

Crieff Air Quality Action Plan



Executive summary

This document sets out Perth & Kinross Council's Air Quality Action Plan (AQAP) for the Crieff high street corridor, which was declared an Air Quality Management Area (AQMA) in 2014 due to exceedances in National Air Quality Objectives. The aim of this plan is to outline improvement measures Perth & Kinross Council (PKC) & partners will take forward to reduce emissions of nitrogen dioxide (NO₂) and particulate matter less than 10 micrometres in diameter (PM₁₀) in order to comply with the national objectives; a requirement of the Environment Act 1995.

Analysis of the sources of the pollutant exceedances within the Crieff AQMA concluded:

- The proportion of emissions from queuing traffic is higher at the western end of West High Street than at other locations. Traffic surveys indicate that traffic appears to queue regularly throughout the day at this location with longer queues occurring during peak periods.
- The highest proportion of Oxides of Nitrogen (NO_x) emissions at all receptors is from HGV's and cars.
- NO₂ and PM₁₀ emissions from buses are relatively low when compared to other vehicle types.

A steering group including key representatives from Perth and Kinross Council (PKC), Transport Scotland and the Tayside and Central Scotland Transport Partnership (TACTRAN) was formed to develop a draft Crieff AQAP. The steering group considered a wide range of potential options for improving air quality within Crieff, and have developed a package of improvement measures that aims to reduce concentrations of pollutants within the AQMA to acceptable levels.

These improvement measures were assessed against the following criteria:

- Potential air quality impact
- Potential costs
- Overall cost-effectiveness
- Potential co-environmental benefits
- Risk factors
- Social impacts and economic impacts
- Feasibility and acceptability

Following the development of the draft AQAP, a public consultation was undertaken at the beginning of 2019. The consultation allowed participants to voice their opinions and concerns about the draft AQAP and the proposed improvement measures. The consultation outcomes along with the aforementioned assessment of the improvement measures by the steering group enabled the final Crieff AQAP to be compiled.

Successful delivery of the plan will require us to work in partnership with all relevant stakeholders to deliver the individual measures, and PKC will report annually on the progress we are making, and review the AQAP, as required.

Karen Reid

Chief Executive

Perth & Kinross Council

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1 Introduction

This report outlines the actions PKC deem necessary to reduce concentrations of air pollutants within the declared AQMA (see Figure 1) and exposure to air pollution; thereby positively impacting on the health and quality of life of residents and visitors to Crieff.

It has been developed in recognition of the legal requirements on the local authority to work towards Air Quality Strategy Objectives (see Table 1) under Part IV of the Environment Act 1995, to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

Following consideration of results from a public consultation and comments from the steering group, the Final AQAP has been developed.

The final plan will be reviewed every five years, and progress on the measures set out within this Plan will be reported annually within PKC's Annual Progress Report to the Scottish Government.

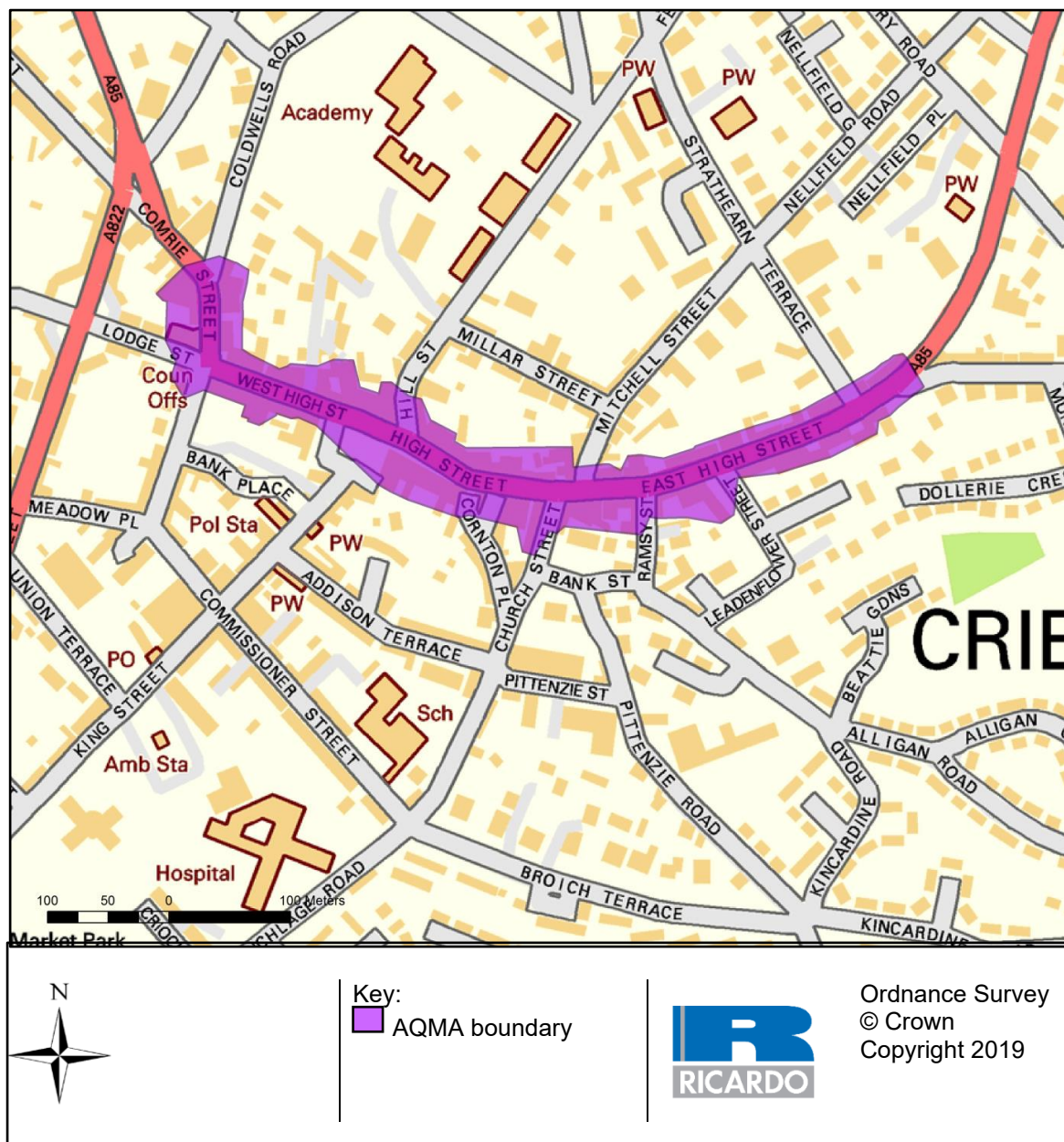


Figure 1: AQMA Boundary

This Action Plan adopts the requirements of LAQM technical guidance TG (16) for an effective Action Plan:

- **Section 2** presents a summary of recent monitoring data and reviews of local air quality undertaken by Perth & Kinross Council.
- **Section 3** provides a brief overview of the significance of local air quality management on human health, the statutory duties placed on local authorities, and a summary of existing plans and strategies which may influence air quality at the study location.
- **Section 4** describes how the AQAP has been developed by Perth & Kinross Council.
- **Section 5** presents the range of options that were considered when aiming to improve local air quality within the designated AQMA
- **Section 6** gives a summary of measures to be adopted by Perth & Kinross Council.

2 Summary of Current Air Quality in Crieff

The AQAP focuses on the Crieff high street corridor, where an AQMA (see Figure 1) has been declared as a result of elevated concentrations marginally exceeding the Air Quality (Scotland) Regulations Annual Mean objectives for NO₂ and PM₁₀.

Previous Review and Assessments, including the Detailed Assessment (2012) and Further Assessment (2015), which included source apportionment, identified the area of exceedance. For more details on these assessments see Appendix 4.

PKC have a statutory duty through the LAQM process to report annually to the Scottish Government on monitoring undertaken within Perth and Kinross. All reports and assessments, including the existing AQAP for Perth, are available at <http://www.pkc.gov.uk/article/15307/Air-quality-reports>.

A traffic survey was undertaken by Systra in 2018 to provide insight into traffic movements within Crieff, and to further inform how to improve air quality in the area. For more details on the survey see Appendix 5.

Recent monitoring results indicate a general downward trend in levels of both NO₂ and PM₁₀ within the Crieff AQMA. This trend, which is being seen on a national basis, is most likely due to an increasing number of newer and therefore cleaner vehicles within the vehicle fleet. Although exceedances are marginal (5-10% above objective limits) further monitoring is required to establish if this is a continual trend that could eventually lead to compliance with the objectives. A period of 3-5 years of compliance is required before PKC would be in a position to consider amending/revoking the AQMA. As a result, the application of an action plan is still required.

3 Ambient Air Quality and Local Air Quality Management

A. Potential Impacts of Air Pollution on Human Health

Air pollution has been associated with a wide range of effects on 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.

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).

Large studies have shown a strong link with cardiovascular disease such as heart disease and strokes. There is also clear evidence that long term exposure to outdoor air pollution can suppress lung function and is linked to the development of asthma and can exacerbate symptoms for those that already have the condition.

B. Cleaner Air for Scotland - The Road to a Healthier Future

Cleaner Air for Scotland (CAFS) was published in November 2015 and is currently in the process of being reviewed. This Strategy identifies the Scottish Government's policies on air quality and sets out a series of actions to improve air quality across Scotland. The document sets out six main objectives:

1. To reduce transport emissions by implementing low and zero emissions zones, promoting a modal shift away from the car, through active travel (walking and cycling), and reducing the need to travel;
2. To comply with the European and the Scottish legal requirements relating to air quality;
3. To inform, engage and empower the population to improve air quality;
4. To protect citizens from the harmful effects of air pollution and to reduce health inequalities;
5. To make sure that new or existing developments are not compromising air quality requirements and that places are designed to minimise air pollution and its effects;
6. To reduce greenhouse gas emissions and achieve Scotland's renewable energy targets whilst delivering co-benefits for air quality.

In addition to the six main objectives, CAFS outlines new initiatives to be implemented to compliment the objectives set. These initiatives include a National Modelling Framework and National Low Emissions Framework. CAFS outlines further changes such as the adoption of the WHO guideline values for PM_{2.5}; this was transposed by the Air Quality Scotland Amendment Regulations 2016 when the annual mean objective for PM_{2.5} was set at 10µg.m⁻³.

CAFS considers the impact of air quality on health and looks at the estimated costs as well as the premature deaths associated with poor air quality. It was estimated that 2,000 premature deaths and around 22,500 lost life-years across the Scottish population were linked to fine particulate air pollution in 2010¹.

¹ https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/332854/PHE_CRCE_010.pdf

The proposed actions outlined in CAFS not only work towards reducing pollutant concentrations but in turn aim to reduce congestion and improve traffic flow within urban areas.

The Scottish Government recognises that a multi-disciplinary approach is required to deliver the main objectives of CAFS.

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

The latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland was published in July 2007. The objectives specified in the strategy incorporate the limit values outlined by the EU Framework.

The Air Quality Strategy sets out the UK vision of clean air for a good quality of life and the steps being taken to achieve this. The Strategy also outlines the established framework of the LAQM 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 (Air Quality Strategy 2007).

However the Scottish Government have set more stringent national objectives for PM₁₀ in Scotland and have introduced the requirement for local authorities to monitor PM_{2.5} with an annual mean objective level of 10µg/m³ to be achieved by 2020.

D. The Local Air Quality Management Regime

Under the Environment Act 1995 local authorities are required to review and assess air quality annually against the air quality objectives. Where local authorities identify an exceedance of the objectives they are required to declare an Air Quality Management Area (AQMA).

The air quality objectives to be worked towards in Crieff are detailed below in Table 1.

Table 1: Air Quality Objectives

Pollutant	Air Quality Objective Concentration	Measured as
Nitrogen Dioxide	200 µg.m ⁻³ not to be exceeded more than 18 times a year	1 hour mean
	40 µg.m ⁻³	Annual Mean
Particles (PM ₁₀) (Gravimetric) Authorities in Scotland	50 µg.m ⁻³ not to be exceeded more than 7 times a year	24 hour mean
	18 µg.m ⁻³	Annual Mean
Particles (PM _{2.5}) (Gravimetric) Authorities in Scotland	10 µg.m ⁻³	Annual Mean

E. Existing Strategies and Policies relevant to Air Quality in Crieff

PKC already have a number of plans and policies in place which aim to improve air quality and the key ones are listed below with other relevant strategies and policies found in Appendix 2.

National Transport Strategy

The National Transport Strategy for Scotland was published in December 2006 and updated in 2015. The Strategy introduced three key strategic objectives. The strategy works towards an efficient and integrated transport system which promotes economic growth, health and environmental benefits. The three key objectives include:

- To improve journey times and connections by reducing congestion;
- To reduce emissions to tackle climate change;
- To improve the quality, accessibility and affordability of transport.

These key objectives have been set to support the vision of the Scottish Government. The strategy sets out a number of commitments in order to achieve the three objectives outlined above. In particular, areas which are applicable to the Crieff AQMA include tackling congestion and improving connections. In addition to the three key strategic outcomes, the National Transport Strategy outlines five high level objectives:

- Promotes economic growth
- Promote social inclusion
- Protect our environment and improve health
- Improve safety of journeys
- Improve integration

Successful outcomes of the strategy rely on transport partnerships between local authorities and transport operators.

Tayside and Central Scotland Transport Partnership (TACTRAN)

Regional Transport Partnerships (RTPs) were established in 2005 to strengthen the planning and delivery of regional transport developments.

The TACTRAN RTP includes Angus, Dundee, Perth and Kinross and Stirling Councils. The partnership was developed to bring together local authorities and stakeholders to deliver a strategic approach to transport within the region.

The strategy outlines improvements to the transport infrastructure within the region over a 5-year period up until 2023.

The Regional Transport Strategy (RTS) objectives are classified into six key areas, these include:

- Economy
- Accessibility
- Equity and Social Inclusion
- Health and Well-being
- Safety and security
- Integration

The objectives are delivered via nine detailed strategies/frameworks; these include Health and Transport which includes for example HT3 – Transport and Public Health, policy HT3.1 Review Traffic Management at air quality hot spots within AQMAs.

The strategy aims to build on the existing transport network established within the region. Measures have been developed to work towards the vision outlined by TACTRAN; there are three key themes in the Strategy to work towards this:

- Delivering economic prosperity
- Connecting communities and social inclusion
- Environmental sustainability and promoting health and wellbeing

TACTRAN are a key partner in delivering measures that could benefit air quality within Crieff and the wider Perth and Kinross area. The delivery of the measures outlined in the AQAP will require close partnership working with TACTRAN.

The RTS identifies congestion and pressure on the road network as a result of increased traffic over the past 10 years. The strategy outlines commuting patterns and statistics within the region detailing the percentage of journeys made by car, bus etc. This is important for PKC when considering the development of AQAP taking into account residents' transport needs, target communication and engagement strategies.

The RTS outlines local air quality issues within the TACTRAN area such as road traffic emissions. The key air pollutants from this source are nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}).

The RTS shows the national cycling network which incorporates Crieff for a proposed national route running between Stirling and Perth.

Local Development Plan

Perth & Kinross Council's Local Development Plan (LDP) sets out policies and proposals that the Council will use to guide development in the area up to 2024. The LDP was adopted in 2014 and will be reviewed before a replacement Plan is adopted in 2019.

At the time of writing, the Local Development Plan review is at the stage at which the Council has reached its settled view as to the policies and proposals it wishes to see in the replacement Plan. Public consultation took place in 2017/8 and an independent examination of the issues raised in consultation is under way. Depending on the outcome of the examination, the Council will make modifications to the Proposed Plan before adopting it to replace the 2014 LDP.

The LDP outlines Perth & Kinross Council's vision for future development to promote sustainable growth. The Local Development Plan is supported by statutory Supplementary Guidance, which expands on the policies and proposals in the Plan. The LDP key objectives are set out below.

Local Development Plan Key Objectives

Our area - highly valued for the beauty of its natural and built environment - is a great place to live, work and visit, and should be developed in a way that does not detract from its attractiveness nor places an unsustainable burden on future generations.

We want to improve the distinctiveness of our towns, villages and neighbourhoods. We want growth to be undertaken sensitively and in keeping with our environment whilst providing enough dynamism to keep communities viable and prosperous.

A well cared-for rural environment is a social and economic asset vital to the wellbeing of the area's citizens and to its future prosperity.

Place	Housing	Climate	Infrastructure	Economy	Biodiversity
Livable with new and regenerated neighbourhoods	Well designed and built with a quality built and natural environment	Resilient and adapted with communities resilient to a changing climate	Well served with public and private investment appropriate to the areas needs	Thriving with a flourishing and diverse local economy	Connecting with green networks providing sustainable long term management
Produce a more efficient settlement pattern by ensuring that the location of new development contributes to reducing the need to travel. Protect and enhance the cultural and historic environment. Ensure that new development enhances the environment and embraces the principles of sustainable design and construction. Protect and enhance the character, diversity and special qualities of the area's landscapes to ensure that new development does not exceed the capacity of the landscape in which it lies.	Accommodate population and household growth and direct that growth to appropriate locations. Ensure a continuous seven year supply of developable housing land. Seek to ensure that the housing land supply accommodates the needs of the various sectors of the market.	Improve the longterm resilience and robustness of the natural and built environment to climate change. Ensure that development and land uses make a positive contribution to helping to minimise the causes of climate change and adapting to its impacts.	Identify and provide for new and improved social and physical infrastructure to support an expanding and changing population. Establish clear priorities to ensure stakeholders and agencies work in partnership so that investment is co-ordinated and best use is made of limited resources to enable the delivery of the strategy. Ensure investment in the renewal and enhancement of existing infrastructure is consistent with the strategy of the Plan in order to make best use of the investment embedded in our existing settlements.	Provide the framework to increase the economic sustainability of Perth and Kinross by maintaining and providing locally accessible employment opportunities. Ensure a continuous seven year supply of developable economic development land. Provide a flexible policy framework to respond to changing economic circumstances and developing technology. Promote the vitality and viability of shopping centres and reduce the potential loss of shoppers to retail centres outwith Perth and Kinross.	Conserve and enhance habitats and species of international, national and local importance. Identify and promote green networks where these will add value to the provision, protection, enhancement and connectivity of habitats, recreational land and landscape in and around settlements.

The LDP contains a policy that deals specifically with transport. The policy outlines transport assessment requirements for new developments, and addresses the potential impacts of increased traffic (as a result of developments) on the designated AQMA. Developments which propose to adversely affect air quality may not be permitted as outlined by the policy dealing with air quality management areas. Both the transport and air quality policies are under review to ensure they continue to address impacts on the AQMA. It is proposed to expand the scope of the Air Quality policy to apply to all but the smallest developments in or adjacent to AQMAs.

The LDP also contains several site-specific proposals for development. Crieff is identified as an area of growth for both housing and commercial development. The Plan allocates land for the following housing proposals in Crieff:

- Broich Road (300+ units);
- Wester Tomaknock (100-120 units);

The LDP outlines that in relation to the housing proposals, developers will be required to demonstrate that the A85 trunk road through Crieff can accommodate the level of development proposed. Further information can be obtained from page 250, Crieff 8.3, within the 2014 adopted LDP. All of the site specific proposals are under review. It is proposed to increase the density of the Broich Road allocation to make better use of this green field site, and to introduce a smaller mixed use site allocation to the north of Broich Road for retail and other uses. These proposals are subject to the outcome of the LDP examination.

The Local Development Plan is reviewed every five years. More detailed information on the policies and proposals in the Plan is available on the Council's website. The first LDP was adopted in February 2014 and the replacement LDP is scheduled to be adopted in 2019. This section of the report may be updated as the review of the LDP progresses.

i. Local Development Plan-Action Programme

The Action Programme has been prepared to support the delivery of the Perth and Kinross LDP. The Action Programme is reviewed every 6 months to identify any relevant updates for specific sites. The plan outlines the outcome of proposed developments within Crieff, detailing if an Environmental Impact Assessment has been a requirement of the planning proposal. In Crieff, the proposal for a large mixed use site at Broich Road will be the subject of a masterplan, with an Environmental Impact Assessment.

Climate Change Declaration

Scotland's Climate Change declaration acknowledges the importance of climate change and is a means of demonstrating PKC's commitment to action: all of Scotland's 32 local authorities are signatories. The declaration includes commitments both to mitigate our impact on climate change through reducing greenhouse gas emissions and to adapt to future predicted climate change impacts.

PKC is a signatory to the Declaration and this has been included within the AQAP. Where measures seek to reduce road transport, this will have a direct impact not only on air quality within the AQMA but also a reduction in carbon dioxide (CO₂) emissions.

4 Development of Air Quality Action Plan

A steering group was formed and held regular meetings to develop the Action Plan. The members of the steering group are:

- PKC officers from the following departments:
 - Environmental Health
 - Sustainable Development
 - Roads
 - Transport Planning
 - Public Transport
 - Development Control
 - Parking
 - Community Greenspace
- Ricardo Energy & Environment- Consultants engaged by PKC to assist the steering group and action planning process
- Transport Scotland - Head of Environment & Sustainability Branch
- Tayside and Central Scotland Transport Partnership (TACTRAN)

The meetings followed the guidance of LAQM TG (16) outlining the key requirements for the development of an effective Action Plan:

- Undertake appropriate local monitoring and assessment (source apportionment)
- Decide what levels of actions are required
- Establish links with other key policy areas/strategies
- Undertake measures selection and impact assessment
- Agree monitoring and evaluation of success
- Undertake Consultation
- Finalise Air Quality Action Plan

The complete AQAP Process undertaken is detailed in [Figure 2](#).

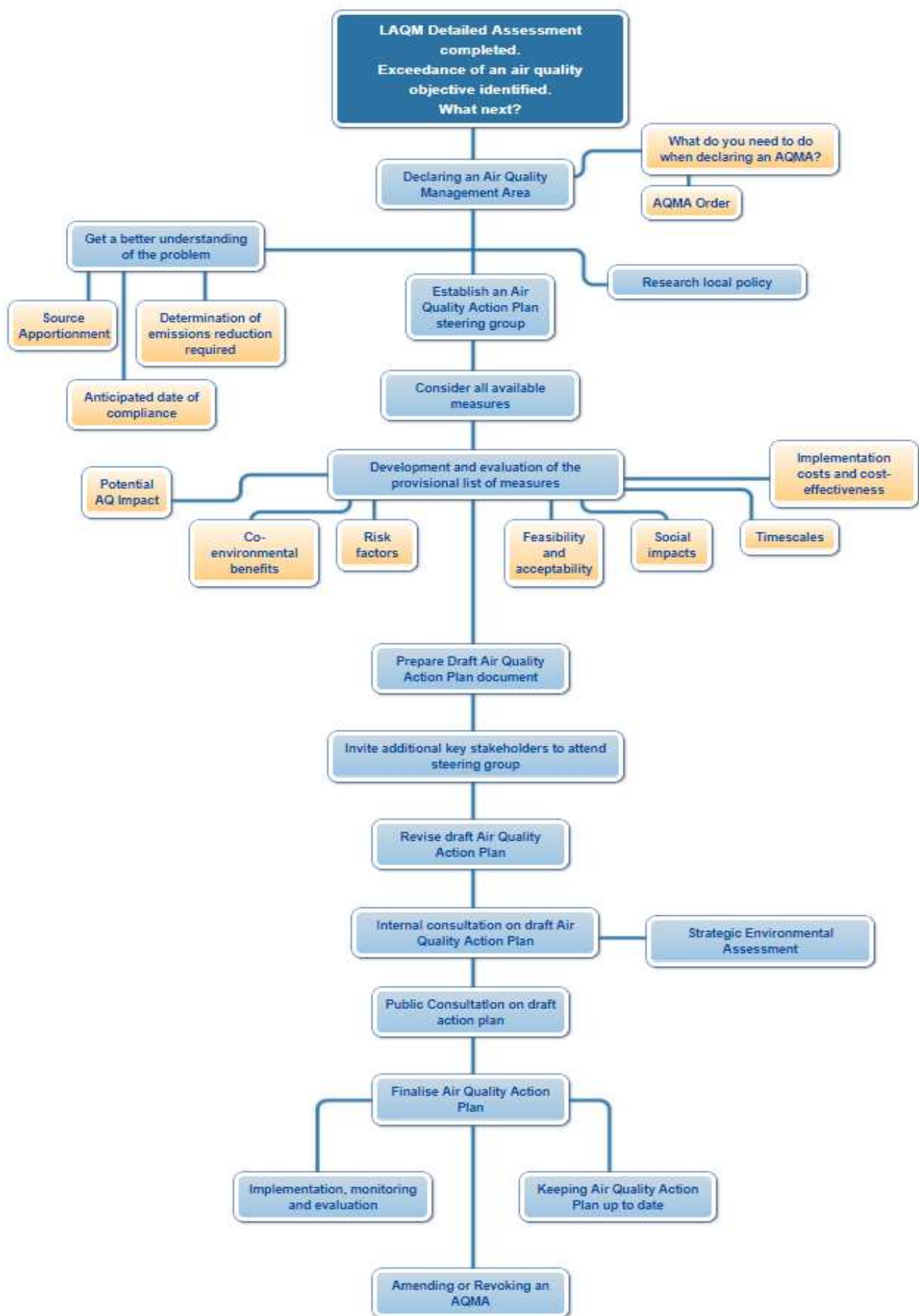


Figure 2: The Complete AQAP Process

5 Action Plan Options and Assessment

During the Action Plan process the steering group has considered a full range of relevant options aimed at reducing ambient pollutant concentrations within the designated AQMA. The process 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.

Following the internal and external consultations the steering group reviewed the responses and amalgamated together, reworded or rejected options where necessary to form the final list of measures.

This chapter provides more information on the options and their assessment. The measures in the Action Plan are presented in Chapter 5.

A. Assessment of Options

This section outlines the work undertaken by the steering group to consider action plan options as outlined in LAQM Policy Guidance for Scotland 2016 (LAQM. PG (S) (16)). From the initial full list of options, measures were selected based on their feasibility and effectiveness to take forward into a draft Air Quality Action Plan. This draft was then taken to public consultation, from which responses were used to help finalise the options included in the final AQAP.

5.A.1 Range of Possible Options

The Policy Guidance LAQM.PG (S) (16) states that AQAPs 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 range of potential options is available to PKC and other stakeholders to improve local air quality within the Crieff AQMA, and the surrounding area.

Therefore, it was important at the early stages of the action planning process to consider all potential options. The identification of potential measures for the consideration of the steering group was undertaken through a review of existing local and regional plans, consideration of measures referenced in LAQM.PG (S) (16) as well as recommendations of members of the steering group.

Whilst PKC may not have the necessary powers to implement all such options, they may engage with other organisations and agencies that have the capacity to take such options forward.

A list of six 'Option Categories' was 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

5.A.2 Responses to the Options

From the draft list of options considered by the steering group, a decision was made on which options to take forward as measures in the final action plan and those options to be discounted from further action. This decision is the result of:

- Comments received from the steering group members
- The conclusions from the source apportionment exercise and LAQM assessments presented in Appendix 4.
- Additional comments from Perth & Kinross Council's consultant based on experience in prior assessments.

- Feasibility and acceptability of measures
- Public Consultation on the draft Crieff AQAP measures

The measures discounted from further development are presented below:

Table 2: AQAP Options Eliminated from Further Consideration

Options eliminated from further consideration in the Crieff AQAP	Reason for Elimination
Move receptors away from AQMA	Not feasible to do so
Provision of new bypass to take traffic away from High St	Not feasible to do so
Re-routing of HGV traffic	This would move issue elsewhere, either in Crieff or similar settlements as there is no suitable alternative route
Consider “de-trunking” the road	No benefits of doing this
Consider relocation of bus stops in the AQMA	No better options for bus stops in the near vicinity
Use of A85 for trunk traffic only	Not feasible or practical to do so
Consider one-way traffic on West/East High street to reduce congestion	Not clear how this could be done practically

The options listed above have been excluded from further consideration at this time, after consultation with the steering group 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. Notwithstanding, should future consultation result in justifiable reasons to revisit any of these options then, the benefits may be reconsidered.

A summary of the measures selected by the Steering Group for inclusion in the Action Plan are presented in **Table 3** below. Further details of the measures and their assessment are also presented in the following sections.

Table 3: Crieff AQAP Measures

Measures selected for inclusion in the Crieff AQAP by Steering Group
A. Strategic Measures
A.1 Liaise with the Scottish Government regarding the consideration of national measures to reduce background concentrations of PM.
A.2 Improving Links with Local Transport Policies
A.3 Improve Links with Regional Transport Strategy
A.4 Ensure Integration of Air Quality with Other Council Strategies and Policies
A.5 Local Development Plan- Assess merit of further development in Crieff
B. Move Traffic Away from AQMA
B.1 Redirect local road traffic movements away from the A85
B.2 Incentivise parking out with AQMA (e.g. reduce/remove on street parking, increased signage)
C. Traffic Management
C.1 Possible provision of smart parking in Crieff
C.2 Urban Traffic Control Systems congestion management
C.3 Anti-idling Enforcement
C.4 Undertake a review of the current locations of pedestrian crossings
C.5 Limit or prioritise traffic turning right on to High Street
D. Reduce the Emissions from Source
D.1 Encourage private and public operators to pursue cleaner vehicles
D.2 Maintenance of the Local/ Voluntary Bus Quality Partnership
D.3 School Travel Plans
D.4 Public transport improvements
D.5 Restrict access for polluting vehicles within the AQMA
D.6 Implement Eco Stars scheme for HGV and bus operators
E. Reduce Emissions by Reducing Demand for Traffic
E.1 Promotion of lift sharing and development of car clubs
E.2 Travel Plans for large institutions and businesses
E.3 Create and implement PKC Corporate Travel Plan
E.4 Promotion of active travel
E.5 Awareness raising and education, presentations at local school's/ community meetings
E.6 Cycling and walking routes to be routed to link in with the campus for sport.
E.7 Provision of PKC "Champions" for transportation methods
F. Reduce Emissions from Non-Transport Sources
F.1 Biomass Installations and other developments likely to cause pollution- review developments which may cause pollution
G. Other
G.1 Increase AQ Monitoring Network
G.2 Regional AQ Modelling study.
G.3 Cycling and walking routes to be incorporated into transport model
G.4 Transport assessments for developments to be required as part of the planning process

6 AQAP Measures

Each of the measures are discussed in detail below, together with the relevant authorities responsible for implementation, and the powers available to implement the given measures.

A. Strategic Measures

It is important that AQAPs support and consider existing or forthcoming plans and strategies. Therefore, some integration of the AQAP with the local transport strategy, the development plan and other relevant Council strategies is considered essential and represents a strategic and integrated approach to local air quality management. The adoption of these measures will help to improve air quality across Perth and Kinross. These strategic actions are outlined in the measures 1 to 5, below.

A.1 Liaise with the Scottish Government

The source apportionment study undertaken as part of the further assessment identified that background sources make a significant contribution to local concentrations of PM₁₀. Background sources of particulate matter include a wide range of natural and man-made processes including industry, residential and commercial combustion and transport sources. However, local authorities have very limited opportunities to address background concentrations of pollutants and instead must rely on regional and national measures to address these and contribute to improving local concentrations. In light of the new PM_{2.5} annual mean objective of 10 µg.m⁻³, PKC have extended their monitoring network to include PM_{2.5}. The measures outlined within this AQAP which work towards reducing PM₁₀ concentrations are anticipated to have the same impact on PM_{2.5} concentrations within Crieff.

PKC proposes to liaise with the Scottish Government regarding the consideration and adoption of new measures that will contribute to reducing background concentrations of Particulate Matter (PM) and other pollutants.

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

A.2 Improve Links with Local Transport Policies

Air quality measures have been included in the forthcoming Active Travel Strategy and will be a part of any Local Transport Strategy should one be written. The forthcoming Corporate Travel Plan will also link to the AQAP, as this will encourage more sustainable methods of traveling to work. The 'Crieff on the Go' social marketing campaign also promotes sustainable and active travel, which links to the AQAP.

Measure	Title
A.2	Improve Links with Local Transport Policies
Definition	Key Intervention
Ensure AQ is incorporated into local transport policies to raise awareness of air quality.	Measures to ensure that air quality is improved in the AQMA through local transport measures.
Responsible authority and other partners	Powers to be used
Perth & Kinross Council/TACTRAN/Transport Travel Associations	Voluntary

A.3 Improve Links with Regional Transport Strategy

The Regional Transport Strategy contains a section on air quality, and the AQAP will link to this by working with both TACTRAN and other partners such as Transport Scotland to tackle transport issues that contribute to poor air quality. As the major hotspot is the A85 Trunk Road, any AQAP will have a regional and national dimension to it as the A85 is a major strategic route on the national transport network.

Measure	Title
A.3	Improving Links with Regional Transport Strategy
Definition	Key Intervention
PKC when considering improvement to the transport network within Crieff, will ensure that ongoing improvements, identified from PKCs Capital programme or when addressing new development application, will work within the wider objectives set out within the National Transport Strategy and the Regional Transport Strategy. Ensure that the economic and environmental objectives, which include AQ and Climate Change, are set out within PKC Local Development Plan.	Measures to ensure that AQ and Climate change are considered with regards to Transport Planning for Crieff at a regional strategy level.
Responsible authority and other partners	Powers to be used
Perth & Kinross Council/TACTRAN	Voluntary

A.4 Ensure Integration of Air Quality with Other Council Strategies and Policies

PKC will ensure air quality is considered within various council strategies and policies to minimise any negative impacts they may cause. Air quality planning policies and guidance will make sure any impacts and appropriate mitigation measures are considered at the design stage of all proposed developments. Procurement guidance will influence the uptake of more fuel efficient and lower emission vehicles by PKC and public transport services.

Measure	Title
A.4	Ensure Integration of Air Quality with Other Council Strategies and Policies
Definition	Key Intervention
a. Encourage and enhance joint-working between Council Services to consider air quality implications of existing and future Council strategies and policies b. Ensure that air quality impacts and mitigation measures are considered at the design stage for all proposed developments across the Local Development Plan area c. Ensure air quality is formally considered in future tender process for new PKC vehicles and public transport decisions (i.e. for school subsidised public services, school buses and taxis)	Encourage opportunities for improving local air quality and minimising negative impacts from existing and future PKC strategies and policies.
Responsible authority and other partners	Powers to be used
Perth & Kinross Council	Statutory: Town & Country Planning (Scotland) Act 1997 as amended by the Planning etc. (Scotland) Act 2006 Voluntary

A.5 Local Development Plan-Assessment of further development in Crieff

The Development Plan currently focuses the majority of new development in the principal settlements, where most people live, and where most jobs, services and facilities are already located. Crieff is one of the principal settlements. Principal settlements usually have significant land and infrastructure capacity to accommodate new development. However, in Crieff's case, there are additional considerations between accommodating significant new development and the aims of the Air Quality Action Plan.

Measure	Title	
A.5	Local Development Plan - Assess merit of further development in Crieff	
Definition		Key Intervention
a. Integration of the AQAP with future versions of the LDP b. Ensure that development proposals with the potential to exert an impact on the Crieff 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. Review Crieff's future ability to accommodate significant development proposals. e. Ensure new developments incorporate green infrastructure to promote active travel and make connections where possible to blue and green networks.		Maintain and update air quality considerations with planning and development control. Ensure the AQ impacts from significant development proposals avoid Crieff's AQMA.
Responsible authority and other partners		Powers to be used
Perth & Kinross Council		Voluntary

B. Move Traffic Away from AQMA

B.1 Redirect local road traffic movements away from the A85

Perth & Kinross Council, in partnership with Transport Scotland (and working with relevant stakeholders) will aim to examine transport flow movements off and onto the trunk road in relation to local roads around the AQMA and to assess the impact and possibility of altering the flows onto and off of the A85 in relation to local roads and local traffic. Ultimately, if the A85 through Crieff can be used predominantly for strategic road journeys, and alternative local roads can be used for local road journeys within Crieff, then, the theoretical lower levels of traffic on the A85 could lead to tangible lowering of emissions. Rerouting some of the traffic that currently accesses onto the A85 from local roads to otherwise use only local roads, where practicable would be one key area of consideration.

Measure	Title	
B.1	Redirect local road traffic movements away from the A85	
Definition		Key Intervention
Examining transport flow movements off and onto the trunk road in relation to local roads around the AQMA, to understand: a. how movements of vehicles, particularly from local roads onto the trunk road contribute to air pollution and b. to understand the impact of altering the flows of local traffic away from the A85 and how this might impact on local road capacity and practicality.		Undertake a feasibility study to examine alteration of traffic flows and movements off and onto the trunk road in relation to local roads around the AQMA.
Responsible authority and other partners		Powers to be used
Perth & Kinross Council & Transport Scotland		Traffic Regulation Order

B.2 Incentivise parking out with AQMA

Perth & Kinross Council, in consultation with relevant stakeholders will continue to consult and review the existing parking options in Crieff to reduce parking pressures and alleviate the impact on congestion in order to improve air quality.

Measure	Title	
B.2	Incentivise parking out with AQMA (e.g. reduce/remove on street parking on the A85, increased signage for car parks etc.)	
Definition		Key Intervention
Examining parking policies and seek to potentially discourage parking within, or in close proximity to the AQMA.		Encourage parking of polluting vehicles away from the AQMA through e.g. parking charges parking restrictions, signage and length of stay and incentivise parking by electric vehicles, car clubs etc.
Responsible authority and other partners		Powers to be used
Perth & Kinross Council		Traffic Regulation Order

C. Traffic Management

C.1 Possible provision of smart parking in Crieff

Perth & Kinross Council will seek to assess the potential options for SMART parking in Crieff to facilitate effective location of available parking spaces and in doing so reduce adverse impacts on congestion. SMART parking technology gives real time information to enable users to find spaces quickly and easily.

Measure	Title	
C.1	Possible provision of smart parking in Crieff	
Definition		Key Intervention
Ensure that parking behaviour does not negatively impact on local air quality by ensuring people travelling by car are able to find a parking space quickly and easily thereby reducing parking pressures and congestion.		Review existing parking behaviour and consider feasibility studies on the benefits of introducing SMART parking based on advanced sensor technology to enable real time parking availability via a smart phone app.
Responsible authority and other partners	Powers to be used	
Perth & Kinross Council	Voluntary	

C.2 Urban Traffic Control Systems/Congestion Management.

In conjunction with Transport Scotland and their operating company BEAR Scotland, PKC will consider investigating the efficiency and optimisation of traffic management controls to optimise traffic flows.

Measure	Title	
C.2	Urban Traffic Control Systems/Congestion Management	
Definition		Key Intervention
a. Improve efficiency of transit through the AQMA to reduce local emissions and concentrations.		Assess and implement a variety of traffic interventions to optimise the existing traffic management system. Consider traffic control measures appropriate to the local issues in order to optimise traffic flows
b. Review measures to minimise congestion within the existing AQMA.		
Responsible authority and other partners		Powers to be used
Perth & Kinross Council & Transport Scotland/BEAR Scotland		Voluntary

C.3 Anti-Idling enforcement

PKC will consider the adoption of powers to undertake enforcement through Traffic Regulation Orders to compel drivers to switch off idling engines. Fixed penalty notices could be issued to drivers who refuse to co-operate.

Measure	Title	
C.3	Anti-Idling enforcement	
Definition		Key Intervention
Investigate the potential for undertaking enforcement action with respect to idling vehicles.		The enforcement against idling vehicles can contribute to reducing emissions of air quality pollutants but also help to raise awareness of local air quality issues.
Responsible authority and other partners	Powers to be used	
Perth & Kinross Council	Voluntary The Road Traffic (Vehicle Emissions) (Fixed Penalty) (Scotland) Regulations 2003	

C.4 Review of pedestrian crossings within the high street corridor

In conjunction with Transport Scotland and their operating company BEAR Scotland, PKC may review the location and timings of the existing pedestrian crossings to determine if traffic flow within the AQMA can be improved.

Measure	Title
C.4	Undertake a review of the current location of pedestrian crossings in and around the A85
Definition	Key Intervention
Review the current pedestrian crossing locations/timings in and around the A85.	Implement required/relevant changes upon completion of review (if needed).
Responsible authority and other partners	Powers to be used
Perth & Kinross Council & Transport Scotland/BEAR Scotland	Voluntary

C.5 Limit or prioritise traffic turning right on the High Street

PKC will carry out relevant traffic management assessments/counts and modelling thereafter to determine alternative junction arrangements to enhance traffic flow within/affecting the AQMA.

Measure	Title
C.5	Limit or prioritise traffic turning right on the High Street
Definition	Key Intervention
Review of existing junction arrangements and impact of possible changes to seek improved traffic flow.	Amendment to junction priorities to further reduce congestion
Responsible authority and other partners	Powers to be used
Perth & Kinross Council and Transport Scotland	Voluntary

D. Reduce the Emissions from Source

D.1 Encourage private and public operators to pursue cleaner vehicles

Crieff already has a rapid charger for electric vehicles in the King Street public car park, and this is advertised not only on the Council's website, but also on various websites that promote electric car use. Local bus and coach operators in the area do have a relatively modern fleet, but when upgrading could be encouraged to buy vehicles meeting the latest Euro engines standards. Operators could also be encouraged to use bio-fuels, electric vehicles and/or retro fitting existing vehicles.

Measure	Title
D.1	Encourage private and public operators to pursue cleaner vehicles
Definition	Key Intervention
a. Liaise with Local operators to promote the use of lower emission vehicles within Crieff b. The Council to look to include lower emission standards in their future Conditions of Contract for subsidised bus services c. Electric charging infrastructure	Encourage a reduction in emissions of NO ₂ and PM _s from companies operating vehicles in Crieff.
Responsible authority and other partners	Powers to be used
Perth & Kinross Council	Voluntary and contractual

D.2 Maintenance of the local/voluntary bus quality partnership

The continuation of a voluntary bus partnership to promote and share 'best practice'. The Council's Public Transport Unit will continue to work with local bus operators to promote best practice operational standards, including vehicle 'euro standards'.

Measure	Title
D.2	Maintenance of the local/voluntary bus quality partnership
Definition	Key Intervention
a. Continue to liaise with local bus operators, as well as the voluntary sector, to promote 'best practice' operational standards, including the promotion of the Scottish Government's Bus Emissions Abatement Retrofit (BEAR) Programme b. Look to improve the minimum 'euro standard' of vehicles operating in the AQMA.	Encourage good operational practices, including driving standards, which support the environmental agenda; whilst still providing high quality bus provision.
Responsible authority and other partners	Powers to be used
Perth & Kinross Council	Voluntary

D.3 School Travel Plans

All schools in Perth and Kinross have a School Travel Plan which is aimed at reducing the incidence of car usage, especially around the school gates. These are aimed at both pupils and staff. Several schools, including both Crieff Primary School and St Dominic's participate in the Travel Tracker initiative run by Living Streets Scotland and as part of the Crieff on the Go campaign; both primaries have received AQ and Travel Planning workshops. This should facilitate a modal shift from car to active travel, reducing transport emissions. It will also help inform, engage and empower locals to improve air quality in Crieff. There would be a co-benefit to greenhouse gas reduction.

Measure	Title	
D.3	School Travel Plans	
Definition	Key Intervention	
Encourage uptake of School Travel Plans to promote sustainable travel	Education of local pupils and staff on alternative/sustainable travel	
Responsible authority and other partners	Powers to be used	
Perth & Kinross Council	Voluntary	

D.4 Public Transport Improvements

After active travel, the next most desirable form of transport is the use of public transport; in the case of Crieff, this means bus travel. Work to improve local bus quality should further encourage the modal shift away from cars again reducing transport emissions

Measure	Title	
D.4	Public Transport Improvements	
Definition	Key Intervention	
a. Engage with key local stakeholders to consider enhanced public transport provision both within and serving Crieff b. To encourage the use of public transport as an alternative to using private vehicles. c. Continue to encourage, promote and increase awareness of public transport options through working with partner organisations. d. Look to identify additional funding sources to facilitate network enhancements.	Look at opportunities to provide additional public transport options, directly linking residential areas with key traffic generators. Identification of funding sources will be key both for revenue and capital developments.	
Responsible authority and other partners	Powers to be used	
Perth & Kinross Council	Voluntary	

D.5 Restrict access for polluting vehicles within the AQMA

The introduction of a vehicle access restriction scheme would allow for polluting vehicles to be limited in regards to how they access the Crieff high street corridor. This would allow for a reduction in emissions from transport sources. This measure would also allow for a review into loading/unloading on the Crieff high street corridor and how this could be altered to further reduce emissions from these sources.

An access regulation scheme may be applicable at Crieff's AQMA; this depends on the outcomes from the proposed NLEF assessment.

Measure	Title	
D.5	Restrict access for polluting vehicles within the AQMA	
Definition	Key Intervention	
Appraise the Crieff AQMA in line with the future NLEF and put in place a scheme as recommended.	This may involve Low Emission or Clean Air Zones or other Access Regulation Schemes. It may also involve Traffic Management Vehicle Licensing Regulations or other measures.	
Assess the possible provision of access restrictions for vehicles loading/unloading.		
Responsible authority and other partners	Powers to be used	
Perth & Kinross Council & Transport Scotland/BEAR Scotland	LAQM statutory duties & Traffic Regulation Orders	

D.6 Introduce eco schemes for HGV and bus operators

The introduction of an eco-scheme would raise awareness among commercial vehicle operators to improve air quality through improved fleet environmental performance. It would provide recognition, guidance and advice to operators of goods vehicles, buses and coaches on operational and environmental performances. It would be attractive to operators on the potential for environmental benefits and for the reduction in operational costs. This should help to reduce both transport emissions affecting air quality and greenhouse gases.

Measure	Title	
D.6	Introduce Eco Star scheme for HGV and bus operators	
Definition	Key Intervention	
Promote awareness among commercial vehicle operators of improved fleet environmental performance	To reduce emissions from commercial vehicles by improving environmental efficiency of operations	
Responsible authority and other partners	Powers to be used	
Perth & Kinross Council & Eco Stars	Voluntary	

E. Reduce Emissions by Reducing Demand for Traffic

E.1 Promotion of car sharing and development of car clubs

PKC participates in the TACTRAN Liftshare scheme and this is promoted on the Council's and TACTRAN website. There will also be further promotion as part of the Smarter Choices, Smarter Places (SCSP) projects. This should reduce transport emissions and greenhouse gas emissions.

Measure	Title	
E.1	Promotion of car sharing and development of car clubs	
Definition		Key Intervention
Continued and further promotion of this scheme.		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
Perth & Kinross Council/TACTRAN		Voluntary

E.2 Travel Plans for large institutions and businesses

All large businesses in Perth and Kinross are encouraged to produce a Travel Plan, sometimes in compliance with the conditions of a planning consent. Transport Planning works with large employers to encourage implementation of Travel Plans and has actively participated with employers such as Crieff Hydro in staff awareness sessions. This encourages a modal shift from away from car travel improving pollution levels and greenhouse gas emissions.

Measure	Title	
E.2	Travel Plans for large institutions and businesses	
Definition		Key Intervention
a. To encourage and assist large organisations to develop and implement travel plans. b. Work with local businesses to encourage the development/ 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
Perth & Kinross Council		Voluntary

E.3 PKC Corporate Travel Plan

A Corporate Travel Plan is currently being progressed and this will encourage active and sustainable travel modes to be used by all staff. The aim will be to achieve a modal shift away from single occupancy car use. This will have a direct bearing on air quality by reducing the amount of traffic on the roads. Eco driver training for PKC staff will also be considered as part of the Travel Plan to reduce vehicle emissions.

Measure	Title	
E.3	Create and implement PKC Corporate Travel Plan	
Definition		Key Intervention
PKC Corporate Travel Plan encompasses staff travelling to and from PKC workplaces and fleet operators for PKC.		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
Perth & Kinross Council/Sustrans/Tactran/Cycling Scotland/Paths for All (SCSP)		Voluntary

E.4 Promotion of Active Travel

Active travel is promoted and encouraged within the PKC Active Travel Strategy², alongside our 'On the Go' social marketing campaigns which are funded through SCSP. The Crieff on the Go campaign will continue to promote walking and cycling in the area, as well as the use of public transport as most journeys are very local in nature. To further encourage members of the community to adopt active and sustainable travel alternatives, walking and cycling infrastructure within Crieff will be improved. It is also recommended that as part of the AQAP, the Travel Guide is updated and reissued as required.

Measure	Title	
E.4	Promotion of Active Travel	
Definition		Key Intervention
To encourage members of the community to adopt cycling and walking as alternatives to using private vehicles. a. Continue to develop and promote active and sustainable travel through social marketing campaigns such as ‘Crieff On the Go’ b. Improve active travel infrastructure such as footpaths/pavements/cycle parking to encourage modal shift c. Continue to actively investigate available funding sources		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		
Perth & Kinross Council/Community Council/Business Sectors		

E.5 Awareness raising and education at local schools and community meetings

PKC have a 'Schools on the Go' package of workshops for both primary and secondary pupils, which is regarded as an example of best practice by Transport Scotland. These workshops encourage pupils to consider why active and sustainable travel is beneficial to the environment and health. The workshops will equip the community with the skills and knowledge to make informed choices that will influence future travel choices.

Measure	Title	
E.5	Awareness raising and education at local schools and community meetings	
Definition		Key Intervention
a. Continue to make information relating to local air quality management available through the Council website;		Continue to encourage and promote and increase awareness of active and sustainable transport options through working with partner organisations and the community.
b. Undertake a publicity campaign to raise awareness of the Crieff AQMA;		
c. Include reference to air quality in promotion of active travel to school campaigns.		
Responsible authority and other partners		Powers to be used
Perth & Kinross Council & Community Council		Voluntary

² Active Transport Strategy for Perth and Kinross, available at: <https://perth-and-kinross.cmis.uk.com/Perth-and-Kinross/Document.ashx?czJKcaeAi5tUFL1DTL2UE4zNRBcoShgo=mZcCnujHqiTukOtiNVvedggYITs7XU2kYZGUKY9TX0HwyoLS84Z%2b1g%3d%3d&rUzwRPF%2bZ3zd4E7lkn8Lvw%3d%3d=pwRE6AGJFLDNIh225F5QMaQWCtPHwdhUfCZ%2fLUQzgA2uL5INRG4idQ%3d%3d&mCTIbCubSFFxsDGW9IXnlq%3d%3d=hFflUdN3100%3d&kCx1AnS9%2fWZQ40DXFvEw%3d%3d=hFflUdN3100%3d&uJovDxwdjMPoYv%2bAJvYtyA%3d%3d=ctNJf55vVA%3d&FqPIIEJYlotS%2bYGoBi5olA%3d%3d=NHdURQburHA%3d&d9Qji0ag1Pd993jsvOJqFvmyB7X0CSQK=ctNJf55vVA%3d&WGewmoAfeNR9xqBux0r1Q8Za60lavYmz=ctNJf55vVA%3d&WGewmoAfeNQ16B2MHuCPMRKZMwaG1PaO=ctNJf55vVA%3d>

E.6 Cycling and walking routes to be linked in with the Campus for Sport

Accessibility audits are currently being conducted in Crieff, which will provide information on the current infrastructure and also suggest where travel routes could be improved or upgraded.

Action Plan for future improvement works to be carried out and allow for more robust funding bids to be made to funding partners such as Sustrans.

Measure	Title	
E.6	Cycling and walking routes to be linked in with the Campus for Sport	
Definition		Key Intervention
a. Undertake an audit on walking & cycling infrastructure for Crieff		Improve and develop walking and cycling routes, to encourage active transport.
b. Create a walking and cycling infrastructure Action Plan		
Responsible authority and other partners		Powers to be used
Perth & Kinross Council/Sustran/Crieff Community Groups/Council		Voluntary

E.7 Provision of PKC “Champions” for transportation methods

The Transport Planning team within PKC works in partnership with community groups to encourage them to take ownership of projects and to promote local initiatives regarding active and sustainable travel. Our ‘On the Go’ campaigns are very much seen as a partnership and PKC actively encourages local walking or cycling groups to get involved and to champion their modes of travel.

Measure	Title	
E.7	Provision of PKC “Champions” for transportation methods	
Definition		Key Intervention
Engage with local groups to promote active travel within Crieff.		To encourage community involvement and ownership of promoting active and sustainable modes of travel within and around Crieff.
Responsible authority and other partners		Powers to be used
Perth & Kinross Council/Local Community Groups/Community Council		Voluntary

F. Reduce Emissions from Non-Transport Sources

F.1 Review Biomass Installations and other developments that may to cause pollution

The Environmental Health Team, as internal consultees for development management, will continue to request and assess all planning applications for Crieff that are specifically for biomass installations and other developments that cause pollution. The screening process will ensure that all new biomass installations will not have an adverse effect on air quality especially within the AQMA.

Measure	Title	
F.1	Biomass Installations and other developments - minimise developments which causes pollution	
Definition		Key Intervention
Consider air quality in planning decisions for new biomass installations and other types of development likely to cause pollution by carrying out initial screening process to determine if an air quality assessment is required.		Continue to assess new biomass installations and other types of development likely to cause pollution to ensure air quality is considered at the planning development stage.
Responsible authority and other partners		Powers to be used
Perth & Kinross Council		Voluntary

G. Other Measures

G.1 Increase AQ monitoring network

PKC will continue to monitor air quality within Crieff and to ensure that monitoring is in line with LAQM statutory duties, thus ensuring that monitoring data is robust for annual reports and the decisions on air quality measures are well informed.

Measure	Title	
G.1	Increase AQ Monitoring network	
Definition		Key Intervention
Continue to evaluate and review monitoring network: a. Establish PM _{2.5} monitoring within AQMA b. Review Real Time Monitors location		Continue to access and review monitoring to collate accurate data to ensure more accurate and informed decisions on air quality measures, modelling and reporting.
Responsible authority and other partners		Powers to be used
Perth & Kinross Council		Voluntary / Statutory

G.2 Regional modelling study

PKC with Consultants Ricardo Energy & Environment have developed a regional model for Perth and Kinross which encompasses Crieff. The model will allow more continuity with regards to planning applications that require an Air Quality Assessment. The model will predict any future exceedances of the Air Quality Objectives within the Crieff area which may also have a detrimental effect on the AQMA, with regards to future developments.

Measure	Title	
G.2	Regional AQ modelling study	
Definition		Key Intervention
To establish a Crieff regional dispersion model for NO ₂ & PM ₁₀ & PM _{2.5} .		To ensure a more consistent air quality evidence based proactive model that can anticipate issues of air quality rather than react to them and will also aid and support the evaluation of planning applications.
Responsible authority and other partners		Powers to be used
Perth & Kinross Council & AQ Consultants		Voluntary

G.3 Cycling and walking routes to be incorporated into transport model

The Crieff transport model allows for different transport scenarios to be modelled, including walking and cycling routes, therefore allowing an assessment of the feasibility of these routes to be made. PKC will work with other partners, including our term consultants to investigate this option.

Measure	Title	
G.3	Cycling and walking routes to be incorporated into transport model and their feasibility assessed	
Definition		Key Intervention
a. Incorporate walking and cycling routes into the transport model b. Assess feasibility of routes and consult with the community c. Progress a modal shift towards walking and cycling		To identify and develop walking and cycling routes within Crieff to encourage the uptake of active travel within the Crieff Community.
Responsible authority and other partners		Powers to be used
Perth & Kinross Council		Voluntary

G.4 Transport assessment for developments to be required as part of the planning process

The Local Development Plan contains a policy on Transport Standards and Accessibility Requirements, which applies to all development proposals that involve significant travel generation. Its aims include reducing travel demand by car and incorporating appropriate mitigation measures on and off-site to enhance active travel and public travel provision. It sets out that transport assessments should be prepared and implemented for significant travel generating developments; and that supplementary guidance is provided that explains when a travel plan and transport assessment is required. Mitigation measures could include a requirement that development proposals support the provision of infrastructure necessary to support positive changes in transport technologies, such as charging points for electric vehicles.

Measure	Title
G.4	Transport assessment for developments to be required as part of the planning process
Definition	Key Intervention
a. Review of Local Development Plan (LDP3) policy on Transport Standards and Accessibility Requirements (TA1) b. Adoption of non-statutory guidance for transport alongside the reviewed policy c. Developers to be required to provide financial contribution(s) towards local bus services if there are identified as significant trip generators.	The consideration of additional criteria requiring new development proposals to support the provision of infrastructure such as charging points for electric vehicles.
Responsible authority and other partners	Powers to be used
Perth & Kinross Council	Statutory: Town & Country Planning (Scotland) Act 1997 as amended by the Planning etc. (Scotland) Act 2006

The Stakeholders having undertaken evaluation criteria for all measures have compiled a summary of the results of the assessment which is presented in Table 4 below.

Each of the measures have been evaluated following a specific criteria, the evaluation process is detailed in Appendix 6. Also included in Table 4 are results from the public consultation on the measures.

Table 4: Action Plan Measures (to be read in conjunction with Section 5)

Action Plan Measures											
No.	Measure Title	Potential Air Quality Impact Zero 0% Small 1% Medium 2-5% Large > 5%	Estimated Costs Low ≤£20k Medium £20k≤£60k High £60k≤£200k Very High ≥£200k	Cost Effectiveness Low ≤ 4 Med 5-9 High ≥10	Public Consultation Feedback	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Short Term 1-2 yrs Medium Term 3-6 yrs Long Term > 6yrs
A. Strategic Measures											
A.1	Liaise with the Scottish Government regarding the consideration of national measures to reduce background concentrations of PM.					Y	Unknown	Y	Y	Scottish Govt & PKC	Medium/Long
A.2	Improving Links with Local Transport Policies					Y	N	Y	Y	PKC Transport Planning	Medium
A.3	Improving Links with Regional Transport Strategy					Y	N	Y	Y	PKC Transport Planning & TACTRAN	Medium
A.4	Ensure Integration of AQ with other Council strategies and Policies					Y	N	Y	Y	PKC Planning	Medium
A 5	Local Development Plan – Assess merit of further development in Crieff					Y	Y	Y	Y	PKC Planning	Long
B. Move Traffic Away from AQMA											
B.1	Redirect local road traffic movements away from A85	Medium	Medium/High	6	30% Agree 31% Neutral 39% Disagree	Y	Y	Y	Y	PKC Roads & Transport Scotland	Medium
B.2	Incentivise parking out with AQMA (e.g. reduce/remove on-street parking, increased signage)	Medium	Medium/High	6	61% Agree 16% Neutral 24% Disagree	Y	Y	Y	Y	PKC	Short/Medium

Action Plan Measures											
No.	Measure Title	Potential Air Quality Impact Zero 0% Small 1% Medium 2-5% Large > 5%	Estimated Costs Low ≤£20k Medium £20k≤£60k High £60k≤£200k Very High ≥£200k	Cost Effectiveness Low ≤ 4 Med 5-9 High ≥10	Public Consultation Feedback	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Short Term 1-2 yrs Medium Term 3-6 yrs Long Term > 6yrs
C. Traffic Management											
C.1	Possible provision of smart parking in Crieff	Small	High	2	45% Agree 35% Neutral 20% Disagree	Y	Y	Y	Y	PKC Transport Planning	Medium
C.2	Urban Traffic Control Systems Congestion Management	Medium	High	4	81% Agree 11% Neutral 8% Disagree	Y	Y	Y	Y	Transport Scotland & PKC Roads	Medium
C.3	Anti –idling enforcement	Small	Medium	3	65% Agree 18% Neutral 16% Disagree	Y	Y	Y	Y	PKC	Medium
C.4	Undertake a review of the current locations of pedestrian crossings	Small	Low	4	58% Agree 24% Neutral 18% Disagree	Y	Y	Y	Y	Transport Scotland & PKC	Short
C.5	Limit or prioritise traffic turning right on to High Street	Medium	High	8	50% Agree 29% Neutral 21% Disagree	Y	Y	Y	Y	Transport Scotland & PKC Roads	Short
D. Reduce the Emissions from Source											
D.1	Encourage Private and public operators to pursue cleaner vehicles	Small	Medium	3	82% Agree 10% Neutral 8% Disagree	Y	Y	Y	Y	PKC	Long
D.2	Maintenance of the Local/ Voluntary Bus Quality Partnership	Small	Low	4	73% Agree 21% Neutral 6% Disagree	Y	Y	Y	Y	PKC Public Transport Unit	Long
D.3	School Travel Plans	Small	Low	4	80% Agree 16% Neutral 3% Disagree	Y	N	Y	Y	PKC Roads & PKC Public Transport Unit	Long

Action Plan Measures											
No.	Measure Title	Potential Air Quality Impact Zero 0% Small 1% Medium 2-5% Large > 5%	Estimated Costs Low ≤£20k Medium £20k≤£60k High £60k≤£200k Very High ≥£200k	Cost Effectiveness Low ≤ 4 Med 5-9 High ≥10	Public Consultation Feedback	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Short Term 1-2 yrs Medium Term 3-6 yrs Long Term > 6yrs
D.4	Public Transport Improvements	Small	Medium	3	62% Agree 24% Neutral 15% Disagree	Y	Y	Y	Y	PKC Public Transport Unit	Long
D.5	Restrict access for polluting vehicles within the AQMA	Medium	High	4	40% Agree 20% Neutral 40% Disagree	Y	Y	Y	Y	Transport Scotland & PKC	Long
D.6	Introduce ECO Stars scheme for HGV and bus operators	Small	Medium	3	77% Agree 19% Neutral 3% Disagree	Y	Y	Y	Y	PKC	Short
E. Reduce Emissions by Reducing Demand for Traffic											
E.1	Promotion of liftsharing and development of car clubs	Small	Low	4	51% Agree 27% Neutral 22% Disagree	Y	N	Y	N	PKC & TACTRAN	Short/ Medium
E.2	Travel Plans for large institutions and businesses	Small	Low	4	62% Agree 16% Neutral 21% Disagree	Y	Y	Y	N	PKC Planning & TACTRAN	Short
E.3	Create and Implement PKC Corporate Travel Plan	Small	Low	4	74% Agree 12% Neutral 14% Disagree	Y	N	Y	Y	PKC & TACTRAN	Medium
E.4	Promotion of active travel	Small	Low	4	70% Agree 20% Neutral 10% Disagree	Y	Y	Y	Y	PKC	Short
E.7	Awareness raising and education, presentations at local schools/ community meetings	Small	Medium	3	70% Agree 27% Neutral 3% Disagree	N	N	N	N	PKC	Short
E.8	Cycling and walking routes to be routed to link in with the campus for sport.	Small	Medium	3	66% Agree 21% Neutral 13% Disagree	Y	Y	Y	Y	PKC	Short

Action Plan Measures											
No.	Measure Title	Potential Air Quality Impact Zero 0% Small 1% Medium 2-5% Large > 5%	Estimated Costs Low ≤£20k Medium £20k≤£60k High £60k≤£200k Very High ≥£200k	Cost Effectiveness Low ≤ 4 Med 5-9 High ≥10	Public Consultation Feedback	Potential Co-environmental Impacts	Risk Factors	Potential Social Impacts	Potential Economic Impacts	Lead Authority	Short Term 1-2 yrs Medium Term 3-6 yrs Long Term > 6yrs
E.9	Provision of PKC "Champions" for transportation methods	Small	Low	4	50% Agree 20% Neutral 30% Disagree	Y	N	Y	N	PKC & Crieff Voluntary Groups	Short
F. Reduce Emissions from Non-Transport Sources											
F.1	Review Biomass installations & other developments likely to cause pollution	Small	Low	4	41% Agree 45% Neutral 14% Disagree	Y	N	Y	Y	PKC Planning	Short
G. Other Measures											
G.1	Increase AQ Monitoring Network:	Zero	Medium	0		N	N	N	Y	PKC	Medium/Long
G.2	Regional AQ Modelling Study	Zero	Low	0		N	N	N	Y	PKC & AQ Consultant	Short
G.3	Cycling and walking routes to be incorporated into transport model	Small	Low	4		Y	N	Y	Y	PKC	Short
G.4	Transport assessments for developments to be required as part of the planning process	Small	Low	4		Y	Y	Y	Y	PKC Transport Planning	Medium

7 Appendices

Appendix 1: AQMA Order

Environment Act 1995 Part IV, Section 83(1)

Perth and Kinross Council

AQMA Order

Perth and Kinross 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 "Perth and Kinross Council Air Quality Management Area (No2) Order" and shall come into effect on the Fourteenth day of April 2014.

The area shown in red on the attached maps 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 at the Y-Junction at Perth Road and Dollerie Terrace, follow the A85 east to East High Street, the Cross, High Street, James Square then on to West High Street stopping at the junction of Galvelmore Street and Lodge Street and north up Comrie Street to the Y-Junction at Coldwells Road and mid point of Comrie Street. The AQMA area will take in the whole of the buildings along East High Street /High Street /West High Street /and Comrie Street.

This Order and map may be viewed at all public Council offices, all libraries (including mobile ones) and on the Council Website.

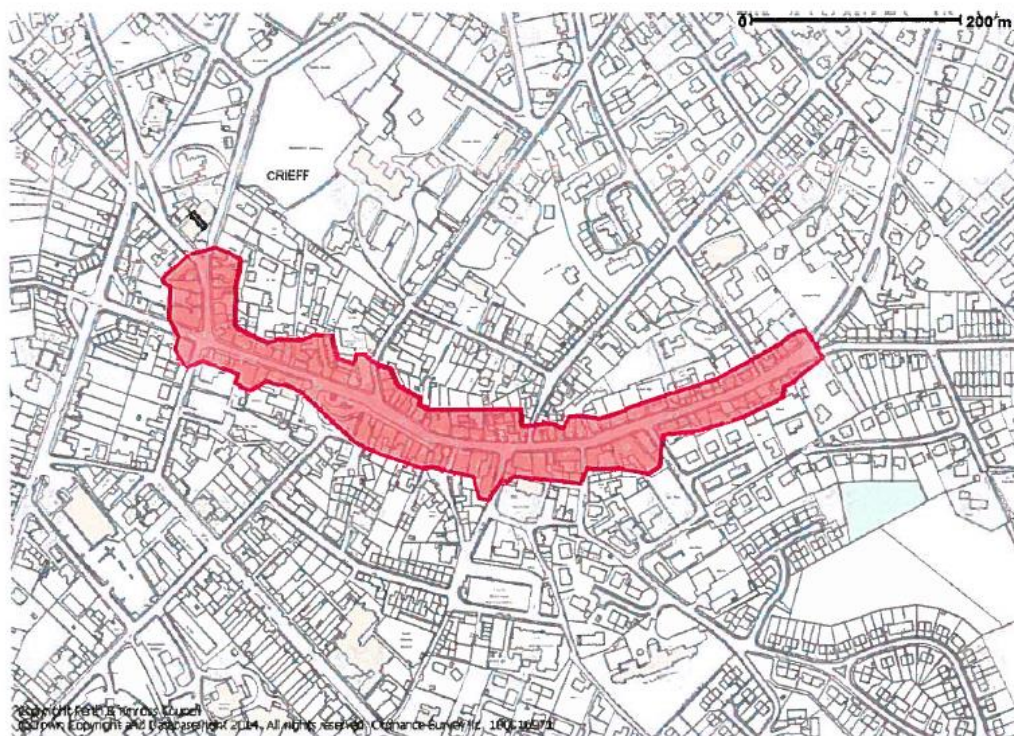
This area is designated in relation to a breach of the nitrogen dioxide and fine particles (annual mean) objectives as specified in the Air Quality (Scotland) Regulations 2000, as amended.

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 Perth and Kinross Council and subscribed for them and on their behalf by Ian Taylor Innes their Head of Legal Services and Proper Officer for the purposes hereof at Perth on the Tenth day of April Two thousand and fourteen.



This is the map referred to in the foregoing Order entitled the “Perth and Kinross Council Air Quality Management Area (No2) Order”



Appendix 2: Existing Strategies and Policies Relevant to Air Quality in Crieff

A. Local Transport Policies

i. Shaping Perth's Transport Future

In order to shape transport at a local level in Perth, PKC have adopted a transport strategy for Perth to address congestion locally. The strategy focuses mainly on the city of Perth however the key transport issues it highlights are applicable to Crieff, these are:

- Walking and Cycling - Unattractive due to road traffic, better routes required.
- Bus Network - congestion caused by bus traffic, reliability of existing bus serves.
- Local Road Network - constraints on local road network, resulting in congestion

The strategy adopts the visions and objectives set out by the regional and national transport strategy.

ii. Perth Traffic and Transport Issue Transport Appraisal

The Perth Traffic and Transport Issues Transport Appraisal were carried out in 2010. The transport appraisal was commissioned by PKC to assess the transport issues in and around Perth. The study was conducted in accordance with the Scottish Transport Appraisal Guidance (STAG).

The Appraisal recognises that air pollutants can cause local problems if they occur at high concentrations. The traffic modelling indicated that the existing road network in Perth could not support the anticipated future development.

Although the appraisal was specifically for Perth the aforementioned principle is also relevant to Crieff in that high concentrations of ambient air pollutants can cause local issues.

B. Community Plan

PKC Community Plan (Local Outcomes Improvement Plan) 2017-2027 is a plan for improving the lives and experiences of everyone who lives, works and visits Perth & Kinross.

The purpose of the Community Plan is to provide strategic direction for Perth and Kinross for the area, local communities and individuals. One of the underpinning values within the plan is sustainability, to shape the economic, social and environmental impacts of decision making and activities within local communities.

One objective is to create safe and sustainable places within P&K for future generations which include specific actions that relate to AQ: By

- 2018/19 there will be 'AQAPs for Perth City and High Street area in Crieff'
- 2020/21 there will be 'Improved health and wellbeing of the local community as a result of reducing air pollution in Perth and Crieff'

PKC recognise that the challenges cannot be addressed by one organisation; they require multiple organisations working together to understand the changing environment and to improve and sustain the wellbeing of local communities.

The Crieff Community Trust & Crieff Community Council in conjunction with Crieff & Upper Strathearn Partnership developed a Community Action Plan for Crieff 2013-2018. This action plan is currently being refreshed for 2019-2024, with plans to launch it later in 2019.

Appendix 3: Consultation on the Draft Air Quality 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;
- SEPA;
- 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.
- NHS Tayside

PKC have a serious commitment to ethics and equality regarding public consultations and in turn carried out a variety of consultation exercises beginning on 7 January 2019 and ending 18 February 2019.

The beginning of the public consultation involved the release of a draft AQAP document which was made available on the PKC website and in paper form in various locations throughout Perth, Crieff and Comrie in order to maximise public engagement with the plan. Consultation questionnaires were also released with the action plans again in both online and paper format.

The online survey was created using the survey medium KwikSurveys. Social media was used to distribute the URL for the online survey and it was posted on the PKC website and emailed to some 200 individuals, businesses and stakeholders throughout the Strathearn area.

Paper versions of the questionnaire were distributed throughout Strathearn through face to face hand-outs, posted through doorways on the A85 and handed into community hubs and businesses in the area. These paper questionnaires contained FREEPOST PKC envelopes in order to ensure no cost was incurred to the public and responses could be maximised.

Both local and national organisations were encouraged to forward formal responses out with the questionnaire format in order to be able to further voice their professional opinion in a way that suited them.

PKC also held 2 consultation events during the public consultation period. These events were advertised via the distribution of leaflets which also aimed to educate the public on the issue. Both a midweek evening event and a weekend daytime event were chosen in an attempt to increase attendance rates at these events which were held on Wednesday 9 January 2019 from 17:00 to 19:00 and on Sunday 13 January from 12:00 to 15:00.

The format of these events included a presentation by Regulatory Services Principle Officer Kirsty Steven of PKC and by Air Quality Consultant, Stephen Stratton of Ricardo Energy & Environment. This presentation detailed the causes of the exceedances on the Crieff high street corridor in detail and the action planning process itself in order to inform the attendees further. Following the presentation, the attendees were encouraged to take part in a workshop where they were able to

voice how they feel air quality in Crieff could be improved and their thoughts on the implications of the proposed measures. This was complimented by a question and answer session where the public were encouraged to speak to representatives of PKC and Ricardo Energy & Environment and view the various materials regarding the AQMA placed around the events.

The online consultation survey was viewed 127 times and 66 responses were received. Another 4 responses were submitted separately and a small number of organisations such as SEPA and The Tayside and Central Scotland Transport Partnership (TACTRAN) submitted formal written consultation responses.

The results of the public consultation have been made available on the PKC Consultation Hub website at: <https://consult.pkc.gov.uk/change-and-improvement/crieff-draft-air-quality-action-plan-consultation/>

Following consultation and the formal adoption of the Action Plan, the Council is required to submit annual Action Plan progress updates as part of the Annual Progress Report submission to the Scottish Government and SEPA.

Appendix 4: Conclusions of LAQM Review and Assessments

Summary of LAQM Review and Assessment in Perth and Kinross

A. Updating and Screening Assessment 2009

The 2009 Updating and Screening Assessment (USA) identified annual mean concentrations above the Air Quality Strategy (AQS) objective of $40\mu\text{g.m}^{-3}$ at two sites in Crieff (out with Perth Centre AQMA) during 2008. As a result, two additional monitoring sites at the façade of buildings were introduced in Crieff.

B. Updating and Screening Assessment 2012

The 2012 USA started the fifth round of review and assessment for PKC. During 2011 the diffusion tubes in Crieff continued to show NO_2 levels above the objective, therefore PKC commissioned Ricardo AEA to conduct a Detailed Assessment.

C. Detailed Assessment Crieff (2012)

A Detailed Assessment was conducted to investigate the magnitude and spatial extent of exceedances of nitrogen dioxide (NO_2) and particulate matter (PM_{10}) annual mean along the A85 in Crieff.

The study concluded that exceedances of the NO_2 annual mean objective of $40\mu\text{g.m}^{-3}$ occurred at locations with relevant exposure in 2011. The exceedances are in areas along East High Street and West High Street. The study also concludes that exceedances of the Scottish PM_{10} annual mean objective of $18\mu\text{g.m}^{-3}$ occurred at locations with relevant exposure in 2011. The exceedance areas for PM_{10} are slightly larger than for NO_2 , but are still confined to short stretches of East High Street and West High Street.

NO_2 and PM_{10} concentrations were modelled at two heights, 1.5 m and 4 m to represent relevant exposure at ground floor height and 1st floor height. Figure 3 and Figure 4 show contour plots with annual mean NO_2 concentrations along the A85 in Crieff at the two specified heights during 2011. The results clearly showed that several residential properties lie within the exceedance areas for both NO_2 and PM_{10} at 1.5m and 4m height. The exceedance area for PM_{10} is larger than that for NO_2 .

The Detailed Assessment recommended that PKC should consider declaring an AQMA for the NO_2 and PM_{10} annual mean objectives in the areas of the East High Street and West High Street in Crieff. As a result of the assessment PKC declared an AQMA in Crieff in April 2014.

D. Further Assessment Crieff (2015)

The Further Assessment was conducted in May 2015 to assess the magnitude and spatial extent of any exceedances of the annual mean air quality objectives for NO_2 and PM_{10} within the Air Quality Management Area (AQMA) that was declared at Crieff's High Street corridor in April 2014. The AQMA boundary within Crieff is presented in Figure 1.

The study confirmed the findings of the previous Detailed Assessment, namely that there were exceedances of the annual mean NO_2 objective and annual mean PM_{10} objective where relevant exposure exists. The monitoring and dispersion modelling carried out to support the Further Assessment indicated that exceedances of the NO_2 and PM_{10} annual mean objectives were still occurring within the Crieff AQMA. The boundaries of the AQMA were therefore still appropriate and did not require to be revoked or amended at the time of the Further Assessment.

Within the Crieff AQMA, the dispersion modelling results indicated that up to 70 residential properties within the AQMA were exposed to exceedances of the annual mean NO₂ and PM₁₀ objectives during 2012, equating to an exposed population of approximately 153 people.

The further assessment estimated that emission reductions of road NO_x (first noted) in the Crieff AQMA of up to 22% were required in order to achieve compliance with the annual mean NO₂ objective at all locations of relevant exposure. For compliance with the annual mean PM₁₀ objective, it was estimated that a reduction in the road contribution of PM₁₀ of up to 46% was required.

E. Source Apportionment Analysis

As part of the 2015 Further Assessment, Source Apportionment was undertaken to quantify the contributions of different pollutant sources to ambient concentrations. This aims to allow the Local Authority's Action Plan to target specific sources when attempting to reduce pollutant concentrations in the AQMA. Tailpipe emissions are predominantly NO_x which is converted to NO₂ through chemical reactions, therefore emissions of NO_x are analysed.

The source apportionment for the Crieff AQMA assessment:

- Confirmed that exceedances of the NO₂ and PM₁₀ objective are due to road traffic.
- Determined the extent to which different vehicle types are responsible for the emission contributions to NO_x/NO₂ and PM₁₀.
- Quantified what proportion of total NO_x and PM₁₀ are due to background emissions, or local emissions from busy roads in the local area. Quantifying emissions aided PKC to focus actions on local traffic movements.

Examination of the source apportionment results indicates that:

- The proportion of emissions from queuing traffic is higher at the western end of West High Street than at other locations. Traffic surveys indicated that traffic appears to queue regularly throughout the day at this location with longer queues occurring during peak periods; this may be when vehicles are waiting to turn right onto Comrie Street.
- The source apportionment also indicated that the highest proportion of NO_x emissions at all receptors is from HGV's and cars.
- NO_x and PM₁₀ emissions from buses are relatively low when compared to other vehicle types.

It was also evident from the results that background PM₁₀ concentrations are responsible for a large proportion of PM₁₀ concentrations within Crieff. In order to reduce background concentrations national policies and measures are required to address background PM₁₀ concentrations across Scotland. PKC will work with Scottish Government in support of any national PM reduction measures.

F. Scenario Analysis

Following the conclusions from the source apportionment analysis, three mitigation scenarios were modelled:

- Increase average speed via parking restrictions
- Reduce traffic queue lengths during peak periods at the junction of West High Street and Comrie Street
- Decrease in the number of HGV traffic passing through the AQMA/Restrict HGV traffic to Euro 5 and 6 vehicles

The Further Assessment concluded that the three mitigation scenarios modelled indicated that each option will provide reduction in both NO_x and PM₁₀ emissions. The predicted reduction in NO₂ concentrations were much greater than the predicted reduction in PM₁₀ concentrations for all scenarios tested.

The modelling results indicate that compliance with NO₂ annual mean objectives may be achievable by implementing the measures modelled in the further assessment. However it is likely that a combination of the measures will be required to reduce annual mean PM₁₀ concentrations sufficiently to be compliant with the Scottish objective.

Further information on all of these assessments can be found on the PKC website : <https://www.pkc.gov.uk/article/15307/Air-quality-reports>

Appendix 5: Traffic Survey

Summary

SYSTRA Ltd (SYSTRA) was contracted by Perth & Kinross Council (PKC) in August 2018 to develop a microsimulation traffic model of Crieff. The traffic model will be used to undertake scenario testing to inform air quality modelling work. The work will provide the evidence behind PKC's proposals in the Air Quality Action Plan (AQAP) for Crieff.

In order to develop an accurate traffic model, a detailed traffic survey programme was carried out to collect up-to-date traffic data in Crieff. The programme was conducted on 16 August 2018, and consisted of the following surveys:

- Junction Turning Counts
- Queue Length Surveys
- Automatic Number Plate Recognition (ANPR)
- Pedestrian Crossing Surveys
- Bus Dwell Time Surveys
- Parking Surveys

All surveys were carried out in consultation with PKC to ensure that special events and school holidays did not affect the data. The traffic surveys were based around the following time periods:

- AM peak period 07:00 – 10:00
- Inter peak period 10:00 – 16:00
- PM peak period 16:00 – 19:00

A. Turning Counts

Junction turn counts were undertaken at 34 junctions in Crieff. Of those sites, eight were carried out in the Crieff High Street corridor.

The traffic movements observed were tidal in nature, with traffic flows weighted towards A85T Perth during the morning period and coming from A85T Perth in the evening period. The PM peak traffic flows were also much higher than the AM peak period flows.

Traffic coming from A85T Comrie was around 25% of the traffic volume from Lodge Street and A822 Burrell Street. At the other end of town, traffic from Dollerie Terrace was around 25% of the traffic coming in from A85T Perth.

The junction of Lodge Street/Galvelmore Street/A85T Comrie Street was the busiest junction with a high proportion of turning traffic. This junction experiences a high proportion of right turns from West High Street onto A85T Comrie Street

Overall, there was a high proportion of turning traffic along the length of the Crieff high street corridor, reflecting its role as the key route in Crieff.

B. Queue Length Survey

Queue length data was taken for key junctions around Crieff throughout the entire survey period. Analysis of this data illustrated the cumulative queuing pattern for these junctions.

The junctions at A85/Comrie Street/Galvelmore Street and at A85 Perth Road/Dollerie Terrace experienced the most queuing during the survey. This was especially true during the PM peak period, in which there was a maximum of 33 vehicles queued at the A85/Comrie Street/Galvelmore Street junction.

During the AM period junctions near Strathearn Community Campus had the longest queues, in particular the junctions at Pittenzie Road/Hebridean Gardens/High School and Pittenzie Road/Broich Road

C. ANPR Survey

In order to understand the origin of trips passing through Crieff and through the AQMA, an Automatic Number Plate Recognition (ANPR) survey was undertaken. Several ANPR cameras were set up in various cordons to monitor those travelling into or around Crieff. These cameras would capture the registration plate of each passing vehicle, the time, vehicle classification (Car, LGV, HGV etc) and the direction of travel. The locations of the cameras are shown in [Figure 3](#).

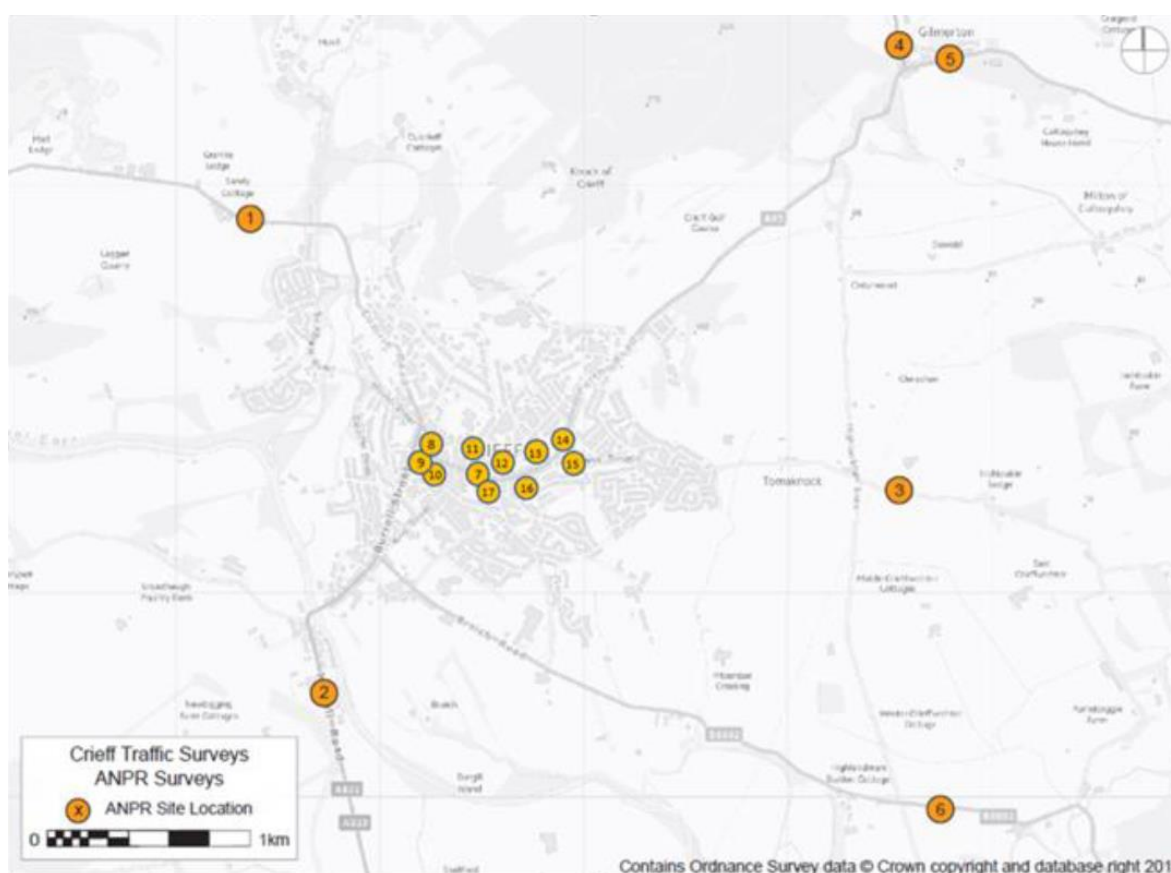


Figure 3: Map of Crieff Traffic Survey ANPR Camera Locations

The results of the ANPR surveys suggest:

Outer Cordon:

- During the morning peak period, around 93 trips (cars and vans) and 6 HGVs (trucks and coaches) were captured travelling through Crieff from A85T Comrie Road to A85T Perth Road, representing around 65% of the total traffic flow eastbound on A85T Comrie Road. Around 81 trips and 7 HGVs were captured travelling between A85T Perth Road to A85T Comrie Road, about 69% of the total traffic flow westbound on A85T Perth Road. Of the traffic captured heading north on A822 Muthill Road (into Crieff), 146 were captured again on strategic routes (heading out of Crieff).

- During the evening peak period, around 116 trips and 5 HGVs were captured travelling through Crieff from A85T Comrie Road to A85T Perth Road, representing around 51% of the total flow eastbound on A85T Comrie Road. Around 113 trips and 7 HGVs were captured travelling between A85T Perth Road to A85T Comrie Road, around 63% of the total flow westbound on A85T Perth Road. Of the traffic captured heading north on A822 Muthill Road (into Crieff), 191 were captured again on strategic routes (heading out of Crieff).

East Cordon:

- During the morning peak period, 373 trips and 14 HGVs were captured travelling from A85T Perth Road to A85T High Street, representing around 78% of the westbound flow on A85T Perth Road. About 383 trips and 25 HGVs were captured travelling between A85T High Street and A85T Perth Road, around 67% of the total flow eastbound on A85T High Street.
- During the evening peak period, about 677 trips and 15 HGV were captured travelling from A85T Perth Road to A85T High Street, representing around 75% of the westbound flow on A85T Perth Road. About 540 trips and 25 HGVs were captured travelling between A85T High Street and A85T Perth Road, around 58% of the total flow eastbound on A85T High Street.

West Cordon:

- During the morning peak period, around 374 trips and 22 HGVs were captured travelling from Lodge Street to A85T High Street, representing around 71% of the flow on Lodge Street. Over 200 trips and around 10 HGVs were captured travelling between A85T High Street and both A85T Comrie Road and Lodge Street.
- During the evening peak period, around 547 trips and 13 HGVs were captured travelling from Lodge Street to A85T High Street, representing around 75% of the flow on Lodge Street. Over 400 trips and around 10 HGVs were captured travelling between A85T High Street and Lodge Street.

A85T High Street:

- Both morning and evening peak data suggests that of the (matched) vehicles passing eastbound along Crieff High Street, around two thirds came from Lodge Street and around a quarter from A85T Comrie Street. Of those, a third were captured entering Crieff from A85T Comrie Road and a third from A822 Muthill Road.
- Of the (matched) vehicles passing westbound along the High Street, around half came from A85T Perth Road and a quarter from Dolerie Terrace. Of those, a third were captured entering Crieff from A85T Perth and around 10% from Gilmerton.

D. Pedestrian Crossings

Pedestrian crossing counts were carried out at two locations in Crieff town centre. These were located on the A85 west of Hill Street and on the A85 west of Church Street. The information obtained from these surveys suggested that the pedestrian crossing on the A85 west of Hill Street was the busier of the two locations, with around 60% more pedestrian movements occurring than at the crossing west of Church Street over the course of the survey.

E. Bus Stop Dwell Times

Bus stop dwell time surveys were carried out at two locations. The time each bus stopped at each of the bus stops was recorded, along with the bus service number and the time between the bus moving

off from the stop. A dwell time was then calculated for each bus using both bus stop locations. The following locations were surveyed:

- Stop 1 (Eastbound) A85 West of Hill Street (outside the former Drummond Arms Hotel)
- Stop 2 (Westbound) A85 East of Hill Street (Outside RS McColl)

A total of 82 buses were observed stopped at these locations during the survey period. The information gathered suggested that:

- The westbound bus stop (outside RS McColl) saw more buses stopped overall during the survey period
- On average, the eastbound bus stop (outside the former Drummond Hotel) had a greater bus dwell time for the AM, Inter and PM Peak periods.
- The Service 15/15A generally had the longer dwell time, probably reflecting the higher number of passengers boarding/alighting.

F. Parking Survey

Parking surveys were undertaken at a number of car parks within Crieff (James Square, King St, Leadenflower Road and Leadenflower Street) and on the A85T High Street between Coldwells Road and Strathearn Terrace. The surveys were conducted in 15 minute beats. In the case of the on-street surveys, the beats were carried out on both sides of the road and included on-street parking bays, blue badge parking bays and any illegal parking on double yellow lines. The data gives information on both parking occupancy and parking duration.

For the town centre car parks, the majority of vehicles parked for less than 2 hours, with greatest proportion parking for less than 15 minutes. For the on-street parking beats, the majority of vehicles parked for less than 2 hours, with 50% staying for less than 30 mins.

The town centre car parks are generally busier during the middle part of the day (0900-1500hrs). All have some residual (overnight) parked vehicles. The car park at James Square had a high occupancy rate, and due to its small size was at 100% capacity during the middle of the day. Car parks at King Street, Leadenflower Road and Leadenflower Street all remained below 100% capacity. Leadenflower road car park in particular did not exceed more than 50% capacity throughout the survey period.

The on-street parking beats suggest the high street is busy throughout the day, with the west end busier than the east end. A number of vehicles were captured double/illegally parked for short periods taking the occupancy over the 100% capacity.

G. Conclusion

The Crieff high street corridor is a core route through the area, with many vehicles turning onto or off the A85 regularly. The most used junctions in this route are the junctions at Lodge Street/Galvelmore Street/A85T Comrie Street and A85 Perth Road/Dollerie Terrace, where the longest queue lengths were found during the survey. During the morning, roads around Strathearn Community Campus have the longest queues.

On street car parking on the A85 is frequently over 100% capacity, with vehicles double/illegally parking for short periods. The car parks at King Street, Leadenflower Street and Leadenflower Road all remained under 100% capacity throughout the survey, with Leadenflower Road car park remaining below 50% capacity during the survey.

Appendix 6: Evaluation of Action Plan Measures

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:

- 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.
- A view is then expressed on how much of the traffic would actually be changed by the option.
- 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.
- 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%.

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)

These cost bandings may be subject to revision.

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		5	0	1	2	3
Neutral		4	0	4	8	12
Low		3	0	3	6	9
Medium		2	0	2	4	6
High		1	0	1	2	3
Very High						

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.

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.

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.

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.

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 Crieff
- Reduce or increase overall travel time
- Place additional requirements on operators.

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.

Table 5 below sets out the criteria adopted for defining the option as being feasible over the short, medium or long term, or as being unfeasible. Each option is assessed against each criterion. The final feasibility timeframe is defined according to which of the three assessments results in the longest of the four possible terms (short, medium, long or unfeasible). For example, an option for which powers are clear and for which impacts are well characterised but for which funding will be difficult to obtain would be assessed as feasible over the long term.

Table 5: Criteria for Feasibility Analysis

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

Appendix 7 - Glossary of Air Quality Terms

Air Quality Action Plan (AQAP)

When a Local Authority has set up an Air Quality Management Area, AQMA, it must produce an action plan setting out the measures it intends to take in pursuit of the Air Quality Objectives in the designated area

Air Quality Management Area (AQMA)

If a Local Authority identifies any locations within its boundaries where the Air Quality Objectives are not likely to be achieved, it must declare the area as an Air Quality Management Area (AQMA). The area may encompass just one or two streets, or it could be much bigger. The Local Authority is subsequently required to put together a plan to improve air quality in that area - a Local Air Quality Action Plan.

Air Quality Objectives

The Air Quality Objectives are policy targets generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances, within a specified timescale. The Objectives are set out in the UK Government's Air Quality Strategy for the key air pollutants.

Air Quality Standards

Air Quality Standards are the concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The Standards are based on assessment of the effects of each pollutant on human health, including the effects on sensitive sub-groups.

Air Quality Strategy

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland describes the plans drawn up by the Government and the Devolved Administrations to improve and protect ambient air quality in the UK in the medium-term. The Strategy sets Objectives for the main air pollutants to protect health. Performance against these Objectives is monitored where people regularly spend time and might be exposed to air pollution.

Annual mean

The annual mean is the average concentration of a pollutant measured over one year. This is normally for a calendar year, but some species are reported for the period April to March, which is known as a pollution year. This period avoids splitting a winter season between two years, which is useful for pollutants that have higher concentrations during the winter months.

Automatic Monitoring

Monitoring is usually termed "automatic" or "continuous" if it produces real-time measurements of pollutant concentrations. Automatic fixed point monitoring methods exist for a number of pollutants, providing high resolution data averaged over very short time periods. BAM, TEOM and FDMS instruments are all automatic monitors.

COMEAP

Committee on the Medical Effects of Air Pollutants, COMEAP is an Advisory Committee of independent experts that provides advice to Government Departments and Agencies on all matters concerning the potential toxicity and effects upon health of air pollutants.

Diffusion Tube Samplers

Passive diffusion tube samplers collect nitrogen dioxide and other pollutants by molecular diffusion along an inert tube to an efficient chemical absorbent. After exposure for a known time, the absorbent material is chemically analysed and the concentration calculated.

Dispersion Model

A dispersion model is a means of calculating air pollution concentrations using information about the pollutant emissions and the nature of the atmosphere. In the action of operating a factory, driving a car, or heating a house, a number of pollutants are released into the atmosphere. The amount of pollutant emitted can be determined from knowledge of the process or actual measurements. Air Quality Objectives are set in terms of concentration values, not emission rates. In order to assess whether an emission is likely to result in an exceedance of a prescribed objective it is necessary to know the ground level concentrations which may arise at distances from the source. This is the purpose of a dispersion model.

Emission Factor

An emission factor gives the relationship between the amount of a pollutant produced and the amount of raw material processed or burnt. For example, for mobile sources, the emission factor is given in terms of the relationship between the amount of a pollutant that is produced and the number of vehicle miles travelled. By using the emission factor of a pollutant and specific data regarding quantities of materials used by a given source, it is possible to compute emissions for the source. This approach is used in preparing an emissions inventory.

Exceedance

An exceedance defines a period of time during which the concentration of a pollutant is greater than, or equal to, the appropriate air quality criteria. For Air Quality Standards, an exceedance is a concentration greater than the Standard value. For Air Pollution Bandings, an exceedance is a concentration greater than, or equal to, the upper band threshold.

Local Air Quality Management (LAQM)

The Local Air Quality Management (LAQM) process requires Local Authorities to periodically review and assess the current and future quality of air in their areas. A Local Authority must designate an Air Quality Management Area (AQMA) if any of the Air Quality Objectives set out in the regulations are not likely to be met over a relevant time period.

Micrograms per cubic metre ($\mu\text{g}/\text{m}^3$)

A measure of concentration in terms of mass per unit volume. A concentration of $1 \mu\text{g}/\text{m}^3$ means that one cubic metre of air, contains one microgram (10^{-6} grams) of pollutant.

Oxides of Nitrogen (NO_x)

Combustion processes emit a mixture of nitrogen oxides (NO_x), primarily nitric oxide (NO) which is quickly oxidised in the atmosphere to nitrogen dioxide (NO_2). Nitrogen dioxide has a variety of environmental and health impacts. It is a respiratory irritant which may exacerbate asthma and possibly increase susceptibility to infections. In the presence of sunlight, it reacts with hydrocarbons to produce photochemical pollutants such as ozone. NO_2 can be further oxidised in air to acidic gases, which contribute towards the generation of acid rain.

Particulate matter (PM)

Airborne PM includes a wide range of particle sizes and different chemical constituents. It consists of both primary components, which are emitted directly into the atmosphere, and secondary components, which are formed within the atmosphere as a result of chemical reactions. Of greatest concern to public health are the particles small enough to be inhaled into the deepest parts of the lung. Air Quality Objectives are in place for the protection of human health for PM_{10} and $\text{PM}_{2.5}$ – particles of less than 10 and 2.5 micrometres in diameter, respectively.

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