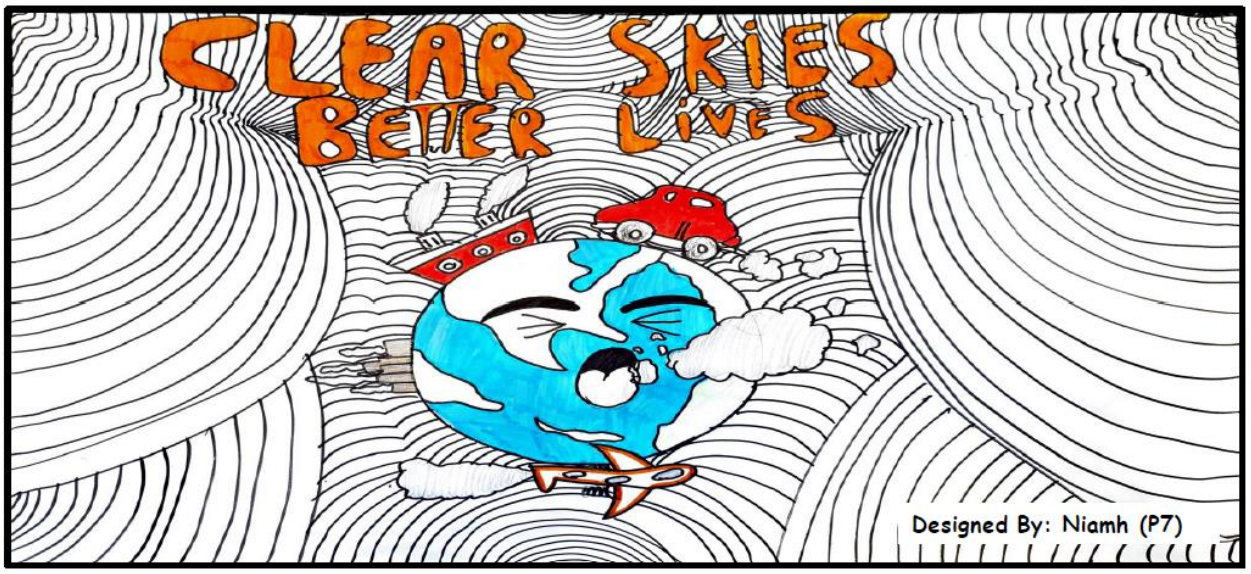
THE CITY OF EDINBURGH COUNCIL

Draft Air Quality Action Plan



In fulfilment of Part IV of the Environment Act 1995
Local Air Quality Management

December 2022

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Executive Summary

Air pollution is associated with adverse health impacts, including lung disease, heart disease, cancers and mental impairment. It is also recognised that air pollution particularly affects the most vulnerable in society: children and older people, and those with existing health conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often the less affluent areas[1].

Health well-being is the key reason why local authorities are tasked to manage air quality under the statutory Local Air Quality Management (LAQM) framework, as set out in Part IV of the Environment Act (1995), with the main pollutants of concern being nitrogen dioxide (NO2) and fine particulate matter (PM10 and PM2.5).

This Draft Air Quality Action Plan (AQAP) outlines the proposed actions to take to improve air quality in Edinburgh between 2022 and 2027. It will, once approved following statutory consultation and engagement, replace the previous Action Plan which was produced in 2008 and updated in 2010 and reported on annually.

The main focus of the previous AQAP was to reduce emissions from buses and freight vehicles operating in the city. A Low Emission Strategy Feasibility Study undertaken prior to 2008, concluded that the greatest reductions in local pollutant emissions would be achieved by targeting bus and road freight operators. Projects that progressed through the timescales of the previous AQAP include:

- upgrade of the bus fleet to ensure improving emission standards, which now aim for compliance with the Low Emission Zone (LEZ),
- implementation of the fleet efficiency recognition, ECO Stars scheme,
- implementation of the Local Transport Strategy (since replaced by the City Mobility Plan),
- various traffic management schemes (in particular the implementation of SCOOT and MOVA[2] at various junctions across the city),
- the Edinburgh Trams network,

[1] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006 https://uk-air.defra.gov.uk/assets/documents/reports/cat09/0701110944_AQinequalitiesFNL_AEAT_0506.pdf

[2] SCOOT (Split Cycle Offset Optimisation Technique) is an adaptive traffic control system for the coordination and control of traffic signals across an urban road network, which automatically adjusts the traffic signal timings to adapt to current traffic conditions, using flow data from traffic sensors. MOVA is a similar system for use at isolated junctions and standalone pedestrian crossings.

- Borders Rail Link,
- Electric Vehicle charging infrastructure development, and;
- extensive feasibility work on the LEZ.

Even without the effect of the pandemic, long term trends show concentrations of the main pollutants are decreasing at most locations across the city. This will be as a result of the local measures mentioned above, measures being implemented by the Scottish Government for example through Cleaner Air for Scotland, and those at a wider scale, such as the reduction in road transport emissions, as newer vehicles subject to stricter emissions standards enter the fleet.

The improvements in air quality in Edinburgh have meant that the Council is taking steps to make changes to some of the Air Quality Managements Areas.

Scottish Government has approved the Councils intention to revoke the Inverleith Row AQMA and amend the St John's Road AQMA. Although there has been much improvement at St John's Road, there remains a risk of breaching the NO_2 annual mean statutory objective. There is also a risk in Glasgow Road AQMA that objectives are exceeded.

Within the Great Junction Street AQMA, there have been no reported breaches of NO2 objectives since 2016. It is uncertain what the impact of the traffic management changes from the new tram network extension and the low traffic neighbourhood in the local area will have on NO2 concentration. Therefore, the Council will consider revoking this AQMA once the impacts of these are known.

The Central AQMA has the greatest number of sites exceeding the objectives and some of the highest concentrations in the city. The appraisal work for the Low Emission Zone scheme concluded that this area was a priority for action.

There continues to be a downward trend in annual concentrations of PM10 in the Salamander St AQMA notwithstanding delays in producing a finalised action plan. There have been no exceedances in the annual PM10 objective since 2019, and the 24hourly objective since 2015.

Draft Air Quality Action Plan (AQAP)

This draft Plan focuses on locations where there are current exceedances of the NO_2 Air Quality Objectives, but also identifies strategic measures which will ensure concentrations of a number of pollutants are reduced across Edinburgh, even below

current objectives. This approach is supported by that set out in the Cleaner Air for Scotland 2 strategy (2021), which provides national policy support for a precautionary public health approach to air pollution.

This revised Plan is intended to complement the substantial amount of work which has been undertaken in relation to the Low Emission Zone, which was implemented on 31 May 2022 (and will be enforced from 1st June 2024). It also strongly supports elements of the Council's City Mobility Plan, 2030 Climate Strategy, and the current Local Development Plan and emerging City Plan 2030.

For this Draft AQAP, actions have been developed that can be considered under eight broad themes:

- Low Emission Zone (LEZ)
- Strategic Transport
- Behavioural Change to Active Travel
- Public Transport
- Low Emission Vehicles
- 2030 Climate Strategy
- Integrated Policies and Guidance
- Domestic Solid Fuel Burning

The following issues need to be prioritised:

- Implementation of the LEZ, which should reduce concentrations of nitrogen dioxide in central Edinburgh to a level which achieves the air quality objectives and Limit Values at most locations,
- Specific action in other areas of poor air quality such as St Johns Road AQMA and continued action in areas where AQMAs are being revoked to ensure air quality continues to improve for example Inverleith Row,
- Through collaborative working, ensure that wider strategic air quality action is implemented through existing policy areas. This will include strategic transport improvements, promotion of behaviour-change to reduce private vehicle use, promotion of low emission vehicles and controlling domestic emissions, and;

- Plans being developed and implemented for placemaking, climate change and noise reduction are closely co-ordinated and aligned with those for air quality in order to maximise co-benefits.

If the LEZ is fully implemented NOx emissions from traffic sources within LEZ are expected to reduce by 55% (equivalent to 25-30 tonnes/year), when compared to 2019 levels. This AQAP also deals with the residual exceedances where the LEZ may not achieve compliance with statutory air quality objectives over the next few years. The priority of major policies and other actions in this AQAP is to deliver significant modal shift to active travel and public transport, and where vehicle use is required, use of low emission vehicles wherever possible.

It is judged that with the implementation of the LEZ, the actions outlined in this draft Plan and the Council's wider commitments, the current air quality objectives for NO2 will be achieved within the duration of the Plan.

There also is evidence that the rate of diesel vehicle sales is reducing, and the proportion of lower emissions vehicles (Euro 6/VI, electric or part electric) is increasing in Edinburgh and across Scotland, and this will also have a relatively large impact on concentrations across the city.

This draft AQAP outlines how the Council plan to effectively tackle air quality issues within the administration area. However, it is recognised that there are a large number of air quality policy areas that are outside of the direct control of the Council, such as vehicle emissions standards. The Council will therefore continue to work with regional and central government and key stakeholders on policies and issues beyond the Council's direct influence, particularly where local evidence can be provided to support and influence change.

Continuing economic growth in the city and wider region presents a challenge for air quality. Population growth has inevitable demand for all modes of transport and supported infrastructure. The Council is preparing a new Local Development Plan for Edinburgh - the City Plan 2030, which sets out policies and proposals for development in Edinburgh between 2020 and 2030. Alignment with local air quality management and in developing local and national air quality strategies is crucial to ensuring sustainable economic growth.

Separately, further work will be undertaken in respect to the actions that are required to address Particulate Matter (PM10) exceedances. This will include the drafting of a PM10 Air Quality Action Plan to address specific issues within the Salamander Street Air Quality Management Area. Due to priorities in dealing with the Low Emission Zone, the steering group to consider these specifics has not reconvened. This steering group, consisting of Scottish Government, SEPA, Forth Ports and Council officials will now reconvene in 2023.

Responsibilities and Commitment

This AQAP was prepared by the Place, Environment and Heritage Team of the City of Edinburgh Council with the support and agreement of the following officers and departments from the Council:

- Executive Director of Place
- Service Director – Sustainable Development
- Service Director – Operational Services

As well as the Council Service managers for:

- Placemaking and Mobility
- Planning and Building Standards
- Network Management and Enforcement (Transport)
- Policy and Insight (Sustainability, Climate Change)
- Regulatory Services (Environmental Health and Licensing)
- Finance and Procurement
- Communications

The project team consisted of Environmental Health Officers, the Place, Environment & Heritage Team Leader and Air Quality Consultants LTD. Associate members included professionals from the external bodies SEPA, Transport Scotland and NHS Lothian.

Next Steps

This draft AQAP will be considered by the Transport and Environment Committee in December 2022 prior to a period of statutory consultation. With the feedback from the

consultation, a final AQAP will be produced and again presented to the Transport and Environment Committee for approval, before submission to the Scottish Government, as per the requirements under the Local Air Quality Management regime.

The final approved AQAP will be subject to an annual review, appraisal of progress on actions and reporting to the relevant Council Committee. Progress each year will be reported in the Air Quality Annual Progress Reports (APRs) produced by the Council, as part of statutory Local Air Quality Management duties.

If you have any comments on this Draft AQAP please send them to Shauna Clarke at Place, Environment and Heritage Team, Level G3, Waverley Court, 4 East Market Street, Edinburgh, EH8 8BG or email Spatial.Policy@edinburgh.gov.uk.

The above and front cover designs were compiled by pupils from Stenhouse Primary School during the school's banner competition for Clean Air Day, June 2022.

Table of Contents

1. Introduction

Health well-being is the key reason why local authorities are tasked to manage air quality under the statutory Local Air Quality Management (LAQM) framework, as set out in Part IV of the Environment Act (1995).

The links between poor air quality and the adverse impacts on human health are now well recognised by scientific evidence, in terms of premature death and on-set of disease. It is widely accepted that outdoor air pollution causes damage to human health across a wide range of conditions, from pre-birth to old age.

The main local pollutants of concern are nitrogen dioxide (NO2) and fine particulate matter (PM10 and PM2.5). In healthy people exposure to high levels of NO2 causes a shortness of breath and inflammation of airways, and a worsening of pre-existing lung conditions such as asthma in more sensitive individuals. Exposure to particulate matter is known to have a direct effect on the cardiopulmonary (heart and lung) system, leading to strokes and heart disease and the development of some types of cancer. There is also recent evidence showing a link between air pollution and an acceleration of the decline in cognitive function[3].

Each year in the UK, around pre-mature 40,000 deaths are attributable to exposure to outdoor air pollution which plays a role in many of the major health challenges of our day. Based on modelling, the estimated mortality burden on the population in Scotland in 2010 showed that there were around 2,000 premature deaths and a total of around 22,500 life years lost across the population which can be attributed to anthropogenic (man-made) fine particle pollution. In Edinburgh, this can be related to 205 premature deaths and 2,300 life-years lost[4]. Table 1.1 (overleaf) shows the rising trend in the estimated number of deaths attributed to air pollution in the UK and Scotland alone.

[3] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1090376/COMEAP-dementia-report-2022.pdf
[4] HPS Website - Air Pollution and Health Briefing Note. Mortality Associated with exposure to fine particulate matter (PM2.5 Attributable Mortality) in Scotland

Table 1.1 The rising trend in the estimated number of deaths attributed to air pollution in the UK and Scotland

Report	Pollutant	Number of attributable deaths in Scotland	Number of attributable deaths in UK
COMEAP (2010)	PM2.5	1,500	28,861
Public Health England (2014)	PM2.5	2,094	28,969
Royal College of Physicians (2016)	NO2 and PM2.5	n/a	40,000

Air pollution incurs economic costs across a range of sectors, predominantly through health care costs, workdays lost, and the deterioration of the environment and buildings. The overall economic cost to society associated with air pollution in the UK has been estimated at £20 billion per year[5] but could be as much as £54 billion[6]. Low-income groups are disproportionally affected since they are more likely to live in urban areas with high pollution levels, less access to green spaces and tend to lack healthy food in their diet.

Unlike the notorious smogs of the 1950s, the pollutants NO2 and fine particulates are not visible to the human eye and consequently there is a lack of public awareness with respect to the existence of poor air quality.

Poor air quality puts the health of Edinburgh's residents at risk and creates an unpleasant environment for visitors to the city.

Description of Administrative Area

The administration area for the City of Edinburgh Council (now referred to as 'the Council') is representative of the second largest city in Scotland and the seventh most populous in the UK. Located in the south-east of Scotland's central belt it is bounded by the Firth of Forth to the north and the Pentland Hills to the South. The latter comprises of 20 miles of farming and recreational land. The peripheral areas to the west and south-west are predominately semi-rural. The city is a financial, commercial and tourist centre and attracts over one million visitors annually.

[5] Every breath we take: the lifelong impact of air pollution | RCP London 2016
[6] Cleaner Air for Scotland – the road to a healthier future Cleaner air for Scotland: the road to a healthier future - gov.scot (www.gov.scot) 2015

Edinburgh has one of the fastest growing populations of any city in the UK. In the ten years to 2020, Edinburgh's population grew by 12.3% from an estimated 469,930 to an estimated 527,620 people. In the same time period Scotland grew by 3.9%.

The population of those age groups most vulnerable to the effects of air pollution, children (0-15) and older people (65+), grew by 11.1% and 17% respectively. By 2043 the proportion of these age groups will represent almost half of the population in Edinburgh.

In Edinburgh a large number of people live within the core of the city centre. Approximately 64% of Edinburgh's population live in tenements or high-rise flats, compared to the Scottish average of 37%. The majority of tenement properties are located in the central and northern areas of the city. There has been a substantial growth of residential flats within these locations due to the development of many former industrial sites. The southern and western peripheral areas of the city have predominantly detached and semi-detached housing. Both these locations are identified as major growth areas for housing and commercial development.

Many of Edinburgh's main streets and major radial routes into the city are narrow with tenement buildings four to five stories high on either side of the road carriageway which form street canyons. In some instances, the distance from the edge of the road to residential building facade can be as little as two metres. This type of urban design does not facilitate the dispersion of pollution and public exposure is greater due to the close proximity to traffic exhaust emissions.

As a major employment centre, Edinburgh attracts a substantial amount of road and rail commuter traffic. However, the main means of transport within Edinburgh is by the road network. Figures obtained from 2011 Census show that the car is the most dominant mode of travel to work (44.5%). The percent share of travel modes are shown in Table 1.2.

Table 1.2 Census 2011: Percentage mode share for travel to work/study

Mode of travel to work/study	%
Car	40
Train	2
Bus	26
Walk	16

Other	6
Work at home	10

The main East Coast rail line is routed through the city centre of Edinburgh and there are further rail links to Glasgow, Fife and to the major centres of the north. Edinburgh Airport is the busiest in Scotland with 14.7 million passengers per year (2019) and Leith (Port) has around 360 large shipping movements per year (2019).

Smoke Control Orders cover the entire Edinburgh Administrative Area and significant improvements in air quality have been achieved since their introduction due to use of natural gas in the domestic and commercial sectors. However, within the Council administration area, there are an increasing number of complaints about domestic burning. The recent trend to install wood burning stoves in urban areas as a secondary or amenity heating source is evident.

There is a general desire for continuing economic growth in the city and wider region presenting a challenge for air quality. Population growth has inevitable demand for all modes of transport and supported infrastructure. The Council is preparing a new Local Development Plan for Edinburgh - the City Plan 2030, which sets out policies and proposals for development in Edinburgh between 2020 and 2030. Alignment with local air quality management and local and national air quality strategies is crucial to ensuring sustainable economic growth.

Scope of the revised Air Quality Action Plan

This report outlines the revised actions that the Council will aim to deliver between 2022-2027 in order to reduce concentrations of air pollutants and exposure to air pollution; thereby positively impacting on the health and quality of life of residents and visitors to Edinburgh.

It has been developed in recognition of the legal requirement on the local authority to work towards air quality strategy objectives under Part IV of the Environment Act 1995 (as amended) and relevant regulations made under that part.

Local authorities are obliged to regularly review and assess air quality within their geographical areas, through the Local Air Quality Management (LAQM) review and assessment process. This regime requires analysis of recent air quality monitoring data, new planning developments and any significant changes in the area to identify

all locations where one or more of the air quality objectives are being or are likely to be exceeded. Where an exceedance is identified or considered likely, the local authority must, under section 83(1) of the Act:

- Declare an Air Quality Management Area (AQMA),
- Assess and identify the reasons for the problem, quantifying the sources of emissions, and;
- Develop an Air Quality Action Plan (AQAP), which details how the air pollution problem will be tackled within the AQMA.

The revised Plan focuses on locations where there are current exceedances of the nitrogen dioxide (NO_2) Air Quality Objectives, but also identifies strategic measures which will ensure concentrations of a number of pollutants are reduced across Edinburgh, even below current objectives. This approach is supported by that set out in the Cleaner Air for Scotland 2 Strategy (2021), which provides national policy support for a precautionary public health approach to air pollution.

This revised Plan is intended to complement the substantial amount of work which has been undertaken in relation to the Low Emission Zone, which was implemented on 31 May 2022 (and will be enforced from 1st June 2024).

This draft Plan strongly supports elements of the City Council's City Mobility Plan (CMP), the 2030 Climate Strategy, the current Local Development Plan (LDP) and emerging City Plan 2030 (CP2030).

Separately, further work will be undertaken in respect to the actions that are required to address Particulate Matter (PM10) exceedances. This will include the drafting of a PM10 Air Quality Action Plan to address specific issues within the Salamander Street Air Quality Management Area. Due to priorities in dealing with the Low Emission Zone, the steering group to consider these specifics has not reconvened. This steering group, consisting of Scottish Government, SEPA, Forth Ports and Council officials will now reconvene in 2023.

Summary of Previous Action Plan

This draft AQAP will, once approved, replace the previous AQAP which ran from 2008 and updated in 2010. The annual LAQM reporting process provided updates

and progress on the actions included within the Plan as well as other actions the Council was undertaking which affected or were likely to affect air quality.

The main focus of the 2010 AQAP was to reduce emissions from buses and freight vehicles operating in the city. A Low Emission Strategy Feasibility Study undertaken prior to 2008, concluded that the greatest reductions in local pollutant emissions would be achieved by targeting bus and road freight operators. Further Assessments at St John's Road and Great Junction Street Air Quality Management Areas (AQMAs) also identified that buses were the main contributors of NOx emissions.

Projects progressed through the previous AQAP include:

- upgrade of the bus fleet to ensure compliance with the Low Emission Zone (LEZ)),
- implementation of the ECO Stars scheme,
- implementation of the Local Transport Strategy (since replaced by the City Mobility Plan),
- various traffic management schemes (in particular the implementation of SCOOT and MOVA[7] at various junctions across the city),
- the Edinburgh Trams,
- Borders Rail Link,
- Electric Vehicle infrastructure, and;
- extensive feasibility work on the LEZ.

Progress on actions in the plan and other measures the Council is undertaking which affect air quality have been reported annually within Edinburgh's Air Quality Annual Progress Report (APR). The APR has also reported a general downward trend in concentrations of NO2 across Edinburgh. This will be as a result of both local measures, as mentioned above, measures being implemented by the Scottish Government for example through Cleaner Air for Scotland, and those at a wider scale, such as the reduction in road transport emissions, as newer vehicles subject to stricter emissions standards enter the fleet.

[7] SCOOT (Split Cycle Offset Optimisation Technique) is an adaptive traffic control system for the coordination and control of traffic signals across an urban road network, which automatically adjusts the traffic signal timings to adapt to current traffic conditions, using flow data from traffic sensors. MOVA is a similar system for use at isolated junctions and standalone pedestrian crossings.

Reporting and review of the Air Quality Action Plan

Once agreed, this Plan will be reviewed every five years and progress on the actions set out within the Plan will be reported annually in the Council's Air Quality Annual Progress Report (APR).

Review of the Local Air Quality Management regime

The Cleaner Air for Scotland 2 Strategy has committed to undertake a review of the Local Air Quality Management system. A working group including local authorities, SEPA and Scottish Government representatives will convene before the end of 2022.

2. Air Quality in Context

What are the main local air pollutants of concern?

The main pollutants of concern are nitrogen dioxide and particulate matter (small dust particles made up of a variety of different chemicals and metals). Each has different sources, health effects and chemical behaviours.

What is nitrogen dioxide (NO_2)?

Nitrogen dioxide (NO_2) is a gas produced as a result of road traffic and other fossil fuel combustion processes eg for heating, power. Its presence in air contributes to the formation and modification of other air pollutants, such as ozone and particulate matter, both of which are also harmful to health. Breathing air with a high concentration of NO_2 can irritate the airways in the lungs.

What is Particulate Matter (PM)?

Particulate matter is the most important air pollutant in terms of health effects and is different from the gaseous pollutants in that it is not a clearly defined chemical compound. It is a mixture of small particles which are usually described by their size. PM_{10} are particles below 10 micrometres in diameter and $PM_{2.5}$ are below 2.5 micrometres (approximately 30 times smaller than the width of a human hair). The larger particles can penetrate into the upper airways, while $PM_{2.5}$ can penetrate deeper into the lungs. Both groups contain much smaller particles which are much more numerous and can penetrate all areas of the lungs and even pass into the bloodstream or brain.

What are the health effects of air pollution?

There is an ever-growing evidence base for the connections between air pollution and heart and lung health and the link to premature mortality, with connections also being made to other conditions such as diabetes, dementia, mental health and birth outcomes, and most recently potential links to Covid-19[8].

Some of the effects occur over a short period, from minutes to days, whereas others result from long term exposure. Air pollution is known to cause some conditions, and also exacerbate existing conditions, such as triggering an asthma attack. These

[8] See https://www.imperial.ac.uk/media/imperial-college/medicine/sph/environmental-research-group/ReportfinalAPCOVID19_v10.pdf

short- and long-term health effects are reflected in the air quality objectives, which have both short- and long-term averaging times for pollution measurements. A table including the air quality objectives for relevant pollutants is included below.

While the majority of the published evidence relates to the long-term impacts of fine particulate matter ($PM_{2.5}$), evidence is also strengthening for the health impacts of nitrogen dioxide (NO_2), mainly around pulmonary and cardiovascular effects and the link to premature mortality.

It is generally accepted that air pollution can be harmful to anyone. However, some people are more likely to suffer than others because they live in deprived areas, which often have higher levels of air pollution; they live, learn or work near busy roads; and/or are more susceptible because of their age or existing medical conditions. Therefore, groups that can be considered vulnerable include, but are not limited to, the old, the young, deprived communities and those with existing health conditions.

The following table outlines the relevant air quality objectives, including their averaging periods.

Table 2.1 – Air Quality Objectives for Relevant Pollutants

Pollutant	Averaging Period	Air Quality Objective
Nitrogen dioxide	1-hour Mean	200 µg/m^3 not to be exceeded more than 18 times a year
	Annual Mean	40 µg/m^3
PM_{10}	24-hour Mean	50 µg/m^3 not to be exceeded more than 7 times a year
	Annual Mean	18 µg/m^3
$PM_{2.5}$	Annual Mean	10 µg/m^3

What are the trends in air pollution?

Across the UK for most of the 2000s, the annual mean NO2 concentration in the urban environment was stable, likely as a result of the increased ownership of diesel-fuelled vehicles which historically emitted far more nitrogen oxides compared to equivalent petrol-fuelled vehicles. This may have offset the impact of reduced emissions from other sources.

From late 2000s to 2019, the annual mean NO2 concentration at roadside sites reduced, likely to be a consequence of the reduction in road transport emissions, as newer vehicles subject to stricter emissions standards enter the transport fleet.

In 2020, the annual mean NO2 concentration at the roadside reduced further due to the reduction in traffic as a result of COVID-19 restrictions. In 2021 there was an increase in concentrations likely as a result of increased road traffic following the removal of lockdown restrictions. Concentrations are on average still lower than concentrations in 2019, after falling to the lowest point since records began.

Urban background and roadside particulate pollution (PM10 and PM2.5) has shown long-term improvement and in 2020, annual average concentrations at both roadside and urban background sites reached a low point in the time series (despite a period of relative stability between 2015 and 2019).

Residential combustion of wood and coal in stoves and open fires is a large contributor to emissions of particulate matter both in the UK and across Europe, and is a large contributor towards elevated concentrations in winter months and during the evenings.

PM10 concentrations also tend to peak in spring, which can be associated with air arriving from continental Europe, composed of fine particles (PM2.5) and not coarse particles (PM2.5-10), with nitrate playing a particularly important role. This nitrate appears to be largely associated with ammonium, derived from ammonia emissions which form secondary particulates and become Fine Particulate Matter (PM2.5) in the UK.

3. Summary of Current Air Quality in Edinburgh

The City of Edinburgh Council has declared six Air Quality Management Areas (AQMAs), five for the pollutant nitrogen dioxide (NO_2) and one for fine particulates (PM_{10}).

Road traffic is by far the greatest contributor to the high concentrations of NO_2 in the city. However, the AQMA at Salamander Street declared for PM_{10} exceedances is due to other sources as well as traffic. Emissions from industrial and fugitive sources from operations in and around Leith Docks are a contributory factor. Domestic and commercial power and heating (including solid fuel), will also contribute to NO2 and PM_{10} concentrations in the City.

Current Status of the AQMAs

The Scottish Government has approved the Council's intention to revoke the Inverleith Row AQMA as there has been a number of consecutive years of compliance with the objectives. Furthermore, air quality modelling has predicted a sustained reduction of NO2 concentrations when the LEZ is operational.

Approval has also been given to amend the St John's Road AQMA in order to remove the hourly exceedance designation, although there remains concern of breaches of in the annual mean objective.

Within the Great Junction Street AQMA, there have been no reported breaches of NO2 objectives since 2016. It is uncertain what the impact of the traffic management changes from the new tram network extension and the low traffic neighbourhoood in the local area will have on NO2 concentration. Therefore, the Council will consider revoking this AQMA once the impacts of these are known.

In Glasgow Road AQMA, objectives are achieved, albeit marginally (distance corrected for relevant receptor).

The Central AQMA has the greatest number of sites exceeding the objectives and some of the highest concentrations in the city. The appraisal work for the Low Emission Zone scheme concluded that this area was a priority for action. There has however, also been improvement on the arterial routes to the city, such as Gorgie

Road and Slateford Road. The Council will consider any amendments to the Central AQMA in these areas as part of the LAQM Review and Assessment annual process.

There continues to be a downward trend in annual concentrations of PM10 in the Salamander St AQMA notwithstanding delays in producing a finalised action plan. There has been no exceedances in the annual PM10 objective since 2019, and the 24hourly objective since 2015.

The status of the AQMAs is described below in Table 3.1. Further details can be found at: https://www.edinburgh.gov.uk/downloads/download/13180/air-quality-management-areas. Figure 1 shows the AQMAs within the Council area, and the Low Emission Zone (LEZ) boundary.

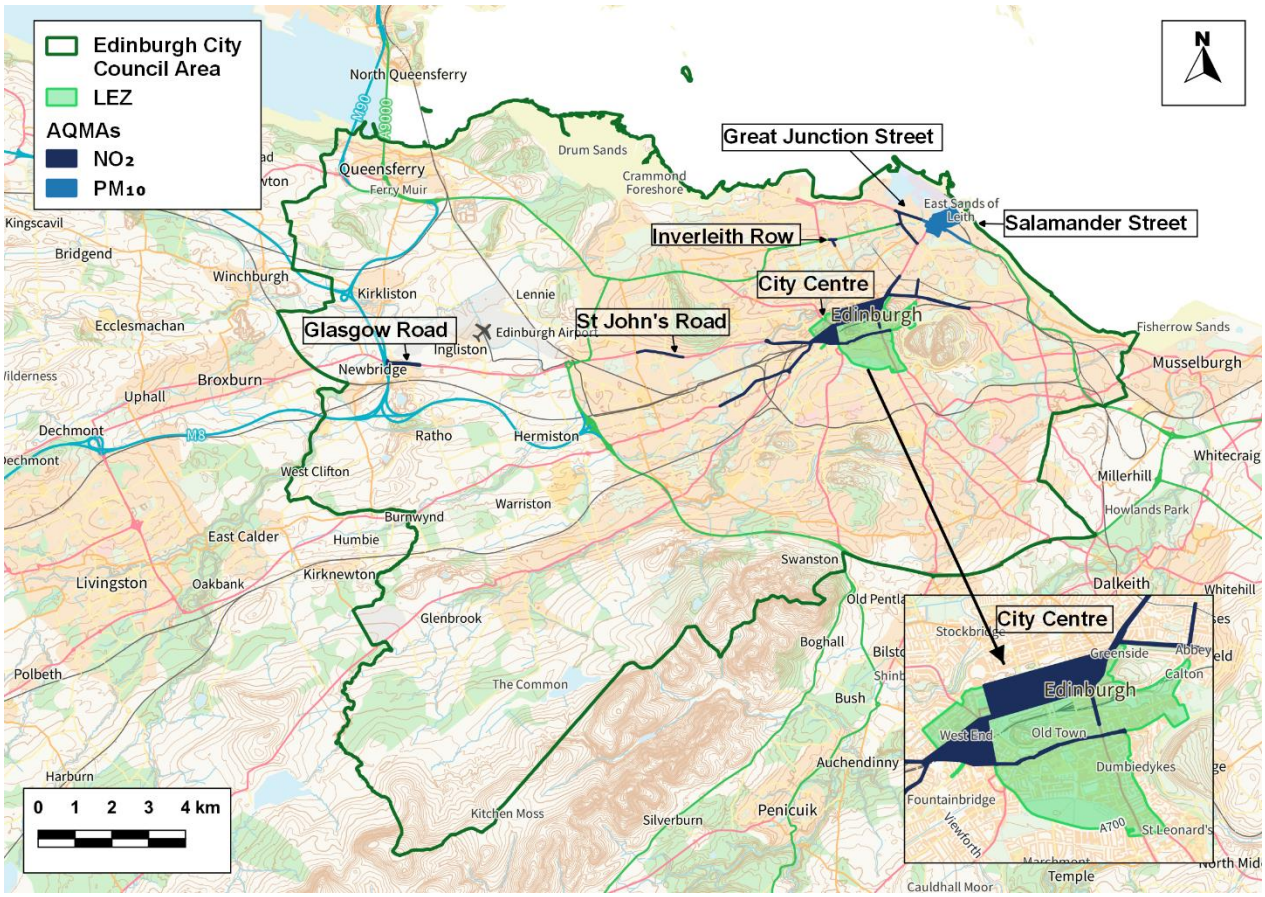
Table 3.1 – Status of AQMAs in Edinburgh

AQMA	Objectives declared	Current Status
Central	NO_2 annual mean	Exceedances of annual mean objective at multiple locations in 2019 and 1 location in 2020
	NO_2 1-hour mean	No exceedances since 2018
St Johns Road	NO_2 annual mean	Exceedance of the annual mean objective in 2019 and not in 2020
	NO_2 1-hour mean [1]	No exceedances since 2015
Great Junction Street	NO_2 annual mean	No exceedances since 2016
Glasgow Road	NO_2 annual mean	No exceedances in 2019 or 2020 at relevant locations (although marginal)
Inverleith Row	NO_2 annual mean [2]	No exceedances since 2017
Salamander Street	PM_{10} annual mean	Exceedance of the annual mean objective in 2019 and not in 2020
	PM_{10} 24hr mean	No exceedance since 2015

[1] Hourly mean objective at St Johns Road AQMA to be revoked

[2] Inverleith Row AQMA to be revoked

Figure 1 Edinburgh's AQMAs and Low Emission Zone



Air Quality Data

Even without the effect of the pandemic, long term trends show concentrations of the main pollutants are decreasing at most locations across the city, albeit there remain hot spot areas of concern, especially in the Central AQMA.

The impact of the COVID-19 pandemic was significant for air quality during 2020. Restrictions on travel resulted in a significant drop in NO2 concentrations at almost all locations across the city with just one location within the Central AQMA breaching the legal objective. No objectives for fine particulate matter (PM10 and PM2.5) were breached, including within the PM10 Salamander Street AQMA, for the first year since it was declared in 2017.

Monitoring data from 2020 is unlikely to be representative in terms of long-term trends. For the purpose of this AQAP, consideration has also been given to pre-pandemic pollution concentrations to account for more typical travel behaviour while emerging from the pandemic.

In 2019, exceedances of the NO_2 annual objective were monitored within St John's Road and the Central AQMAs. Exceedances of the NO_2 annual objective were also reported within the Glasgow Road AQMA, however once distance correction calculations were carried out, the estimated concentrations were below the objectives. There were measured exceedances outwith, but adjacent to, the Central AQMA, which will continued to be monitored.

This AQAP focuses predominately on the nitrogen dioxide (traffic related) AQMAs, although the need to reduce local air pollutant emissions across Edinburgh is also noted and incorporated. The Salamander Street AQMA, declared for PM_{10}, will have a separate focus as detailed in the Scope in Section 1.

For Scottish Local Authorities, $PM_{2.5}$ has now been prescribed in regulations with an annual mean objective of 10 µg/m^3 to be achieved by 2020. This objective was not exceeded at any monitoring location during 2019 or 2020.

At the time of writing, 2021 monitoring data are not yet available. However, a national analysis of long-term trends (which removes the effects of weather using statistical models)[9] has shown that average concentrations during 2021 were marginally higher than those in 2020 but remained below those seen before the pandemic. The overriding pattern reveals the longer-term positive effects of emissions reduction measures such as the increased use of lower emissions (newer) vehicles.

[9] https://www.aqconsultants.co.uk/news/may-2022/aqc-updates-its-analysis-of-nox-and-no2-trends

4. Edinburgh's Air Quality Priorities

The priority for this revised AQAP is meeting the statutory air quality objectives, but also, where practicable and feasible, to reduce local air pollutant emissions across the city.

These priorities are consistent with Cleaner Air for Scotland 2 (CAFS2), in which the first theme is adopting a precautionary public health approach to air pollution reduction, with compliance with domestic and international air quality standards being a minimum.

Continuing economic growth in the city and wider region presents a challenge for air quality. Population growth has inevitable demand for all modes of transport and supported infrastructure. The Council is preparing a new Local Development Plan for Edinburgh - the City Plan 2030, which sets out policies and proposals for development in Edinburgh between 2020 and 2030. Alignment with local air quality management and in developing local and national air quality strategies will be crucial to ensuring sustainable economic growth.

Alongside the City Plan 2030, the City Mobility Plan, the Edinburgh 2030 Climate Strategy and various action plans for noise reduction and the different aspects of transport, will shape the Council's priorities over the 5 years of this AQAP.

Actions underway within Edinburgh are driven by national as well as local priorities, and therefore the policy context below outlines relevant national as well as local policy.

Public Health Context

Air pollution is a major public health risk ranking alongside cancer, heart disease and obesity. A review by the World Health Organisation (WHO) concluded that long-term exposure to air pollution reduces life expectancy by increasing the incidence of lung, heart and circulatory conditions.

In 2021 WHO published guideline values for air pollutants including NO_2, PM_{10} and $PM_{2.5}$. These values in most cases are lower than current air quality objectives. However, as the WHO recognises, the health evidence shows that there is no safe level of PM. Poor air quality can affect health at all stages of life. Those most affected are the young and old. In the womb, maternal exposure to air pollution can

result in low birth weight, premature birth, stillbirth or organ damage. In children, there is evidence of reduced lung capacity, while impacts in adulthood can include diabetes, heart disease and stroke. In old age, a lifetime of exposure to air pollution can result in reduced life-expectancy and reduced wellbeing at end of life. There is also emerging evidence for a link between air pollution and an acceleration of the decline in cognitive function[10].

Poor air quality disproportionately affects the poorest and most vulnerable in our communities including children. This is because in many areas the most deprived members of the population are exposed to the highest levels of air pollution, therefore they have both a higher exposure and are more vulnerable to ill health. There is, however, spatial differences in this trend. Public health, which aims to prevent disease, promote health, and prolong life among the population as a whole, also aims to reduce health inequalities by using an evidence-based approach to make recommendations on the delivery of health and wellbeing services. As such, this AQAP will support work underway within the public health arena.

Planning and Policy Context

UK Policy Context

Air Quality Strategy

The Air Quality Strategy published in 2007 by the Department for Environment, Food, and Rural Affairs (Defra) and Devolved Administrations, provides the policy framework for air quality management and assessment in the UK.

It provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. Local authorities are seen to play a particularly important role.

The strategy describes the Local Air Quality Management (LAQM) regime that has been established, whereby every authority has to carry out regular reviews and assessments of air quality in its area to identify whether the objectives have been, or

[10] Clean Air Strategy 2019. Available at https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

will be, achieved at relevant locations, by the applicable date. If this is not the case, the authority must declare an Air Quality Management Area (AQMA) and prepare an action plan which identifies appropriate measures that will be introduced in pursuit of the objectives.

UK Air Quality Plan

Defra has produced an Air Quality Plan to tackle roadside nitrogen dioxide concentrations in the UK ; a supplement to the 2017 Plan was published in October 2018 and sets out the steps Government is taking in relation to a further 33 local authorities where shorter-term exceedances of the Limit Value were identified.

Additional actions for the devolved administrations are set out within the plan, and for the Scottish Government this included "*Consultation on detailed proposals for the establishment and operation of Scotland's first Low Emission Zone by 2018, along with the development of Scotland's National Low Emission Framework*".

The work for the National Air Quality Plan is underpinned by Cleaner Air for Scotland (CAFS and CAFS2), which sets out a national approach to improving air quality. CAFS contained 40 key actions within six policy areas – transport, health, climate change, legislation, placemaking and communications and introduced the National Modelling Framework (NMF) and the National Low Emission Framework (NLEF). CAFS has now been replaced by CAFS2 which is described below.

Reducing Emissions from Road Transport: Road to Zero Strategy

The Office for Low Emission Vehicles (OLEV) and Department for Transport (DfT) published a Policy Paper in July 2018 outlining how the UK Government will support the transition to zero tailpipe emission road transport, and reduce tailpipe emissions from conventional vehicles during the transition. This Paper affirms the UK Government's initial pledge to end the sale of new conventional petrol and diesel cars and vans by 2040.

The Paper sets out a number of measures by which the UK Government will support this transition but is clear that UK Government expects the transition to be industry and consumer led. Following consultation, in November 2020 the UK Government announced a two-phased approach to ending the sale of new petrol and diesel cars in the UK. Step 1 will see the phase-out date for the sale of new petrol and diesel cars and vans brought forward to 2030, whilst Step 2 will see all new cars and vans

become fully zero emission at the tailpipe from 2035 (i.e., including hybrid vehicles). If these ambitions are realised then road traffic-related NOx emissions can be expected to reduce significantly over the coming decades

Scotland Policy Context

National Transport Strategy

Transport Scotland published the National Transport Strategy in February 2020. The document identifies four priorities which form the basis upon which decisions will be made and policies evaluated with regards to transportation in Scotland. Two of these priorities are particularly relevant to air quality; 'Takes Climate Action' and 'Improves our Health and Wellbeing'. The Strategy states:

> *"As well as causing adverse impacts on climate change, our transport system has negative impacts on our air quality. Transport generates just over one-sixth of Scotland's total particulate matter (PM_{10}) and over one-third of the total emissions of nitrogen oxides (NOx). The majority of these emissions are caused by road transport."(p22)*

Regarding the 'Takes Climate Action' Priority, the Strategy sets out the following policy: "*Reduce emissions generated by the transport system to improve air quality*". The Strategy elaborates:

> *"More people wanting to access our city centres, often by private car, is impacting on air quality, and subsequently on people's health. While Scotland's four largest cities are introducing low emission zones, which through the restrictions on the most polluting vehicles will ultimately help improve air quality, more will need to be done. The Transport (Scotland) Act 2019 will enable local authorities to introduce schemes under which a charge may be levied for employers providing workplace parking places." (p49)*

Regarding the 'Improves our Health and Wellbeing' Priority, the Strategy sets out the policy to "*Reduce the negative impacts which transport has on the safety, health and wellbeing of people*". The Strategy states:

> *"People are more likely to walk and cycle where safe and accessible active travel infrastructure is available. By embedding the Sustainable Travel Hierarchy, Scotland's transport system will be designed with sufficient walking and cycling options to help us become a healthier, more active and fitter*

nation and tackle medical problems caused by poor levels of activity. It will also reduce the adverse impact on our air quality and the risks from diseases this causes."(p59)

"Our ongoing work on planning reform will continue to improve links with transport infrastructure, in the long term benefiting air quality and greenhouse gas emissions, and improving health."(p59)

Scottish Planning Context

The Scottish Government published finalised versions of Scotland's third National Planning Framework (NPF) in 2014 and the Scottish Planning Policy (SPP) revised in 2020. The NPF sets the context for development planning in Scotland and provides a framework for the spatial development of Scotland as a whole. The SPP sets out national planning policies which reflect Scottish Ministers' priorities for operation of the planning system and for the development and use of land.

The NPF aims to make keys areas of Scotland "*successful, sustainable places*". The NPF recognises that "*reducing the impact of the car on city and town centres will make a significant contribution to realising their potential as sustainable places to live and invest by addressing congestion, air pollution and noise and improving the public realm*".

The SPP introduces a presumption in favour of sustainable development, outlining that the planning system should support economically, environmentally and socially sustainable places by enabling development that balances the costs and benefits of a proposal over the longer term. Policies and decisions are guided by a number of principles, including "*avoiding over-development, protecting the amenity of new and existing development and considering the implications of development for water, air and soil quality*".

The Scottish Executive Development Department has also produced 'Planning Advice Note (PAN) 51 (Revised 2006): Planning, Environmental Protection and Regulation'. It supports existing policy on the role of the planning system in relation the environmental protection regimes. The PAN quotes SPP1: "*the planning authority should have regard to the impact of a proposal on air…quality, although the regulation of emissions or discharges will fall to be dealt with under other legislation*". It then goes on to summarise the statutory responsibilities of the environmental

protection bodies, as well as informing these bodies about the planning system, and the need for planning decisions to take account of a much wider range of material considerations and the weight to be accorded to them. This includes the LAQM regime.

Scotland's planning system is being reformed to strengthen the contribution it can make to inclusive growth, to delivering housing and infrastructure, empowering communities and addressing climate change. The Planning (Scotland) Act 2019 was passed by the Scottish Parliament in June 2019. Scotland 2045: Our Fourth National Planning Framework was published for consultation in November 2021. Once approved by the Scottish Parliament and adopted by the Scottish Ministers (expected during 2022), this plan will become part of the statutory development plan and will directly influence planning decisions. Part 1 sets out an overarching spatial strategy for Scotland in the future, which includes priorities, spatial principles and action areas. Part 2 sets out proposed national developments that support the spatial strategy. Part 3 sets out policies for the development and use of land which are to be applied in the preparation of local development plans, local place plans and for determining the range of planning consents. Part 4 outlines how the strategy will be delivered.

Scottish Air Quality Context

Cleaner Air for Scotland has been superseded by Cleaner Air for Scotland 2 (CAFS2), which is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution to protect human health.

CAFS2 is shaped around 10 general themes, which are health, integrated policy, placemaking, data, public engagement and behaviour change, industrial emissions regulation, tackling non-transport emissions source, transport, governance, accountability and delivery, and further progress review.

CAFS2 recognises that air pollution, climate change, quality of the urban environment and mobility are strongly interconnected. From this, it follows that effective policy co-ordination across these broad themes, at both central and local government levels, will deliver co-benefits greater than those possible by considering each in isolation. Key to ensuring that these co-benefits are fully realised will be

embedding placemaking principles, with a focus on nature-based solutions across policy areas to guide our way to a cleaner, healthier and more attractive environment.

Local Level Policy

City Mobility Plan

The Council published its City Mobility Plan (CMP) in 2021 which sets out the strategic approach to the sustainable, safe and effective movement of people and goods and a strong commitment to meeting the net zero carbon target by 2030 including through behaviour change, infrastructure provision and network management tools. It confirms a commitment to developing a LEZ scheme along with many other related measures such as electric vehicle charging infrastructure, expansion of Controlled Parking Zones and considering a Workplace Parking Levy, and a 'Pay as you Drive' scheme, if necessary, to tackle congestion and support cleaner air.

The CMP, alongside the adopted Local Development Plan and emerging City Plan 2030, aim to create a city where it is not necessary to own a car in order to get around. Development of the 20-minute neighbourhood concept reinforces the importance of having access to local services catering for daily needs within a 20-minute walk of anyone's front door (in Edinburgh's case, adopting a 10-minute walk there and 10-minute walk back principle).

The CMP contains objectives which this AQAP seeks to address directly (primary objective) or support (secondary objective) in tandem with other actions plans including the emerging Public Transport and Active Travel Action Plans:

- Primary CMP Objective relevant to this AQAP:
    - Reduce harmful emissions from road transport.
- Secondary CMP Objectives relevant to this AQAP:
    - Increase the proportion of trips people make by active and sustainable travel modes,
    - Improve sustainable travel choices for all travelling into, out of and across the city,
    - Maximise the efficiency of our streets to better move people and goods,

    - Reduce the need to travel and distances travelled, and;
    - Reduce vehicular dominance and improve the quality of our streets.

The CMP contains a number of policy measures which are also key to this AQAP including:

- Encouraging changes in behaviour towards the use of sustainable modes of travel through information provision, initiatives and campaigns,
- Requiring the provision of travel plans for major new developments as well as for existing workplaces, schools and other major trip generators,
- Expansion of the tram/ mass rapid transport network,
- Reviewing the city's bus network,
- City interchanges – public transport interchanges at key locations in the city, supported by taxi ranks,
- Bus priority measures,
- Other public transport improvements such as integrated, smart and flexible ticketing, bus and tram shelters,
- Regional interchanges (transport hubs on the edge of the city where people travelling into Edinburgh can switch to or between public transport and active travel),
- Supporting improvements to rail and rail integration,
- Enhance and where necessary expand the walking and wheeling network across the city,
- Expand and enhance the citywide network of cycle routes to connect key destinations across the city,
- Identifying opportunities for Mobility hubs that provide a range of sustainable travel choices and amenities,
- Strategic approach to road space allocation,
- Managing deliveries and servicing – edge of town consolidation and micro distribution centres,
- Encouraging the switch to cleaner vehicles,
- Supporting the transition to zero emission buses, and;
- 20-minute neighbourhoods to reduce the need for longer journeys.

City Plan 2030

Edinburgh's emerging new local development plan, City Plan 2030, sets out the strategy for development, proposals and policies to shape development and inform planning decisions in the city over the next 10 years and beyond. The representation period for the proposed City Plan 2030 concluded in December 2021 and the Council are currently considering the representations received prior to submitting the proposed plan to Scottish Ministers.

By 2030 the vision is for a sustainable city which supports everyone's physical and mental wellbeing, a city where you don't need to own a car to move around, a city which everyone lives in a home they can afford and a city where everyone shares in its economic success.

The City Plan reflects the target to be carbon neutral by 2030 as well as the commitment to build 20,000 affordable and low-cost homes over the next 10 years. The City Plan also reflects the programme to transform the City Centre and implement the City Mobility Plan, which will radically change how residents and visitors move around the city.

Within the current Edinburgh Local Development Plan which was adopted in November 2016, there is one policy that refers to air quality. Policy Env 22 refers to air, water and soil quality and states that:

"*Planning permission will only be granted for development where:*

- *there will be no significant adverse effects for health, the environment and amenity and either*
- *there will be no significant adverse effects on air, water or soil quality (…) or*
- *appropriate mitigation to minimise any adverse effects can be provided."*

2030 Climate Strategy

The vision of the 2030 Climate Strategy is that by 2030 Edinburgh will be a net zero and climate resilient city, with a transformed city centre connected to thriving local neighbourhoods where historic, natural and built environments are protected and valued for their contribution to people's wellbeing.

There are a number of synergies between measures being implemented through the Climate Strategy and those required to improve air quality. These include a

reduction in travel (both through people working from home more of the time, or in local hubs reducing the need to travel for work), the city having a network of safe and attractive active travel routes and an integrated world-class sustainable public transport system which is affordable for everyone.

The Climate Strategy includes the vision that most citizens find they no longer need a car, with a network of Electric Vehicle (EV) charging hubs supporting electric commercial vehicles, car clubs and citizens who still need to own a private car, with the city centre a place for walking, cycling and wheeling with excellent public transport accessibility.

In relation to non-transport sources, the vision is that all homes will be well insulated, energy efficient and heated and powered by low-cost, renewable energy with a higher proportion of energy generated locally.

Although there are many co-benefits between the climate strategy and local air quality management, care is needed to ensure measures implemented to deal with greenhouse gas emissions do not inadvertently worsen local air pollution.

Low Emission Zone (LEZ)

In March 2022 the Transport and Environment Committee approved the City Centre Low Emission Zone (LEZ), following legal processes. The LEZ was introduced on 31 May 2022 and will be enforced from 1 June 2024. The 'grace period' of 2 years, aims to help individuals and organisations prepare for the scheme. Some exemptions will apply for example, disabled persons (including blue badge holders), historic vehicles and emergency vehicles. Those which are non-compliant will have to pay a penalty charge to travel within the area, to effectively ban non-compliant vehicles.

The LEZ boundary includes the West End, Queen Street and the New Town, Greenside at the top of Leith Walk, Abbeyhill on the east, Pleasance, Meadows and Tollcross.

City Centre Transformation Programme

The Edinburgh City Centre Transformation (ECCT) Programme is an ambitious plan for a vibrant and people-focused capital city centre which seeks to improve community, economic and cultural life. It outlines a programme to enhance public

spaces to better support life in the city, by prioritising movement on foot, by bike and by public transport in central streets while improving access for all.

Changes will include a walkable city centre right at the heart of the World Heritage Site, enabled by a pedestrian priority zone and a network of connected, high-quality, car-free streets, a connected network across the city centre of new segregated and safe cycle routes, enhanced bus priority measures, the creation of public transport interchanges and a reallocation of space in the city centre to reduce the impact of vehicles and free up space for other users. The ECCT is supported by the CMP and the emerging City Plan 2030.

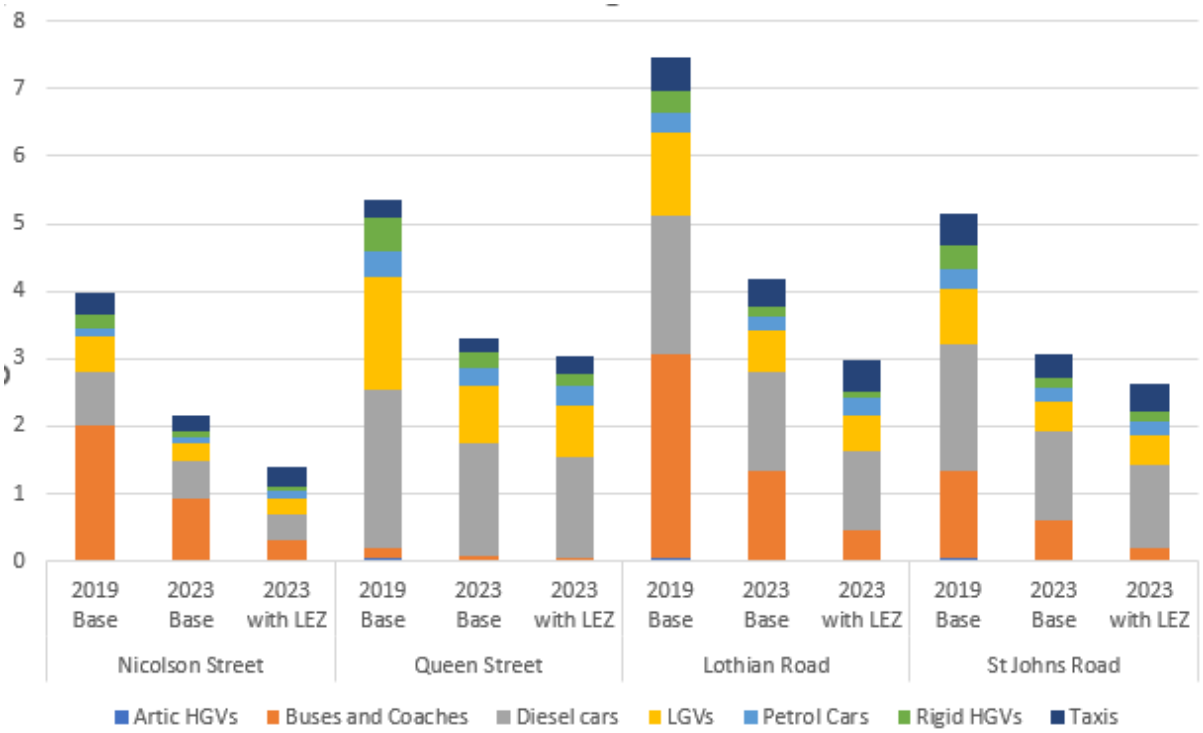
Source Apportionment

The measures presented in this AQAP are intended to be targeted towards the predominant sources of emissions within the Council's area.

A source apportionment exercise was carried out as part of the feasibility work for the LEZ by SEPA in 2021 within the Low Emission Zone Evidence Report[11]. This included percentage source contributions (as emissions) for the overall LEZ area, and at key locations within, and just outside, the LEZ in order to illustrate the variation at different locations across Edinburgh. Figure 2 illustrates emissions factors (NOx emissions in tonnes/ km/ year) at four locations within and outside the LEZ. Figures for 2019 baseline, 2023 baseline and 2023 with LEZ are presented.

[11] Available at https://www.edinburgh.gov.uk/downloads/file/30519/cleaner-air-for-scotland-%E2%80%93-national-modelling-framework-low-emission-zone-evidence-report-%E2%80%93-edinburgh-scottish-environment-protection-agency-september-2021

Figure 2: Emission Factors (tonnes/km/yr) from all Vehicle Sectors from data provided by SEPA



Total emissions from all vehicle categories will fall significantly between 2019 and 2023, with the implementation of the LEZ showing further reductions. The contribution from each vehicle class is different on a street-by-street basis. The figures show that proportionally buses and coaches will have the greatest emissions reductions through the implementation of the LEZ. Significant reductions are predicted from all vehicle categories, except for petrol cars, which are predicted to increase emissions marginally due to an increase of petrol cars (which are mostly compliant) travelling through the LEZ. Lothian Road, within the LEZ has one of the highest predicted concentrations, however total emissions will decline significantly with the LEZ, with proportionally buses having the greatest reductions. Queen Street outwith and on the boundary of the LEZ, sees slight reductions from all vehicle categories however diesel cars are the predominantly contributor.

The source apportionment presented, although based on a fleet which will have since improved nonlinearly, illustrates the need to include all vehicle types across a range of actions within this Plan.

These findings are also supported by work that was carried out in the St John's Road and Great Junction Street AQMAs. With grant funding the Council contracted Ricardo AEA to undertake remote sensing emissions testing in February and July 2020. This

consisted of specialist equipment at the roadside, alongside automatic number plate recognition cameras to collect details of the vehicle's tail-pipe emissions in the real-world. Real-world emission factors were derived from the study and then combined with the local fleet data, where it was possible to apportion the overall vehicle tail-pipe emissions to the different vehicle categories (source apportionment).

Figures 3 and 4 below show the apportionment of car, LGV, bus and rigid HGV emissions to vehicles by fuel type and Euro standard based on the fleet composition during the survey campaigns. Vehicle classes for which the emission factors are particularly uncertain because there were fewer than 10 valid emissions measurements were excluded from the source apportionment plots. In general, these vehicles would be expected to contribute a small proportion of the total NOx emissions as only a small number of these vehicles were seen on the road during the measurement campaigns.

Some key observations from the data shows:

• On St John's Road (Figure 3) Euro 5 diesel cars, Euro 4 diesel buses, Euro 5 diesel LGVs and Euro 6 diesel rigid HGVs are identified as the highest emissions sources, with other diesel vehicles also having significant contributions to emissions,

• On Great Junction Street (Figure 4), a similar distribution is seen to St John's Road with Euro 5 diesel LGVs, Euro 5 diesel cars and Euro 6 diesel rigid HGVs contributing the most to emissions. No Euro 4 diesel buses were measured at Great Junction Street,

• On both roads, emissions are dominated by diesel vehicles because they have larger NOx emission factors than petrol vehicles,

• Both source apportionment plots show that total emissions from Euro 5 diesel cars are greater than emissions attributed to Euro 6 diesel cars even though there are more Euro 6 diesel cars at both measurement locations. This is because the emission factor is higher for Euro 5 diesel cars than for Euro 6 diesel cars and so contributes more to overall emissions on the roads,

• Buses are a smaller emissions source on Great Junction Street compared to St John's Road due to lower vehicle counts, and;

• The emission factors for rigid HGVs and early Euro standard buses are uncertain; this will have an impact on the uncertainties in the proportion of NOx attributed to these vehicle classes.

Figure 3 Apportionment of emissions to cars, vans, buses and rigid HGVs by fuel type and Euro standard (E) based on real-world emission factors and fleet composition at St John's Road

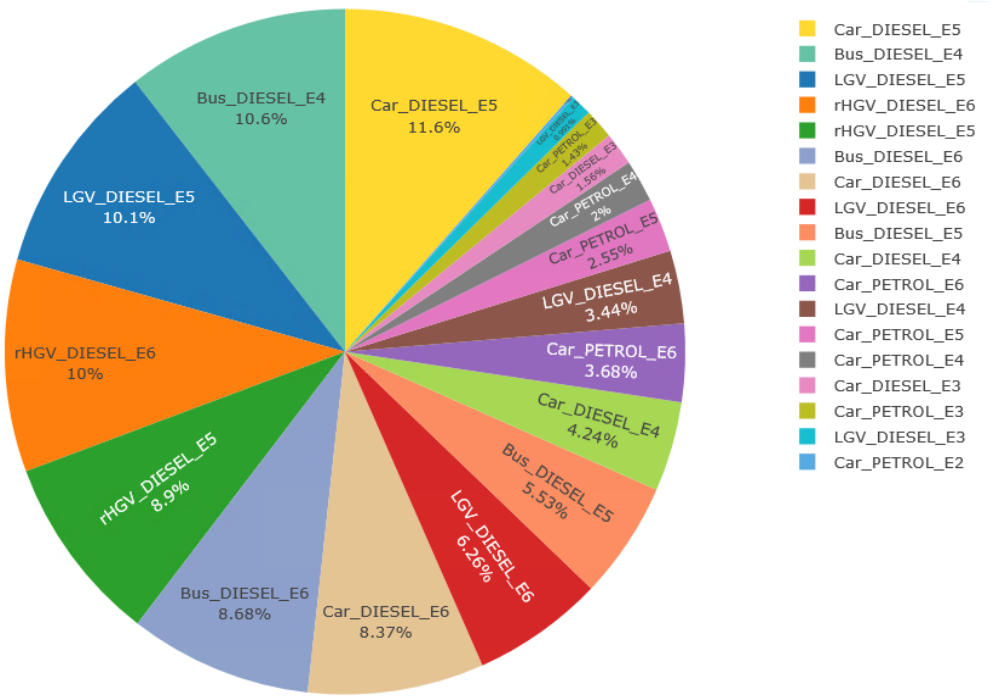
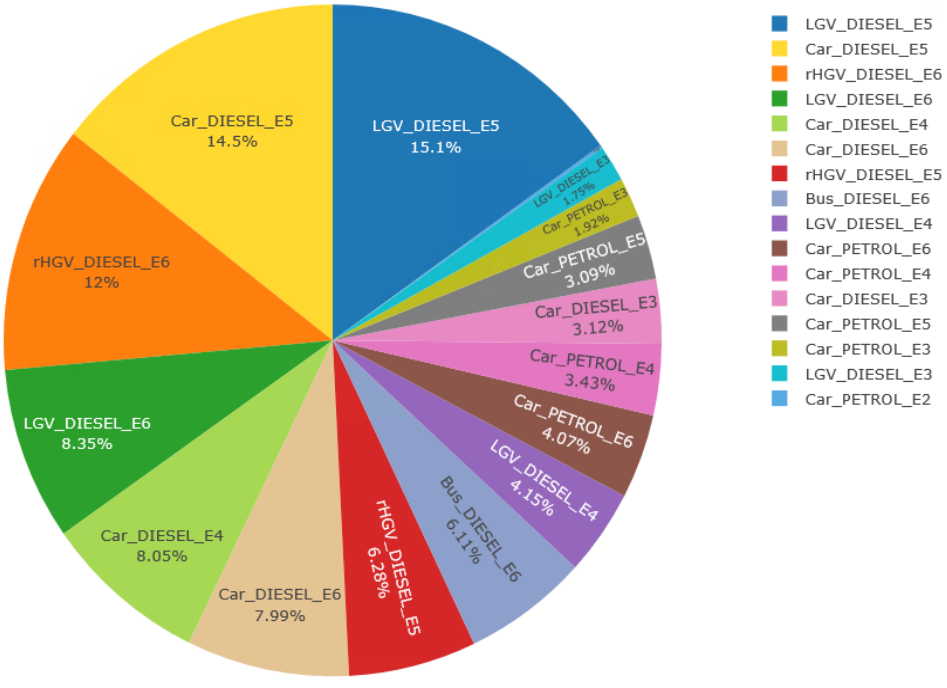


Figure 4 Apportionment of emissions to cars, vans, buses and rigid HGVs by fuel type and Euro standard (E) based on real-world emission factors and fleet composition at Great Junction Street



The Council has also been awarded funding from the Scottish Government to undertake source apportionment work for the Glasgow Road AQMA in 2022/23.

Required Reduction in Emissions

Predictions on emission reductions were calculated through the Council's participation in the CAFS National Modelling Framework (NMF) process to develop the City NMF Model, for the Low Emission Zone (LEZ) assessment work. These findings have been well defined in SEPA's evidence reports.

The NMF assessment work suggested that there will be locations in the Central and St John's Road AQMAs which may still have 'exceedances' at the kerbside locations post LEZ implementation, but current monitoring data at relevant receptors (normally buildings, rather than kerbside locations), indicates that the exceedance area for the Air Quality Objectives has reduced substantially.

Although 2021 monitoring data are not yet available, data prior to the Covid 19 pandemic suggests that in the Inverleith Row and Great Junction Street AQMAs, the annual mean objective is being achieved. In Glasgow Road AQMA, objectives are achieved, albeit marginally (distance corrected for relevant receptor).

It is suggested that through this AQAP, modelling undertaken by SEPA is updated in order to provide a post-pandemic picture of current air quality at key locations across the city. This will assist in identifying where further reductions are still required, and hence where to focus future measures.

It should also be noted that although compliance with air quality objectives is important, from a health perspective, a general reduction in emissions of the key pollutants (including PM_{10} and $PM_{2.5}$) may provide better health outcomes than focussing on hotspot locations. For this reason, wider, more strategic measures have been included.

Key Priorities

Based on the evidence provided above, the following issues need to be prioritised:

- Implementation of the LEZ, which should reduce concentrations of nitrogen dioxide in central Edinburgh to a level which achieves the air quality objectives and Limit Values at most locations,

- Specific action in other areas of poor air quality such as St Johns Road AQMA and continued action in areas where AQMAs are being revoked to ensure air quality continues to improve for example Inverleith Row,
- Through collaborative working, ensure that wider strategic air quality action is implemented through existing policy areas. This will include strategic transport improvements, promotion of behaviour-change to reduce private vehicle use, promotion of low emission vehicles and controlling domestic emissions, and;
- Plans being developed and implemented for placemaking, climate change and noise reduction are closely co-ordinated and aligned with those for air quality in order to maximise co-benefits.

5. Development and Implementation of Edinburgh's AQAP

Consultation and Stakeholder Engagement

In updating this AQAP, the Council will ensure that the requirements of the statutory consultation are adhered to and that engagement with stakeholders including local authorities, agencies, businesses and the local community is undertaken, which will help improve local air quality.

This draft AQAP will be considered by the Council's Transport and Environment Committee in December 2022. It is proposed that thereafter, a period of 12 weeks is programmed to undertake the statutory consultation and engagement process in combination with related emerging placemaking and mobility-led action plans. This approach will maximise strategic understanding of the interlinkages and opportunities for coordinated delivery of actions. Activities will likely consist of stakeholder workshops, as well as making the document available online with questions provided for response.

Schedule 11 of the Environment Act 1995 requires local authorities to consult the bodies listed in **Table 5.1**.

Table 5.1 – Consultation Requirements

Consultees
Scottish Government
Scottish Environmental Protection Agency
the regional transport authority South-East Scotland Transport Partnership and Transport Scotland
all neighbouring local authorities
other public authorities as appropriate, such as Public Health officials
bodies representing local business interests and other organisations as appropriate

The Council has already engaged with some of these bodies in bringing forward this draft AQAP (see Steering Group below).

With the feedback from the consultation and engagement process, a final AQAP will be produced in 2023. This will also be presented to the Council's Transport and Environment Committee for approval, prior to submission to the Scottish Government. A summary of the consultation responses will be provided in that final AQAP.

Steering Group

A Steering Group was set up in order to take this draft AQAP forward. Three steering group meetings have been held (9th March, 7th April and 27th June 2022) and involved the collaboration of officers across the Council in different disciplines, and wider organisations such as SEPA, Transport Scotland and NHS Lothian.

Further details on these meeting and contributors can be found in Appendix A.

Integrated Impact Assessment

The Council's Integrated Impact Assessment (IIA) process and guidance has been developed by the four local Lothian local authorities and NHS Lothian and is relevant for developing or revising action plans. The IIA process ensures legal obligations are met in terms of equality, socio-economic disadvantage, climate change, sustainability, the environment and human rights, by assessing the impact the action plan could have on certain population groups.

A IIA workshop was carried out on 22nd September 2022 with representatives of the following disciplines within the Council; Transport, Placemaking, Environment and Heritage, Strategy and Insight, Environmental Health and Planning.

Findings to date highlight that there will be positive impacts across all sectoral considerations – equality, health, well-being and human rights, environment and sustainability and economic impacts. Impacts were also highlighted that have the potential to cause negative effects however all but one of these was able to be mitigated through education and communication and working effectively with key stakeholder and partner organisations. Potential negative impacts on commercial biomass providers could not be negated.

Further research is required to explore how gypsy/travelling communities could be impacted in respect to future policy development on solid fuel burning. The consultation process will allow investigations to be undertaken.

Overall, the consultation on the plan will provide an opportunity for the public and stakeholders to engage with the Council in respect to all impacts.

Strategic Environmental Assessment

A Strategic Environmental Assessment (SEA) screening process has also been undertaken for those actions not previously considered under the SEA requirements in other Council strategic for example City Mobility Plan, 2030 City Plan or Climate Strategy.

The screening exercise showed that the relevant actions were likely to have slight positive impacts, but the effects were not expected to be significant. Therefore, concluding that a SEA is not required.

A report detailing the screening assessment has been submitted to the SEPA Gateway for consideration, as per due process. Their response and any actions required will also form part of the final plan development.

6. AQAP Actions

The Council's proposed AQAP measures consist of actions under eight key themes:

- Low Emission Zone (LEZ)
- Strategic Transport
- Behavioural Change to Active Travel
- Public Transport
- Low Emission Vehicles
- 2030 Climate Strategy
- Integrated Policies and Guidance
- Domestic Emissions.

The actions are summarised in Table 6.1 Air Quality Action Plan Actions overleaf, under each theme with the following details:

- a full list of the actions that form part of the themes
- the responsible departments/organisations who will deliver this action
- expected benefit in terms of pollutant emission and/or concentration reduction (where possible)
- the timescale for implementation
- how progress will be monitored.

Thereafter each action is described in detail with information regarding funding sources and an estimation of the costs involved.

The report concludes with details on the quantification of air quality improvements and an assessment of cost and effectiveness of each action.

It should be noted that there is some overlap between the overriding themes, with some of the actions cutting across multiple categories. For example, measures which support the 2030 Climate Strategy are also likely to support behavioural change to active travel, support low emission vehicles, or reduce domestic emissions. The LEZ will also support a modal shift to active travel and public transport as well as encouraging residents to use lower emission vehicles.

Table 6.1 – Air Quality Action Plan Actions

Theme	Action	Category and Classification	Lead Authority (Service Area)	Planning Phase	Implementation Phase	Key Performance Indicator	Target Reduction in Pollutant / Emission from Action	Progress to date	Estimated Completion Date	Comments
1 LEZ	1.1 Implement the Low Emission Zone and key actions such as the road network mitigation measures, signage, enforcement systems, communication plan and further development of the LEZ through continued working with Scottish Government to monitor and evaluate performance and maintain City modelling work.	Promoting Low Emission Transport – Low Emission Zone	The Council (Placemaking and Mobility, Network Management and Communications)	N/A	2022 onwards	Annual LEZ performance reporting	NOx emissions from traffic sources within LEZ by 55% (equivalent to 25-30 tonnes/year), when compared to 2019 levels	Initial implementation in place 31 May 2022	2025	Enforcement begins 1 June 2024.
	1.2 Work with Transport Scotland and SEPA to look at opportunities to promote zero-carbon city centres within the existing LEZs structure.	Promoting Low Emission Transport – Low Emission Zone	The Council (Placemaking and Mobility), SEPA, Transport Scotland	2021-2026	N/A	N/A	N/A	None	2026	Cleaner Air for Scotland Strategy action
2 Strategic Transport	2.1 In the context of a strategic approach to traffic management that seeks to reduce motorised traffic and encourage public transport and active travel, seek to ensure that traffic management projects achieve positive impacts on	Traffic Management – Strategic Highway Improvements	The Council (Network Management)	N/A	N/A	Modelled emission reductions for individual schemes	N/A	N/A	N/A	The City NMF Model should be utilised

	air quality especially in locations in breach of, or at risk of breaching, air quality objectives, and include mitigations for negative impacts.									
	2.2 Undertake detailed design work for the St John's Road/Drumbrae South junction and implement improvements	Traffic Management – Strategic Highway Improvements	The Council (Placemaking and Mobility)	2018	To be confirmed	Implementation of changes	Not quantifiable	Preliminary design and traffic modelling undertaken	To be confirmed	Details of resourcing and programming to be confirmed with Major Junctions Review
	2.3 In conjunction with Transport Scotland, ensure that any new traffic management schemes within the Glasgow Road AQMA achieve improvements in local air quality and reduce exposure to pollutants	Traffic Management – Strategic Highway Improvements	The Council (Placemaking and Mobility and Network Management) and Transport Scotland	N/A	N/A	Implementation of changes	Not quantifiable	N/A	N/A	Scheme could be considered in the lifetime of the Plan
	2.4 Make use of the City's air quality model developed under the CAFS National Modelling Framework (NMF) for the LEZ, to help understand the air quality impacts of proposed street projects; and to assist in the selection of mitigation measures where necessary, to maximise improvements in air quality	Transport Planning and Infrastructure - Other	The Council (Placemaking and Mobility) and SEPA	2023	Across the timescale of this Plan	Annual LEZ performance reporting	N/A	None	2024 to have process in place	
3 Active Travel	3.1 Engage in Clean Air Day on an annual	Promoting Travel Alternatives/	The Council (Placemaking and Mobility)	2022	Annually across the timescale of this Plan	Clean Air Day activities	Not quantifiable	Previous engagement	2027	

	basis over the 5-year period of this plan	Public Information								
	3.2 Work with Council education officers and schools, to increase awareness of air quality across the school community	Promoting Travel Alternatives/ Public Information	The Council (Placemaking and Mobility) and SEPA	2022	Across the timescale of this Plan	N/A	Not quantifiable	Ongoing ad-hoc activities within schools	2027	
	3.3 Support citizen science-type projects looking at air quality to encourage behaviour change towards sustainable travel modes	Promoting Travel Alternatives	The Council (Placemaking and Mobility)	N/A	N/A	N/A	Not quantifiable	N/A	Unknown at this stage	
4 Public Transport	4.1 Incorporate air quality considerations into the new Public Transport Action Plan (PTAP)	Transport Planning and Infrastructure	The Council (Placemaking and Mobility)	2022	2022-2027	PTAP produced which identifies air quality as a determining factor when considering the prioritisation of schemes	Not quantifiable	None	Across the timescale of this plan	
	4.2 Support projects to decarbonise the Edinburgh bus fleet.	Promoting Low Emission Transport	The Council (Placemaking and Mobility)	2022/23	Ongoing	Number of electric or alternatively fuelled vehicles in Edinburgh bus fleet	Not quantifiable	Low uptake to date	n/a	
5 Low Emission vehicles	5.1 Continue the ECO Stars fleet recognition scheme	Vehicle Fleet Efficiency – Fleet Efficiency and Recognition Schemes	The Council (Regulatory Services)	Annually	Ongoing	Numbers of vehicles registered on the scheme	Not quantifiable	ECO stars well established	2027	
	5.2 Update Edinburgh Planning Guidance to incorporate a greater provision of electric vehicle (EV) infrastructure in new developments	Promoting Low Emission Transport-Priority Parking for LEVs	The Council (Planning and Building Standards)	2022	2022/23	Updated guidance (within Edinburgh Design Guidance)	Not quantifiable	N/A	2023	Annual incremental improvements to be applied until 100% car parking is EV charging-ready
6 2030 Climate Strategy	6.1 Discourage the uptake and use of biomass in	Promoting Low Emission Plant -Other Policy	The Council (Planning and	2022	2023/24	City Plan policy adoption	Not quantifiable	City Plan drafted for examination	2024	

7 Integrated Policy	commercial settings through Planning Policy in order to ensure no negative impacts on local air quality and to support the transition to low carbon technologies		Building Standards)							
	7.1 Host a workshop with relevant Council officers to increase collective knowledge of air quality issues and solutions	N/A	The Council (Placemaking and Mobility)	2022	2022/23	Workshop held	N/A	None		
	7.2 Use SEPA's regional air quality model to investigate the impacts of City Plan development on air quality in the long term	Transport Planning and Infrastructure - Other	The Council (Planning and Building Standards) and SEPA	2022	2023	Development of SEPA regional model	N/A	See Comments	2027	Work is ongoing to incorporate road network and traffic data into to the AERIUS tool, a pilot tool is expected in 2022. Discussions with the Scottish Planning Group to integrate this into the Scottish planning process will form part of a later work package.
	7.3 Lobby Scottish Government for an update of licensing laws to tackle concerns such as patio gas heaters and external solid fuel burning in licensed premises	Promoting Low Emission Plant – Other Policy	The Council (Regulatory Services)	2022	2022 onwards	Change in licensing laws	N/A	None		

8 Domestic Emissions	7.4 Continue to enforce against vehicle idling and expand awareness raising campaigns, including advising commercial fleet operators at Council's Events Planning and Oversight Group of engine idling laws	Traffic Management – Anti-Idling Enforcement	The Council (Network Management and Enforcement and Communications)	2022	2022 onwards	TBC	Not quantifiable	Enforcement mechanism already in place.	Across the lifetime of this plan	
	7.5 Ensure Placemaking strategies and guidance including Place Briefs take account of air quality.	Policy Guidance and Development Control – Air Quality Planning and Policy Guidance	The Council (Planning and Building Standards & Placemaking and Mobility)	2022	ongoing	Evidence of Increasing prominence of air quality consideration within strategies and guidance	Not quantifiable	Air quality is a considering factor in the development of the emerging Street Space Allocation Framework	Across the lifetime of this plan	Link to Cleaner Air for Scotland 2 Strategy Action
	8.1 Local information campaigns to support the national message – for example communications from the Council in winter on energy needs to work in partnership with air quality messaging	Public Information	The Council (Placemaking and Mobility, Communications)	2022	Unknown at this stage	Campaigns undertaken	Not quantifiable	None	Unknown at this stage	
	8.2 Lobby Scottish Government to review the Clean Air Act, in particular supporting abolishing permitted development rights for flues for woodburning stoves and biomass boilers	Promoting Low Emission Plant – Other Policy	The Council (Regulatory Services)	2022	2022 onwards	New Clean Air Act	Not quantifiable	None		
	8.3 Review complaints and gather information on solid fuel burning to see whether there are any 'hotspot' areas within the city	Promoting Low Emission Plant – Other Policy	The Council (Regulatory Services)	2022	2022	Summary report on initial analysis of findings	Not quantifiable	None	2024	

	to inform any targeted intervention									
	8.4 Lead on the development and delivery of net zero community pilots based in geographies with different demographic profiles and community capacity.	Promoting Low Emission Plant – Other Policy	The Council (Policy and Insight)	Already started working on Phase 1 of the pilot	2023/24 onwards	n/a	Not quantifiable	Funding secured (£500k one-off Council investment) Phase 1 started	TBC	
	8.5 Develop a Whole House Retrofit (WHR) delivery programme for retrofitting social housing across the city to the highest energy standards, to reduce energy demand and tackle fuel poverty	Promoting Low Emission Plant – Other Policy	The Council (Housing Strategy & Development)	Already started	Already started	% of social housing compliant with EESH2	Not quantifiable	Stock condition surveys of Council housing stock carried out in 2022/2023. A WHR pilot across 10 pilot areas covering 10 different building types is underway and will inform the longer-term investment and roll out of the whole house retrofit programme	Development of the programme by end of 2023. Completion of the works beyond 2030	

Action 1: Implement the Low Emission Zone and Mitigation Measures and look at opportunities to promote zero emission city centres

A Low Emission Zone (LEZ) is an area where targeted action is taken to improve air quality, by penalising the most polluting vehicles from entering the zone. Drivers of those which are non-compliant will have to pay a penalty charge if travelling within the area, which effectively bans non-compliant vehicles.

The Edinburgh LEZ covers most of the city centre with the boundary including the West End, Queen Street and the New Town, Greenside at the top of Leith Walk, Abbeyhill on the east, Pleasance, Meadows and Tollcross (See Figure 1, page 13). The LEZ, which includes all types of vehicles (with few exemptions), was implemented on 31st May 2022 and has a 2 year 'grace period' before being enforced from 1 June 2024. Further information about the zone, including exemptions, funding assistance and consultation updates can be found at: https://www.edinburgh.gov.uk/lez.

Detailed and tailored traffic and air quality data collection exercises between 2016 and 2020 in Scotland's four major cities underpinned the development of the LEZs and created local city models through the National Modelling Framework (NMF).

For Edinburgh, this work showed how the LEZ will have a positive impact on the Central AQMA as well as other parts of the city centre and wider suburban area. NOx emissions from traffic sources within LEZ are expected to reduce by 55% (equivalent to 25-30 tonnes/year), when compared to 2019 levels, which will result in lower pollutant concentration, however, it was also recognised that this did not necessarily mean that compliance with the air quality objectives would be met at all locations within the LEZ. Other actions are necessary to ensure full compliance. Modelling identified a potential risk the LEZ may result in limited new exceedances of the statutory objectives on Palmerston Place and Chester Street on the LEZ boundary however, these are expected to be short-lived with the modelling of the *future fleet* scenario predicting that concentrations would be compliant at these locations.

The full modelling and assessment work has been considered by the Council and the decision was made in March 2022 to proceed with the LEZ implementation. Delivering the LEZ is the first and most significant action in this draft Plan as the Council works towards the start of enforcement (1 June 2024). Continued

assessment will be undertaken through the Local Air Quality Management regime of the predicted air quality improvements to support its delivery:

Action 1.1 Implementation of the Low Emission Zone including key actions as follows:

- Road network mitigation including engagement with key stakeholders on proposed changes and putting in place relevant traffic orders,
- Signage and lineage notifying drivers at LEZ boundary and approach roads
- Enforcement infrastructure and systems,
- Communications timed across period to June 2024 to ensure maximum early compliance,
- Further develop the LEZ through continued working with the Scottish Government to monitor and evaluate the LEZ by publishing regular updates on performance, and;
- Continue to update the LEZ City Model developed under the National Modelling Framework to reflect changes to the road network and more recent fleet predictions from ANPR data collected.

Funding Source: The Council, the Scottish Government

Cost: High

Through Scottish Government and Transport Scotland grant awards, approximately £2.03million has been spent to date on development and implementation costs for LEZ. Council staffing and legal costs are not included. An estimated £400k per annum operational and maintenance costs are currently unfunded. Any revenue surplus from penalty fines will cover operational/maintenance costs and/or be re-invested to support the LEZ scheme's objectives, however this revenue stream is anticipated to be limited due to the deterrent nature of Scotland's LEZ regime.

In addition, to LEZ implementation the Cleaner Air for Scotland 2 strategy suggested local authorities work with Scottish Government, Transport Scotland, citizens and other relevant partners to explore opportunities to promote zero carbon city centres within the existing LEZ structures. An action is also included to this effect:

Action 1.2 Work with Transport Scotland and SEPA to look at opportunities to promote zero-carbon city centres within the existing LEZs structure.

Funding Source: The Council

Cost: Low

Action 2: Support and Implement Strategic Transport Improvements

As set out in the City Mobility Plan, "*investment in the city's travel infrastructure, services and network's management needs to be focussed on making sustainable travel the best choice, not just the right choice"*.

As Scotland's fastest growing city, the transport system in Edinburgh must evolve in a sustainable way, to cater for a rapidly growing population and to support the city becoming net zero by 2030.

Edinburgh's approach to land use planning, through the 20-minute neighbourhood concept means that people will have less distance to travel to meet their daily needs. Many journeys will, however, require changes across travel modes. Interchanges between public transport, active travel and other modes must be well planned and implemented, conveniently placed, seamlessly integrated and easy to understand.

Measures which support strategic transport improvements are currently committed by Council:

- develop and deliver a strategic approach to road space allocation between modes of travel to define the degree of priority to be given to different modes on different streets,
- expand the tram/mass rapid transport network to the north and south of the city as well as to Newhaven,
- review the city's bus network to better align with the Council's strategic priorities including improving accessibility, integration and reducing congestion in the city centre,
- develop public transport interchanges at key locations in the city to enable better connections between services and modes,

- investigate opportunities to expand and create strategically placed transport hubs on the edge of the city where people travelling into Edinburgh can switch to or between public transport and active travel,
- identify opportunities for mobility hubs[12] in existing communities and major new developments that provide a range of sustainable travel choices and amenities including public transport, shared mobility, click and collect and electric vehicle charging,
- Deliver Low Traffic Neighbourhoods (LTNs) in Corstorphine and Leith with an aspiration to deliver LTNs more widely, depending on the outcomes of the initial schemes,
- Use innovative approaches to managing traffic flow, for example incorporating air quality sensors to manage traffic flow in real time in line with the Digital and Smart City Strategy,
- Extend the coverage and operational period of parking controls in the city to manage parking availability for the benefit of local residents and people with mobility difficulties. The developing Parking Action Plan is likely to continue linking parking permit prices in the city centre to polluting vehicles,
- Review of major junction efficiency across the city, including consideration of air quality. Junction reviews are also being undertaken with respect to any potential impacts from the LEZ to ensure that the network management strategy for the LEZ mitigates congestion and the resulting pollutants,
- In 2019, a traffic modelling study investigated the optimum junction layout for the A8/Drumbrae South junction, which would aim to reduce vehicle emissions on the St John's Road corridor, particularly between the junctions of Clermiston Road and Drumbrae South. This work should be reconsidered in the context of specific actions of this Plan alongside other specific measures which support strategic transport improvements for air quality improvements.

[12] Mobility hubs, whilst serving as places that enable and promote multiple transport modes, can also serve as easily-accessible attractions in their own right – performing a role as 'community hubs'. A mobility hub can, therefore, be both a place for travellers to leave from and be a place to go to; as a shared workspace for instance, or as a parcel drop-off or pick-up point, or as a group of electric vehicle charging points.

Consideration was given to the development of the Council's Park and Ride strategies, however due to the impending revision to the Public Transport Action Plan, this element was not taken forward. See Appendix B.

The following actions are new specific measures to be contained within the draft Action Plan to support strategic transport improvements:

> ***Action 2.1*** In the context of a strategic approach to traffic management that seeks to reduce motorised traffic and encourage public transport and active travel, seek to ensure that traffic management projects achieve positive impacts on air quality especially in locations in breach of, or at risk of breaching, air quality objectives, and include mitigations for negative impacts.

Funding Source: The Council, the Scottish Government

Cost: Specific for each scheme

> ***Action 2.2*** Undertake detailed design work for the Drumbrae South junction and implement improvements to the new junction to reduce congestion.

Funding Source: The Council, the Scottish Government

Cost: Approximately £500,000

> ***Action 2.3*** In conjunction with Transport Scotland, seek to ensure that investigate the feasibility of any new traffic management schemes within the Glasgow Road AQMA to reduce the impacts of congestion achieve improvements in local air quality and reduce exposure to pollutants.

Funding Source: The Council, Transport Scotland, the Scottish Government

Cost: Unknown at this stage

> ***Action 2.4*** Make use of the City's air quality model developed under the CAFS National Modelling Framework (NMF) for the LEZ, to help understand the air quality impacts of proposed street projects; and to assist in the selection of mitigation measures where necessary, to maximise improvements in air quality.

Funding Source: The Council, SEPA, the Scottish Government

Cost: Low

Action 3: Promote Active Travel to Reduce Private Vehicle Use

Achieving change in travel mode choice to active travel can be an effective strategy to manage transport demand and so reduce NOx and PM emissions. Changes in travel mode may come about through incentivisation, public engagement or a regulatory scheme (such as the LEZ which will have an impact on modal choice). Measures to provide information on alternative ways of travelling or encouraging lift sharing can be implemented relatively quickly compared to provision of transport infrastructure or the development and introduction of cleaner vehicles, and in many cases can be a more cost-effective approach.

Edinburgh has a number of strategies and specific projects aimed at promoting active travel which are largely being implemented through the City Mobility Plan and its associated Action Plans, for example the Active Travel Action Plan (which is currently being updated). The City Mobility Plan is complemented by the emerging City Plan 2030, which includes key components for encouraging behavioural change to active travel. In addition, the Edinburgh City Centre Transformation Programme also contains a number of measures to provide infrastructure for Active Travel within the city centre.

Measures which the Council is currently undertaking which will promote active travel are:

- Enhance and where necessary expand the walking/ wheeling network to serve and connect key destinations around the city. This will be undertaken following the update of the Active Travel Action Plan, which will contain an implementation plan,
- Expand and enhance the citywide network of cycle routes to connect key destinations across the city, including increasing segregated cycle infrastructure on main roads. This will be undertaken following the update of the Active Travel Action Plan, which will contain an implementation plan,
- Limit the level of parking in new developments based on current and planned levels of walking/ wheeling, cycling and public transport access and the capacity of surrounding streets, and include requirements for car club and bike hire space,
- Include cycle parking facilities in new developments,

- Expand the School Streets Programme to further primary schools across the city,
- Lead by example by promoting active travel through the Council Travel Plan, which is currently being updated,
- Declutter streets by minimising signing, bins and other street furniture to create an uncluttered space for both movement and place functions so they are accessible for all and support street uses and activities,
- Smarter Choices Smarter Places Programme which supports behaviour change to more active and sustainable forms of transport amongst Edinburgh's citizen's and working communities, and;
- Support the CAFS2 national public engagement strategy.

The following measures are new specific measures to be contained within the Action Plan to help promote active travel:

Action 3.1 Engage in Clean Air Day on an annual basis over the 5-year period of this plan. Depending on the theme of Clean Air Day, this could be linked to other initiatives (such as working with schools, increasing awareness of solid fuel burning, or car free streets);

Funding Source: Smarter Choices Smarter Places funding programme (annual)

Cost: £25,000

Action 3.2 Work with the Council education officers, and schools to increase awareness of air quality across the school community. This will entail projects with SEPA using their online teaching package, and embedding air quality and climate change into the school curriculum;

Funding Source: The Council, SEPA, the Scottish Government

Cost: Low

3.3 Utilise citizen science projects looking at air quality to encourage behaviour change towards active travel modes

Funding Source: Industry

Cost: unknown at this stage

Action 4: Support and Implement Public Transport Improvements

For a city of its size, Edinburgh has a well-regarded public transport network and plans are in place to ensure its continued improvement. By 2030, the Council's vision is for Edinburgh's transport system to be one of the greenest, healthiest and most accessible in northern Europe.

The City Mobility Plan contains a number of policy measures to improve public transport, supported by the Public and Accessible Transport Action Plan, which is currently being updated. The update of the Public Transport Action Plan will take into account the principles being agreed in respect to road space allocation strategy, with public transport priority schemes optioneering and detailed business cases to follow.

The timescale for an age limitation and vehicle engine (emission) policy for taxis and private hire vehicles has been extended in light of the COVID-19 pandemic, to alleviate pressure on the sector. As of 1 April 2023, any new licensed taxi (or private hire) vehicle, or a replacement vehicle under an existing licence, is to be Euro 6 engine standard. Significant progress has been made by taxi operators with approximately 75% of the fleet already at least Euro 6. The extension of these dates allows licence holders to retain existing vehicles for a longer period (18 months) than would previously have been allowed, however these timescales complement the LEZ, with grants available from Transport Scotland.

Current measures which are already committed by the Council to support public transport improvements include:

- Expand and enforce public transport priority measures to improve journey time reliability and operational efficiency within the city and wider region,
- Ensure ticketing is integrated across public transport operators and smart, flexible tickets can be purchased via contactless payment, and;
- Extend the free bus travel for Edinburgh under 22's to other forms of public transport such as trams.

The following measures are new specific measures to be contained within this Draft Air Quality Action Plan to support public transport improvements:

> ***Action 4.1*** Ensure that air quality is considered in the new Public Transport Action Plan.

Action 4.2 Support projects to decarbonise the Edinburgh bus fleet. This may include a more strategic view on future infrastructure and routing, retrofitting existing buses as an emerging technology and investigating finance models. It may also include wider collaboration with other key service operators in the city, such as shared electric charging infrastructure, to support holistic and spatially efficient solutions.

Funding Source: The Council, the Scottish Government

Cost: Unknown at this stage.

Action 5: Support the Use of Low Emission Vehicles

The primary objective of promoting a switch to low emission vehicles is the reduction of carbon and local pollutant emissions from transport. However, it does not have additional benefits such as congestion reduction, or increased levels of physical activity that are generated by measures to encourage active travel modes. Provision of suitable infrastructure to support low emission vehicles is critical to their introduction. For commercial vehicle operators, the financial case for investing in electric vehicles is strongly dependent on ensuring high vehicle usage.

ECO Stars is a free fleet recognition scheme that encourages commercial and public operators to run their vehicle fleets more efficiently by helping them to reduce fuel consumption, improve efficiency and reduce emissions. ECO Stars is operated on behalf of the Council by TRL and is the largest ECO Stars scheme in the UK, with 312 operators covering more than 10,000 vehicles.

The Council is committed to leading by example through membership of ECO Stars and the acquisition of lower emission vehicles for its own fleet. The proportion of the Council's entire fleet being Euro 6/VI and above, continues to increase from 51% in 2020 to 60% in 2021. The number of electric vehicles significantly increased with all new cars now electric. These improvements will continue, with the impact of the LEZ and the restrictions that this will place on some fleet units, being assessed. The careful planning of key replacement vehicles will mitigate the effect on operations.

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

economic benefits. More recently, the Council approved a Business Case for the installation of on-street EV charging infrastructure and developed a detailed project plan, to strengthen the existing network. £2.2m funding was awarded from Transport Scotland through the Switched-on Towns and Cities Fund for installing EV on street chargers. For new development, the current requirement is that one of every six spaces should include a fully connected and ready to use electric vehicle charging point, in developments where ten or more car parking spaces are proposed.

Current measures being undertaken by the Council to support low emission vehicles are:

- Encourage the switch to cleaner vehicles by supporting the growth of the EV infrastructure, including the development of a citywide charging network, and ensuring that mobility hubs include provision for EV charging where appropriate,
- Monitor progress in other low and zero emission technologies (for example hydrogen) for different vehicle types,
- Reduce emissions from the Council fleet. This is being undertaken as part of the Council's Emission Reduction Plan, where the approach will be to reduce vehicle miles travelled thanks to route optimisation strategies, to prioritise electrification for cars and light vans (with a commitment to fully decarbonise the cars and vans fleet by December 2023), begin the roll out of low-carbon heavy vehicle fleet (with five new electric refuse collection vehicles due to be purchased in 2023), and partner with Scottish Government and Scottish Enterprise to pilot innovative low-carbon alternatives to heavy fleet,
- Work towards 'EV only' for business travel by taxi,
- Implement a further 81 charging points with 141 electric vehicle charging bays across the city,
- Further charging infrastructure in residential areas is proposed, aimed at long stay/overnight charging in areas of the city where residents lack off-street parking. Ten (10) new locations have been awarded funding from the UK Governments Office for Low Emission Vehicles (OZEV) to cover the capital cost of installation, with delivery of these expected by April 2023,

- Support car clubs to expand, through the planning system as well as by provision of car club spaces across the city,
- Over 70 on-street car club bays are to receive electric vehicle chargers for exclusive use by car club operators, to support their transition to a lower emission fleet whilst improving the shared mobility offering in the city,
- Continue working with Scottish Futures Trust and Transport Scotland to develop a business case by April 2023 focused on partnering with the private sector to help fund and deliver EV charging infrastructure up to and beyond 2030,
- Work with third sector partners to pilot the replacement of business journeys by car with e-cargo bikes and roll-out e-cargo bike training to target staff groups (in line with the City Emissions Reduction Plan),
- Expand the implementation of logistics hubs to provide 'last mile' support for large-sized deliveries and dispatch items made by larger delivery vehicles. In some cases, these may combine with mobility hubs,
- Continue to investigate further opportunities for projects which involve innovative solutions for deliveries,
- Supporting public sector transition to electric vehicles by Identifying opportunities to align to investment in EV infrastructure for public service and blue light fleet at strategic locations across the city, which also delivers 'down-time' availability for citizens and businesses, where possible, and;
- Delivering electric vehicle infrastructure by developing electricity grid infrastructure and capacity to respond to increased demand from growth in EV use; and developing pilot proposals for blended finance public-use EV charging hubs in locations which align with the City Mobility Plan's aims of increasing sustainable travel and avoid adding to city-centre congestion.

The following are specific actions to aid transition to low emission vehicles.

Action 5.1 Continue the ECO Stars fleet recognition scheme

Funding Source: The Scottish Government

Costs: £10k per annum

Action 5.2 Update Edinburgh Planning Guidance to incorporate a greater provision of electric vehicle (EV) infrastructure in new developments.

Funding Source: The Council

Cost: Low

Action 6: Support Actions in the Council's 2030 Climate Strategy

There is a link between emissions of greenhouse gases and poor air quality. The co-emission of greenhouse gases and short-lived air pollution is well established in some sectors, including fossil fuel electricity production, industrial manufacturing, space heating, transportation and agriculture[13]. National and local commitments to a net zero greenhouse gas budget create major opportunities for delivering additional economic and environmental co-benefits including an improvement in ambient air quality, and vice versa.

For air pollutants, in contrast to greenhouse gas emissions, it matters if emissions shift closer to areas of population (even if total national emissions decrease). For example, air pollutants from district heating biomass boilers can have disproportionate impacts on people close by compared with large power generation facilities remotely located, and with tall chimneys.

The 2030 Climate Strategy sets out a series of strategic actions across a number of priority areas and to support the delivery of the strategy, an implementation plan has been developed setting out deliverables, milestones, timescales, resources, and an approach to measuring outcomes and impact. It is anticipated that the implementation plan will evolve over the lifespan of the 2030 Climate Strategy.

This AQAP fully supports measures set out in the 2030 Climate Strategy, which include the following priority areas:

- Accelerating energy efficiency in homes and buildings,
- Enabling the development of a citywide programme of heat and energy generation and distribution infrastructure,
- Accelerating the decarbonisation of public transport,

[13] Air Quality Expert Group (2020) Impacts of Net Zero Pathways on future Air Quality in the UK. Available at: https://uk-air.defra.gov.uk/assets/documents/reports/cat09/2006240802_Impacts_of_Net_Zero_pathways_on_future_air_quality_in_the_UK.pdf

- Renewing the focus on climate resilience and accelerating adaptation of the city,
- Supporting citizen empowerment, behaviour change and community activism, and;
- Supporting business transition and the green economy.

In particular, supporting behaviour change, actions around accelerating energy efficiency in homes and buildings, developing heat and energy generation and reducing the need for fossil or solid fuels, as well as supporting business transition, should also reduce emissions of local pollutants.

The LEZ has a secondary objective to contribute towards net zero greenhouse gases target which will predominantly occur as a result of a shift to sustainable travel modes, rather than from fleet compliance. This is supported by CAFS2 which contains an action to look at opportunities for promoting zero carbon city centres within the LEZ structure.

In addition, the following new specific action is included in the AQAP in relation to the Climate Strategy:

> ***Action 6.1*** Discourage the uptake and use of biomass in commercial settings through Planning Policy in order to ensure no negative impacts on local air quality and to support the transition to low carbon technologies.

Funding Source: The Council

Cost: Low

Action 7: Integrated Policies and Guidance to Support Better Air Quality

Integrated policies and guidance, including a coherent message to residents and visitors to Edinburgh, is essential to support the aims of this AQAP. This is also a key theme in CAFS2. There are a number of policies already in place which will help support air quality, which have been outlined in previous sections of the Plan. Most of these policies cannot be quantified in terms of the impact on pollutant concentrations at specific locations, but they will lead to an overall reduction in emissions across Edinburgh, which in turn will reduce concentrations.

CAFS2 request local authorities, with support from the Scottish Government to assess how effectively air quality is embedded in plans, policies, City Deals and other

initiatives, and more generally in cross departmental working, identifying and addressing evidence, skills, awareness and operational gaps. An action is recommended to this effect.

The appropriate regulatory framework is in place to guide new and existing developments in the city to minimise emissions, for example by reducing travel demand and opening up possibilities for increasing cycling and walking. The emerging City Plan 2030 sets out the strategy for proposals and policies to shape development and inform planning decisions in the city over the next 10 years and beyond. Air quality is embedded within the City Plan within 'Making Edinburgh a sustainable, active and connected city'. The City Plan 2030 aims to reduce reliance on the car (incorporating a target to reduce car kilometres travelled by 30%) and ensure that Edinburgh moves towards its climate change targets, whilst delivering new homes, particularly to the west of the city.

The aim of Action 7 overall is to ensure that air quality is considered fully and consistently within the planning process, both within policy, guidance and development management. Specifically, that developers know what is required of them, and that mitigation, proportionate to the impacts of the development is routinely implemented. This will be undertaken by reviewing the Edinburgh Design Guidance, to ensure that it fully covers the air quality considerations of new developments. In addition, wider planning processes will also consider air quality, such as the City Mobility Plan, Edinburgh City Centre Transformation Programme and the 2030 Climate Strategy (Action 6).

The National Modelling Framework, developed through the extensive Low Emission Zone development work, ultimately provides a two-tiered standardised approach to modelling air quality – locally and at regional levels - using a nationally consistent methodology. The local, city models informed the LEZ design decision making, whilst the regional model will offer an air quality assessment-based tool within and across neighbouring local authority areas associated with large-scale planned developments. SEPA are leading on this work, which may entail the use of the Airius project[14] modelling in relation to human health effects. As a later work package,

[14] The UK AERIUS project will develop an online tool to support UK risk assessment of air pollution effects on ecosystems, statutory reporting requirements and also the potential to support the issue of permissions for individual plans or projects (for example, Environmental Permits and planning permission). https://jncc.gov.uk/our-work/uk-aerius/

discussions will be undertaken with the Scottish Planning Group to integrate this into the Scottish planning process.

Use of construction Non-Road Mobile Machinery (NRMM)[15] is controlled locally through the planning process, where conditions and/or informatives are routinely applied to individual planning consents to minimise NRMM emissions during the construction phase of development. Further action on will be supported through the CAFS2 process which commits to providing guidance based on existing industry-led guidelines such as the Supply Chain Sustainability School and the London NRMM guidelines. Guidance would focus on construction projects in AQMAs, cover construction NRMM with a net power rating of between 37kW and 560kW and seek to progressively tighten over time using the NRMM engine emission stages.

In order to support collaborative working between planners and air quality professionals, a workshop will be undertaken to increase collective knowledge of the air quality issues and discuss how the process of assessing impacts within the local government context is undertaken.

Wider collaboration will also continue with transport professionals (Council transport planners and Transport Scotland), planners, climate strategy colleagues and with NHS Lothian in order to identify future policy areas which will require consideration.

The following are new specific actions to be contained within the Action Plan to support policy integration:

> ***Action 7.1*** Host a workshop with relevant Council officers including planning officers (development management and strategic planning), transport, environmental protection, housing and regeneration to increase collective knowledge of air quality issues and solutions,
>
> ***Action 7.2*** Use SEPA's regional air quality model to investigate the impacts of City Plan development on air quality in the long term. This may entail the use of the Airius project modelling in relation to human health effects (the project is currently looking at ecological receptors),

[15] NRMM includes mobile machines, and transportable industrial equipment or vehicles which are fitted with an internal combustion engine and not intended for transporting goods or passengers on roads, such as that on construction sites, but also generators and other machinery NRMM does not utilise the Euro emission standards as adopted by vehicles. Rather, the UK Government introduced new legislation via the Non-Road Mobile Machinery (Type-Approval and Emission of Gaseous and Particulate Pollutants) Regulations 2018, where the most recent NRMM stage is Stage V. However, not all NRMM machinery will comply with the Stage V level as they were manufactured before the 2018 Regulations were established

Action 7.3 Lobby Scottish Government for an update of licensing laws to tackle concerns such as patio gas heaters and external solid fuel burning in licensed premises,

Action 7.4 Continue to enforce against vehicle idling and expand awareness raising campaigns, including advising commercial fleet operators at Council's Events Planning and Oversight Group of engine-idling laws, and;

Action 7.5 Ensure Placemaking strategies and guidance including Place Briefs take account of air quality.

Funding Source: The Council, SEPA

Cost: Low

Action 8: Control Domestic Emissions

Open fires and wood-burning stoves have risen in popularity over recent years. They are now an additional form of heating for many households in both urban and rural areas. This increase in burning solid fuels in our homes is having an impact on our air quality and now makes up the single largest contributor to UK wide Particulate Matter emissions at 38%[16]. This compares with industrial combustion (16%) and road transport (12%). What people burn and the appliance they use will have a significant impact on emissions. A report by King's College London[17], measuring local concentrations, found that wood burning accounts for up to 31% of the urban derived $PM_{2.5}$ in London.

The Scottish Government have recently commissioned research, to provide the context for Scotland, focusing on urban air pollution issues, particularly domestic combustion and its distribution, its effects on particulate matter and the consequences for human health. Issues around solid fuel burning in urban areas like Edinburgh will be very different to rural areas of Scotland. Once this research is available a specific action(s) will be explored and an update to this Action Plan made for consideration if necessary. See Appendix B.

Not all forms of domestic burning are equally polluting. The appliance (for example, stove or fireplace), how well it is used and maintained, and what fuels are burnt in it,

[16] Clean Air Strategy 2019 https://www.gov.uk/government/publications/clean-air-strategy-2019
[17] Font, Fuller et al, 'Airborne particles from wood-burning in UK cities' (2017), https://uk-air.defra.gov.uk/assets/documents/reports/cat05/1801301017_KCL_WoodBurningReport_2017_FINAL.pdf

all make a big difference to how much pollution is produced. Significant air quality benefits can be realised, both by reducing the amount burnt (especially if the stove is a secondary source of heat), or through a new efficient appliance as compared with an old stove or open fire.

There are other simple steps that households can take to limit emissions both indoors and out. For example, using cleaner fuels, in a cleaner appliance which is installed by a competent person, knowing how to operate it efficiently, and ensuring that chimneys are regularly swept, will all reduce emissions. However, a reduction in solid fuel burning towards low carbon renewable sources of heat and power, as being implemented through the 2030 Climate Strategy will reduce the overall emissions of this sector.

There needs to be careful messaging around the reduction in solid fuel burning, and 'burning better' which may appear as an endorsement of solid fuel burning. A longer-term shift to heat pumps will provide benefits from both a climate change and air quality perspective.

Nationally, CAFS2 provides a number of actions around solid fuel burning, including encouraging the uptake of Ecodesign stoves, working with business and industry to support educational schemes (such as Woodsure and Ready to Burn), taking forward potential measures to control the supply of the most polluting domestic fuels – including a ban on house coal, and restricting the sulphur content of smokeless fuels to 2% and prohibiting the sale of wet wood. In developing programmes to support households and businesses in transitioning to low-carbon heating solutions, consideration will be given to the needs of those affected by controls on the supply of the most polluting domestic fuels. At a policy level, the Scottish Government will consider what changes are needed to current permitted development rights for flues for woodburning stoves and consider revision of the Clean Air Act.

The Council will support work being undertaken by the Scottish Government in reducing emissions from this source, and where necessary undertake the following actions:

> ***Action 8.1*** Local information campaigns to support the national message – for example communications from the Council in winter on energy needs to work in partnership with air quality messaging. Direct campaigns on Solid fuel

burning need to balance messages around reducing burning, and ‘burning better’,

Action 8.2 Lobby Scottish Government to review the Clean Air Act, in particular supporting abolishing permitted development rights for flues for woodburning stoves and biomass boilers, and;

Action 8.3 Review complaints and gather information on solid fuel burning to see whether there are any ‘hotspot’ areas within the city and inform any targeted interventions.

Funding Source: The Council and the Scottish Government

Cost: Low

Action 8.4 Lead on the development and delivery of net zero community pilots based in geographies with different demographic profiles and community capacity,

Action 8.5 Develop a Whole House Retrofit (WHR) delivery programme for retrofitting social housing across the city to the highest energy standards, to reduce energy demand and tackle fuel poverty.

Funding Source: The Council and the Scottish Government

Cost: High

Quantification of AQAP Actions

The actions within this draft AQAP have been developed based on the best available evidence of what works in securing emissions reductions within the wider priorities of the AQAP. Actions being implemented across different timescales, alongside other policy processes at local, national and international levels mean that it is rarely possible to definitively attribute specific actions to outcomes, as outcomes are often driven by multiple and inter-related factors and can be difficult to measure with current datasets.

Implementation of the Low Emission Zone (Action 1), has been quantified within ongoing work for the National Modelling Framework, undertaken by SEPA in collaboration with local authorities and the Scottish Government. If the LEZ is fully implemented NOx emissions from traffic sources within LEZ are expected to reduce by 55% (equivalent to 25-30 tonnes/year), when compared to 2019 levels. However, since the modelling was undertaken, the Covid pandemic has meant that changes to travel patterns have occurred, and other issues such as availability of new vehicles are likely to impact on predicted changes.

Many of the other measures cannot be easily quantified, as they are ongoing interventions to be implemented over a number of years, and it is difficult to know what the impact will be specifically in the areas of exceedance, or where/whether there will be an exceedance area following implementation of the LEZ and while the city recovers from the Covid pandemic. Some measures, although have not been specifically quantified, are designed to reduce emissions more widely than just the exceedance area.

It is proposed to use SEPA's regional model to quantify other long-term impacts, such as the impact of additional population growth in the City Plan 2030, if that is feasible, which will assist with ongoing LAQM work.

It is also proposed to quantify transport-based emissions in line with emissions inventories for climate change, which will provide an overall picture of trends, although this will not provide data on any remining hotspot areas.

It is judged that with the implementation of the LEZ, the actions outlined in this draft plan and the Council's wider commitments, the current air quality objectives for NO2 will be achieved within the duration of the Plan. There also is evidence that the rate

of diesel vehicle sales is reducing, and the proportion of lower emissions vehicles (Euro 6/VI, electric or part electric) is increasing in Edinburgh and across Scotland, and this will also have a relatively large impact on concentrations across the city.

Cost Effectiveness of AQAP Actions

The Scottish Government does not expect authorities to undertake detailed cost-benefit analyses in their AQAPs.

However, to provide an indication of cost effectiveness, the table below has been determined using best professional judgement to clearly set out impact (i.e., effectiveness) and cost in a qualitative way. Although the impacts for many of the actions is judged to be low individually, as a package, and over a number of years, the impacts of the measures will cumulatively be much larger.

Table 6.2 Cost Effectiveness of AQAP Actions

Action No.	Action	Impact on Air Quality	Cost	Lead Authority (Service Area)
1 LEZ	1.1 Implement the Low Emission Zone, including key actions as follows: • Network Mitigation Strategy including engagement on details undertaken and traffic orders in place • Signage notifying drivers at LEZ boundary and on key approach roads • Enforcement infrastructure and systems • Communications timed across period to June 2024 to ensure maximum early compliance Further develop the LEZ through continued working with Scottish Government to review and improve LEZs by publishing regular updates on LEZ performance and continue to update the LEZ City Model developed under the National Modelling Framework to reflect changes to the road network and more recent fleet predictions from ANPR data collected.	High	High	The Council (Placemaking and Mobility, Network Management and Communications)

	1.2 Work with Transport Scotland and SEPA to look at opportunities to promote zero-carbon city centres within the existing LEZs structure.	Low	Low	The Council (Placemaking and Mobility)
2 Strategic Transport	2.1 In the context of a strategic approach to traffic management that seeks to reduce motorised traffic and encourage public transport and active travel, seek to ensure that traffic management projects achieve positive impacts on air quality especially in locations in breach of, or at risk of breaching, air quality objectives, and include mitigations for negative impacts.	Medium (locally) – depending on scheme implemented	Medium	Council (Network Management)
	2.2 Undertake detailed design work for the St John's Road / Drumbrae South junction and implement improvements	Medium (locally) – depending on scheme implemented	High	The Council (Placemaking and Mobility
	2.3 In conjunction with Transport Scotland, ensure that any new traffic management schemes within the Glasgow Road AQMA achieve improvements in local air quality and reduce exposure to pollutants	Medium (locally) – depending on scheme implemented	Low	The Council (Network Management) and Transport Scotland
	2.4 Make use of the City's air quality model developed under the CAFS National Modelling Framework (NMF) for the LEZ, to help understand the air quality impacts of proposed street projects; and to assist in the selection of mitigation measures where necessary, to maximise improvements in air quality	Low (directly), but will reduce the risk of future impacts	Low	The Council Placemaking and Mobility) and SEPA
3 Active Travel	3.1 Engage in Clean Air Day on an annual basis over the 5-year period of this plan	Low individually, but potential for cumulative active travel modal shift to be medium	Low	The Council (Placemaking and Mobility)
	3.2 Work with Council education officers, and schools to increase awareness of air quality across the school community		Low	The Council (Placemaking and Mobility) and SEPA
	3.3 Utilise citizen science projects looking at air quality to encourage behaviour change towards active travel modes		Low	The Council (Placemaking and Mobility)
4 Public Transport	4.1 Incorporate air quality considerations into the new	Potential to be high in long term,	Medium	The Council (Placemaking and Mobility)

	Public Transport Action Plan (PTAP)	depending on modal shift		
	4.2 Support projects to decarbonise the Edinburgh bus fleet.	Potential to be high in long-term depending on shift to electric	High	The Council (Placemaking and Mobility)
5 Low Emission vehicles	5.1 Continue the ECO Stars fleet recognition scheme	Low	Low	The Council (Regulatory Services)
	5.2 Update Edinburgh Planning Guidance to incorporate a greater provision of EV infrastructure in new developments	Medium (over a number of years)	Low	The Council (Planning and Building Standards)
6 2030 Climate Strategy	6.1 Discourage the uptake and use of biomass in commercial settings through Planning Policy in order to ensure no negative impacts on local air quality and to support the transition to low carbon technologies	Potentially medium locally	Low	The Council (Planning and Building Standards)
7. Integrated Policy	7.1 Host a workshop with relevant Council officers to increase collective knowledge of air quality issues and solutions	Low	Low	The Council (Placemaking and Mobility)
	7.2 Use SEPA's regional air quality model to investigate the impacts of City Plan development on air quality in the long term	Low	Low	The Council (Planning and Building Standards) and SEPA
	7.3 Lobby Scottish Government for an update of licensing laws to tackle concerns such as patio gas heaters and external solid fuel burning in licensed premises	Low	Low	The Council (Regulatory Services)
	7.4 Continue to enforce against vehicle idling and expand awareness raising campaigns, (including advising commercial fleet operators at EPOGs (Events Planning and Oversight Group) of engine idling laws)	Low	Low	The Council (Network Management)
	7.5 Placemaking strategies and guidance including Place Briefs to take cognises of air quality.	Low (directly), but will reduce the risk of future impacts	Low	The Council (Planning and Building Standards)
8 Domestic Emissions	8.1 local information campaigns to support the national message – for example communications from the Council in winter on energy needs to work in partnership with air quality messaging	Low	Low	The Council (Placemaking and Mobility, Communications)

	8.2 Lobby Scottish Government to review the Clean Air Act, in particular supporting abolishing permitted development rights for flues for woodburning stoves and biomass boilers	Low (directly), but will reduce the risk of future impacts	Low	The Council (Regulatory Services)
	8.3 Review complaints and gather information on solid fuel burning to see whether there are any 'hotspot' areas within the city and inform any targeted intervention	Low	Low	The Council (Regulatory Services)
	8.4 Lead on the development and delivery of net zero community pilots based in geographies with different demographic profiles and community capacity	Low	High	The Council (Policy and Insight)
	8.5 Develop a Whole House Retrofit (WHR) delivery programme for retrofitting social housing across the city to the highest energy standards, to reduce energy demand and tackle fuel poverty	Low	High	The Council (Housing Strategy & Development)

Impact: *Low* – would reduce emissions, but not measurable by air quality monitoring and would be termed 'negligible' using industry standard guidance for modelling the impacts of developments; *Medium* - a change could be detected using an air quality model such as the NMF, but unlikely to be measurable by air quality monitoring; *High* – a change could potentially be monitored using standard monitoring techniques. It should be noted that the impact is based on NO_2, not $PM_{2.5}$.

Cost: *Low* - < £50K; *Medium* - £50K-£250K; *High* - >£250K

Appendix A: Steering Group

At the first meeting, background to the air quality issue in Edinburgh was set out, the process of the AQAP was discussed, and insight shared into existing and future policy measures within Edinburgh and how these may assist in the implementation of actions within this Plan (and vice versa). Some discussions around evaluation of the actions were also held.

Meetings with specific members of the Group, and others with relevant responsibilities have also been held. These have included meetings relating to Climate Change work, the Council's Travel Plan, EV infrastructure and Parking Strategy and Public Transport. SEPA have provided specific information on the LEZ and NMF modelling development.

The second meeting focussed on measures for inclusion within this document and the third meeting was to provide specific comment on a draft version of this document, including details of the measures included, and the overall focus of the document. The Steering Group will continue to be fully involved, and consulted on as the process continues, through a wider consultation.

More specifically, the Steering Group was made up of the following members:

- Executive Director of Place
- Service Director – Sustainable Development
- Service Director – Operational Services

As well as the Council Service managers for:

- Placemaking and Mobility
- Planning and Building Standards
- Network Management and Enforcement (Transport)
- Policy and Insight (Sustainability)
- Regulatory Services
- Finance and Procurement
- Communications

In addition, the project team consisted of

- Environmental Health Officers

- Place, Environment & Heritage Team Leader
- Air Quality Consultants Ltd

Associate members from external bodies included SEPA, Transport Scotland and NHS Lothian.

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Appendix B: Reasons for Not Pursuing Action Plan Measures

Table B.1 – Action Plan Measures Not Pursued and the Reasons for that Decision

Action category	Action description	Reason action is not being pursued
Strategic Transport **Transport Planning and Infrastructure**	New or extensions to Park and Ride schemes	The Public Transport Action Plan is currently under development and is likely to consider this action in more detail
Domestic Emissions **Solid Fuel Burning**	Review and action relevant outcomes of the national study on domestic solid fuel burning.	Once the research become available the Council will review the findings and take relevant action on outcomes, through working with Scottish Government under the Cleaner Air for Scotland Strategy 2. This process will be picked up in the Edinburgh Air Quality Annual Progress Reports for the city, which monitor the actions in this Plan.

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality objectives
AQC	Air Quality Consultants Ltd
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
AQS	Air Quality Strategy
APR	Air quality Annual Progress Report
BEAR	Bus Emission Abatement Retrofit
CAFS	Cleaner Air for Scotland
Defra	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
ECCT	Edinburgh City Centre Transformation
ESS	Environmental Standards Scotland
EU	European Union
EV	Electric Vehicle
HETAS	Heating Equipment Testing and Approval Scheme
HGV	Heavy Goods Vehicle
LAQM	Local Air Quality Management
LEZ	Low Emission Zone
LPG	Liquid Petroleum Gas
LTN	Low Traffic Neighbourhood
MOVA	Microprocessor Optimised Vehicle Actuation

NLEF	National Low Emission Framework
NMF	National Modelling Framework
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPF	National Planning Framework
OLEV	Office for Low Emission Vehicles
PAN	Planning Advice Note
PCM	Pollution Climate Mapping
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
SCOOT	Split Cycle Offset Optimisation Technique
SEPA	Scottish Environmental Protection Agency
SG	Scottish Government
SPP	Scottish Planning Policy
TEOM	Tapered Element Oscillating Microbalance
TS	Transport Scotland
WHO	World Health Organisation