusion Tube		92	38	37	32	32	29
DT29	Roadside	Diffusion Tube		100	58.2	48.8	42.7	45	42

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DT30	Roadside	Diffusion Tube		100	50.9	46.5	41.9	41	39
DT33	Roadside	Diffusion Tube		100	46.4	43.1	40.4	40	35
DT34	Roadside	Diffusion Tube		100	29.2	28.7	27.6	26	24
DT36 ⁽⁴⁾	Roadside	Diffusion Tube		100	47	46	41	43	39
DT37 ⁽⁴⁾	Roadside	Diffusion Tube		100	30	30	24	23	22
DT39	Roadside	Diffusion Tube		100	54.2	47.4	45.4	43	37
DT40	Facade	Diffusion Tube		100	39.0 ⁽³⁾	n/a	31.0	30	26
DT41 ⁽⁴⁾	Roadside	Diffusion Tube		100	49	48	44	40	36
DT45	Facade	Diffusion Tube		100	41.7	30.6	25.2	24	21
DT46	Roadside	Diffusion Tube		100	30.1	26	25.5	26	24
DT47 ⁽⁴⁾	Roadside	Diffusion Tube		100	48	45	43	41	40

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DT48 ⁽⁴⁾	Roadside	Diffusion Tube		92	32	31	29	28	26
DT49 ⁽⁴⁾	Roadside	Diffusion Tube		100	34	37	32	31	30
DT50 ⁽⁴⁾	Roadside	Diffusion Tube		100	27	27	25	23	22
DT54 ⁽⁴⁾	Roadside	Diffusion Tube		100	24	24	24	20	20
DT55 ⁽⁴⁾	Roadside	Diffusion Tube		100	32	30	24	25	22
DT56	Urban Background	Diffusion Tube		100	12.0	12.5	13.1	13	11
DT57 ⁽⁴⁾	Roadside	Diffusion Tube		100	33	29	21	27	27
DT58 ⁽⁴⁾	Roadside	Diffusion Tube		100	28 ⁽³⁾	23	22.3	25	25
DT59	Facade	Diffusion Tube		100	n/a	24.2	21.4	20	19
DT60	Roadside	Diffusion Tube		100	n/a	32.9	32.4	31	27
DT62	Urban Background	Diffusion Tube		100	14.5 ⁽³⁾	14.4	14.0	12	11

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DT63 ⁽⁴⁾	Roadside	Diffusion Tube		100	30 ⁽³⁾	29	23	23	23
DT64	Urban Background	Diffusion Tube		100	16.9 ⁽³⁾	16.9	17.2	17	14
DT65 ⁽⁴⁾	Roadside	Diffusion Tube		92	n/a	19 ⁽³⁾	26	19	19
DT66 ⁽⁴⁾	Roadside	Diffusion Tube		100	n/a	21 ⁽³⁾	26	21	21
DT67 ⁽⁴⁾	Roadside	Diffusion Tube		100	n/a	35 ⁽³⁾	25	38	32
DT70	Urban Background	Diffusion Tube		92	n/a	n/a	14.7	14	13
DT71	Urban Background	Diffusion Tube		92	n/a	n/a	10.6	10	9
DT72	Urban Background	Diffusion Tube		100	n/a	n/a	7.8	8	7
DT73	Facade	Diffusion Tube		100	n/a	n/a	39.7	40	38
DT74 ⁽⁴⁾	Roadside	Diffusion Tube		100	n/a	n/a	39	34	34
DT75	Urban Background	Diffusion Tube		100	n/a	n/a	19.1	16	15

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DT77	Façade	Diffusion Tube		100	n/a	n/a	n/a	37	38
DT78	Roadside	Diffusion Tube		100	n/a	n/a	n/a	21	20
DT79	Roadside	Diffusion Tube		92	n/a	n/a	n/a	20	20
DT80	Façade	Diffusion Tube		100	n/a	n/a	n/a	24	23
DT81	Façade	Diffusion Tube		100	n/a	n/a	n/a	30	27
DT82	Façade	Diffusion Tube		92	n/a	n/a	n/a	44	42
DT83	Roadside	Diffusion Tube		100	n/a	n/a	n/a	27	26
DT84	Roadside	Diffusion Tube		100	n/a	n/a	n/a	18	19
DT85	Urban Background	Diffusion Tube		92	n/a	n/a	n/a	13	13
DT86 ⁽⁴⁾	Roadside	Diffusion Tube		100	n/a	n/a	n/a	n/a	17
DT87 ⁽⁴⁾	Roadside	Diffusion Tube		58	n/a	n/a	n/a	n/a	24

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2015	2016	2017	2018	2019
DT88	Roadside	Diffusion Tube		100	n/a	n/a	n/a	n/a	35
DT89	Background	Diffusion Tube		100	n/a	n/a	n/a	n/a	21

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

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

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

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

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

(4) Measurement at a monitoring site not representative of public exposure. See Appendix C, Table C.5 for estimation of concentrations at nearest relevant receptor using the “NO₂ fall-off with distance calculator” described in LAQM.TG.16.

Figure 7: Trend in NO₂ Annual Mean Concentration (µg/m³) Continuous Monitoring Sites 2015 – 2019

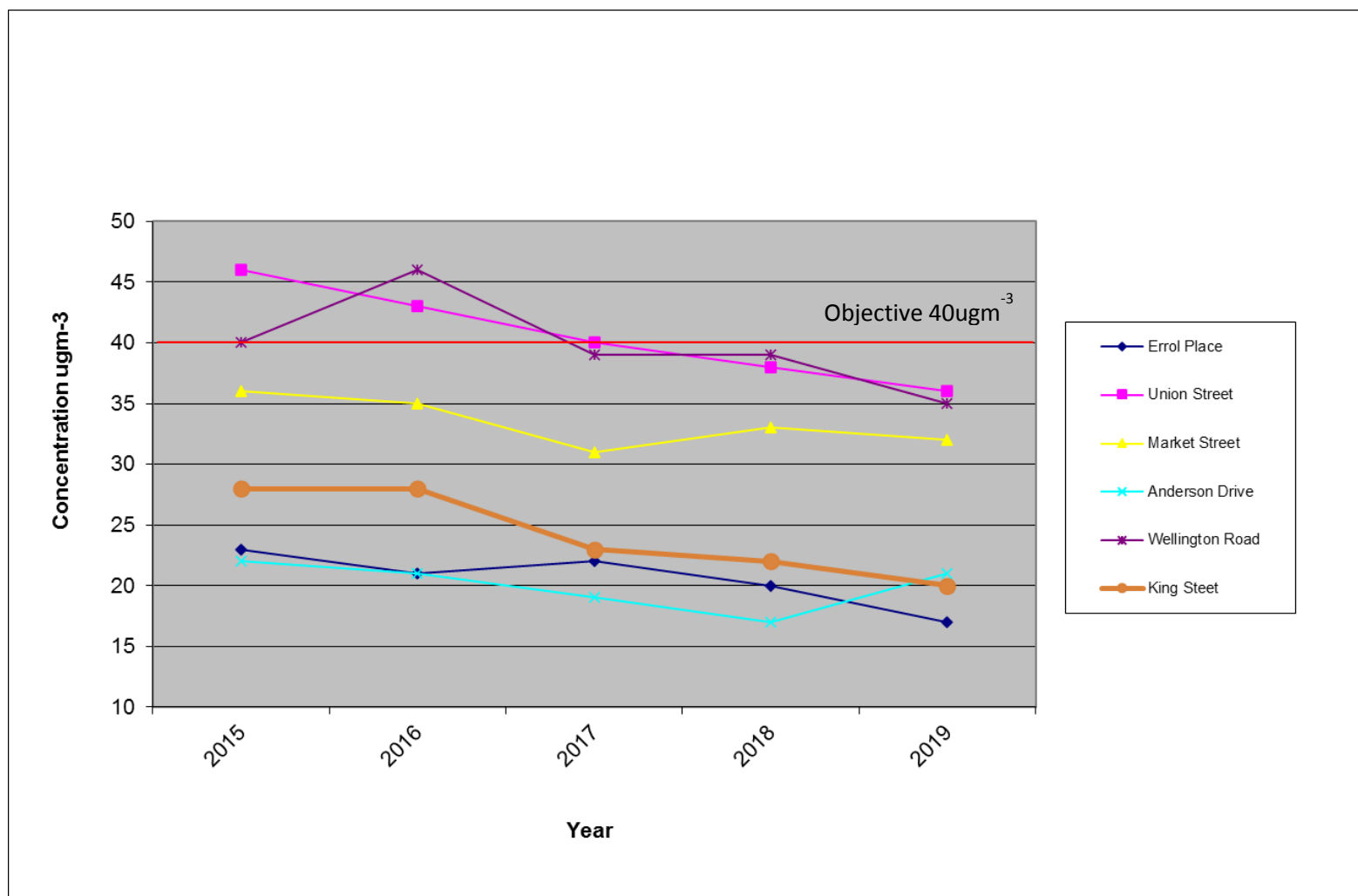


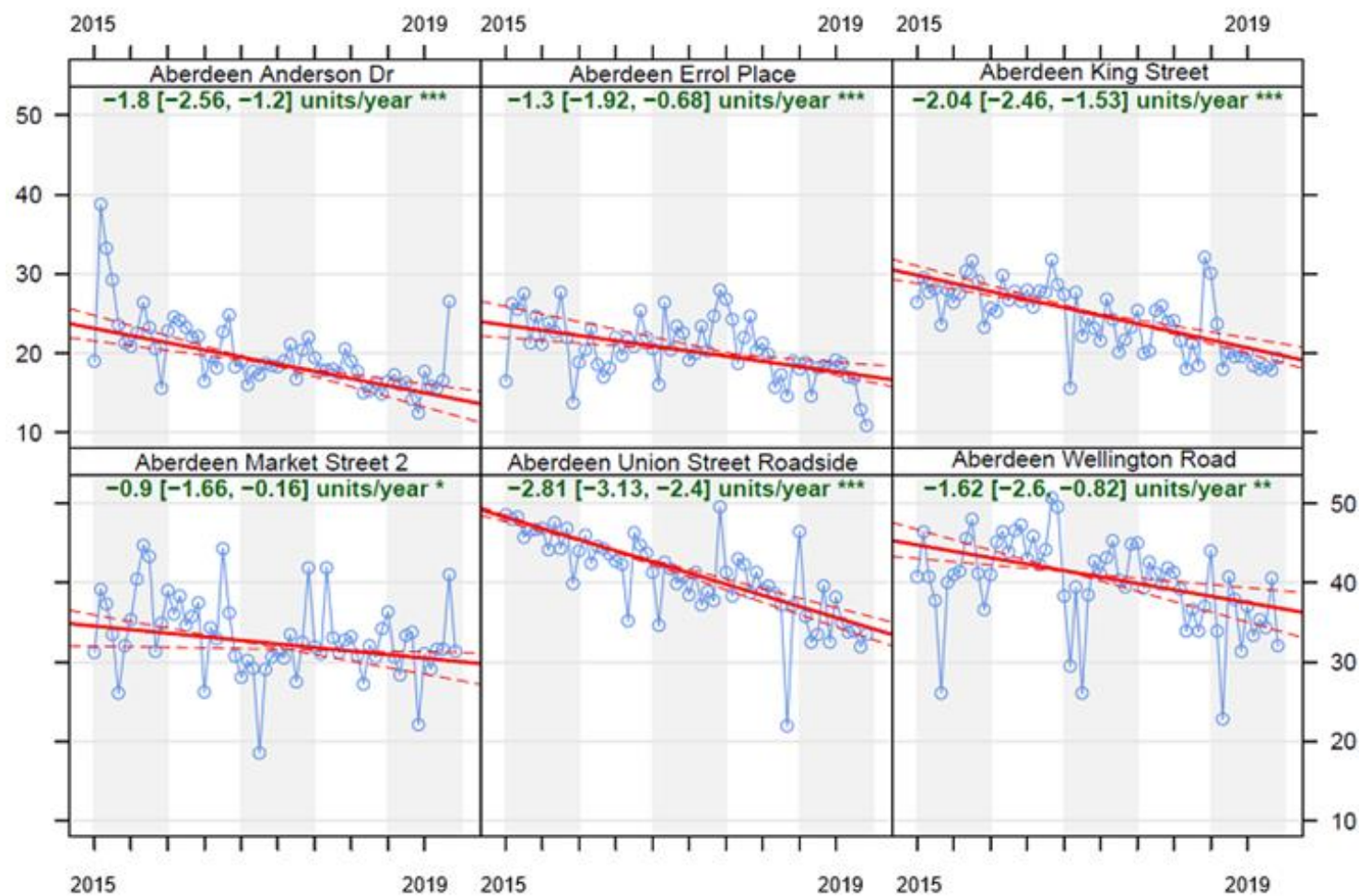
Figure 8: De-seasonalised NO₂ trends for the period 2015 to 2019

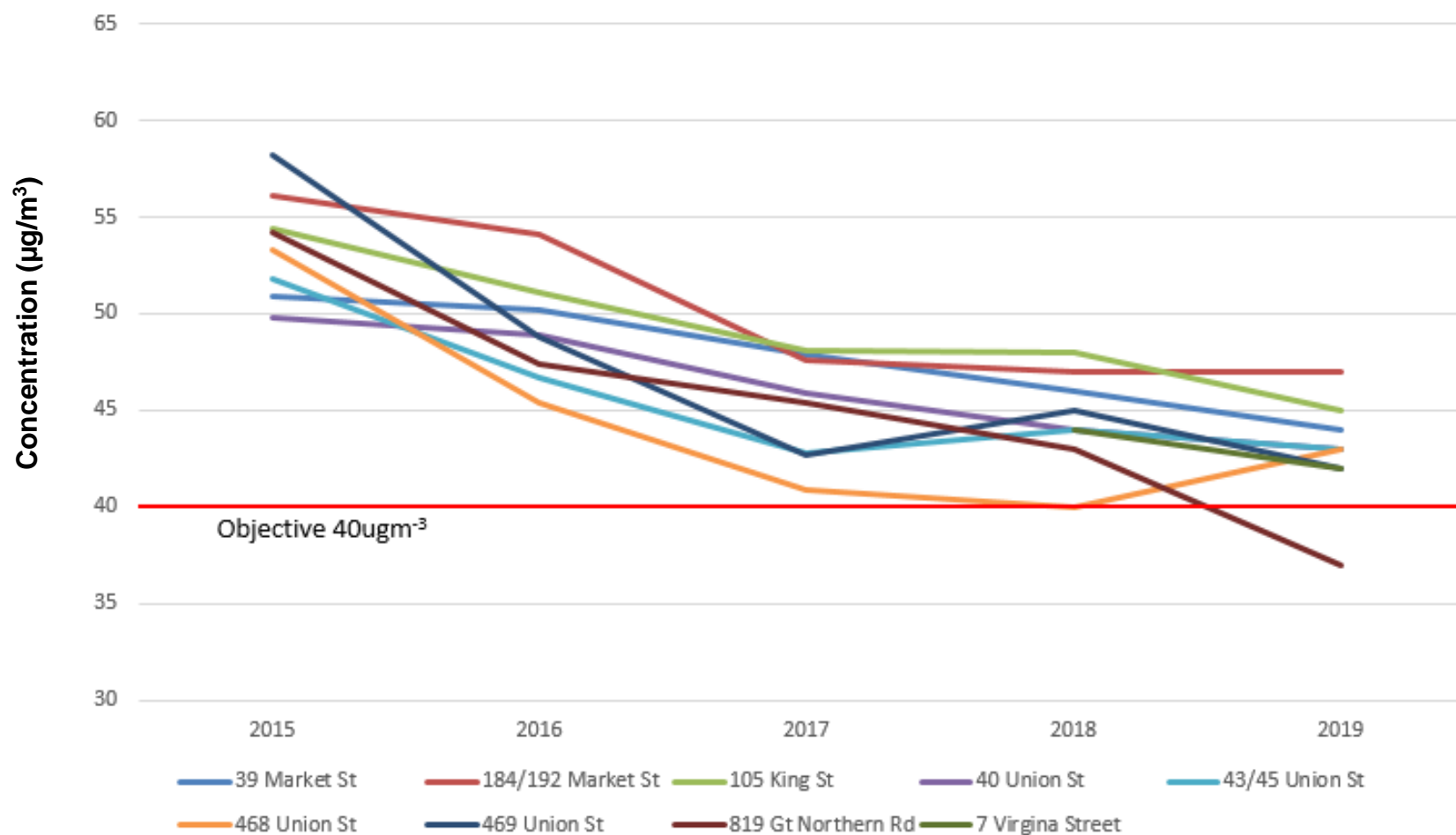
Figure 9: Trend in NO₂ Annual Mean Concentration (µg/m³) Diffusion Tubes exceeding objective

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2015	2016	2017	2018	2019
CM1	Background	Automatic		97	1	0	4	1	0
CM2	Roadside	Automatic		99	3	0	0	0	0
CM3	Roadside	Automatic		99	0	1	0	0	0
CM4	Roadside	Automatic		55	0(109)	0	0	0	0(93)
CM5	Roadside	Automatic		99	0	2	0	0	0
CM6	Roadside	Automatic		95	0	0	0	0	0

Notes: Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(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 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2015	2016	2017	2018	2019
CM1	Background		93	12	12	11	14	14
CM2	Roadside		64	17	13	13	15	12
CM3	Roadside		99	19	12	11	17	13
CM4	Roadside		80	13	12	12	14	13
CM5	Roadside		99	20	16	13	17	14
CM6	Roadside		79	17	16	12 ⁽⁴⁾	14	14

Notes: Exceedances of the PM₁₀ annual mean objective of 18µg/m³ are shown in **bold**.

(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 10: Trend in PM₁₀ Annual Mean Concentration (µg/m³) Continuous Monitoring Sites 2015 - 2019

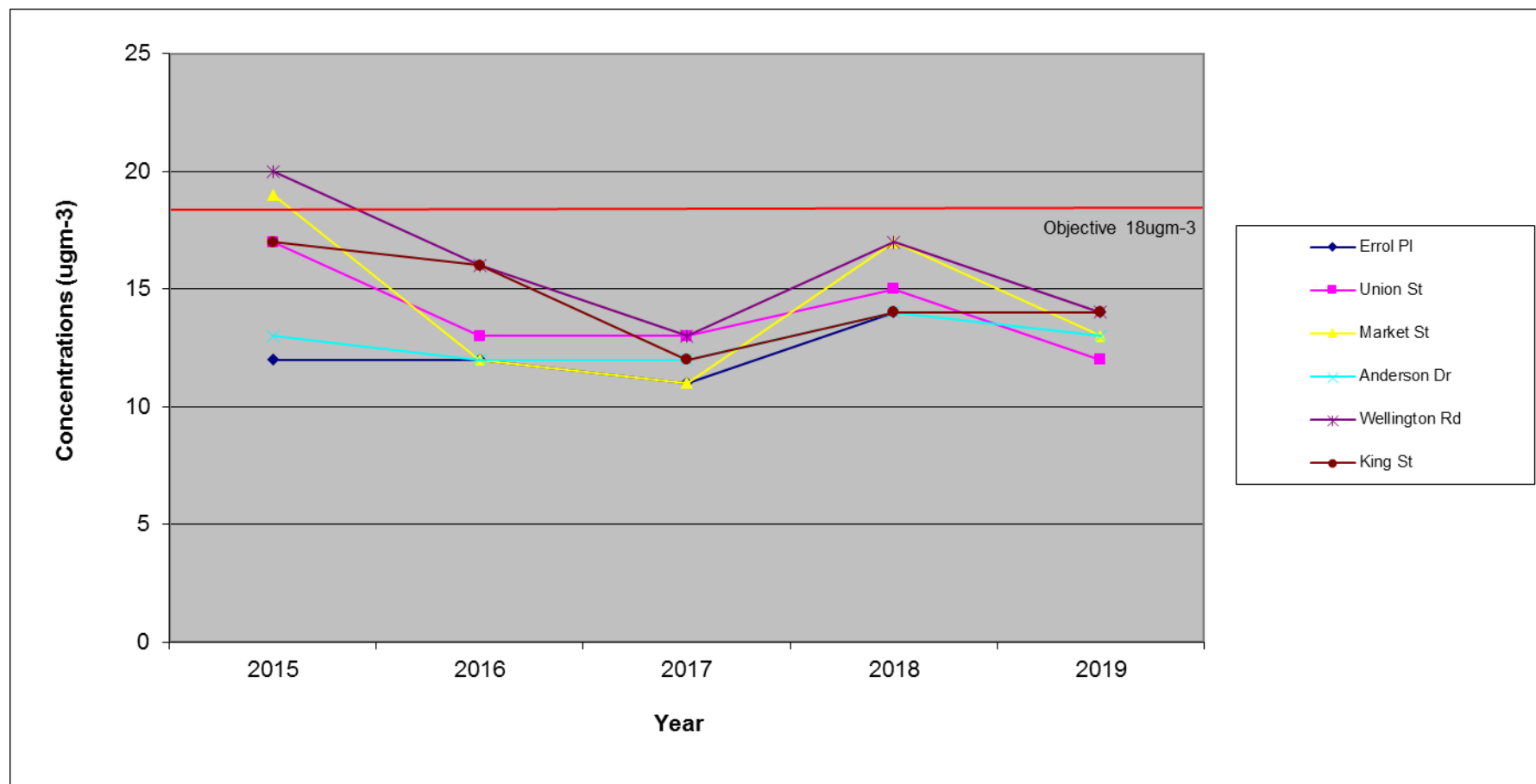


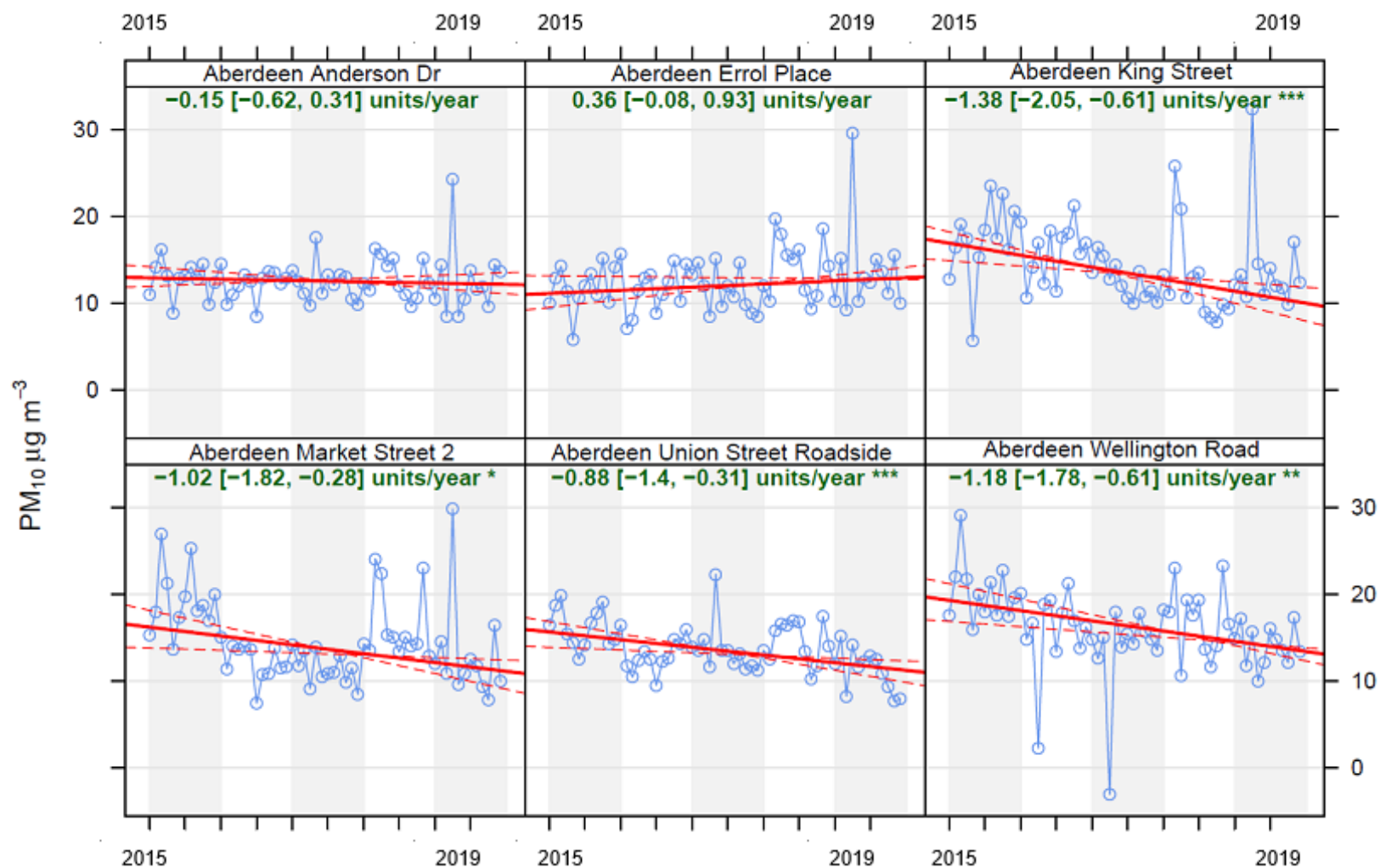
Figure 11: De-seasonalised PM₁₀ trends for the period 2015 to 2019

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM ₁₀ 24-Hour Means > 50µg/m ³ (3)				
				2015	2016	2017	2018	2019
CM1	Background		93	4	0	0	1	1
CM2	Roadside		64	4(49)	0 (26)	0	0	0(32)
CM3	Roadside		99	12	1	0	5	4
CM4	Roadside		80	2	0	0	0	3
CM5	Roadside		99	16	2 ⁽⁵⁾	0	3	4
CM6	Roadside		79	8	1	0 ⁽⁶⁾	5 (48)	3(45)

Notes: Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 7 times/year) are shown in **bold**.

(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 98.1st percentile of 24-hour means is provided in brackets.

Table A.7 – Annual Mean PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2019 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2015	2016	2017	2018	2019
CM1	Background		94	8	5	6	7	7
CM2	Roadside		69	11	7	7	8	8
CM3	Roadside		99	11	6	6	8	7
CM5	Roadside		99	n/a	n/a	6	8	7
CM6	Roadside		79	n/a	n/a	6	7	7

Notes: Exceedances of the PM₁₀ annual mean objective of 10µg/m³ are shown in **bold**.

(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.

Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 – NO₂ Monthly Diffusion Tube Results for 2019

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⁾
DT2	37	34	27	36	32	24	42	24	33	40	59	43	36	29
DT4	49	47	36	27	25	23	27	24	29	32	28	46	33	27
DT5	48	43	34	26	27	25	27	26	30	34	36	39	33	27
DT6	40	33	34	37	35	32	36	27	38		53	39	36	30
DT7	48	43	34	41	39	34	35	27	32	36	46	32	37	31
DT8	63	65	48	58	45	39	42	29	36	41	54	49	47	39
DT9		50	49	66	58	46	64	41	46	53	68	50	54	44
DT10	81	61	62	58	58	52	56	42	50	64	57	44	57	47
DT11	70	65	63	61	49	47	46	42	53	51	56	54	55	45
DT12	64	56	58	72	56	50	55	39	52	44	54	36	53	43
DT13	55	45	46	49	44	35	38	35	38	41	51	32	42	35
DT14	20	17	10	9	8	7	7	6	8	12	11	17	11	8
DT15	13	15	8	15	10	10	11	9	11	16	15	14	12	9
DT16		45	43	67	50	40	50		38	46	56	42	48	39
DT17	51	55	52	78	52	45	54	42	47	50	55	46	52	43
DT18	63	50	55	39	47	43	39	33	41	48	59	48	47	39
DT19	81	49	65	53	54	38	42	32	42	45	83	47	52	43
DT20	46	48	34	35	28	25	28	26	30	33		38	33	27
DT21	42	47	36	54	38	36	37	31	34		43	41	40	33
DT22	48	48	39	57	41	41	40	33	36	41	44	38	42	34
DT24	38	29	30	21	26	22	22	19	22	25	34	26	26	21
DT25	47	48	38	56		38	49	5	41	52	51	42	42	35
DT26	36	31	26	35	29	21	27	20	23	29	36	26	28	23
DT27			26	34	28		27						28	30

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⁾
DT28	42	39	31	44	37	32	35	29	28		43	33	36	29
DT29	57	62	49	72	48	46	46	44	44	49	50	53	52	42
DT30	53	56	50	57	46	41	44	35	38	46	53	47	47	39
DT33	48	55	25	53	37	36	40	36	40	44	49	50	43	35
DT34	43	39	15	32	24	20	24	24	29	30	32	35	29	24
DT36	55	51	48	61	46	48	52	33	44	45	58	39	48	39
DT37	39	31	29	19	24	23	23	22	25	27	32	25	27	22
DT39	57	52	49	48	39	40	37	38	35	45	47	49	45	37
DT40	45	40	33	28	26	22	22	26	29	32	35	37	31	26
DT41	64	59	48	37	31	33	32	37	41	49	54	48	44	36
DT45	33	34	27	32	25	20	24	13	17	27	32	28	26	21
DT46	35	31	24	42	24	22	26	22	27	31	28	34	29	24
DT47	62	60	46	63	44	40	42	37	45	43	50	49	48	40
DT48	48	45	30	35	25	26	23	24	29	31	31		32	26
DT49	53	44	33	42	31	27	30	22	31	35	47	39	36	30
DT50	40	34	25	24	19	19	21	20	24	28	34	28	26	22
DT54	43	32	29	19	20	14	18	16	19	24	31	26	24	20
DT55	36	36	29	32	25	22	27	21	23	29	14	26	27	22
DT56	20	19	12	15	13	10	14	12	12	16	18	17	15	11
DT57	42	46	29	34	25	25	28	27	27	30	35	41	32	27
DT58	46	49	28	25	21	21	25	27	29	22	33	42	31	25
DT59	35	29	23	23	20	16	18	17	20	20	30	28	23	19
DT60	36	47	28	43	28	26	31	28	30	33	27	32	32	27
DT62	25	21	7	20	13	9	13	9	12	16	22	18	15	11
DT63	37	37	25	34	25	22	24	20	24	28	33	31	28	23
DT64	30	26	16	25	15	12	15	12	15	21	26	23	19	14
DT65	36	29	20	20	20	13		14	19	24	33	26	23	19
DT66	39	32	25	27	21	16	18	17	22	28	30	35	26	21
DT67	52	41	36	51	42	35	35	30	37	35	48	32	40	32

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⁾
DT70	29	23	16	11	8	15	17		14	19	24	18	18	13
DT71	18		10	9	11	13	12	8	10	14	19	12	12	9
DT72	14	12	7	7	8	6	9	6	7	10	15	9	9	7
DT73	64	51	47	55	43	38	42	40	41	40	49	45	46	38
DT74	47	44	35	59	41	35	38	29	36	49	55	36	42	34
DT75	34	23	21	11	21	14	19	15	22	21	31	20	21	15
DT77	60	49	48	51	40	34	34	29	40	77	48	42	46	38
DT78	33	30	20	31	23	15	24	17	20	25	31	29	25	20
DT79	32		21	30	23	17	25	17	18	24	33	26	24	20
DT80	48	29	17	30	22	19	25	14	19	17	59	32	28	23
DT81	47	42	31	38	30	28	30	24	29	28	36	38	33	27
DT82	62	55	51	69	48	44	46	39	47		53	51	51	42
DT83	52	40	33	21	21	32	24	24	26	34	52	18	31	26
DT84	20	30	16	29	21	20	21	14	16	20	33	32	23	19
DT85	25	19	14	16	18	16	19	11	15		28	17	18	13
DT86	31	20	13	21	17	15	30	13	17	19	29	19	20	17
DT87	23	35	17	45	33	27	19						28	24
DT88	61	54	41	46	34	37	33	39	35	41	42	50	43	35
DT89	53	34	38	15	26	17	22	24	30	29	29	35	29	21

(1) See Appendix C for details on bias adjustment

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

QA/QC of Diffusion Tube Monitoring

Diffusion tube monitoring is carried out in accordance with the procedures contained in the guidance 'Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance for Laboratories and Users' and LAQM.TG 16. All tubes, other than those co-located at the continuous analysers are attached to lampposts/downpipes at a height of approximately 2 meters above ground level and exposed for 4 to 5 weeks in line with the Defra calendar of exposure periods. Co-located tubes are in triplicate close to the analyser air intake. All exposure times are recorded. Unexposed field samples are submitted to the laboratory with each batch of exposed tubes.

Aberdeen Scientific Services Laboratory is UKAS accredited for the analysis of diffusion tubes.

UKAS carried out an annual assessment of the laboratory in March 2020 to ensure laboratory guidance is being implemented. No problems were identified.

The laboratory participates in the Laboratory of the Government Chemist (LGC) AIR scheme. During 2019, 19 of the 20 results submitted were satisfactory (z-score < ± 2). One result received was categorised as "questionable" with a z-score of -2.50, and no further investigation of the result was deemed necessary.

The laboratory also participates monthly in the nitrogen dioxide "inter comparison" exercise, managed by the National Physical Laboratory. All results during 2019 were satisfactory and the annual summary (produced by AEA Energy & Environment) indicates that the results were classified as "Good" throughout 2019 with a "Bias Correction Factor A" of 0.77.

Triplicate and duplicate tube monitoring locations were assessed for precision and accuracy. Table C1 details action taken for duplicate/triplicate tube results with poor precision.

Table C.1: Adjustment of Duplicate/Triplicate Tubes

Diffusion Tube Measurements									Data Quality Check	Action
Monitoring Period 2019	Tube ID	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Diffusion Tubes Precision Check	Tube Adjustment
January	DT9	70.0	48.0		59.0	15.56	26.37	139.77	Poor Precision	Excluded from study
July	DT70	5.0	18.0	16.0	13.0	7.00	53.85	17.39	Poor Precision	Tube 1 excluded from study
August	DT16	34.0	18.0		27.0	12.73	47.14	114.36	Poor Precision	Excluded from study
August	DT70	12.0	11.0	31.0	18.0	11.27	62.61	27.99	Poor Precision	Excluded from study
September	DT85	15.0	14.0	5.0	11.3	5.51	48.60	13.68	Poor Precision	Tube 3 excluded from study
October	DT6	38.0	58.0		48.0	14.14	29.46	127.06	Poor Precision	Excluded from study
October	DT21	36.0	20.0		28.0	11.31	40.41	101.65	Poor Precision	Excluded from study
October	DT28	38.0	54.0		46.0	11.31	24.60	101.65	Poor Precision	Excluded from study
October	DT82	69.0	49.0		59.0	14.14	23.97	127.06	Poor Precision	Excluded from study
October	DT85	29.0	20.0	18.0	22.3	5.86	26.24	14.56	Poor Precision	Excluded from study

Factor from Local Co-location Studies

Aberdeen City Council operates a co-location study at all automatic sites across the city. All results are submitted to the national bias adjustment factors (NBAFS). The national diffusion tube bias adjustment factor spreadsheet version 3/20 advises to use 0.81 for Aberdeen City. Although the Aberdeen Scientific Services Laboratory undertakes the analysis of diffusion tubes from neighbouring authorities, Aberdeen City Council is the only authority with continuous monitoring stations that can be used to calculate bias adjustment factors. Accordingly, a locally derived bias factor based on the co-located tubes at the Aberdeen continuous monitoring stations was used to adjust diffusion tube measurements at the other locations across the city. This process was considered appropriate due to the lack of other co-located studies using the laboratory for tube analysis, the remote location of Aberdeen from other conurbations and the good QA/QC performance of the laboratory.

Triplicate diffusion tubes are located adjacent to continuous monitor air analyser inlets. Tubes are exposed in 4 week periods throughout the year. Diffusion tubes are provided by Gradko International and analysed by Aberdeen City Council's Public Analyst. The preparation technique is 20% tri-ethanolamine in water.

In accordance with LAQM TG 16 the Local bias factor adjustment tool, downloaded from the DEFRA Local Air Quality Management website, is used to calculate bias adjustment factors and the precision and accuracy of the triplicate co-located tubes. Table C1 summarises the bias adjustment factors. Only data with good precision has been used (coefficient of variation smaller than 20%).

Errol Place is an urban background site while the other sites are roadside.

Table C.2: Bias Factor Calculations

Type	DT Mean ($\mu\text{g m}^{-3}$)	CM Mean ($\mu\text{g m}^{-3}$)	Bias Factor A	Bias B (%)	CM Data Capture for periods used (%)	Number Monitoring Periods
Errol Place	24	17	0.73	36	97	13
Union Street	44	36	0.82	22	99	13
Wellington Rd	42	35	0.85	17	100	13
King Street	24	20	0.83	21	94	12
Market Street	40	32	0.79	26	99	13
Anderson Dr	18	14	0.77	30	99	6

Diffusion Tube Bias Adjustment Factors

LAQM TG 16 advises the value of a local co-location study (and the subsequent bias adjustment) will be improved if the concentrations being measured are similar to those in the wider survey. Therefore, separate bias adjustment has been derived for roadside and background.

In accordance with LAQM TG 16 Bias B values of roadside continuous monitoring locations were averaged for the roadside locations and the inverse derived to obtain a bias adjustment factor of **0.82**. This provides a slightly greater conservative adjustment than the factor published by NBAFS. Anderson Drive automatic site colocation study was not included in the bias factor calculation due to only 6 months of data being available.

A separate adjustment factor is derived for background sites using the Bias A, from Errol Place. LAQM TG 16 advises the value of a local co-location study (and the subsequent bias adjustment) will be improved if the concentrations being measured are similar to those in the wider survey. Therefore, separate bias adjustment has been derived for roadside and background.

A separate adjustment factor is derived for background sites using the Bias A, from Errol Place, of **0.73**.

QA/QC of Automatic Monitoring

All equipment is subject to the QA/QC procedure recommended in LAQM.TG 16. Equipment is serviced at 6 monthly intervals. The contract includes call outs to site for repairs and the routine replacement of consumables.

The Errol Place, Union Street and Wellington Road sites are part of the UK's Automatic Urban Network. All sites are part of the Scottish Government data reporting process and subject to independent audit by Ricardo AEA (RAEA) at 6 monthly intervals. Data validation and ratification is also performed by RAEA.

The analysers perform daily automatic calibrations which are used to assess the routine performance of the analysers and any long term response drift. Manual calibrations are performed by trained Council officers every two weeks using a calibration mixture traceable to national standards. These calibrations act as a check on the operation of the analysers and enable determination of the instrument response factors used to calculate the concentration of NO₂.

Data is checked daily (Monday-Friday). Should a problem be identified either by Council officers or by RAEA the site is visited immediately and, if necessary, a further manual calibration is performed. Data considered suspect is deleted. Records are kept of instrument breakdowns, services and audits and any local activities or weather that may influence readings.

Data Annualisation

Annualisation of data was carried out in accordance with LAQM TG 16 where there was insufficient data capture for the following locations in 2019:

- Anderson Drive NO₂
- Union Street PM_{2.5} and PM₁₀
- Diffusion tube DT27
- Diffusion Tube DT87

Erroll Place (urban background) continuous monitoring data was used to annualise diffusion tube data.

Two long term, urban background continuous monitoring sites, that form part of the national monitoring network have been used to carry out annualisation of the continuous monitoring sites in 2019:

- Aberdeen Erroll Place
- Dundee Mains Loan

Mains Loan is within a 55 mile radius of the monitoring locations in Aberdeen. There are no other background monitoring sites available. Valid data capture for Errol Place and Mains Loan is above 85%.

Table C3 and C4 summarise annualisation process for each of the pollutants measured.

Table C4a to C4c summarise the annualisation factors derived from the urban background continuous monitoring sites.

Table C.3: Annualising diffusion tube data 2019

Site ID	Type	Data	Data Capture 2019 (%)	Measured Mean DT Raw data (M)	Period of data	Errol PI Annual Mean (Am)	Errol PI Period Mean (Pm)	Ratio Am/Pm (Ra)	Estimate of annual mean at monitoring site (M x Ra)
DT27	Roadside	NO ₂ Annual Mean	33	28	11/3/19 to 5/6/19 and 5/7/10 to 7/8/19	17	12.75	1.294	37
DT87	Roadside	NO ₂ Annual Mean	58	28	9/1/19 to 7/8/19	17	16	1.031	29

Table C.4: Annualising automatic data 2019

Site ID	Type	Data	Data Capture 2019 (%)	Measured Mean Raw data (M)	Period of data	Annualisation Factor (Ra)	Estimate of annual mean at monitoring site (M x Ra)
CM4	Roadside	NO ₂ Annual Mean	55	16	18/4/19 to 7/11/19	1.291 (See table C.4a)	21
CM2	Roadside	PM ₁₀ Annual Mean	64	11	1/1/19 to 18/7/10 and 28/10/19 to 31/12/19	1.110 (See table C.4b)	12
CM2	Roadside	PM _{2.5} Annual Mean	69	7	1/1/19 to 18/7/10 and 30/9/19 to 31/12/19	1.098 (See table C.4c)	8

Table C.4a NO₂ Annualisation Factor

Background Site	Annual Mean 2019 (Am)	Period Mean 2019 (Pm)	Ratio (Am/Pm)
Aberdeen Erroll Place (CM1)	16.734	13.229	1.265
Dundee Mains Loan	11.011	8.352	1.318
		Average (Ra)	1.291

Table C.4b PM₁₀ Annualisation Factor

Background Site	Annual Mean 2019 (Am)	Period Mean 2019 (Pm)	Ratio (Am/Pm)
Aberdeen Erroll Place (CM1)	13.697	12.212	1.122
Dundee Mains Loan	9.165	8.350	1.098
		Average (Ra)	1.110

Table C.4c PM_{2.5} Annualisation Factor

Background Site	Annual Mean 2019 (Am)	Period Mean 2019 (Pm)	Ratio (Am/Pm)
Aberdeen Erroll Place (CM1)	7.256	6.677	1.087
Dundee Mains Loan	5.510	4.968	1.109
		Average (Ra)	1.098

NO₂ fall-off with distance

Where it is not possible to monitor at locations representative of exposure the NO₂ concentration at the nearest relevant location for exposure (building façade) has been calculated using the NO₂ fall-off with distance calculator available on the Defra website.

Background NO₂ concentration data is obtained from the Scottish Air Quality Database website. Erroll Place automatic site annual mean (urban background concentration) was used for diffusion tube DT57. This was due to the background concentration of 30ugm⁻³ on the SAQD website being greater than the levels measured by the monitoring location.

SAQD background data is derived from the emission inventory and for this location NO_x concentrations are heavily influenced by shipping, resulting in the elevated NO₂ concentrations. Erroll Place is with 1km of the diffusion tube location and is therefore considered a more accurate value to use.

Table: C.5 Diffusion Tube concentrations showing calculations to façade (2019)

Site ID	Bias Measured Concentration	Background Concentration	Distance to kerb	Distance façade	Façade Concentration
	Cy	Cb	Dy	Dz	Cz
DT2	29	11	3	11	23
DT4	27	11	3	7	23
DT5	47	13	0.1	9	26
DT8	39	12	3	14	28
DT28	29	19	3	5	28
DT36	39	15	1	8	29
DT37	22	15	10	13	21
DT41	36	11	0.1	7	22
DT47	40	15	0.1	5	26
DT48	26	13	0.1	10	18
DT49	30	13	3	11	24
DT50	22	13	0.1	6	17
DT54	20	13	2	14	17
DT55	22	11	2	9	18
DT57	27	17 ^(a)	0.1	16	20
DT58	25	13	4	8	23
DT63	23	15	2	11	20
DT65	19	9	3	8	16
DT66	21	9	3	6	19
DT67	32	9	3	8	26
DT74	34	19	3	5	32
DT86	17	11	3	11	14
DT87	24	11	3	7	21

Dy -distance to kerb at which concentrations were measured

Dz -distance to kerb at which concentrations are to be predicted

^(a)Erroll Place background concentration due to measured concentration lower than mapped background concentration

PM Monitoring Adjustment

All TEOM data between at Anderson Drive is corrected to gravitational equivalent by AEA using the Volatile Correction Model (VCM).

FDMS and FIDAS PM10 do not require adjustment. FIDAS PM2.5 is adjusted using a factor of 0.943.

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
SAQD	Air Quality in Scotland website http://www.scottishairquality.scot/
VCM	Volatile Correction Model

References

- 1 Environment Act 1995.
- 2 The Air Quality (Scotland) Regulations 2000.
- 3 The Air Quality (Scotland)(Amendment) Regulations 2001.
- 4 Local Air Quality Management Technical Guidance LAQM, TG(16), DEFRA, April 2016
- 5 Local Air Quality Management Policy Guidance, (PG)(S)(16), DEFRA, March 2016
- 6 Aberdeen City Council Action Plan, March 2011
- 7 2019 Air Quality Annual Progress Report (APR) for Aberdeen City Council