



City Centre
Air Quality Management Area
Amendment Report
July 2024

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1. Background

1.1 Introduction

Aberdeen City Council declared parts of the City Centre an Air Quality Management Area (AQMA) in 2001 due to exceedances of the annual mean nitrogen dioxide (NO₂) air quality objective and the 1-hour objective on Market Street. The AQMA was subsequently amended on several occasions to include a larger geographical area and the particulate (PM₁₀) annual mean and 24-hour objectives. In 2018 the AQMA was amended to remove the 1-hour NO₂ objective as there had been no exceedance for a number of years. An Air Quality Action Plan (AQAP) was published in 2011 describing measures that the Council would undertake to improve air quality in the City's 3 AQMAs:- the City Centre, Wellington Road and Anderson Drive corridor.

Air quality within the City Centre AQMA has progressively improved and there has been no exceedance of the PM₁₀ objectives since 2015. Aberdeen City Council is satisfied that the PM₁₀ objectives will continue to be met at all locations in the future and consequently proposes to remove PM₁₀ from the AQMA. The AQMA will not be revoked at this time due to a continued risk of exceedance of the NO₂ annual mean objective.

1.2 Legislation

Under section 83 of the Environmental Act 1995 (the 1995 Act) local authorities are required to regularly review and assess the current and future air quality within their geographical areas against the air quality objectives set out in the Air Quality (Scotland) Regulations 2000, as amended in 2002 and 2016. Where the levels are exceeded, or modelling suggests levels are likely to be exceeded at any location the authority must declare the affected area an Air Quality Management Area (AQMA). Local authorities must then develop and publish an Air Quality Action Plan (AQAP) detailing the actions the authority proposes to improve air quality in the designated area.

The Scottish Government Air Quality Policy Guidance PG(S) 24 provides guidance to local authorities on the steps that should be considered to manage air quality and report on in their areas. The Guidance describes the review and assessment process, the declaration and revocation of an AQMA and development of an AQAP.

Where air quality has improved and the authority is satisfied that the objectives are being met within an AQMA and unlikely to be exceeded in any future occasion the authority is required to revoke the AQMA.

1.3 Summary of Proposal

The proposal is to amend the City Centre AQMA to remove PM₁₀ due to compliance with the PM₁₀ air quality objectives at all monitoring locations in the last 5 years and predicted compliance in future years.

2. Description of AQMA

The City Centre AQMA was declared in 2001 due to exceedance of the annual mean objectives for NO₂ and the 1-hour objective on Market Street. It was subsequently expanded in 2003, expanded and amended in 2011 to include the annual mean and 24-hour PM₁₀ objectives and again amended in 2018 to remove the hourly NO₂ mean objective.

The current AQMA covers the following streets: Market Street, Union Street, King Street (between Castle Street and Roslin Terrace), Virginia Street, Commerce Street, Guild Street, Bridge Street, Holburn Street (between Union Street and Great Southern Road), Victoria Road, Torry (between Queen Elizabeth II Bridge and Crombie Road) and West North Street (King Street to 100m north of the junction with Littlejohn Street). Appendix 1 shows a map of the AQMA.

3. Description of Local Sources

3.1 Local Sources

Road traffic is the most significant local source of the raised NO₂ and PM₁₀ concentrations. There is no industry or other point or local diffuse sources of emissions in the area. Modelling undertaken in 2011 suggested emissions from road traffic accounted for 64% of NO_x emissions and 44% of PM₁₀ emissions on Union Street with the remaining emissions from background sources. On Market St traffic was predicted to account for 89% of NO_x emissions and 58% of PM₁₀ emissions.

The major roads in the City Centre comprise of a higher proportion of buses than other streets within the city. Market Street has a higher proportion of HVGs due to the location of Aberdeen Harbour.

Aberdeen Harbour is located adjacent to Market St and the AQMA. Detailed modelling carried out in 2011 indicated impacts from shipping did not extend over a very large area and were mostly concentrated around Virginia Street to the north of the Harbour. The maximum annual mean concentration of PM₁₀ was predicted to be <9% and generally <5%. Modelling carried out by SEPA during the development of the AQMA similarly concluded emissions from road traffic were the most significant source of PM₁₀ emissions in the AQMA.

3.2 Action Planning measures implemented

The Air Quality Action Plan 2011 described a range of measures to improve air quality in the designated area. Action planning measures that have been implemented include:

- Opening of the Aberdeen Western Peripheral Route (AWPR) in 2019, contributing to reduced traffic flows and congestion throughout the city;
- Formal declaration of a city centre Low Emission Zone (LEZ);
- City Centre Masterplan (CCMP) adoption and roll-out, including delivery of various traffic restriction schemes to give priority to walking, wheeling, cycling and public transport;

- Delivery of Phase 1 of the South College Improvement Scheme to facilitate continued improvement of CCMP transport projects:
- Completion of the Roads Hierarchy review including a programme of city centre road reclassifications to reflect its status as a destination rather than a through-route for traffic;
- Ongoing improvements to strategic and local walking and cycling routes and the Core Path network;
- Launch of I Bike Schools and Communities projects to encourage more cycling, particularly amongst traditionally hard to reach groups;
- Launch of the Scottish Government's Bus Partnership Fund, with a number of corridor improvement strategies underway to identify opportunities for bus priority improvements;
- Commencement of Aberdeen Rapid Transit (ART) appraisal to assess options for a high-capacity rapid public transport system in Aberdeen;
- Continued expansion and promotion of the Grasshopper integrated and multi-operator bus ticket;
- Aberdeen to Inverness Rail Improvements, including dualling of the track between Aberdeen and Inverurie and the re-opening of Kintore Station;
- Ongoing improvement and expansion of the Aberdeen Car Club;
- Ongoing expansion of the public Electric Vehicle (EV) charging network;
- Ongoing expansion of the local hydrogen fleet and hydrogen refuelling capabilities;
- Launch of the Eco Stars fleet recognition scheme to support and encourage bus, freight and van fleet operators to reduce emissions and running costs; and
- Ongoing programme of events and promotions.

Vehicle access restrictions were introduced in 2022 and 2023 as part of the CCMP adoption to minimise the amount of traffic in parts of the City Centre. These measures prevent general traffic from using the streets as a through route thereby significantly reducing congestion and emissions in some areas while also supporting a more reliable and efficient bus service. The access restrictions included:

- Bus gates introduced in June 2022 on the central section of Union Street/Market Street (between the junction with Hadden Street and the Adelphi); and
- Vehicle access restrictions introduced in August 2023 on Market Street (north of Guild Street), Guild Street (east of Wapping Street) and Bridge Street

A City Centre Low Emission Zone (LEZ) was also introduced in June 2024 preventing the most polluting vehicles from entering the restricted areas and further improving air quality.

4. Local Monitoring Equipment

4.1 Automatic

There are 2 automatic monitoring station within the AQMA located on Union Street (between Union Row and Huntley Street) and Market Street (at the junction with Poynerook Road). Monitoring commenced in 2005 at the Union Street site and in 2009 at Market Street. Details of the monitoring sites and equipment are shown in Table 1. Monitoring locations are shown in Appendix 2.

Table 1: Union Street and Market Street Automatic Monitoring Site Information

Site ID	Site Location	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	Monitoring Technique	Distance to Relevant Exposure (m)	Distance to kerb of nearest road (m)
CM1	Union Street	Roadside	X393656	Y805967	PM ₁₀ , PM _{2.5} NO ₂ (NO, NO _x)	Fidas 200 Chemiluminescence	2	2
CM2	Market Street	Roadside	X394560	Y805677	PM ₁₀ , PM _{2.5} NO ₂ (NO, NO _x)	Fidas 200 Chemiluminescence	0	2

* Union St Fidas PM₁₀ monitor installed in July 2021 replacing a FDMS.

* Market St Fidas PM₁₀ monitor installed in September 2015 replacing a BAM.

4.2 Non-automatic

No non-automatic PM₁₀ monitoring is undertaken.

5. Local Monitoring data

5.1 Results and interpretation from automatic sites

Table 2 shows the annual mean PM₁₀ and PM_{2.5} concentrations and number of exceedances of the short term PM₁₀ objectives at the Union Street and Market Street automatic monitoring station over the period 2015-2023.

Table 2: Union Street and Market Street Automatic Monitoring Site Annual mean PM10 Concentrations and Number of 24-hour PM10 means >50ugm-3

Union Street	2015	2016	2017	2018	2019	2020	2021	2022*1	2023*1
Union Street Annual mean PM₁₀ (ugm⁻³)	17	13	13	15	12	10	11	13 (14.3)	12.9 (14.1)
Union Street Annual mean PM_{2.5} (ugm⁻³)	11	7	7	8	8	5	6	7.1 (7.5)	6.6 (6.9)
Union Street No of PM₁₀ 24-hour mean >50ugm⁻³	4	0	0	0	0	0	0	2	2
Market Street Annual mean PM₁₀ (ugm⁻³)	19	12	11	11	13	10	11	12.7 (14)	11.9 (13.1)
Market Street Annual mean PM_{2.5} (ugm⁻³)	11	6	6	8	7	5	5	6.4 (6.8)	5.7 (6.0)
Market Street No of PM₁₀ 24-hour mean >50ugm⁻³	12	1	0	5	4	0	0	4	1

Exceedances of the objectives are shown in bold.

*1 Corrected results as recommended by [Ricardo for the Scottish Government report](#) in brackets.

No exceedance of the PM₁₀ and PM_{2.5} objectives have been recorded at the Union Street or Market Street continuous air quality monitoring stations since 2015.

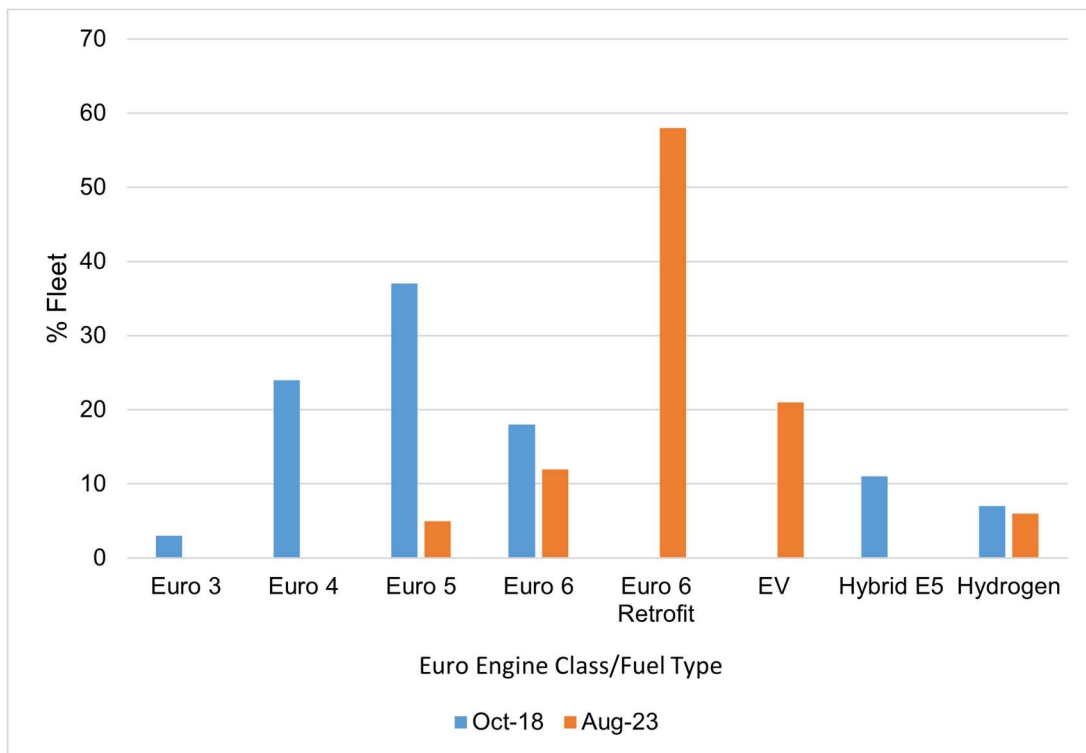
Concentrations of both PM₁₀ and PM_{2.5} reduced significantly between 2015 and 2016 which coincided with the sudden downturn in the offshore sector.

Prior to 2018 the bus fleet in Aberdeen comprised of a high proportion of pre-Euro VI diesel vehicles which were the most significant source of traffic related pollution in many of the City Centre streets with elevated pollution levels. Table 3 and Figure 1 show the improvement in bus fleet between October 2018 and August 2023. The introduction of the LEZ in 2022, with enforcement commencing in June 2024, encouraged the bus operators to upgrade their fleets to compliant vehicles. Vehicle exhaust emissions account for a relatively small proportion of total particulate concentrations compared to NO_x emissions therefore the improvement in measured concentrations of PM₁₀ due to the improved fleet is relatively insignificant compared to measured NO₂ concentrations. Nonetheless, the improvement in the bus fleet will have had a positive impact on PM₁₀ emissions.

Table 3: Aberdeen Bus Fleet October 2018 and August 2023

	October 2018	August 2023
Euro 3	3%	0%
Euro 4	24%	0%
Euro 5	37%	5%
Euro 6	18%	12%
Euro 6 Retrofit	0%	58%
EV	0%	21%
Hybrid E5	11%	0%
Hydrogen	7%	6%

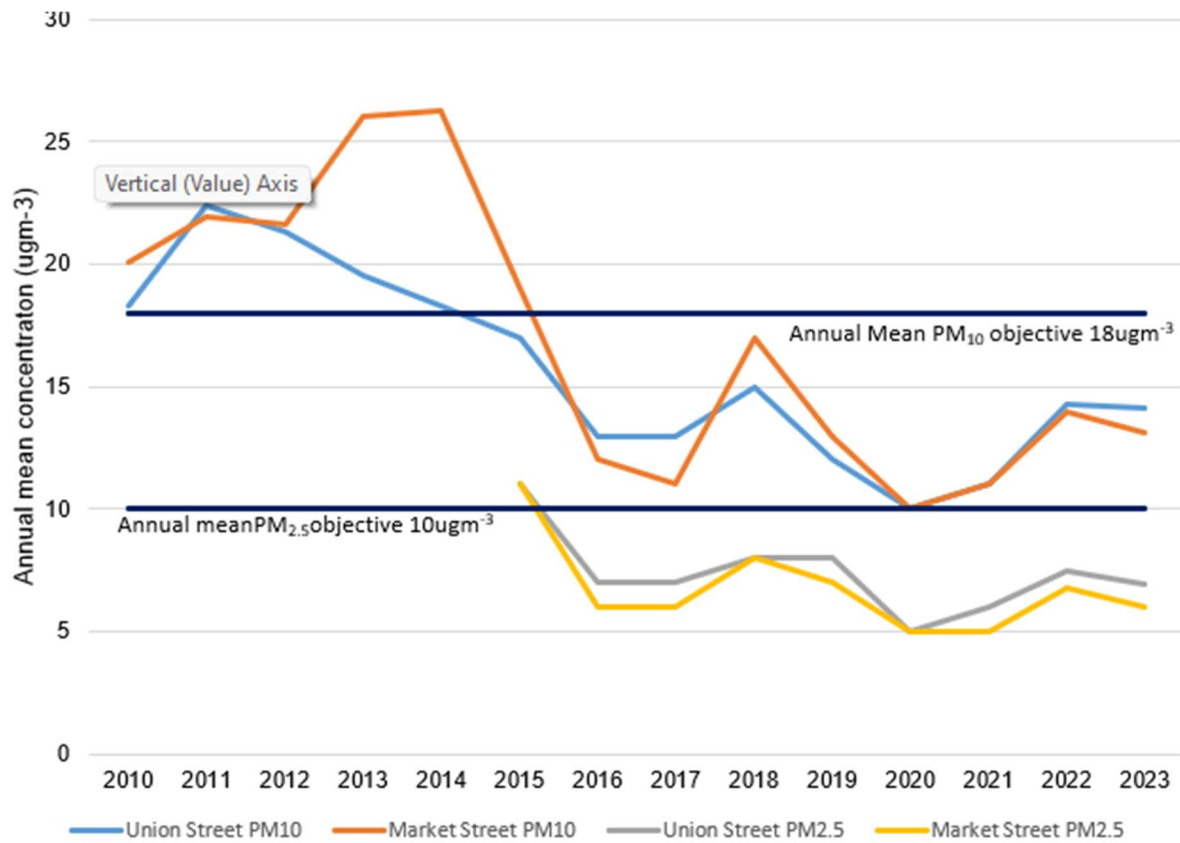
Figure 1: Aberdeen Bus Fleet October 2018 and August 2023



5.2 Trends in monitoring data

Trends in annual mean PM₁₀ and PM_{2.5} concentrations at the Union Street and Market Street continuation monitoring stations and are shown in are shown in Figure 3.

Figure 2: Annual mean PM10 and PM2.5 concentrations 2010-2023 Market Street and Union Street monitoring stations



PM_{2.5} monitoring commenced in 2015 at both continuous monitoring stations. Annual mean PM₁₀ concentrations exceeded the objective at Union Street until 2015 and at Market Street until 2016. Reduced City Centre traffic flow and congestion associated with the downturn in the oil industry is likely to have been a significant factor in the improvement in air quality at that time. There was a further reduction in concentrations in 2020-2021 due to the reduced traffic flows during the covid pandemic. Although concentrations in 2022 and 2023 were similar to pre-covid levels, they were still well below the annual mean objectives.

5.3 City Centre LEZ and City Centre Vehicle Access Restrictions

The vehicle access restrictions introduced in 2022 and 2023 have significantly reduced traffic flows in parts of the city centre by preventing general traffic from accessing the restricted streets and using the city centre as a through route.

Traffic counts undertaken in 2019 and 2023 as part of the LEZ development showed a reduction in the total flow from 13,600 vehicles per day in 2019 to 3400 per day in 2023 along the stretch of Union Street restricted to buses and taxis only. At the west end of Union Street where there are no restrictions the flow reduced from 15000 vehicles per day in 2019 to <8000 vehicles per day in 2023 due to the access restrictions. The reduced traffic flow has resulted in less direct emissions from vehicle exhausts and from non-tailpipe emissions including brake, tyre and road wear.

A City Centre Low Emission Zone (LEZ) was introduced in June 2024 preventing the most polluting vehicles from entering the restricted areas. Appendix 3 shows the area of the LEZ and vehicle access restrictions. The SEPA modelling predicted compliance with all the air quality objectives in the City Centre with the LEZ and City Centre vehicle access restrictions operational.

6. Future Actions to be Retained for the AQMA

6.1 Measures to be Continued to Ensure Future Air Quality Compliance

The monitoring of NO₂, PM₁₀ and PM_{2.5} at the Union Street and Market Street continuous monitoring station and diffusion tube locations will be retained to ensure continued compliance with the objectives.

A Draft Area Quality Action Plan (AQAP) was developed in 2023 to replace the 2011 Action Plan. The draft Plan was issued for stakeholder consultation in November 2023 as an appendix within the Council's draft revised Transport Strategy (2023-2030). The proposed new AQAP describes the actions the Council will implement to continue to improve air quality within the City's 3 AQMA. It is anticipated the refreshed Transport Strategy and new AQAP will be submitted for council approval and adoption in late 2024/early 2025. Progress in implementing the AQAP will be reported in the authority's Annual Progress Reports. The key priorities within the draft 2023 AQAP that will contribute to further air quality improvements in the City Centre Road AQMA are:

- Ongoing development and delivery of transport corridor improvement strategies: and
- Ongoing strategic and city-wide infrastructure and behaviour-change measures to promote and encourage more walking and cycling, more public transport use and further adoption of alternative fuel vehicles, in preference to continued use of fossil fuel (particularly diesel) vehicles.

Compliance with the NO₂, PM₁₀ and PM_{2.5} national air quality objectives was achieved at all monitoring locations within the 3 AQMA for the first time in 2023. It is anticipated that, through the implementation of the city centre LEZ and the action within the 2023 draft AQAP, compliance with the objectives will be achieved at all locations in future years. Should this be case the Council will look towards the revocation of the City Centre AQMA and replace the AQAP with an Air Quality Strategy that will support the implementation of measures to improve air quality across the city.

7. Conclusions and recommendations

The air quality objectives for PM₁₀ and PM_{2.5} have been met at the Union Street and Market Street continuous monitoring station since 2015. Modelling undertaken by SEPA as part of the city centre LEZ appraisal work did not predict any likelihood of exceedance of the objectives with the LEZ and other recently adopted city centre vehicle access restrictions operational.

The Council will continue to implement measures within the 2023 draft air quality action plan and draft refreshed Transport Strategy to further improve air quality both in the 3 AQMAs and the wider area. Monitoring of NO₂, PM₁₀ and PM_{2.5} will continue across the AQMA to ensure continued compliance with the objectives and that air quality continues to improve. The replacement of the Air Quality Action Plan with an Air Quality Strategy to support improvement in air quality across the city will also be considered.

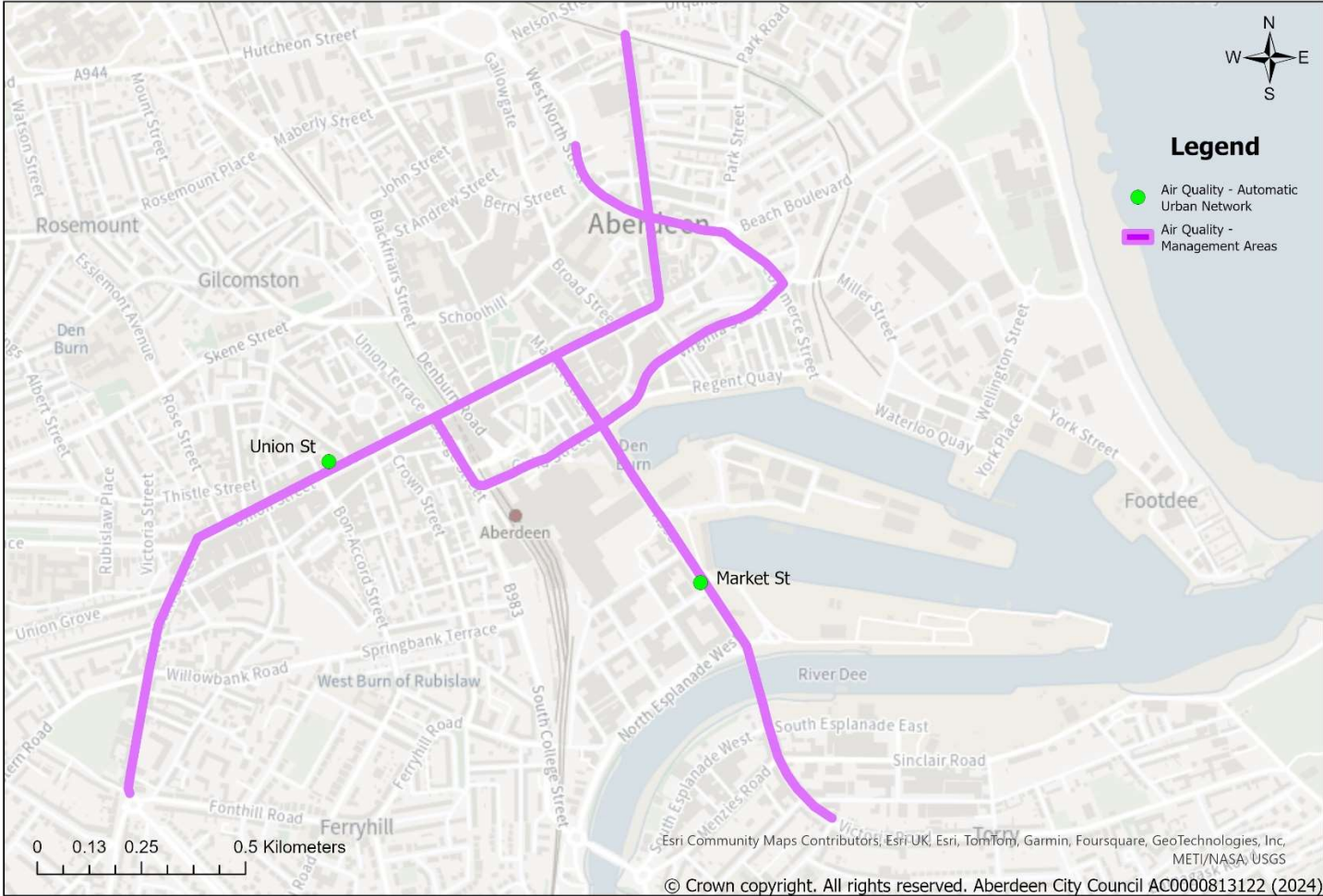
8. Glossary of Terms

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
CCMP	City Centre Masterplan
LAQM	Local Air Quality Management
LEZ	Low Emission Zone
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
SEPA	Scottish Environmental Protection Agency

9. References

1. Environment Act 1995
2. The Air Quality (Scotland) Regulations 2000
3. The Air Quality (Scotland) Amendment Regulations 2001 and 2016
4. Local Air Quality Management Technical Guidance LAQM (TG22), DEFRA, August 2022
5. Local Air Quality Management Policy Guidance, (PG(S) (24), the Scottish Government, May 2024
6. Aberdeen City Council Action Plan, March 2011
7. Aberdeen City Council Draft Air Quality Action Plan, August 2023
8. Draft Aberdeen Local Transport Strategy (2023-2030)
9. Aberdeen City Council Progress Report 2023
10. Low Emission Zone Evidence Report October 2021 and Addendum Report October 2022, SEPA

Appendix 1: City Centre Air Quality Management Area and Automatic Monitoring Sites



Appendix 2: City Centre Low Emission Zone and Vehicle Access Restrictions

