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Bearsden Air Quality

Action Plan

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Executive summary

Bearsden Air Quality Action Plan Executive Summary

As part of its statutory duties, East Dunbartonshire Council monitors and assesses local air quality levels within its boundaries. A Detailed Assessment of air quality in 2008 identified potential exceedence of air quality objectives for both Nitrogen Dioxide (NO_2) and fine particle material (PM_{10}) within Bearsden. Further investigation of the potential exceedences confirmed that air quality objectives would not be met along the A809 Drymen Road/A810 Duntocher Road corridor within Bearsden and around the Bearsden Cross area close to Roman Road.

In 2011, East Dunbartonshire Council declared an area of Bearsden an Air Quality Management Area in response to the predicted exceedences of air quality objectives for NO_2 and PM_{10}. In order to improve air quality, a Draft Action Plan was developed to identify actions and policies which East Dunbartonshire Council could implement to ensure that the air quality objectives were met. This Draft Action Plan was developed with the assistance of Ricardo-AEA air quality consultants and was consulted upon by the public and statutory consultees in early 2018. A summary of the responses can be found in Appendix 3. Appraisal of the document by statutory consultees recommended that further quantification work be undertaken and the findings of that exercise can be found in Appendix 4. The updated Action Plan was approved by committee in August 2019.

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion. East Dunbartonshire Council is committed to reducing the exposure of people in East Dunbartonshire to poor air quality in order to improve health.

What is the cause of the problem?

An assessment was undertaken to identify the main sources of pollutant concentrations within the AQMA. The assessment found that road traffic emissions appear to be the main contributor and in particular, emissions from queuing traffic of all vehicle classes, and emissions from cars. It was shown that a reduction in both queuing of traffic and the volume of traffic within the AQMA would result in a decrease in NO_2 concentrations. Road traffic is the main contributor to PM_{10} and a reduction in both queuing traffic and volume of traffic would result in a decrease of PM_{10} annual mean concentrations.

The Action Plan therefore considered measures that the Council could support to reduce emissions of NO_2 and PM_{10}. Of the 29 original measures aimed at reducing pollutant concentrations, only one has not progressed and the reasons for that are documented. The actions were identified through consultation with internal stakeholders and where possible, are linked to other existing Council policies and Plans. The measures have been updated and incorporated into the Bearsden Action Plan.

The actions are separated into six option categories:

1. Strategic measures
2. Move sources away from AQMA
3. Traffic Management
4. Reduce emissions from sources by technical means
5. Reduce emissions from sources by reducing demand for travel or achieving better travel choices
6. Other

Our priorities are to tackle emissions from all vehicle types, particularly from queuing traffic and congestion. We will outline how we plan to effectively tackle air quality issues within our control however, we recognise that there are a large number of air quality policy areas out with our influence (such as vehicle emission standards agreed in Europe) but for which we may have useful evidence, and so we will continue to work with the Scottish Government and central government on policies and issues beyond East Dunbartonshire Council's direct influence.

The Action Plan also includes measures to raise awareness of local air quality issues, the health benefits of reducing atmospheric pollution within the AQMA and information on how the public can help reduce atmospheric pollution within the AQMA. The Action Plan sets out targets and a schedule of reporting to ensure the public is kept informed of what the Council is doing to improve local air quality and the progress being made to reduce pollutant levels. These measures have been quantified and further updated following consultation. The quantification report is included as Appendix 4.

What happens next?

Some measures have not progressed as they are thought not to result in a worthwhile benefit to improving local air quality. The remaining measures are presented here having been consulted upon and altered where appropriate in response to comments received during the consultation process. This Air Quality Action Plan requires to be approved by Council prior to publication and being made publicly available and passed through committee in August 2019.

The Action Plan will be subject to an annual review contained within the Annual Progress Report produced by East Dunbartonshire Council as part of our statutory Local Air Quality Management duties.

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Appendices

References

1 Introduction

This Plan has been produced by East Dunbartonshire Council and constitutes the Air Quality Action Plan (AQAP) designed to address the air quality problems identified in the Bearsden Air Quality Management Area (AQMA). It is a statutory duty for East Dunbartonshire Council to develop an Air Quality Action Plan following the declaration of an AQMA in response to identified exceedance(s) of one or more of the air quality strategy objectives. Before the plan can be adopted it must be subject to consultation with the general public, and must also be appraised and accepted by the Scottish Government and the Scottish Environment Protection Agency as being suitable for purpose. The purpose of the Air Quality Action Plan is, on the basis of the evidence available, to set out the local actions that will be implemented to improve air quality and work towards meeting the objectives. In the intervening period since the Plan was created, levels have reduced sufficiently and are now below the objective levels however, we will continue to work towards further reducing pollutant levels across East Dunbartonshire. Not all of the measures discussed in this report have been formally adopted by East Dunbartonshire Council, but are actively under consideration.

The Action Plan has been developed from discussions within a steering group and on the basis of guidance from East Dunbartonshire Council's contracted consultants, Ricardo Energy & Environment. The Plan has been subject to internal consultation and will thereafter be submitted to:

- East Dunbartonshire Council
- The Scottish Government
- The Scottish Environment Protection Agency (SEPA)
- Statutory consultation, where the document will be made available to the general public and other stakeholders for scrutiny and general comment.

Comments received during the internal consultation process were taken into consideration and where possible incorporated into the Plan. The final version of the Plan will be submitted to the Scottish Government and SEPA for appraisal, and if accepted will then be adopted as a formal authority plan and will be implemented via the efforts of East Dunbartonshire Council and other stakeholders.

It should be noted that the Bearsden Air Quality Action Plan was subject to statutory and public consultation in early 2018 and the comments received have been appraised, and where necessary, appropriate amendments have been made. A summary of the comments received can be found in Appendix 3. Appraisal comments recommended further quantification work be undertaken and this is included in Appendix 4.

During the period in which the Action Plan has been drafted, some of the proposed measures have already been adopted and put into place. Ongoing local air quality monitoring has indicated an ongoing reduction in objective levels and this should be taken into account when deciding on which final measures to adopt.

Progress Reports Update

Over the intervening years during which the Action Plan has evolved, there has been a gradual improvement in air quality across East Dunbartonshire and since the declaration of Bearsden Air Quality Management Area, the objective levels have, on the whole, continued to decrease. The 2018 Annual Progress Report indicates that NO_2 and PM_{10} levels in Bearsden are well below the Scottish Objective levels although there remains some diffusion tube locations where the annual mean NO_2 level is close to the objective. The Council is committed to continually improving the air quality throughout East Dunbartonshire and will endeavour to implement the measures within this Plan, particularly those found to give the best pollutant reduction. The appraisal of the Annual Progress

Report 2018 has recommended that Bearsden AQMA be revoked for NO_2 annual mean exceedences as objective levels have reduced sufficiently however, we will continue to monitor and review our data for a further year to obtain one full year of data so that we will be in a position to make a decision on revocation.

1.1 Objectives

This Air Quality Action Plan summarises the air quality review and assessments that have been undertaken within East Dunbartonshire Council to date. It has focused on exceedances of the Air Quality Strategy Objectives, and outlined the mechanisms and the targeted measures proposed by the Council with the aim of improving local air quality. The plan focuses on air quality within the area surrounding Bearsden Cross, where an Air Quality Management Area (AQMA) came in to force in July 2011 as a result of predicted NO_2 and PM_{10} concentrations in excess of the 2010 NO_2 and PM_{10} annual mean objective at locations of relevant exposure. Current data has indicated that there were no exceedences in Bearsden however, that said, we are committed to progressing the measures in the action plan to ensure our air quality continues to improve. Twenty nine action plan measures were incorporated into the Action Plan, many of which have already been developed/ implemented through existing plans and policies and one has not been taken forward. In addition, new measures have been proposed aimed at supplementing ongoing activities and focussing specifically on improving air quality within the Bearsden AQMA. However, many of the measures included within the Action Plan will also contribute to improving air quality within Bearsden and wider East Dunbartonshire area generally.

1.2 Report content and structure

Policy Guidance LAQM.PG(S) (16) was published by Defra in 2016[1] and provides statutory guidance on the development of air quality action plans. As a minimum, the AQAP is expected to include the following:

- Quantification of the source contributions to the predicted exceedances of the objectives; this will allow the action plan measures to be effectively targeted
- Evidence that all available options have been considered on the grounds of cost effectiveness and feasibility
- How the local authority will use its powers and also work in conjunction with other organisations in pursuit of the air quality objectives
- Clear timescales in which the authority and other organisations and agencies propose to implement the measures within its plan
- Quantification of the expected impacts of the proposed measures and, where possible, an indication as to whether the measures will be sufficient to meet the objectives
- How the local authority intends to monitor and evaluate the effectiveness of the plan

At the time of writing the first draft of this action plan the Scottish Government recommended that a Further Assessment of air quality should be undertaken in parallel with the development of the action plan to provide the technical justification for the measures an authority later includes in its action plan. This Further Assessment has been undertaken and the findings have been summarised in this plan.

[1] Defra (2016) *Local Air Quality Management Policy Guidance 2016*: Defra, Area 2C, Nobel House, 17 Smith Square, London, SW1P 3JR air.quality@defra.gsi.gov.uk [Publication]. Available at: https://consult.defra.gov.uk/communications/laqm_changes/supporting_documents/LAQMPolicyGuidance2016.pdf (Accessed: 14/07/16.

The remainder of this report is structured as follows:

- **Chapter 2** provides a brief overview of the significance of local air quality management on human health, the statutory duties placed on local authorities, and a summary of existing plans and strategies which may influence air quality at the study location;
- **Chapter 3** presents a summary of recent reviews of local air quality undertaken by East Dunbartonshire Council, and the results of the source apportionment exercise undertaken for the Bearsden AQMA including the improvement required to meet the air quality objectives;
- **Chapter 4** describes how the AQAP has been developed by East Dunbartonshire Council;
- **Chapter 5** presents the range of potential options that were considered when aiming to improve local air quality within the Bearsden AQMA and a summary of proposed measures to be assessed against a variety of criteria;
- **Chapter 6** provides an overview of the assessment process and the results of an assessment of each option;
- **Chapter 7** summarises the AQAP, outlining measures proposed for implementation and makes reference to important factors that require to be considered and addressed prior to the adoption of the plan.

2 Ambient Air Quality and Local Air Quality Management

This chapter outlines the significance of local air quality management in the context of human health, the legislation in place to protect human health, and the statutory duties placed on local authorities in relation to Local Air Quality Management. This information is included to provide readers with a general overview of air quality issues and the Local Air Quality Management process in Scotland.

2.1 Potential impacts of air pollution on human health

Air pollution has been associated with a wide range of effects on human health and the wider environment; however, it is the potential negative impacts of ambient air pollution on human health that is the primary focus of local air quality management. Air pollution has been associated with both long and short-term effects on human health (COMEAP, 2009; Updated 2018), the effects influenced by factors such as the type and concentration of pollutant and the duration of exposure. Short-term exposure to high concentrations of common outdoor pollutants has been linked with a temporal increase in hospital admissions (Anderson et al., 2001).

In the long-term, the available scientific evidence indicates that air pollution can have a significant effect on human health, although the effects will vary depending on where an individual lives (urban or rural) and the type of pollutant(s) to which they are exposed. Whilst the full extent of these impacts across the population is difficult to quantify, in the UK, poor air quality is considered to reduce the average life expectancy by several months (COMEAP, 2009, updated 2018). In general, air quality in the UK is considered to have improved significantly since the smogs of the 1950s, with improvement primarily resulting from the increased regulation of domestic and industrial emissions. However, in recent years, emissions from motor vehicles have been shown to be having an increasing impact on urban air quality. As a result, a large number of authorities across the UK have declared Air Quality Management Areas in response to identified exceedances of the air quality strategy objectives and are developing plans to improve air quality at the local level.

Furthermore, action is also being taken at national and international levels to reduce exposure to air pollution. National Government, through the Air Quality Strategy for England, Scotland, Wales and Northern Ireland and the Integrated Transport Policy, is setting the framework for local action to be taken to reduce levels of pollution (AQS, 2007).

2.2 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Under Part IV of the Environment Act, 1995, local authorities have a statutory duty to undertake periodic reviews of ambient (outdoor) air quality within their respective boundaries. The 1997 Air Quality Strategy introduced the Local Air Quality Management (LAQM) model and associated Review and Assessment process.

The most recent version of the Air Quality Strategy sets out the UK vision for clean air for a good quality of life and the steps being taken to achieve this. The Strategy also outlines the established framework of local air quality management and details a series of air quality objectives to be achieved with the aim of protecting human health and the environment. The objectives have been set throughout the UK at levels that aim to protect the vulnerable in society from the harmful effects of breathing pollution (AQS, 2007), although more stringent national objectives have been established in Scotland (annual mean objective for PM_{10}). Additionally, the Scottish Government introduced the requirement for local authorities to monitor $PM_{2.5}$ as of April 2016 with an annual mean objective level of 10µg/m^3 to be achieved by December 2020.

A list of the air quality objectives relevant to Scotland is presented in Table 1.

Table 1: Air Quality Objectives

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	3.25 µg m^{-3}	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg m^{-3}	Running annual mean	31.12.2003
Lead	0.5 µg m^{-3}	Annual mean	31.12.2004
	0.25 µg m^{-3}	Annual mean	31.12.2008
Nitrogen dioxide	200 µg m^{-3} not to be exceeded more than 18 times a year	1 hour mean	31.12.2005
	40 µg m^{-3}	Annual mean	31.12.2005
PM_{10}*	50 µg m^{-3} not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
	18 µg m^{-3}	Annual mean	
$PM_{2.5}$	10 µg m^{-3}	Annual mean	31.12.2020
Sulphur dioxide	350 µg m^{-3} not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
		24 hour mean	31.12.2004
		15 minute mean	31.12.2005

Pollutant	Concentration	Measured as	Date to be achieved by
	125 μg m^{-3} not to be exceeded more than 3 times a year 266 μg m^{-3} not to be exceeded more than 35 times a year		

* These 2010 Air Quality Objectives for PM_{10} apply in Scotland only, as set out in the Air Quality (Scotland) Amendment Regulations 2002.

The Objectives apply at locations where members of the public are likely to be exposed over the averaging period of the objective. Table 2 below summarises the locations where these objectives should and should not apply respectively.

Table 2: Typical locations where the objectives should and should not apply

Averaging Period	Pollutants	Objectives should apply at …	Objectives should not generally apply at …
Annual mean	1,3 Butadiene Benzene Lead Nitrogen dioxide PM_{10} $PM_{2.5}$	All background locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, libraries etc.	Building facades of offices or other places of work where members of the public do not have regular access. Gardens of residential properties. Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term
24 hour mean and 8-hour mean	Carbon monoxide PM_{10} Sulphur dioxide	All locations where the annual mean objective would apply. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building facade), or any other location where public exposure is expected to be short term.
1hour mean	Nitrogen dioxide Sulphur dioxide	All locations where the annual mean and 24 and 8-hour mean objectives apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks and railway stations etc. which are not fully enclosed.	Kerbside sites where the public would not be expected to have regular access.
15 minute mean	Sulphur dioxide	Any outdoor locations to which the public might reasonably be expected to have access. All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	Kerbside sites where the public would not be expected to have regular access.

Whilst it is anticipated that measures adopted at a national and international level will enable the objectives to be attained in the majority of relevant locations, measures adopted at a local level can make a significant contribution to improving air quality in specific locations. The UK government acknowledges the significant role that local authorities play in helping to achieve the air quality objectives.

2.3 The Local Air Quality Management Regime

Part IV of the Environment Act, 1995, places numerous statutory duties on local authorities in relation to local air quality management, a summary of which is outlined below:

1. Local authorities are required to undertake annual assessments of current and future air quality within their respective authority boundary and determine whether any of the air quality objectives are likely to be exceeded.

2. Where an authority identifies an area where one or more of the objectives are likely to be exceeded, the authority is required to designate the identified area, by official Order, as an Air Quality Management Area (AQMA). Such Orders may be amended or revoked as a result of the findings of later air quality assessments where these indicate a change in the extent of the exceedance, or that the relevant objective(s) are likely to be attained.
3. Following the declaration of an AQMA, the local authority is required to undertake a Further Assessment of current and likely future air quality within the AQMA, and to develop an Air Quality Action Plan (AQAP) outlining the measures that will be implemented at a local level in pursuit of the air quality objectives. The Further Assessment should be completed within 12 months of the AQMA designation Order and provide the technical justification to enable the authority to prepare an AQAP "for the exercise by the authority, in pursuit of the achievement of air quality standards and objectives in the designated area". Note that authorities are not obliged to meet the objectives but must show that they are working towards them.

The Air Quality Strategy states that air quality issues should be dealt with in a holistic and multi-disciplinary way. In developing an Air Quality Action Plan it is therefore important that the local authority engages with officers across relevant Services, notably strategic-, development- and transport- planners, to ensure the actions are supported by all parts of the authority. It is vital that organisations, groups and individuals that have an impact on local air quality work towards the objectives of an adopted plan. Furthermore, it is essential that the AQAP considers existing policies and programmes in operation within the region that may have important implications for the plan.

2.4 Cleaner Air for Scotland (CAFS)

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

Vision

Scotland's air quality will be the best in Europe.

Mission Statement:

To protect and enhance health, wellbeing, environment, placemaking and sustainable economic growth through improved air quality across Scotland.

The Strategy has 6 key objectives including objectives for transport and placemaking. It acknowledges that air quality improvements cannot be made by one profession in isolation. Key areas of influence:

- Health
- Climate Change
- Legislation and policy
- Place making
- Communication
- Transport
-

Figure 1: 6 key areas of influence

There are a number of key areas of CAFS future development in which planning authorities/professionals will be involved and can influence:

Policy

1. Develop a 2 level National Modelling Framework (NMF) to provide a standardised approach for air quality modelling to support transport and planning decision making.
2. Develop a National Low Emission Framework (NLEF) for appraisal and implementation of transport and land use options to improve air quality.
3. Transport
4. Increase infrastructure and access for low/zero emission vehicles and active travel.
5. Placemaking
6. CAFS to align with future SPP and NPF updates
7. authorities to update Local Development Plans in line with CAFS
8. update air quality and planning guidance

2.5 Existing strategies and policies relevant to air quality in East Dunbartonshire

Numerous existing policies and strategies adopted at a local, regional and national level can exert significant effects, both positive and negative, on air quality in East Dunbartonshire. It is important that these plans and strategies are considered at an early stage of the development of the plan, as these will likely establish the context in which any specific options for improving air quality can be implemented. This Chapter identifies the most important of these.

2.5.1 The National Transport Strategy

The National Transport Strategy for Scotland was published in December 2006 and a Refresh was published in 2015 with a commitment to carry out a more comprehensive review in the 2016-2021 parliamentary period. The Strategy identified the need to provide an efficient, integrated and reliable transport network that successfully promotes economic growth, protection of the environment, health and social inclusion, and introduced three key strategic outcomes:

1. To improve journey times between Scotland's cities and towns and its global markets, tackle congestion and provide access to key markets.
2. To reduce emissions to tackle climate change

3. To improve the quality, accessibility and affordability of transport, to give people the choice of public transport as an alternative to the car

These key objectives have been designed to support the role of Government and respond to the strategic objectives, namely a Wealthier, Fairer, Smarter, Healthier, Safer, Stronger and Greener Scotland.

The plan includes a wide range of commitments aimed at tackling each of the key strategic objectives. Commitments identified as being of particular significance to East Dunbartonshire Council and the AQMA at Bearsden are:

- Investing to tackle congestion from the School Run
- Promoting SMART[2] measures on all journeys, focusing especially on the commute to work through developing travel awareness and marketing campaigns; Exploring with key partners sustainable travel across Scotland to reduce car use and promote cycling and walking
- Promoting and encouraging new vehicle technologies
- Supporting sustainable distribution strategies through the Scottish Road Haulage Association
- Publishing a Bus Action Plan to help achieve a step change in the quality of bus service provision
- Introducing integrated ticketing pilots to enhance the passenger journey.

The Strategy clearly states that regional transport partnerships, local authorities and transport operators will be key partners in delivering the strategic outcomes.

2.5.2 Regional Transport Strategy (2008-2021)

East Dunbartonshire Council is a member of the Strathclyde Partnership for Transport (SPT). SPT is one of seven Regional Transport Partnerships in Scotland. The SPT Regional Transport Strategy was developed to compliment the objectives of the National Transport Plan and establishes 17 strategic priorities which aim to achieve four high strategy outcomes of Improved connectivity; Access for All; Reduced Emissions; and, Attractive, Seamless, Reliable Travel.

SPT's core activities that are relevant to East Dunbartonshire and will help to achieve these outcomes are:

- Planning the regional transport network – analysing and planning the transport network across modes to ensure it meets the region's needs.
- Delivering regional projects – the project management and delivery of projects across the transport network.
- Delivering school transport – acting as an agent for member councils.
- Promoting developments on the rail network – Promotion and development of rail projects, in conjunction with Transport Scotland.
- Developing integrated ticketing initiatives – administering and developing a range of integrated tickets.
- Addressing transport affordability.
- Making journeys safer – planning and providing safety and security initiatives on the transport network.
- Providing bus infrastructure – operating, managing and developing bus stations and maintaining the network of bus shelters and stops.

[2] SMART Measures: Specific, Measurable, Achievable, Realistic and Time

- Giving travel information to the public – through marketing and education, through providing a network of travel centres and travel points, through timetables, and through using innovative technology.
- Supporting bus services.
- Providing demand responsive transport – for those with mobility problems.
- Promoting "smarter choices "– encouraging more sustainable travel.
- Promoting equality – developing transport initiatives to assist those who experience difficulties more than most when using the transport network.
- Developing walking and cycling initiatives – working with member councils and partners to increase use of these modes.
- Connecting freight – through the freight quality partnership, encouraging more sustainable transfer of freight.
- Integrating transport – across modes, and through timetabling, and with land-use and community plans.

The regional strategy also makes specific reference to key priorities in aiming to reduce transport's contribution to air quality, including encouraging people to car share and to make more use of active travel and public transport for at least part of their journeys; and promotion of "smarter choices", travel planning and active travel.

2.5.3 East Dunbartonshire Council Local Transport Strategy

The most recent adopted local transport strategy for East Dunbartonshire Council is Local Transport Strategy (LTS) 2013 - 2017[3] and work is underway for the period beginning 2018.

The LTS aims to set out objectives and transport interventions that will help address the changing needs of local communities across East Dunbartonshire in terms of providing a transport network that provides an effective and efficient way to travel across all travel modes. The transport network must meet the needs of all age groups of East Dunbartonshire and provide access to employment, healthcare, retail and leisure facilities.

East Dunbartonshire Council has seven transport objectives and these are defined as:

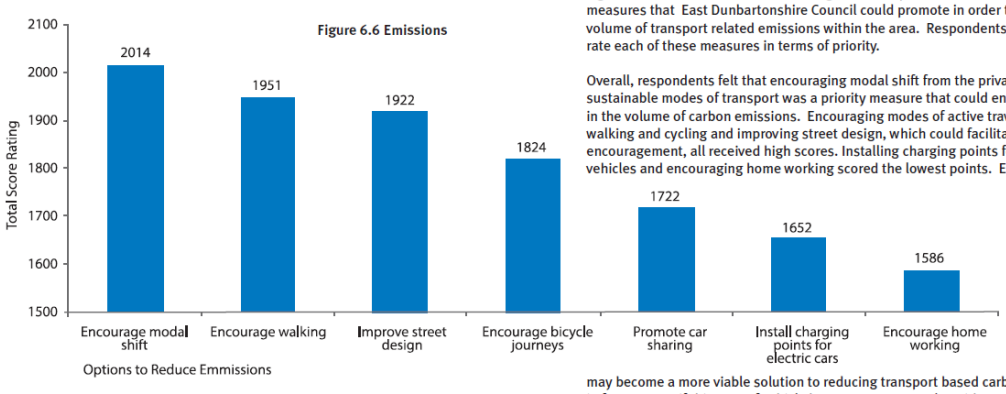
- Delivering a safe transport network across all modes.
- Improving the health and wellbeing of the community through promoting sustainable travel, attractive well designed streets and active travel routes throughout East Dunbartonshire.
- Enhancing the accessibility of services, facilities and businesses in East Dunbartonshire, which promotes social inclusion.
- Delivering reliable and efficient public transport services through close working with key transport partners and providers in order to achieve modal shift.
- Ensuring that existing roads and footways are maintained incorporating high environmental and design standards.
- Developing a transport network that supports both the local and wider region through delivering sustainable economic growth and travel, while conserving and enhancing the natural and historic environment where possible.
- Ensuring that the impacts from transportation on the environment and air quality are mitigated in order to work towards the targets set out in the Climate Change Act 2008.

The increased production of emissions and the subsequent effect on air quality is a key challenge that faces both Scotland and East Dunbartonshire Council. The NTS outlines a desire to increase the

[3] https://www.eastdunbarton.gov.uk/local-transport-strategy

proportion of short journeys made by active travel, improve air quality, reduce congestion, and contribute to a healthier Scotland. This is a modal shift that East Dunbartonshire Council (EDC) supports and aims to promote through the LTS and is presented in Figure 2 and Figure 3.

Figure 2: Respondent options for reducing emissions from EDC LTS



Emissions

Transport is one of the main causes of emissions (fine particulate matter (PM10) and nitrogen dioxide (NO_2)) and East Dunbartonshire Council currently has two Air Quality Management Areas in Bishopbriggs and Bearsden, primarily caused by the high volumes of vehicles that travel on the road network. The Scottish Government aims to achieve a reduction of 42 per cent in greenhouse gas emissions by 2020 over the 1990 baseline. East Dunbartonshire Council aims to support this decrease through implementing measures to reduce road based emissions. Not only will this contribute to the national reduction target, but also improve the air quality of towns and villages within East Dunbartonshire.

Figure 6.6 illustrates the results relating to seven options that relate to possible measures that East Dunbartonshire Council could promote in order to reduce the volume of transport related emissions within the area. Respondents were asked to rate each of these measures in terms of priority.

Overall, respondents felt that encouraging modal shift from the private car to sustainable modes of transport was a priority measure that could enable a reduction in the volume of carbon emissions. Encouraging modes of active travel such as walking and cycling and improving street design, which could facilitate such an encouragement, all received high scores. Installing charging points for electric vehicles and encouraging home working scored the lowest points. Electric vehicles may become a more viable solution to reducing transport based carbon emissions in future years if this type of vehicle becomes more popular with motorists. Home working may be suitable for certain types of employment, but can allow the opportunity for employers to offer flexible working conditions, especially during adverse weather conditions.

Figure 3: Transport issues in Bearsden / Milngavie from EDC LTS

Table 7.1 Transport Issues in the Bearsden/Milngavie Area

Ref	Mode	Issue	Description
1-1	Walk Cycle	Both Bearsden and Milngavie town centres and the four railway stations in the area are served by poor footpaths and cycle routes in terms of condition and routing.	The quality of walking and cycling routes to the four railway stations in the area needs to be improved to encourage active travel. There are footways and paths located adjacent to roads that experience high levels of traffic.
1-2	Cycle Car Park	Car parking in cycle lanes.	Cars that park in cycle lanes can obstruct and create difficulties and safety issues. There are issues in relation to road design, lining and enforcement.
1-3	Bus Rail	Poor direct connectivity and services to other areas of East Dunbartonshire.	There are a limited number of bus services that connect the Bearsden/Milngavie area with towns and villages across East Dunbartonshire such as Bishopbriggs, Kirkintilloch, Milton of Campsie, Lennoxtown and Twechar.
1-4	Bus Rail	There are limited bus services between railway stations and outlying areas.	There are limited feeder bus services between residential areas in the Bearsden/Milngavie area and Milngavie, Hillfoot, Bearsden and Westerton railway stations.
1-5	Rail	Train capacity does not always meet demand on peak services between Milngavie and Glasgow.	There has been an increase in the volume of rail passengers that travelled through the four stations in the Bearsden and Milngavie area during recent years. Respondents highlighted that there is often a lack of seating capacity on services between the area and Glasgow during peak travel periods
1-6	Rail	Funding and delivering a new rail station at Allander.	The Council has aspirations to deliver a rail station at Allander. There are issues to consider including cost, operational impact on existing services across the west of Scotland rail network and timetabling. The section of railway between Hillfoot and Milngavie stations is single track, which is a constraint that has to be considered.
1-7	Rail/ Car Park	The capacity of existing railway station car parks does not meet current demand.	Due to the substantial increase in the volume of passengers travelling through Milngavie, Bearsden, Westerton and Hillfoot, the current parking provision does not meet demand. Station car parks are often at full capacity during the AM peak period. This has created parking and operational issues in areas adjacent to station car parks.
1-8	Bus	Bus timetable and routing have been altered and as a result the level of accessibility and service has reduced. The cost of fares is also high.	Recently, changes were made to bus services that operate through Bearsden. As a result, there has been a reduction in the number of bus services in the area in terms of frequency and amended routing. The cost of bus travel has increased and service coverage in some areas in both Bearsden and Milngavie is considered poor by respondents.
1-9	Bus	There are no express bus services between Bearsden/Milngavie and Glasgow. Journey time of services is unreliable during peak travel periods on A81.	There are no express services between Bearsden/Milngavie and Glasgow. Implementing such a service may be constrained due to congestion on roads such as the A81 during peak travel periods and a lack of bus priority measures. Bus journey times do not compare favourably with car.
1-10	Road	High volumes of traffic recorded on roads located in the area (A81, A739, A809 and A810) and a general reliance on the private car for short, medium and long distance trips.	Traffic data suggests a reduction in vehicles travelling on roads in the area. However, further analysis shows that traffic during both the AM and PM peaks has decreased but remains high. High volumes of traffic impacts on the operational performance of roads and junctions, journey time reliability, safety, air quality and willingness to participate in active travel in the areas adjacent to congested roads.
1-11	Road	Operational problems with of junctions in the area including the following: • A81/A807 Junction • A81/B8030 Junction • A81/Boclair Road Junction • Canniesburn Toll • A81/ASDA Junction	Due to high volumes of traffic, junctions in the area have been highlighted as experiencing operational issues. Vehicles that travel via the A81 can experience queuing at junctions and considerable delays during the peak travel periods. Junctions in the area are constrained due to a lack of available land to increase road capacity.
1-12	Road	Poor air quality in Bearsden due to roads in the town centre area experiencing high volumes of traffic.	Poor air quality has resulted from the large volume of vehicles that travel through Bearsden town centre. Vehicle idling at busy junctions and at schools also contributes to poor air quality. An Air Quality Management Area was declared in Bearsden during 2010 due to a breach of the nitrogen dioxide (NO_2) and the fine particulate matter (PM_{10}) annual mean objectives.
1-13	Road	Road infrastructure and layouts are not suitable for encouraging sustainable modes of transport.	There is a need for priority measures for bicycles and buses on the A81, A809, A810 and A739 to be improved. Some road layouts are constrained through a lack of available space to incorporate bus or bicycle priority measures.
1-14	Road	Road safety on the A809.	The Road Safety Foundation identified that road safety on the A809 is an issue due to the single carriageway, sharp bends and overall rural nature of the road.

The objectives outlined in this strategy are consistent with the Council's Local Outcomes Improvement Plan, Local Development Plan and current transport policy documents at regional and national levels. Responses received during the consultation period have also been considered when formulating the transport objectives.

2.5.4 The East Dunbartonshire Council Local Development Plan

The Local Development Plan was adopted in February 2017. It sets the framework for the growth and development of East Dunbartonshire up to 2025 and beyond. Summarised below are the highlights from the plan that may have an impact on air quality.

Policy 4. Sustainable Transport

The Council seeks to adopt an integrated approach to development, land use and transport, and supports the enhancement of a sustainable transport system that will facilitate economic growth and

fulfil the area's development needs. As such it includes policy to reduce travel through development in sustainable locations by directing development to locations where there are already existing public transport services and active travel routes and the effect on air quality is minimised. Development proposals for significant travel generating uses will not be supported in locations where:

- There are no immediate links to walking or cycle networks or where links cannot be easily delivered
- There is no access to public transport within a 400m walk via well lit, safe and all weather routes that have been designed for all users
- There would be clear reliance on access by private car.

Policy 4 also includes policy on air quality and states that 'Where developments are likely to have a significant impact on the natural, historic or community environment, the Council will require developers to submit an Air Quality Assessment. In particular, any potential significant impact on local air quality from development within or adjacent to the existing Air Quality Management Areas at Bishopbriggs Cross, Bearsden Cross and any future designated Air Quality Management Areas, should be mitigated by provision for measures that support active travel and public transport as an alternative to vehicular traffic. The provisions of air quality management plans will be a key consideration in assessing proposals with potential to impact on local air quality in these areas. Air Quality Planning Guidance was presented to committee and adopted during 2018 and should help ensure that air quality impact assessments are provided where appropriate.

Other Policies

The LDP also includes the following policies which will work to improve air quality: Policy 1. Sustainable Economic Growth requires development to re-use land, buildings and construction materials and that they are sustainably located. Policy 2. Design and Placemaking requires the use of sustainable energy, design and construction methods and the reduction in use of the car by prioritising pedestrians, cyclists and public transport. Policy 5. Green Infrastructure and Green Network, Policy 7 Community Facilities and Open Space and Policy 8. Protecting and Enhancing Land Character and Nature Conservation all require improvements and additions to the natural environment which will act as a carbon store and have positive benefits for air quality. Policy 15. Renewable Energy and Low-Carbon Technology states that 'Development will support the change to a low-carbon economy by ensuring that all new development reduces emissions and energy use in new buildings and considers the potential to develop heat networks'. It also ensures that new energy infrastructure proposals will be assessed against their impact, or contribution, to air quality. Similarly Policy 16. Managing Waste requires development to not have an adverse impact on air quality or include satisfactory mitigation measures in place and Policy 17. Mineral Resources requires dust, fumes and other impacts to be assessed.

2.5.5 East Dunbartonshire Council Carbon Management Plan

East Dunbartonshire Council has been reporting on climate change since 2007, initially on a voluntary basis through Scotland's Climate Change Declaration and, more recently, through the introduction of required reporting to the Scottish Government. A key theme running through all reports is the importance of working in partnership with others in responding to climate change.

Carbon management continues to be a key aspect of the Council's approach to tackling climate change; the Carbon Management Plan 2015 – 2020 sets a target to reduce the Council's total annual carbon footprint by the end of 2019/2020. Reductions will be achieved through a range of projects including renewables installations, fleet management initiatives and street lighting replacement, supported by a range of 'enabling measures' including policy development support and procurement processes.

The wide-ranging significance of climate change is reflected in East Dunbartonshire's Local Outcome Improvement Plan (LOIP). The LOIP sets out the strategic priorities for East Dunbartonshire and identifies six local outcomes relating to social, economic, health and environmental challenges facing East Dunbartonshire. The agreement is underpinned by a series of outcome measures.

2.6 Consultation on the Action Plan

Authorities in Scotland must consult the agencies and organisations listed below following the preparation or revision of their Air Quality Action Plan:

- Scottish Ministers
- The Scottish Environment Protection Agency
- Neighbouring local authorities
- Other public authorities as appropriate
- Bodies representing local business interests and other organisations as appropriate (potentially including representatives of the public e.g. community councils)
- Any National Park authority within or adjacent to the local authority area.

Authorities should also proactively make copies of the Action Plan available to the public, and undertake other efforts deemed necessary to adequately consult members of the public on the content and significance of the plan. It is recommended that the consultation period be no less than 6 weeks in duration to enable consultees the opportunity to contribute to the process. This was undertaken in 2018 and a summary of the consultation responses can be found in Appendix 3.

Following consultation and the formal adoption of the Action Plan, the Council is also required to submit annual Action Plan progress reports to the Scottish Government and SEPA, and also revise the Action Plan appropriately when circumstances influence the content and progress of the plan. An annual update of progress will be undertaken as part of the Annual Progress Report required by the local air quality management review and assessment regime.

3 Conclusions of previous rounds of review and assessment

East Dunbartonshire Council has completed its Local Air Quality Management duties in compliance with the guidance provided in Chapter 2 of this report. The bulk of work to date was to review air quality in the East Dunbartonshire area and to assess whether any exceedances of the health-based air quality objectives have been identified or have been predicted for future years. Although at the time of compiling the first draft of the Action Plan exceedences of the air quality objectives were measured and reported upon, ongoing recent monitoring has indicated that air quality across East Dunbartonshire is complying with the Scottish Air Quality Objectives however; we are committed to progressing the measures within the Action Plan to ensure we continue to comply. This chapter provides a summary of our work to date.

3.1 Summary of LAQM Review and Assessment in East Dunbartonshire Council

3.1.1 Review and Assessment

The 2007 Progress Report identified that measured NO_2 concentrations were close to the annual mean NO_2 objective at several locations in Bearsden and four diffusion tube monitoring sites were in excess of the objective. The Progress Report also identified potential exceedance of the PM_{10} annual mean and 24 hour mean objectives.

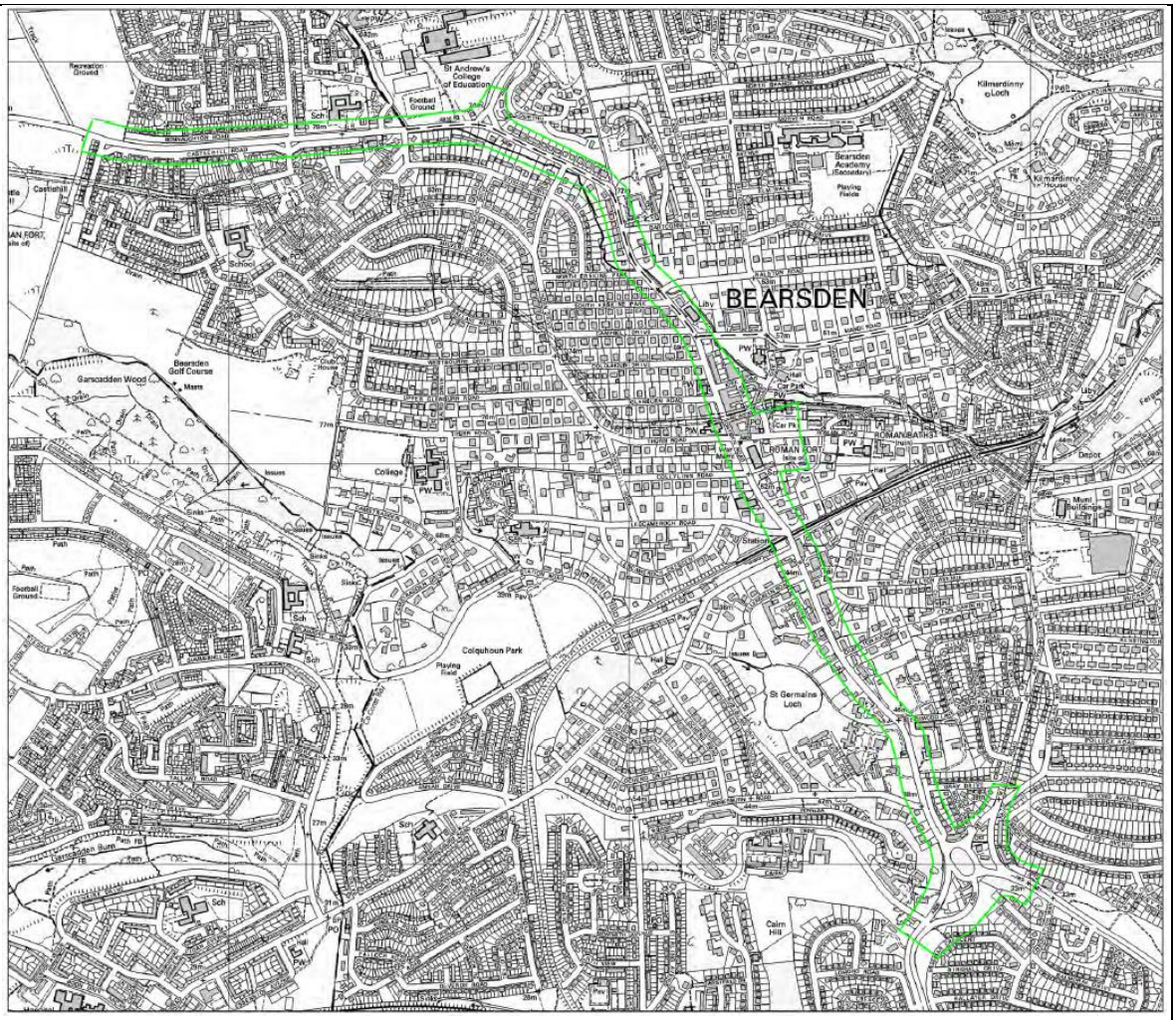
In 2008 the Council completed a Detailed Assessment of PM_{10} and NO_2 concentrations. This study concluded that it was likely that there would be exceedance of both the NO_2 and PM_{10} annual mean objectives around Bearsden Cross and the Council should continue to monitor pollutant levels before declaring an AQMA.

After further monitoring the Council declared an AQMA at Bearsden Cross in July 2011 in respect of both the PM_{10} and NO_2 annual mean objectives.

3.1.2 Bearsden AQMA Declaration

The Bearsden AQMA for annual mean concentrations of both NO_2 and PM_{10} was declared in July 2011. The boundary of the AQMA is presented in Figure 4.

Figure 4: Bearsden AQMA



3.2 Consultant's observations from site visits to the Bearsden AQMA

Throughout the development of the Air Quality Action Plan for Bearsden, numerous visits were made in order to observe the prevailing conditions, and to help guide the development of the action plan.

The visits identified that the exceedances of the annual mean objective for NO_2 could in part be exacerbated by the close proximity of several residential properties to the road. The close proximity of residential properties to the road offers minimal opportunity for road traffic pollution to disperse and to be diluted to lower concentrations. During busy periods queues of traffic often form at Bearsden Cross contributing to emissions of air pollutants including NO_2 and PM_{10}. The visits supported the view however that it was the volume and nature of the flow of traffic through Bearsden

Cross that was primarily responsible for the air quality exceedances identified in the previous review and assessment reports. The local authority is required to act where levels are raised close to residential properties, schools, hospitals or any area where the public may be regularly exposed.

Photograph of the site is presented in Figure 5

Figure 5: Bearsden Cross – automatic monitoring station

3.3 Summary of Further Assessment of NO_2 and PM_{10} in Bearsden AQMA

Following the declaration of the AQMA at Bearsden in 2011, the LAQM process at that time required a Further Assessment of air quality for the area to be undertaken. The objective of the Further Assessment was to re-assess the conclusions of the 2008 detailed assessment including any new information since the completion of the detailed assessment. The report also included:

- An investigation of current and potential NO_2 and PM_{10} concentrations through a combination of modelling exercises and by reference to monitored air quality data
- An Emissions Inventory of the Council area and the AQMA
- An assessment of source apportionment whereby the contributions from different sources of each relevant pollutant were determined

3.3.1 Emissions inventory

An emissions inventory for the Council area was compiled using the atmospheric emissions database package EMIT, which aggregates emissions into 1km by 1km grid squares. The inventory includes emissions from the following sources:

- Road traffic
- Commercial and domestic combustion
- Industrial combustion

- Industrial processes
- Large industrial sources
- Other transport
- Waste treatment and disposal
- Solvent use
- Agriculture
- Nature.
-

All emissions data were obtained from the National Atmospheric Emissions Inventory (NAEI). The NAEI is a national atmospheric emissions database which holds data on emissions from a variety of sources in 1km by 1km grid squares. Emissions are reported in tonnes per year. The NAEI data can be downloaded from the NAEI[4] website for individual local authority areas, so the emissions are directly attributed to each authority. The East Dunbartonshire Council emissions inventory is based on the most recent NAEI data available, at the time of compiling this inventory were for 2008. The study assumed that 2008 emissions from the NAEI remain unchanged in 2010.

The total atmospheric emissions from the 1km grid squares covering the Bearsden AQMA in 2008 are presented in Table 3 with the totals broken down by source in Figure 6 and Figure 7.

Figure 6 indicates that 54% of NOx emissions are attributable to road transport with 40% commercial/residential combustion and other transport (5%) account for the remainder. Figure 7 indicates that the dominant source of PM_{10} in Bearsden is road transport with a range of other sources accounting for the remainder of emissions.

Table 3: Emission Totals in Bearsden AQMA

Source	NOx emitted (tonnes/year)	PM_{10} emitted (tonnes/year)
Agriculture	0.0	0.0
Commercial, Domestic and Institutional	55.6	0.5
Industrial Combustion	0.9	0.0
Industrial Processes	0.0	0.4
Minor Roads	75.1	5.3
Nature	0.1	1.0
Other Transport	7.3	0.4
Solvents	0.0	0.1
Waste Treatment	0.2	2.2

[4] http://naei.defra.gov.uk/data/

Figure 6: Annual NOx emissions Bearsden AQMA

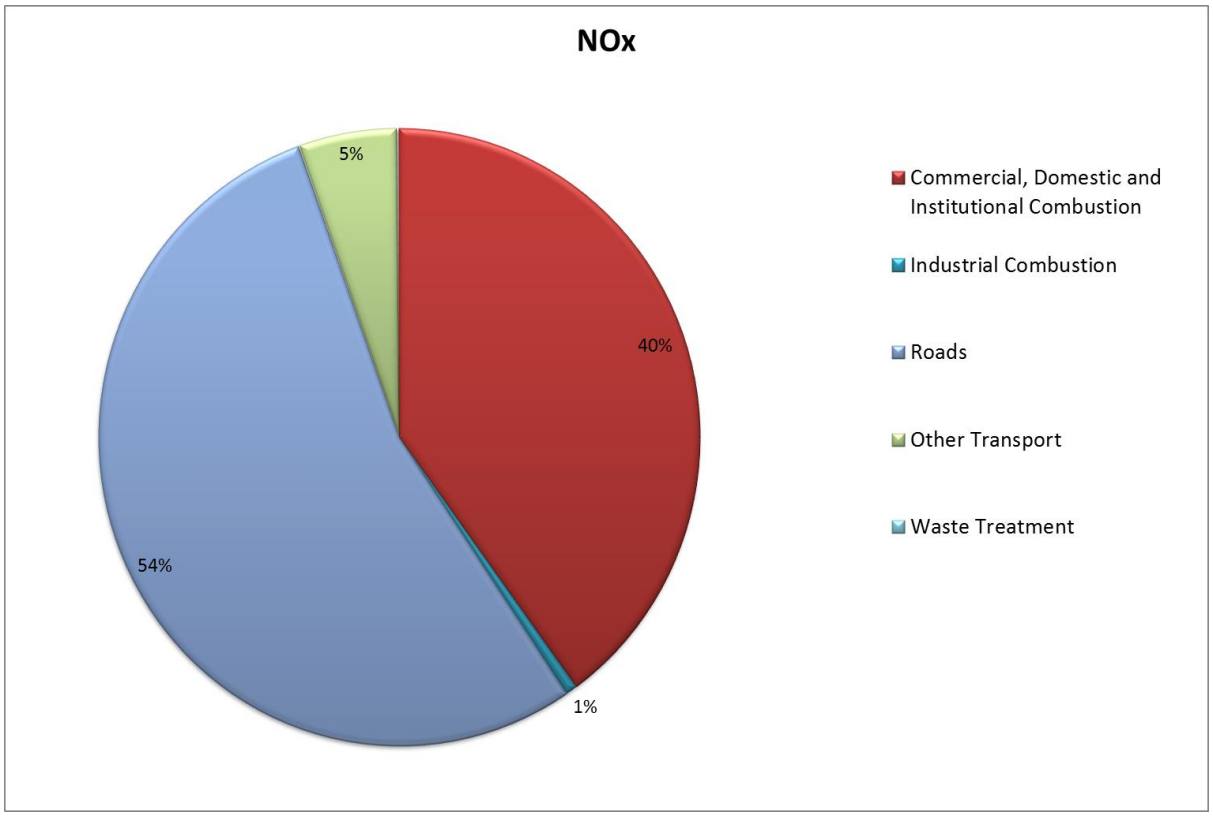
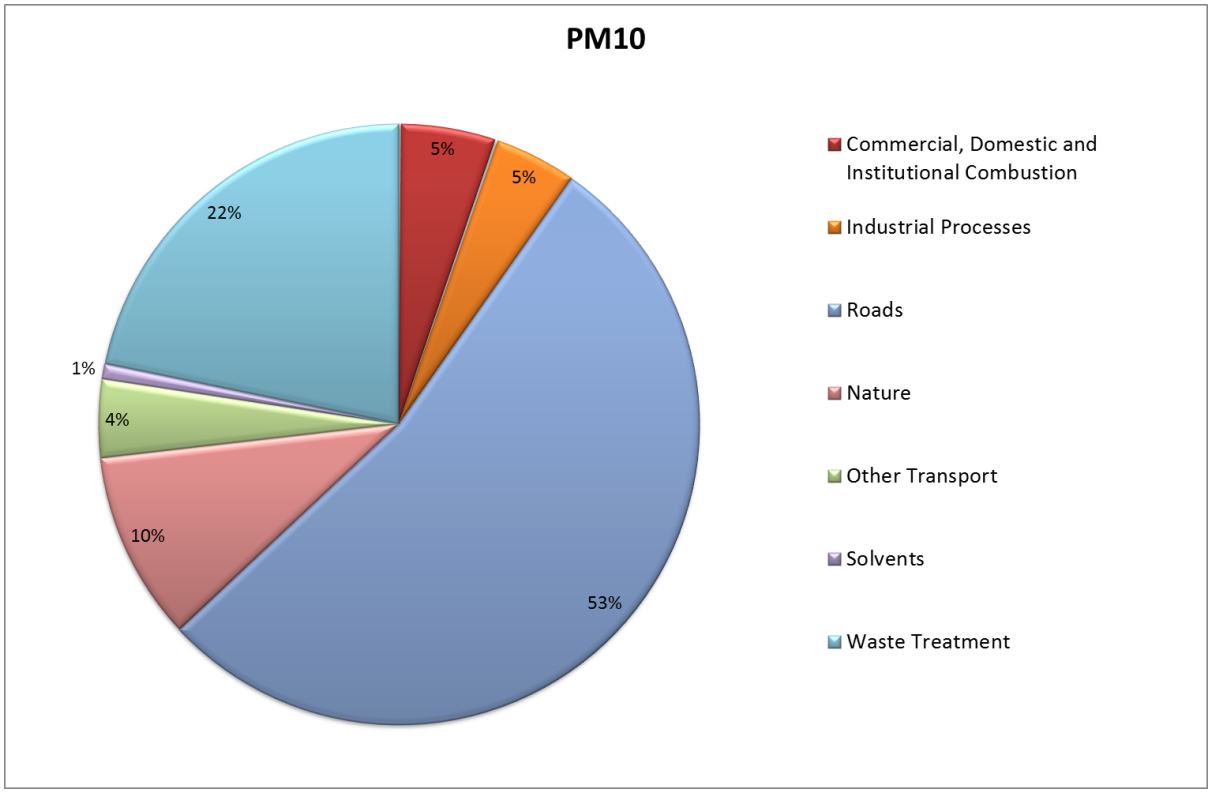


Figure 7: Annual PM10 emissions Bearsden AQMA

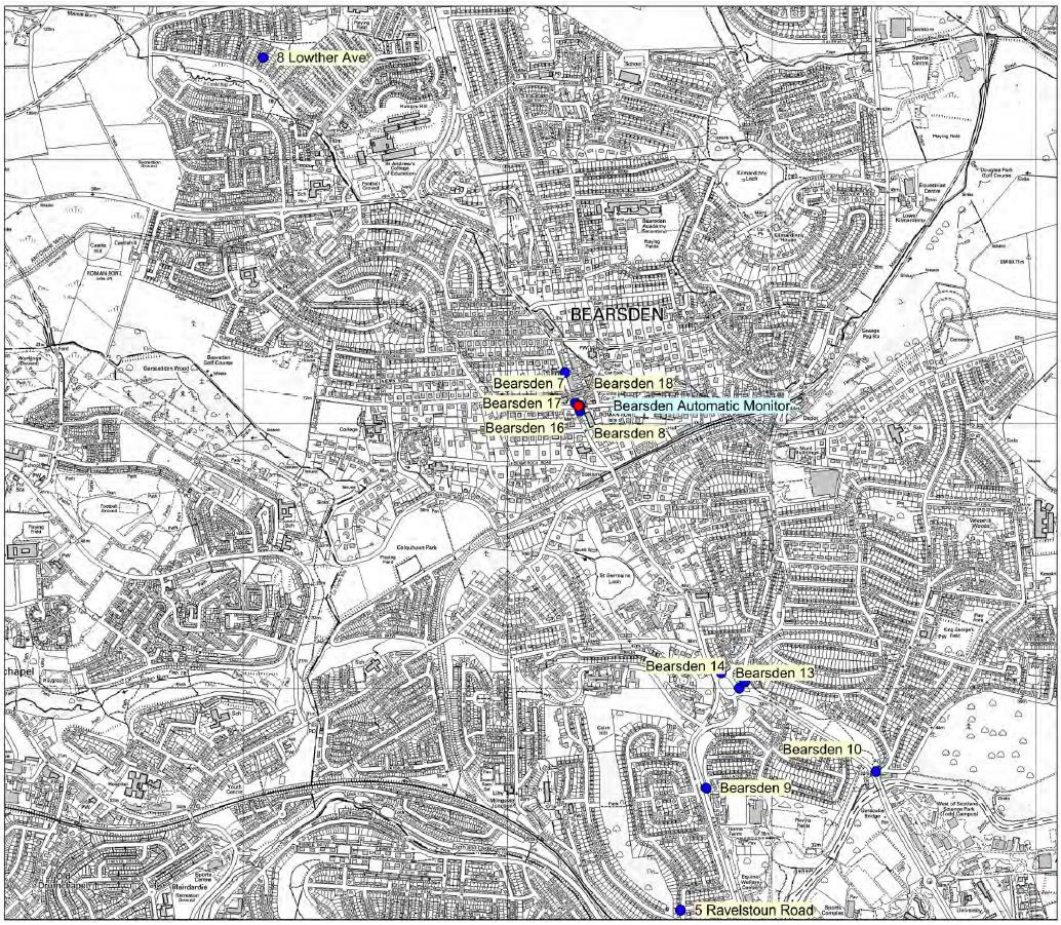


3.3.2 Source apportionment analysis

Source apportionment is the process whereby the contributions of different pollutant sources to ambient concentrations are quantified. This aims to allow the Local Authority's action plan to target specific sources when attempting to reduce pollutant concentrations in the AQMA. In local air quality, the relevant sources typically include: road transport, local background concentrations, industrial, domestic and commercial sources. In AQMAs where road transport is identified as the principal source of emissions, the relative contributions from the different types of vehicles (e.g. cars, HGVs and buses) can also be determined to identify which vehicle types represent the most significant sources of pollution. Thus, the source apportionment allows the most important source or sources to be identified and options to reduce ambient concentrations of pollutants can then be considered and assessed.

The source apportionment exercise was undertaken using an air dispersion model which modelled the contributions of emissions of NOx and PM_{10} from various sources at relevant exposure locations. Full details of the chosen sensitive receptors are presented in Figure 8. These receptors were chosen as locations where the public were likely to be regularly present and exposed over the averaging period of the objectives. Further details can be found in the Further Assessment.

Figure 8: Further Assessment specified receptors



The results of the source apportionment exercise helped the Bearsden AQAP Steering Group to identify the most appropriate measures to include within the draft Action Plan. This exercise has enabled the prominent sources of emissions to be targeted, to help bring about the most effective reduction in emissions and subsequently annual mean concentrations of both NOx and PM_{10}.

3.3.3 Sources of NO_2 and PM_{10}

Nitrogen Dioxide is mainly a secondary source i.e. the result of the oxidation of Nitrogen Oxides. Therefore, source apportionment analysis considers the emission of NOx (Nitrogen Oxides) which are assumed to be representative of the main sources of NO_2.

The source apportionment study was undertaken at 19 specified receptor locations as detailed in section 3.3.1. The contributions from each of the following sources have been quantified:

- Background
- Local background
- Roads Sources

Source apportionment information including the emissions inventory indicated that road traffic emissions appeared to be the main contributor to both NOx and PM_{10} concentrations at the locations which were predicted to exceed or were close to the NO_2 and PM_{10} annual mean objective. The findings are presented in Figure 9 and Figure 10.

Figure 9: Source apportionment of NOx - all sources

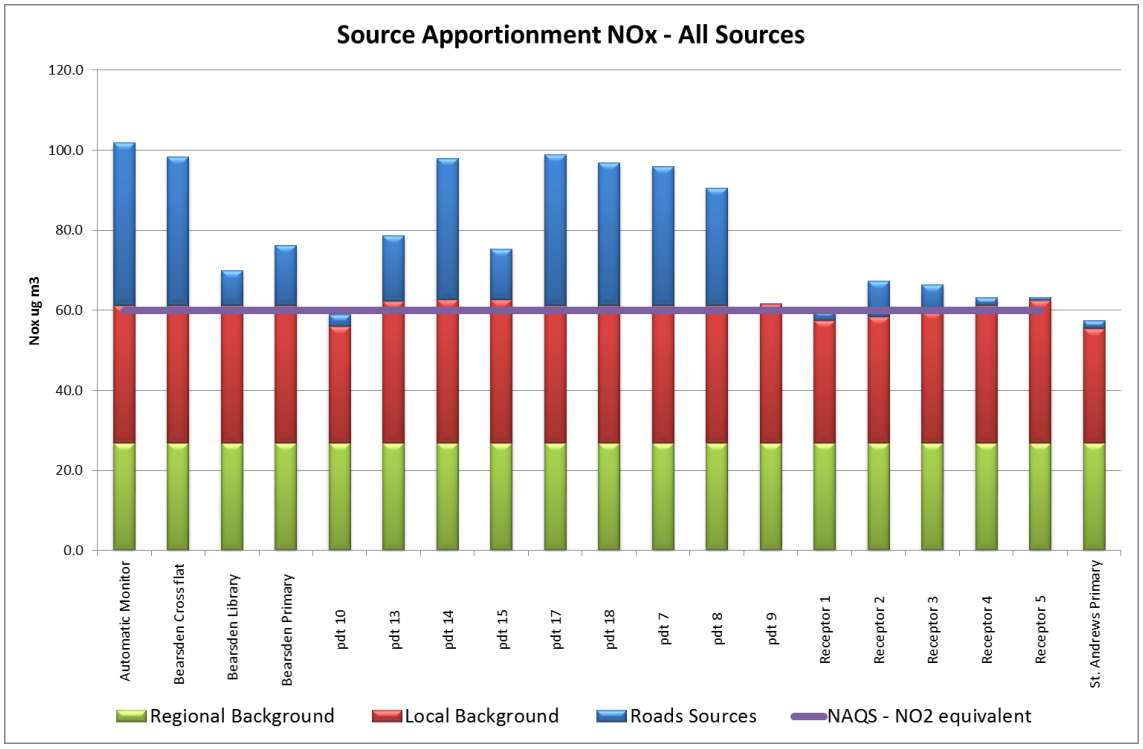
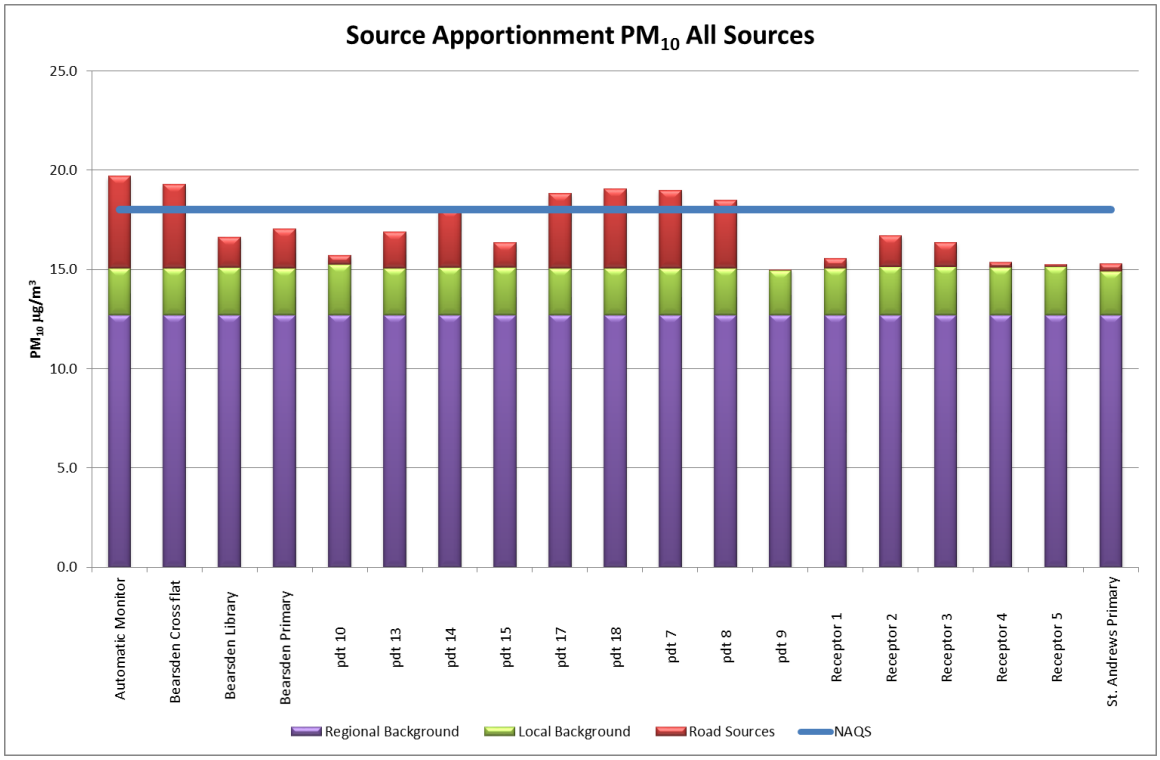


Figure 10: Source apportionment PM10- all sources



Further analysis of the road traffic component was undertaken and the following sources were quantified:

- Congestion - Queuing vehicles
- Buses
- Cars
- Light Goods Vehicles
- Heavy Goods Vehicles

Further analysis of the road traffic component indicated that emissions from cars and from queuing of all vehicle classes contributed the largest proportions. A reduction in both the volume of traffic and queuing traffic within the AQMA will result in a decrease in the concentrations of NO_2. Figure 11 and Figure 12 summarise the key findings of the source apportionment study undertaken as part of the Further Assessment.

Figure 11: Source apportionment NOx – road sources

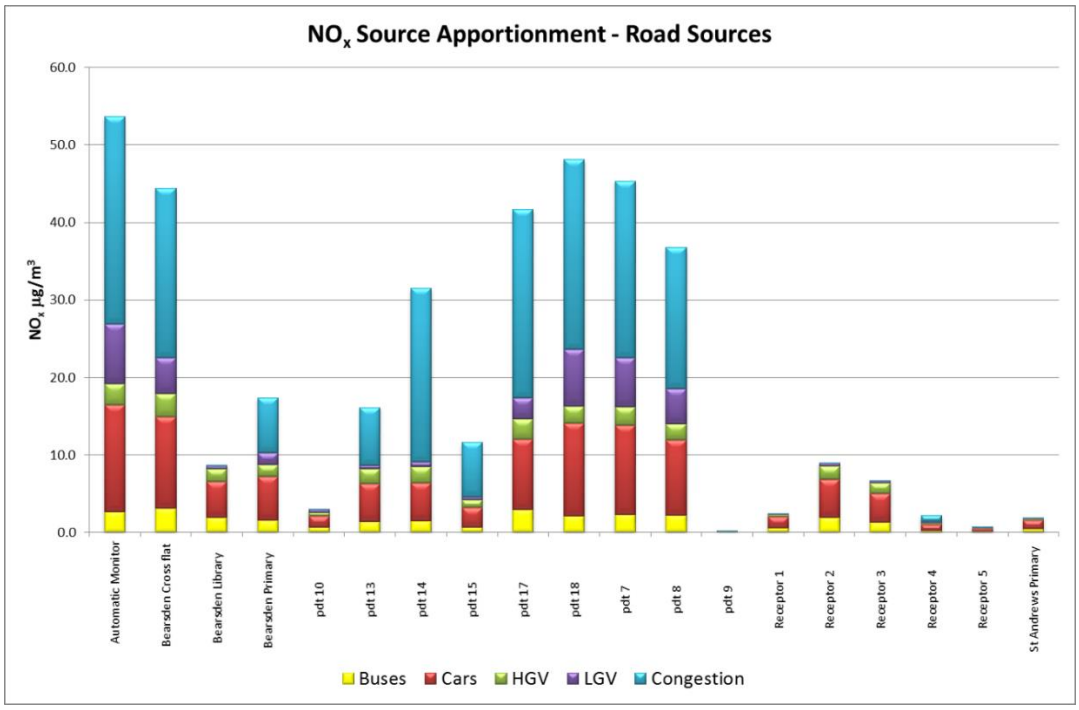
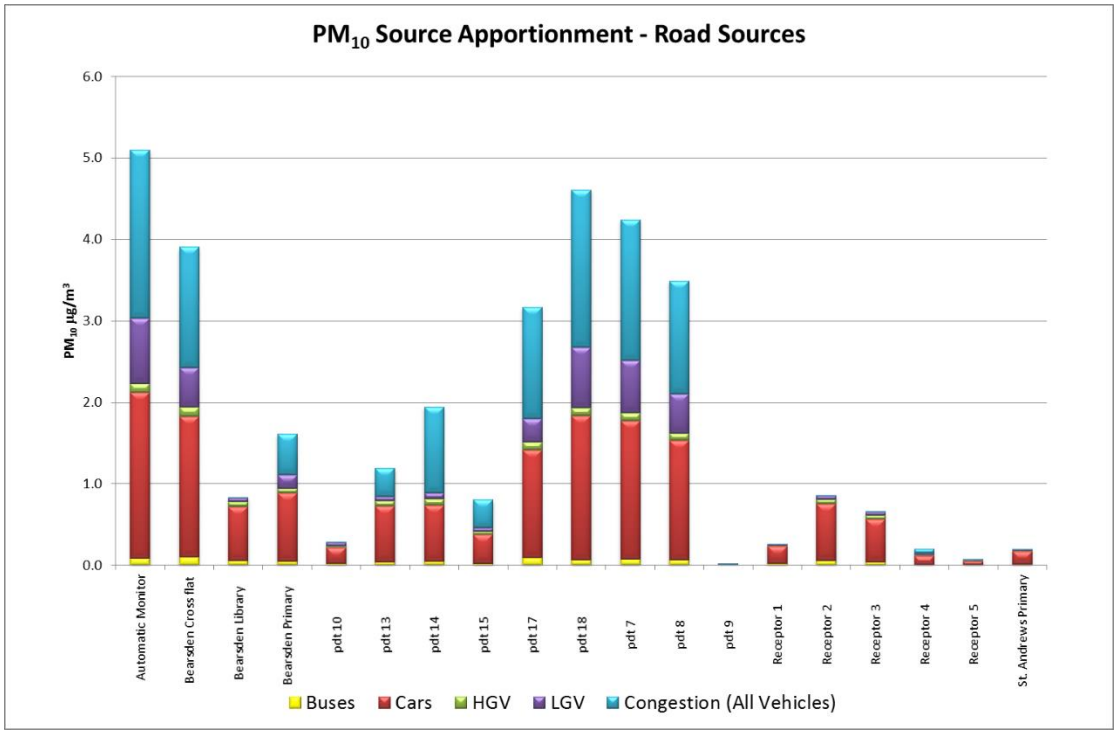


Figure 12: Source apportionment PM10 – road sources



3.3.4 Required reduction in pollutant concentrations

LAQM.PG(S) ((16) states that the Further Assessment must show that a Local Authority has calculated the reduction in emissions required to achieve the objectives of concern, as this will enable the authority to consider whether the measures proposed to achieve these reductions are proportionate and cost effective. Based on the modelling undertaken as part of the Further Assessment, analysis was

undertaken to quantify the reduction required in annual mean NOx and PM_{10} concentrations from road transport to meet the annual mean objective.

The results of this analysis indicated that the maximum reduction required for NOx and PM_{10} is 31.5% and 56.9% respectively. The results of this analysis are also presented in Table 4 and Table 5.

Table 4: Reduction required in NOx concentration to meet annual mean objective

Diffusion Tube	Annual mean NO_2 ($\mu g\ m^{-3}$)	Total NOx ($\mu g\ m^{-3}$)	Background NOx ($\mu g\ m^{-3}$)	Current Roadside NOx ($\mu g\ m^{-3}$)	Ambient required Road NOx ($\mu g\ m^{-3}$)	Road NOx Ambient Reduction (%)
Bearsden 7	46.6	108.3	26.8	81.5	59.9	26.5
Bearsden 8	40.4	87.9	26.8	61.1	59.9	2.0
Bearsden 13	43.7	98.4	26.8	71.6	59.9	16.3
Bearsden 14	43.5	97.8	26.8	71.0	59.9	15.6
Bearsden 16	45.5	104.5	26.8	77.7	59.9	22.9
Bearsden 16B	46.0	106.2	26.8	79.4	59.9	24.6
Bearsden 16C	48.3	114.3	26.8	87.5	59.9	31.5
Bearsden 17	42.2	93.6	26.8	66.8	59.9	10.3

Table 5: Reduction required in PM10 concentration to meet annual mean objective

Receptor	Annual Mean PM_{10} ($\mu g\ m^{-3}$)	Background PM_{10} ($\mu g\ m^{-3}$)	Current Roadside PM_{10} ($\mu g\ m^{-3}$)	Required Road PM_{10} ($\mu g\ m^{-3}$)	Road PM_{10} Ambient Reduction (%)
FDMS	25	12.7	12.3	5.3	56.9

3.3.5 Conclusions of Further Assessment

NO_2 and PM_{10} concentrations in and around the Bearsden AQMA were considered using a combination of new monitoring data and dispersion modelling. The results of the Further Assessment indicated that both the NO_2 and PM_{10} annual mean objectives were exceeded during 2010 in the AQMA.

After model adjustment the area of exceedance of the annual mean objective was found to be within the boundary of the existing AQMA. It was, therefore, concluded that the existing AQMA boundary for the NO_2 annual mean objective was appropriate and it was unlikely that the AQMA boundary would require amendment in the short to medium term. It was therefore recommended that the AQMA should remain in its present form and monitoring should continue.

The predicted area of exceedance of the adjusted PM_{10} annual mean concentrations extended out with the existing AQMA boundary. It should be noted that adjustment of the PM_{10} modelling results was based on an adjustment factor calculated from the comparison from only one kerbside monitoring

site and therefore may have overestimated the annual mean concentrations at receptors located at both roadside and urban background locations. The Council installed an additional monitor and results confirmed that no alteration to the boundary of the AQMA was required.

Source apportionment of both NOx and PM_{10} emissions at a number of locations within the AQMA was also carried out and the results fed into the Council's developing Action Plan. Analysis of the NOx source apportionment information, including the emissions inventory, indicated that the group road traffic emissions were the largest contributor at locations close to and above the objective. On further analysis of the road traffic component it indicated that emissions from the Cars and from queuing of all vehicle classes contributed the largest proportions. A reduction in both the volume of traffic and queuing traffic within the AQMA would have resulted in a decrease in NO_2 concentrations.

The analysis of the emissions inventory also indicated that the other major source of NOx appeared to be from the commercial, domestic and institutional combustion sector. It was therefore recommended that the Council should consider measures to address reduction of emissions from this sector in their Action Plan.

Analysis of the PM_{10} emissions inventory and source apportionment indicated that road traffic emissions were the largest contributor. Further analysis was undertaken of the road traffic emissions component and this indicated that emissions from cars and queuing of all vehicle classes appeared to contribute the largest components. A reduction in both the volume of traffic and queuing traffic within the AQMA would have resulted in a decrease in the annual mean concentrations of PM_{10}.

There have been several further rounds of review and assessment in the intervening years since the AQMA was first declared in 2011. Between 2013 and 2017 there was only one exceedence of NO_2 annual mean and the most recent review and assessment has indicated that during 2017 there were no exceedences of either the NO_2 or PM_{10} annual mean objective. Appraisal of the Annual Progress Report 2018 (which reviews all of the air quality monitoring data for 2017) recommends that the AQMA for annual mean NO_2 should be revoked. The AQMA for exceedence of the annual mean PM_{10} may be revoked once biomass installations are no longer considered a challenge to local air quality.

East Dunbartonshire Council will continue to monitor and obtain one full year of data so that we will be in a position to make a decision on revocation.

4 Development of the Action Plan

This section reports on how the Action Plan has been developed to date.

4.1 Formation of Action Planning Steering Group

The development of the Action Plan began with an inception meeting, which was attended by a number of local authority officers. These officers have guided and consulted on the development of the Action Plan. In this way the Action Plan has been influenced by their local knowledge and area of responsibility. Due to a number of changes of roles in the Council since the first steering group meeting there have been several changes in attendees.

A full list of the members of the steering group and the service being represented is given in appendix 2.

The steering group was formed to provide an appropriate forum for developing the Air Quality Action Plan. The composition of the group was considered to include representatives from all local authority services with an interest in air quality and who may have an influence on the measures being considered within the draft plan.

4.2 Action Plan Development Process

The Scottish Local Air Quality Management Policy Guidance LAQM.PG(S) (16) provides statutory guidance on the content and development of air quality action plans. This document outlines that the AQAP should include the following as a minimum:

1. Quantification of the source contributions to the predicted exceedances of the objectives (to enable measures to be effectively targeted).
2. Evidence that all available options have been considered on the grounds of cost-effectiveness and feasibility.
3. Indicate how the Council will use its powers and also work in conjunction with other organisations and agencies in pursuit of the air quality objectives.
4. Clear timescales in which the Council, other organisations and agencies aim to implement measures identified within the plan.
5. Quantification of the expected impacts of the proposed measures and, where appropriate, an indication as to whether the measures will be sufficient to meet the air quality objectives.
6. Indicate how the Council intends to monitor and evaluate the effectiveness of the action plan.

The Steering Group has taken the content of this guidance into consideration during the development of the plan.

4.3 Actions to date

To date the steering group has completed:

- 29th August 2014. Ricardo AEA began responsibility to assist the Council through the AQAP process. A renewed Air Quality Action Plan steering group meeting was held to provide overview of the progress to date and a background on the AQAP process to the new steering

group members. A wide range of potential measures were presented for the consideration of the steering group and an initial assessment of their feasibility undertaken (further details are presented in Appendix 3).

- 16th December 2014. A series of meetings were held with the steering group members to review their respective action plan measures and a more detailed assessment of their respective feasibility was undertaken. Further discussion was held regarding the measures and supporting actions that should be included in the draft plan.
- 15th February 2016. A further meeting was held as some new members joined the steering group. A number of similar measures were amalgamated in an attempt to keep the Action Plan reasonably clear and concise.

The steering group has, over a period of time, considered various action measures and has now filtered these actions into those that are manageable and achievable without entailing excessive cost. The following sections of this report present the outcome.

5 Action Plan Options and their assessment

During the development of the Action Plan, the steering group considered a full range of relevant options aimed at reducing ambient annual mean concentrations of NO_2 and PM_{10} within the Bearsden AQMA. The process has consisted of a gradual refinement of the range of potential options under consideration, to enable the focus to be centred on measures that directly address the principal problem (road traffic emissions), and are feasible and cost-effective compared to others. As a result of continuing discussions and considerations of the steering group, some options have been amalgamated with other options, and going forward, further changes may also result from the forthcoming wider consultation process. This section describes how this was achieved and outlines some of the considerations of the steering group.

This chapter provides more information on the options and their assessment. The measures in the Action Plan are presented in the next chapter.

5.1 Initial Assessment of Options

This section reports on the work undertaken to consider the full range of Air Quality Action Plan options available in line with the requirements outlined in LAQM.PG(S) (16), to enable the identification of feasible and effective measures that can be developed in the Action Plan.

5.1.1 Range of possible options

The Policy Guidance LAQM.PG(S) (16) states that Air Quality Action Plans must focus on 'effective, feasible, proportionate and, quantifiable measures' and provide 'evidence that all available options have been considered on the grounds of cost effectiveness and feasibility'.

A wide range of potential options may be available to East Dunbartonshire Council and other stakeholders to improve local air quality within the Bearsden AQMA, and the surrounding area. Therefore, at the onset of the action planning process it is appropriate to consider all potential options. The identification of potential measures for the consideration of the Steering Group was undertaken through a review of existing local and regional plans, consideration of measures referenced in LAQM.PG(S) (16) and relevant Environmental Protection UK guidance documents as well as recommendations of members of the Steering Group. Whilst East Dunbartonshire Council may not have the necessary powers to implement all such options, they may work with, or encourage other organisations and agencies that have the capacity to take such options forward.

Table 6 presents a list of six 'Option Categories' presented to the Steering Group. The Group was invited to provide an initial assessment of their feasibility and applicability. Each Option category includes several specific options that were considered by the Steering Group.

Table 6: Potential Options to improve Air Quality within Bearsden AQMA

Type	Description	Notes
1	Strategic measures	Road transport emissions constitute a significant source of air pollution across the UK, and have contributed to the declaration of numerous Air Quality Management Areas. Due to the prevalence of road transport, a local long-term strategy is required to bring about a progressive reduction in emissions from the road transport sector in future years and encourage improvements in local air quality as a result. Furthermore, in Scotland, a more stringent annual mean objective for PM_{10} is in place. Consequently, background concentrations of

Type	Description	Notes
		particulate matter make a significant contribution to local PM_{10} concentrations. A long-term strategy aimed at reducing concentrations from these sources might include: • Building the capacity to better assess and manage the environmental impacts from road transport. • Specific commitments or targets within local development and transport planning policy to significantly reduce the impacts of new development.
2	Move sources away from the AQMA	Road transport emissions have been shown to represent the principal source of NOx within the AQMA and make a significant contribution to local PM_{10} concentrations. The construction of new roads could divert traffic away from the roads in the AQMAs. Less traffic on these roads results in lower pollution levels in the AQMAs. However, the opportunity to build such roads is frequently absent. In cases where such roads can be built, care needs to be exercised that the locations where the new roads are built do not become AQMAs in turn. Note that this option moves emissions from one location to another with no requirement to reduce them. Overall emissions may be increased by such actions.
3	Traffic Management– optimisation of traffic movement through AQMA	Changes in how the roads in the AQMA are signed or otherwise managed may reduce emissions from road transport a) by diverting some traffic onto better routes for them, or b) by reducing congestion/ stationary traffic. Note that the opportunity to take such action is frequently limited.
4	Reduce emissions from sources by technical means	The majority of vehicles using roads in the AQMA are conventional petrol or diesel powered vehicles with a range of ages. There are many technical options to convert such vehicles into ones using cleaner engine and fuel technology. By accelerating the uptake of these technologies the emissions in the AQMAs would be reduced. Note that technology does not always work in a positive sense for all emissions. They sometimes trade benefits for one pollutant against negative aspects for another one.
5	Reduce emissions from sources by reducing the demand for travel or achieving better travel choices	An important way to reduce emissions from transport is to reduce the number of journeys made through the AQMA. This could be achieved either through reducing the need to make some journeys, or by ensuring that these journeys are made via a less polluting form of transport. The success of such measures depends on policies that influence how people make travel choices. Note that there is increasing emphasis placed on such policies and that they work holistically by reducing emissions of all pollutants and greenhouse gases.
6	Other	May include a variety of measures e.g. targeting reduced emissions from domestic sources, industry or statutory nuisance.

5.1.2 Initial responses to the options

For each of the provisional options considered by the Steering Group, a decision has been made to eliminate several options from further consideration, or to consider the option further. This decision has been made with reference to:

1. Comments received from the steering group

2. The conclusions from the source apportionment exercise presented in Chapter 3
3. Additional comments from East Dunbartonshire Council's consultant based on experience in prior assessments.

Taking into consideration the situation in the Bearsden AQMA the findings of the source apportionment exercise (Section 3) and existing Council Policy, several of the measures included within the provisional list of measures were eliminated from further consideration at this time. These measures are presented in Table 7.

Table 7: Options eliminated from further consideration in the Bearsden AQMA
Move receptors away from AQMA
Relocating sensitive receptors from the AQMA
Move sources away from AQMA
Local ban on freight, car or bus traffic
Speed controls
Commercial deliveries - loading/ unloading restrictions
Reduce the emissions from sources by technical means
Retrofitting Council Fleet
Freight quality partnerships
Reduce the emissions from sources by means of encouraging better travel choices/ behavioural change
Bus lanes
Other

The measures listed in Table 7 have been excluded from further consideration at this time, as they were either not considered feasible, or were not believed to have an appropriately targeted impact on the predominant sources of emissions identified in the further assessment.

East Dunbartonshire Council intends to develop all of the remaining measures for inclusion within the Air Quality Action Plan. Also included are numerous measures that are in the process of being implemented by East Dunbartonshire Council but which may require some modification or supplementation in order to make a more significant contribution to improving local air quality in the Bearsden AQMA and also meet future reporting requirements.

Figure 13: Overview of measures included with Draft Action Plan

A summary of the measures proposed for inclusion in the Action Plan are presented in Table 8. Further details of the measures and their assessment are also presented in the following sections.

Table 8: Measures selected for further assessment and potential inclusion in the Bearsden AQAP
1. Strategic Measures
Liaise with Scottish Government regarding national air quality policy
Promote Planning and Transport Strategies that seek to reduce the need to travel and integrate Air Quality.
Integrate Air Quality with other Council Policies
2. Traffic Management – optimisation of traffic movement through the AQMA
Feasibility study – Junction improvements at Bearsden Cross
Traffic management e.g. Mova, Scoot
3. Measures aimed at moving road traffic away
Parking Controls – decriminalise parking and extend the controlled parking zone
Parking Controls – Additional yellow lines near schools and hotspots
Developments within or impacting on AQMA are reviewed for air quality impacts and where necessary all practical emission mitigation options are considered and implemented. Planning GIS system to have upgrade to include AQMA boundary
Introduce Air Quality Guidance for Environmental Health and Planning officers
4. Reduce the emissions from sources by technical means
Fleet waste collection- reduced to fortnightly service
Council Fleet replacement programme
ECO stars
Construction / Demolition Sites within or close to AQMA – Dust Management Plans to target dust and smoke emissions
Electric Fleet vehicles
Enforcement of Vehicle Idling
Management of biomass installations
5. Better travel choices/ behavioural change
Quality Bus/Bike partnership
Council – Smart working
Modal shift (new cycle paths)
Green Travel Planning including: Councils workplace travel plan
School Travel Plans
Awareness Raising and education
Travel Plans for large institutions and business
Eco driver Training for Council staff
Vehicle Idling Awareness
Council car sharing prioritised spaces

Table 8: Measures selected for further assessment and potential inclusion in the Bearsden AQAP
Masternaut vehicle tracking
Vehicle Emissions Testing
Improvements to SPT prioritised bus stops
6. Other
Soft measures – Healthy Habits
Domestic Emissions & Fuel Consumption Awareness Raising
Tree and Wild Flower planting
Joint Health Improvement Plan
Green Infrastructure
Taxi Licensing

5.2 Development of proposed measures

Each of the measures short-listed for further consideration in the Action Plan are discussed in more detail below, together with a summary of potential sub-measures, the relevant authorities responsible for implementation, and the powers available to implement the given measures. Options were identified as being within the responsibility of the following authorities:

1. East Dunbartonshire Council further subdivided into:
   a. Roads and Transportation;
   b. Neighbourhood Services;
   c. Land Planning and Development;
   d. Place and Community Planning;
   e. Education
2. The Regional Transport Partnership (SPT)
3. Police Scotland

The assessment of the measures including their perceived cost-effectiveness and wider impacts together with the methodology utilised to undertake the assessment are discussed in Section 6**.** The proposed measures have been broken into relevant categories as presented in further detail below.

5.2.1 Strategic Measures

It is important that Air Quality Action Plans support and consider existing and or forthcoming transport and development plans, and vice versa. Therefore, some integration of the AQAP with the current and any future Local Transport Strategy and the Local Development Plan is considered essential and represents a strategic and integrated approach to local air quality management.

5.2.1.1 Liaise with the Scottish Government to encourage the consideration and adoption of new measures that aim to reduce background concentrations of PM_{10}

The source apportionment study undertaken as part of the further assessment identified that background sources make a significant contribution to local concentrations of PM_{10}. Background sources of particulate matter include a wide range of natural and man-made processes including industry, residential and commercial combustion and transport sources. However, local authorities

have very limited opportunities to address background concentrations of pollutants and instead must rely on regional and national measures to address these and contribute to improving local concentrations.

East Dunbartonshire Council has been proactive in reviewing local concentrations of particulate matter (PM) and proposes to liaise with the Scottish Government regarding the consideration and adoption of new measures that will contribute to reducing background concentrations of PM and other pollutants. We have also improved our monitoring network to include instrumentation which can measure finer fractions of particulates ie $PM_{2.5}$.

Measure	Title
1.	Liaise with the Scottish Government regarding the consideration of national measures to reduce background concentrations of PM
Definition	Key Intervention
a. Maintain contact with the Scottish Government regarding the adoption of national air quality measures.	Increase focus on background concentrations of PM and encourage national action.
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

5.2.2 Integrate and promote air quality with planning and transport strategies and other Council Plans

Planning Development and Control play an important role in minimising the potential detrimental impacts that new developments may have on local air quality. This Strategic measure is intended to minimise the potential impact of future developments on local air quality across the Council Area. As a strategic measure it has a broader remit that is not specific to Bearsden but East Dunbartonshire generally. Whilst Air Quality is already a material consideration by the Council during the development planning process, the declaration of the AQMA in Bearsden presented the opportunity to refocus on the potential impacts of developments on local air quality during construction and operational phases. Whilst it is important that all large-scale developments are considered in terms of their potential impact on local air quality, it is particularly important that proposed developments that may exert an impact on the Bearsden AQMA should be subject to particular consideration in terms of their potential impact on local air quality, and that all practicable mitigation measures are implemented.

East Dunbartonshire Council recognises the benefit of increasing the general awareness of air quality issues throughout the Council and the need to integrate air quality considerations within existing and future Council plans and strategies. The emerging Local Outcomes Improvement Plan (LOIP) 2017-2027 for East Dunbartonshire sets out the vision and high level priorities for the Council and the other statutory agencies operating in the authority area. Whilst the LOIP does not make specific reference to air quality, it demonstrates a strong commitment to environmental sustainability and protection of our built and natural environment for future generations. In future, the Bearsden Air Quality Action Plan could represent a key tool for helping the Council to deliver on these environmental sustainability intentions within the LOIP. Furthermore, the Council is focused on the delivery of the Carbon Management Plan which seeks to reduce emissions of greenhouse gases from the Council estate. As emissions of CO_2 and air quality pollutants often have a strong relationship, there are distinct benefits of integrating both the air quality action plan and the carbon management plan in order to maximise any benefits and minimise any conflicts between the two schemes.

The forthcoming Sustainability and Climate Change Framework (SCCF) will set the context for a strategic cross-Council approach to sustainability and will include air quality. The Green Network

Strategy was approved in March 2017 and the Local Biodiversity Action Plan is being updated – both of which will have benefits for air quality.

Measure	Title
2.	Promote air quality with planning and transport strategies and other Council Plans

Definition	Key Intervention
a. East Dunbartonshire Local Development Plan was adopted in 2017. The Local Development Plan provides the planning context for the Local Transport Strategy which was written in conjunction with the Bishopbriggs Air Quality Action Plan. The Local Development Plan and Local Transport Strategy integrate air quality, planning development and transport planning to mitigate the air pollution effects of traffic. b. Continue to maintain regular and on-going communication between members of the Steering group to continue working towards ongoing air quality improvement c. Look for opportunities to enhance joint working between Council Services to encourage potential air quality implications of existing and future Council strategies.	Monitor air quality and the level of traffic in Bearsden Ensure Transport Assessments and Travel Plans are submitted when assessing developments meeting criteria set out in Planning Guidance Ensure any possible negative impacts are accounted for and mitigated against Encourage opportunity for contributions towards improving local air quality and minimising negative impacts from existing and future Council strategies. Increase awareness of local air quality.
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council	Voluntary

5.2.3 Traffic management – optimisation of traffic movement through the AQMA

As discussed in the source apportionment analysis, emissions from road traffic in particular, congestion, within the AQMA were making a significant contribution to local annual mean concentrations of NO_2 and PM_{10}. In order for the AQAP to continue to be successful, the Council recognised that the plan must include measures that will reduce emissions from vehicles travelling through the AQMA, by numerous means including reducing the volume of traffic and minimising congestion.

5.2.3.1 Junction improvements- Feasibility study

The Council undertook a feasibility study in 2013 to better understand what possible junction improvements could be made at Bearsden Cross. A number of improvement scenarios were considered by traffic consultants. The results from the traffic modelling study were then used to further investigate what air quality impact or benefit might result from each scenario. However, it is recognised that such studies can result in moving congestion to other areas with no overall benefit to air quality.

On completion, the feasibility study indicated that none of the scenarios would result in a significant air quality benefit and in some cases, would create pollutant hot spots in other areas. It was therefore decided not to take this measure forward.

Measure	Title
3.	Junction improvements- Feasibility study

Definition	Key Intervention
a. Traffic model study b. Air Quality impact assessment of each transport scenario	Model of junction improvements at Bearsden Cross. Provide Council with evidence to assist in decision whether to make appropriate junction improvements.
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire /Traffic Consultant/ Air Quality Consultant	

Consideration was again given to this measure during 2016 as part of a larger Bearsden Town Centre Redevelopment, however; it was felt that no improvement in air quality would result.

Following public and statutory consultation during 2018, this measure has again been raised therefore consideration will be given as to how best to take this forward however, our Annual Progress Report 2018 (which reviews all air quality data for the year 2017) indicates that there has been no exceedences of the air quality objectives during 2017. The appraisal of the data has also recommended that consideration should be given to revoking the Bearsden AQMA for nitrogen dioxide annual mean exceedences.

5.2.3.2 Intelligent Traffic Management Systems

Queuing of traffic can result in elevated concentrations of pollutants, creating local hot spots. These elevated concentrations may be reduced or dispersed by the phasing of traffic signals in such a manner as to facilitate the smooth flow of traffic along a given street. Dispersion modelling indicated hotspots around Bearsden Cross and further analysis indicated congestion and queuing as contributing factors. An intelligent traffic management system was installed in December 2014 with synchronised fixed time signals in order to address peak hour congestion and queuing.

Measure	Title
4.	Traffic management e.g. Mova, Scoot

Definition	Key Intervention
a. Identify appropriate locations and implement intelligent traffic management systems to improve traffic flows b. Identify improvements at junctions and consider modifying surrounding environment to achieve maximum benefit	Installation of intelligent traffic management systems could reduce traffic congestion. Air quality issues are linked to congestion as slow moving, stop-start traffic generates more pollution than free flowing traffic. Investigate and upgrade junctions with known traffic problems to intelligent traffic management systems on a case by case basis
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council – Roads and Transportation	Voluntary

Intelligent traffic management systems are regularly improved and updated with improved capability. This measure was highlighted during the public/statutory consultation earlier in 2018. Funding was put in place to upgrade the current system to the latest available model and this was undertaken during 2019. Further analysis has still to be undertaken to gauge the air quality improvement gained as a result.

5.2.4 Measures aimed at moving road traffic away from the AQMA

5.2.4.1 Parking controls

Prior to 2014, parking in controlled areas was a criminal offence with penalties enforced by the Police. In April 2014, EDC adopted the powers to enforce the Road Traffic Act 1991 thus decriminalising parking in controlled zones. Persons can discharge their liability to prosecution on payment of a penalty charge notice (PCN)

Parking controls in the form of double yellow lines and signage can move traffic away from certain areas or control access at certain times of day.

Measure	Title
5.	Parking Controls
Definition	**Key Intervention**
a. Decriminalise parking	The procedure for on street decriminalised parking has taken place. Off street decriminalised parking was introduced in Summer 2016
b. Extend the controlled parking zone	Controlled parking zones could be extended however the appropriate TROs signs and lines must be in place
c. Additional yellow lines near schools and hotspots	An across Council steering group in conjunction with Police Scotland looking at parking controls around primary school estate has been formed
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council – Roads and Transportation and Community Protection	Voluntary

5.2.4.2 Mitigation of emissions from developments within and around the AQMA

East Dunbartonshire Council area is perceived as a safe, healthy and prosperous place to live where the quality of life is perceived as high. In 2007, it was voted the best place to live in the UK to raise a family based on such factors as education, environment and low levels of crime.

It is therefore attractive to potential developers and it is imperative that development does not go unchecked. Local air quality requires to be fully integrated into the Local Development Planning process. It is a material consideration requiring appropriate assessment as part of the development management process with respect to the potential impact on air quality.

Consideration of measures to deal with potential impacts from development within and around AQMAs, and the cumulative impact from development will be assessed as part of the planning process.

The LDP states: “Where developments are likely to have a significant impact on the natural, historic or community environment, the Council will require developers to submit an Air Quality Assessment. In particular, any potential significant impact on local air quality from development within or adjacent to the existing Air Quality Management Areas at Bishopbriggs Cross, Bearsden Cross and any future designated Air Quality Management Areas, should be mitigated by provision for measures that support active travel and public transport as an alternative to private vehicular traffic. The provisions of air quality management plans will be a key consideration in assessing proposals with potential to impact on local air quality in these areas.”

Emissions of dust to air can occur during both demolition and construction. Emissions can vary substantially from day to day, depending on the level of activity, the specific operations being undertaken, and the weather conditions. A large proportion of the emissions result from site plant and road vehicles moving over temporary roads and open ground. If mud is allowed to get onto local roads, dust emissions can occur at some distance from the originating site. The scale of these impacts depends on the dust suppression and other mitigation measures applied. There is evidence of major construction sites increasing both long term and short term PM_{10} concentrations.

Measure	Title
6.	Mitigation of emissions from developments within and around the AQMA
Definition	**Key Intervention**
a. Developments within or impacting on AQMA are reviewed for air quality impacts and where necessary all practical emission mitigation options are considered and implemented. Planning GIS system has been upgraded to include AQMA boundary b. Ensure through planning that all construction / demolitions sites have a Dust Management Plan.	Regular review and updating of LDP to take account of all policies consistent with air quality objectives and requirements set out in Policy 4 – Sustainable Transport. These policies set out that new development must aim to provide access by active travel and public transport infrastructure. Ensure local air quality is fully integrated in to the LDP process and all development to be appropriately assessed with respect to potential impact on air quality. Prioritise in terms of size of site and include in planning guidance
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council – Land Planning and Development	Voluntary

5.2.4.3 Air quality planning guidance

This measure includes the provision of East Dunbartonshire’s Sustainable Transport guidance note for developers. This document outlines the requirement to undertake an Air Quality Impact Assessment for certain developments and the required content of such assessments. The guidance note enables a consistent approach to air quality impact assessment to be adopted in the Council and minimise the potential effects of future development on air quality across the Council area. Air Quality Planning Guidance was approved by committee and adopted during 2018 and advises prospective developers in advance of the requirements and duties placed on them.

Measure	Title
7.	Air quality planning guidance

Definition	Key Intervention
a. Improving links with Local Planning and Development Framework b. consistent approach to air quality impact assessment	Potential developers will know in advance the requirements and expectations of EDC Planning and Environmental Health in regard to pollutant minimisation.
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council – Land Planning and Development and Environmental Health	Voluntary

5.2.5 Reduce emissions from sources by technical means

5.2.5.1 Fleet waste collection

Waste collection takes place on a fortnightly, seven days a week system. The system alternates with general waste bins (and garden waste when in season) being uplifted fortnightly and glass, plastics and paper are uplifted in between. This has led to a reduction in the number of vehicles on the roads and hopefully, a reduction in the emission of pollutants. The seven day a week service has reduced the number of large, heavy vehicles on the road.

Staff travel patterns have also changed due to shift pattern change which will add to pollution reduction particularly where alteration in shift patterns alters the number of Council vehicles on the roads. With more staff working early start shifts, the number of vehicles on the roads network at peak time should alter appropriately.

Measure	Title
8.	Fleet waste collection
Definition	Key Intervention
a. Reduce emissions from source by reducing number of vehicles on road at any one time b. Seven day a week operation has reduced the overall number of vehicles required to operate the service	Altered shift patterns leads to less heavy vehicles in use across EDC area at any one given time. Early start and weekend working spreads the use of vehicles reducing peak travel time emissions
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council – Neighbourhood Services	Voluntary

5.2.5.2 Council fleet replacement programme

The Council operate a 3 and 5 year vehicle replacement lease on all Council fleet. The current fleet has semi-automatic gearboxes, start/stop technology. Euro VI replacement programme is in place. The Council adopt new technologies as they are released as part of the replacement programme.

Switched on Scotland: A Roadmap to Widespread Adoption of Plug-in Vehicles sets out the measures that Transport Scotland and its partners will take to increase uptake of plug in vehicles. The Roadmap sets out a vision that by 2050 Scottish towns, cities and communities will be free from the damaging effects of petrol and diesel fuelled vehicles. Electric and plug-in hybrids will make a substantial contribution to this ambition – motivated by Climate Change targets and commitments to improve local air quality and noise pollution. As a local authority, there is much EDC can do to increase the use

and uptake of electric and plug-in hybrid vehicles. Four EV Charging points for public use have been installed by EDC, one in Bishopbriggs, one in Kirkintilloch, one in Milngavie and one in Bearsden.

In terms of Council Pool car provision, EDC now has twelve electric pool cars with charging points situated across several work centres.

Measure	Title
9.	Council fleet replacement programme

Definition	Key Intervention
a. Continue current replacement programme	Promote the uptake and use of cleaner or alternative fuels where possible.
b. Pool EDC will attempt to increase the availability of electric/hybrid vehicles to appropriate staff	Where funding allows, the Council will look to increase the provision of electric/hybrid vehicles for staff use as part of the available pool of vehicles for staff
c. Fleet EDC will investigate options available for making use of electric/hybrid vehicles as part of the Council fleet	The Council will investigate, possibly through a feasibility study, the options available for electric/hybrid vehicles which are suitable for use as part of EDC fleet
d. Increase number of charge points across EDC area	The Council will investigate options for installing further charge points at Council buildings
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council – Neighbourhood Services	Voluntary

5.2.5.3 Environmental Fleet Recognition Scheme

Environmental Fleet Recognition Scheme is a voluntary scheme that provides recognition and guidance on environmental best practice to operators of goods vehicles, buses and coaches whose fleets regularly serve within a Council area.

Environmental Fleet Recognition Scheme rates individual vehicles and the overall operation of a vehicle fleet, using a star rating system, to recognise levels of operational and environmental performance. It aims to reduce the energy used by commercial and passenger transport fleets by

encouraging increased adoption of fuel efficiency measures. This will bring about benefits for members through more efficient operations, reduced fuel costs and emissions.

The scheme was introduced during 2017. The running of the scheme is being undertaken by TRL and will continue as funding allows. The East Dunbartonshire Council Scheme currently has 111 members covering 4014 vehicles.

Measure	Title
10.	Environmental Fleet Recognition Scheme
Definition	**Key Intervention**
a. Introduce an environmental fleet recognition scheme	This has the potential to influence drivers of fleet who join the scheme. Members must meet certain criteria for emissions and efficient driving technique thus reducing pollutant emissions within all of the EDC area.
Responsible authority and other partners	**Powers to be used**
EDC, TRL and all members	Voluntary

5.2.5.4 Idling enforcement

East Dunbartonshire Council Environmental Health Officers carry out regular engine idling patrols and enforcement, including buses. EDC adopted the enforcement powers some years ago and undertake proactive and reactive monitoring where required. Regular awareness raising "Switch off your engine" campaigns are carried out and appropriate "Switch off your engine" signage is displayed throughout EDC area, particularly close to all primary schools and in some cases, at bus stops.

EDC adopted the powers some years ago to begin a scheme of vehicle idling enforcement. This has primarily been focussed in areas surrounding primary schools however complaints are responded to and hot spots are targeted regularly.

Measure	Title
11.	Vehicle Idling enforcement
Definition	**Key Intervention**
a. The Council has adopted the necessary enforcement powers to allow staff to undertake monitoring of engine idling, including buses, and where appropriate, enforce financial penalties for non-compliance b. Regular vehicle idling awareness raising campaigns are undertaken with distribution of leaflets and advice	Continue to carry out engine idling enforcement patrols and issue fixed penalties where appropriate Continue to investigate complaints and take any action necessary Continue to carry out awareness raising campaigns to highlight the increase in emissions of exhaust pollutants and greenhouse gases due to inefficient combustion during engine idling Continue to take part in joint vehicle idling initiatives with Police Scotland Continue to erect appropriate signage
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council – Community Protection	Statutory

5.2.5.5 Management of biomass installations

Biomass installations are on the increase and are viewed as a positive measure in terms of Climate Change however adequate control is required to ensure systems being installed are as efficient as possible. Environmental Health enforces the Environmental Protection Act 1990 and the Clean Air Act 1993. Only some biomass installations require planning approval therefore some may go unnoticed but without the correct permissions in place such as boiler and chimney height approval (from Environmental Health). Without adequate chimney height, pollutants from the combustion process will not adequately disperse. There has been an increase in domestic biomass installations and a resultant increase in complaints of smoke and smell as, in some cases, there is no control mechanism over suitability of installation.

There has been an increase in installation of biomass in the domestic sector however, often no approval is required therefore poorly designed systems may unknowingly be installed increasing particulate emissions and leading to poorer air quality. Small scale installations are more difficult to control in terms of emissions however, most of East Dunbartonshire is covered by Smoke Control Area Orders therefore the type of solid fuel appliance that can be installed is more strictly controlled and must be an "exempt" appliance. This is to ensure minimal smoke emission.

Concerns regarding the increase in numbers of wood burning stoves being installed were raised during the public consultation and have been highlighted as a challenge in EDCs latest Annual Progress Report. If the number being installed continues to increase unchecked, there could be an adverse effect on pollutant levels therefore a corporate decision requires to be made as to what action should be taken.

A recent change in legislation will introduce tighter controls as all new appliances, no matter where they are to be installed, will require to be exempt[5].

Measure	Title	
12.	Management of biomass installations	
Definition		Key Intervention

[5] https://www.gov.uk/government/publications/clean-air-strategy-2019

a. Suitably manage biomass installations as part of the planning process b. Suitably manage biomass installations in the domestic sector	Ensure installations are to the highest standard possible as part of the planning approval process Ensure chimney height and boiler approval applications are dealt with timeously and raise awareness of the process Create a mapping system to keep track of the number of installations in EDC area Adequately and timeously respond and investigate complaints concerning biomass installations An increase in domestic biomass installations has led to an increase in complaints concerning smoke and smell. Environmental Health Officers will continue to respond and investigate complaints and take action in terms of the Environmental Protection Act 1990 where appropriate however, there are circumstances in which the Act does not apply.
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Statutory

5.2.6 Better travel choices / behavioural change

The choices that people and organisations make in terms of travel and general behaviour can have a significant impact on local air quality. The Local Transport Strategy lists 'modal shift' as one of its key objectives. The Active Travel Strategy has two Action Plans, one focussed on 'Infrastructure' and another on 'Behaviour Change' aimed at educating residents, business and school students on the options available to them with respect to active travel. The strategy outlines a range of measures outlining the benefits of active travel, which could easily be integrated with education on Air Quality.

By raising awareness of air quality and the AQMA, and by promoting options and alternatives by which people can contribute to improving local air quality, it is hoped that long-term behavioural change can be encouraged. It is important that members of the public and organisations are informed about local air quality issues, as their support is important to the success of the AQAP. It is also important that local air quality is linked with other programmes being progressed within the Council

5.2.6.1 Quality Bus/Bike partnerships

Active travel such as walking and cycling is healthy and environmentally friendly however the percentage of people in East Dunbartonshire who regularly walk or cycle is lower than the national average (LTS 2013-2017). East Dunbartonshire Council aims to make both walking and cycling attractive and popular. In recent years, EDC has invested significantly in walking and cycling infrastructure and promotion and recently delivered a number of key infrastructure enhancements improving connectivity with adjacent local authorities. This has included the publication of its first Active Travel Strategy in 2015. The improvements included in the Active Travel Strategy are aimed at increasing the uptake of cycling as an attractive and safe travel option for a wide range of users. The strategy aims to provide an evidence base and framework for projects that will help East Dunbartonshire contribute to the Scottish Government's ambitious targets of having a 10% of all short journeys by bike and 30% by foot by 2020.

Measure	Title

13.	Quality Bus/Bike partnerships
Definition	Key Intervention
a. Consider extending opportunities to improve infrastructure and create further cycle/bus corridors in other areas of Bearsden b. Expand the network with new cycle and walking routes both within towns and the countryside dedicated for active travel use to avoid conflict with motor vehicles	Improve active travel routes and upgrade existing routes and install active travel improvement measures such as cycle lanes as set out in the Active Travel Strategy. Provide change and storage facilities at train stations and town centres All new developments should integrate dedicated active travel routes which connect to the network Maintain the network to a high standard ensuring eg good quality surfaces along cycle routes
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council, SPT, Sustrans	Voluntary

5.2.6.2 Council smart working

EDC has invested in Smart working technology. Smart working is about moving to smarter and more flexible ways of working, at the same time as becoming more efficient by making up to date technology available to staff. This investment in technology means that a large number of staff can work in variable workplaces including remotely, in other organisations and at home. Smart working means being more flexible about when and where employees work and how technology is used to find new and more efficient ways to do things.

Measure	Title
14.	Council smart working
Definition	Key Intervention
a. Continue to invest in up to date methods and technology which encourage smart working. The process is complete for office based staff	Put mechanisms in place to increase availability of Smart working to increased numbers of staff Invest in the most up to date technology to ensure flexibility and efficiency is maintained Invest in further training for staff to maintain efficiency
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

5.2.6.3 Green Travel Planning

Travel plans aim to address the negative impacts of car travel, notably single occupancy vehicles, by encouraging car sharing, or a shift to more sustainable forms of transport, such as walking, cycling and

public transport; or reducing the need for travel. Such plans typically recognise that one solution is unlikely to be suitable for everyone and thus focus on encouraging the consideration of alternative forms of travel through the provision of incentives such as improved cycle facilities, flexible working arrangements and discounted public transport.

Travel plans have been widely adopted across the UK and have been shown to be cost-effective at reducing car usage in numerous situations. As a result, the adoption of Travel Plans is now widely promoted by the UK Government[6].

The Council's Corporate Travel Plan is currently being developed and will provide staff with comprehensive information on sustainable ways to travel to work.

Measure	Title	
15	Green travel planning	
Definition		Key Intervention
a. Improve cycle parking at places of work b. Provide facilities for encouraging staff to cycle to work C Investigate possible car sharing scheme with other organisations/local authorities		New, improved cycle parking installed at Southbank Campus Shower facilities and lockers provided at Southbank Campus Car sharing scheme introduced during 2016
Responsible authority and other partners		Powers to be used
East Dunbartonshire Council		Voluntary

5.2.6.4 School travel plans

There is guidance available to local authorities on sustainable school travel and travel plans to ensure and promote the use of sustainable travel and transport. Schools throughout East Dunbartonshire have an individual school travel plan which should be updated regularly as appropriate. All new build schools within EDC require a school travel plan as part of their planning permission ensuring pupils are catered for and presented with sustainable travel options. The Active Travel Strategy has actions to reduce vehicular access to new build schools accompanied with a wide range of training for school children to travel to school by bike. Actions 2.1-2.7 within the Active Travel Strategy are all designed to improve active travel participation in Schools.

Measure	Title	
16	School travel plans	
Definition		Key Intervention
a. Update all school travel plans where appropriate ensuring sustainable travel options are presented.		An assessment of travel and transport needs of pupils should be undertaken including an audit of the sustainable travel and transport infrastructure that may be used by pupils A strategy to develop sustainable travel and transport infrastructure to ensure pupils are best catered for Promotion of sustainable travel and transport modes Provision of funded personnel to deliver School Active Travel Plans and implementation of actions

[6] Good Practice Guidelines. Delivering Travel Plans through the planning Process. DfT (2009)

Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

5.2.6.5 Air quality awareness raising and education

Understanding the reasons behind poor air quality; what the pollutants are; where they come from; what makes them worse and what makes them better is beneficial if one is to make improvements. The development management process has a significant role to play in ensuring that new developments take due cognisance of air quality issues however, resolving the issues can impinge on a number of related services such as transport, sustainability and climate change. Educating the public too is vital and passing on information through school pupils is a good way of ensuring the message is taken home. The air quality message overlaps too with certain areas of the curriculum for excellence in schools and advantage should be taken of this.

Measure	Title
17	Air quality awareness raising and education

Definition	Key Intervention
a. Raise awareness of air quality issues as part of joint action days with Police Scotland b. Raise awareness among EDC staff by providing air quality training sessions c. Raise awareness in schools by involving pupils in science projects, art competitions and planting days	EDC officers regularly take part in co working with Police Scotland to raise awareness of issues with engine idling particularly around schools Awareness raising campaigns are advertised on billboards and bus shelters throughout East Dunbartonshire along with regular radio campaigns. Introduction of an air quality training programme for planners and other associated staff Regular update of EDC webpage to ensure up to date information and air quality reports are available
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

5.2.6.6 Travel plans for large employers

A travel plan is a general term for a package of measures tailored to the needs of individual sites and aimed at promoting more sustainable travel choices and reducing reliance on cars. Reducing reliance on cars should in turn reduce pollutant levels associated with exhaust emissions. Action 2.8 in the Active Travel Strategy outlines scope for providing major employers with relevant information to assist with workplace travel planning including using corporate travel plan as a model. Actions 2.8-2.13 in the ATS are all aimed at increasing active travel participation through local employers.

Measure	Title
18	Travel plans for large employers

Definition	Key Intervention

a. Strategic development and regeneration team to ensure all relevant commercial planning applications have travel plan conditions applied in accordance with current best practice b. Offer assistance to existing companies to aid the process of creating a travel plan	EDC is probably one of the biggest employers in the area and a Draft Travel Plan is currently underway Promotion of travel plan initiatives such as Travel Smart
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

5.2.6.7 Eco driver training

Training for Council Staff as well as fleet. Fuel good training can help individuals become more efficient drivers either at work or during leisure and help save money on fuel costs. Based on 12,000 miles per annum, this equates to typical annual savings of £250 – and to improvements in Air Quality.

East Dunbartonshire Council hope to provide free Fuel Good sessions to employees. This would help to further improve air quality, reduce emissions, save money and improve EDCs environmental credentials in terms of its carbon footprint. This will take place as funding allows.

Measure	Title
19	Eco driver training

Definition	Key Intervention
a. Provide free fuel good driver training sessions for all appropriate employees	Typical annual savings of £200-250 for a car driver (more for a van) Reduced likelihood of accidents Reduced wear and tear on tyres, brakes and clutches Helps improve Air Quality Helps carbon reduction
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council in conjunction with an approved trainer	Voluntary

5.2.6.8 Council Fleet – Pool Cars – prioritised spaces

EDC has a Pool Car Protocol and a variety of vehicles, including electric vehicles are available to staff for work use. Prioritised spaces are given over to Council pool cars at each Council building and a booking system is in place.

East Dunbartonshire embarked on a car share scheme in 2016 with employees being encouraged to sign up.

Colleagues are being urged to find out more about a car-share scheme which is helping to reduce congestion, parking demand and travelling costs.

The Scheme has signed up a number of employees who see the benefit of car-sharing, which helps to reduce local congestion, parking issues, travel costs, and engine wear and tear. At the same time it's a great way of networking and is completely flexible. To date, 116 employees have signed up to participate.

Measure	Title
20	Council Pool Cars – prioritised spaces and Car Sharing

Definition	Key Intervention
a. Council pool cars to have prioritised parking spaces b. Car sharing database to be instigated (introduced in 2016)	Prioritised parking spaces for pool cars ensures cars are easily accessed and parked within easy reach and staff do not have to drive and search for suitable alternative spaces. Car sharing encourages staff to share journeys thus reducing fuel use and emissions across EDC area.
Responsible authority and other partners	**Powers to be used**
EDC and Liftshare	Voluntary

5.2.6.9 Vehicle emissions testing

EDC undertakes vehicle emission testing within AQMAs and other parts of the area. Fixed penalty notices are served for vehicles failing to meet the appropriate emission standards, although there is an option to have a faulty vehicle repaired and re tested.

Measure	Title
21	Vehicle emissions testing

Definition	Key Intervention
a. Vehicle emission testing is carried out as part of partnership working with Police Scotland and North Lanarkshire Council	Fixed penalty notices are served on vehicles failing the appropriate emissions standards, This raises awareness of the impact that vehicle emissions has on air quality.
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council, North Lanarkshire Council, Police Scotland	Statutory

5.2.6.10 Vehicle Tracking and Telematics

Fitted to all council vehicles, details vehicle routes and whether moving or idling. Vehicle tracking systems help monitor and manage fleet operations providing real time information which can help towards the reduction of fuel use and emissions, carbon reduction, encourage better driving techniques and put a stop to any council vehicles engine idling. Reduction in fuel use is a cost benefit and best route information can lead to more efficient fleet operations. Investment in stop/start technology eliminates vehicle engine idling.

Measure	Title
22	Vehicle Tracking and Telematics

Definition	Key Intervention

a. Council fleet to have vehicle tracking system installed as standard b. Council pool vehicles have tracking system installed as standard	Reduced fuel use, reduced carbon emissions, reduced pollutant emissions, prohibits vehicle engine idling
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

5.2.6.11 Improvements to SPT prioritised bus stops

Each year the Traffic and Transport Team apply for capital funding from SPT for the upgrade of bus stops throughout the Council area. The priority list is collated by SPT with input from local bus operators. SPT have had their government funding downgraded by 37% for 2016/17, therefore funding of Local Authority's projects has also dramatically dropped. Throughout 2014/15 and 2015/16 major improvements were made to various bus stops in Bearsden and Milngavie.

Measure	Title
23	Improvements to SPT prioritised bus stops
Definition	Key Intervention
a. Improvements to bus stops	Encourage Active travel
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council, SPT	Voluntary

5.2.7 Other measures

5.2.7.1 Soft measures – Healthy Habits

The Healthy Habits campaign seeks to inspire people to choose active travel such as walking and cycling. The campaign currently has funding which is being focussed in the Bearsden and Milngavie area and building on the previous good work undertaken throughout Kirkintilloch and Lenzie a few years ago. Action 1.20 of the ATS is dedicated to continuation of rolling out enhanced 'Healthy Habits' signage. This is complemented by Action Plan Table 2 – Behaviour Change (Page 51 of the Active Travel Strategy).

Measure	Title
24	Soft measures – healthy habits
Definition	Key Intervention
a) Continue to seek funding in terms of Healthy Habits and look for further ways to extend walking and cycling routes. Where possible, particularly encourage children to cycle b) Sign post "Healthy Habits" routes in Bearsden and Milngavie c) Publish appropriate maps for public use	Encourage participation in Healthy Habits to help communities across East Dunbartonshire to lead healthier and more active lives Encourage schools within and adjacent to the AQMA to participate in cycle training and encourage children to walk/cycle to school
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

5.2.7.2 Domestic Emissions & Fuel Consumption Awareness Raising

Where properties are in poor condition and poorly maintained, fuel consumption may be higher and more expensive. It is therefore essential to ensure measures such as insulation are encouraged. The government has introduced a package of measures available to most people.

Measure	Title
25	Domestic Emissions & Fuel Consumption Awareness Raising
Definition	**Key Intervention**
a. Support for awareness raising of energy efficient measures by Scottish and UK government	Housing service will continue with programme of improvement measures in its housing stock including new efficient heating systems and boilers, roofs, windows and doors to reduce domestic emission and reduce fuel consumption
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council	Voluntary

5.2.7.3 Tree and wild flowers planting

Much research has been undertaken to examine whether certain species of tree/plant/shrub are helpful in reducing pollutant levels thus helping towards improving air quality. EDC has been successful in securing funding and has undertaken a variety of planting schemes within or adjacent to the Bearsden AQMA and has also involved schools within the AQMA to participate.

Measure	Title
26	Tree and wild flowers planting
Definition	**Key Intervention**
a. Undertake planting schemes within or adjacent to Bearsden AQMA	Bearsden Primary School pupils participated in a day of planting activities in conjunction with Park Wardens Extensive planting around Bearsden Switchback and nearby woods Further schemes to include high school pupils
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council	Voluntary

5.2.7.4 Joint Health Improvement Plan

The Joint Health Improvement Plan seeks to work with local communities and residents in a joint effort to improve the health of the local population and address health inequalities. It sets out joint planning and working arrangements to deliver health improvements priorities in East Dunbartonshire and supports delivery of East Dunbartonshire's Local Outcomes Improvement Plan *our communities are healthier."*

The current Joint Health Improvement Plan seeks to help deliver targets including climate change, fuel poverty and physical activity but does not fully consider the impact poor air quality has on the health of residents of East Dunbartonshire Council area. This measure will require to be looked at more

closely in conjunction with the NHS on the next update of this plan. During the statutory consultation, a request was made to further address health inequalities and an attempt to address this issue will be included in the next update.

Measure	Title	
27	Joint Health Improvement Plan	
Definition		Key Intervention
a. Continue joint working with local communities and residents in joint effort to improve health and address health inequalities		Ensure health risk attributable to long term exposure to particulate pollution is addressed in the next update of the JHIP
Responsible authority and other partners		Powers to be used
East Dunbartonshire Council, NHS Greater Glasgow and Clyde		Voluntary

5.2.7.5 Green Infrastructure

There is already fairly extensive provision of solar panels and photovoltaic panels in schools and Council buildings and this will continue to help reduce carbon emissions and meet climate change targets. Installing solar panels is a carbon neutral technology and effective in the commercial and domestic sector too.

East Dunbartonshire Council does not have a green roofs policy however green roofs are recognised as sustainable and can trap pollutants where appropriate planting takes place. Green roofs hold in heat therefore are good insulators reducing heat loss and can reduce noise.

Measure	Title	
28	Green Infrastructure	
Definition		Key Intervention
a. Expand the programme of installing sustainable energy measures such as solar panels and photovoltaic panels in schools and on Council buildings b. Seek funding and carry out trial of green roof installation		Monitor the number of installations and track carbon reduction Trial a green roof on a building within Bearsden AQMA and monitor heat loss, and pollutant capture
Responsible authority and other partners		Powers to be used
East Dunbartonshire Council		Voluntary

5.2.7.6 Taxi Licensing

Consideration has been given to the possibility of further improving air quality by introducing a measure in terms of taxi licensing which would introduce a way of reducing emissions from the taxi vehicle fleet either by emission standard or vehicle age. Reducing emissions from taxis would contribute towards improving air quality. Many local authorities have introduced measures to control the quality of taxi vehicle fleet within their boundaries, and some local authorities even have taxi environmental recognition schemes operating within their area to encourage taxi owners to aim for the best standard of vehicle within reason.

Measure	Title
29	Taxi Licensing

Definition	Key Intervention
a. Consider means of reducing emissions from taxis and private hire vehicles in AQMA	Measure could be introduced as part of taxi licence. Licence is only forthcoming if vehicle meets a certain Euro standard – or is above a certain age eg Euro VI or no older than 5 years
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council	Voluntary

East Dunbartonshire Council has recently undertaken consultation to introduce new taxi licensing conditions including the requirement for older vehicles to be tested more frequently. If introduced, this will help ensure that the quality of the licensed taxi fleet is improved.

6 Methodology Utilised to Assess Shortlisted Measures

In accordance with the government guidance, the measures short-listed for inclusion within the action plan have been assessed against a wide range of criteria in order to assess their suitability for inclusion within the plan and enable suitable measures to be prioritised. Those measures felt to give the best improvement in air quality and which are achievable and within the control of the local authority have been further assessed and quantified. At this stage a number of measures are still in development, and it is likely that as these measures are further defined their contribution to the plan will require to be assessed in further detail. The criteria against which options were assessed were:

1. Potential air quality impact
2. Implementation costs
3. Cost-effectiveness
4. Potential co-environmental benefits, risk factors, social impacts and economic impacts
5. Feasibility and Acceptability.

The following paragraphs outline how the assessment has been undertaken.

6.1 Potential Air Quality Impact

This is a key assessment in that the AQAP must focus on prioritising options that improve air quality most effectively. The assessment is complex in that the detailed assessment of any given option could normally be subject to a study of its own requiring significant resources.

A semi-quantitative assessment relying on a level of judgement has been adopted. The method used is outlined below:

1. The description of the option and the proposed change to be brought about by the option is used alongside the source apportionment analysis (Chapter 3) to define what proportion of road transport emissions would potentially be affected by the option.
2. A view is then expressed on how much of the traffic would actually be changed by the option.
3. The proportion of emissions potentially affected by the option and the view on how far they could be changed by the option are combined to express a view on how much transport emissions may be reduced in the AQMA due to the option.
4. A view is then expressed on how significant this change in emissions would be in terms of making progress towards the air quality standard in the AQMA.

For the purpose of the AQ assessment the result of the realistic intervention has been assessed as having a potentially:

- **Zero** local AQ benefit if the realistic intervention is 0% or worse
- **Small** local AQ benefit if the realistic intervention is 1%
- **Medium** local AQ benefit if the realistic intervention is 2-5%
- **Large** local AQ benefit if the realistic intervention is >5%.
-

6.2 Implementation Costs

The potential implementation costs of each option are assessed as follows:

- **Cost neutral** (measure already implemented through existing plans/ programmes)
- **Low** costs (up to £20k annually e.g. for small surveys or campaigns or other options using current resources)
- **Medium** costs (up to £60k annually e.g. for a full time officer and resources)
- **High** costs (up to £200k annually e.g. for small traffic management schemes)
- **Very high** costs (above £200k annually e.g. for new infrastructure)
-

The assessed costs attempt to include the costs to vehicle operators as well as to East Dunbartonshire Council. These cost bandings may be subject to revision depending on comments received from those consulted.

6.3 Cost-Effectiveness

The effectiveness of each measure in improving air quality is compared to the implementation costs in the following matrix (Table 9):

Table 9: Effectiveness vs. implementation costs matrix

AQ benefit / Cost	Score	Zero	Small	Medium	Large
Score		0	1	2	3
Neutral	5	0	5	10	15
Low	4	0	4	8	12
Medium	3	0	3	6	9
High	2	0	2	4	6
Very High	1	0	1	2	3

In this table the assessed implementation costs and potential air quality impacts have been given a weighted score. The product of the weighted scores for each option is calculated. The results can be interpreted as follows:

1. If the product is **high** (10 or more) then the measure is more cost-effective (significant impacts for the cost involved) and perhaps favourably cost-effective
2. If the product is **medium** (between 5-9) then the measure is in the **medium** range of cost-effectiveness
3. If the product is **low** (4 or less) then the measure is less cost-effective (small impacts for the cost involved) and perhaps unacceptably poor in cost-effectiveness terms.

This method only estimates the *relative* cost-effectiveness of options rather than their *absolute* values. The method is useful during discussions of the relative priority of different options. The final

cost-effectiveness value is sensitive to changes in the assumptions of how effective a measure might be in reducing emissions and how costly it is.

6.4 Potential Co-Environmental Benefits

In this assessment other environmental benefits are highlighted.

1. Greenhouse gases: The likely effect on greenhouse gas emissions is assessed as being an overall reduction or a local reduction perhaps with emissions being relocated elsewhere.
2. Noise.

Without detailed information on the true impacts of the options these assessments rely on judgement.

6.5 Potential Risk Factors

In this assessment risk factors are highlighted. These may be looked at more closely within a Strategic Environmental Assessment of any measure implemented. At this stage it is simply highlighted whether or not it is likely that the measure would:

1. Relocate emissions and hence lead to worsening air quality elsewhere
2. Require a change in land use
3. Place limits on pace of development, or increase costs of development significantly.

Without detailed information on the true impacts of the measures, these assessments rely on judgement.

6.6 Potential Social Impacts

Potential social impacts are highlighted. These may need to be examined more closely when developing the options further. At this stage it is simply highlighted whether or not it is likely that the option would potentially:

1. Provide health benefits in terms of lower exposure to pollutants or increased mobility
2. Increase road safety
3. Improve accessibility

Without detailed information on the true impacts of the options these assessments rely on judgement.

6.7 Potential Economic Impacts

Potential economic impacts are highlighted. These may need to be examined more closely when developing the options further. At this stage it is simply highlighted whether or not it is likely that the option would potentially:

1. Influence sustainable development or accessibility in Bearsden
2. Reduce or increase overall travel time
3. Place additional requirements on operators.

6.8 Feasibility and Acceptability

Each option has been assessed for its feasibility against three simple criteria. These are whether the authority has:

1. The executive powers under existing legislation to implement and enforce a measure. Alternatively, whether the authority has an existing mechanism to influence other agencies to implement a measure
2. Secured funding for the measure or a straightforward route for securing funding
3. Characterised the potential positive and negative impacts of the measure with sufficient evidence or confidence to make a decision to implement the measure.

Table 10 below sets out the criteria adopted for defining the option as being feasible over the short, medium or long term, or as being unfeasible. Each option is assessed against each criterion. The final feasibility timeframe is defined according to which of the three assessments results in the longest of the four possible terms (short, medium, long or unfeasible). For example, an option for which powers are clear and for which impacts are well characterised but for which funding will be difficult to obtain would be assessed as feasible over the long term.

Table 10 Criteria for feasibility analysis

Feasible in the:	Authority has the powers	Funding secured	Potential positive and negative impacts are well characterised
Short term (1-2 years)	Yes, clearly defined and already exercised	Yes potentially straightforward	Yes
Medium term (3-6 years)	Yes but novel or with an element of uncertainty	Yes with forward planning	Not without further study
Long term (>6 years)	Highly uncertain	No or extremely difficult	Not without further study
Unfeasible	No	Will never attract funding	Hard to characterise and with high risks

In relation to the acceptability, a preliminary judgement is expressed on how acceptable each option might be to stakeholders according to the following criteria:

1. The option is considered potentially acceptable if: the option is unlikely to compel people to change behaviour or increase their costs significantly or at least some level of behaviour change or personal costs are required but the scheme is overall consistent with community policies;
2. The option is considered potentially unacceptable if: unacceptably intrusive changes in behaviour or large personal costs would be incurred.

Final judgements on acceptability will necessarily rest with the elected Council members.

A summary of the results of the assessment are presented in Table 11 below, with further details presented in Appendix 1.

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
Strategic **measures**										
1.	Liaise with Scottish Gov regarding national air quality policy				Greenhouse Gas; Health improvements; Improve the local environment.	None	None	None		Yes / Short to medium term
2.	Integrate Air Quality with Council Policies and Plan				Greenhouse Gas; Health improvements; Improve the local environment.	None	Active Travel			Yes / Short to medium term
Traffic Management – optimisation of traffic movement through the AQMA										
3.	Junction improvements at Bearsden Cross – Feasibility Study Already decided against	Low (4)	Small (1)	Low (4)	Greenhouse Gas; Health improvements; Improve the local environment.	None	None	None		Yes/Short Term
4.	Intelligent Traffic management system	Medium (2)	Neutral (5)	High (10)	GHG	None	Shorter journey times through the AQMA	None		Yes / Short Term

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
Measures aimed at moving road traffic away from AQMA										
5.	Parking Controls Current proposals to decriminalise parking. – already adopted Proposing to extend the controlled parking zone. additional Yellow lines near schools and hotspots	Small (1)	Neutral (5)	Medium (5)	GHG	Attract more vehicles	Concern that local shops may be negatively affected	Concern that local shops may be negatively affected		Yes/ Short
6.	Mitigation of emissions from developments within and around the AQMA. Planning GIS system to have upgrade to include AQMA boundary (already in place) Dust management Plans for all construction / demolition sites	Small to medium depending on development (1)	Neutral (5)	Medium (5)	Reduction in smoke and dust complaints.	None	Health benefits	Developers will know at the start of the planning process what is expected from them		Yes / Short to medium term

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
7.	Introduce Air Quality Guidance for Environmental Health and Planning Officers	Small to medium (1)	Low (4)	Low (4)	Positive impact on climate change, carbon reduction	None		Developers will know at the start of the planning process what is expected from them.		Yes / Short to medium term
Reduce the emissions from sources by technical means										
8.	Fleet - waste collection is now fortnightly Council operation shifts	Small to Medium (2)	Neutral (5)	High (10)	GHG, Carbon reduction	None	Public perception of having waste collected less frequently.	Fuel savings and vehicle savings. Potential savings of 500k per year.		Yes / Short Term

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
9.	Council Fleet Replacement programme and Electric Vehicles	Medium (2)	Neutral (5)	High (10)	GHG, carbon reduction	Increased costs including increased maintenance requirements	none	Increased costs including increased maintenance requirements. Improved efficiency leading to reduction in fuel costs.		Yes/ Short to Medium Term
10.	Environmental Fleet Recognition	Medium (2)	Medium (3)	Medium (6)	Greenhouse Gas; Health improvements; Improve the local environment	Low	None	+ve for businesses taking part		Yes / Short to medium term
11.	Enforcement of Vehicle Idling	Small (1)	Low cost Funding from Scottish Gov.(4)	Low (4)	Yes- GHG	None	Perceived as being worthwhile. Health Benefits	May have cost savings for bus operators		Yes/ Short Term

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
12.	Management of Biomass Installations	Negative unless appropriate Abatement Zero (0)	Neutral (5)	Low (0)	GHG	Possible negative impact on AQ if poorly run and depending on siting.		Removal or repair of unsuitable installations.		Yes / Short to medium term
Better travel choices/ behavioural change										
13.	Quality Bus/ Bike – Partnership/ Corridors	Medium (2)	Neutral (5)	High (10)	GHG, Carbon reduction	None	Better choices for travel and health	none		Yes/ Short Term

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
14.	Council - Smart working	Medium Less staff travelling to work. Flexible working also changes the peak travel (2)	Neutral (5)	High (10)	GHG, Carbon reduction	None	Less social interaction with work colleagues.	Staff benefit from reduced travel costs. May increase fuel use costs in the home with uptake of homeworking		Yes / Short to medium term
15.	Green Travel Planning including: Council's Workplace Travel Plan	Small (1)	Low (4)	Low (4)	GHG	None	Health benefits	Less space required for parking		Yes/ Short Term
16.	School Travel Plans	Small (1)	No post at the moment. Schools responsibility to complete (4)	Low (4)	GHG	None	Health Benefits			Yes/ Short Term

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
17.	Awareness Raising & Education i.e. more info on Council website, real time air quality levels provided on web/in public places. Presentations by Council Staff / Wardens in schools/communities.	Small (1)	Scottish Gov funding. Staff time Low annual costs (4)	Low (4)	None	None	Better informed public. Better travel choices and better links with health.	None		Yes/ Short to Medium
18.	Travel Plans for large institutions and businesses.	Small (1)	Low (4)	Low (4)	Greenhouse Gas; Health improvements; Improve the local environment; Safety	Not monitored	Perception, burden on employee	Negligible		Yes / Short to medium term
19.	Eco Driver Training Council drivers – not necessarily fleet	Small (1)	Energy savings / Transport Scotland trust funding available Possibly Free (4)	Low (4)	GHG	None	Limited to car drivers.	Fuel Savings from better driving		Yes/ Short

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
20.	Council car sharing – prioritised spaces	Small (1)	Low (4)	Low (4)	GHG, Carbon reduction	None		Staff benefit from reduced travel costs.		Yes / Medium Tern
21.	Vehicle Emissions Testing	Small (1)	Funded by Scottish Gov Low (4)	Low (4)	GHG, carbon reduction	None	Fuel savings	Free service to public.		Yes/ Short Term
22.	Masternaut vehicle Tracking – Fitted to all council vehicles, details vehicle routes and whether moving or idling.	Small (1)	Medium (3)	Low (3)	GHG, carbon reduction	None	Drivers learn better driving behaviour that is used in their personal driving too.	Fuel savings leading to financial benefit.		Yes/ Short Term
23.	Improvements to SPT prioritised bus stops	Small (1)	Neutral (5)	Low (5)	GHG, carbon reduction	None	Better choices for travel and health	none		Yes/ medium term
Other										

Table 11 Summary Assessment of Proposed Measures										
No.	Measure Title (CE Score)	Potential Air Quality Impact	Estimated Costs	Cost Effectiveness	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Feasibility/ Acceptability
24.	Soft measures – healthy habits (promotional work)	Small (1)	Funding available so cost neutral (5)	Medium (5)	none	None	Better choices for travel and health	none		Yes / Short term
25.	Domestic Emissions & Fuel Consumption Awareness Raising	Small (1)	Low (4)	Low (4)	GHG, carbon reduction	None	Fuel savings	Fuel savings will result in financial benefit		Yes/ Short Term
26.	Tree and wild flowers planting	Small (1) (PM_{10})	Funding available Low (4)	Low (4)	GHG, carbon reduction. CO_2 reduction greater with grass than trees.	Public Perception	Visual Improvements	none		Yes/ Short Term
27.	Joint Health Improvement Plan	Small (1)	Low (4)	Low (4)	GHG, Carbon reduction	None	Health improvements	None		Long term
28.	Green Infrastructure Solar panels on Primary Schools and Council Buildings	Small (1)	Low (4)	Low (4)	GHG, Carbon reduction	None	None	None		Long term
29.	Taxi Licensing	Small (1)	Low(4)	Low (4)	GHG, Carbon reduction	None	None	None		Yes/ Short Term

7 Action Plan

East Dunbartonshire Council has already introduced several measures that will contribute to improving air quality within the Bearsden AQMA now and in future years. The air quality objectives are being met in Bearsden (Annual Progress Report 2018). EDC is now seeking to implement further measures to bring about a greater improvement in local air quality and ensure levels remain below the objective levels. This Chapter presents the measures that have been identified as being the most appropriate in addressing the local air quality problem identified within the AQMA and therefore the priority measures for inclusion within the Action Plan.

The measures identified via assessment as priorities and therefore included within the Action Plan can be understood as comprising two lists:

- Strategic options aimed at integrating air quality into all relevant areas of decision making within East Dunbartonshire Council.
- Direct actions which target improved air quality within the Bearsden AQMA, reducing emissions from the primary sources, promoting greater awareness of local air quality and encouraging more sustainable travel choices within East Dunbartonshire in general.

7.1 Prioritisation of Measures

Of the original 29 proposed measures, a number are strategic measures which East Dunbartonshire Council adhere to such as supporting and continuing to liaise with the Scottish Government regarding consideration and adoption of new measures which will contribute to reducing background concentrations of PM and other pollutants. A number of measures have already been undertaken, such as decriminalised parking, and one measure has been put aside (this has been previously explained and documented). Of the remaining measures, quantification of six measures has been undertaken by Aecom on behalf of the Council, and the full findings of the quantification exercise are included in Appendix 4.

7.2 Funding Implementation of the Action Plan

The capacity to successfully implement an Air Quality Action Plan is heavily dependent upon obtaining adequate funding and resources to deliver the proposed measures. Many of the measures included within the plan are already supported through existing strategies (e.g. central government funding for electric vehicle charging infrastructure) but may require some additional funding to facilitate modification in line with the requirements of this Action Plan. For other measures, other sources of funding will require to be secured. Other potential sources of funding include:

- Scottish Government Air Quality Funding
- Developer contributions

The availability of such funding is likely to determine how much of the Action Plan can be implemented, and thus it's potential success at improving air quality within the AQMA. East Dunbartonshire Council's most recent Annual Progress Report has indicated that there were no exceedences of the Scottish Air Quality Objectives within the Bearsden AQMA during 2017 and there has been an overall downward trend over the last few years since the AQMA was declared.

The final Action Plan will have to be approved by East Dunbartonshire Council and by the Scottish Government before it can become a fully adopted plan. Once it has been adopted, East Dunbartonshire Council will collaborate with relevant stakeholders regarding the implementation of

identified measures and monitor the progress of their implementation. This information will be reported annually to the Scottish Government and SEPA in the statutory progress report.

Throughout the period that the plan is implemented East Dunbartonshire Council will:

- Continue to monitor and review air quality to assess whether the AQMA should be revised or revoked
- Produce an annual progress report that sets out new information on air quality in East Dunbartonshire, which will also report on progress made with implementing the Action Plan
- Continue to work closely with other stakeholders and partner organisations in implementing the Action Plan measures and in assessing whether the plan needs to be revised in the light of the findings from air quality review and assessments.

Appendices

Appendix 1: Details of the Action Plan Measures

Appendix 2: List of Steering Group Members

Appendix 3: Statutory and Public Consultation Response

Appendix 4: Quantitative Assessment

Appendix 1 - Details of the Action Plan Measures

In line with the requirements outlined in LAQM.PG(S) (16), the priority options have been developed into specific proposals, with associated timetables for implementation, responsible organisations, and where possible, progress indicators.

The following tables include:

- A simple title and definition of what the measure is aiming to achieve
- The authority responsible for implementing and making progress with the measures
- A description of those powers that this authority may use to implement the measures
- A list of specific tasks and completion dates for tasks within each measure
- An indicator (or indicators) that will be used to monitor progress with implementation
- A target for the extent to which the indicator(s) will be changed in pursuit of the air quality objectives within the AQMA.

Measure	Title						
1.	Liaise with the Scottish Government regarding the consideration of national measures to reduce background concentrations of PM						
Definition						Key Intervention	
Maintain contact with the Scottish Government regarding the adoption of national air quality measures.						Increase focus on background concentrations of PM and encourage national action.	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Contact the Scottish Government lead regarding the consideration of national measures to reduce PM	•	•	•	•	•	Meeting/ consultation with Scottish Government	Ongoing target of reducing PM

Measure	Title
2.	Improving Air Quality links with Local Planning and Development Framework and other Council Plans

Definition	Key Intervention
a. Integration of Bearsden AQAP with future versions of Local Plan. b. Ensure that development proposals with the potential to exert an impact on the AQMA are assessed for air quality impacts and where necessary, appropriate mitigation measures adopted. c. Continue to promote sustainable developments by using the planning process to maximise commitment from developers to minimise air quality impacts. d. Maintain and make available - air quality guidance note for developers.	Local planning considerations aim to mitigate the cumulative negative air quality impacts of new development
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council	Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Integration of AQAP with future versions of Local Plan	•	•	•	•	•	Local Development Plan	Local Development Plan Updated and adopted in 2017
Ensure that development proposals with the potential to exert an impact on the AQMA are assessed for air quality	•	•	•	•	•	Air quality is a material consideration	All development proposals assessed in terms of air quality
Continue to promote sustainable development	•	•	•	•	•	Publication of promotion material	
Maintain and make available - air quality guidance note for developers.			•	•	•	Publication of guidance	Increased developer awareness.

Measure	Title						
3.	Junction Improvements – Feasibility Study						
Definition							Key Intervention
a. Traffic Model Study b. Air Quality Impact Assessment of each transport scenario							Model of junction improvements at Bearsden Cross
Responsible authority and other partners							Powers to be used
East Dunbartonshire Council/Traffic Consultant/Air Quality Consultant							Voluntary
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
a) . Traffic Model Study b) Air Quality Impact Assessment of each transport scenario						Model of junction improvements at Bearsden Cross Alter junction in line with findings of studies Carry out further traffic studies to identify source of problem Further modelling of separate scenarios to determine individual Air Quality impact or improvement	Reduction in congestion at Bearsden Cross NB Feasibility Study was undertaken and no scenario showed a significant improvement therefore this measure will not be progressed. During the consultation process, interest was expressed in this measure however, the Annual Progress Report 2018 reported no exceedences of the air quality objectives for the year 2017 therefore, this measure will not be progressed.

Measure	Title	
4.	Intelligent Traffic Management Systems	
Definition		Key Intervention
a. Identify appropriate locations and implement intelligent traffic management systems to improve traffic flow b. Identify improvements at junctions and consider modifying surrounding environment to achieve maximum benefit		Installation of intelligent traffic management systems could reduce traffic congestion. Air quality issues are linked to congestion as slow moving, stop-start traffic generates more pollution than free flowing traffic Investigate and upgrade junctions with known traffic problems to intelligent traffic management systems on a case by case basis
Responsible authority and other partners		Powers to be used
East Dunbartonshire Council		Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Identify appropriate locations and implement intelligent traffic management systems to improve traffic flow Identify improvements at junctions and consider modifying surrounding environment to achieve maximum benefit		●	●	●		Installation of intelligent traffic management systems could reduce traffic congestion. Air quality issues are linked to congestion as slow moving, stop-start traffic generates more pollution than free flowing traffic Investigate and upgrade junctions with known traffic problems to intelligent traffic management systems on a case by case basis	Reduction in congestion and stop-start traffic Extent of installation and number of junctions under traffic management control Implement junction improvements to smooth traffic flows
		●	●	●			

Measure	Title		
5.	Parking Controls		
Definition			Key Intervention
a. Decriminalise parking b Extend controlled parking zones c Additional yellow lines near schools and hotspots			a The procedure for on street decriminalised parking has taken place. Off street decriminalised parking was introduced summer 2016 b Controlled parking zones could be extended however the appropriate TROs signs and lines must be in place. An across Council steering group in conjunction with Police Scotland looking at parking controls around primary school estate has been formed
Responsible authority and other partners			Powers to be used
East Dunbartonshire Council			Voluntary
Actions	Implementation timetable	Progress indicator	Target

	16	17	18	19	20		
a. Decriminalise parking b. Extend controlled parking zones c. Additional yellow lines near schools and hotspots	●	● ● ●	 ● ●	 ● ●		a. The procedure for on street decriminalised parking has taken place. Off street decriminalised parking introduced summer 2016. b. Controlled parking zones could be extended however the appropriate TROs signs and lines must be in place. c. An across Council steering group in conjunction with Police Scotland looking at parking controls around primary school estate has been formed.	Regular reporting of number of fixed penalty notices served Council car parks began charging summer 2016 for vehicles parking over two hours. From June 2018, charges are enforced in most EDC carparks. Certain streets and access routes to be closed to traffic at certain times of day

Measure	Title						
6.	Mitigation of emissions from developments within and around the AQMA						
Definition						Key Intervention	
a Developments within or impacting on AQMA are reviewed for air quality impacts and where necessary all practical emission mitigation options are considered and implemented. Planning/GIS system to have upgrade to include AQMA boundary b Ensure through planning that all construction/demolition sites have a suitable Dust Management Plan						Regular review and updating of LDP to take account of all policies consistent with air quality objectives and requirements set out in Policy 4 – Sustainable Transport. These policies set out that new developments must aim to provide access by active travel and public transport infrastructure Planning/GIS system upgraded Ensure local air quality is fully integrated in to the LDP process and all development to be appropriately assessed with respect to potential impact on air quality. This is reflected in Policy 4 of the LDP under the Air Quality Section Prioritise in terms of size of site and include in planning guidance.	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

a)	●	●	●	●		Regular review and updating of LDP to take account of all policies consistent with air quality objectives and requirements set out in Policy 4 – Sustainable Transport. These policies set out that new developments must aim to provide access by active travel and public transport infrastructure	Ensure new developments are compliant with active travel and public infrastructure demands
b)	●	●	●	●		Ensure local air quality is fully integrated in to the LDP process and all development to be appropriately assessed with respect to potential impact on air quality. This is reflected in Policy 4 of the LDP under the Air Quality Section Prioritise in terms of size of site and include in planning guidance	All applications to include a Dust Management Plan for approval

Measure	Title						
7.	Air Quality Planning Guidance						
Definition						Key Intervention	
a) Improving links with Local Planning and Development Framework and ensure a consistent approach to air quality impact assessment						Potential developers will know in advance the requirements and expectations of EDC Planning and Environmental Health in regard to pollutant minimisation	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Introduce air quality planning guidance		●	●	●		Potential developers will know in advance the requirements and expectations of EDC Planning and Environmental Health in regard to pollutant minimisation	All new applications take cognisance of Air Quality and build in measures to reduce pollutant levels

Measure	Title
8.	Fleet Waste Collection

Definition	Key Intervention
a) Reduce emissions from source by reducing number of vehicles on road at any one time b) Seven day a week operation has reduced the overall number of vehicles required to operate the service	Altered shift patterns leads to less heavy vehicles in use across EDC area at any one time. Early start and weekend working spreads the use of vehicles reducing peak travel time emissions
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
a)		●	●	●		Altered shift patterns leads to less heavy vehicles in use across EDC area at any one time.	Monitor and record number and type of vehicles used by EDC
b)		●	●	●		Early start and weekend working spreads the use of vehicles reducing peak travel time emissions	Monitor and record number and type of vehicles in use during shifts and compare

Measure	Title
9.	Council Fleet Replacement Programme

Definition	Key Intervention
a) Continue current replacement programme	Promote the uptake and use of cleaner or alternative fuels where possible
b) Pool EDC will attempt to increase availability of electric/hybrid vehicles to appropriate staff	Where funding allows, the Council will look to invest in the provision of electric/hybrid vehicles for staff use as part of the available pool of vehicles for staff
c) Fleet EDC will investigate options available for making use of electric/hybrid vehicles as part of the Council fleet	The Council will investigate, possibly through a feasibility study, the options available for electric/hybrid vehicles which are suitable for use as part of EDC Fleet
d) Increase number of charge points across EDC area	The Council will investigate options for installing charge points at Council buildings
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

a)		●	●	●	●	Promote the uptake and use of cleaner or alternative fuels where possible	Monitor number of alternative fuel vehicles available to staff
b)		●	●	●	●	Where funding allows, the Council will look to invest in the provision of electric/hybrid vehicles for staff use as part of the available pool of vehicles for staff	Monitor number of electric/hybrid vehicles available
c)		●	●	●	●	The Council will investigate, possibly through a feasibility study, the options available for electric/hybrid vehicles which are suitable for use as part of EDC Fleet	Monitor number of electric/hybrid vehicles available within fleet
d)		●	●	●	●	The Council will investigate options for installing charge points at Council buildings.	Continue to increase number of charge points at Council buildings and carparks

Measure	Title						
10.	ECO Stars						
Definition						Key Intervention	
a. Introduce an environmental fleet recognition scheme						This has the potential to influence drivers of fleet who join the scheme. Members must meet certain criteria for emissions and efficient driving technique thus reducing pollutant emissions within all of the EDC area.	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council, TRL and all members						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

Introduce an environmental fleet recognition scheme		●	●	●	●	Number of companies participating in scheme	Increase annually the number of companies participating NB scheme introduced in March 2017 and will continue as funding allows. As of March 2019, 85 companies have signed up to the scheme.

Measure	Title						
11.	Vehicle Idling Enforcement						
Definition						Key Intervention	
a. The Council has adopted the necessary enforcement powers to allow staff to undertake monitoring of engine idling, including buses, and where appropriate, enforce financial penalties for non-compliance b. Regular vehicle idling awareness raising campaigns are undertaken with distribution of leaflets and advice						Continue to carry out engine idling enforcement patrols and issue fixed penalties where appropriate Continue to carry out awareness raising campaigns to highlight the increase in emissions of exhaust pollutants and greenhouse gases due to inefficient combustion during engine idling Continue to investigate complaints and take any action necessary Continue to take part in joint vehicle idling initiatives with Police Scotland Continue to erect appropriate signage	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council, North Lanarkshire Council, Police Scotland						Road Traffic Act 1988	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

The Council has adopted the necessary enforcement powers to allow staff to undertake monitoring of engine idling, including buses, and where appropriate, enforce financial penalties for non-compliance Regular vehicle idling awareness raising campaigns are undertaken with distribution of leaflets and advice		●	●	●	●	Continue to carry out engine idling enforcement patrols and issue fixed penalties where appropriate Continue to carry out awareness raising campaigns to highlight the increase in emissions of exhaust pollutants and greenhouse gases due to inefficient combustion during engine idling Continue to investigate complaints and take any action necessary Continue to take part in joint vehicle idling initiatives with Police Scotland Continue to erect appropriate signage	Number of fixed penalty notices served annually Number of awareness raising campaigns per year

Measure	Title						
12.	Management of Biomass Installations						
Definition						Key Intervention	
Suitably manage biomass installations						Ensure installations are to the highest standard possible as part of the planning approval process Ensure chimney height and boiler approval applications are dealt with timeously and raise awareness of the process Create a mapping system to keep track of the number of installations in EDC area Adequately and timeously respond and investigate complaints concerning biomass installations	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council							
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

Suitably manage biomass installations	●	●	●	●	●	Ensure installations are to the highest standard possible as part of the planning approval process Ensure chimney height and boiler approval applications are dealt with timeously and raise awareness of the process	Application forms available on Council website
Create a mapping system to keep track of the number of installations in EDC area		●	●			Mapping system on GIS Adequately and timeously respond and investigate complaints concerning biomass installations	Initial response 48 hours

Measure	Title						
13.	Quality Bus/Bike Partnership						
Definition						Key Intervention	
Consider extending opportunities to improve infrastructure and create further cycle/bus corridors in other areas of Bearsden						All new developments should integrate dedicated active travel routes which connect to the network Maintain the network to a high standard ensuring eg good quality surfaces along cycle routes Provide change and storage facilities at train stations and town centres	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Consider extending opportunities to improve infrastructure and create further cycle/bus corridors in other areas of Bearsden		●	●	●	●	Improve active travel routes and upgrade existing routes Install active travel improvement measures	Monitor numbers using routes 10% of short journeys by bike 30% of short journeys by foot

Measure	Title
14.	Council Smart Working

Definition	Key Intervention
Continue to invest in up to date methods and technology which encourage smartworking. The process is complete for office based staff	Put mechanisms in place to increase availability of Smartworking to increased numbers of staff Invest in the most up to date technology to ensure flexibility and efficiency is maintained Invest in further training for staff to maintain efficiency
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Continue to invest in up to date methods and technology which encourage smartworking.		●	●	●	●	Put mechanisms in place to increase availability of Smart working to increased numbers of staff Invest in the most up to date technology to ensure flexibility and efficiency is maintained Invest in further training for staff to maintain efficiency	No of staff participating in Smart working

Measure	Title
15.	Green Travel Planning

Definition	Key Intervention
a. Improve cycle parking at places of work	New, improved cycle parking installed at Southbank Campus
b. Provide facilities for encouraging staff to cycle to work	Shower facilities and lockers provided at Southbank Campus
c. Investigate possible car sharing scheme with other organisations/local authorities	Car sharing scheme introduced during 2016
d. Update Corporate Travel Plan	
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council	Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
a. Improve cycle parking at places of work	●	●	●	●		New, improved cycle parking installed at Southbank Campus	
b. Provide facilities for encouraging staff to cycle to work	●	●	●	●			
c. Investigate possible car sharing scheme with other organisations and local authorities	●					Shower facilities and lockers provided at Southbank Campus	
d. Update Corporate Travel Plan		●	●			Car sharing scheme introduced during 2016 Corporate Travel Plan update underway	Completion of Corporate Travel Plan

Measure	Title		
16.	School Travel Plans		
Definition		Key Intervention	
Update all school travel plans where appropriate ensuring sustainable travel options are presented.		An assessment of travel and transport needs of pupils should be undertaken including an audit of the sustainable travel and transport infrastructure that may be used by pupils. A strategy to develop sustainable travel and transport infrastructure to ensure pupils are best catered for Promotion of sustainable travel and transport modes Provision of funded personnel to deliver School Active Travel Plans and implementation of actions	
Responsible authority and other partners		Powers to be used	
East Dunbartonshire Council		Voluntary	
Actions	Implementation timetable	Progress indicator	Target

	16	17	18	19	20		
Update all school travel plans where appropriate ensuring sustainable travel options are presented.	●	●	●	●	●	An assessment of travel and transport needs of pupils should be undertaken including an audit of the sustainable travel and transport infrastructure that may be used by pupils A strategy to develop sustainable travel and transport infrastructure to ensure pupils are best catered for Promotion of sustainable travel and transport modes Provision of funded personnel to deliver School Active Travel Plans and implementation of actions	No of travel plans produced Completion and adoption of strategy As funding permits

Measure	Title	
17.	Air Quality Awareness Raising and Education	
Definition		Key Intervention
a) Raise awareness of air quality issues as part of joint action days with Police Scotland b) Raise awareness among EDC staff by providing air quality training sessions c) Raise awareness in schools by involving pupils in science projects, art competitions and planting days		EDC officers regularly take part in co working with Police Scotland to raise awareness of issues with engine idling Awareness raising campaigns are advertised on billboards and bus shelters throughout East Dunbartonshire along with regular radio campaigns. Introduction of an air quality training programme for planners and other associated staff Regular update of EDC webpage to ensure up to date information and air quality reports are available
Responsible authority and other partners		Powers to be used
East Dunbartonshire Council		Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Raise awareness of air quality issues as part of joint action days with Police Scotland Raise awareness among EDC staff by providing air quality training sessions Raise awareness in schools by involving pupils in science projects, art competitions and planting days	●	●	●	●		EDC officers regularly take part in co working with Police Scotland to raise awareness of issues with engine idling Awareness raising campaigns are advertised on billboards and bus shelters throughout East Dunbartonshire along with regular radio campaigns. Introduction of an air quality training programme for planners and other associated staff Regular update of EDC webpage to ensure up to date information and air quality reports are available	No of days devoted to co working with Police Scotland No of staff attending awareness raising training sessions

Measure	Title
18.	Travel Plans for Large Employers

Definition	Key Intervention
a) Strategic development and regeneration team to ensure all relevant commercial planning applications have travel plan conditions applied in accordance with current best practice b) Offer assistance to existing companies to aid the process of creating a travel plan	EDC is probably one of the biggest employers in the area and a Draft Travel Plan is currently underway Promotion of travel plan initiatives such as Travel Smart
Responsible authority and other partners	**Powers to be used**
East Dunbartonshire Council	Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

Strategic development and regeneration team to ensure all relevant commercial planning applications have travel plan conditions applied in accordance with current best practice	●	●	●	●		EDC is probably one of the biggest employers in the area and a Draft Travel Plan is currently underway	Compliance with content of Travel Plan
Offer assistance to existing companies to aid the process of creating a travel plan	●	●	●	●		Promotion of travel plan initiatives such as Travel Smart	Monitor number of companies with travel plans

Measure	Title						
19.	ECO Driver Training						
Definition						Key Intervention	
a. Provide free fuel good driver training sessions for all appropriate employees						Typical annual savings of £200-250 for a car driver (more for a van) Reduced likelihood of accidents Reduced wear and tear on tyres, brakes and clutches Helps improve Air Quality Helps carbon reduction	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

Provide free fuel good driver training sessions for all appropriate employees	●	●	●	●		Typical annual savings of £200-250 for a car driver (more for a van) Reduced likelihood of accidents Reduced wear and tear on tyres, brakes and clutches Helps improve Air Quality Helps carbon reduction	All appropriate employees to complete training

Measure	Title						
20.	Council Car Sharing – Prioritised Spaces and Car Sharing						
a. Council pool cars to have prioritised parking spaces b. Car sharing database to be instigated (introduced in 2016)						Prioritised parking spaces for pool cars ensures cars are easily accessed and parked within easy reach and staff do not have to drive and search for suitable alternative spaces. Car sharing encourages staff to share journeys thus reducing fuel use and emissions across EDC area	
Responsible authority and other partners						Powers to be used	
EDC and Liftshare						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Council pool cars to have prioritised parking spaces Car sharing database to be instigated (introduced in 2016)	●	●	●	●		Prioritised parking spaces for pool cars ensures cars are easily accessed and parked within easy reach and staff do not have to drive and search for suitable alternative spaces. Car sharing encourages staff to share journeys thus reducing fuel use and emissions across EDC area	No of prioritised spaces available at Council buildings No of members

Measure	Title						
21.	Vehicle Emissions Testing						
Definition						Key Intervention	
Vehicle emission testing is carried out as part of partnership working with Police Scotland and North Lanarkshire Council.						Fixed penalty notices are served on vehicles failing the appropriate emissions standards, This raises awareness of the impact that vehicle emissions has on air quality.	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council, Police Scotland, North Lanarkshire Council						Road Traffic Act 1988	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Vehicle emission testing is carried out as part of partnership working with Police Scotland and North Lanarkshire Council	●	●	●	●		Fixed penalty notices are served on vehicles failing the appropriate emissions standards, This raises awareness of the impact that vehicle emissions has on air quality.	Monitor number of fixed penalty notices served annually

Measure	Title						
22.	Vehicle Tracking and Telematics						
Definition						Key Intervention	
Council fleet to have vehicle tracking system installed as standard						Reduced fuel use, reduced carbon emissions, reduced pollutant emissions, prohibits vehicle engine idling	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

Council fleet to have vehicle tracking system installed as standard	●	●	●	●		Reduced fuel use, reduced carbon emissions, reduced pollutant emissions, prohibits vehicle engine idling	100% compliance of all EDC vehicles

Measure	Title						
23.	Improvements to SPT Prioritised Bus Stops						
Definition						Key Intervention	
Improvements to bus stops						Encourage active travel	
Responsible authority and other partners						Powers to be used	
EDC, SPT						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Improvements to bus stops	●	●	●	●		No of bus stops upgraded	Increase active travel

Measure	Title
24.	Soft Measures – Healthy Habits
Definition	Key Intervention
a. Continue to seek funding in terms of Healthy Habits and look for further ways to extend walking and cycling routes b. Sign post "Healthy Habits" routes in Bearsden and Milngavie c. Publish appropriate maps for public use	Encourage participation in Healthy Habits to help communities across East Dunbartonshire to lead healthier and more active lives Encourage schools within and adjacent to the AQMA to participate in cycle training and encouraging children to walk/cycle to school
Responsible authority and other partners	Powers to be used

East Dunbartonshire Council, Scottish Government							Voluntary
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Continue to seek funding in terms of Healthy Habits and look for further ways to extend walking and cycling routes Sign post "Healthy Habits" routes in Bearsden and Milngavie Publish appropriate maps for public use	●	●	●	●		Encourage participation in Healthy Habits to help communities across East Dunbartonshire to lead healthier and more active lives Encourage schools within and adjacent to the AQMA to participate in cycle training and encourage children to walk/cycle to school	Monitor uptake of healthy activities offered by EDLC eg participation in walking clubs Monitor increase in participation of cycle safety courses in schools

Measure	Title
25.	Domestic Emissions and Fuel Consumption Awareness Raising
Definition	Key Intervention

Support for awareness raising of energy efficient measures by Scottish and UK government	An increase in domestic biomass installations has led to an increase in complaints concerning smoke and smell. Environmental Health Officers will continue to respond and investigate complaints and take action in terms of the Environmental Protection Act 1990 where appropriate Housing service will continue with programme of improvement measures in its housing stock including new efficient heating systems and boilers, roofs, windows and doors to reduce domestic emission and reduce fuel consumption
Responsible authority and other partners	Powers to be used
East Dunbartonshire Council, Energy Savings Trust	Voluntary

Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Support for awareness raising of energy efficient measures by Scottish and UK government	●	●	●	●		An increase in domestic biomass installations has led to an increase in complaints concerning smoke and smell. Environmental Health Officers will continue to respond and investigate complaints and take action in terms of the Environmental Protection Act 1990 where appropriate Housing service will continue with programme of improvement measures in its housing stock including new efficient heating systems and boilers, roofs, windows and doors to reduce domestic emission and reduce fuel consumption	Initial response time of 48 hours to complaints Monitor % of housing stock with energy efficient improvements complete

Measure	Title
26.	Tree and Wildflower Planting

Definition						Key Intervention	
Undertake planting schemes within or adjacent to Bearsden AQMA as funding allows						Bearsden Primary School pupils participated in a day of planting activities in conjunction with Park Wardens. Similar to be carried out in other schools Extensive planting around Bearsden Switchback and nearby woods Further schemes to include high school pupils	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Undertake planting schemes within or adjacent to Bearsden AQMA as funding allows	●	●	●	●		Bearsden Primary School pupils participated in a day of planting activities in conjunction with Park Wardens Extensive planting around Bearsden Switchback and nearby woods Further schemes to include high school pupils	Further planting of appropriate species where funding allows Increase number of schools participating in planting activities This measure is undertaken when funding is available.

Measure	Title						
27.	Joint Health Improvement Plan						
Definition						Key Intervention	
Continue joint working with local communities and residents in joint effort to improve health and address health inequalities						Ensure health risk attributable to long term exposure to particulate pollution is addressed in the next update of the JHIP	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council, NHS						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		

Continue joint working with local communities and residents in joint effort to improve health and address health inequalities	●	●	●	●		Ensure health risk attributable to long term exposure to particulate pollution is addressed in the next update of the JHIP	

Measure	Title						
28.	Green Infrastructure						
Definition						Key Intervention	
Expand the programme of installing sustainable energy measures such as solar panels and photovoltaic panels in schools and on Council buildings Seek funding and carry out trial of green roof installation						Monitor the number of installations and track carbon reduction Trial a green roof on a building within Bearsden AQMA and monitor heat loss, and pollutant capture	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Expand the programme of installing sustainable energy measures such as solar panels and photovoltaic panels in schools and on Council buildings Seek funding and carry out trial of green roof installation	●	●	●	●		Monitor the number of installations and track carbon reduction Trial a green roof on a building within Bearsden AQMA and monitor heat loss, and pollutant capture	Track carbon reduction associated with Council estate Undertake pilot project if funding is available

Measure	Title						
29.	Taxi Licensing						
Definition						Key Intervention	
Consider means of reducing emissions from taxis and private hire vehicles in AQMA						Measure could be introduced as part of taxi licence. Licence is only forthcoming if vehicle meets a certain Euro standard – or is above a certain age for example Euro V or no older than 5 years	
Responsible authority and other partners						Powers to be used	
East Dunbartonshire Council, Licensed Taxi Association						Voluntary	
Actions	Implementation timetable					Progress indicator	Target
	16	17	18	19	20		
Consider means of reducing emissions from taxis and private hire vehicles in AQMA	●	●	●	●		Measure could be introduced as part of taxi licence. Licence is only forthcoming if vehicle meets a certain Euro standard – or is above a certain age eg Euro V or no older than 5 years	No of licensed taxis above eg Euro V1. Target to be agreed in conjunction with taxi driver association A consultation has taken place on taxi licensing with a proposal that older vehicles undergo testing twice yearly.

Appendix 2 Steering Group Members

Names		Position	Department
Alison	Laurence	Team Leader	Land Planning Policy
Anne	Prescott	Environmental Health Officer	Community Protection
Evonne	Bauer	Strategic Lead	Place and Community Planning
Ewan	Wilson	Land Planning Policy Officer	
Gail	MacFarlane	Strategic Lead	Road and Transportation
Gbemisola	Taiwo	Team Leader	Assets and Facilities
Isla	Hamilton	Team Leader	Development & Enterprise
Jackie	Gillespie	Project Officer	Neighbourhood Services
Jennifer	Horn	Team Leader	Strategic Development and Regeneration
Jim	Kerr	Head Teacher	St Andrews Primary School, Bearsden
Jimmy	Gray	Energy Officer	Corporate Assets
Joe	Harkin	Team Leader	Community Protection
Lauren	Hollas	SEA Officer	Land Planning & Development
Liam	Greene	Team Leader	Roads Network
Maureen	Daniel	Depute Head Teacher	Bearsden Academy
Neil	Samson	SEA Officer	Land Planning & Development
Niall	Urquhart	Team Leader	Land Planning & Development
Paul	Curran	Strategic Lead	Neighbourhood Services
Paul	Meehan	Acting Head Teacher	Bearsden Primary School
Robin	O'Malley	Transport Development Officer	Development & Enterprise
Stevie	McCafferty	Team Leader	Neighbourhood Technical and Engineering Services
Sylvia	Gray	Team Leader	Sustainability Policy

Appendix 3 Statutory and Public Consultation Responses

The statutory consultation for the Draft Bearsden Air Quality Action Plan ended on 31st January 2018 whilst the public consultation ended on 28th February 2018. Drop In sessions with manned displays were undertaken during January and a consultation page on the Council website encouraged the public to submit their comments.

The responses to the consultation have been summarised and changes made to the Action Plan where appropriate.

Additional information relating to timescales and targets and quantification of certain measures have been added to the document to address the implementation issues raised by the Statutory Consultees.

Responses were received from the following statutory consultees as well as members of the public:

- Scottish Government
- Scottish Environment Protection Agency (SEPA)
- Scottish Natural Heritage
- NHSGG&C
- MSP

Consultation Responses

The consultation responses have been summarised and the main points have been sorted according to broad subject area. The following suggestions, comments and criticisms were made

Public Transport

- Introduction of a rail halt at the Allander Sports Centre site
- Increase frequency of trains and improve reliability of services. Trains failing to stop at some stations to allow catch up of the service deters people relying on them
- Introduction of a local bus at peak times so that people can access train stations without driving to them
- Improve public transport links between Bearsden and the Queen Elizabeth University Hospital site.
- Establish a park and ride on the outskirts of Bearsden or Milngavie
- Improvements to the bus service such as a “loopbus”. This would provide an alternative to car or taxi journeys
- Adoption of bus prioritisation initiatives
- The Bearsway project has been attributed to the increase in traffic at Drymen Road however; buses are often running empty within the area, suggesting poor uptake, especially bus 118
- Green travel plans should be drawn up with the involvement of staff, their trade unions and other appropriate stakeholders. It is vital that the plans are developed with the support of those who are affected
- Subsidise school transport as some parents view driving children to school as a cheaper option

Parking Controls and Enforcement

- Introduction of car exclusion zones around schools
- Many schools have issues with idling traffic at drop off and pick up times.

- Ensure compliance with traffic management schemes ie cars stopping on yellow lines, zig zags and chevroned corners, particularly near schools
- Increase traffic regulation enforcement
- Introduce a low emission zone
- Reduce vehicle idling by extending area where signs are displayed eg Roman Road/Drymen Road

Bearsden Cross Junction

- Introduction of a smart traffic light system – make the phase on the main road longer at the morning and evening peak to reduce queues
- Reversing the one way system around the town centre so that vehicles do not come out on to the main road might reduce queueing

Non Road Sources of Pollution

- The installation of wood burning stoves are impacting neighbours, even within smoke control areas which were introduced to improve the health of the population. There is no control over what is actually burned, even on Defra approved stoves, and the legislation doesn't address the unpleasant smells associated with these appliances

Public Health

- Consideration should be given to moving receptors away from the source of pollution
- More mention should be made of the effect of pollution on vulnerable receptors
- It is not clear why some options were jettisoned so early in the assessment process. More details on the reason why should be given
- Health inequalities should be given specific mention

Other

- Grant fewer placing requests from out with the area as those who live further away are more likely to drive
- Consider use of LPG for powering taxi/private hire fleet
- Relocate schools to improve air quality around Bearsden Cross
- Use green infrastructure to reduce pollutant levels

Appendix 4 Quantification Assessment

The ability to quantify the potential improvements in air quality is useful when determining which actions should be implemented. The following measures were quantified and Emission Factor Toolkit (version 8.0.1) (Defra, 2018) was used to calculate road vehicle emission of NOx and PM_{10} for four roads within the Bearsden AQMA. The percentage emission reduction associated with each action was then determined by comparing scenarios with and without the action. In addition, the damage costs associated with each action was also determined. This helps to determine which measure gives the maximum benefit to improving air quality. The damage costs are indicative of the improvement in terms of air quality. They measure the cost caused by the amount of pollutant being released – or can be read as the value of the impact of exposure to the pollutant on health. The measures have then been placed in order of which measure achieves the largest improvement in air quality

Eg reduce the queueing on each of the assessed roads from 5% to 3% and the potential reduction in NOx emission is 3.6% and PM_{10} concentrations is 0.2%.

This same exercise was carried out for six measures and the improvement to air quality and in turn, impact on public health is indicated.

Of the measures quantified, some have been completed already (such as Measure 8 – Fortnightly Waste Collection), some are underway (such as Measure 4 – Intelligent Traffic Management Systems [an upgrade to the existing MOVA system from 6 to 8 should be complete by March 2019], and some are about to be undertaken (such as Measure 19 - Eco Driver Training which is due for roll out to staff in Summer 2019 if funded permits).

The full report is appended below.

1. Introduction

1.1 As part of its statutory duties, East Dunbartonshire Council (EDC) monitors and assesses local air quality levels within its boundaries. In 2008, a detailed assessment identified potential exceedences of the air quality objective for nitrogen dioxide (NO_2) and fine particulate matter (PM_{10}) within Bearsden. Subsequently, in 2011, EDC declared an Air Quality Management Area (AQMA) in Bearsden for the annual mean NO_2 and PM_{10} objectives (Appendix A).

1.2 EDC are now in the process of preparing their Action Plan to identify actions and policies to improve air quality in the Bearsden AQMA and to ensure the air quality objectives are met.

1.3 In September 2017, Ricardo-AEA prepared the draft Bearsden Air Quality Action Plan on behalf of EDC. This was then consulted on by the public as well as statutory bodies. The statutory consultation ended on the 31st January 2018, whilst the public consultation ended on the 28th February 2018.

1.4 In July 2018, AECOM provided a review of the consultation responses. As part of this review, each action was discussed in terms of whether the potential improvements in air quality could be quantified.

1.5 The following measures were identified as being quantifiable:

- Action 3: Junction Improvements: Feasibility Study;
- Action 4: Intelligent Traffic Management System (ITMS);
- Action 8: Fleet –fortnightly waste collection;
- Action 9: Council Fleet Replacement programme and Electric Vehicles (EV);
- Action 13: Quality Bus/Bike – Partnership/Corridors;
- Action 19: Eco Driver Training; and
- Action 23: Improvements to Strathclyde Partnership for Transport (SPT) prioritised bus stops.

1.6 The ability to quantify the potential improvements in air quality is useful when determining which actions to implement.

1.7 For each of the above actions, the Emission Factor Toolkit (version 8.0.1) (Defra, 2018) was used to calculate road vehicle emission of NO_x and PM_{10} for four roads within the Bearsden AQMA. The percentage emission reduction associated with each action was then determined by comparing scenarios with and without the action. In addition, the damage costs associated with each action was determined.

2. Local Air Quality Management

2.1 The provisions of Part IV of the Environment Act 1995 establish a national framework for air quality management, which requires all local authorities in England, Scotland and Wales to conduct local air quality reviews. Section 82(1) of the Act requires these reviews to include an assessment of the current air quality in the area and the predicted air quality in future years. Should the reviews indicate that the objectives prescribed in the UK Air Quality Strategy (Defra 2007) (AQS) and the Air Quality Regulations (Defra 2010) will not be met; the local authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level to ensure that air quality in the area improves. This process is known as 'local air quality management' or LAQM.

2.2 As part of this process, the EDC annual progress report completed in 2007 identified that monitored NO_2 concentrations were close to the annual mean objective at several locations in Bearsden, with four sites recording concentrations above the objective. In addition, the annual mean and 24 hour PM_{10} objectives were exceeded at the Bearsden continuous monitoring site.

2.3 In 2008, a detailed assessment was completed to determine the extent of the exceedences of NO_2 and PM_{10} objectives. The assessment concluded that exceedences of both the NO_2 and PM_{10} annual mean objectives were likely around Bearsden Cross and that the monitoring should continue before declaring an AQMA.

2.4 In 2011, EDC declared an AQMA at Bearsden Cross, with respect to the NO_2 and PM_{10} annual mean objectives. The boundary of the AQMA is illustrated in Appendix A. The reasons for these exceedences were ascribed to the volume of traffic and queues during peak hours, combined with the close proximity of residential properties to the road (i.e. as the most significant local emission source).

2.5 Following the LAQM process, a further assessment was undertaken in 2011. The purpose of the further assessment was to investigate the current and potential future pollutant concentrations using monitored data and modelling studies as well as conducting an emissions inventory and a source apportionment study.

2.6 The emissions inventory determined that 54% of NOx emissions in the region were attributed to road transport, whilst 40% were from commercial/residential combustion. Similarly, the dominant source of PM_{10} in Bearsden was ascribed to road transport (53%).

2.7 The source apportionment study identified the contributions of different pollutant sources to total concentrations. The results indicated that emissions from cars and queuing of all vehicles classes contributed the largest proportions of NO_2 and PM_{10} concentrations.

2.8 As part of the further assessment, the reduction in emissions required to achieve the objectives of concern were calculated. The results indicated that the maximum reduction required for NO_x and PM_{10} emissions were 31.5% and 56.9% respectively. It should be noted that these reductions were based on monitored pollutant concentrations in 2011.

2.9 The following section provides an overview of pollutant trends between 2011 and 2017.

Pollutant Monitoring

2.10 EDC undertakes monitoring of NO_2 and PM_{10} concentrations within the Bearsden AQMA using both continuous and passive monitoring techniques.

2.11 Concentrations recorded between 2011 and 2017 are provided in Tables 1, 2 and Figure 1.

Table 1: Continuous Monitoring of NO_2 and PM_{10} Concentrations ($\mu g/m^3$)

Site	Type	2011	2012	2013	2014	2015	2016	2017
Annual Mean NO_2 Concentrations (exceedences of the 1 hour objective are provided in brackets)								
Bearsden CM	Roadside	39(0)	**42**(1)	36(5)	37(0)	34(5)	**46**(**19**)	33(0)
Annual Mean PM_{10} Concentrations (exceedences of the 24 hour objective are provided in brackets)								
Bearsden CM	Roadside	**20**(3)	-	-	14(1)	14(0)	14(0)	13(0)

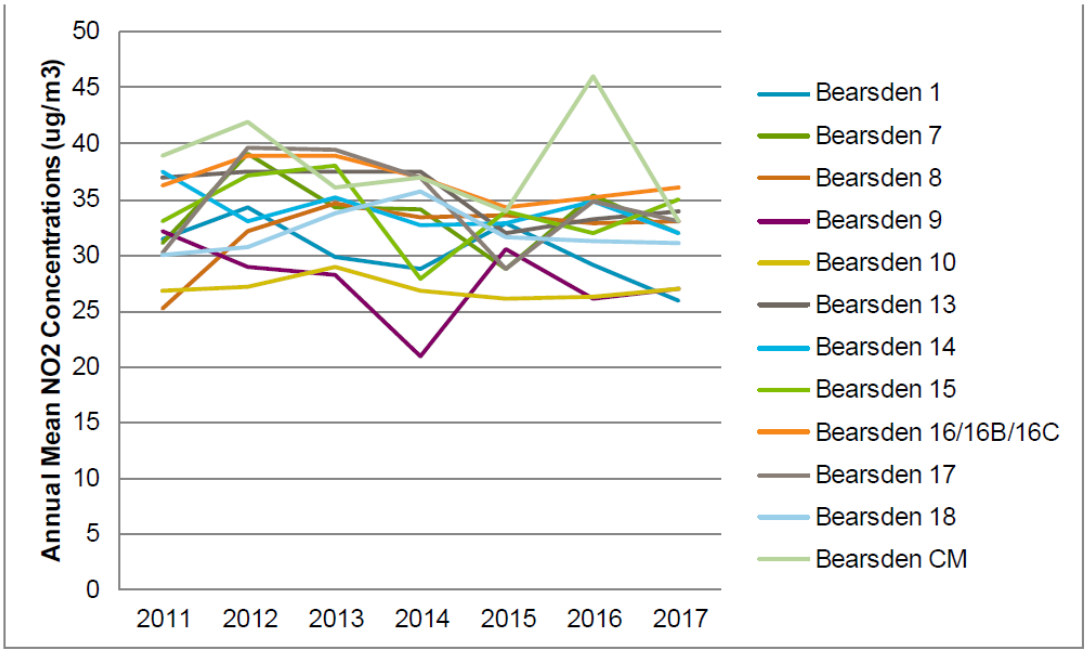
*Exceedences of the objectives are highlighted in Bold

Table 2: Passive Monitoring of NO_2 Annual Mean Concentrations ($\mu g/m^3$)

Site	Type	2011	2012	2013	2014	2015	2016	2017
Bearsden 1	Roadside	31.4	34.3	29.9	28.8	32.9	29.1	26
Bearsden 3	Urban Background	11.7	20.9	18.6	19.8	22.8	18.4	17
Bearsden 4	Urban Background	12.7	11.4	11.4	11.9	12.0	11.8	10
Bearsden 7	Roadside	31.0	39.1	34.3	34.2	28.8	35.3	32
Bearsden 8	Roadside	25.2	32.2	34.6	33.4	33.5	32.8	33
Bearsden 9	Roadside	32.1	28.9	28.2	20.9	30.6	26.1	27
Bearsden 10	Roadside	26.9	27.2	28.9	26.9	26.1	26.2	27
Bearsden 13	Roadside	36.9	37.5	37.5	37.5	32.0	33.2	34
Bearsden 14	Roadside	37.5	33.1	35.2	32.7	32.9	34.8	32
Bearsden 15	Roadside	33.0	37.2	38.1	27.9	33.9	31.9	35
Bearsden 16	Roadside	34.9	35.1	39.5	36.6	33.6	35.0	34
Bearsden 16B	Roadside	39.5	**41.9**	39.3	37.4	34.4	34.5	38
Bearsden 16C	Roadside	34.6	39.5	37.9	37.0	34.8	35.9	36
Bearsden 17	Roadside	30.2	39.7	39.5	37.0	28.8	34.8	33
Bearsden 18	Roadside	30.1	30.8	33.8	35.8	31.7	31.3	31

*Exceedences of the objective are highlighted in Bold, 2017 concentrations provided to Udp. Source: 2018 East Dunbartonshire Council ASR.

Figure 1: Annual Mean NO_2 Concentrations Trends



2.12 Annual mean NO_2 concentrations have generally decreased between 2011 and 2017 at most monitoring sites in the Bearsden AQMA. By 2017 no sites were exceeding the annual mean NO_2 objective; however, several were within 10% of the objective.

3. Study

3.1 Using the Emission Factor Toolkit (Version 8.0.1) (Defra, 2018), the NO_x and PM_{10} emissions were calculated for each of the assessed roads within the AQMA. Comparisons between the 'as usual' scenario and the 'with action' scenario provided an indication of the percentage reduction in road traffic emissions associated with each action. In addition, the damage costs for each action were calculated. The study does not consider the resultant concentrations of roadside NO_2, but focusses on emissions from vehicles within the AQMA.

3.2 The actions quantified in this manner were:

- Action 3: Junction Improvements: Feasibility Study;
- Action 4: Intelligent Traffic Management System (ITMS);
- Action 8: Fleet – fortnightly waste collection;
- Action 9: Council fleet replacement programme and Electric Vehicles (EV);
- Action 13: Quality Bus/Bike – Partnership/Corridors;
- Action 19: Eco Driver Training;
- Action 23: Improvements to SPT prioritised bus stops.

3.3 In 2013 detailed modelling was undertaken to determine the potential improvements in NO_2 and PM_{10} concentrations associated with Action 3. Updating this assessment is outside the scope of this study; however, the results of the 2013 detailed modelling assessment have been discussed with reference to current planning guidance.

Traffic Data

3.4 EDC Roads Department provided traffic data from two traffic counts located on Duntocher Road and Drymen Road. Each automated traffic count recorded traffic volumes and speeds for each vehicle class over 7 days in September or October 2015.

3.5 In addition, the Department for Transport (DfT) reports traffic counts at three sites within the Bearsden AQMA. In 2015, the counts at all three of these locations were 'estimated' based on actual counts in previous years and DfT growth predictions.

3.6 To improve the confidence in these DfT traffic estimates, a ratio was calculated between DfT count point 20840 and the traffic count recorded by EDC Roads Department on Drymen Road as they were located at the same site. Separate ratios were calculated for each vehicle category which ranged from 0.7 and 2.3. The ratios were then applied to the DfT traffic counts at the remaining two locations within the AQMA. This was considered to be the most suitable approach to use the available data.

3.7 The traffic data for the 'as usual' scenario are provided in Table 3.

Table 3: Traffic Data

Road	Source	AADT	Percentage				
			Cars	LGV	Rigid HGV	Artic HGV	Buses and Coaches
Duntocher Road	EDC	9732	79.6	12.2	6.7	0.1	1.4
Drymen Road (south)	EDC	13887	80.1	12.3	6.5	0.1	1.0
Roman Road	DfT	6422	76.4	12.9	10.1	0.3	0.3
Drymen Road (north)	DfT	16825	75.9	10.9	11.8	0.2	1.2

Monitored NO_2 and NOx Concentrations

3.8 The following monitoring sites are located within the Bearsden AQMA. For each site the total NOx concentrations have been provided, as well as the contributions from roadside and

background sources. Thus allowing for a potential NOx reduction associated with each action to be put into context. The total NOx concentration was calculated using version 6.1 of the Defra NOx to NO_2 calculator tool.

Table 4: 2015 NO_2 and NOx Concentrations recorded at EDC monitoring sites in Bearsden AQMA.

Site	Annual Mean NO_2 Concentrations	Annual Mean NOx Concentrations	Background NO_x[a]	Roadside NOx
Bearsden 1	32.9	50.1	16.2	33.9
Bearsden 7	28.8	41.3	16.2	25.1
Bearsden 8	33.5	51.4	16.2	35.2
Bearsden 9	30.6	42.8	18.5	24.3
Bearsden 10	26.1	33.4	18.5	14.9
Bearsden 13	32.0	46.0	18.3	27.7
Bearsden 14	32.9	47.9	18.3	29.6
Bearsden 15	33.9	50.1	18.3	31.8
Bearsden 16	33.6	51.6	16.2	35.4
Bearsden 16B	34.4	53.4	16.2	37.2
Bearsden 16C	34.8	54.3	16.2	38.1
Bearsden 17	28.8	41.3	16.2	25.1
Bearsden 18	31.7	47.5	16.2	31.3
Bearsden	34.0	52.5	16.2	36.3

[a]Background NOx concentrations were derived from the Defra modelled background concentrations for 2015 (Defra, 2017 https://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html) for the relevant grid square

Action 3: Junction Improvements – Feasibility Study

3.9 In 2013, a feasibility study was undertaken to assess three separate scenarios aimed at reducing congestion at Bearsden Cross. These scenarios included:

- Scenario 1: Signal Optimisation;
- Scenario 2: Signal Optimisation and right turn storage for minor arms; and
- Scenario 3: Signal optimisation and realignment of road markings on Drymen Road.

3.10 Based on the conclusions of the 2013 study, EDC decided that the proposed scenarios would not be taken forward.

3.11 In 2016, consideration was given again to these measures as part of a larger Bearsden town centre redevelopment; however, it was felt that there would be no overall improvement in air quality; with improvements experienced in areas near the junction but adverse impacts experienced elsewhere. As such, again the proposals were not considered further.

3.12 Since 2016, planning guidance has been updated (EPUK/IAQM, 2017) and therefore the predicted impacts associated with the scheme at the modelled receptors, as described in the 2013 assessment, have been assessed with reference to the updated guidance Table 5.

Table 5: Significance of NO_2 impacts associated with the three proposed junction improvements

Receptor	Scenario 1	Scenario 2	Scenario 3
Bearsden Cross CMS	Moderate Beneficial	Moderate Beneficial	Moderate Beneficial
PDT1	Negligible	Negligible	Negligible
PDT7	Slight Beneficial	Negligible	Slight Beneficial
PDT8	Negligible	Negligible	Negligible
PDT17	Slight Beneficial	Slight Beneficial	Slight Beneficial
PDT18	Negligible	Slight Beneficial	Negligible
Bearsden Library	Negligible	Negligible	Negligible
Bearsden Primary School	Negligible	Negligible	Negligible
Bearsden Cross Flat	Moderate	Negligible	Moderate
3A Thorn Road	Negligible	Negligible	Negligible
1A Thorn Road	Negligible	Negligible	Negligible
2 Thorn Road	Negligible	Negligible	Negligible
4 Thorn Road	Negligible	Negligible	Negligible
9 Roman Road	Negligible	Negligible	Negligible
1 Douglas Place	Negligible	Negligible	Negligible
3 Douglas Place	Negligible	Negligible	Negligible
7 Douglas Place	Negligible	Negligible	Negligible
11 Douglas Place	Negligible	Negligible	Negligible
20 New Kirk Road	Negligible	Negligible	Negligible
2/4 New Kirk Road	Negligible	Negligible	Negligible
120 Drymen Road	Negligible	Negligible	Negligible
142 Drymen Road	Negligible	Negligible	Negligible
144 Drymen Road	Negligible	Negligible	Negligible
63 Drymen Road	Negligible	Negligible	Negligible
100 Drymen Road	Negligible	Negligible	Negligible
98 Drymen Road	Negligible	Negligible	Negligible

3.13 The assessment concluded that traffic flows and air quality in the area can be improved if the signal timing, junction configuration or junction staging are amended, however, the majority of the improvements are considered to be Negligible. The exception to this is at the Bearsden Cross Continuous Monitoring Site, where a moderate improvement was predicted in all scenarios, and at Bearsden Cross Flat where a moderate improvement was anticipated if Scenario 1 or 3 go ahead. Despite this, all scenarios have consequential negative impacts on annual mean NO_2 concentrations at other locations within the AQMA.

3.14 Taking this into consideration and the current pollutant concentrations recorded in the AQMA (Tables 1 and 2), this study agrees that the proposals should not be taken further.

Action 4: Intelligent Traffic Management System

3.15 The Further Assessment identified that queuing was a dominant factor contributing to elevated pollutant concentrations within the AQMA. These concentrations may be reduced or dispersed by the phasing of traffic signals in such a manner as to facilitate the smooth flow of traffic. Table 6 describes Action 4.

Table 6: Action 4

Traffic Management

Definition	Key Intervention
a) Identify appropriate locations and implement intelligent traffic management systems to improve traffic flows. b) Identify improvements at junctions and consider modifying surrounding environment to achieve maximum benefit.	Installation of intelligent traffic management systems could reduce traffic congestion. Air Quality issues are linked to congestion as slow moving, stop-start traffic generates more pollution than free-flowing traffic. Investigate and upgrade junctions with known traffic problems to intelligent traffic management systems on a case by case basis

3.16 In December 2014, an ITMS was installed at the Bearsden Cross junction with synchronised fixed time signals in order to address peak hour congestion and queueing. Annual mean NO_2 concentrations at the monitoring sites located near to this junction indicated that concentrations have fallen since 2014.

3.17 This emphasises the potential improvements in NO_2 concentrations by using ITMS to reduce congestion and promote free-flowing traffic.

Methodology

3.18 For each road included in the assessment the following scenarios were modelled using the Emission Factor Toolkit (Defra, 2018) to represent the effects of altering the congested component of the traffic flow without changing the average journey time:

- Scenario 1: For all roads modelled, 5% of vehicles travelling at 5kph with the remaining 95% of traffic travelling at a speed whereby the average speed remains unchanged, as shown in Table 3; and
- Scenario 2: For all roads modelled, 3% of traffic travelling at 5kph with the remaining 97% of traffic travelling at a speed whereby the average speed remains unchanged, as in Table 3.

Table 7: Action 4 - Traffic Data

Scenario	Road	Traffic Flow	Speed	Average Speed
1	Duntocher Road	487	5	28.6
	Duntocher Road	9246	29.8	
	Drymen Road (south)	694	5	28.0
	Drymen Road (south)	13193	29.2	
	Roman Road	321	5	48.0
	Roman Road	6101	50.3	
	Drymen Road (north)	841	5	48.0
	Drymen Road (north)	15984	50.3	
2	Duntocher Road	292	5	28.6
	Duntocher Road	9440	29.3	
	Drymen Road (south)	417	5	28.0
	Drymen Road (south)	13471	28.7	
	Roman Road	193	5	48.0
	Roman Road	6229	49.3	
	Drymen Road (north)	505	5	48.0
	Drymen Road (north)	16320	49.3	

Results

3.19 Table 8 provides the NO_x and PM_{10} emissions per km for each of the scenarios described above. Table 9 provides the percentage reduction in NOx and PM_{10} emissions between Scenarios 1 and 2, i.e. the predicted change achieved with a 2% reduction in queueing vehicles.

Table 8: Action 4 - Results

Scenario	Road	NOx Emissions (g/km)	PM_{10} Emissions (g/km)
1	Duntocher Road	7489	458
	Drymen Road (south)	10406	644
	Roman Road	4237	305
	Drymen Road (north)	12184	845
2	Duntocher Road	7368	457
	Drymen Road (south)	10249	643
	Roman Road	4101	305
	Drymen Road (north)	11751	843

Table 9: Percentage reduction in NOx and PM_{10} emissions associated with a 2% reduction in queuing traffic

Road	NOx Emissions (%)	PM_{10} Emissions (%)
Duntocher Road	-1.6%	-0.1%
Drymen Road (south)	-1.5%	-0.1%
Roman Road	-3.2%	-0.2%
Drymen Road (north)	-3.6%	-0.2%

3.20 The results indicated that by reducing the percentage of traffic queueing on each of the assessed roads from 5% to 3%, the potential reductions in NOx emissions of up to 3.6% were anticipated; however, much smaller reductions in PM_{10} concentrations, of up to 0.2%, were predicted.

Action 8: Fleet Waste Collection

3.21 Currently waste collection is undertaken on a fortnightly, seven days a week basis. The system alternates with general waste bins (and garden waste) being collected fortnightly and recyclables collected in between. As a result, the number of large heavy vehicles on the roads has reduced.

3.22 In addition, staff travel patterns have changed due to shift pattern changes, with more staff working early start shifts, thus reducing the number of vehicles on the roads at peak times.

3.23 Less waste collection will also result in a less congestion which is caused by waste collection vehicles regularly stopping and blocking traffic.

3.24 According to Manny Barlow, EDC Fleet Manager, the council waste fleet includes 30 vehicles of which 25 are HGVs.

Table 10: Action 8

Fleet Waste Collection

Definition	Key Intervention
a) Reduce emissions from source by reducing number of vehicles on road at any one time. b) Seven day a week operation has reduced the overall number of vehicles required to operate the service	Altered shift patterns leads to less HGVs in use across EDC area at any one given time. Early start and weekend working spreads the use of vehicles reducing peak travel time emissions.

Methodology

3.25 For each road included in the assessment the following scenarios were modelled using the Emission Factor Toolkit (version 8.0.1) (Defra, 2018).

- Scenario 1: All roads modelled with vehicle flow and speeds as provided in Table 3 for business as usual;
- Scenario 2: For all roads modelled, 1 hour per day modelled at 10kph to represent congestion behind a waste collection HGV and 23 hours at a speed whereby the average speed remains as in Scenario 1.

3.26 No information was available concerning the frequency or duration waste vehicles collect waste from the four assessed roads or the resultant congestion. The purpose of the study was to determine the potential reduction in NO_x and PM_{10} emissions by reducing congestion on the assessed roads caused by the waste fleet.

Table 11: Action 8 – Traffic Data

Scenario	Road	Traffic Flow	Speed	No. of Hours
1	Duntocher Road	9732	28.6	24
	Drymen Road (south)	13887	28.0	24
	Roman Road	6422	48.0	24
	Drymen Road (north)	16825	48.0	24
2	Duntocher Road	9327	29.4	23
	Duntocher Road	406	10.0	1
	Drymen Road (south)	13309	28.8	23
	Drymen Road (south)	579	10.0	1
	Roman Road	6154	49.7	23
	Roman Road	268	10.0	1
	Drymen Road (north)	16124	49.7	23
	Drymen Road (north)	701	10.0	1

Results

3.27 Table 12 provides the NOx and PM_{10} emissions per km for each of the scenarios described above. Whilst Table 13 provides the percentage reduction in NOx and PM_{10} emissions between the scenarios.

Table 12: Action 8 - Results

Scenario	Road	NOx Emissions (g/km)	PM_{10} Emissions (g/km)
1	Duntocher Road	7189	457
	Drymen Road (south)	10017	642
	Roman Road	3902	303
	Drymen Road (north)	11115	839
2	Duntocher Road	7299	458
	Drymen Road (south)	10159	644
	Roman Road	4055	305
	Drymen Road (north)	11597	845

Table 13: Percentage reduction in NOx and PM_{10} emissions between scenario 1 and 2

Road	NOx Emissions (%)	PM10 Emissions (%)
Duntocher Road	-1.5%	-0.3%
Drymen Road (south)	-1.4%	-0.2%
Roman Road	-3.8%	-0.7%
Drymen Road (north)	-4.2%	-0.7%

3.28 The results indicated that by reducing congestion resulting from the waste fleet on the assessed roads then the potential to reduce NOx emissions is up to 4.2% and for PM_{10} emissions 0.7%.

Action 9: Council Fleet Replacement Programme

3.29 The Council operate a 3 and 5 year vehicle replacement lease on all Council fleet. The current fleet has a semi-automatic gearbox and start/stop technology. The Euro VI replacement programme is in place and the Council adopt new technologies as they are released as part of the replacement programme.

3.30 The Council are also increasing the number of electric vehicles in the fleet. They currently have 12 electric pool cars with charging points situated across several work centres.

3.31 In terms of LGVs and HGVs there is limited choice for non-diesel vehicles; however, it may be feasible to propose a preference for petrol LGV to be purchased in future, and if available, to supplement the increasing availability and adoption of electric vehicles.

3.32 The Action in Table 14 encourages the uptake of electric vehicles and Euro VI vehicles within the council fleet, thus reducing the emissions from the vehicles.

Table 14: Action 9

Council Fleet Replacement Programme

Definition	Key Intervention
a) Continue current replacement programme	Promote the uptake and use of cleaner or alternative fuels where possible.
b) Pool EDC will attempt to increase the availability of electric/hybrid vehicles to appropriate staff	Where funding allows, the Council will look to increase the provision of electric/hybrid vehicles for staff use as part of the available pool of vehicles for staff
c) Fleet EDC will investigate options available for making use of electric/hybrid	The Council will investigate, possibility through a

	vehicles as part of the council fleet	feasibility study, the options available for electric/hybrid vehicles which are suitable for use as part of the EDC fleet.
d)	Increase number of charge points across EDC area.	The Council will investigate options for installing further charge points at Council buildings.

Methodology

3.33 For each road included in the assessment the following scenarios were modelled using the Emission Factor Toolkit (version 8.0.1) (Defra, 2018).

- Scenario 1: All council vehicles Euro VI;
- Scenario 2: 90% of council vehicles Euro VI;
- Scenario 3: All council vehicles hybrid
- Scenario 4: 90% of council vehicles hybrid.

3.34 EDC have confirmed that there are 318 vehicles in their fleet; a nominal value of 10% were assumed to be HDVs. The scenarios below provide a hypothetical comparison of the potential effect of increasing the uptake of Euro VI and hybrid vehicles within the Council fleet, whereby all of the council vehicles travel on the study roads.

Table 15: Action 9, Vehicle fleet data (Scenario 1)

Fuel	Euro Proportion	Duntocher Road	Drymen Road (South)	Roman Road	Drymen Road (north)
Petrol	Pre-Euro 1	0.000	0.000	0.000	0.000
	Euro 1	0.002	0.002	0.002	0.002
	Euro 2	0.026	0.027	0.026	0.027
	Euro 3	0.198	0.200	0.193	0.201
	Euro 4	0.280	0.284	0.273	0.285
	Euro 5	0.379	0.384	0.370	0.386
	Euro 6	0.114	0.102	0.136	0.099
	Euro 6c	0.000	0.000	0.000	0.000
Diesel	Pre-Euro 1	0.000	0.000	0.000	0.000
	Euro 1	0.001	0.001	0.001	0.001
	Euro 2	0.006	0.006	0.006	0.006
	Euro 3	0.111	0.113	0.109	0.113
	Euro 4	0.259	0.263	0.253	0.264
	Euro 5	0.492	0.498	0.480	0.500
	Euro 6	0.131	0.119	0.152	0.116
	Euro 6c	0.000	0.000	0.000	0.000
	Euro 6d	0.000	0.000	0.000	0.000

Table 16: Action 9, Vehicle fleet data (Scenario 2)

Fuel	Euro Proportion	Duntocher Road	Drymen Road (south)	Roman Road	Drymen Road (north)
Petrol	Pre-Euro 1	0.000	0.000	0.000	0.000
	Euro 1	0.002	0.002	0.002	0.002
	Euro 2	0.027	0.027	0.026	0.027
	Euro 3	0.199	0.201	0.194	0.202
	Euro 4	0.282	0.285	0.275	0.286
	Euro 5	0.381	0.385	0.372	0.387

	Euro 6	0.110	0.100	0.130	0.097
	Euro 6c	0.000	0.000	0.000	0.000
Diesel	Pre-Euro 1	0.000	0.000	0.000	0.000
	Euro 1	0.001	0.001	0.001	0.001
	Euro 2	0.006	0.006	0.006	0.006
	Euro 3	0.112	0.113	0.109	0.113
	Euro 4	0.261	0.264	0.255	0.265
	Euro 5	0.494	0.500	0.483	0.502
	Euro 6	0.127	0.117	0.146	0.114
	Euro 6c	0.000	0.000	0.000	0.000
	Euro 6d	0.000	0.000	0.000	0.000

Table 17: Action 9, Traffic Data (Scenario 3)

Road	Traffic Flow	%HGV	%Buses	% Full Hybrid Petrol cars	%Plug-in Hybrid Petrol cars
Duntocher Road	318	5	5	45	45
Drymen Road (south)	318	5	5	45	45
Roman Road	318	5	5	45	45
Drymen Road (north)	318	5	5	45	45

Table 18: Action 9, Traffic Data (Scenario 4)

Road	Traffic Flow	%Petrol Cars	% Diesel Cars	%HGV	%Buses	% Full Hybrid Petrol cars	% Plug-in Hybrid Petrol cars
Duntocher Road	318	5.7	4.3	5	5	45	45
Drymen Road (south)	318	5.7	4.3	5	5	45	45
Roman Road	318	5.7	4.3	5	5	45	45
Drymen Road (north)	318	5.7	4.3	5	5	45	45

Results

3.35 Table 19 provides the NOx emissions reductions for each of the assessed roads which can be achieved with all council vehicles replaced with Euro VI.

Table 19: Percentage of NOx reductions (Scenario 1 and 2)

	NOx Emissions Reduction (%)	
	Assuming all Council Vehicles are Euro VI (Scenario 1)	Assuming 90% Council Vehicles are Euro VI (Scenario 2)
Duntocher Road	-0.33	-0.30
Drymen Road (south)	-0.26	-0.21
Roman Road	-0.49	-0.34
Drymen Road (north)	-0.17	-0.15

3.36 Table 19 indicated that reductions of up to 0.49% can be achieved if all council vehicles are replaced with Euro VI vehicles. Smaller reductions in NOx emissions, of up to 0.34%, can be achieved if 90% of Council vehicles are replaced with Euro VI vehicles.

3.37 Potential PM_{10} reductions were not modelled; however, the potential reductions would be smaller than the predicted NOx emissions provided in Table 19 as this pollutant is increasingly associated with non-tailpipe sources.

3.38 Tables 20 and 21 indicate the potential NOx and PM_{10} emissions which may be achieved if all council vehicles (Table 20) or 90 % of Council vehicles (Table 21) were replaced with hybrid vehicles.

3.39 It should be noted that only council vehicles have been included in these scenarios.

Table 20: Percentage reduction in NOx and PM_{10} emissions if all Council vehicles are replaced with Hybrid vehicles (Scenario 3)

	NOx Emissions (%)	PM_{10} Emissions (%)
Duntocher Road	44.4	13.3
Drymen Road (south)	44.1	13.4
Roman Road	51.9	11.3
Drymen Road (north)	51.9	11.3

Table 21: Percentage reduction in NOx and PM_{10} emissions if 90% Council vehicles are replaced with Hybrid vehicles (Scenario 4)

	NOx Emissions (%)	PM_{10} Emissions (%)
Duntocher Road	40.5	12.3
Drymen Road (south)	40.2	12.4
Roman Road	47.7	10.4
Drymen Road (north)	47.7	10.4

3.40 Table 20 indicates that NOx emission reductions from Council vehicles up to 51.9% and 13.9% of PM_{10} emissions can be achieved if all vehicles are replaced with hybrid vehicles. Smaller reductions in NOx emissions, of up to 47.7%, and 12.4% for PM_{10} emissions can be achieved if 90% of Council vehicles are replaced with hybrid vehicles. It should be noted that Council vehicles are a very small component of the total vehicle flows on these roads and therefore the overall effects on air quality will be minor; however, it is essential for the Council to demonstrate their commitment in improving air quality.

Action 13: Quality Bus/Bike Partnerships & Action 23: Improvements to SPT Prioritised Bus Stops

3.41 Both of these Actions (Action 13 and 23) encourage the uptake of sustainable modes of travel and reduce the reliance on car use. Therefore the model scenarios used to determine the potential reductions in NOx and PM_{10} emissions associated with these actions were the same.

Action 13

3.42 Action 13: In recent years, EDC have invested significantly in walking and cycling infrastructure and promotion and recently delivered a number of key infrastructure enhancements improving connectivity with adjacent local authorities. This included the release of the first Active Travel Strategy in 2015, which aims at increasing the uptake of cycling as an attractive and safe travel option for a wide range of users.

Table 22: Action 13

Quality Bus/Bike Partnerships

Definition	Key Intervention
a) Consider extending opportunities to improve infrastructure and create further cycle/bus corridors in other areas of Bearsden.	Improve active travel routes and upgrade existing routes and install active travel improvement measures such as cycle lanes as set out in the Active Travel Strategy.
b) Expand the network with new cycle and walking routes both within towns and the countryside dedicated for active travel use to avoid conflict with motor vehicles	Provide change and storage facilities at train stations and town centres All new developments should integrate dedicated active travel routes which connect to the network. Maintain the network to a high standard ensuring e.g. good quality surfaces along cycle routes.

Action 23

3.43 Each year EDC Traffic and Transport Team apply for capital funding from SPT for the upgrade of bus stops throughout the council area.

Improvement to SPT prioritised Bus Stops

Definition	Key Intervention
a) Improvements to bus stops	Encourage Active Travel

Methodology

3.44 For each road included in the assessment the following scenarios were modelled using the Emission Factor Toolkit (version 8.0.1) (Defra, 2018).

- Scenario 1: All roads modelled with vehicle flow and speeds as provided in Table 3;
- Scenario 2: For all roads modelled, reduce the number of cars by 5% to represent potential modal shift toward cycling;
- Scenario 3: For all roads modelled, reduce the number of cars by 2% to represent potential modal shift toward cycling.

Table 23: Action 13 and 23 - Traffic Data

Scenario	Road	Traffic Flow	No. of Cars
1	Duntocher Road	9732	7748
	Drymen Road (south)	13887	11128
	Roman Road	6422	4908
	Drymen Road (north)	16825	12772
2	Duntocher Road	9344	7361
	Drymen Road (south)	13331	10571
	Roman Road	6176	4662
	Drymen Road (north)	16186	12133
3	Duntocher Road	8447	7593
	Drymen Road (south)	12042	10905
	Roman Road	6324	4810
	Drymen Road (north)	16569	12517

Results

3.45 Table 24 provides the NOx and PM_{10} emissions per km for each of the scenarios described above. Whilst Tables 25 and 26 provide the percentage reduction in NOx and PM_{10} emissions if the modelled reductions in car use is achieved.

Table 24: Action 13 and 23 - Results

Scenario	Road	NOx Emissions (g/km)	PM_{10} Emissions (g/km)
1	Duntocher Road	7189	457
	Drymen Road (south)	10017	642
	Roman Road	3902	303
	Drymen Road (north)	11115	839
2	Duntocher Road	7056	444
	Drymen Road (south)	9824	624
	Roman Road	3834	295
	Drymen Road (north)	10939	818
3	Duntocher Road	7136	452
	Drymen Road (south)	9940	635
	Roman Road	3875	300
	Drymen Road (north)	11045	831

Table 25: Percentage reduction in NOx and PM_{10} emissions with a 5% reduction in car use

Road	NOx Emissions (%)	PM_{10} Emissions (%)
Duntocher Road	-1.9	-2.8
Drymen Road (south)	-1.9	-2.9
Roman Road	-1.7	-2.6
Drymen Road (north)	-1.6	-2.5

Table 26: Percentage reduction in NOx and PM_{10} emissions with a 2% reduction in car use

Road	NOx Emissions (%)	PM_{10} Emissions (%)
Duntocher Road	-0.7	-1.1
Drymen Road (south)	-0.8	-1.2
Roman Road	-0.7	-1.1
Drymen Road (north)	-0.6	-1.0

3.46 As expected, a 5% reduction in cars results in larger reductions in NOx and PM_{10} emissions than a 2% reduction. When considered in terms of percentage reduction, PM_{10} emissions are anticipated to result in larger decreases than NOx emissions.

Action 19: Eco Driver Training

3.47 Eco driver training will be provided for Council staff as well as promoted to external and commercial HGV and bus fleet operators. This training can assist individuals in becoming more efficient drivers and save fuel and therefore money. The sessions, entitled 'Fuel Good' sessions will be provided to all employees.

Table 27: Action 19

Eco Driver Training

Definition	Key Intervention
A) Provide free 'Fuel Good' driver training sessions for all appropriate employees	Typical annual savings of £200 - £250 for a car driver (more for a van) Reduce likelihood of accidents Reduce wear and tear on tyres

3.48 Driver training has been shown in a number of studies to reduce fuel consumption by around 5% (Beusen, 2009) and this is likely to in turn reduce NO_x emissions. Putting a measurable figure on it however is difficult as it depends on numerous factors such as terrain, weather and engine temperature. One study (Rolim, 2014) estimates a reduction in emissions by 8% and showed that drivers decreased the time spent in excessive speed and excessive engine speed by 24% and 38% respectively. A reduction in the number of events such as extreme accelerations and decelerations was also observed. The results indicated an average 4.8% fuel consumption decrease.

3.49 However, it should be noted that the study compared a control group and an experimental group and the control group were aware they were being monitored. This may mean that the control group would naturally look to increase the standard of driving as a result of the monitoring and so real world improvements could be even greater. Furthermore, it is expected that the effects of the training will 'wear-off' with time, and so ongoing awareness and refresher training may be required to ensure long-term benefits.

3.50 This study used the 8% figure in terms of reduction in NO_x and apply that to driver training for HGV and bus drivers.

Methodology

3.51 For each road included in the assessment the following scenarios were modelled using the Emission Factor Toolkit (version 8.0.1) (Defra, 2018).

- Scenario 1: All roads modelled with vehicle flow and speeds as provided;
- Scenario 2: For all roads modelled, reduce the emissions from HGVs and buses by 8%;
- Scenario 3: For all roads modelled, reduce the emissions from HGVs and buses by 8% but for 10% of vehicles in this category only, to represent a nominal uptake of training.

Results

3.52 Table 28 provides the NOx emissions per km for each of the scenarios described above. Whilst Tables 29 and 30 provide the percentage reduction in NOx emissions predicted to be achieved between the scenarios.

Table 28: Action 19 - Results

Scenario	Road	NOx Emissions (g/km)	PM_{10} Emissions (g/km)
1	Duntocher Road	7189	457
	Drymen Road (south)	10017	642
	Roman Road	3902	303
	Drymen Road (north)	11115	839
2	Duntocher Road	6926	446
	Drymen Road (south)	9667	628
	Roman Road	3758	295
	Drymen Road (north)	10641	813
3	Duntocher Road	7163	456
	Drymen Road (south)	9982	641
	Roman Road	3887	303
	Drymen Road (north)	11067	836

Table 29: Percentage reduction in NOx and PM_{10} emissions comparing Scenarios 1 and 2

Road	NOx Emissions (%)	PM_{10} Emissions (%)
Duntocher Road	-3.66	-2.31
Drymen Road (south)	-3.49	-2.17
Roman Road	-3.68	-2.68
Drymen Road (north)	-4.26	-3.15

Table 30: Percentage reduction in NOx and PM_{10} emissions comparing Scenarios 1 and 3

Road	NOx Emissions (%)	PM_{10} Emissions (%)
Duntocher Road	-0.37	-0.23
Drymen Road (south)	-0.35	-0.22
Roman Road	-0.37	-0.27
Drymen Road (north)	-0.43	-0.31

3.53 As expected, Tables 29 and 30 indicated that larger percentage reductions will be experienced if all buses and HGVs drivers complete and implement the eco driving training compared to if only 10% of drivers.

3.54 In both scenarios, larger reductions in NOx were anticipated compared to PM_{10}, with up to 4.26% reduction if all HGV and bus drivers implement the training compared to 3.15% reductions for PM_{10}.

4. Damage Costs

4.1 For each action included in this study, the damage costs were calculated. Damage costs approximate the impact of changes in air pollution. They measure the marginal external costs caused by each additional tonne of NOx and PM_{10} emitted or conversely the benefits of reducing a pollutant emitted by one tonne. The costs include values for the impacts of exposure to pollutants on health, both chronic mortality and morbidity effects as well as damage to buildings (PM_{10}).

4.2 The Interdepartmental Group on Costs and Benefits (IGCB) have provided the costs per tonne of pollutant. The values are presented as 'low', 'central' or 'high' to reflect the uncertainty surrounding the potential lag time between a change in pollutant emissions and impact on health. The 'low' value assumes a 40 year lag time, whilst the 'high' value assumes a 0-year lag time. For the purpose of this study the 'central' values were applied.

4.3 The most recent years for which the IGBC have provided prices for was 2015. For NOx the cost per tonne was £25,252 and for PM_{10}, £58,125 (IGBC, 2018). The Emission Factor Toolkit (version 8.0.1) (Defra, 2018) was used to calculate the change in annual emissions (kg/year) associated with each action. The output was then converted to tonnes per year before multiplying by the relevant pollutant cost per tonne as given in Table 31. It should be noted that as the changes in NOx and PM_{10} emissions were minimal they were excluded from the damage costs calculations

Table 31: Annual Damage Costs for actions

Action	Description		NOx damage costs	PM_{10} Damage Costs
4	Intelligent Traffic Management System (a 2% reduction in queuing traffic)		-£109,219	-£918
8	Fleet Waste Collection (elimination of congestion resulting from the waste fleet)		-£114,518	-£3,209
13	Quality Bus/Bike Partnership	5% reduction in car use	-£73,394	-£17,851
23	Improvements to SPT prioritised Bus Stops			
13	Quality Bus/Bike Partnership	2% reduction in car use	-£29,369	-£7,143
23	Improvements to SPT prioritised Bus Stops			
19	Eco Driver Training	Reduce emissions from 10% of HGVs and Buses by 8%	-£15,872	-£1,754

4.4 The largest NOx cost savings were associated with Action 8, where a saving of £114,518 was anticipated. In contrast the largest PM_{10} cost savings, of £17,851, were associated with Actions 13 and 23 and a 5% reduction in car use.

5. Summary

5.1 In accordance with the Local Air Quality Management process, East Dunbartonshire Council declared an Air Quality Management Area (AQMA) for annual mean NO_2 and PM_{10} concentrations at Bearsden in 2011.

5.2 The local air quality monitoring has not recorded an exceedance of the annual mean NO_2 or PM_{10} objectives since 2012 (apart from at one site in 2016); however, emissions of NO_X and PM_{10} should be minimised where possible.

5.3 EDC are now in the process of preparing their Action Plan to identify actions and policies to improve air quality in the Bearsden AQMA and to ensure the air quality objectives are met.

5.4 In September 2017, Ricardo-AEA prepared the draft Bearsden Air Quality Action Plan on behalf of EDC. This was then consulted on by the public as well as statutory bodies. In July 2018, AECOM provided a review of the consultation responses. As part of this review, each action was discussed in terms of whether the potential improvements in air quality could be quantified.

5.5 The following measures were identified as being quantifiable:

- Action 3: Junction Improvements: Feasibility Study;
- Action 4: Intelligent Traffic Management System;
- Action 8: Fleet –fortnightly waste collection;
- Action 9: Council Fleet Replacement programme and Electric Vehicles;
- Action 13: Quality Bus/Bike – Partnership/Corridors;
- Action 19: Eco Driver Training; and
- Action 23: Improvements to SPT prioritised bus stops.

5.6 For each of the above actions, the Emission Factor Toolkit (version 8.0.1) (Defra, 2018) was used to calculate road vehicle emission of NO_x and PM_{10} for four roads within the Bearsden AQMA. The percentage emission reduction associated with each action was then determined by comparing scenarios with and without the action. In addition, the damage costs associated with each action was determined.

5.7 The results of the study can be summarised in Table 32.

Table 32: Summary Table

Action	Description		% Reduction in NOx Emissions	% Reduction in PM_{10} Emissions	NOx damage costs	PM_{10} damage Costs
4	Intelligent Traffic Management System (a 2% reduction in queuing traffic)		2.5	0.2	-£109,219	-£918
8	Fleet Waste Collection (elimination of congestion resulting from the waste fleet)		2.7	0.5	-£114,518	-£3,209
9	Council Fleet Replacement Programme	All Council vehicles are Euro VI	0.3	-	-	-
		90% Council vehicles are Euro VI	0.3	-	-	-
		All Council vehicles are hybrid[A]	48.1	12.3	-	-
		90% Council vehicles hybrid[A]	44.0	11.4	-	-
13	Quality Bus/Bike Partnership	5% reduction in car use	1.8	2.7	-£73,394	-£17,851
23	Improvements to SPT prioritised Bus Stops					
13	Quality Bus/Bike Partnership	2% reduction in car use	0.7	1.1	-£29,369	-£7,143
23	Improvements to SPT prioritised Bus Stops					
19	Eco Driver Training	Reduce emissions from 10% of HGVs and Buses by 8%	0.4	0.3	-£15,872	-£1,754

[A]the scenarios which considered hybrid vehicles included council vehicles only. Therefore the % reductions cannot be directly compared with the other scenarios.

CONCLUSION

The quantification exercise has indicated that the measures which will most improve air quality in terms of NOx reduction is the alteration to fleet waste collection services. This measure has already been put in place with a fortnightly fleet waste collection seven days a week.

Several measures were found to improve air quality in terms of PM_{10} reduction. Those measures involve the introduction of a quality bus partnership and the improvements to SPT prioritised bus stops. These measures would help make public transport more attractive thus encouraging the public to reduce their car use.

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