AEA

Fife Council

Bonnygate Air Quality Action Plan

Report to Fife Council

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Executive Summary

This Air Quality Action Plan (AQAP) for the Bonnygate (Cupar), has been prepared by Fife Council in line with its statutory obligations under Section 84 [2] of the Environment Act 1995. Fife Council has consulted the public and other statutory consultees on the content of the plan in advance of the final plan being approved by the Council and Scottish Government prior to implementation.

The Council has a statutory duty to manage local air quality within its designated boundaries. Under the Strategic Policy Framework for Local Air Quality Management published by the Scottish Government, Fife Council has undertaken a programme of air quality assessments. The strategy requires each unitary authority to undertake a series of air quality assessments to determine the current situation regarding local air quality, and to outline the progress of their local air quality management procedures to date.

The third round of the air quality review and assessment process commenced in 2006. Fife Council submitted their Progress Report in May 2007 where it was identified that it was likely that the Air Quality Strategy objective for nitrogen dioxide (NO_2), and the Scottish particulate matter (PM_{10}) objective would not be met at Bonnygate, Cupar. A Detailed Assessment was prepared in 2008, which confirmed that exceedences of these objectives existed at the location. These objectives have been set to protect human health, and hence it is now Fife Council's duty to make progress towards these where possible.

Where an authority identifies that a given air quality objective is likely to be exceeded at a relevant location, it is obliged to declare an Air Quality Management Area (AQMA) and undertake a further assessment of existing and likely future air quality. The Authority must then develop an Air Quality Action Plan, setting out the local actions that will be implemented to improve air quality and work towards meeting the objectives.

What is the cause of the problem?
The findings of the further assessment indicate that road traffic is the principal source responsible for the local exceedences of NO_2 and makes a significant contribution to local PM_{10} concentrations. Background sources constitute the principal sources of PM_{10} within the Bonnygate AQMA, however, background sources are difficult to address at the local level.

Air Quality Action Plan
A steering group including key representatives from relevant services of Fife Council was formed to develop the AQAP. The steering group considered the conclusions listed above and the wide range of potential options for improving air quality within the Bonnygate AQMA.

Subsequently the steering group undertook an assessment of each of these options. The options were assessed against the following criteria:

- How much support was there initially within the steering group for the option?
- Potential air quality impact;
- Potential costs;
- Overall cost-effectiveness;
- Potential co-environmental benefits, risk factors, social impacts and economic impacts;
- Feasibility and Acceptability.

The assessments were then considered in total to place the options in a prioritised order. This then became the draft AQAP which was subject to review by the statutory consultees and a public consultation process. The Plan is summarised in tabular form below.

Summary of the Air Quality Action Plan for the Bonnygate AQMA

No	Measure	Timescale[1]
	Strategic Measures	
1	Improving links with Local Transport Strategy/ Area Transport Plan	Ongoing
2	Improving Air Quality links with Local Planning and Development Framework	Ongoing
3	Integrate AQ with other Council Strategies	Ongoing
	Direct measures	
4	Implementation of new Urban Traffic Management and Control system and changes to pedestrian crossings	Short-Term
5	Travel Plans for Large Institutions and Businesses	Short-Medium Term
6	Promotion of Travel Choices	Short-Medium Term
7	Target reduced localised emissions from freight operations.	Medium-Term
8	AQMA Awareness Signs	Short-Term
9	Provision of Information relating to Air Quality	Short-Term
10	Parking Management and Control	Short-Term
11	Promotion of Cycling and Walking	Short-Term
12	Review and support proposed infrastructure changes that will contribute to delivering improvements in local air quality	Medium-Long Term
13	Target reductions in emissions from the Council fleet and contract vehicles (including driver training)	Short-Term
14	Target reductions in emissions from buses	Short-Term

Note: AQMA = Air Quality Management Area. In this document the AQMA is an area of Cupar Town Centre that has been subject to a formal order defining it as an area where an air quality objective is not being achieved.

The plan aims to work towards reducing transport emissions of NO_x and PM_{10} in the AQMA by approximately 53% and 33% respectively. The required improvements appear to be quite onerous, however, it should be noted that these represent the ambient concentrations required to meet the objectives, not the reduction in mass emissions, as a result of the canyon effect within the Bonnygate[2]. It is anticipated that a reduction of this scale will lead to the achievement of the annual mean NO_2 air quality standard (40 $\mu g\ m^{-3}$) and Scottish annual mean objective for PM_{10} (18 $\mu g\ m^{-3}$) within the Bonnygate AQMA in future years. Fife Council will continue to review and assess air quality to monitor the situation and success of the plan.

What happens next?
Fife Council has consulted the public and other statutory consultees on its intention to implement this plan. Consultation responses have been taken into consideration in the finalisation of the Plan which will be adopted by the Council in 2010.

[1] Short term (1-2 years); Medium term (3-6 years); Long term (>6 years)

[2] The improvements in mass emissions required to achieve the NO_2 and PM_{10} objectives are actually significantly lower (15% and 8% respectively) when the influence of the canyon is taken into consideration.

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Appendices

1. Introduction

This Plan has been produced by Fife Council and constitutes the Air Quality Action Plan (AQAP) designed to address the air quality problems identified in Cupar Town Centre, Fife. It is a statutory duty for Fife Council to develop an Air Quality Action Plan following the declaration of an air quality management area (AQMA) in response to identified exceedence(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. **Not all of the measures discussed in this report have been formally adopted by Fife 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 Fife Council's contracted consultants, AEA Technology. The Plan has been subject to consultation, having been submitted to:

- Fife Council;
- Scottish Government;
- 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 consultation process have been 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 Fife Council and other stakeholders.

1.1 Objectives

This Air Quality Action Plan summarises the air quality review and assessments that have been undertaken in Fife to date, focussing on exceedences of the Air Quality Strategy Objectives, and outlining the mechanisms and the targeted measures proposed by Fife Council that aim to improve local air quality. The plan focuses on air quality within Cupar Town Centre, where an Air Quality Management Area (AQMA) came into force in December 2008 as a result of elevated concentrations of nitrogen dioxide and PM_{10}. Fourteen measures have been incorporated within the Action Plan, many of which have already been developed/ implemented through existing plans and policies. In addition, new measures have been proposed aimed at supplementing ongoing activities and focussing specifically on improving air quality within Cupar Town Centre.

1.2 Report Contents and Structure

Policy Guidance LAQM.PGS (09) was published by the Scottish Government in 2009 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 exceedences 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; and,
- How the local authority intends to monitor and evaluate the effectiveness of the plan.

The Scottish Government recommends 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.

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 within Cupar;

- **Chapter 3** presents a summary of recent reviews of local air quality undertaken in Fife Council, and the results of the source apportionment exercise undertaken for the Cupar Town Centre AQMA including the improvement required to meet the air quality objectives;

- **Chapter 4** describes how the AQAP has been developed by Fife Council;

- **Chapter 5** presents the range of potential options that were considered to improve local air quality in Cupar 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.

- **Chapter 8** summarises the consultation exercise undertaken by Fife Council in relation to the Draft AQAP.

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), with the nature of 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). In general, air quality in the UK is considered to have improved significantly since the smogs of the 1950, 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 exceedences of the air quality strategy objectives and are developing plans to improve air quality at the local level.

Furthermore, action is also being taken 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}).

A list of health Objectives relevant to Scotland is presented in Table 2.1.

Table 2.1 Air Quality Objectives			
Pollutant	**Concentration**	**Measured as**	**Date to be achieved by**
Benzene All authorities	**16.25 μg m^{-3}**	**Running annual mean**	**31.12.2003**
Authorities in Scotland and Northern Ireland only	**3.25 μg m^{-3}**	**Running annual mean**	**31.12.2010**
1,3-Butadiene	**2.25 μg m^{-3}**	**Running annual mean**	**31.12.2003**
Carbon Monoxide Authorities in Scotland only	**10.0 mg m^{-3}**	**Running 8-hour mean**	**31.12.2003**
Lead	**0.5 μg m^{-3}** **0.25 μg m^{-3}**	**Annual mean** **Annual mean**	**31.12.2004** **31.12.2008**
Nitrogen dioxide	**200 μg m^{-3} not to be exceeded more than 18 times a year** **40 μg m^{-3}**	**1 hour mean** **Annual mean**	**31.12.2005** **31.12.2005**
Particles (PM_{10}) (gravimetric)[b]	**50 μg m^{-3} not to be exceeded more than 35 times a year** **40 μg m^{-3}**	**24 hour mean** **Annual mean**	**31.12.2004** **31.12.2004**
Authorities in Scotland only [a]	**50 μg m^{-3} not to be exceeded more than 7 times a year** **18 μg m^{-3}**	**24 hour mean** **Annual mean**	**31.12.2010** **31.12.2010**
Sulphur dioxide	**350 μg m^{-3} not to be exceeded more than 24 times a year** **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**	**1 hour mean** **24 hour mean** **15 minute mean**	**31.12.2004** **31.12.2004** **31.12.2005**

a. 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 2.2 below summarises the locations where these objectives should and should not apply respectively.

Table 2.2 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}	All background locations where members of the public might be regularly exposed.	Building facades of offices or other places of work where members of the public do not have regular access.
		Building facades of residential properties, schools, hospitals, libraries etc.	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.
1 hour mean	Nitrogen dioxide Sulphur dioxide	All locations where the annual mean and 24 and 8-hour mean objectives apply.	Kerbside sites where the public would not be expected to have regular access.
		Kerbside sites (e.g. pavements of busy shopping streets).	
		Those parts of car parks and railway stations etc. which are not fully enclosed.	
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.	

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 exceedence, 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 it is 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 Existing Strategies and Policies relevant to Air Quality in Cupar

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 Fife. 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.

2.4.1 The National Transport Strategy

The National Transport Strategy for Scotland was published in December 2006. 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 objectives:

1. To reduce journey times between Scotland's towns/ cities and 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 Cupar and the AQMA are:

In order to improve journey times and connections, tackle congestion and the lack of integration and connections in transport, the strategy outlines the following commitments:

- 'Investing to tackle congestion from the School Run;
- Promoting SMART[3] measures on all journeys, focusing especially on the commute to work through developing travel awareness and marketing campaigns;
- Exploring with key partners sustainable travel demonstration towns 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.'

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

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

2.4.2 Regional Transport Strategy (2008-2023)

Fife Council is a member of the South East of Scotland Transport Partnership (SEStran). The SEStran Regional Transport Strategy was developed to compliment the objectives of the National Transport Plan and includes 17 sub-objectives that stem from the four high level objectives of: Economy, Accessibility, Environment and Safety and Health.

The Strategy Framework comprises three different types of projects and initiatives:

Region-wide initiatives	Region wide initiatives that affect the area measures affecting the whole SEStran area e.g. travel behaviour/ planning, integrated ticketing, regional freight initiatives, awareness campaigns and frameworks for parking (standards and management).
Initiatives for specific areas and groups	Initiatives targeting accessibility and providing minimum levels of service to specific localities and groups, and rural areas.
Network-based initiatives	Covering specific infrastructure schemes and public transport services on principal travel corridors. These include a wide range of measures proposed for movements of strategic importance to the SEStran area.

The regional Strategy makes specific reference to the increasing importance of local air quality, its affects on human health and the role that transport plays in air quality issues in urban areas.

2.4.3 Fife Council Local Transport Strategy (2006-2026)

This Local Transport Strategy 2006 (LTS) sets the 5-year (short term) programme, 10-year (medium term) plan and 20-year (longer term) vision and objectives for transport delivery in Fife. In order to achieve success at a local level, the strategy has adopted a de-centralised approach to service delivery, with teams in West, Central and East areas of Fife having developed local area transport plans through consultation with local communities and stakeholders.

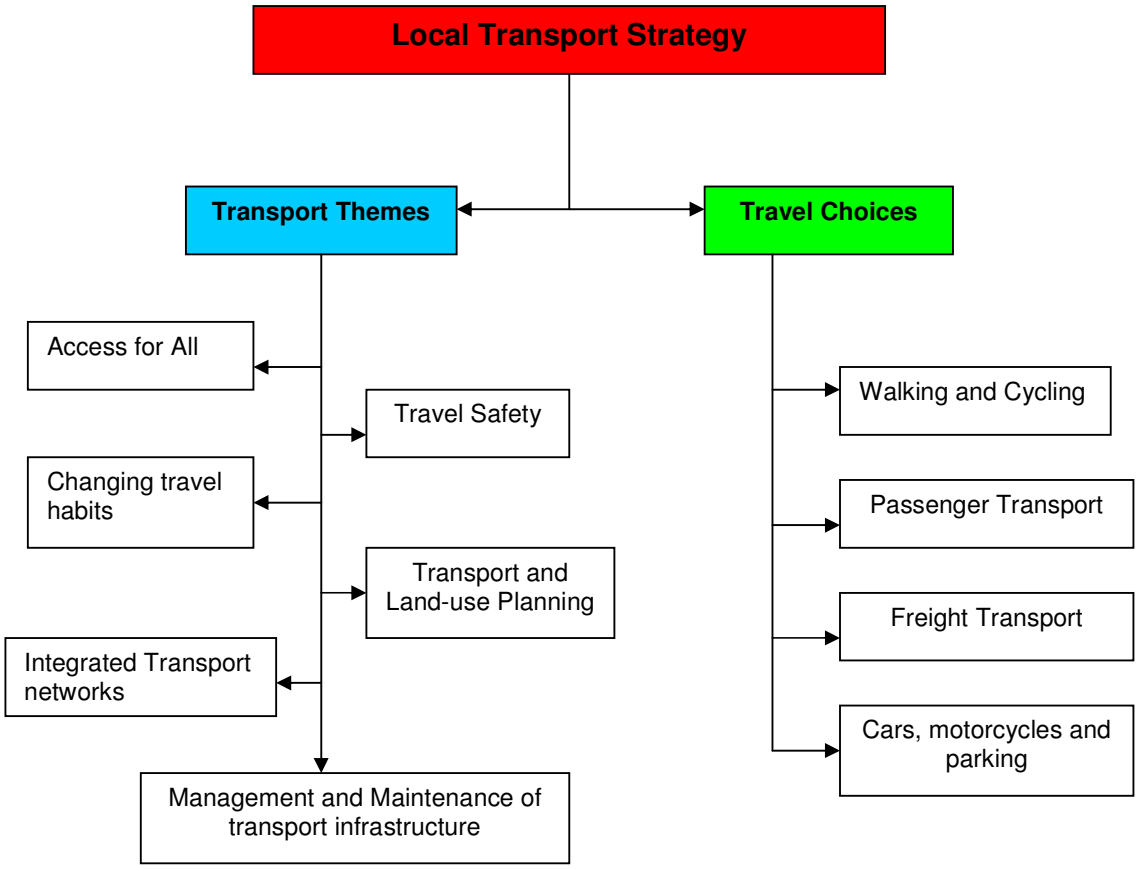
The Strategy has been designed to complement Fife Council's Community Plan, Development Plan and other supporting policies, particularly Fife's Environmental Strategy. The strategy provides an overview of the region's transportation services, pertinent transport issues, visions and objectives together with a list of priorities, policies and projects for future transport provision in Fife.

The key vision of Fife's LTS is:

"an integrated and sustainable transport system which is accessible to all and contributes towards a strong economy, strong community and healthy environment."

The objectives of the Strategy are broadly categorised into 2 groups and are summarised in Figure 2.1.

Figure 2.1 Objectives of the Local Transport Strategy



These objectives have been considered during the development of the air quality action plan for Cupar.

2.4.4 The Fife Structure Plan

The Fife Structure Plan (2006-2026) gained final Scottish Government approval on the 24th May 2009 and represents the strategic element of the development plan for Fife. The Plan sets out the development strategy and strategic land use policies and proposals. It establishes the context for local plans that translate these strategies and policies into site-specific guidance. Together, the Structure Plan and Local Plans will form the Fife Development Plan. The principal aims of the plan are to support the growth of Fife's economy and population, whilst addressing the affordability and quality of housing, ensuring sustainable communities and safeguarding and improving Fife's environment.

The Structure Plan outlines that Dunfermline, Kirkcaldy and St Andrews town centres will constitute the key centres of focus for development, but recognises the need to support other towns and villages in order to achieve balanced and sustainable growth throughout Fife. In order to achieve this, the plan outlines that development will be focused primarily in existing urban areas and in locations that are best placed to support sustainable travel. In particular reference to Cupar, the plan outlines the intention to support the revitalisation of the Town Centre through the proposed delivery of a new relief road which will come forward as part of a new strategic land allocation to the north of the town. The relief road is considered as a long-term goal within the scope of the Air Quality Action Plan.

2.4.5 Fife Council Carbon Emissions Reduction Plan

Fife Council is committed to reduce its carbon emissions by 80% by 2050. The Carbon Emissions Reduction Plan (2009) was developed to provide managers within the Council with the tools to build carbon emission reductions into day-to-day service delivery and long term planning. In addition to helping the Council meet its own carbon emission reduction targets, the Plan has been designed to support the achievement of the Scottish Government's national climate change targets.

The vision of the plan is to enable Fife Council to thrive in a low carbon economy, facilitating the transition to a low carbon organisation whilst maintaining quality services. Through embedding carbon emissions reduction, environmental awareness and efficiency in the use of our assets and operations, Fife Council will be a leading Green Council. The plan includes the commitment to consider the carbon emissions, and environmental impact of all services and projects.

The plan aims to deliver through:

- Setting carbon emissions reduction targets to meet or exceed government legislation;
- Embedding carbon emissions reduction into the culture and governance of the Council; and,
- Developing management tools to embed carbon emissions reduction and carbon efficiency into the Council systems, processes and operations.

The Plan targets reductions in 'direct emissions' from Council buildings, infrastructure energy, transport fleet fuel and commercial waste. Some of these measures may link with this Air Quality Action Plan, particularly the targeted reduction in emissions from the Council transport fleet.

2.4.6 Fife Community Plan – A Stronger Future for Fife

Fife Council's Community Plan, "A Stronger Future for Fife" is the overarching strategic plan for Fife. It provides a framework for every other strategy and plan that the Council put in place.

The Community Plan sets goals of achieving an Inclusive and Sustainable Fife whilst delivering Best Value and Excellence. Community planning is a way of working that brings together key organisations within Fife with the communities they serve, ensuring that everyone is working together to deliver a shared vision for improving the quality of life. Fife's community planning partners, Fife Council, NHS Fife, Fife Constabulary, CVS Fife, Scottish Enterprise Fife, Communities Scotland and Fife's further and higher education sector have all signed up to the shared vision set out in this plan.

The Council's vision is of a confident, ambitious and caring Fife that is a great place to live, work and visit. The plan outlines the Council's aim to deliver the shared vision of a Stronger Future for Fife by:

- Building a stronger, more flexible and diverse economy;
- Improving health and wellbeing in Fife;
- Creating a well-educated and skilled Fife;
- Sustaining and improving our environment; and,
- Making Fife's communities safer.

2.4.7 Fife Council Plan 2007-2011

Fife Council's Plan 2007-2011 is intrinsically linked to the Council's Community Plan and outlines the Council's commitment to make a difference to the people of Fife and provide top performing public services. In order to achieve this, the plan outlines the following key priorities for the Council and how these ambitions will be achieved and progress measured:

1. Improve educational achievement and education for all;
2. Make Fife the leading green Council;
3. Increased access to housing;

4. Improved local conditions for economic development;
5. Improved sport, leisure and cultural opportunities;
6. Targeted support to vulnerable people;
7. Improved community safety; and,
8. Become a top performing Council.

Many of the objectives introduced by Fife Council through the Council Plan offer the potential to improving local air quality across Fife, most notably the objective of making Fife the leading green Council. This priority objective include initiatives aimed at:

- Promoting sustainable transportation options and encouraging better travel habits;
- Ensuring that environmental awareness is promoted as part of the education curriculum; and,
- Reducing Council energy use and promoting sustainable procurement.

2.4.8 State of Environment Report

Fife Council's State of the Environment Report provides an overview and basic analysis of environmental baseline information to support the Strategic Environmental Assessment (SEA) of future plans. The report also provides a summary of progress towards achieving environmental targets set by the 'Take A Pride in Fife Environmental Network' (TAPIFEN) known as Theme Measures and Community Plan Milestones.

The Report includes a Chapter on the atmosphere which relates directly to air quality and climate change. A summary of relevant local air quality issues is presented, including concentrations of air quality pollutants (2006-2007) and objectives of improving air quality and reduce contributions and vulnerability to climate change.

2.5 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); and,
- 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.

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.

3. Conclusions of previous rounds of LAQM review and assessment undertaken in Fife Council

Fife 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 has been to review air quality in Fife and to assess whether any exceedences of the health based air quality objectives have been identified or have been predicted for future years. This chapter provides a summary of this work.

3.1 Summary of LAQM Review and Assessment in Fife Council

3.1.1 First Round of Review and Assessment

For the first round of air quality review and assessments Fife Council carried out the following:

- Fife Council (1999) First Stage Air Quality Review & Assessment. (Fife Council, May 1999); and,
- Fife Council (2002) First and Second Stage Air Quality Review & Assessment. (Fife Council, September 2002)

Both reports indicated that none of the objectives listed in the Air Quality Strategy were being exceeded or were likely to be exceeded within Fife. The reports therefore concluded that a Third Stage Review and Assessment of local air quality was not necessary for any of the pollutants listed in the strategy, and that Fife Council did not need to declare an Air Quality Management Area.

3.1.2 Second Round of Review and Assessment

For the second round of Air Quality review and assessments Fife Council prepared the following reports:

- Air Quality Updating and Screening Assessment (USA) for Air Quality 2003 (Fife Council, 2003);
- Air Quality Progress Report for Air Quality 2004 (AEA on behalf of Fife Council, April 2004); and,
- Air Quality Progress Report for Air Quality 2005 (AEA on behalf of Fife Council, June 2005)

The listed reports indicated that the respective air quality objectives for the following pollutants were unlikely to be exceeded, and that therefore there was no requirement to progress to a detailed assessment in relation to the listed substances:

- Carbon Monoxide;
- 1,3-butadiene;
- Benzene;
- Sulphur dioxide, and
- Lead

However, the Updating and Screening Assessment (2003) and Progress Reports (2004/05) identified issues relating to ambient concentrations of NO_2 and PM_{10} that required further consideration.

In relation to nitrogen dioxide, the findings of the Updating and Screening Assessment (2003) indicated that annual mean concentrations of NO_2 in exceedence of the air quality strategy objective (40 $\mu g\ m^{-3}$) had been recorded at diffusion tube locations at North Approach Road, Kincardine, Carnegie Drive, Dunfermline and Admiralty Road, Rosyth. However, as these elevated concentrations were recorded at kerbside monitoring locations, it was recommended that further monitoring be undertaken at the façade of adjacent buildings to enable concentrations at locations of relevant exposure (residential properties) to be ascertained. This adjustment to the monitoring programme was carried out during 2004 (by Fife Council) and reported in the 2005 Progress Report. Furthermore,

following the recommendations in the Progress Report (2005) additional automatic monitoring for NO_2 was undertaken at Admiralty Road, Rosyth, North Approach Road, Kincardine and Bonnygate, Fife.

Due to the limited data available pertaining to ambient concentrations of PM_{10} within Fife, the reports concluded that further PM_{10} monitoring was to be undertaken. This recommendation was addressed via the implementation of appropriate monitoring programmes at Admiralty Road, Rosyth and Bonnygate, Cupar.

3.1.3 Summary of Updating and Screening Assessment (2006)

The findings of the Updating and Screening Assessment concluded that the respective air quality objectives for carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide were unlikely to be exceeded, and that therefore there was no requirement to progress to a detailed assessment for these pollutants.

The results of PM_{10} monitoring undertaken at Admiralty Road (Rosyth) and Bonnygate (Cupar) indicated that the 2004 air quality objectives for PM_{10} were attained at these locations, but that projected concentrations of PM_{10} in 2010 for both sites were likely to approach and potentially exceed the 2010 annual mean objective. The report recommended that a detailed assessment was not required but that further monitoring should undertaken at both sites to gain a more complete perspective of local concentrations of PM_{10}.

In addition, concentration of NO_2 recorded at automatic monitoring sites and diffusion tubes deployed locations within Fife indicated that annual mean concentrations close to the 40 $\mu g\ m^{-3}$ objective were noted at Bonnygate, Cupar and Appin Crescent, Dunfermline respectively. No other relevant locations were shown to approach or exceed the NO_2 objective concentrations.

3.1.4 Summary of Progress Report (2007)

The Progress Report concluded that the respective air quality objectives for carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide were unlikely to be exceeded, and that therefore there was no requirement to progress to a detailed assessment for these pollutants.

The results of automatic and passive sampling of NO_2 and PM_{10} undertaken at Bonnygate, Cupar indicated that the annual mean objectives for each pollutant were likely to be exceeded and that therefore a Detailed Assessment of air quality for NO_2 and PM_{10} was required for the area.

In addition, one NO_2 diffusion tube deployed at Appin Crescent, Dunfermline recorded a slight exceedence of the annual mean objective, whilst the data of PM_{10} monitoring undertaken at Rosyth indicated that the annual mean objective was at risk of being exceeded at this location. In light of these findings, the report identified that Fife Council intended to continue monitoring of PM_{10} at Rosyth, and deploy a chemiluminescent analyser at Appin Crescent to assess concentrations of NO_2 at this location in more detail.

3.1.5 Summary of Detailed Assessment for Bonnygate, Cupar (2008)

The Detailed Assessment reported that the results of air quality monitoring undertaken in the Bonnygate area of Cupar identified exceedences of the annual mean objectives for NO_2 and PM_{10} in 2007. In addition, the results of air dispersion modelling of the Bonnygate (A91), Crossgate (A914) and St Catherine Street (A91) suggested that the AQS objectives for NO_2 and PM_{10} were likely to exceeded at several locations within the Bonnygate area in 2007 and were also likely to be exceeded in 2010.

As a result of these findings, and in accordance with the Local Air Quality Management Guidance, the Bonnygate and Crossgate (Figure 3.1) Air Quality Management Area came into force in December 2008. A copy of the order including a map identifying the extent of the AQMA is presented in Appendix 1.

The most recent listed LAQM Review and Assessment documents are available for viewing at Fife Council's website (Fifedirect.org.uk), whilst all other documents are available on request from Fife Council.

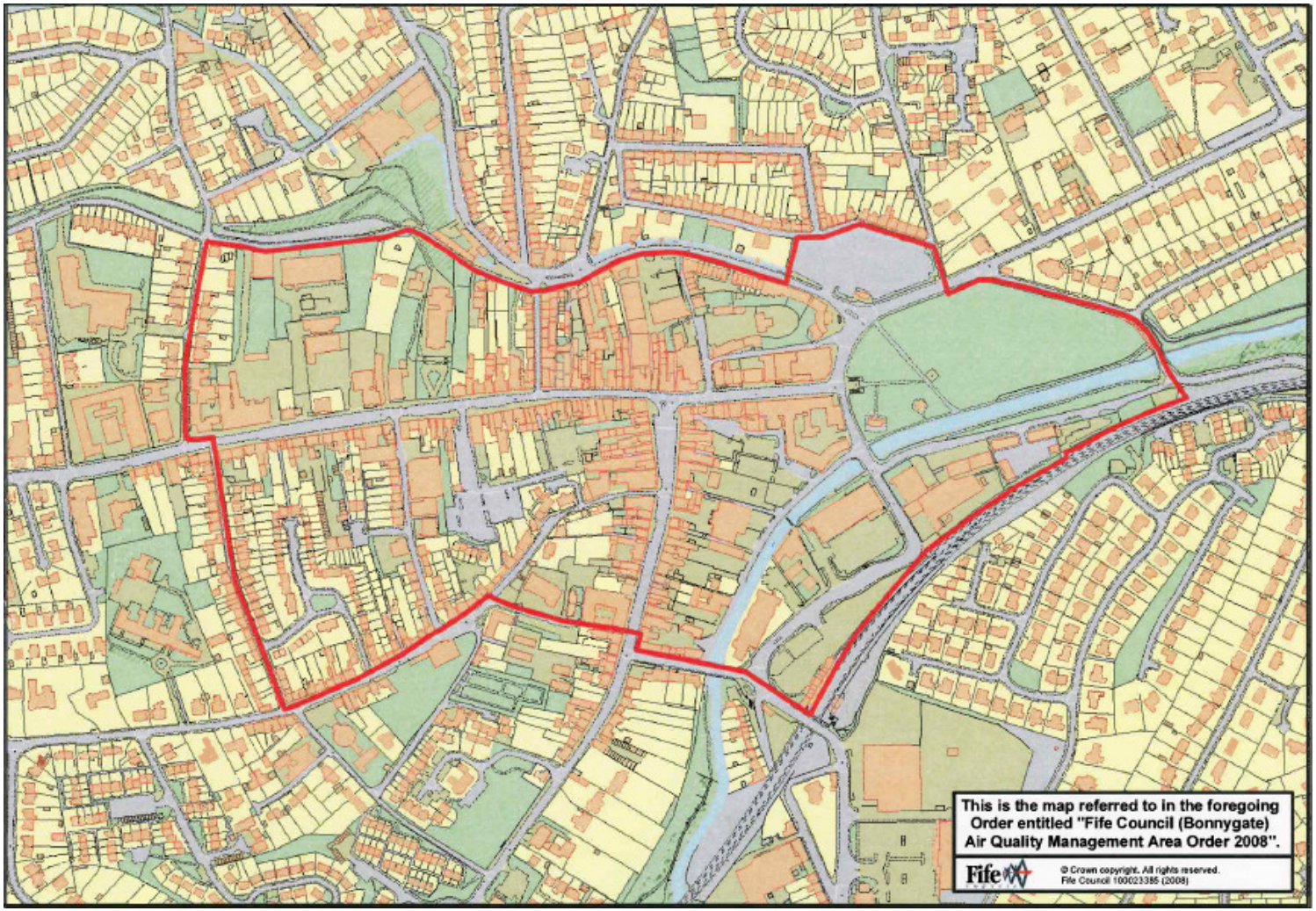


Figure 3.1. Map of Cupar Town Centre AQMA

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

Throughout the development of the Air Quality Action Plan for Cupar Town Centre, numerous visits have been made to the Bonnygate/ Crossgate area in order to observe the prevailing conditions, and to help guide the development of the action plan.

The visits firstly identified that the area where exceedences of the annual mean objectives for NO_2 and PM_{10} have been reported is situated in a 'street canyon', comprising of a narrow street flanked by closely spaced buildings on both sides of the road (Figure 3.2).

Figure 3.2 Bonnygate (A91) – Facing West

Such street canyons have been associated with exceedences of air quality strategy objectives in many urban locations, particularly where such streets run perpendicular to prevalent wind direction. In such situations, restricted and turbulent airflow can reduce the dispersion of air pollutants and result in elevated concentrations at certain locations.

It was also observed that the street formed a T-junction with the Crossgate, with traffic flow managed through traffic lights located at the cusp of the junction, resulting in the queuing of traffic within the street canyon and the formation of a bottle-neck. The visits supported the view that the nature of the flow of traffic through the Bonnygate is mainly responsible for the air quality exceedences identified in the previous review and assessment reports. In addition, it was noted that traffic flow within the Bonnygate and Crossgate is also affected by short-term illegal parking. Furthermore, traffic queues were noted on the Crossgate, which were exacerbated by cars exiting from roadside parking at this location.

The results from the Transport Model for Scotland in 2002 indicated that in Fife, some 80% of all journeys start and finish within the region and, of these trips, the majority of movements are within and between the major towns. In Cupar, the results of the Council's Travel Diary Survey undertaken in 2004 indicated that 53% of these trips were attributable to short-distance trips within the town. Although slightly dated, these findings suggest that road transport issues in Cupar are principally associated with local travel, within the town itself or between other towns in Fife.

3.3 Summary of Further Assessment for the Bonnygate AQMA (2009)

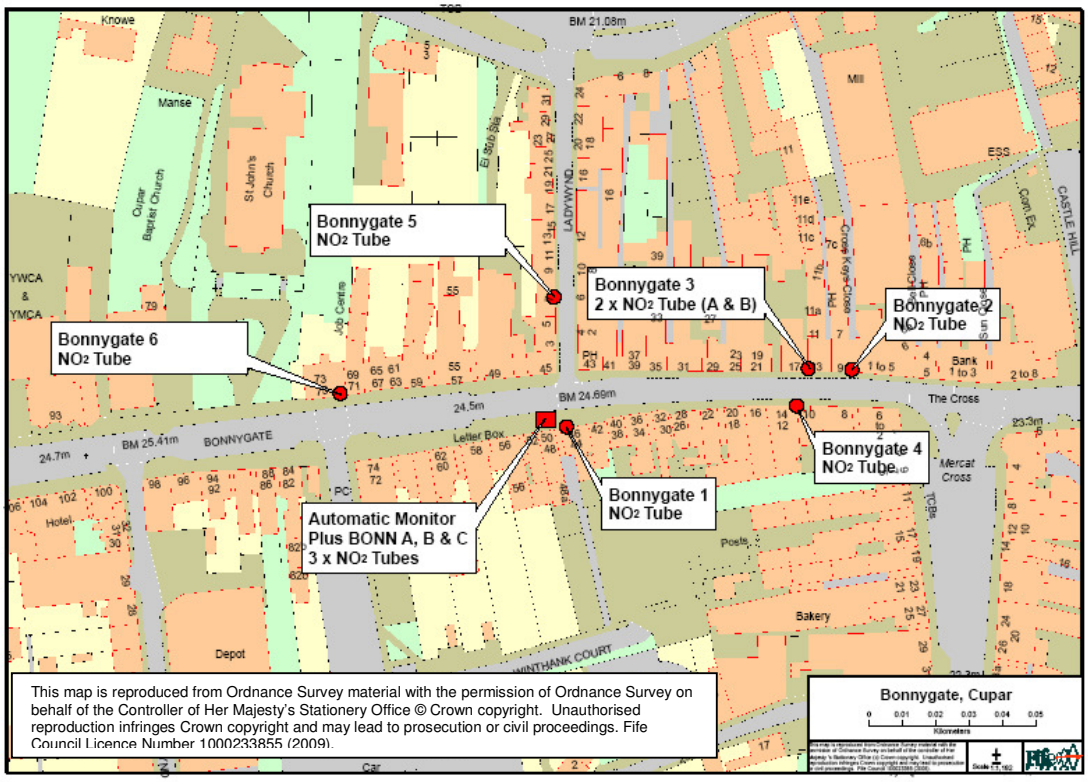
Following the declaration of the Cupar AQMA, the LAQM process requires a Further Assessment of air quality for the Bonnygate area to be undertaken. The objective of this Further Assessment was to re-assess the conclusions of the detailed assessment including any new information since the completion of the detailed assessment. This report also assesses the potential impact of traffic management scenarios on pollutant concentrations in future years and their likely effectiveness at addressing local air pollution. The report investigates current and potential future nitrogen dioxide and PM_{10} levels through a combination of modelling exercises and by reference to monitored air quality data.

3.3.1 Source Apportionment

The report included an assessment of source apportionment whereby the contributions from different sources of each relevant pollutant are determined. 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, HGV 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 contribution of emissions of NO_x and PM_{10} from various sources at relevant exposure locations. The receptors of relevant exposure utilised within the study were correlated with the NO_2 diffusion tubes located on the façades of buildings within the study area. These receptor locations (B1, B2, B3, B4 and B6) are presented in Figure 3.3. These receptors were chosen as locations where the public are likely to be regularly present and exposed over the averaging period of the objectives. Data for the source apportionment exercise presented below, represent averages from all five monitoring locations. Further details are presented in the Further Assessment.

Figure 3.3 Receptor locations considered within the source apportionment



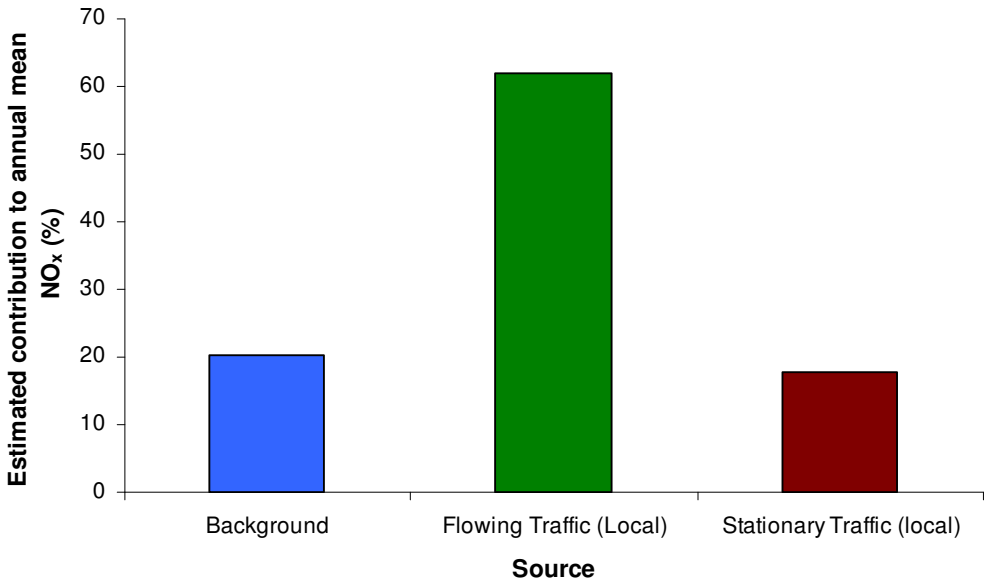
The results of the source apportionment exercise have helped the Action Plan Steering Group to identify the most appropriate measures to include within the draft Action Plan. This exercise has enabled the prominent sources of emissions to be targeted, to help bring about the most effective reduction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

In the AQMA the exceedence of the annual mean NO_2 objective has been identified as being mainly attributable to emissions generated from road transport sources. There are no other significant sources within the locality of the AQMA, and as such, road traffic is identified as being the main source and should be the focus of any work undertaken to remedy the problem in the AQMA. Figures 3.4-3.7 summarises the key findings of the source apportionment study undertaken as part of the Further Assessment. Further details are presented in Appendix 2.

Sources of Nitrogen dioxide

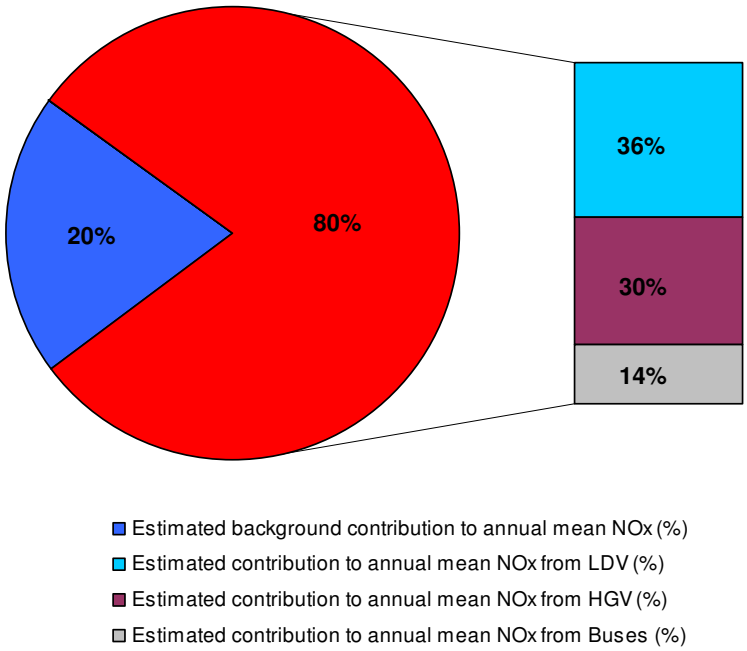
The results of the source apportionment exercise relating to ambient concentrations of NO_2 (NO_x) are summarised in Figures 3.4 and 3.5. Modelling indicated that background concentrations of NO_x contributed an average of 20% of total NO_x concentrations, with the remaining 80% predicted to be attributable to emissions from local road traffic. Analysis of the average contributions to NO_x concentrations from free-moving traffic and stationary vehicles (Figure 3.4) indicated that moving traffic contributed approximately 62% of NO_x emissions on average, with stationary vehicles estimated to contribute approximately 18%. Details of the estimated contributions from each source at each of the receptor points are presented in Appendix 2.

Figure 3.4 Estimated contributions to ambient NO_x concentrations within the Bonnygate AQMA



It is also useful to assess the emissions attributable to different classes of vehicles, to enable the action plan to target highly polluting vehicle types. Hence analysis was undertaken to assess emissions contributions from various categories of the traffic fleet, namely Light Duty Vehicles (LDV) (cars, vans and motorcycles), Heavy Goods Vehicles (HGV) and buses. A summary of the results of the analysis for NO_x at Bonnygate is presented in Figure 3.5.

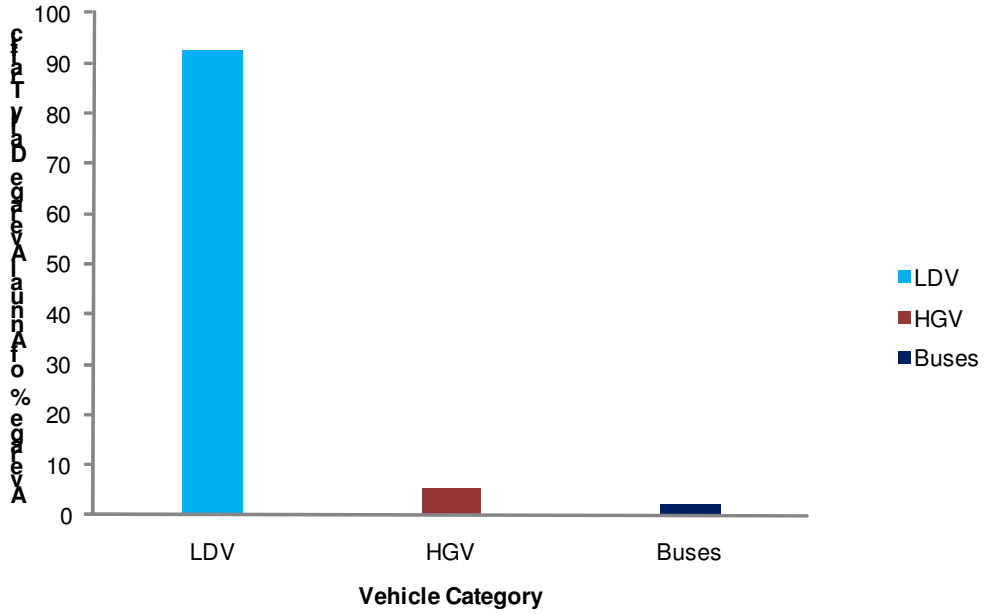
Figure 3.5 Sources of ambient NO_x concentrations within the Cupar Town Centre AQMA



The results indicated that light duty vehicles (cars, vans and motorcycles) make the most significant contribution to local NO_x emissions, being estimated to contribute on average 36% of NO_x concentrations in the Bonnygate. Heavy goods vehicles were found to make the second most significant contribution to local NO_x concentrations, contributing on average 30%, and buses estimated to make a smaller contribution of approximately 14%.

The source apportionment data was reviewed against the estimated composition of traffic passing through the Bonnygate (Figure 3.6). This data indicated that the high proportion of NO_x emissions attributed to light-duty vehicles were a result of the large number of these vehicles that travel through the Bonnygate AQMA. Light-duty vehicles are estimated to represent approximately 93% of the traffic passing through the Bonnygate each day, with HGVs and buses estimated to represent approximately 5% and 2% respectively. These figures indicate that whilst light duty vehicles represent the principle source of NO_x emissions in the Bonnygate, both HGV and buses contribute a disproportionately larger amount of NO_x on a per vehicle basis. Consequently, it is recognised that measures aimed at reducing emissions from HGVs and buses could make a positive contribution to the Air Quality Action Plan.

Figure 3.6 Percentage contributions from various vehicle categories to annual traffic flow within the Bonnygate AQMA



Taken collectively, these findings indicate that road transport, in particular light duty vehicles and heavy goods vehicles, represent the principal source of NO_x emissions within the Bonnygate. Consequently, these sources represent prime targets for measures aimed at reducing emissions of NO_x within the Bonnygate AQMA. In general, measures aimed at reducing the amount of traffic whether free-flowing or stationary will have a beneficial effect on local NOx concentrations. Of the vehicle types assessed, HGVs constitute the main contributors on an emissions per vehicle basis. This indicates that measures to reduce the number of freight vehicles transiting the AQMA would likely have a beneficial effect on local air quality, as would measures to improve the quality of the vehicles themselves.

The remaining 20% of NOx emissions not attributed to road transport are attributed to background sources from outside of the Bonnygate AQMA and are likely to arise largely from the domestic, commercial and industrial combustion of fuels. Measures to address emissions from these sources could be included within the action plan, however, such measures would require to be adopted at a national level to be effective, and are therefore largely outwith the scope of this action plan.

Required Reduction in NO_x Concentrations

LAQM.PGS(09) 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. From the modelling undertaken in the Further Assessment, it has been calculated that a 53% reduction in ambient concentrations of NO_x from road transport is required to attain the annual mean NO_2 objective (Table 3.1).

Table 3.1 Reductions required in NO_x concentrations to achieve the 2005 NO_2 annual mean objective

Location	[Background] ($\mu g\ m^{-3}$)	Current Road-[NO_x] ($\mu g\ m^{-3}$)	Required Road-[NO_x] ($\mu g\ m^{-3}$)	Road-[NO_x] Reduction required (%)	Road-[NO_x] Reduction required (%) x0.29 for canyon, x0.56 for wide canyon
B1	20	48	71	**0**	**-**
B2	20	151	71	**53**	**15**
B3	20	128	71	**45**	**13**
B4	20	144	71	**51**	**15**
B6	20	37	71	**0**	**-**

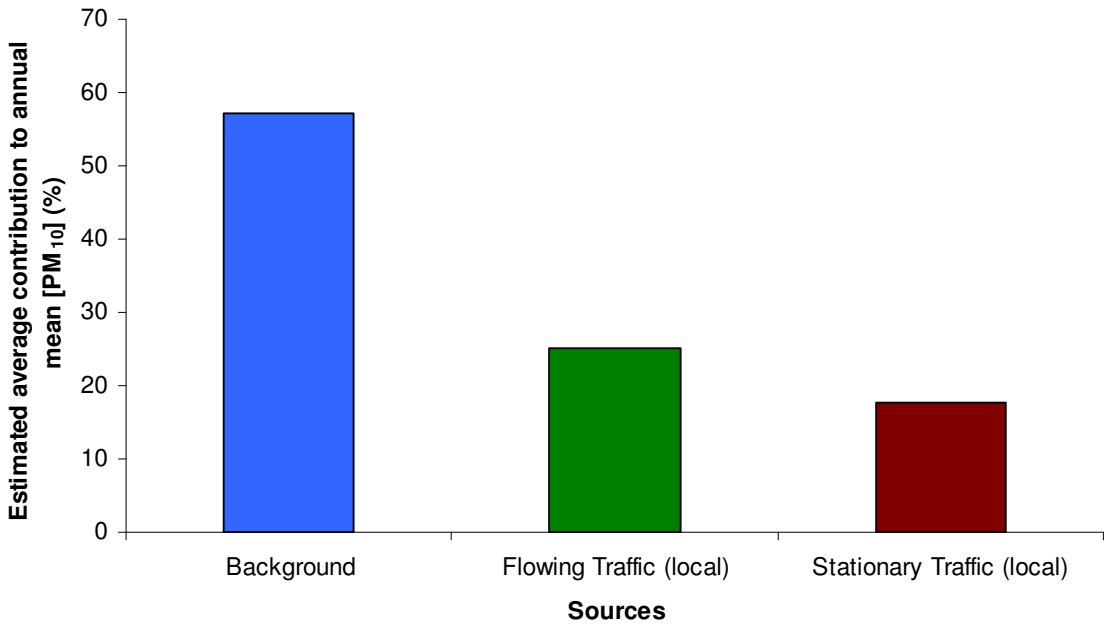
However, it should be noted that the 53% reduction required represents the *ambient concentration* required to achieve the objectives, not the reduction in *mass of emissions.* In a canyon location, a unit of emission will have a disproportionately high impact on ambient concentrations due to restricted dispersion. Thus, it is important to consider how this impacts on calculated improvements. The improvement in mass emissions required to achieve the NO_2 objectives is actually significantly lower (15%) when the influence of the canyon is taken into consideration. Full details are presented in the Further Assessment.

Sources of Particulate Matter (PM_{10})

The results of the source apportionment exercise regarding ambient concentrations of PM_{10} are summarised in Figures 3.7 and 3.8. The results of modelling indicate that background concentrations constitute the most significant source of ambient concentrations of PM_{10} within the Bonnygate, being estimated to contribute 57% of ambient concentrations on average. Emissions from local road traffic are estimated to contribute the remaining 43% (Figure 3.7), with 25% estimated to originate from moving traffic, and 18% from stationary traffic respectively.

The high percentage contribution of PM_{10} from background sources represents a problem for Fife Council, as it is difficult to implement measures at a local level that will result in a significant reduction in background concentrations. The background concentration of PM_{10} represents the contribution from sources outside of the Bonnygate AQMA. Common sources of background PM_{10} include industrial, road transport, and domestic/ commercial combustion sources (heating), but natural sources and particulates produced through atmospheric reactions can also contribute significantly.

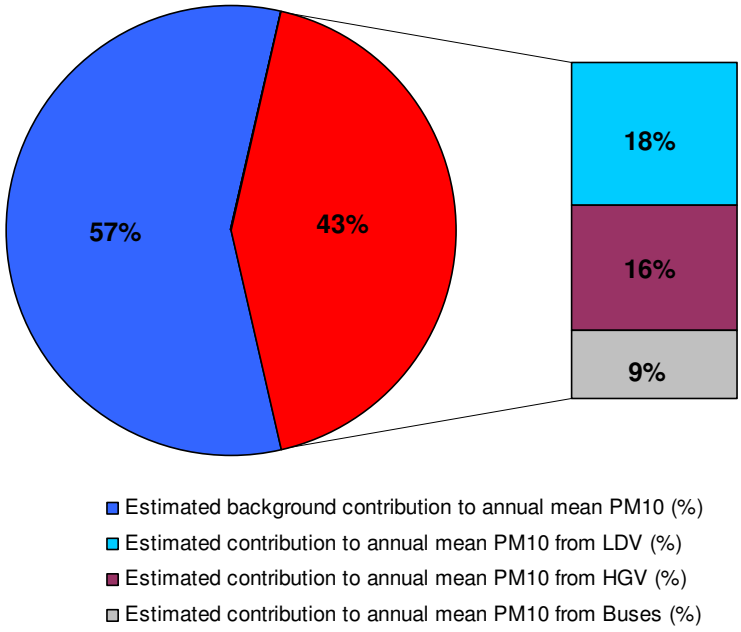
Figure 3.7 Estimated contributions to local concentrations of PM_{10} within the Bonnygate AQMA



The results of the estimated contribution from different vehicle types to ambient annual mean PM_{10} concentrations are presented in Figure 3.8. These indicated that LDV were found to represent the most significant road transport source of PM_{10} within the Bonnygate, being estimated to contribute 18% to annual mean concentrations on average. HGVs were estimated to contribution a further 16% to local concentrations, and buses 9%.

These findings indicate that whilst background concentrations represent the principal source of elevated PM_{10} concentrations within the Bonnygate, road transport also makes a significant contribution to local concentrations. In particular, light duty vehicles and heavy goods vehicles make significant contributions to local concentrations and thus represent prime targets for measures aimed at reducing concentrations of PM_{10} within the Bonnygate AQMA. In general, measures aimed at reducing the amount of traffic whether free-flowing or stationary will have a beneficial effect on local PM_{10} concentrations. Of the vehicle types assessed, HGVs constitute the main contributors on an emissions per vehicle basis. This indicates that measures to reduce the number of freight vehicles transiting the AQMA would likely have a beneficial effect on local air quality, as would measures to improve the quality of the vehicles themselves.

Figure 3.8. Sources of ambient PM_{10} concentrations within the Cupar Town Centre AQMA



Required Reduction in PM_{10} Concentrations

Taking into consideration the current concentrations of PM_{10} reported in the Bonnygate AQMA and the annual mean objective for 2010 (18 µg m^{-3}), it is calculated that a 33% reduction in ambient PM_{10} concentrations is required in order for the objective to be attained at all locations within the AQMA (Table 3.2).

Table 3.2 Reductions required in [PM_{10}] to achieve the 2010 annual mean objective

Location	[Background] (µg m^{-3})	Current Road-[PM_{10}] (µg m^{-3})	Required Road [PM_{10}] (µg m^{-3})	Road [PM_{10}] Reduction required (%)	Road PM_{10} Reduction required (%)x0.29 for canyon, x0.56 for wide canyon
B1	10	5	8	**0**	**-**
B2	10	12	8	**33**	**10**
B3	10	9	8	**11**	**3**
B4	10	10	8	**20**	**6**
B6	10	4	8	**0**	**-**

However, it should be noted that the 33% reduction in emissions from road transport required represents the *ambient concentration* required to achieve the objectives, not the reduction in *mass of emissions*. In a canyon location, as in the Bonnygate, a unit of emission will have a disproportionately

high impact on ambient concentrations due to restricted dispersion. Thus, it is important to consider how this impacts on calculated improvements. The improvement in mass emissions required to achieve the PM_{10} annual mean objective is actually significantly lower (8%) when the influence of the canyon is taken into consideration. Further details are presented in the Further Assessment.

Conclusions of Source Apportionment

On the basis of the findings of the source apportionment exercise, Fife Council have considered measures that will target reductions in emissions from road traffic in general, but with a particular focus on reducing emissions from cars and heavy goods vehicles during the development of the Action Plan. Measures targeting reduced emissions from buses were also considered due to the high level of emissions produced by buses on a per vehicle basis. This approach targets the principal sources of emissions that can be addressed through local measures.

In the absence of specific mitigation measures, the Further Assessment estimated that the annual mean objective for NO_2 and PM_{10} is unlikely to be achieved at all relevant locations within the Bonnygate prior to 2020 and 2015 respectively.

3.3.2 Scenario Analysis

In addition to modelling baseline concentrations of NO_2 and PM_{10} for the Bonnygate area for 2008 and future years, the Further Assessment modelled the potential impact of six potential mitigation scenarios (measures) to ascertain their potential impact on local concentrations of NOx/ NO_2 and PM_{10}. The scenarios assessed were:

1. All Euro II buses replaced with Euro III
2. 20% of Euro II and 20% of Euro III buses replaced with Euro IV
3. 40% of Euro II and 40% of Euro III buses replaced with Euro IV
4. 60% of Euro II and 60% of Euro III buses replaced with Euro IV
5. 20% reduction in HGV
6. Traffic queue relocation and traffic light coordination aimed at minimising congestion within the Bonnygate

The scenarios were modelled to inform future management decisions, but do speculate on how the necessary reductions may be achieved. A summary of these scenario analyses is presented below together with anticipated impacts on concentrations of NO_x and PM_{10} at relevant receptors.

Bus Scenarios (Scenarios 1-4)

Scenario 1 was developed in order to assess the effectiveness of replacing very old buses with slightly newer ones, taking into account that a move to Euro IV may not be financially viable for local operators. Scenarios 2-4 reflect ambitious interventions and would typically be taken forward by the larger operators and can include both vehicle replacement and retrofitting of abatement systems to Euro IV standard.

The results of the analyses are presented in Tables 3.3 and 3.4.

Table 3.3 Bus scenarios NOx (all values in µg m^{-3})						
Location	**2008 Road [NOx]**	**Required Road [NOx] to achieve NO_2 Objective**	**Road [NOx] Bus Scenario 1 (9.8% reduction in bus NOx)**	**Road [NOx] Bus Scenario 2 (5.5% reduction in bus NOx)**	**Road [NOx] Bus Scenario 3 (11.0% reduction in bus NOx)**	**Road [NOx] Bus Scenario 4 (22.6% reduction in bus NOx)**
B1	48	71	47	47	47	46
B2	151	71	150	150	150	149
B3	128	71	126	127	126	125
B4	144	71	142	143	142	140
B6	37	71	36	36	36	35

Table 3.4 Bus scenarios PM_{10} (all values in µg m^{-3})						
Location	**2008 Road [PM_{10}]**	**Required Road [PM_{10}] to achieve objective**	**Road [PM_{10}] Bus Scenario 1 (8.0% reduction in bus PM_{10})**	**Road [PM_{10}] Bus Scenario 2 (10.6% reduction in bus PM_{10})**	**Road [PM_{10}] Bus Scenario 3 (21.1% reduction in bus PM_{10})**	**Road [PM_{10}] Bus Scenario 4 (31.7% reduction in bus PM_{10})**
B1	5	8	5	5	5	5
B2	12	8	12	12	12	11
B3	9	8	9	9	9	8
B4	10	8	10	10	10	9
B6	4	8	4	4	4	4

The data presented in Table 3.3 and 3.4 suggests that the bus interventions outlined would not facilitate the necessary reductions in NO_x or PM_{10} at the highest concentration areas within the Bonnygate to enable the annual mean objectives to be attained. The results indicate that none of the identified exceedences within the Bonnygate would be removed using any of the assessed bus interventions alone.

HGV Reduction Scenario (Scenario 5)

Scenario 5 reflects a general reduction in HGV traffic that could theoretically be achieved in the Bonnygate, Cupar. The results of the analyses are presented in Tables 3.5 and 3.6.

Table 3.5 HGV scenario NO_x (all values in µg m^{-3})

Location	2008 Road [NOx]	Required Road NOx to achieve objective	Road NOx HGV Reduction scenario (20% reduction in HGV NOx)
B1	48	71	45
B2	151	71	**135**
B3	128	71	**117**
B4	144	71	**135**
B6	37	71	35

Table 3.6 HGV scenario PM_{10} (all values in µg m^{-3})

Location	2008 Road [PM_{10}]	Required Road [PM_{10}] to achieve objective	Road [PM_{10}] HGV reduction scenario (20.0% reduction in HGV [PM_{10}])
B1	5	8	5
B2	**12**	8	**11**
B3	**9**	8	8
B4	**10**	8	**9**
B6	4	8	4

The data presented in Tables 3.5 and 3.6 indicates that the HGV intervention outlined would not be sufficient to facilitate the necessary reductions in NO_x or PM_{10} at the highest concentration areas within the Bonnygate, although the gains observed are more significant than those for the bus scenarios. However, the results indicate that the scenario may reduce PM_{10} concentrations sufficiently to enable the annual mean objective to be achieved at location B3. It is considered that none of the other exceedences would be removed as a result of the HGV 20% reduction scenario alone.

Queue Relocation scenario

Scenario 6 aims to assess the impact of moving some of the congestion out of the narrowest areas of the street canyon in Bonnygate to a more open location to the West. The results of the queue relocation modelling exercise is summarised in Tables 3.7 and 3.8.

Table 3.7 Queue relocation NO_x (all values in µg m^{-3})

Location	2008 Road [NOx]	Required Road [NOx] to achieve objective	Road [NOx] Queue relocation scenario
B1	48	71	70
B2	151	71	**101**
B3	128	71	**91**
B4	144	71	**101**
B6	37	71	41

The data presented in Table 3.7 indicates that the queue relocation scenario could have some success in mitigating NO_x (and therefore NO_2) at the worst locations in Bonnygate. Plots of modelled NO_2 concentrations for the scenario before and after implementation are presented in Appendix 3 and indicate that the areas of exceedence are generally less pronounced following implementation. Whilst it is not anticipated that any of the exceedences are likely to be removed by queue relocation alone, the magnitudes of the exceedences are estimated to be markedly reduced at the worst points of relevant exposure. However, there is a compromise inherent in this scenario, in that it is predicted that there will be a slight increase in concentrations of NO_2 to the West of Lady Wynd (indicated by the increase in Road NO_x at receptor B6), although this is not anticipated to result in an exceedence of the annual mean objective for NO_2.

Table 3.8 Queue relocation PM_{10} (all values in µg m^{-3})

Location	2008 Road [PM_{10}]	Required Road [PM_{10}] to achieve objective	Road [PM_{10}] Queue relocation scenario
B1	5	8	6
B2	**12**	8	**9**
B3	**9**	8	7
B4	**10**	8	8
B6	4	8	4

The data presented in Table 3.8 indicates that the queue relocation scenario could also have some success in mitigating PM_{10} at the worst locations in Bonnygate. The results of the analysis presented in Table 3.8 and Appendix 3 suggest that the queue relocation will remove the PM_{10} exceedences at locations B3 and B4, and the magnitude of the exceedence at location B2 will be significantly reduced. However, the same compromise exists as for NO_x; there is a predicted slight increase in PM_{10} concentrations predicted for locations to the West of Lady Wynd, although it is anticipated that this slight increase is unlikely to cause an exceedence of the annual mean PM_{10} objective at points of relevant exposure.

3.3.3 Conclusions and recommendations

The Bonnygate AQMA has been declared on the basis of recognised exceedences of the annual mean objectives for NO_2 and PM_{10}, and thus, the action plan should be developed to focus on measures that effectively reduce emissions and concentrations of both these pollutants.

In summary, the findings of the Further Assessment for the Bonnygate AQMA indicate the following:

- Road traffic represents the predominant source of NOx within the Bonnygate AQMA, with LDV and HGVs representing the principal source of road-traffic based emissions of NO_x and PM_{10}.
- Background sources contribute the most significant proportion of prevailing PM_{10} concentrations within the Bonnygate AQMA.
- Moving traffic represents a more significant source of emissions of NOx and PM_{10} than stationary traffic, although queuing traffic is estimated to contribute approximately 18% of emissions of both pollutants.

From consideration of these findings and the findings of the scenario analyses, it is recommended that the action plan should include measures aimed at:

- Reducing the impacts of cars and heavy goods vehicles (HGVs) within the Bonnygate;
- Minimising the impacts of congestion within the Bonnygate street canyon;
- Encouraging a reduction in traffic volumes;
- Reducing the background concentration of PM_{10} through encouragement of efforts at the national level.

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.

This steering group comprises:

- Douglas Mayne, Environmental Services, Fife Council (Chair)
- Nick Barron, Transportation Services, Fife Council
- Kenny Bisset, Environmental Services, Fife Council
- Pauline Bogie, Media and Communications, Fife Council
- Lee Cessford, Education Service, Fife Council
- Tara Cowley, Development Services, Fife Council
- Blair Falconer, Environmental Services, Fife Council
- Jane Findlay, Transportation Services, Fife Council
- Peter Findlay, Fleet Services, Fife Council
- Colin Gilbert, Local Services, Fife Council
- Sgt Roy Giles, Fife Constabulary
- Anne Gray, Environmental Services, Fife Council
- Keith Grieve, Procurement & Supplies, Fife Council
- Eloise Griffin, Environmental Services, Fife Council
- Dr Jackie Hyland, NHS Fife
- John Lamb, Scottish Environment Protection Agency
- Sheona McClure, Legal Services, Fife Council
- Steven Paterson, Legal Services, Fife Council
- Donald Payne, Environmental Services, Fife Council
- Jim Robb, Environmental Services, Fife Council
- David Struthers, Financial Services, Fife Council
- Stuart Sneddon, AEA

The steering group was formed to provide an appropriate forum for developing the Air Quality Action Plan. The composition of the group was carefully 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 steering group met eleven times between December 2008 and August 2010. These meetings have included the following agendas:

- Overview of the requirements of the action planning process;
- Review of air quality management options for the steering group to consider as potential measures within the AQAP;
- Steering group meeting to enable further consideration of potential options;
- Consultant-led review of the draft assessment of air quality management options;
- Steering group meetings to further consider the assessments, identify priorities, timescales, targets and indicators.
- Public consultation and the finalisation of the Air Quality and Action Plan

The Scottish Local Air Quality Management Policy Guidance LAQM.PG(S)(09) 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 exceedences 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; and
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 three main actions:

1. Initial consideration of all possible options for reducing ambient concentrations of NO_2 and PM_{10} within the Bonnygate AQMA. This provisional assessment enabled the identification of measures that are not feasible, sufficiently focussed, or which are considered disproportionate to the prevailing situation.
2. More detailed consideration and assessment of short-listed options aimed at reducing emissions. The role of the group is to provide comments, evaluate the options and to make decisions so that a list of prioritised options could be developed.
3. Determination of how proposals outlined in the draft plan will be prioritised and implemented.
4. Submission of the draft Action Plan for the consideration of the wider Council and other stakeholders to review the proposed content of the draft Action Plan and offer the opportunity to influence the development of the plan.

The following sections of this report present the outcomes of these actions.

5. Action Plan Options and their Assessment

During the development of the Action Plan, the steering group has considered a full range of relevant options aimed at reducing ambient concentrations of NO_2 and PM_{10} within the Bonnygate 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), 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.PGS(09), to enable the identification of feasible and effective measures that can be developed in the Action Plan.

Range of Possible Options

The Policy Guidance LAQM.PGS(09) 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 Fife Council and other stakeholders to improve local air quality within the Bonnygate 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.PGS(09) and relevant Environmental Protection UK guidance documents as well as recommendations of members of the Steering Group. Whilst Fife 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 5.1 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. A full list of the provisional options, together with a summary of comments from the steering group and the Council's consultant regarding their feasibility and applicability are presented in Appendix 4.

Table 5.1 Potential Options to Improve Air Quality within Bonnygate 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 particulate matter make a significant contribution to local PM_{10} concentrations.

Table 5.1 Potential Options to Improve Air Quality within Bonnygate AQMA		
Type	Description	Notes
		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.

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; and,
3) Additional comments from Fife Council's consultant based on experience in prior assessments.

Taking into consideration the situation in Cupar Town Centre the findings of the source apportionment exercise (Section 3) and existing Council Policy, several of the measures included within the

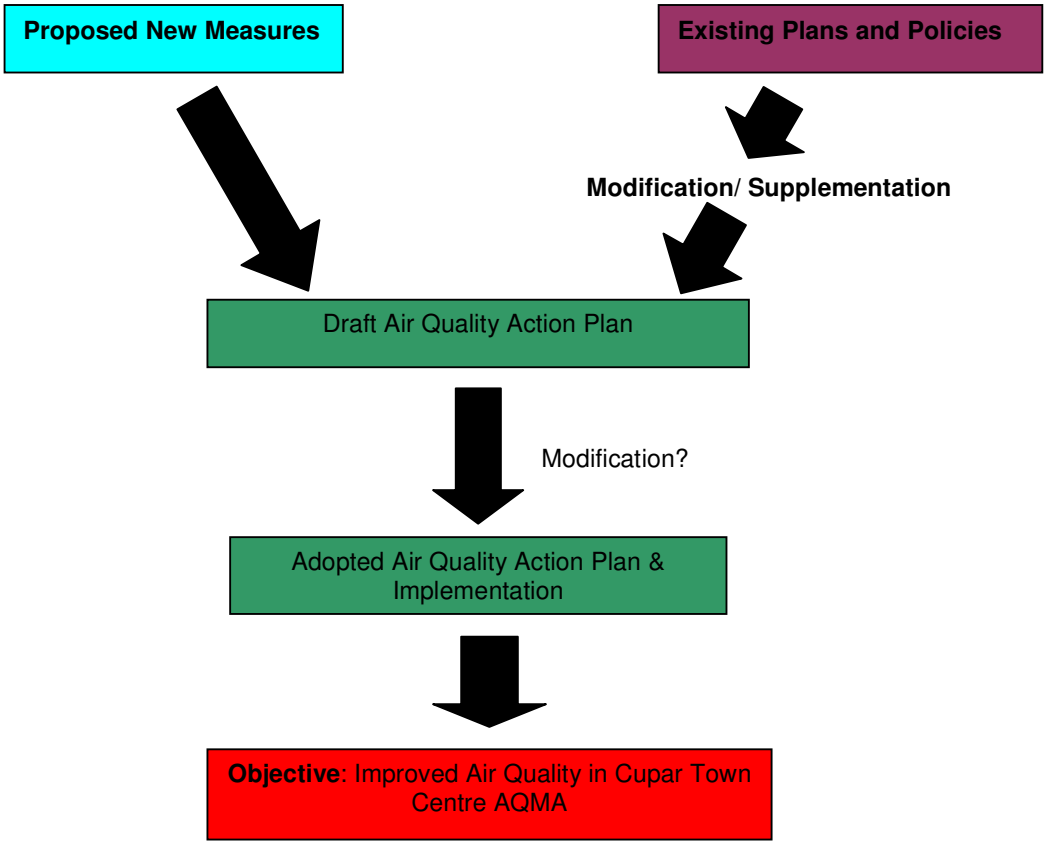
provisional list of measures were eliminated from further consideration at this time. These measures are presented in Table 5.2.

Table 5.2 Options eliminated from further consideration in the Cupar Town Centre AQMA	
Move receptors away from AQMA	
Create alternative accommodation for the residents of Bonnygate area	
Move sources away from AQMA	
Local ban on freight, car or bus traffic	
Pedestrianisation of Bonnygate	
Traffic Management – optimisation of traffic movement through AQMA	
Urban Clearway	
Reduce the emissions from sources by technical means	
Road User/ Work Place Charging	
Vehicle emissions testing	
Idling Vehicle Enforcement	
Retrofitting Council Fleet	
Development of infrastructure for cleaner vehicle fuels	
Vehicle scrappage incentives	
Speed Controls	
Investigate potential development of a Taxi Quality Partnership	
Reduce the emissions from sources by means of encouraging better travel choices/ behavioural change	
Road use charging and workplace parking levy	
Bus lanes	
Relocating bus stops	
Other	
Home Energy Efficiency	
Environmental Nuisance (including bonfires)	
Lobby for additional National Policy	

The measures listed in Table 5.2 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.

Fife Council intends to develop all of the remaining measures for inclusion within the Air Quality Action Plan. These measures include several new measures that will require to be developed further and assessed prior to implementation. Also included are numerous measures that are in the process of being implemented by Fife Council but which may require some modification or supplementation in order to make a more significant contribution to improving local air quality in the Bonnygate AQMA and also meet future reporting requirements.

Figure 5.1. Overview of measures included within the Action Plan



Consequently, the approach adopted in this action plan to enable the assessment of new measures differs from that utilised to assess measures that have already been implemented. Most significantly, for measures that have already been implemented through existing plans and programmes, it is clear that these measures have previously been determined to be **acceptable.** As such, the assessment of existing measures undertaken within this plan is restricted to the assessment of their potential impact on air quality within the AQMA, plus any additional costs/ benefits associated with any modification/ supplementation of these measures.

A summary of the remaining **new** and **existing** measures proposed for inclusion in the Action Plan are presented in Tables 5.3 and 5.4 respectively. Further details of the measures and their assessment are presented in the following sections.

Table 5.3 New measures selected for further assessment and potential inclusion in the Bonnygate AQAP
1 Strategic Measures
a) Improving links with Local Transport Strategy
b) Improving links with Local Planning and Development framework
c) Encourage Integration of AQ with other Council strategies
d) Air Quality Guidance note for Developers
2 Traffic Management – optimisation of traffic movement through AQMA
a) Target reduced local emissions from freight operations
b) Relief Road
c) Changes to junction layouts
3 Reduce the emissions from sources by technical means
a) Target reduced emissions from buses
4 Reduce the emissions from sources by means of encouraging better travel choices/ behavioural change
a) Improved signage – AQMA signs

Table 5.4 Existing measures selected for further assessment and potential inclusion in the Bonnygate AQAP
2 Traffic Management – optimisation of traffic movement through AQMA
d) Implementation of new Urban Traffic Management and Control system and changes to pedestrian crossings
e) Parking Management and Control
3 Reduce the emissions from sources by technical means
b) Green Procurement (Council) and fleet management – Council fleets and contract vehicles.
c) Eco-driving training policy (Fife Council)
4 Reduce the emissions from sources by means of encouraging better travel choices/ behavioural change
b) Provision of information regarding air quality and travel options – includes awareness raising
c) Promotion of alternative modes (cycling + walking)
d) Travel Plans for large institutions and businesses.

5.2 Development of proposed measures

Each of the measures short-listed for further consideration in the draft 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. Fife Council further subdivided into:
   a. Transportation Services;
   b. Development Services;
   c. Environmental Services;
   d. Procurement and Supplies;
   e. Fleet Services.

2. The Regional Transport Partnership (SEStran)

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 Table 5.1, and discussed in further detail below.

5.2.1 Strategic Measures

It is important that Air Quality Action Plans support and consider existing or forthcoming transport and development plans, and vice versa. Therefore some integration of the AQAP with the local transport strategy/ area transport plan and the development plan is considered essential and represents a strategic and integrated approach to local air quality management. This strategic approach is outlined in proposed measures 1 and 2.

Improving links with the Local Transport Strategy

Road transport has been identified as the principal source of NO_x and a significant source of PM_{10} within the Bonnygate AQMA. Consequently, Fife Council's Local Transport Strategy and Area Transport Plan for Cupar present a key platform for delivering initiatives aimed at improving local air quality.

Measure	Title
1	Improving links with Local Transport Strategy
Definition	Key Intervention
Future versions of LTS to be revised to include: a. Reference to Bonnygate AQMA and measures included in Air Quality Action Plan. Integration of plan with LTS. b. Develop action plan options that will be implemented via the local transport strategy.	Measures to ensure the current poor air quality in the AQMA is improved where possible and to avoid future problems are implemented via the Local Transport Strategy.
Responsible authority and other partners	Powers to be used
Fife Council – Transportation Services and Environmental Services	Voluntary

Improving links with Local Planning and Development Framework

Planning and development 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 Fife. As a strategic measure it has a broader remit that is not specific to Cupar, but across Fife. Whilst, Air Quality is already considered in Fife Council during the development planning process, the declaration of the AQMA in Cupar presents the opportunity to refocus on the potential impacts of new 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 Bonnygate 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

This measure also includes the development and distribution of a guidance note for potential developers. This document is currently being developed by Fife Council's Environmental Services and includes information for developers outlining the potential requirement to undertake an Air Quality Impact assessment for certain developments and the required content of such assessments.

The development of the note should enable 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 in Cupar and other areas of Fife.

Measure	Title

2	Improving Air Quality links with Local Planning and Development Framework
Definition	Key Intervention
This measure incorporates options 1b and 1d from the provisional assessment. Sub-measures to include: a. Integration of AQAP with future versions of Local Plan (medium term). b. Ensure that development proposals with the potential to exert an impact on the Bonnygate AQMA are assessed for air quality impacts and where necessary, appropriate mitigation measures considered. c. Continue to promote sustainable developments by using the planning process to maximise commitment from developers to minimise air quality impacts. d. Run internal seminar on air quality – aimed at planning officers. e. Prepare and publish 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
Fife Council: Development Services and Environmental Services	Voluntary

Encourage Integration of Air Quality with other Council Strategies

Fife Council recognised 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 Community Plan identifies Sustaining and Improving Our Environment as a key outcome theme. Section 1.21 of the Community Plan identifies 'better air quality' as an outcome to be delivered through action involving a wide range of partners. The Air Quality Action Plan is therefore a key tool for helping to deliver the Fife Community Plan and the Single Outcome Agreement (SOA) with the Scottish Government. The SOA sets out indicators, baselines and progress to 2011/12 targets.

Measure	**Title**
3	Encourage Integration of AQ with other Council strategies
Definition	Key Intervention
a. Continue and enhance joint working between Council Services to encourage potential air quality implications of existing and future Council strategies. b. Maintain regular and ongoing communication between members of the air quality action plan steering group.	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
Fife Council and community planning partners	Statutory and Voluntary

5.2.2 Traffic Management – optimisation of traffic movement through AQMA

Target Reduced Localised Emissions from Freight Operations

The results of the source apportionment exercise for the Bonnygate AQMA indicated that heavy goods vehicles make a significant contribution of emissions of NO_x and PM_{10} within the Bonnygate/ Crossgate, but comprise a relatively small proportion of traffic. It was therefore recognised that reducing emissions from heavy goods vehicles within the Bonnygate may represent a targeted and effective approach to improving air quality within the AQMA.

The proposed measure includes the potential for assessing the feasibility of diverting HGV freight along the South Road, rather than through the Bonnygate/ Crossgate. During the development of the AQAP numerous constraints have been raised that may inhibit the implementation of this proposal. These constraints include the presence of overhead lines, culverts, access issues and road safety. Consequently, if adopted, the first phase of the proposed measure may consist of a feasibility study to ascertain the potential for implementation, any constraints and associated costs.

The results of scenario testing (Section 3.4) assessed the potential impact of reducing HGV numbers on the Bonnygate by 20%. The results of the modelling indicated that such an intervention would not be sufficient to facilitate the necessary reductions in ambient NO_2 or PM_{10} concentrations within the Bonnygate to enable the annual mean objectives to be attained. However, the results indicate that a reduction in HGV would contribute significantly to the Council's efforts in working towards achieving the objectives.

The measure also includes proposals for Fife Council to continue working with SEStran on the development of the Regional Freight Quality Partnership, and also to investigate the possibility of establishing a local voluntary freight quality partnership. Both forms of freight quality partnership offer the potential to achieve a balance between improving the local economy and protecting the environment across Fife.

Measure	**Title**
4	Target reduced localised emissions from freight operations
Definition	Key Intervention
This measure incorporates options 2a and 3c from the provisional assessment. Sub-measures include: a. Undertake a feasibility study to assess potential and constraints of encouraging freight operators to utilise the South Road in preference to the Bonnygate/ Crossgate. b. Continue to meet with stakeholders through the Freight Forum to identify key needs, issues and areas for progress. c. Assess potential for the development of local freight quality partnership aimed at reducing emissions within AQMA and wider area.	Improve efficiency of transit through the AQMA and facilitate reduced emissions by encouraging HGV operators to use alternative route.
Responsible authority and other partners	Powers to be used
Fife Council Transportation Services and SEStran	Voluntary

Improved Phasing of new Traffic Signalling (Urban Traffic Management and Control) and changes to Pedestrian Crossings

Queuing of traffic can result in elevated concentrations of air pollution, creating localised hot spots. These may be reduced by the phasing of traffic signals to facilitate the smooth flow of traffic along a given street. Following traffic surveys undertaken in Cupar in 2004, Fife Council identified that traffic in Cupar had increased by an average of 1.5% per annum since 1989 and was predicted to continue to increase in future years as a result of further development and natural growth. As a consequence, it was recognised that the existing town centre traffic signals, operated via a MOVA system, had reached capacity and should be replaced.

During 2009 and 2010, the Council is implementing a SCOOT (Split Cycle Offset Optimisation Technique) compatible Urban Traffic Management and Control (UTMC) system in Cupar Town Centre with synchronised fixed time signals in order to address peak hour congestion and queuing at key junctions.

Furthermore, a queue management system is to be implemented on the Bonnygate in Cupar in order to reduce the emissions from road traffic in the narrowest 'canyon' section of the street. This action involves altering an existing pedestrian crossing located immediately to the west of Lady Wynd, stopping traffic before it enters the narrowest section of the Bonnygate. The signals at this crossing are to be re-timed and coordinated with the Crossgate signals so that eastbound traffic is stopped at the Lady Wynd crossing on every cycle and presented with a green light when progressing through the Crossgate junction.

It is anticipated that the successful implementation of this new UTMC system together with the changes to the pedestrian crossing should help to reduce congestion and associated emissions from road traffic sources in the Bonnygate AQMA. In particular, the planned relocation of traffic queues outwith the narrowest section of the street canyon will facilitate the dispersion of air pollutants in this area and bring about a reduction in concentrations of NO_2 and PM_{10} respectively.

Measure	Title
5	Implementation of new Urban Traffic Management and Control system and changes to pedestrian crossings

Definition	Key Intervention
This measure incorporates options 2d and 2e from the provisional assessment. Sub-measures include: a. Installation of new pedestrian crossing in Bonnygate linked to new traffic management system. b. Implementation of new UTMC in Cupar Town Centre with synchronised fixed time signals.	Improve efficiency of transit through Cupar Town Centre and reduce emissions from road traffic sources within the Bonnygate street canyon.
Responsible authority and other partners	**Powers to be used**
Fife Council (Transportation Services)	Voluntary

During the public consultation on the draft Action Plan, numerous comments were received regarding the removal of traffic lights or changes to traffic lights and pedestrian crossings within the Bonnygate. Transportation Services has brought forward plans to reconfigure the junctions at Crossgate, St Catherine Street and East Burnside to improve traffic flow. These proposals have been the subject to local consultation.

Parking Management and Control

Parking policies have an important role to play in reducing reliance on the car. It has been found that parking policy measures are likely to be relatively more important than many other traffic management measures in influencing mode choice. More specifically, the decision to use a car for the journey to work is greatly influenced by the availability and cost of parking. Hence parking policy has a major role to play in encouraging Fife Council's strategy of increasing opportunities for travel by other modes.

Consequently, measures addressing parking may contribute to various headings within the plan, including traffic management and encouraging behavioural change.

Fife Council's Parking Strategy (2003) aims to support policies to encourage travel by sustainable modes, whilst also support town centre development and economic growth. The Strategy seeks to maintain an adequate supply of short stay town centre parking in order to support economic growth and town centre vitality, whilst discouraging long stay commuter parking in favour of sustainable transport modes.

The Strategy outlines 22 measures that have been considered by the Council for the effective management of parking across Fife, including adequate service provision, length of stay restrictions, parking enforcement and parking charges. The applicability, effectiveness and limitations of different measures are discussed in detail.

Commercial vehicles that are illegally parked can also contribute to congestion and associated emissions of air pollutants. Fife Council has already introduced restrictions to commercial deliveries (loading/ unloading) within Cupar Town Centre. In order to ensure that parked commercial vehicles do not result in additional congestion and associated emissions of air pollutants, Fife Council will continue to review and enforce loading/ unloading restrictions with Cupar Town Centre (The Police will continue to provide enforcement), with a particular focus on the Bonnygate/ Crossgate area.

Measure	**Title**	
6	Parking Management and Control	
Definition		Key Intervention
a. Support the objectives of Fife Council's Parking Strategy to discourage long stay commuter parking. b. Length of stay restrictions and parking controls in town centres should be monitored and reviewed on a bi-annual basis. c. Continued enforcement of loading restrictions within the AQMA.		Reduce traffic by discouraging long stay parking and associated commuting movements. Minimise impacts of commercial deliveries on traffic movement.
Responsible authority and other partners		Powers to be used
Fife Council (Transportation Services) and Fife Constabulary		Statutory

Review and support proposed Infrastructure Changes that will contribute to improving Local Air Quality

Changes to infrastructure such as the construction of relief roads and changes to junctions can contribute to improving local air quality in certain circumstances where effectively planned and implemented. However, changes to infrastructure can also have negative wider environmental and social impacts that must be considered prior to implementation.

Fife Council's Structure Plan includes the potential construction of a relief road to the north of Cupar as a long-term measure, which will come forward as part of a new strategic land allocation. The development of the relief road offers the potential to reduce the flow of through-traffic flow and associated emissions in Cupar Town Centre. Furthermore, recent proposals relating to improvements of Cupar's St Catherine Street & The Cross Traffic & Streetscape are being considered by Fife Council. Various options of improvements are being considered which are likely to contribute to improving vehicle movements within Cupar Town Centre and also improving pedestrian accessibility.

These measures offer the potential to contribute to improving local air quality within Cupar Town Centre. Consequently, Fife Council's Action Plan Steering Group proposes to review relevant

information made available and consult with relevant Council Services in relation to the proposed measures and consider their potential impact (positive and/ or negative) upon local air quality within Cupar Town Centre and the wider area.

Measure	Title
7	Review and support proposed infrastructure changes that will contribute to delivering improvements in local air quality

Definition	Key Intervention
This measure incorporates options 2b and 2c from the provisional assessment. Sub-measures include: a. Review and support the proposed delivery of a new relief road which will come forward as part of a new strategic land allocation to the north of Cupar (Structure Plan)[4]. b. Review and support the proposed Cupar, St Catherine Street & The Cross Traffic & Streetscape Improvements that will contribute to improved vehicle movements and enhanced pedestrian accessibility within Cupar Town Centre.	Support Council proposals for infrastructure changes that will facilitate improvements in vehicle movements within Cupar. (Confirm that proposals will be subject to suitable environmental assessments).
Responsible authority and other partners	**Powers to be used**
Fife Council (Transportation Services)	Voluntary

During the public consultation process, a number of comments were made concerning the provision of a relief road to divert through traffic around Cupar. This has been included as a proposal in the St Andrews and East Fife Local Plan and the Fife Structure Plan. As a result land has been allocated for such a development. However it is important to understand that the realisation of such a measure is driven by cost and availability of resources.

[4] Proposal to require suitable assessment of potential environmental impacts.

5.2.3 Reduce the Emissions from Sources by Technical Means

Target Reductions in Emissions from Buses

Buses and coaches constitute an essential component of public transport in Cupar, representing an important alternative to cars. However, buses can make a significant contribution to emissions of NO_x and PM_{10}, and consequently it is important to assess what can be done to minimise emissions from fleet vehicles.

Voluntary Bus Quality Partnerships are informal agreements between relevant bus operators and local authorities that are not enshrined in legislation. Such partnerships are usually formed between one or more local authority and bus operator(s) but may also include large organisations or institutions (e.g. businesses). In these partnerships each party makes a commitment to improvements that will result in enhancements to bus services in a given area through measures such as improved infrastructure or better vehicles. Numerous authorities in Scotland have already developed voluntary agreements with bus operators.

Since 2000, Fife Council has operated a voluntary partnership with Stagecoach in Fife at the Ferrytoll Park & Ride. Through the partnership, the Council provides a 500 vehicle car park, CCTV system, and associated facilities. In return, Stagecoach provides a frequent service to Edinburgh and supervisory staff. In order to try and reduce emissions from buses operating within the Bonnygate AQMA, Fife Council proposes to investigate the potential for establishing a voluntary bus partnership with local operators.

Measure	Title
8	Target reductions in emissions from buses
Definition	Key Intervention
a. Liaise with local bus operators to establish the potential for developing a local bus quality partnership. b. Encourage bus companies to improve emission performance of fleet.	Target reduced emissions from buses operating within the Bonnygate AQMA.
Responsible authority and other partners	Powers to be used
Fife Council (Transportation Services)	Voluntary

Reduce Emissions from the Council Fleet and Contract Vehicles

Fife Council considers that it should lead by example and target reductions in emissions from their transport fleet activities as much as practicable.

Fife Council currently operates in the region of 1800 vehicles, comprising of:

- 130 Cars;
- 1120 Light commercial vehicles;
- 277 Heavy Goods Vehicles;
- 146 Passenger Vehicles;
- 127 items of heavy plant.

The Council has implemented numerous policies and programmes aimed at improving the energy efficiency of the Council fleet. These are divided into four categories:

Procurement of Lower Emission Vehicles

Fife Council undertakes an evaluation process, taking into consideration fuel consumption figures and CO_2 emissions when procuring new vehicles for the Council fleet. Wherever practicable, Fife

Council's Fleet Services aim to procure vehicles meeting the new emission limits established in the EU Directives. As a result of this replacement policy, during 2009 the Council procured seventeen refuse collection vehicles meeting the new Euro V standard, and before the end of 2011, all heavy goods vehicles operating within Fife Council's fleet should comply with Euro IV or V emission standards.

Fuel Monitoring Management

Fife Council's Fleet Services provide data relating to fuel consumption to all Services within Fife Council, enabling each service to monitor targeted reductions in fuel usage and emissions. In order to refine this process, Fleet Services are currently piloting a new vehicle telemetry system on 5 of its fleet vehicles. The system collects data on speed, odometer readings and fuel consumption from each vehicle and sends the data to a central server for collation.

Alternative Fuelled Vehicles

There are a number of alternative fuels and technologies available that offer the potential to lower emissions of air pollutants and CO_2 from road transport sources. Fife Council operates a policy of assessing and where appropriate, incorporating new alternative fuelled vehicles within its fleet.

In line with the requirements of the Renewable Transport Fuel Obligation[5], as of October 2008, all diesel utilised by Fife Council contains 5% bio diesel. Whilst bio-diesel is currently seen as the best alternative fuel approach, Fleet Services will continue to evaluate the use of other alternative fuels such as hybrid vehicles and electric vehicles. As part of this process, Fife Council is currently considering introducing gas powered refuse collection vehicles to be powered by biomethane. In addition, Fleet Services are undertaking trials of numerous electric powered cars and vans to test the effectiveness and reliability of these vehicles during operation.

Safe and Fuel Efficient Driving Training

The Council intends to train and re-train drivers to ensure that they drive in a more efficient way in a process linked to the introduction of the Driver CPC's (Certificate of Professional Competence). Fife Council's Fleet Services have received accreditation through the Joint Approvals Unit for Periodic Training (JAUPT), to undertake in-house training for the new Driver CPC.

The Vehicle Drivers (Certificates of Professional Competence) Regulations 2007 requires the continuous training of vocational bus, coach and lorry drivers with part of the syllabus covering Safe and Fuel Efficient Driving (SAFED). The Council have identified approximately 400 members of staff who require to complete the training. However, Fleet Services are in discussions with other services within the Council regarding the advantages of fuel-efficient driver training and exploring the potential for extending training to other services.

[5] Renewable Transport Fuel Obligation. The UK has since set a target of 5% of road fuel sold to come from biofuels by 2010

Measure	Title
9	Continue to target reductions in emissions from the Council fleet and contract vehicles.

Definition	Key Intervention
Continue to target reductions in emissions from the Council fleet and contract vehicles through: a. Continue periodic procurement of low emission vehicles; b. Monitor and assess viable options for alternative fuels, technologies and fuel additives; c. Undertake periodic training for vocational fleet drivers including Safe and Fuel Efficient Driving (SAFED); d. Assess potential for emissions standards for fleet contracts.	Target reduced emissions from Council fleet vehicles and Council contract fleet vehicles operating within the Cupar AQMA.
Responsible authority and other partners	**Powers to be used**
Fife Council (Fleet Services/ Procurement and Supplies)	Voluntary and Certificate of Professional Competence

5.2.4 Reduce emissions from sources by means of encouraging 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 'changing travel habits' as one of its key objectives.

By raising awareness of the Bonnygate AQMA and promoting options by which people can contribute to improving local air quality, it is hoped that long-term behavioural change can be encouraged, with associated long-term benefits for local air quality. 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, such as the Council's Climate Change Strategy. In order to achieve this, Fife Council is aiming to progress numerous actions outlined below.

AQMA Signs

In order to raise the awareness of the AQMA, the Council will consider erecting signs at various locations within Cupar Town Centre to alert drivers to the presence of the AQMA and encouraging behavioural change e.g. reduce vehicle idling. The content of the sign should incorporate the positive approach that the Council is taking to improving local air quality within Cupar.

Measure	Title
10	AQMA Awareness Signs

Definition	Key Intervention
a. To design and erect AQMA signs at various locations within Cupar Town Centre.	To increase awareness of the Bonnygate AQMA and encourage behavioural change.
Responsible authority and other partners	**Powers to be used**
Fife Council (Transportation Services)	Voluntary

Travel Plans for Large Institutions and Businesses

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]. Fife Council have been proactive in the development of Travel Plans, through the development of the 'Way Ahead to Work' Council Travel Plan, and by providing guidance and support to schools, businesses and organisations in relation to the design and implementation of successful Travel Plans. A summary of some of the activities undertaken by Fife Council in relation to travel plans is presented below.

School Travel Plans

School Travel Plans represent a commitment from schools to develop a package of measures aimed at encouraging healthier, safer and more environmentally friendly methods of travelling to and from school by parents, pupils and staff.

Fife Council employs School Travel Plan Coordinators to assist teachers, pupils and parents in the development and implementation of Travel Plans, together with promoting health and environmental benefits of alternative travel choices. The Travel Coordinators provide guidance, and where appropriate, help establish a link between schools and other stakeholders. The Plans incorporate established programmes such as 'Safer Routes to School' and 'Active School Travel' but also aim to initiate a change in transport culture through education and encouraging change through initiatives like walking buses. Fife Council produced Primary and Secondary School Travel Plan resource packs which were distributed to all schools in Fife. Also a wide variety of publications aimed at encouraging the establishment of School Travel Plans have been made available through the Council website at www.fifedirect.org.uk/schooltravelplans.

Fife Council Travel Plan

In order to encourage a reduction in car dependency for commuting to and from work and whilst at work, Fife Council has developed a Council Travel Plan 'Way Ahead to Work' (2000). The Plan was based on a Council Travel Survey undertaken in 1999 and identified the following Objectives:

- A reduction in the number of single occupancy car journeys to work
- An increase in the use of more sustainable forms of travel to work, and,
- A reduction in the amount of travel undertaken at work.

In order to achieve this, the plan outlined numerous actions covering walking and cycling, public transport, car use and reducing the need to travel. This overall plan has been supplemented by the development of framework travel plans for Cupar and Dunfermline, of which the measures proposed within the plan for Cupar are of particular interest to this Action Plan.

Measures promoted through the Fife Council Travel Plan include:

- Carshare2work scheme with designated parking;
- The development and implementation of Car Park Management Guidelines;
- The support and promotion of cycling and walking;
- Promotion of public transport;
- Reducing the need of staff to travel (e.g. flexible working).

Fife Council's travel plan is widening staff travel options.

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

Encouraging External Organisations to Develop Travel Plans

Fife Council provides guidance and support to local businesses and organisations in the design of successful Travel Plans.

Measure	Title
11	Travel Plans for Large Institutions and Businesses

Definition	Key Intervention
To encourage and assist large organisations to develop and implement travel plans, including: a. Continue the implementation of Fife Council's travel plan; b. Continue to support the implementation of School travel plans; c. Work with local businesses/ organisations to encourage the development and implementation of travel plans.	To encourage a shift to more sustainable forms of travel, or reducing the need for travel.
Responsible authority and other partners	**Powers to be used**
Fife Council	Voluntary

Promotion of Cycling and Walking

Promoting cycling and walking represents a key objective of Fife Council's Local Transport Strategy and also constitutes important aspects of the Fife Access Strategy. Fife Council aims to encourage members of the public to consider walking or cycling instead of using their car, and as a consequence, promote healthy lifestyle choices and environmental improvement by reducing the number of cars on the road.

Fife's vision is to develop cycling into a realistic choice as a method of transport and Fife as a cycle friendly leisure location. As part of this, the Local Transport Strategy (LTS) includes numerous short term objectives aimed at achieving this goal. In addition, the Council has developed a Cycling Strategy (2008-2013) to supporting the objectives of the Access Strategy and Local Transport Strategy (2006-2026). Fife attracted Millennium Funding to put in place over 300 miles of off and on road cycle network. In order to promote cycling, Fife Council has produced a series of maps to help cyclists navigate the 24 circular routes and five town networks. Each map shows colour-coded routes and gives route advice and recommends things to look out for and attractions to visit along the way.

Measure	Title
12	Promotion of Cycling and Walking

Definition	Key Intervention
To encourage members of the community to adopt cycling and walking as alternatives to using private vehicles. a. Ensure cycle networks and facilities are provided, as a matter of course, within existing and new networks and developments. b. To improve integration between cycling, walking and public transport. c. Increase cycling trips to employment, education and leisure facilities. d. Improve pedestrian facilities such as new footpaths and crossings.	To encourage a shift away from the use of private motor vehicles for travelling to more sustainable forms of transport, or reducing the need for travel.
Responsible authority and other partners	**Powers to be used**
Fife Council (Transportation Services) and SEStran	Statutory

Provision of Information relating to Air Quality and Travel options

Fife Council aims to provide information and undertake marketing initiatives targeting increasing the Public's awareness of air pollution issues in Fife and to encourage members of the public to participate in improving the situation. This measure is intrinsically linked to the promotion of cycling and walking and the development of travel plans but focuses on the provision of information relating to air quality within Fife and public transport.

Public Transport Information

Public Transport is a key priority for Fife Council and our Transportation Services work closely with the commercial operators of taxis, buses and trains. In order to encourage members of the public to utilise public transport instead of private vehicles, Fife Council provides information on public transport services operating within Fife through the Council website, and links to external organisations such as Traveline Scotland. The Council in partnership with Traveline also operates a mobile phone texting service for information on bus times for any bus stop (charged service). Fife Council is looking to enhance the promotion of travel choices and have identified numerous potential approaches.

Measure	Title
13	Promoting Travel Choices

Definition	Key Intervention
To increase awareness of travel choice options, Fife Council propose to: a. Produce a Travel Choices map of Cupar. b. A Mass Marketing Campaign for Cupar to raise awareness about the project and encourage people to take sustainable modes of travel. c. Production of a community booklet. d. Production of a residential travel pack. e. Undertaking individualised Travel Marketing at households throughout Cupar. f. Undertaking individualised Travel Marketing at businesses throughout Cupar. g. New housing developments in Cupar to be designed with the Scottish Government's travel hierarchy in mind and new residential developments set up Car Clubs for use by residents. h. Residential Travel Packs, to be issued to all 'new built' homes identified in the local plan through the planning process. i. Setting up a car club so that Fife Council pool cars are able to be used by the community for hire at evenings and weekends. j. Continue to provide information about public transport services through the Council website.	To increase awareness of travel choices and encourage changes in behaviour that will contribute to improving local air quality.
Responsible authority and other partners	**Powers to be used**
Fife Council (Environmental Services and Transportation Services)	Voluntary

Provision of Information relating to Air Quality

Fife Council operates an extensive air quality monitoring network, with data from these sites made available to the public through the Scottish Air Quality Database and website. In addition, the most recent air quality management reports prepared by the Council are available through the Council website.

In order to continue to raise the profile of Air Quality Management across Fife, and in particular the Bonnygate AQMA, Fife Council propose to undertake a public awareness exercise aimed at improving awareness of local air quality issues and encouraging members of the public to participate in improving local air quality.

Measure	Title
14	Provision of Information relating to Air Quality

Definition	Key Intervention
To increase awareness of local air quality issues and public transport information. a. Continue to make information relating to local air quality management available through the Council website. b. Undertake a publicity campaign to raise awareness of the Bonnygate AQMA.	To increase awareness of local air quality issues and encourage changes in behaviour that will contribute to improving local air quality.
Responsible authority and other partners	**Powers to be used**
Fife Council (Environmental Services and Transportation Services)	Voluntary

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. 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:

- Potential air quality impact;
- Implementation costs;
- Cost-effectiveness;
- Potential co-environmental benefits, risk factors, social impacts and economic impacts;
- Feasibility and Acceptability.

The following paragraphs outline how the assessment has been undertaken.

6.2 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%.

6.3 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 Fife Council. These cost bandings may be subject to revision depending on comments received from those consulted.

6.4 Cost-Effectiveness

The effectiveness of each measure in improving air quality is compared to the implementation costs in the following 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:

- 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;
- If the product is **medium** (between 5-9) then the measure is in the **medium** range of cost-effectiveness;
- 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.

6.5 Potential Co-environmental Benefits

In this assessment other environmental benefits are highlighted.

- 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.
- Noise.

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

6.6 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:

- Relocate emissions and hence lead to worsening air quality elsewhere;
- Require a change in land use;
- 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.

6.7 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:

- Provide health benefits in terms of lower exposure to pollutants or increased mobility;
- Increase road safety;
- Improve accessibility.

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

6.8 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:

- Influence sustainable development or accessibility in Cupar;
- Reduce or increase overall travel time;
- Place additional requirements on operators.

6.9 Feasibility and Acceptability

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

- 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;
- Secured funding for the measure or a straightforward route for securing funding;
- Characterised the potential positive and negative impacts of the measure with sufficient evidence or confidence to make a decision to implement the measure.

The table 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.

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:

- 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;
- 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 is presented in Table 6.1 below, with further details presented in Appendix 5.

Table 6.1 Summary Assessment of Proposed Measures									
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									
Improving links with Local Transport Strategy/ Area Transport Plan				GHG - positive Other AQ pollutants – positive	Care to avoid relocating pollution	None Identified	May influence development and associated aims.	Fife Council Transportation Services	Short-term/ Acceptable
Improving Air Quality links with Local Planning and Development Framework				GHG - positive Other AQ - positive	Care to avoid relocating pollution	None Identified	May influence development and associated aims.	Fife Council Development Services and Environmental Services	Medium-term/ Acceptable
Integrate AQ with other Council strategies				GHG - positive. Other AQ-positive		None Identified		Fife Council Environmental Services	Medium-term/ Acceptable
Measures aimed at optimising how road traffic sources transit AQMA									
Target reduced localised emissions from freight operations (6)	M-L (FA data)	M-H	Medium	GHG – neutral/ positive Other AQ – neutral/ positive	Potential to relocate proportion of pollution. Road safety issues	Potential to relocate proportion of pollution. Road safety issues. Noise.	None identified	Fife Council Transportation Services	Feasible Medium- term (partially dependent upon findings of feasibility study)
Implementation of new Urban Traffic Management and Control system and changes to pedestrian crossings (9)	M-L	H*	Medium-High	Other AQ – positive Noise – positive GHG – positive	Relocate a proportion of emissions.	Improved road safety.	None identified	Fife Council Transportation Services	Short-term/ Acceptable
Parking Management and Control (3)	S	M*	Low	Other AQ – positive.	None Identified	None identified	None identified	Fife Council Transportation Services	Short-term/ Acceptable

Table 6.1 Summary Assessment of Proposed Measures									
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 optimising how road traffic sources transit AQMA (continued)									
Review and support proposed infrastructure changes that will contribute to delivering improvements in local air quality (3)	M-L	VH	Low	Other AQ (local) – positive.	Relocate a proportion of emissions.	Relocation of pollution. Noise. Positive impact on economic development. Potential negative impact on housing/ lifestyles of those impacted by relief road.	Potential positive impact on economic development.	Fife Council	Medium-Long-term
Reduce the emissions from sources by technical means									
Target reductions in emissions from buses (2)	S	H	Low	GHG- positive Other AQ – positive	Relocation of pollution to other areas.		Potential impact on Operators	Fife Council Transportation Services	Medium Term/ Acceptable
Target reductions in emissions from the Council fleet and contract vehicles (including driver training). (2)	S	H*	Low	GHG- positive Other AQ – positive Noise - positive	None identified	Neutral Positive impact of training.	Neutral	Fife Council Procurement and Supplies	Short-Medium term/ Acceptable
Reduce emissions from sources by means of encouraging better travel choices/ behavioural change									
AQMA Awareness Signs (4)	S	L	Medium	GHG - positive Other AQ – positive	Potential hazard – distract drivers.	None identified	May have a positive or negative impact on public perception	Fife Council Transportation Services	Short-term/ Acceptable
Travel Plans for Large Institutions and Businesses (6)	M	M*	Medium	GHG - positive Other AQ – positive Noise - positive	None identified	Health benefits	Potential financial benefits to employees	Fife Council Transportation Services	Short-term/ Acceptable

Table 6.1 Summary Assessment of Proposed Measures									
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**
Reduce emissions from sources by means of encouraging better travel choices/ behavioural change (continued)									
Promotion of Cycling and Walking (3)	S	M*	Low	GHG - positive Other AQ – positive Noise - positive	Potential road safety issues.	None	Potential benefits	Fife Council Transportation Services	Short-term/ Acceptable
Promotion of Travel Choices (6)	M	M	Medium	GHG - positive Other AQ – positive Noise - positive				Fife Council Environmental Services and Transportation Services	Short-Medium-term/ Acceptable
Provision of Information relating to Air Quality (4)	S	L*	Medium	GHG - positive Other AQ – positive Noise - positive		Access to information.		Fife Council Environmental Services and Transportation Services	Short-term/ Acceptable

*Implemented through existing finance stream

7. Action Plan

Fife Council has already introduced several measures that will contribute to improving air quality within the Bonnygate AQMA in future years. They are now seeking to implement further measures to bring about a greater improvement in local air quality and make progress towards meeting all of the respective air quality strategy objectives. This Chapter presents the measures that have been identified as being the most appropriate in addressing the local air quality problem identified within the Bonnygate 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:

1. Strategic options aimed at integrating air quality into all relevant areas of decision making within Fife Council.
2. Specific options aimed at reducing congestion within the Bonnygate AQMA, reducing emissions from principal sources, promoting greater awareness of local air quality and encouraging more sustainable travel choices within Fife in general.

7.1 Prioritisation of Measures

Based on the assessment undertaken for each measure, a prioritised list of options has been produced. It is potentially complex to decide on priorities from such a wide range of criteria. However, for the purpose of the AQAP we have put particular weight on those options, which are supported by members of the Steering Group, and which provide good potential AQ benefits (with appropriate consideration of cost-effectiveness and the wider environmental benefits or risks). Due to their overarching nature, it is anticipated that the strategic measures will provide some of the frameworks by which measures 4-14 will be successfully implemented. Therefore they are not assessed in the same way and are regarded as overall priorities for implementation.

To enable the prioritisation of measures, the score (1-3) assigned to the air quality impact has been multiplied by the score assigned to the anticipated cost implications (1-5). This approach provides a basic cost-effectiveness analysis which together with consideration of other factors and timescales has enabled the prioritisation of the measure included within the plan. This has identified the following ranking of options:

No	Measure	Timescale
	Strategic Measures	
1	Improving links with Local Transport Strategy/ Area Transport Plan	Ongoing
2	Improving Air Quality links with Local Planning and Development Framework	Ongoing
3	Integrate AQ with other Council Strategies	Ongoing
	Direct measures	
4	Implementation of new Urban Traffic Management and Control system and changes to pedestrian crossings	Short-Term
5	Travel Plans for Large Institutions and Businesses	Short-Medium Term
6	Promotion of Travel Choices	Short-Medium Term
7	Target reduced localised emissions from freight operations.	Medium-Term
8	AQMA Awareness Signs	Short-Term
9	Provision of Information relating to Air Quality	Short-Term
10	Parking Management and Control	Short-Term
11	Promotion of Cycling and Walking	Short-Term
12	Review and support proposed infrastructure changes that will contribute to delivering improvements in local air quality	Medium-Long Term
13	Target reductions in emissions from the Council fleet and contract vehicles (including driver training)	Short-Term
14	Target reductions in emissions from buses	Short-Term

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. local transport strategy) 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 the progress of the Action Plan.

The final action plan will have to be approved by Fife Council and by the Scottish Government before it can become a fully adopted plan. Once it has been adopted, Fife 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 Fife Council will:

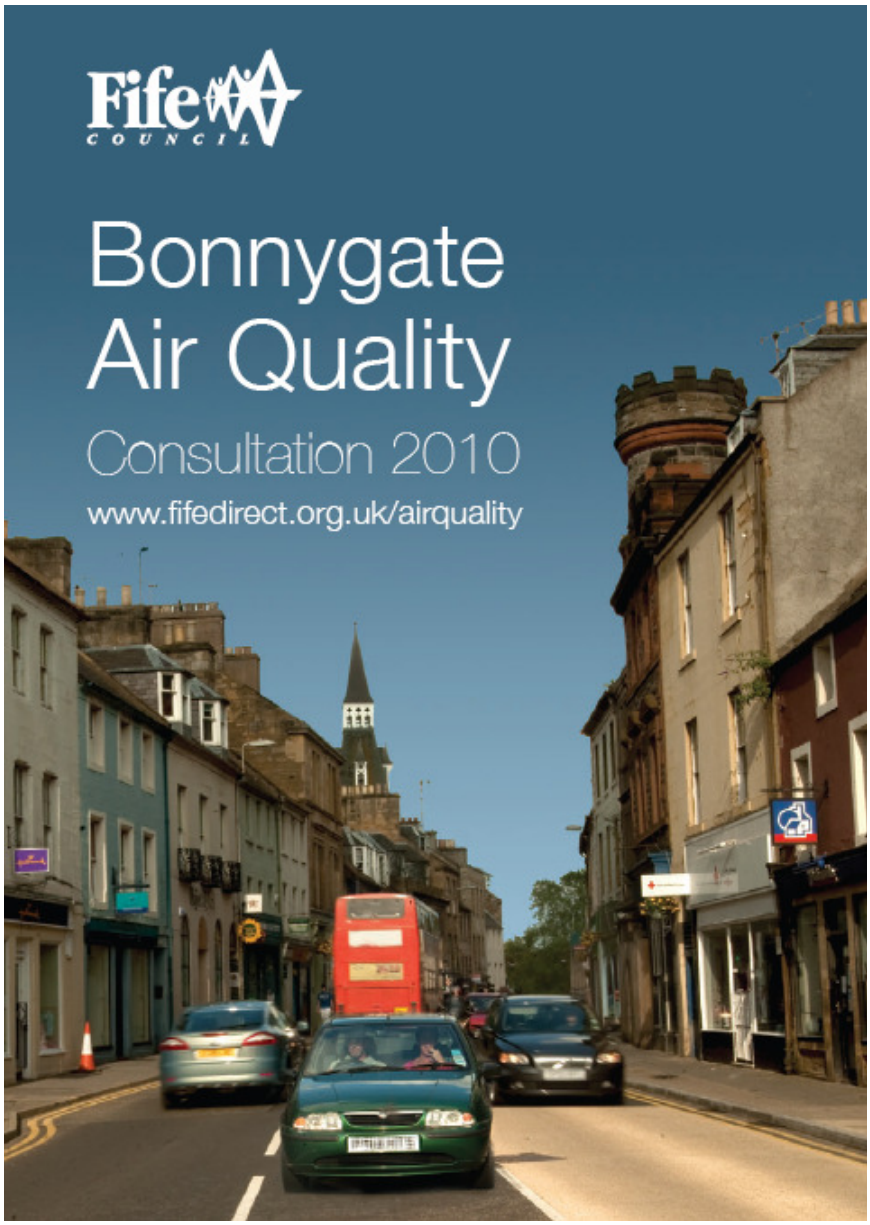
- Continue to monitor and review air quality to assess whether the AQMA should be revised or revoked;
- Produce an annual progress report that sets out new information on air quality in Fife, which will also report on progress made with implementing the action plan;
- Continue to work closely with other 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.

8. Consultation on the Draft Air Quality Action Plan

During the period of 10th May to the 2nd July 2010, Fife Council undertook an extensive consultation process where complete and summarised copies of the draft Air Quality Action Plan were distributed to statutory consultees, external organisations and the general public. In addition, consultation leaflets (Figure 8.1) with an associated questionnaire were made available at www.fifedirect.org.uk and at various locations throughout Cupar, including public buildings and the Council's offices.

In order to increase public awareness of the draft Air Quality Action Plan, the Council publicised the Plan through the local press, www.fifedirect.org.uk and through displays at various locations throughout Cupar town centre. In addition, the Council hosted a series of workshops on the 24th May and 14th June to gain further feedback on the plan from members of the business community and with general public. The workshops were attended by individuals with an interest in air quality in Cupar, including representatives from SEPA and neighbouring authorities.

Figure 8.1 Consultation Leaflet



8.1 Draft Air Quality Action Plan: Public Consultation Summary

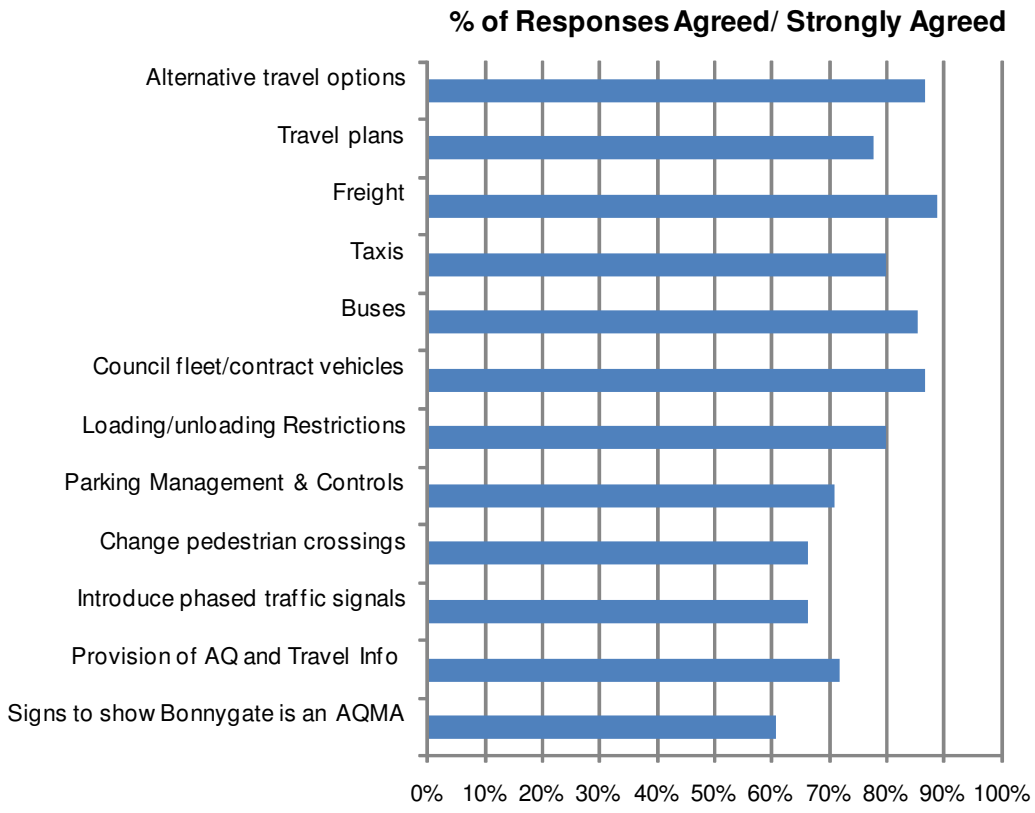
The following sections summarise the public consultation process undertaken by Fife Council in relation to the draft Air Quality Action Plan and the responses received from the general public and representatives from various organisations during the official 6-week consultation period.

8.1.1 Consultation Questionnaire

The leaflet distributed during the consultation period outlined the main air quality problems in Cupar and the measures proposed by Fife Council in the AQAP aimed at addressing these. The associated questionnaire sought opinions on the measures proposed within the Action Plan and the opportunity to make further comments. Formal responses from relevant organisations/ agencies (i.e. the Scottish Government, SEPA, Scottish Natural Heritage, Historic Scotland and the Road Haulage Association) on the draft Action Plan have all been positive and these will be accounted for in progressing the action plan measures.

A summary of the responses to the AQAP questionnaire are presented in Figure 8.2.

Figure 8.2 Percentage of positive responses to draft Air Quality Action Plan measures received during consultation process



Overall, the results of the consultation process indicate general support for the majority of proposed action plan measures, with the highest percentage of agreement being for freight related measures (88.8%) and the lowest being for AQMA signs (60.7%). Obviously, continuing dialogue with the public and businesses will be a key component in considering such measures in greater detail in the future.

8.1.2 Comments and Suggestions

In addition to the measures proposed by Fife Council, the Air Quality Action Plan Questionnaire asked for additional comments and suggestions. Due to the diversity of comments made it is not possible to discuss all of these within the report. However, several comments were submitted on related topics. These including statements in support of the development of a relief road to reduce the need for traffic to pass through the Bonnygate, and the need to improve traffic flow through the town centre by improving traffic management and pedestrian crossing provisions. Statements were also submitted in support of measures to promote provisions for pedestrians and cyclists and the need to reduce the impact from HGVs and buses. All comments and suggestions received were considered during finalisation of the Action Plan.

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Appendices

Appendix 1: Fife Council (Bonnygate) Air Quality Management Order
Appendix 2: Source Apportionment Tables
Appendix 3: Modelling contour plots from Scenario analyses – Traffic Queue Relocation
Appendix 4: Initial Consideration of Options by Steering Group
Appendix 5: Details of the Action Plan measures

Appendix 1: Fife Council (Bonnygate) Air Quality Management Area Order No. 1, 2008

ENVIRONMENT ACT 1995 PART IV
SECTION 83(1)

FIFE COUNCIL (BONNYGATE) AIR QUALITY MANAGEMENT AREA ORDER 2008

The Fife Council
Planning & Environment Team
Legal Services
Fife House
North Street
Glenrothes KY7 5LT

ENVIRONMENT ACT 1995 PART IV SECTION 83(1)

FIFE COUNCIL (BONNYGATE) AIR QUALITY MANAGEMENT AREA ORDER 2008

The Fife Council, in exercise of the powers conferred upon it by Section 83(1) of the Environment Act 1995, hereby makes the following order.

This Order may be referred to as the Fife Council (Bonnygate) Air Quality Management Area Order 2008 and shall come into effect on 15th December 2008.

The area within the red outline shown on the attached map is to be designated as an air quality management area ("the designated area").

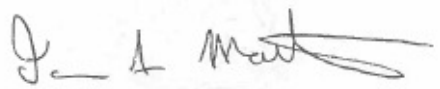
The designated area incorporates an area within this boundary line:- from the point where South Road (A914) crosses the railway line follow the railway line north-east to a point immediately to the south-southeast of the junction of Pitscottie Road with Coal Road; follow Pitscottie Road northwest to its junction with East Road; follow East Road west to its junction with Castlebank Road; follow Castlebank Road north to its junction with Castlefield; follow Castlefield west along the northern boundary of The Fluthers car park and continuing south along the western boundary of The Fluthers car park to join East Burnside; follow East Burnside west and continuing west along Moathill Road to the junction with North Union Street; follow North Union Street south to Bonnygate; follow Bonnygate east to its junction with South Union Street; follow South Union Street south to join Kirkgate; follow Kirkgate east to its junction with Short Lane; follow Short Lane east to its junction with Crossgate; follow Crossgate south to its junction with South Bridge; follow South Bridge southeast, continuing into South Road to the starting point where South Road crosses the railway line.

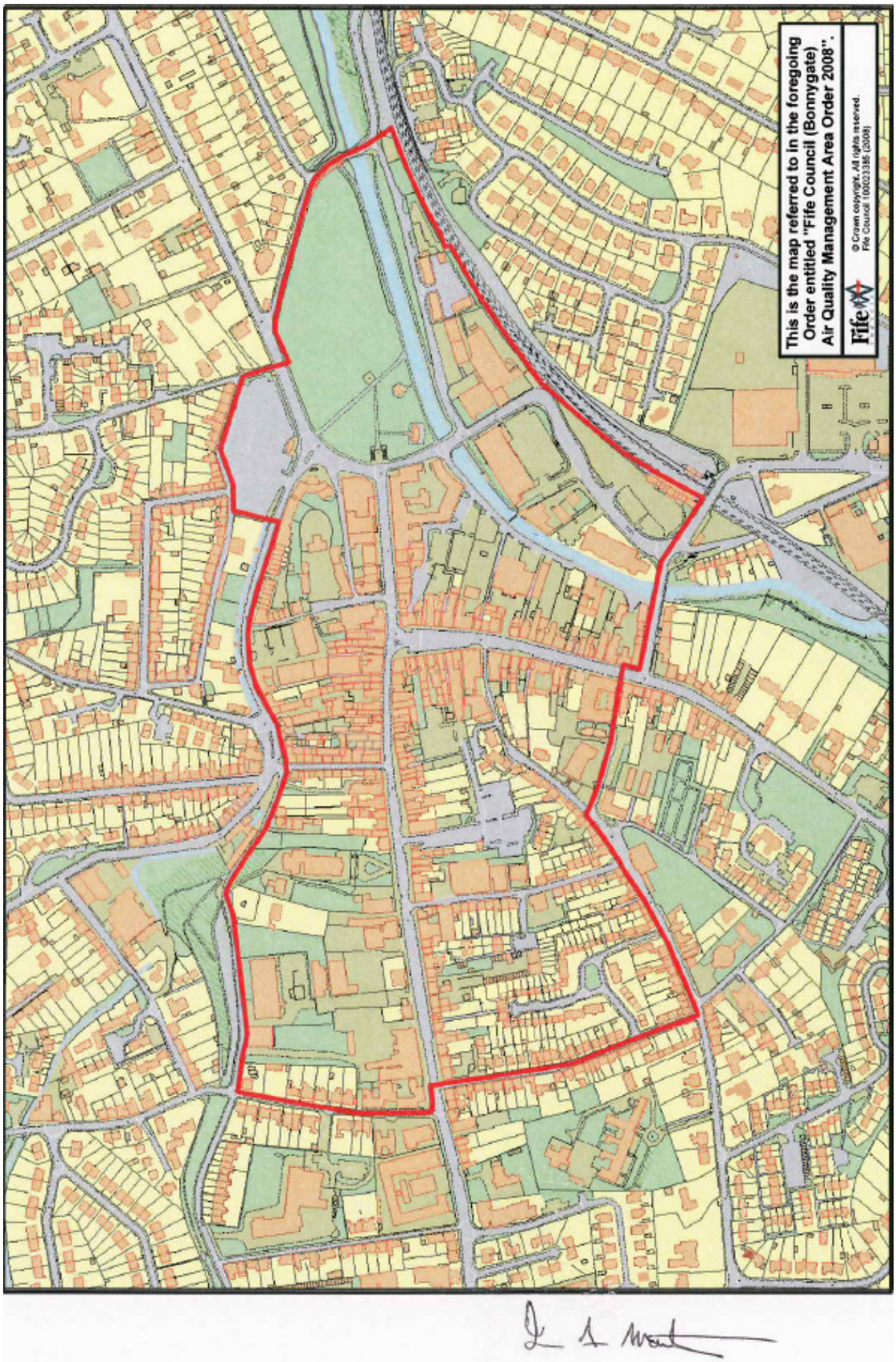
The Order and map may be viewed at the Fife Council's offices at County Buildings, St Catherine Street, Cupar, the Town House, Wemyssfield, Kirkcaldy and New City House, 1 Edgar Street, Dunfermline, in all libraries in North East Fife and on the Fife Council web-site.

This area is designated in relation to a likely breach of the nitrogen dioxide and particulate matter annual mean objectives as specified in the Air Quality (Scotland) Regulations 2000, as amended.

This Order shall remain in force until it is varied or revoked by a subsequent order.

This Order together with the attached map are sealed with the Common Seal of The Fife Council and subscribed for them and on their behalf by Iain Alexander Matheson their Chief Legal Officer and Proper Officer at Glenrothes on the Tenth day of November Two thousand and eight.




This is the map referred to in the foregoing Order entitled "Fife Council (Bonnygate) Air Quality Management Area Order 2008".
Fife
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AEA

Appendix 2: Source Apportionment Tables

Results of NOx source apportionment exercise for Bonnygate (Further Assessment)

Apportionment of oxides of nitrogen concentrations by background, local roads, stationary vehicles

Receptor	Contribution to oxides of nitrogen concentration, µg m^{-3}				
	Total	Background	Local Roads	Moving Vehicles	Stationary Vehicles
Bonnygate, Cupar Bonnygate B1	68	20	48	37	11
Bonnygate, Cupar Bonnygate B2	171	20	151	110	41
Bonnygate, Cupar Bonnygate B3	148	20	128	104	24
Bonnygate, Cupar Bonnygate B4	164	20	144	114	30
Bonnygate West, Cupar Bonnygate B6	57	20	37	29	8

Apportionment of oxides of nitrogen concentrations by vehicle type

Receptor	Contribution to oxides of nitrogen concentration, µg m^{-3}				
	Total	Background	LDV	HGV	Buses
Bonnygate B1	68	20	22	16	10
Bonnygate B2	171	20	78	82	11
Bonnygate B3	148	20	52	53	23
Bonnygate B4	164	20	56	44	24
Bonnygate B6	57	20	19	8	10

Results of PM_{10} source apportionment exercise for Bonnygate (Further Assessment)

Apportionment of PM_{10} concentrations by background, local roads, stationary vehicles

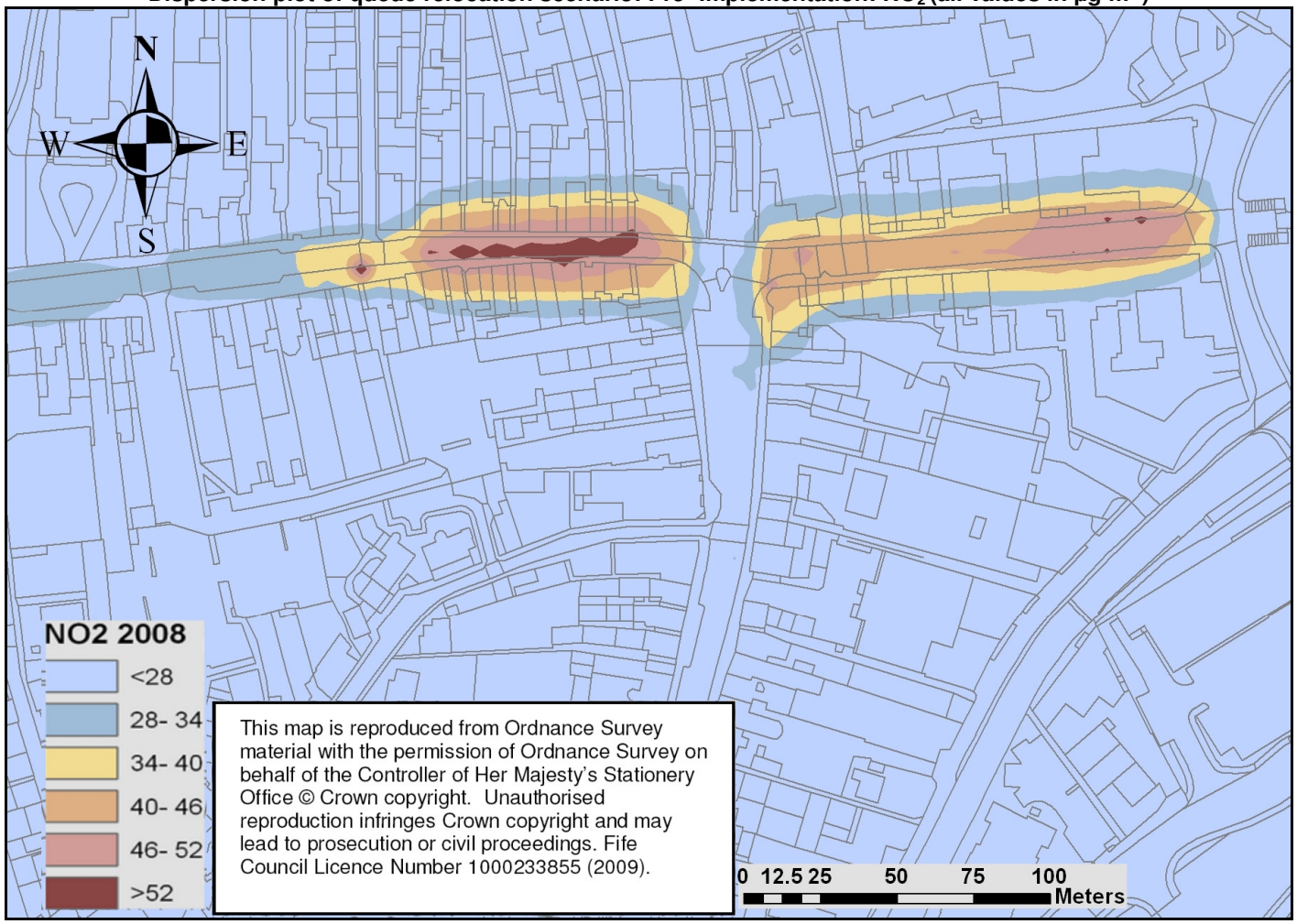
Receptor	Contribution to PM_{10} concentration, µg m^{-3}				
	Total	Background	Local Roads	Moving Vehicles	Stationary Vehicles
Bonnygate B1	**15**	10	5	2	3
Bonnygate B2	**22**	10	12	8	4
Bonnygate B3	**19**	10	9	6	3
Bonnygate B4	**20**	10	10	6	4
Bonnygate B6	**14**	10	4	2	2

Apportionment of PM_{10} concentrations by vehicle type

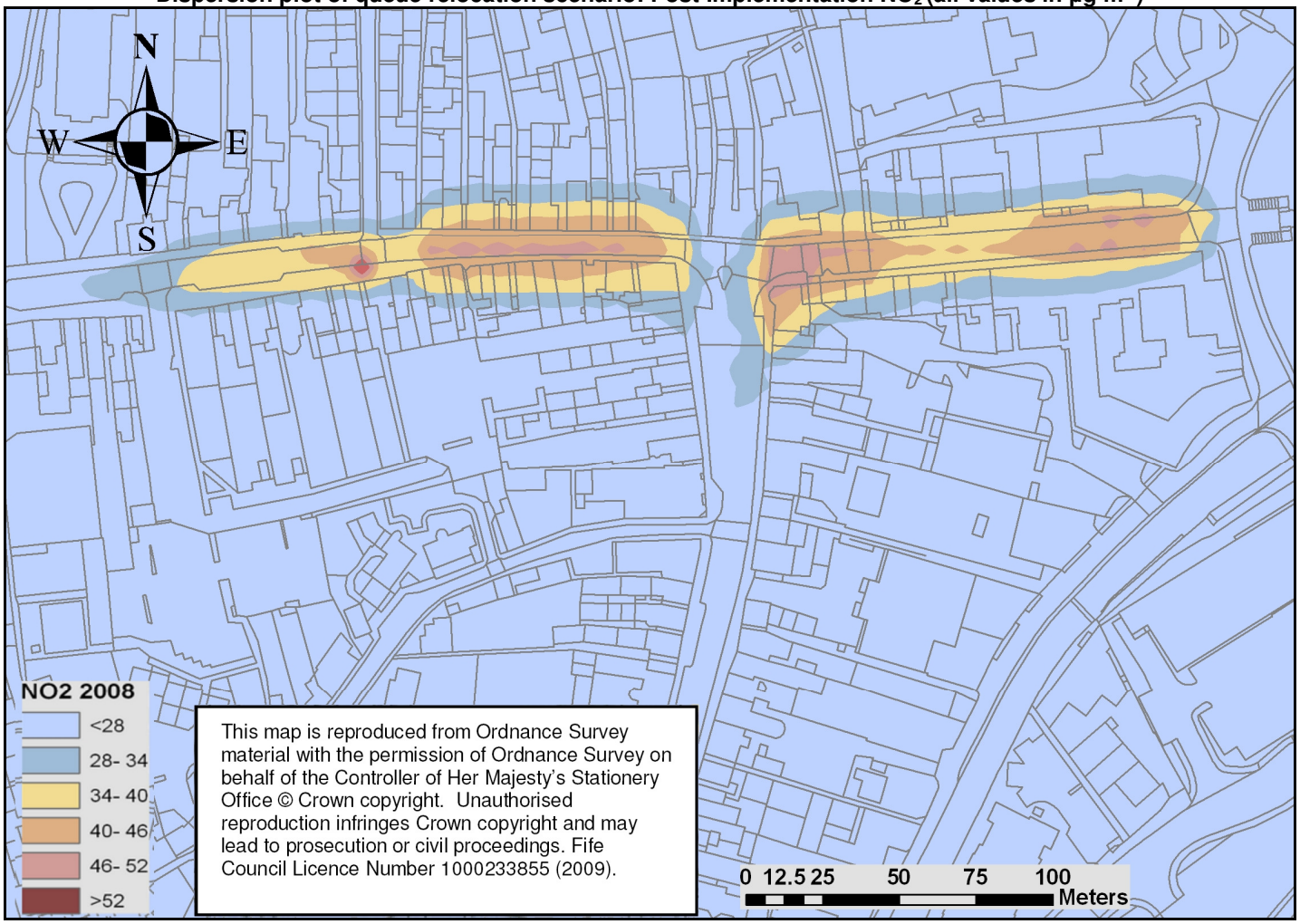
Receptor	Contribution to PM_{10} concentration, µg m^{-3}				
	Total	Background	LDV	HGV	Buses
Bonnygate B1	**15**	10	2	2	1
Bonnygate B2	**22**	10	5	5	2
Bonnygate B3	**19**	10	4	3	2
Bonnygate B4	**20**	10	4	4	2
Bonnygate B6	**14**	10	2	1	1

Appendix 3: Modelling contour plots from Scenario analyses – Traffic Queue Relocation

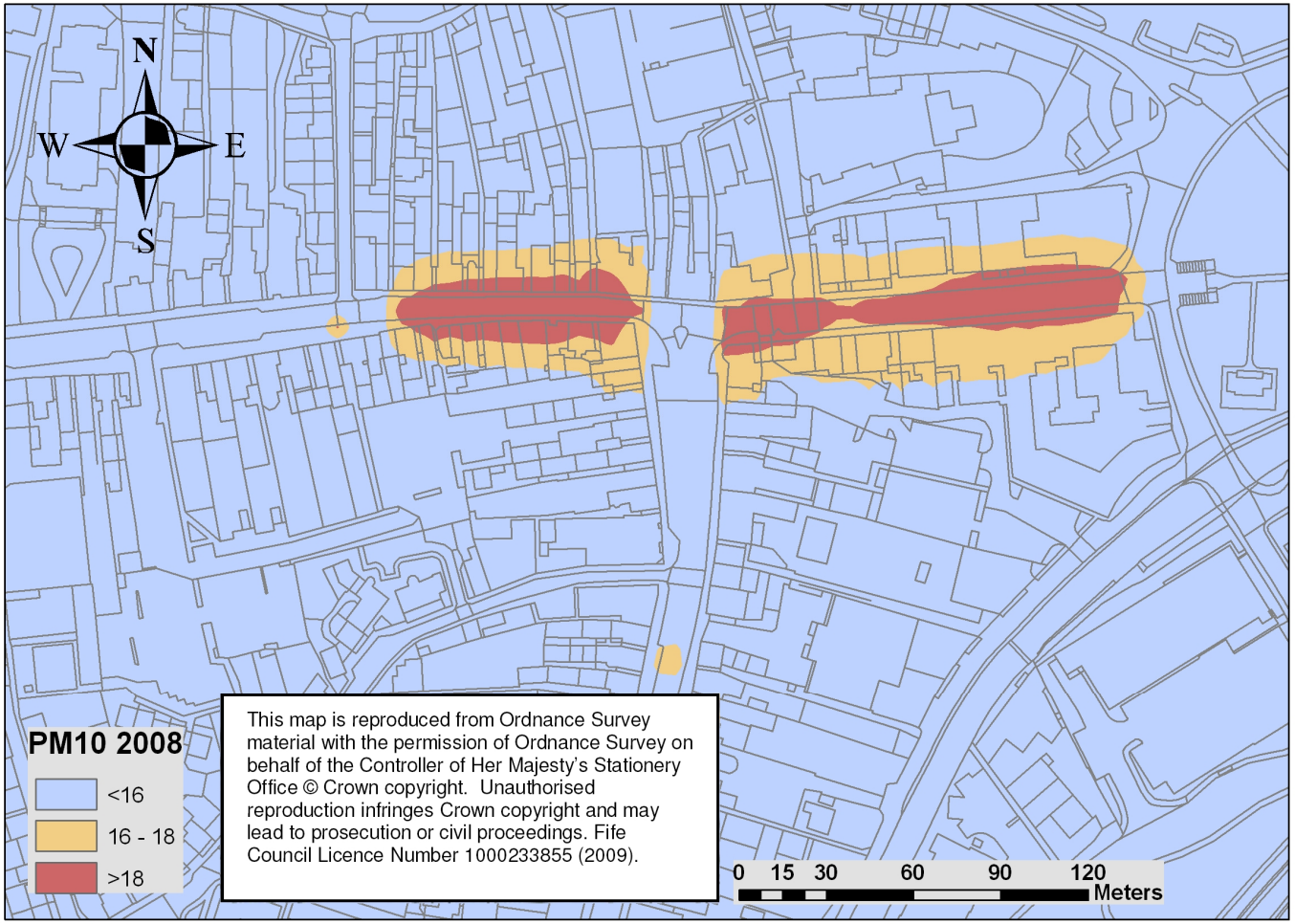
Dispersion plot of queue relocation scenario: Pre- Implementation: NO_2 (all values in µg m^{-3})



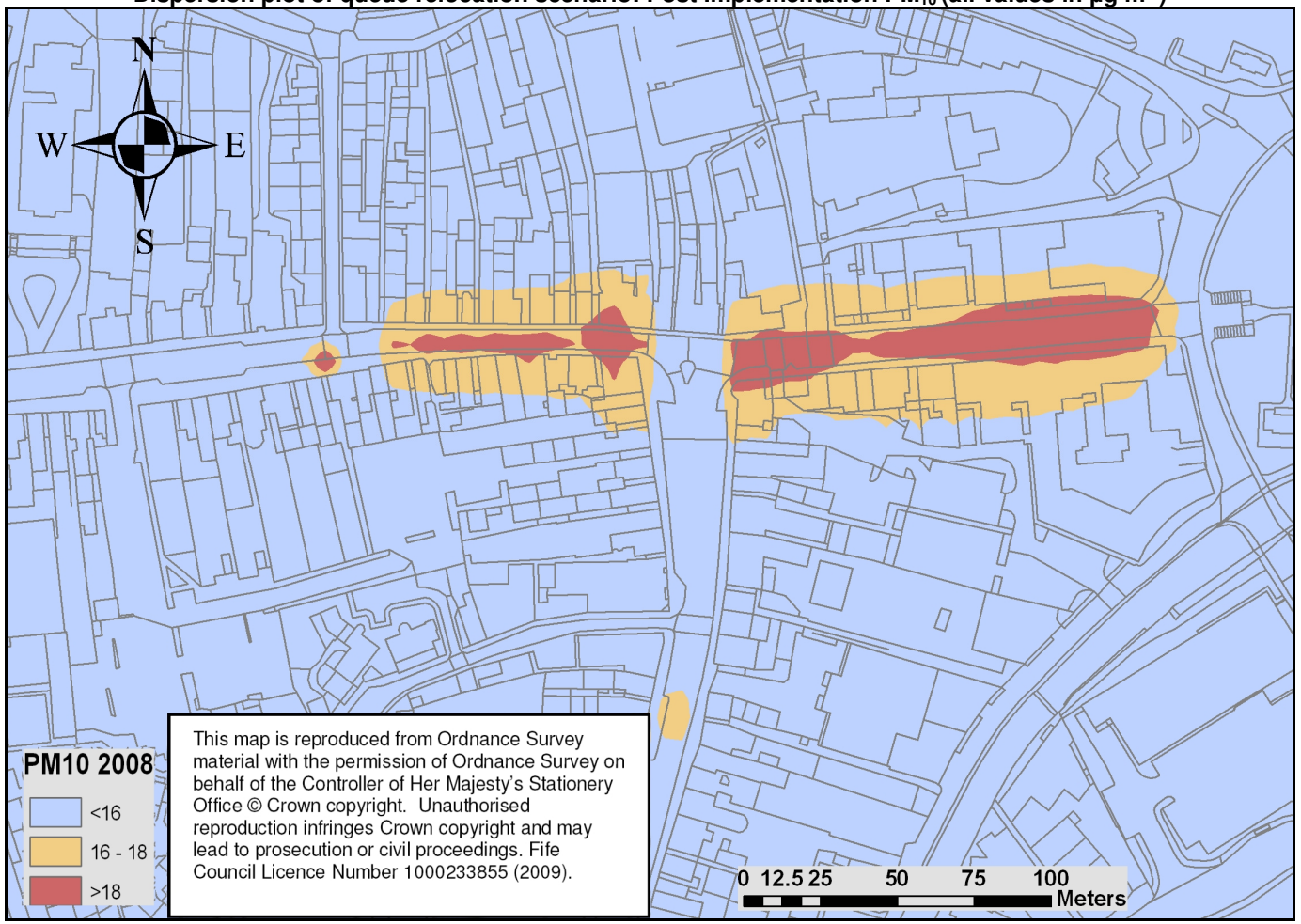
Dispersion plot of queue relocation scenario: Post Implementation NO_2 (all values in µg m^{-3})



Dispersion plot of queue relocation scenario: Pre-Implementation PM_{10} (all values in µg m^{-3})



Dispersion plot of queue relocation scenario: Post Implementation PM_{10} (all values in µg m^{-3})



Appendix 4: Initial Consideration of Options by Steering Group

Initial assessment of Action Plan options			
Options	Steering group's comments	Consultant's comments	Conclusion
1 Strategic Actions			
Improving links with Local Transport Strategy	Air Quality Management Area already included in LTS. AQAP to be included in future versions of Strategy.		To be included in draft Plan.
Improving links with Local Planning and Development framework	Air Quality is already a consideration in development planning process. AQAP could be included in future versions of Local Plan.		To be included in draft Plan.
Air Quality Guidance note for Developers	Note currently being developed and will be made available to developers during the submission of planning applications.		To be included in draft Plan.
Improved signage – AQMA signs			To be included in draft Plan.
Road user charging and workplace levy	Not feasible		To be removed from further consideration
2.Move receptors away from AQMA			
Remove homes and businesses	Option is not feasible or practicable.	Option is not sustainable in the long term, as does nothing to reduce emissions.	Removed from further consideration.
3.Move sources away from AQMA			
Consideration encouraging freight operators to take alternative route (via South Road)*	Potential issues regarding access, culverts and overhead lines.	– HGVs are estimated to contributing 30% and 16% of total NOx and PM_{10} emission. – These measures	Include within draft Plan.

Initial assessment of Action Plan options			
Options	Steering group's comments	Consultant's comments	Conclusion
Feasibility study – assess potential for encouraging HGV to use south road		potentially have a significant role to play. Fife Council may wish to consider undertaking a feasibility study to assess what potential exists for implementing these measures. This may include not only an assessment of the capacity of the south road to sustain such vehicles (limitations and additional risks), but also liaison with local businesses and local community. Links with proposed measure to develop local freight partnership – see below.	
Relief Road	Relief included in Local Plan, but long-term and would require external funding. Construction would occur during the 1st phase of any future development	New and relieved roads often induce new traffic, and without the implementation of other measures to establish improvements, then the situation will return in a few years. Also need to be confident that the location of the new bypass does not lead to new exposure.	To be included in draft Plan.
Local ban on freight, car or bus traffic	Not Feasible	No further comment	To be removed from further consideration
Pedestrianisation of Bonnygate	Not Feasible	The Bonnygate is an	To be removed from further consideration.

Initial assessment of Action Plan options			
Options	Steering group's comments	Consultant's comments	Conclusion
		important through-road. Pedestrianisation could not feasibly be considered without an appropriate alternative route being available.	
4.Optimise how sources transit the AQMA			
Traffic signal phasing	Works undertaken in Bonnygate during 2009 to optimise timing of lights/ reduce congestion.		To be included in draft Plan.
Changes to pedestrian crossings	Work undertaken in Bonnygate during 2009 to install a new pedestrian island and bi-directional crossing lights.	Timing of lights at crossing will require to be optimised with those at the Bonnygate/ Crossgate junction to minimise congestion effectively.	To be included in draft Plan.
Changes to junction layouts	Being considered within Council but at initial stages – likely to be medium to long term if at all.	No further comment	To be included in draft Plan.
Speed controls	Are already in force (30 mph)	No further comments	No further comment.
Commercial deliveries - loading/ unloading restrictions	Already in force within the Bonnygate/ Crossgate area.	May form part of local freight partnership	To be included in draft Plan.
Urban Clearway	Not feasible in Bonnygate/ Crossgate	No further comments.	To be removed from further consideration

Initial assessment of Action Plan options			
Options	Steering group's comments	Consultant's comments	Conclusion
5.Reduce the emissions from sources by technical means			
Development of a Local Bus Quality Partnership	Partnership in operation at Ferrytoll Park and Ride – could a similar agreement be arranged in Cupar.	Encouraging regulating bus emissions via voluntary BQP is to be preferred options such as expensive LEZ schemes.	To be included in draft Plan.
Taxi Quality Partnership		Likely to make a small contribution to emissions – limited impact.	Decision taken to remove from further consideration due to limited contribution to emissions in the AQMA.
Encourage Private and Public Operators to pursue cleaner vehicles and abatement.	Buses		To be included in draft Plan
Green Procurement (Council) – Council fleets and contract vehicles.	Already in operation in Fife Council Minimum emissions standards for contract vehicles could be problematic. School bus contracts; to be European standard 4 by 2015.	Council leading by example is important. Is a minimum emissions standard part of School buses contract discussions? If not why not? Minimum emission standards could be introduced for all contracted services.	To be included in draft Plan.
Eco-driving training policy	Consideration of extended scheme in addition to statutory scheme already underway in Fife Council		To be included in draft Plan.
Fleet/ fuel monitoring	Already in operation in Fife Council	Recommend included under heading of Green procurement and fleet management	To be included in draft Plan.

Initial assessment of Action Plan options			
Options	Steering group's comments	Consultant's comments	Conclusion
Monitoring new technology/ fuel additives	Already in operation in Fife Council and through work with SEStran. Council looking into using landfill gas to power refuse collection vehicle. Use of new fuels has been built into future contacts.	Recommend included under heading of Green procurement and fleet management	To be included in draft Plan
Vehicle emissions testing	Expensive to implement with very small impact. Suitable roadside testing sites difficult to identify in Cupar Town Centre.	Most effective in raising public awareness rather than actually reducing emissions significantly. May not be considered cost-effective – reference to other authorities who have adopted VET.	To be removed from further consideration
Idling vehicle enforcement	Expensive to implement with very small impact. Idling vehicles not main problem in Bonnygate. A Fife-wide issue best served with a public awareness campaign.	Idling vehicles not principal problem in Bonnygate.	To be removed from further consideration
Retrofitting Council Fleet	Not considered feasible.	No further comment	To be removed from further consideration
Freight quality partnerships	Voluntary partnership could be considered.	See previous discussion on freight. The basis of the partnership would be that in return for effort to improve reliability of freight routes, cleaner vehicles might be introduced.	To be included in draft Plan.
Development of infrastructure	Not feasible or applicable	Not applicable to local problem.	To be removed from further consideration.

Initial assessment of Action Plan options			
Options	Steering group's comments	Consultant's comments	Conclusion
for cleaner vehicle fuels			
Parking Management and Control	Already in place in Fife. Limited scope to change due to nature of parking facilities in Cupar.	Not particularly relevant to problem in Bonnygate.	To be included in draft Plan.
Planning conditions policy	Already in Place. Air Quality considered during planning applications. Air quality issues were already covered within Local Plans. It was hoped the Air Quality Developers Guide would raise awareness internally as well as externally.	Are planners aware of air quality issues around Cupar (e.g. cumulative impacts and biomass boilers)? Would an awareness event for Planning Officers be useful?	To be included in draft plan.
Lobby for additional national policy	Already undertaken through SEStran.	Additional national policies highly unlikely to have an impact before 2010.	To be removed from further consideration.
Vehicle scrappage incentives	Not feasible – being adopted at national level (not relevant to Bonnygate AQMA)	No further comments	To be removed from further consideration.
6.Reduce the emissions from sources by means of encouraging better travel choices/ behavioural change			
Provision of information regarding air quality and travel options	Already in place to some degree. Bus Information	A key consideration should be setting targets for the impacts of such plans.	To be included in draft Plan.

Initial assessment of Action Plan options			
Options	Steering group's comments	Consultant's comments	Conclusion
	Strategy Air quality information on Council website Car-share schemes Fife Council now employs two travel-planning officers to help organisations develop travel plans.		
Promotion of alternative modes (cycling + walking)	Already in place to some degree. Some measures aimed at promoting cycling have been implemented across Fife. Some of these fall under the banner of 'travel planning' for the Council and other organisations. Cycling spaces and shower facilities at local offices.	The local transport strategy indicates that a percentage of car journeys into Cupar are short-distance in nature. A shift towards cycling and walking may have a large impact and could therefore contribute to improving air quality. Feeling safe is an important factor preventing people cycling and walking so that the provision of high quality routes will remove barriers to change.	Include within draft Plan.
Travel Plans for large institutions and businesses.	Already in place. School travel plans Council travel plans Travel plans for businesses/ organisations Travel planning officers in place to help organisations develop plans.	Setting targets and monitoring progress should be considered.	Include within draft Plan.

Initial assessment of Action Plan options			
Options	Steering group's comments	Consultant's comments	Conclusion
Road use charging and workplace parking levy	Not feasible.	No further comments.	To be removed from further consideration.
Bus lane	Not feasible or practicable in Bonnygate/ Crossgate area of Cupar.	Not appropriate to existing situation.	To be removed from further consideration.
Relocating bus stops	Not feasible or practicable in Bonnygate/ Crossgate area of Cupar.	Not appropriate to existing situation.	To be removed from further consideration.
7. Other			
Home Energy Efficiency	Not significant in terms of existing problem.	No further comments.	To be removed from further consideration.
Environmental Nuisance (including Bonfires)	Not relevant to existing problem.	No further comments.	To be removed from further consideration.

Appendix 5: Details of the Action Plan Measures

In line with the requirements outlined in LAQM.PGS(09), 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 Bonnygate AQMA;

Measure	**Title**
1	Improving links with Local Transport Strategy (LTS)

Definition	Key Intervention
Future versions of LTS to be revised to include: (a) Reference to Bonnygate AQMA and measures included in Air Quality Action Plan. Integration of plan. (b) Options that will be implemented via the Area Transport Plan (ATP)	Measures to ensure the current poor air quality in the AQMA is improved where possible and to avoid future problems are implemented via the LTS & ATP
Responsible authority and other partners	**Powers to be used**
Fife Council – Transportation Services and Environmental Services.	Voluntary (although government guidance recommends this measure as road transport is the dominant cause of the AQMA Declaration)

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)	●	●						It is not possible to provide quantitative indicators. These are strategic options but we will report on development of future versions of LTS and comment on specific air quality provisions contained in it.	N/A
(b)		●						Actions to be detailed in LTS & ATP (for subsequent implementation in future years)	End 2010

Notes

Measure	Title
2	Improving Air Quality links with Local Planning and Development Framework

Definition	Key Intervention
(a) Integrate AQ Action Plan with Local Plan - liaise with Development Services re: inclusion of specific reference within Local Plan policies to Air Quality Issues and legislative requirements. (b) Ensure development proposals in AQMA are assessed for AQ impacts - Development Services staff to consider Air Quality issues and consult Developer's Guidance note when determining applications within AQMA. (c) Developers guidance note Development Services staff to liaise with Environmental Services to ensure continued understanding and correct interpretation of Developer's Guidance note – linked to Action (e) (d) Promote sustainable developments to minimise AQ impacts - Local Plan policy requires all new developments to incorporate sustainable technology and/or methods. (e) Internal seminar on AQ – Environmental Services to co-ordinate internal seminar aimed at Development Services Staff dealing directly with applications or new proposals in Local Plans.	Local planning considerations to mitigate cumulative negative AQ impacts of new developments
Responsible authority and other partners	**Powers to be used**
Fife Council Development and Environmental Services	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)		●	●					It is not possible to assign a quantitative indicator. We will report on the integration with Local Plan and provide evidence that air quality considerations have been formalised within it	N/A
(b)		●	●	●	●	●	●		
(c)		●						It is not possible to assign a quantitative indicator. We will report on progress of development of new guidance.	N/A
(d)		●	●	●	●	●	●	Publication of relevant promotional materials.	Increased public/developer awareness
(e)		●						Provision of in-house seminar by Environmental Services	Increased awareness for planners of importance of air quality issues in relevant developments.

Notes

Measure	Title
3	Encourage Integration AQ with other Council strategies

Definition	Key Intervention
Better water, air and land quality	Maintain monitoring regime
Responsible authority and other partners	Powers to be used
Fife Council and community planning partners	Statutory and Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
AQAP	●	●	●	●	●	●	●	Comparison with AQ standards	Achieve AQ objectives

Notes

Measure	Title
4	Target reduced local emissions from freight operations

Definition	Key Intervention
(a) Undertake a study to assess the feasibility e.g. encouraging freight operators to utilise the South Road(A914) approach to the town in preference to the Bonnygate(A91) (b) Continue to meet with stakeholders through the SEStran Freight Quality Partnership to identify key needs, issues and areas for progress. (c) Assess potential for the development of local freight quality partnership aimed at reducing emissions within AQMA and wider area.	Improve efficiency of transit through AQMA and facilitate reduced emissions by encouraging HGV operators to use alternative route (assuming this does not lead to the migration of problems to other communities)
Responsible authority and other partners	Powers to be used
Fife Council – Transportation Services and SEStran	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)		●	●					Assess the possibility of moving all freight to the South Road	N/A
(b)	●	●	●	●	●	●	●	Continue to attend the SEStran Freight Quality Partnership and contribute to Air Quality Group within the partnership	N/A
(c)		●	●					Discuss with local operators vehicle emissions and routing policies.	N/A

Notes

Measure	Title
5	Implementation of new Urban Traffic Management and Control System and changes to pedestrian crossings

Definition	Key Intervention
(a) Installation of new pedestrian crossings in Bonnygate linked to new traffic management system. (b) Implementation of new UTMC in Cupar town centre with synchronised fixed time signals.	Improve efficiency of transit through Cupar Town Centre and reduce emissions from road traffic sources within the Bonnygate street canyon.
Responsible authority and other partners	Powers to be used
Fife Council - Transportation Services	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)	●							Completed	N/A
(b)	●	●						Completed	N/A

Notes

Measure	Title
6	Parking Management and Control

Definition	Key Intervention
(a) Support the objectives of Fife Council's Parking Strategy to discourage long stay commuter parking. (b) Length of stay restrictions and parking controls in town centre should be monitored and reviewed annually. (c) Continued enforcement of loading restrictions within AQMA. (d) Assess the need for on street parking charges to manage the demand for parking.	Reduce traffic by discouraging long stay parking and associated commuting movements. Minimise impacts of commercial deliveries on traffic movement.
Responsible authority and other partners	Powers to be used
Fife Council – Transportation Service and Fife Constabulary	Voluntary Statutory

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)	●	●	●	●	●	●	●		
(b)	●	●	●	●	●	●	●	On-going monitoring	
(c)	●	●	●	●	●	●	●	Police enforce traffic road orders	
(d)		●	●					Carry out assessment	

Notes

Measure	Title
7	Review and support proposed infrastructure changes that will contribute to delivering improvements in local air quality

Definition	Key Intervention
(a) Review and support the proposed delivery of a new relief road which would come forward as part of a new strategic land allocation to the north of Cupar (Structure Plan). (b) Review and support the proposed Cupar, St Catherine Street and The Cross, Traffic and Streetscape Improvements that will contribute to more efficient vehicle movements and enhanced pedestrian accessibility within Cupar Town centre.	Support Council proposals for infrastructure changes that will facilitate improvements in vehicle movements within Cupar. (It is assumed that proposal will be subject to suitable environmental assessments).
Responsible authority and other partners	**Powers to be used**
Fife Council – Transportation Service and Development Services	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)				●	●	●	●	This scheme would be developer funded and therefore could only be implemented through the Structure Plan process.	
(b)	●	●	●	●				Feasibility study, design and raise funding to implement proposals.	

Notes

Measure	Title
8	Target reduction in emissions from buses

Definition	Key Intervention
(a) Liaise with local bus operators to establish the potential for developing a local bus quality partnership. (b) Encourage bus operators to improve emission performance of their fleet.	Target reduced emissions from buses operating in Bonnygate AQMA
Responsible authority and other partners	**Powers to be used**
Fife Council - Transportation Services	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)		●	●	●	●	●	●	Establish a Bus Quality Partnership	Raise awareness with bus operators
(b)		●	●	●	●	●	●	New buses and technologies being developed all the time	

Notes
Quality Bus Partnerships take a very long time (can be as much as 6 to 8 year) to finalise an agreement. Bus emissions have been discussed with the Passenger Transport Services Team and it is considered too costly to retrofit buses.

Measure	Title
9	Continue to target reduction in emissions from Council Fleet and contract vehicles

Definition	Key Intervention
(a) Continue procurement of low emission vehicles. (b) Monitor and assess alternative fuels, technologies and fuel additives. (c) SAFED training. (d) Assess potential for emissions standards for fleet contracts.	Target reduced emissions from Council fleet and contract vehicles operating in AQMA
Responsible authority and other partners	Powers to be used
Fife Council – Fleet Services and Procurement and Supplies	Voluntary and CPC

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)	●	●	●	●	●	●	●	Number of low emissions vehicles in fleet	3% carbon eq./yr
(b)	●	●	●	●	●	●	●	Increase in fleet using alternative fuels	All ES vehicles converted to bio-methane
(c)	●	●	●	●	●	●	●	Driver certification	All HGV drivers
(d)	●	●	●	●	●	●	●	Number of Vehicles	Reduce age profile

Notes

Measure	Title
10	AQMA Awareness Signs

Definition	Key Intervention
To design and erect AQMA signs at various locations within Cupar Town Centre.	To increase awareness of the Bonnygate AQMA and encourage behavioural change
Responsible authority and other partners	Powers to be used
Fife Council – Transportation Services	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
		●	●					Authorisation, design, procurement and installation.	

Notes
Need to comply with Signs Regulation Act and may require authorisation from Scottish Government.

Measure	Title
11	Travel plans for large organisations and businesses

Definition	Key Intervention
(a) Continue the implementation of Fife Council's Travel Plan. (b) Continue to support the implementation of School Travel Plans. (c) Work with local businesses/organisations to encourage the development and implementation of travel plans.	To encourage a shift to more sustainable forms of travel, or reducing the need to travel.
Responsible authority and other partners	Powers to be used
Fife Council – Transportation Services	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)	●	●	●	●	●	●	●	Results of Council travel surveys	Reduce private car use by Council employees for commuting to/ from work
(b)	●	●	●	●	●	●	●	Travel plans implemented and promoted in schools	
(c)	●	●	●	●	●	●	●	Number of large businesses approached regarding the development of travel plans.	

Measure	Title
12	Promotion of Cycling and Walking

Definition	Key Intervention
(a) Development of walking and cycling routes within Cupar. (b) Signage and Interpretation. (c) Provision of Cycle Parking throughout the town centre; at workplaces and at Transport interchange points. (d) A programme of led Cycle Rides will be set up in Cupar to encourage people to cycle as part of their daily routine.	To encourage a shift to cycling and walking.
Responsible authority and other partners	Powers to be used
Fife Council – Transportation Services	Voluntary

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)	●	●	●	●	●	●	●	Number/ length of cycling and walking routes developed.	
(b)	●	●	●	●	●	●	●	Installation of Signage	
(c)	●	●	●	●	●	●	●	Installation of cycle parking points.	
(d)		●	●	●	●	●	●	Number of led cycle rides.	Project to be in place by March 2010

Notes
12(a) There is a recognised need to improve cycle routes in Cupar (This why there is no dedicated cycle map for Cupar, because currently the routes are not significant/sufficient enough to encourage cycling. Study being undertaken by Transportation Services to decide costs etc then to attract money to create routes.

Measure	Title
13	Promoting Travel Choices

Definition	Key Intervention
(a) Production of a Travel Choices map of Cupar (b) A Mass Marketing Campaign for Cupar to raise awareness about the project and encourage people to take sustainable modes of travel. (c) Production of a community booklet. (d) Production of a residential travel pack. (e) Undertaking individualised Travel Marketing at households throughout Cupar. (f) Undertaking individualised Travel Marketing at businesses throughout Cupar. (g) New housing developments in Cupar to be designed with the Scottish Government's travel hierarchy in mind and new residential developments set up Car Clubs for use by residents. (h) Residential Travel Packs, to be issued to all 'new built' homes identified in the local plan through the planning process. (i) Setting up a car club so that Fife Council pool cars are able to be used by the community for hire at evenings and weekends. (j) Continue to provide information about public transport services through the Council website.	To encourage a shift to more sustainable forms of travel, or reducing the need to travel.
Responsible authority and other partners	**Powers to be used**
Fife Council – Transportation and Environmental Services	

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)		●	●	●	●	●	●	Creation and publication of map.	
(b)		●	●	●	●	●	●	Undertake marketing	
(c)		●	●	●	●	●	●	Production of booklet.	
(d)		●	●	●	●	●	●	Production of travel pack.	
(e)		●	●	●	●	●	●	Undertaking visits with households.	
(f)		●	●	●	●	●	●	Undertaking visits to businesses throughout Cupar to discuss Travel.	
(g)		●	●	●	●	●	●	Obtain internal and developer agreement to progress the car club's approach by Transport Planning and Development Management	
(h)		●	●	●	●	●	●	Travel packs to be distributed to 'new build' homes	
(i)		●	●	●	●	●	●	Establish Car Club.	
(j)	●	●	●	●	●	●	●	Regular updates of public transport information on Council website	

Notes
Funding is currently being sought for many of the outlined actions.

Measure	Title
14	Provision of information relating to Air Quality and Travel options

Definition	Key Intervention
(a) Continue to make information relating to local air quality management available through Council website (b) Undertake a publicity campaign to raise awareness of the Bonnygate AQMA.	To increase awareness of local air quality issues and encourage behaviour changes that will contribute to improving local air quality
Responsible authority and other partners	**Powers to be used**
Fife Council - Transportation and SEStran Fife Council - Environmental Services	Statutory

Actions	Implementation timetable							Progress indicator	Target
	09	10	11	12	13	14	15		
(a)	●	●	●	●	●	●	●	Publication of new LAQM reports and details relating to the Bonnygate AQMA/ AQAP on the Fifedirect.	
(b)		●	●					Publication of materials, events held, website statistics.	Target to follow on penetration of publicity and increased awareness

Notes

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