

# **REPORT TO EXECUTIVE**

## **PORTFOLIO AREA: ENVIRONMENT AND INFRASTRUCTURE**

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**Date of Meeting:** 19 November 2007

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**Public**

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**Key Decision:** Yes

**Recorded in Forward Plan:** Yes

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**Inside Policy Framework**

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### **LOCAL AIR QUALITY MANAGEMENT: FINAL DRAFT AIR QUALITY ACTION PLAN**

**Title:** Local Air Quality Management: Final Draft Air Quality Action Plan

**Report of:** Director of Community Services

**Report reference:** CS 85/07

#### **Summary:**

The 1995 Environment Act requires the City Council to monitor air quality in its area and to produce an Action Plan to address air quality where necessary. This follows on from the declaration of two Air Quality Management Areas in the City in December 2005 and December 2006 applying to the A7, along Scotland Road/Kingstown Road and to Currock Street, respectively.

The Action Plan fulfills the Council's duty to pursue the achievement of air quality objectives in the Air Quality Management Areas.

**Note: in compliance with section 100d of the Local Government (Access to Information) Act 1985 the report has been prepared in part from the following papers: Previous Report to Executive 2 July 2007 – Local Air Quality Management: Draft Air Quality Action Plan Ref CS 33.07**

The Council is not under any legal obligation to achieve the objectives. However, through the implementation of the local measures included in this Final Draft Air Quality Action Plan and continued improvement in vehicle emissions nationally, it is believed that the nitrogen dioxide levels in Carlisle will reduce below the air quality standard by 2010.

Executive considered a Draft Air Quality Action Plan on 2 July 2007 and the information contained in a Further Assessment Report from consultants engaged by the council has now enabled the final draft Action Plan to be prepared.

**Recommendations:**

It is RECOMMENDED that:-

1. That members consider and comment on the final draft Air Quality Action Plan.
2. That members refer the final draft Action Plan to Community Overview and Scrutiny Committee on 22 November 2007 and Infrastructure Overview and Scrutiny Committee on 29 November 2007 for consideration and comment.

**Contact Officer:** David Ingham  
Environmental Quality Manager

**Ext:** 7328

**Note:** in compliance with section 100d of the Local Government (Access to Information) Act 1985 the report has been prepared in part from the following papers: Previous Report to Executive 2 July 2007 – Local Air Quality Management: Draft Air Quality Action Plan Ref CS 33.07

## **BACKGROUND INFORMATION AND OPTIONS**

### **1.1 Introduction**

The 1995 Environment Act requires the Council to produce an Action Plan to address air quality in the area. This follows on from the declaration of two Air Quality Management Areas in the City for Nitrogen Dioxide.

This report presents an Air Quality Action Plan which sets out 41 actions that have been identified to help reduce levels of Nitrogen Dioxide within Carlisle.

These actions are considered to strike an appropriate balance between direct and indirect costs of taking action and the benefit in terms of improved air quality. The types of action set out in the plan fall under the following headings:

- ◆ Improvements to the Road Network and introduction of traffic management schemes to reduce congestion.
- ◆ Encouraging walking and cycling.
- ◆ Encouraging use of public transport.
- ◆ Reducing emissions from non-transport related sources.
- ◆ Reducing emissions from road vehicles.
- ◆ Raising awareness of air quality issues.
- ◆ Implementation of land use and development control policies.

The Further Assessment has confirmed that the main source of the Nitrogen Dioxide air pollution is from motor vehicles using the road network. This Action Plan therefore is integrated with the Local Transport Plan and the Carlisle Renaissance Movement Strategy.

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## 1.2 **The Requirement for Further Assessment and Analysis**

- 1.2.1 Action Planning is an essential part of the local air quality management process where air quality monitoring and the review and assessment procedures have indicated that national measures will be insufficient to meet specific local problem areas.

Government requirement for the content of an Action Plan advises that due consideration be given to the following:

- ◆ Quantification of the source contributions to the predicted exceedences of the limit values. This allows the action plan measures to be effectively targeted.
- ◆ Quantification of the expected impacts of the proposed measures and where possible an indication as to whether these will be sufficient to ensure compliance with the objectives.

- 1.2.2 Where Air Quality Management Areas have been declared it is also a requirement for the Council to carry out a “Further Assessment” (which was formerly referred to as a Stage 4 Assessment).

This assessment is to provide a close examination and reassessment of all the relevant data but most importantly

- ◆ Source apportionment data.
- ◆ Assessment of the impact of certain of the measures outlined in the Action Plan.

- 1.2.3 The Air quality consultants ‘A.E.A. Technology’ were commissioned to carry out the Further Assessment work necessary in Carlisle. Their Further Assessment Report was received on 30 October 2007, which enabled the draft version of the Action Plan to be upgraded to incorporate their findings and conclusions.

## 1.3 **Further Assessment Report**

- 1.3.1 The AEA Technology Consultants report concluded that the dispersion model continues to predict areas within the declared AQMA’s where concentrations of

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nitrogen dioxide exceed the air quality objective and it is recommended that the AQMA's remain unchanged from the form in which they were declared because:

- Modelled and measured concentrations have not changed much since the AQMA's were declared
- Model predictions continue to show areas where members of the public will be exposed to nitrogen dioxide concentrations greater than the annual mean objective at relevant receptor locations
- Diffusion tube measurements continue to show concentrations in excess of the objective
- It remains possible, within the uncertainty of modelling that exceedence of the objective will occur throughout most or all of the area of the AQMA's.

1.3.2 The Consultants report agrees with the Councils assertion that traffic congestion and in particular heavy-duty vehicle emissions make the largest contributions to nitrogen dioxide concentrations in the AQMA's.

1.3.3 The Consultants scenario testing to quantify the potential benefits of the proposed range of measures to reduce traffic congestion and heavy-duty vehicle emissions, which are identified in the Air Quality Action Plan concluded that the measures would be effective in reducing nitrogen dioxide levels in the AQMA

#### 1.4 **Air Quality Action Plan**

1.4.1 The Draft Air Quality Action Plan was incomplete in that Further Assessment information was not available at the time of preparation and additional road traffic data was required to enable accurate assessment work to be carried out.

1.4.2 The final draft Air Quality Action Plan now contains all relevant information and both the content and the format render it suitable for submission to the Secretary of State.

#### 1.5 **Feedback from Initial Consultation**

1.5.1 The consultation process undertaken regarding the Draft Air Quality Action Plan resulted in comments and observations being received from the Cumbria County Council Local Committee (appendix 1)

This Committee at its meeting on 30<sup>th</sup> July 2007 endorsed the minutes of the Carlisle Highways and Transport Groups meeting of 18<sup>th</sup> July which resolved that

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i). Changes were required to a number of the Plans actions as detailed in the Air Quality Action Plan – Summary Table

ii). Referral is made to Cabinet requesting that the issue of bus Park n' Ride for Carlisle be removed from the Local Transport Plan and not be included in the emerging Local Development Framework.

It also stressed that this should not be included in the Air Quality Action Plan at this time.

1.5.2 With exception of the reference to Park and Ride these observations do not significantly amend the proposed action measures by the County Council.

1.5.3 The Carlisle Local Committee request that the Park and Ride proposals be removed from the Air Quality Action Plan have not been met and the Action Plan still includes proposals relating to Park and Ride

1.5.4 Observations from the City Councils Development Services Department regarding the comments of the Carlisle Local Committee regarding Park and Ride are as follows:

Park and Ride is established City Council policy through its Development Plan. Proposal T14 for Park and Ride in the 1997 adopted Carlisle District Local Plan is a saved policy which promotes Park and Ride. Policy T4 of the Revised Redeposit Local Plan has just gone through the Local Plan Inquiry. Whilst there were some representations to the policy these were minor issues rather than the principle of Park and Ride. There has been a number of supporting statements for the policy including one from Cumbria County Council. Officers consider there is no reason for the Inspector to exclude Park and Ride from the plan and the Inspector's Report will be binding on the City Council.

1.5.5 There are no additional comments or observations received from the other consultees.

## **2. CONSULTATION**

2.1 The following parties were consulted during the compilation of the Action Plan:

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Cumbria County Council Local Committee:- copy of the response is appended (appendix 1)

Cumbria County Council Highways Authority

Cumbria County Council Transport and Spatial Planning Dept

Stagecoach N.W. Bus Company

All relevant services/Team Managers within the Council

- 2.2 Further consultation will be necessary with Cumbria County Council before the final plan is submitted to DEFRA
- 2.3 It is proposed that the Action Plan be considered by members of Community Overview and Scrutiny Committee on 22 November 2007 and Infrastructure Overview and Scrutiny Committee on 29 November 2007.
- 2.4 Consultation will also take place regarding the Action Plan with Senior Management Team and Joint Management Team.

### 3. **RECOMMENDATIONS**

It is recommended that:

- 3.1 That members consider and comment on the Air Quality Action Plan.
- 3.2 That members refer the final draft Action Plan to Community Overview and Scrutiny Committee on 22 November 2007 and Infrastructure Overview and Scrutiny Committee on 29 November 2007 for consideration and comment.

### 4.0 **REASONS FOR RECOMMENDATIONS**

- 4.1 To ensure compliance with Council constitution and with Government requirements regarding Local Air Quality Management.

### 5.0 **IMPLICATIONS**

- Staffing/resources - Existing Staffing Resource
- Financial - Financial implications of individual proposals will be

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brought forward in separate reports. Subject to separate approval in each case. There is no financial commitment at this stage.

- |                       |   |  |
|-----------------------|---|--|
| ❑ Legal               | - | The Council is under legal obligation to carry out Local Air Quality Management.   |
| ❑ Corporate           | - | The Council is required to prepare an Air Quality Action Plan in respect of the two Air Quality Management Areas declared in Carlisle. The Action Plan supports priorities identified within the Corporate and Community Plans to reduce carbon emissions. |
| ❑ Risk Management     | - | Failing to meet the Government's requirements would be a reputation risk to the Council.   |
| ❑ Equality Issues     | - | See start of Chapter 2 in the Action Plan.   |
| ❑ Environmental       | - | The management of Local Air Quality is an important Part of the Council's objectives to maintain a healthy environment.  |
| ❑ Crime and Disorder  | - | Nil  |
| ❑ Impact on Customers | - | Nil  |



## APPENDIX 1

To: Fiona Donald,  
Environmental Quality Section,  
Community Services,  
Civic Centre,  
Carlisle,  
CA3 8QG

Dear Fiona,

Our Ref: T21-02

Your Ref: EP4/D

### Draft Carlisle Air Quality Action Plan

The draft Carlisle Air Quality Action Plan was considered by Carlisle Local Committee at its meeting on 30<sup>th</sup> July 2007. It endorsed the minutes of the Carlisle Highways and Transport Working Group's meeting of 18<sup>th</sup> July which resolved that a :-

- 1) Changes were required to a number of the Plans actions as set out below in the summary table.
- 2) Referral is made to Cabinet requesting that the issue of bus Park n' Ride for Carlisle, be removed from the Local Transport Plan and not be included in the emerging Local Development Framework.

AIR QUALITY ACTION PLAN – SUMMARY					
Action Plan Ref No	Action Measure	Feasibility	Date to be Achieved	Likely Air Quality Improvement	Recommendation to Committee
1	A new major road, the Carlisle Northern Development Route will be constructed to the	√√√√	2010	√√√√	Agreed as listed

	West of the City which will remove approximately 25% of through traffic from the A7 and the A595				
2	The possibility of providing a stronger route to ease congestion between the A6 and the A595 (either by a series of junction improvements or a new routes entirely) will be investigated	√√√√	Unable to Specify	√√√√	If not viewed as a new road then there would be minor alteration. Changed AQI from 5 ticks to 2
3	Investigate to improve traffic flows in the City particularly at signals along the A 7 and the A595 will take place during summer 2007	√√√√	2007	√√√√	Date to be changed to 2010 (after the DNDR is opened)
4	Within the emerging draft local plan, the City Council has set policies which target a number of areas such as Green Travel Plans and accessibility by different modes of sustainable transport. These policies will also contribute to improving air quality	√√√√	Ongoing	√√	Change Feasibility ticks from 2 to 3
7	Supplementary Planning Guidance will be produced on planning obligations to financial contributions from developers to movement and public realm	√√√√	2007	√√	Guidance will be issued later in 2007. The Guidance will encourage other forms of transport

	projects set out in the Development Framework and Movement Strategy				
8	The County Council has entered a Quality Bus Partnership with Stagecoach to improve bus route infrastructure	√√√√	Ongoing	√√	Agreed as listed
9	Bus priority measures will take place on Scotland Road, Wigton Road and London Road Including traffic signal priority	√√√√	2008/09	√√	Change date to be achieved to 2011
10	Smart Card Ticketing Solution will be developed on public bus services	√√√√	2007/08	√√	This is operational. There have been some 'teething' problems
11	Roadside publicity and telemarketing will be used to encourage bus patronage	√√√√	2007	√√	Change date to ongoing. This is promoted each year
12	Development of Park and Ride will take place during the LTP(2) plan	√√√√	2009/10	√√√√	It was stressed that this should NOT be included at this time. The Local Committee has already taken decisions against Park and Ride and the Group recommended a Referral to Cabinet to get it expunged from the LTP and the City Council be asked to do the same from the local Development framework.
14	A Cycle Development Action Plan will be implemented through LTP (2) which will provide safer and better maintained cycle	√√√√	Ongoing	√√√	Agreed as listed

	routes, more secure cycle parking, promotional programmes and improved signage				
15	A proposed Of Road Cycling Network has been developed for the City which makes use of green corridors.	Add √√√√	Ongoing	Add √√√	Add reference to on road cycle network and replaced developed with identified and remove reference to green corridors. Include Cumbria County Council as body responsible.
16	Cycling an Walking will be encouraged through promotional campaigns e.g. Bike Week (June 2007) and through regular features in Carlisle Focus Magazine and on the Council's website	√√√√√	Ongoing	√√	Agreed as listed
17	A cycling and walking guide for the City will be published by the end of 2007	√√√√√	2007	√√	It will be 2008 before the map is available.
18	Existing businesses will be encouraged to implement, monitor and review Travel Plans and promote more sustainable travel to their staff	√√√√√	Ongoing	√√	Feasibility ticks to be changed from 5 to 3
19	Travel plans will be required to be implemented and monitored through S106 agreements through the Development Control Process for all new developments that meet the criteria for travel	√√√√√	Ongoing	√√	Feasibility ticks to be changed from 5 to 3

	plan preparation				
20	Local Schools will be encouraged and supported in taking up the School Travel Plans through the 'Better Ways to School Programme'	√√√√	Ongoing	√√√	It was noted the Committee have made a Referral to Cabinet on the control of the Better Ways to School Programme. Reduce the AQI ticks from 3 to 2
28	The City Council and the County Council will develop and implement a comprehensive Car Parking Strategy	√√√√	2007	√√√√	This was underway but it will be 2008 before any Strategy is adopted and implementation will be ongoing thereafter. The date to be achieved should be changed from 2007 to ongoing.

Please let me know if you require any further information.

Yours sincerely

Allan McNicoll,  
Senior Transport Policy Officer.

# Environmental Quality

## Carlisle City Council



## Air Quality Action Plan

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## Executive Summary

Carlisle City Council's Air Quality Action Plan (AQAP) sets out the measures the Council along with its partners intends to take to achieve a reduction in nitrogen dioxide concentrations in the city and in particular those locations designated as Air Quality Management Areas. A reduction in nitrogen dioxide concentrations is needed to meet the annual average objectives for this pollutant set by the government.

The measures included in this AQAP are those which are currently considered to be the most cost effective and appropriate for Carlisle. They have been drawn up following consultation with residents, businesses and key stakeholders and have been reviewed by the council's air quality steering group.

The action plan measures seek to manage and continuously improve air quality at a local level whilst maintaining the level of access and development needed to maintain a vibrant, attractive and prosperous city.

Whilst many specific air quality improvement measures have been included in this AQAP the key action areas are as follows.

### **KEY ACTION AREAS FOR IMPROVING AIR QUALITY IN CARLISLE**

- **Improvements to the road network and introduction of traffic management schemes to reduce congestion**
- **Encouraging walking and cycling**
- **Encouraging use of public transport**
- **Reducing emissions from non-transport related sources**
- **Reducing emissions from road vehicles**
- **Raising awareness of air quality issues**
- **Implementation of land use and development control policies**

This action plan fulfills Carlisle City Council's legal responsibility to act in pursuit of the achievement of air quality objectives in the designated Air Quality Management Areas. The council is not under any legal obligation to achieve the objectives, however through implementation of the local measures included in this AQAP and the continued improvement in vehicle emissions predicted nationally, it is believed that nitrogen dioxide concentrations within Carlisle will reduce to below the air quality standard by - 2010 (awaiting confirmation from consultants).

Through the development and implementation of the Local Transport Plan (LTP 2) and the Carlisle Renaissance Movement Strategy and the monitoring of the AQAP, both Carlisle City Council and Cumbria County Council will



continue to address air quality issues in the city and seek to deliver the air quality objectives wherever possible.

# **CHAPTER 1 - Introduction**

## **Aims and Objectives**

The main aim of the Action Plan is to deliver improved air quality across the Carlisle City Council, and in particular those locations which have been designated as Air Quality Management Areas. In order to achieve this the Action Plan has the following aims and objectives.

- To ensure that air quality is integrated into other relevant City Council and County Council authority plans, strategies and activities
- To develop closer relationships with organisations that can help deliver improved air quality.
- To identify new parties that can work with Carlisle City Council to improve air quality issues amongst the population of Carlisle City Council.
- To encourage individuals to recognise that they can make choices which can lead to improved air quality.

## **The legal framework**

The Environment Act 1995 established the current framework for the National Air Quality Strategy and placed statutory duties upon local authorities in respect of Local Air Quality Management (LAQM).

Due to the health implications and costs associated with poor air quality, the government through the strategy has set health based *air quality objectives* for seven of the most common pollutants found in our cities. The air quality objectives are shown in Table 1. Every local authority in Britain has a duty to review and assess air quality against these objectives and to declare *Air Quality Management Areas* (AQMA) where it would be considered that the objectives are not likely to be met.

Once an AQMA has been declared the local authority has a duty to draw up an *Air Quality Action Plan (AQAP)* and to take positive steps to improve air quality.

Action planning is an essential part of the local air quality management process providing a practical opportunity for improving air quality in areas where review and assessment has shown that national measures will be insufficient to meet one or more of the air quality objectives. Government guidance suggests that an air quality action plan should include the following:

- Quantification of the source contributions to the predicted exceedences of the limit values. This allows the action plan measures to be effectively targeted.
- Evidence that all available options have been considered on the grounds of cost and feasibility.
- How the local authority will use its powers and also work together with others in pursuit of the relevant air quality objectives.
- Clear timescales within which the authority and other organisation propose to implement the measures contained in the plan.
- Quantification of the expected impacts of the proposed measures and where possible an indication as to whether these will be sufficient to ensure compliance with the objectives.
- How the local authority intends to monitor and evaluate the effectiveness of the plan.

These principles were followed on the development of the Air Quality Action Plan for Carlisle.

**Table 1- Air Quality Standard and Objectives**

<b>Pollutant</b>	<b>Objective</b>	<b>Compliance Date</b>
Benzene	16.25 ug/m <sup>3</sup> as a running annual mean	31 <sup>ST</sup> December 2003
	5.0 ug/m <sup>3</sup> as a running annual mean	31 <sup>ST</sup> December 2010
1,3 Bultadine	2.25 ug/m <sup>3</sup> as a running annual mean	31 <sup>st</sup> December 2003
Carbon Monoxide	10.0mg/m <sup>3</sup> as a maximum daily running 8 hour mean	31 <sup>st</sup> December 2003
Lead	0.5 ug/m <sup>3</sup> as an annual mean	31 <sup>st</sup> December 2004
	0.25 ug/m <sup>3</sup> as an annual mean	31 <sup>st</sup> December 2008
Nitrogen Dioxide	200 ug/m <sup>3</sup> as a one hour mean not to be exceeded more than 18 times per year.	31 <sup>st</sup> December 2005
	40 ug/m <sup>3</sup> as an annual mean	31 <sup>st</sup> December 2005
PM <sub>10</sub>	50ug/m <sup>3</sup> (gravimetric) as a 24 hour mean not to be exceeded more than 35 times per year	31 <sup>st</sup> December 2004
	40 ug/m <sup>3</sup> as an annual mean	31 <sup>st</sup> December 2004
Sulphur Dioxide	350ug/m <sup>3</sup> as a one hour mean not to be exceeded more than 24 times per year	31 <sup>st</sup> December 2004
	125 ug/m <sup>3</sup> not to be exceeded more than 3 times per year	31 <sup>st</sup> December 2004
	266ug/m <sup>3</sup> as a 15 minute mean not to be exceeded more than 35 times per year	31 <sup>st</sup> December 2005

## **CHAPTER 2 - What is the Air Quality like in Carlisle?**

### **Air Quality – Why should it interest me?**

The impacts on health from poor air quality are felt mainly by the most vulnerable members of society, the very young, the elderly and those who are already suffering from existing respiratory conditions. Air pollution is also damaging to the economy. Poor air quality results in loss of working days and reduces productivity. It also makes the environment less attractive to visitors and can cause damage to buildings and artefacts. This is of particular concern in an historic city such as Carlisle.

#### **Key Information**

##### **Who should be concerned about local air quality?**

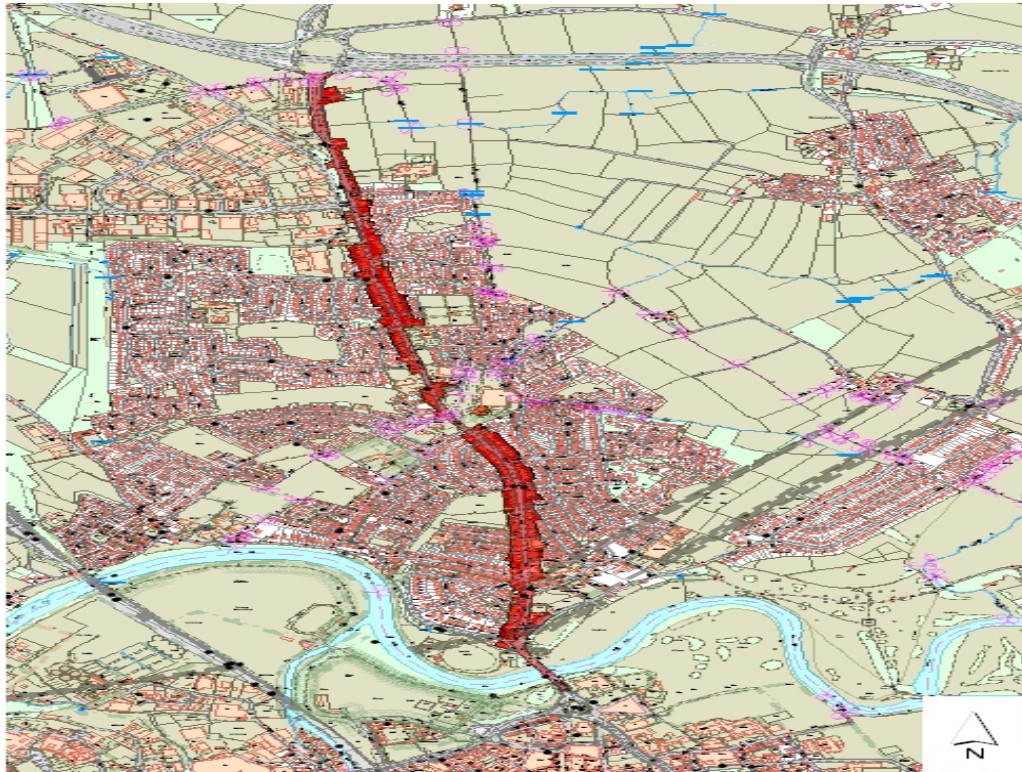
- **Anyone who is elderly or has elderly relatives**
- **Parents of young children**
- **People with existing respiratory or heart conditions**
- **Members of the business community**
- **Anyone involved with the tourist industry**
- **People with an interest in historic buildings and artefacts**
- **Anyone who contributes towards the cost of health care in the UK**

Since 1996 Carlisle City Council has been monitoring pollution levels in Carlisle and comparing them with the national air quality objectives. For the majority of pollutants the concentrations found in Carlisle are well below the government's health based objectives and are not of concern.

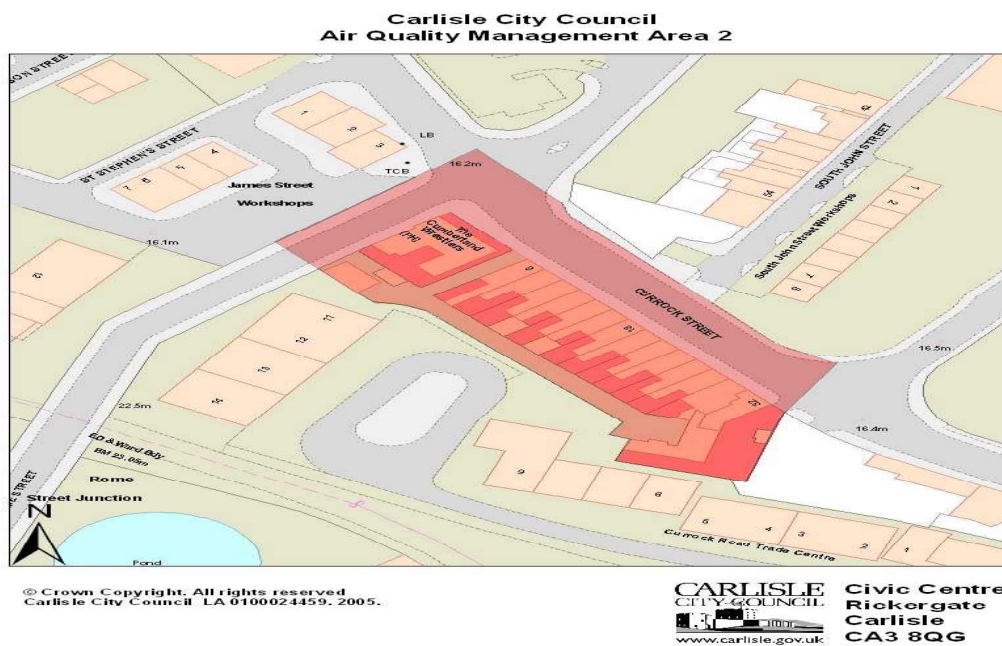
However for one pollutant, known as nitrogen dioxide (NO<sub>2</sub>) annual average concentrations have been found to be currently above the health based objective level in 2 areas of the City i.e the A7 from Hardwicke Circus to Junction 44 of the M6 motorway and Currock Street.

Due to the exceedances of the annual average nitrogen dioxide objective AQMA's were declared in Carlisle in December 2005 and December 2006 for these areas respectively. The declaration of the AQMA placed a duty on Carlisle City Council to draw up an AQAP and take actions to reduce nitrogen dioxide concentrations in the city. The extent of the AQMA's in Carlisle is shown in Figure 1 and 2.

**Figure 1: Air Quality Management Area (No 1) – A7, Kingstown and Stanwix, Carlisle**



**Figure 2 – Air Quality Management Area (No2) – Currock Street, Carlisle**



To find out more information about air quality monitoring in Carlisle and the declaration of the AQMA visit our website [www.carlisle.gov.uk](http://www.carlisle.gov.uk).

Detailed information about the review and assessment process can be found in the following documents:

- Local Air Quality Management, Carlisle First Stage Review and assessment, 1998
- Local Air Quality Management, Second Stage Review June 1999
- Third Stage Review and Assessment – May 2000
- Updating and Screening Assessment – May 2003
- Detailed Assessment 2005
- Updating and Screening Assessment – May 2006

These documents are also available on the Council's website

### **Key Information**

#### **Air Quality in Carlisle**

- **Air Quality has been monitored in Carlisle since the 1960's (following the introduction of the Clean Air Act)**
- **Most of the Government's health based objectives have been met in Carlisle and are not of concern**
- **An Air Quality Management Area (AQMA) has been declared in two areas of the city.**
- **As Carlisle City Council has declared an AQMA it has a legal duty to draw up an Air Quality Action Plan (AQAP)**

**For more information see [www.Carlisle.gov.uk/air quality](http://www.Carlisle.gov.uk/air%20quality)**

## What is Nitrogen Dioxide?

The only pollutant of current concern in Carlisle is nitrogen dioxide. Nitrogen dioxide (NO<sub>2</sub>) is one of two gases, which together are referred to as nitrogen oxides (NO<sub>x</sub>). The other member of the group is nitric oxide (NO).

Oxides of nitrogen are formed whenever combustion takes place. During the combustion process the majority of the oxides of nitrogen (NO<sub>x</sub>) released are in the form of nitric oxide (NO). Once released into the atmosphere nitric oxide (NO) can react with oxygen (O<sub>2</sub>) and ozone (O<sub>3</sub>) to produce nitrogen dioxide (NO<sub>2</sub>). As the majority of nitrogen dioxide in the atmosphere has been formed from nitric oxide it is often referred to as a *"secondary"* pollutant.

## Why is nitrogen dioxide of concern?

Nitrogen dioxide is a gas, which acts as an irritant to the eyes, nose, throat and respiratory tract. Nitrogen dioxide can have both short term "acute" effects and long term 'chronic' effects.

## Short term effects of nitrogen dioxide

The short term 'acute' effects of nitrogen dioxide involve irritation of the eyes, nose and throat can increase the symptoms of existing respiratory conditions such as asthma, bronchitis or emphysema. Because of the short term health impacts the government has a short term hourly objective level for nitrogen dioxide of 200 ug/m<sup>3</sup> not to be exceeded more than 18 times per year.

Currently hourly concentrations of nitrogen dioxide measured in Carlisle are well below the 200 ug/m<sup>3</sup> objective level. Based on current medical evidence the short term conditions of nitrogen dioxide found in Carlisle are unlikely to give rise to acute health impacts, even in the most vulnerable members of society.

## Long term effects of nitrogen dioxide

The possibility of exposure to nitrogen dioxide causing long term health effects is less well studied and the available information is more difficult to interpret. Studies from Switzerland and the United States have suggested that those living areas with higher exposure levels to nitrogen dioxide have a poorer lung function, but other similar studies have failed to find an association. Taking all this into account the Expert panel on Air Quality Standards (EPAQS) have taken the view that while longer term effects have not yet been demonstrated they cannot be ruled out.

The Government has therefore also set a long term annual average objective for nitrogen dioxide of  $40\mu\text{g}/\text{m}^3$

In Carlisle it is the longer term annual average nitrogen dioxide objective which has been found to be currently exceeded at locations alongside the A7 in Kingstown and Stanwix and at Currock Street in Carlisle. There are also a few other locations approaching the annual average objective level, these are sections along

- Caldewgate/Castleway
- Botchergate/London Road
- Victoria Viaduct/Junction Street

**Key Information**  
**Nitrogen Dioxide**

- Oxides of nitrogen are formed during combustion
- Nitrogen dioxide is an irritant gas
- Short term 'hourly' concentrations of nitrogen dioxide are not of concern in Carlisle
- Long term 'annual average' concentrations of nitrogen dioxide in Carlisle need to be reduced



## **CHAPTER 3 - Sources of nitrogen dioxide in Carlisle**

Once a local authority has declared an Air Quality Management Area it then has a statutory duty to carry out a 'Further Assessment' to confirm the exceedences within the areas declared. The Further Assessment is intended to "supplement such information that the Council has in relation to the designated area in question". The Further Assessment should be sufficiently detailed to determine whether an existing AQMA needs amending or revoking and should also include source apportionment data and an assessment of the impact of measures outlined in this Action Plan.

Further Assessment Work has been undertaken by consultants AEA Technology, for Air Quality Management Area's No 1 and 2. The Further Assessment work has concluded that the concentrations of nitrogen dioxide in AQMA's No's 1 and 2 have not changed substantially since the AQMA's were declared. The concentrations at the diffusion tube monitoring sites in the AQMA's in 2006 are similar to those measured in 2005, with increases at sites along the A7 and a small decrease at Currock Street. Traffic counts and modelling have also shown similar traffic flows in AQMA 1. The dispersion model continues to predict areas within the declared AQMA's where concentrations exceed the air quality objective for nitrogen dioxide.

Carlisle City Council took a relatively conservative approach when designating the boundaries of the AQMA's and consequently there is some potential for reducing the areas. However it is recommended that the AQMA's remain unchanged because:

- Modelled and measured concentrations have not changed much since the AQMA was declared;
- Model predictions continue to show areas where members of the public will be exposed to nitrogen dioxide concentrations greater than the annual mean objective at relevant receptor locations;
- Diffusion tube measurements continue to show concentrations in excess of the objective;
- It remains possible, within the uncertainty of the modelling that exceedence of the objective will occur throughout most or all of the area of the AQMA's.

### **Source apportionment of 'base case' predictions**

Nitrogen dioxide in Carlisle is the result of NO<sub>x</sub> emissions from a variety of different sources. The main ones are:

- Localised point source emissions from large industrial chimney stacks, which can be quantified.
- Localised `line source` emissions. These are transport related emissions arising mainly from road transport but also including a small contribution from rail transport.
- Localised `area source` emissions. This covers all emissions arising from domestic and commercial space heating and any other source of emission which arise locally but cannot be easily quantified.

`Source apportionment` studies have been undertaken by AEA Technology for the AQMA's where the annual average air quality objective for nitrogen dioxide is currently being exceeded.

Source apportionment is the process whereby the contributions from the sources of a pollutant are determined. In local air quality, the relevant sources could include: traffic; local background; industrial and domestic. Contributions from the different types of vehicles (for example, cars, lorries and buses) can also be considered to highlight which class of vehicle is contributing most to the emissions from traffic. Source apportionment allows the most important source or sources to be identified and so enable options to effectively reduce ambient concentrations of pollutants to be considered and assessed.

The source apportionment should:

- Confirm that exceedences of NO<sub>2</sub> are due to road traffic
- Determine the extent to which different vehicle types are responsible for the emission contributions to NO<sub>2</sub>: this will allow traffic management scenarios to be modelled/tested to reduce the exceedences
- Quantify what proportion of the exceedences of NO<sub>2</sub> is due to background emissions, or local emissions from busy roads in the local area. This will help determine whether local traffic management measures could have a significant impact on reducing emissions in the area of exceedence, or, whether national measures would be a suitable approach to achieving the air quality objectives

The results of the source apportionment work is shown below.

### **Source Apportionment - The 'base case'**

The base case in this source apportionment assessment is defined as the annual mean concentrations of NO<sub>2</sub> that are predicted in 2006 in the absence of any measures to improve air quality in Carlisle City. They are the concentrations that should be relevant in defining the extent of the Air Quality

Management Areas.

### Receptors considered

Receptors have been selected inside the existing AQMAs for the purposes of the source apportionment exercise; these are shown in Table 2.

**Table 2: Receptors selected inside existing AQMAs**

General Area	Description	OS Grid reference of receptor
North Kingstown Road, A7	Property on the east side of the A7, Kingstown Road, south of the junction with Kingstown Broadway.	339561, 559097
South Kingstown Road, A7	Property on the west side of the A7, Kingstown Road, 100 m north of the junction with Briar Bank.	339760, 558047
Scotland Road, A7	Property on the east side of the A7, Scotland Road, between Church Street and Mulcaster Crescent.	340016, 557108
Stanwix Bank, A7	Property on the east side of the A7, Stanwix Bank, between Brampton Road and the Bowling Green.	340013, 556865
Brampton Road	Property on the west side of Brampton Road, 40 m from the junction with the A7.	340023, 556828
Currock Street	Property on the south side of Currock Street, at the south eastern end of the terrace of properties on Currock Street.	340232, 555166

### Sources of pollution considered

We have considered the effect of the following sources in this detailed assessment at the selected receptors:

- Background from sources outside the local area
- Traffic
- Heavy duty vehicles (buses, coaches and heavy goods)
- Stationary vehicles in queues

Further model runs were carried out for the cases with no stationary vehicles and no heavy-duty vehicles to enable the apportionment of the oxides of nitrogen concentrations to those sectors.

The concentrations of oxides of nitrogen concentrations apportioned to each source category and the fractions of the total concentrations are shown in Table 3. Table 3 shows the contributions from the rural background (at High Muffles), modelled background contribution from Carlisle and surrounding

district sources and the modelled local roads contribution. It then shows the breakdown of the local road contribution between heavy and light duty vehicles and between moving and stationary vehicles (in queues and at bus stops).

**Table 3: Apportionment of oxides of nitrogen concentrations at selected receptors**

Area	Contribution to oxides of nitrogen concentration, $\mu\text{g m}^{-3}$							
	Total	Rural background	Modelled background	Local roads	Local HDV	Local LDV	Moving vehicles	Stationary vehicles
North Kingstown Road, A7	92	7	10	76	57	18	19	56
South Kingstown Road, A7	78	7	7	64	49	15	14	50
Scotland Road, A7	104	7	10	87	65	22	29	58
Stanwix Bank, A7	87	7	9	70	54	17	19	51
Brampton Road	102	7	10	85	62	22	33	52
Currock Street	72	7	15	50	37	13	18	32

Results show that at each of the receptor sites, heavy-duty vehicles make a significant contribution to the total oxides of nitrogen concentrations. Stationary vehicles in queues and at bus stops also make a substantial contribution at each of the receptor sites. Overall source apportionment has determined that traffic congestion and heavy duty vehicle emissions make the largest contributions to nitrogen dioxide concentrations in these AQMA's.

## **CHAPTER 4 - What can be done to improve nitrogen dioxide levels in Carlisle**

To achieve a reduction in NO<sub>2</sub> concentrations in Carlisle we need to reduce the amount of NO<sub>x</sub> being emitted at a local level. This means implementing a range of measures to tackle the major sources of No<sub>x</sub>.

The emissions modelling, undertaken by AEA Consultants, has confirmed that motorised road transport accounts for the majority of NO<sub>x</sub> emissions in the City.

The main focus of the Air Quality Action plan therefore needs to be on transport related measures. Some additional measures aimed at reducing emissions from businesses and households is also needed in recognition of the contribution they make to the overall problem.

Nationally there have already been a considerable number of policies introduced for the purposes of reducing emissions to air. Generally these measures are controlled by national legislation and are aimed at achieving the same standards across the UK.

Table 5 gives examples of some of the main measures that have been introduced at a national level for the purposes of improving air quality.

<b>Emission Source</b>	<b>National Measures to reduce emissions to air</b>
Road Transport	<ul style="list-style-type: none"><li>• <b>Vehicle Emission Standards</b><ul style="list-style-type: none"><li>- European legislation requires all new vehicles manufactured for sale in the UK to meet progressively cleaner emission standards</li><li>- UK MOT certification system requires all vehicles over three years old to pass an emission test on an annual basis.</li></ul></li><li>• <b>Fuel Standards</b><ul style="list-style-type: none"><li>- European legislation requires progressively cleaner fuels to be produced. This has resulted in the removal of lead from petrol and has significantly reduced the amount of sulphur and benzene in fuels.</li></ul></li><li>• <b>Tax based measures</b><ul style="list-style-type: none"><li>- Fuel duty differentials have been put in place to encourage the use of cleaner fuels.</li><li>- A graduated road tax system has been introduced to encourage the purchase of smaller, cleaner vehicles.</li><li>- Company car tax has been graduated to encourage the use of more fuel efficient vehicles.</li></ul></li><li>• <b>Active promotion of cleaner fuels</b></li></ul>

	<ul style="list-style-type: none"> <li>- Powershift programme which provides grants aimed at developing a sustainable market for alternatively powered vehicles such as LPG and electric vehicles.</li> <li>- Clean up programme which provides grants for the fitting of pollution reduction equipment to existing vehicles.</li> </ul>
Industry	<ul style="list-style-type: none"> <li>• <b>Local Air Pollution Prevention and Control (LAPPC)/Integrated Pollution Prevention and Control (IPPC)</b> <ul style="list-style-type: none"> <li>- Local authorities control emissions to air from certain industrial processes under the provisions of the Pollution Prevention and Control Act 1999.</li> </ul> </li> <li>• <b>Industrial smoke control</b> <ul style="list-style-type: none"> <li>- Dark smoke emissions from industrial processes which fall outside LAPPC/IPPC can be controlled under the Clean Air Act. This Act also allows local authorities to control new furnace installations and chimney heights.</li> </ul> </li> </ul>
Area Sources	<ul style="list-style-type: none"> <li>• <b>Smoke Control</b> <ul style="list-style-type: none"> <li>- The Clean Air Act allows for the declaration of smoke control areas, which restricts smoke emissions from any premises within it.</li> </ul> </li> </ul>

Where national legislation already exists to control a particular type of emission it is difficult for a local authority to require higher standards at a local level.

In drawing up a local Air Quality Action Plan the emphasis must be on emission reduction measures which offer improvements above those already provided by national measures but which at the same time are enforceable. These are the types of measures which have been included in this Air Quality Action Plan.

## What else must be considered?

The principal aim of the Air Quality Action Plan is to improve local air quality. The measures contained within it may also have the potential to impact on a number of policy objectives and cross authority themes.

The Government expects air quality issues to be dealt with in a corporate and multi disciplinary way. Local authorities need to ensure that the measures within the action plan enjoy the support of, and wherever possible are actually endorsed by, all parts of the Council. Measures to reduce NOx emissions must support and be supported by wider council policies such as the community plan, local transport plan, draft local plan and Carlisle

Renaissance. They can do this by contributing towards the reduction of greenhouse gas emissions, alleviating congestion, promoting sustainable development /sustainable transport and generally improving the air quality and safety of Carlisle's environment.

## **Links to other Carlisle City Council Plans and Strategies**

This Air Quality Action Plan is intrinsically linked to other important areas of work including the Local Transport Plan, Development Planning, Energy Conservation, Carlisle City Council Corporate Improvement Plan 2007-2010, Carlisle Renaissance and the Community Plan. Some of the key strategies and policies are given below.

## **Corporate Improvement Plan**

The Corporate Improvement Plan sets out what Carlisle City Council's core values and corporate priorities are over the coming years.

The Carlisle Corporate Plan has the aim of improving all aspects of pollution control with the intention of making Carlisle the cleanest and healthiest City in Europe. The City vision statement for 2002 – 2012 seeks to significantly limit pollution, thus reducing damage to the environment.

One of the key priorities of the Council is a Cleaner, Greener, Safer Carlisle, promoting sustainable, local communities where people want to live and work and where they feel safe. A priority which links directly to the Air Quality Action Plan.

## **Carlisle City Council - Environmental Policy**

Carlisle City Council has signed up to the Nottingham Declaration on Climate change and have given our commitment to:

- Working with central government to contribute at a local level, to the delivery of the UK Climate Change Programme, the Kyoto Protocol and the target for carbon dioxide reduction by 2010.
- Participating in local and regional networks for support.
- Within the next two years developing plans with our partners and local communities to progressively address the causes and the impacts of climate change, according to our local priorities, securing maximum benefit for our communities.

- Publicly declaring within appropriate plans and strategies the commitment to achieve a significant reduction of greenhouse gas emissions from our own authorities operations especially energy sourcing and use, travel and transport, waste production and disposal and the purchasing of goods and services.
- Assessing the risk associated with climate change and the implications for our services and our communities of climate change impacts and adapt accordingly.
- Encouraging all sectors in our local community to take the opportunity to adapt to the impacts of climate change, to reduce their own greenhouse gas emissions and to make public their commitment to action.
- Monitoring the progress of our plans against the actions needed and publish the result.

## **Carlisle Partnership**

The Carlisle Partnership is the organisation that brings together the local council's that serve Carlisle, the Health Service, Police and other public agencies, local businesses and voluntary and community organisations to improve the well being of Carlisle. **The Community Plan** produced by the Partnership, sets our high level aims and ambitions for the area and ensures that they are achieved by the Partnership.

The Air Quality Action Plan is consistent with the objectives of improving the quality of life and producing a healthier environment.

## **Local Transport Plan**

The Local Transport Plan (LTP) is the statutory planning document that sets out the County Councils vision, strategy and policies for transport. It also describes the approaches and measures that will be taken to implement these policies in each district. The plan provides the framework to co-ordinate the local delivery of integrated transport and seeks improvements to our transport systems. Improving air quality is one of the key priorities of the LTP(2). A number of strategies have been developed through the LTP(2) to encourage and improve public transport, cycling and walking. The Carlisle Area Transport Plan will also include the schemes identified in the Carlisle Renaissance Movement Strategy. Carlisle Renaissance is discussed below and at length in Chapter 5 and 6. Chapter 8 contains more information on the measures within the LTP that are expected to contribute to improving air quality.



## **Draft Local Development Plan and Development Control**

The Carlisle District Local Plan establishes policies that guide the general location of development in the local authority and ensure that such development does not adversely affect its surroundings.

The impact of air quality on or by new development is now a material consideration and is therefore taken into account in the planning system.

## **Home Energy Conservation Act (HECA) 1995**

Carlisle City Council has produced a HECA Strategy. This aims to improve the energy efficiency of the residential properties in our area. Improving energy efficiency reduces the need to burn fuel, thus reducing domestic emissions of air pollutants.

## **Carlisle Renaissance – City Centre Development and Citywide Movement Strategy Policy Statement**

Carlisle Renaissance is the partnership regeneration agenda for the whole of Carlisle. It is led by Carlisle City Council and is focused on achieving the following objectives:-

- establishing Carlisle as a learning City
- strengthening the economy
- maximising tourism potential
- tackling deprivation
- revitalising the City Centre
- **improving movement**

The latter objective again links directly to the Air Quality Action Plan. One of the key drivers for improving movement is the need to improve air quality.

The Carlisle Renaissance Development Framework and Movement Strategy study was commenced in November 2005 and was set within the context of the January 2005 floods that affected over 2000 homes and business in the city. In the immediate aftermath of the floods a task group of local, regional and national public sector organisations was convened to bring forward a long term vision for the economic, physical and social regeneration of Carlisle.

The brief that emerged from the process formed the basis for appointment of a consultant team led by Taylor Young (Architect and Urban Designers) and

including DTZ (Property Advisors) and Faber Maunsell (Transport Advisors) assigned with the task of examining physical, economic and social change in the City over the next 10 to 15 years.

The brief for the team was to provide a body of work that achieves the following overall objectives:

- A document that will influence **land use and transport policy** in the City for the next decade and play a major role in shaping the realisation of the vision of an urban renaissance in Carlisle.
- A document that will guide public sector investment into high quality development in the city's urban core, creating an environment that stimulates long term economic growth.

The outcome is in the form of the **Development Framework and Movement Strategy** which sets out a long term vision of how the City Council along with its partners will revitalise the city centre and improve infrastructure for all modes of transport in and around the city over the next 10-15 years. The Movement Strategy which is particularly important in terms of this action plan is a long term vision for a more balanced pattern of movement within Carlisle; one that addresses the environmental and economic impact of congestion, extends the quality, frequency and reach of public transport provision and encourages walking and cycling. It also links land use and transport policy in a way that will enable some of the financial benefits from development in the city centre to be invested in the city wide movement infrastructure. The Movement Strategy is referred to in detail in the following chapters.

Following on from the production of this work, Carlisle City Council has issued the City Centre Development Framework and Citywide Movement Strategy Policy Statement which is based on the Development Framework and Movement Strategy.

In respect to movement the policy states that the City Council will work with other public service partners to promote and support measures to:-

- Reduce through traffic crossing the City Centre
- Improve the quality and scope of public transport throughout Carlisle
- Increase pedestrian and cycle use throughout Carlisle
- Provide high quality, safe gateway parking at strategic locations in and around the City Centre.
- **Improve air quality along key vehicle corridors**
- Become an exemplar City that offers a real choice of high quality modes of transport for all.

It is the City Council's intention to take full account of this Policy Statement in considering issues, making decisions and allocating resources as they relate directly or indirectly to the physical environment and infrastructure in Carlisle.

As part of this policy the City Council is in the process of preparing a new Car Parking Strategy for Carlisle and Supplementary Planning Guidance on planning obligations to financial contributions from developers to movement and public realm projects. This is discussed in our action measures section.

In 2007 the Transport Plan for Carlisle will be produced by Cumbria County Council, which will link the schemes identified in the Movement Strategy into a programme of deliverable projects for the city.

### **Key Information**

#### **Reducing Nitrogen Dioxide Concentrations in Carlisle**

- **The majority of NOx emissions in Carlisle arise from motorised road transport**
- **The main focus of the AQAP must be on transport improvement measures**
- **Measures to reduce business and domestic NOx emissions are also needed**
- **Local measures must offer improvements above those which will be provided by national measures**
- **The measures in the Action Plan must support and be supported by much wider council policies**

## **CHAPTER 5 - Understanding the traffic issues within Carlisle**

As part of the Carlisle Renaissance brief Carlisle City Council commissioned Faber Maunsell to undertake a detailed baseline transport study to establish the key transport issues currently facing Carlisle. This work involved regular and comprehensive visits to the City to consider issues at different times, discussions with key stakeholders including Cumbria County Council and relevant officers from Carlisle City Council and a review of existing data including air monitoring data and the designation of two Air Quality Management Areas.

A series of transport movement issues and pressures were identified, many of which have been created by either historical or physical constraint factors.

### **The 5 keys types of movement patterns within the City.**

- Non detrimental strategic movements through and past Carlisle – primarily using the M6 motorway and West Coast mainline railway, providing little benefit but having little adverse effect locally.
- Detrimental strategic through movement e.g. Southern Scotland towards West Cumbria which need to travel through the centre of Carlisle via the A7 (AQMA No 1) and A595 (Caldewgate, Wigton Road) creating significant impact upon these core areas of the City.
- Movements from the hinterland into Carlisle both from community/business activity and related to Carlisle's location as a key centre for the region culturally and socially.
- Movements from within Carlisle to the City Centre – those who live within Carlisle and seek to use the amenities.
- Movements across the City – increasingly over recent years decentralised development has taken place at the motorway hubs e.g. Kingmoor Park and business premises around M6 junction 43 creating traffic demand through the City Centre.

The baseline work also identified 2 key physical issues that have had and will continue to have a key influence on the way in which movement within Carlisle occurs (they also present key attributes of the City both environmentally and economically).

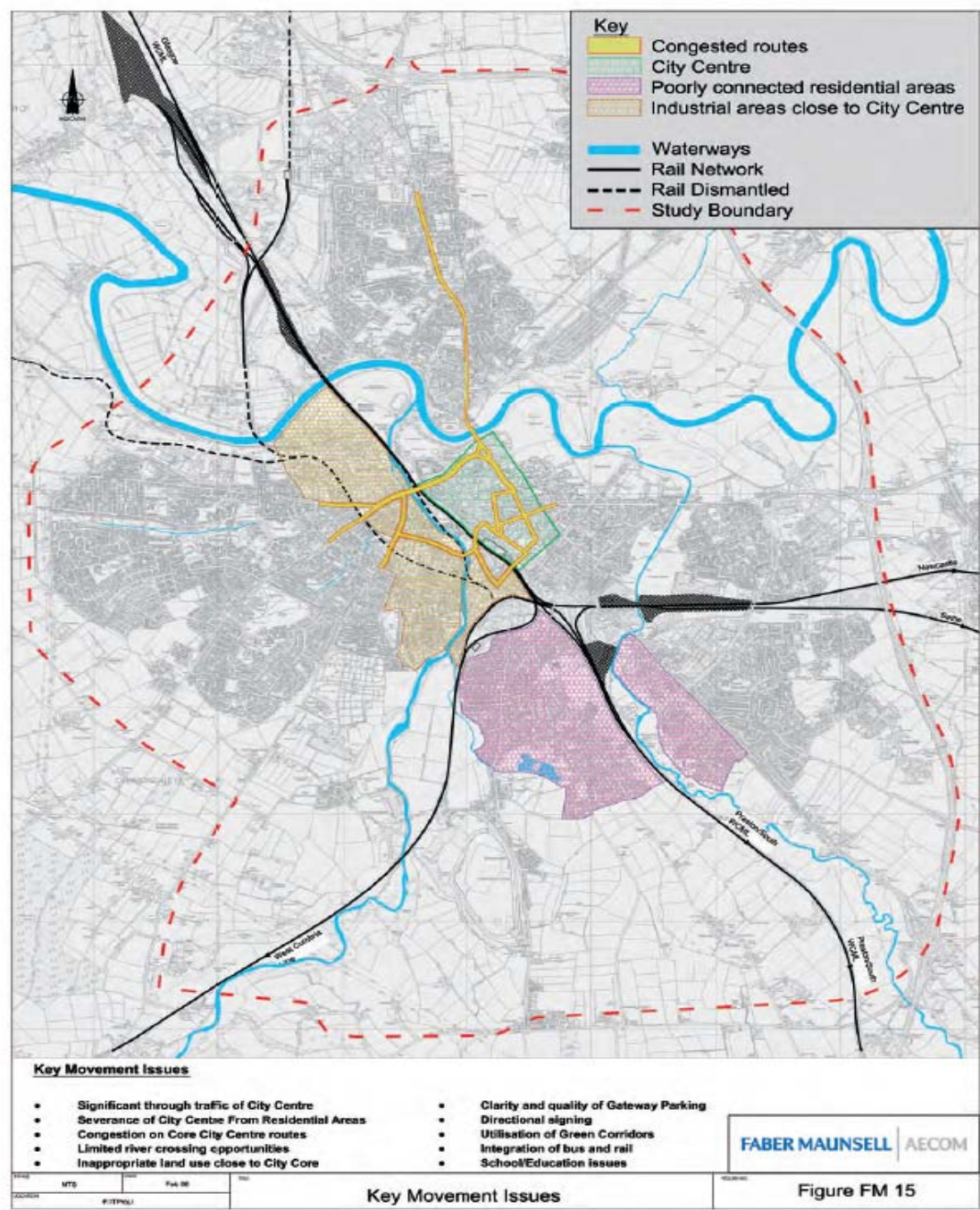
- The 3 rivers, with limited crossing points forming key constraints on the road networks, but with 'green corridors' that create potential for movement currently under exploited.
- The railways – limited crossing points which presents significant barriers to movement, particularly to the south of the City.

Several core movement characteristics of the City were also identified:

- Congestion is particularly focused on some of the key pinch points and barriers related to the above physical constraints and tends to be relatively localised in terms of affecting key meeting points of the regional distributor roads.
- HGV's and larger vehicles create significant impacts on key locations within the City Centre, but relate to either through city movements or outlying industrial areas.
- Lack of western orbital route means congested junctions and inappropriate routes being used at that side of the City i.e. Currock Street, Victoria Viaduct, Junction Street and Dalston Road.
- Traffic flows generally are tidal in nature with AM peaks reversing into PM peaks. This often leads to congestion in one direction, with free flowing traffic in the other.
- There are particular issues occurring in relation to specific land uses, which due to the relatively small size of Carlisle can have a significant proportional impact on the City's movement capability.
- Areas such as Currock and Upperby tend to be isolated by the previously mentioned barriers despite their close proximity to the City Centre.
- Public transport provision is a strength of Carlisle – it has a relatively good bus network for a City of its size and a well placed high profile railway station. What is lacking is the ability to provide effective access from the wider hinterland by these modes of public transport and the volume of activity to ensure economic viability of services off peak.

These movement issues are summarised in Figure 3 below:

**Figure 3 – Key Movement Issues in Carlisle**



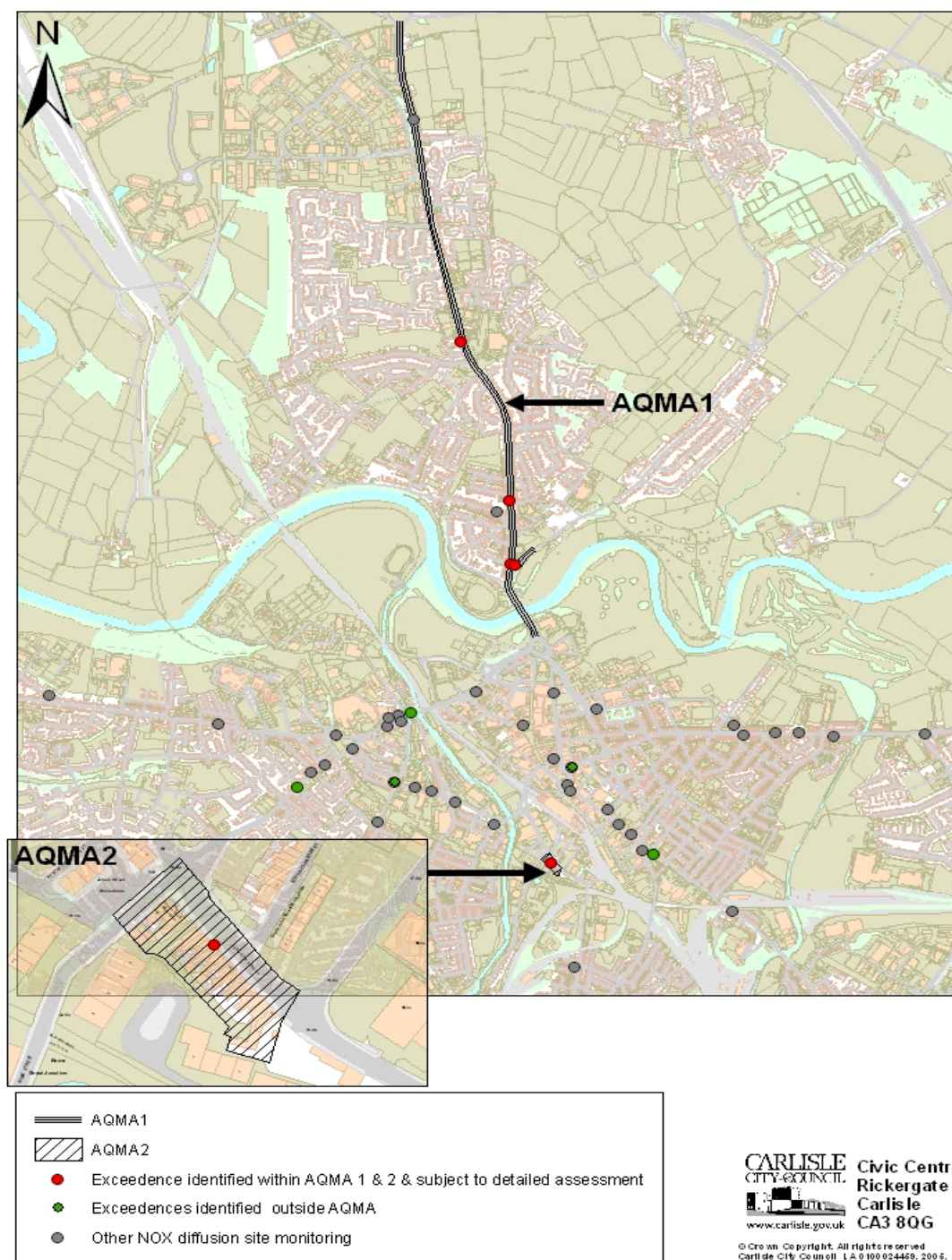
The next diagram, Figure 4, shows the location of our NO<sub>2</sub> monitoring sites within the City. It can be clearly seen that monitoring is essentially targeted at 'relevant locations' along the most congested routes identified above.

The two Air Quality Management Area's are shown on the map in addition to other sites (highlighted green) where elevated levels of NO<sub>2</sub> have been identified and are currently subject to a detailed assessment being undertaken by AEA Technology (Results to be reported in July 2007)



Figure 4:

# NO2 Diffusion Tube Monitoring Locations





This baseline work concluded that the following key issues needed to be addressed and resolved in order to improve transport movement within the city and hence air quality.

- Removal of unnecessary traffic from core areas of the City Centre
- Removal and/or reduction of impact of traffic with no destination in Carlisle, but simply passing through it
- Expansion of pedestrianisation and enhancement of public realm
- Improvement of use of green corridors, joining up missing links
- Rationalising off street parking – creating gateway parking opportunities on key approaches
- Creating bus priority at areas of key delay and developing new ways of allowing bus based provision to take a step upwards
- Undertaking corridor long improvement along main routes
- Promoting a park and ride strategy as part of a balanced public transport and parking strategy to enable interception of long stay and long distance visitors to Carlisle at the edge and offer them attractive alternatives to driving into the Centre
- Improving pedestrian and cycling linkages between City Centre and surrounding residential areas, overcoming physical barriers.
- Creating a city that is accessible to all, with strong emphasis on health and mobility

## **CHAPTER 6 - The long term vision – Carlisle Renaissance Movement Strategy**

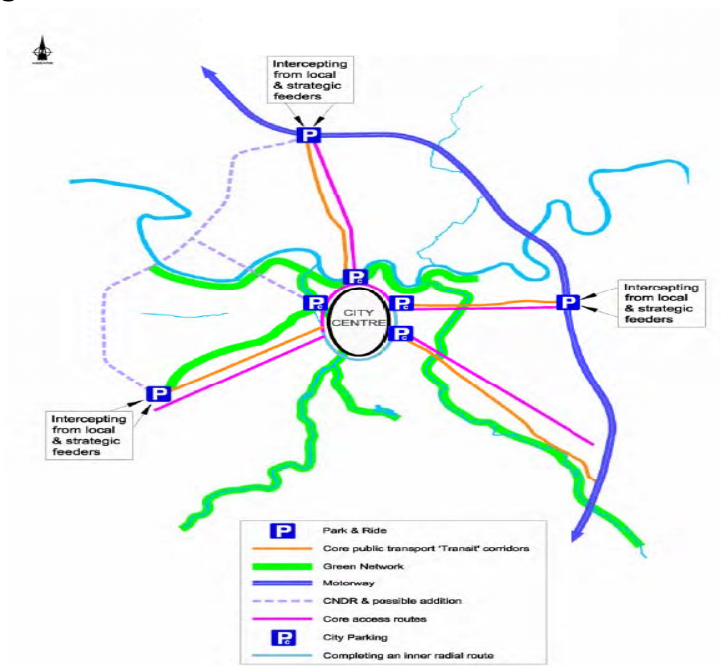
As a result of the Baseline Study and following extensive consultation with key stakeholder groups and the public, discussed in chapter 7, a multi layered Transport Strategy has been developed. This addresses the 5 key movement patterns found in Carlisle, incorporates all modes of transport and is based on the following 6 principles:

- Reducing through traffic in the City Centre
- Making better use of existing transport assets
- Intercepting long stay and long distance visitors at the edge of the urban area and provide them with alternatives to driving into the City Centre
- Creating a walkable and cycleable urban area, particularly by making better use of the river corridors
- Improving the quality and scope of the public transport offer
- Becoming an exemplar City which offers a real choice of high quality transport modes for all

**Note:** These principles have since been adopted in the Policy Statement issued by Carlisle City Council. Each of these principles will contribute to the improvement in local air quality.

An overview of the Transport Strategy is shown in the diagram below:

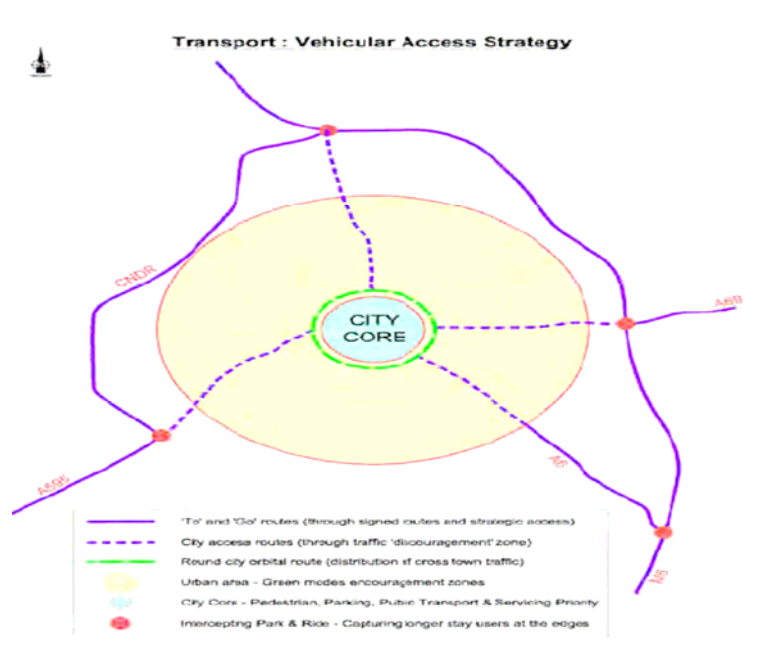
**Figure 5 - TRANSPORT STRATEGY FOR CARLISLE - OVERVIEW**



### **Transport: Vehicular Access Strategy**

The diagram below (figure 6), illustrates the vehicular access strategy, showing the principle of enhancing the outer routes around the urban area, continuing to focus car traffic on radial routes and discouraging through traffic in the City Centre and creating a better orbital opportunity for across town traffic, but not significantly increasing overall City vehicular capacity in doing so. The concept of intercepting longer stay users at the edges creates a vital link between modes of transport.

**Figure 6 – Transport Vehicular Access Strategy**



## Public Transport Strategies

The following 2 diagrams highlight the broad principles of the public transport strategies for the City.

The first shows the use of interception points on the edge of the City as hubs, combining park and ride (and potentially going further to create 'feeder' locations for bus services from outlying village locations for coaches to stop without entering the City Centre and interchange points between modes.

The second shows how an eventual 'transit' public transport network (bus based) will work.

Figure 7





## Delivery of the Overall Transport Strategy

A final list of 48 schemes or 'work packages' have been tabled in order to develop the wider transport strategy following discussion with relevant key stakeholders and have been subject to a substantial public consultation (see next chapter). The schemes are shown in Appendix 1 along with an indication of whether each will contribute to an improvement in air quality.

The overall aim of each of the schemes are as follows:-

- |                |   |
|----------------|---|
| Items 1 – 10 - | To make more use of natural assets of the City for 'sustainable' travel around the urban areas.   |
| Items 11-16 -  | To create strong ability to walk and cycle to and around the city centre from the walkable/cycleable hinterland.  |
| Items 17-20 -  | To ensure maximum but realistic use of rail assets of the City.   |
| Items 21-28 -  | To build towards a longer term cross city public transport service that provides multiple opportunities.  |
| Items 29-31 -  | To provide appropriate alternative traffic notices, filling in gaps in car provision but not creating undue excess capacity that would encourage more car use.                        |
| Items 32-37 -  | To reduce road space created by items 29-31 in an appropriate manner, reducing negative impacts and using the ability to create strong new linkages, particularly in the city centre. |
| Items 38-39 -  | Consider ways of upgrading the air based offer of Carlisle.   |
| Items 40-43 -  | Create gateway car parking of stronger quality than at present.   |
| Item 44 -      | Use one of the strongest assets of Carlisle in a more appropriate manner.   |
| Items 45-48 -  | Ensure the city centre is attractive for those on foot in particular.   |

## Putting Vision Into Practice

Carlisle City Council along with Cumbria County Council and its partners has developed a strategy and vision that builds towards a co-ordinated approach to providing sustainable integrated transport systems for the City and its hinterland.

Clearly change will not occur overnight and many of the schemes will need to be phased effectively to build as the City's economy grows over the next 10 – 15 years.

In general the schemes represent the core 'work packages' to be adopted in developing the wider strategy. The list must be seen as dynamic not definitive. Other schemes may arise and likewise some schemes may prove more difficult to develop than initially envisaged and may even require subsequent removal from the strategy.

At this stage the Carlisle Renaissance Prospectus has established a clear and common vision across a variety of agencies, most notably Cumbria County Council as the Highway Authority and Carlisle City Council as the Planning Authority, but with responsibility for certain key transport assets in particular parking. Clearly funding is and will be the major issue in the future implementation of the Movement Strategy. There are 3 potential sources of funding:

1. LTP (2) – Cumbria County Council is currently preparing its Carlisle Area Transport Plan and the Movement Strategy will be a key element of it. Although it is clear that the current levels of Local Transport Plan funding for Cumbria will not meet the expectations against the schemes shown.
2. Developer – There is potential for developers to play a significant role in cross funding the schemes, the key will be to ensure that all applications of any scale are considered in light of providing towards the 'bigger picture' rather than to unlinked projects. With this in mind Carlisle City Council is currently developing a supplementary Planning Guidance which will set out guidance on financial contributions.
3. Other – A major advantage of having a city wide strategy or 'goal' is that it starts to allow other funding sources to be developed e.g. from North West Development Agency (NWDA), English Partnerships, Sustrans etc.



As stated the complete picture will take 10 - 15 years to develop which is clearly outside the scope of this Action Plan. Priorities have however been identified that need to be developed and implemented at an early stage in order for the strategy to move forward:

- Top of the list is the CNDR which has a major strategic role.
- Second has to be ensuring that the maximum benefit is obtained through planned development.
- There are shorter term improvements such as the series of schemes related to pedestrian /cycle modes and to integrated pedestrian signing and mapping of the City Centre that can be commenced at a very early stage and enhanced as elements of the scheme occur.
- Consideration and planning of Inner Relief Route options
- Develop a comprehensive car parking strategy across the city (to include park and ride).
- The development of both commercial parking and interchange around the Railway Station.

Both Carlisle City Council and Cumbria County Council have given their commitment to addressing these key priorities and so take the Movement Strategy forward. Consequently they are included as part of this Action Plan and discussed in more detail in Chapter 8.

The future development of Carlisle Renaissance and the Movement Strategy as it evolves will be reported in the Carlisle City Council's Air Quality Progress Reports which will be published annually.

## **CHAPTER 7 - Consultation and Participation**

This section outlines the consultation that has been undertaken in the preparation of this Action Plan. In keeping with the guidance on action planning a number of groups has been consulted.

### **Development of the Action Plan – Statutory Consultees**

A series of meetings has taken place with between representatives from the following departments/organisations who provided expertise on transport policy, traffic management, planning, air quality monitoring and assessment, sustainable development and energy efficiency. The group included representation from:-

Carlisle City Council – Highways  
Carlisle City Council – Environmental Quality Section (air pollution control)  
Carlisle City Council – Carlisle Renaissance Team  
Carlisle City Council – Planning Services / Local Plans  
Cumbria County Council – Highways  
Cumbria County Council – Transport and Spacial Planning  
Carlisle City Council – Environmental Policy Performance Manager  
Carlisle City Council – Energy Efficiency Advice Centre  
Stagecoach North West

From these meetings a significant number of existing policies and ideas to improve transport and air quality within the city were identified, mainly from the Local Transport Plan LTP(2) and the Carlisle Renaissance Movement Strategy and these have been included in this Action Plan.

### **Development of the Action Plan - Phase 1 General Public / Local Businesses Organisation Consultation**

A massive consultation exercise aimed at the general public, local businesses, community groups and organisations was undertaken in 2006.

The consultation exercise was part of the Carlisle Renaissance Development Framework, and more specifically, in respect to this air quality action plan, the Carlisle Renaissance Movement Strategy. The consultation exercise generated over 2000 responses from individuals and organisations.

The views of a wide range of people have been sought on what they think of the current transport infrastructure and what they would like to see improved.

An initial consultation and potential options to improve movement in Carlisle began in February 2006. A detailed questionnaire was sent out to Carlisle City Council Citizens Panel members (1500) asking for views on what transport initiatives they would like for Carlisle. A slightly shorter questionnaire was

provided and distributed to members of the public that visited the Carlisle Renaissance 'drop in' event held in the Lanes Shopping Centre between 30/01/2006 to 04/02/2006. The questionnaire was also put on the Council's website to allow people to give their opinion electronically.

A total of 629 questionnaires were received from the Citizens Panel members (a response of 41%).

349 community 'drop in' event and 17 on line questionnaires were also received from members of the public.

Results of this initial consultation are summarised below:

***"Would any of the following encourage you to use public transport more?"***

55% of the public and 69.5% of the panel stated that they would be encouraged to use public transport more if the cost was more attractive than using the car, 43% of the public and 47% of the panel said they would be encouraged if the reliability of public transport is improved. 33.2% of the public and 34.7% of the panel said they would be encouraged if there were more services on existing routes, 25.8% if the public transport covered more routes and 21.5% if the public transport vehicles were cleaner and more comfortable.

***"Which transport initiatives would you support?"***

48% of the public and over half of the panel (53.5%) would support a transport initiative to improve bus facilities and routes, 37.9% of the public and 43% of the panel would support better pedestrian routes, 45.4% of the public and 40% of the panel support removing the traffic from the city centre and 43.9% of the public and 38.8% of the panel say they would support better cycle ways.

***"Which of the following would most improve city centre car parking?"***

56% of the public and 50% of the panel feel a low cost park and ride would improve city centre car parking the most.

***"Can you think of any barriers that prevent you walking and/or cycling locally?"***

10% said heavy traffic prevented them from walking/cycling locally, 9% said there needed to be better cycle paths. 5% said the pavements were badly maintained.

As a result of the baseline study undertaken by Faber Maunsell and initial consultation work the Development Framework and Movement Strategy was developed by the Consultancy team. The overall Development Framework and

Movement Strategy including the 48 suggested schemes was then put through a substantial public consultation during September 2006.

## Phase 2 Public Consultation

This consultation exercise took place in September 2006 and was aimed at raising awareness of the emerging transport strategy, listening to peoples views and options and taking these into account to make more informed decisions on what should be done to improve transport movement.

The exercise was based around the publication of an explanatory supplement (shown below), which set out the ongoing strategies for both City Centre development and the transport issues.

The three specific key driving forces behind the need to develop the Carlisle Renaissance Detailed Framework & Movement Strategy are set out in this supplement; the economy, the environment and the need to improve air quality and public policy, i.e. the review of Carlisle District Local Plan and the preparation of the Carlisle District Area Transport Plan.



**Carlisle renaissance**  
CARLISLE IS CHANGING

**Carlisle City Council**  
Cumbria County Council

# Your city's future Get involved!

See pages 5, 8, 9, 10, 11 & 12

Last year we launched Carlisle Renaissance; an ambitious vision for the future of our city and a once in a generation opportunity to tackle the social, economic and environmental challenges we face.

From the beginning we have committed to public consultation as part of Renaissance. It is only by working together, sharing views, ideas and experiences, that we will have a real chance at success. Now is another chance to get involved.

Earlier this year you told us where you would like to see improvements made in the city centre and what you thought about the transport infrastructure.

This supplement shows you the progress we have made and how we could achieve:

- the revitalization of the city centre and improve movement into and around Carlisle.
- We'd like your views on our proposals and over the next fortnight there are many ways in which you can do this. Get involved in your city's future.

CL: Mike Mitchellson  
Leader, Carlisle City Council

CL: Tim Stoddard  
Leader, Cumbria County Council

### KEY EVENTS

**11 - 16 September 2006**  
Display Exhibition, Assembly Rooms, Old Town Hall  
Time - Open daily

**19 September 2006**  
Public Meeting, The Civic Centre  
Time - 6.00pm prompt

**20 and 21 September 2006**  
Business Forum, Carlisle United FC  
Time - 6.00pm prompt

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Telephone 01228 817200 or visit [www.carlisle.gov.uk](http://www.carlisle.gov.uk) for the questionnaire

People were invited to respond to the supplement by the return of a questionnaire and through attendance at the consultation events detailed below.

45,000 of these supplements were distributed throughout the City and beyond via publication in the Cumberland News. Copies of the supplement have also been widely available at public buildings throughout the City such as the Civic Centre and Community Centres.

The supplement and questionnaires were also published on the City Council's website with a link from the County Council website. The initial analysis of the returned questionnaire is shown below, together with the other main issues and questions that arose out of the consultation exercise.

### **Consultation events were held over a 2 week period and have taken various forms.**

At each event members of the Carlisle Renaissance team were on hand to answer queries heading members from across the political spectrum and officers from both the City and County also attended all of the Public and Business Forum events to form a panel to answer specific questions from attendees.

- A week long City Centre public exhibition, attended by over 1300 people
- A public meeting in the Civic Centre attended by almost 80 people
- 2 business forums attracting 60 prominent business people
- 2 events at school engaging with young people
- Staff forums for employees at both the City and County Councils
- A stakeholder forum attracting nearly 30 public and community sector agencies

In total the consultation exercise directly reached 1,800 people.

There was widespread media coverage leading up to and throughout the consultation period. Articles appeared in the Cumberland News and the consultation exercise was featured locally by the BBC and Border TV.

458 Questionnaires were returned.

People were specifically asked which five schemes did they think should be prioritised and what other movement schemes did they think should be included in the priority list.

Of the measures suggested the top 5 were:

Carlisle Northern Development Route (58% supporting)  
Bus Station Improvements/Relocation (48% supporting)  
Park and Ride (42% supporting)  
South West Inner Relief Road (40% supporting)  
Lowther Street pedestrianisation (32% supporting)  
(Closely followed by Castle Way improvements)

Queries and issues relating to the Movement Strategy arising from the Consultation were as follows:

- Support and recognition of the need to develop a cohesive movement strategy.
- Considerable strong support for better use of off roads for both walking and cycling especially along “green corridors”. This was backed by a strong desire to have improvements to cycle lanes on existing routes in to the City and better cycling parking facilities in the City Centre.
- Support to use eventual and potential benefits of the CNDR to reduce severance in the City Centre.
- Strong support for public transport improvement but questions over delivery of change in respect of the private sector running such services. Very strong support for the aim of improving services outside core hours.
- Need to supplement improvements in the urban area with improvements in the rural areas.
- Seeking of more clarity over potential bus station improvements and consideration of the relationship with Citadel station.
- Seeking of more clarity over the potential for alteration of Lowther Street – in particular in relation to pedestrian activity and buses.
- Questions over the potential for park and ride in particular over relative costs between city centre and out of town parking.

The views and comments obtained from this consultation exercise was used in the further development of the movement strategy, particularly in the development of the priorities, and has also been used in the development of this Air Quality Action Plan and Carlisle Area Transport Plan.

## **Consultation on The Draft Action Plan**

The draft Action Plan will be sent to the following Statutory Consultees:

Secretary of State

Cumbria County Council – Highways

Cumbria County Council – Local Transport & Spatial Planning

Cumbria county Council – Chief Executive

Carlisle & District Primary Care NHS Trust

Carlisle City Council – Planning Department

Carlisle City Council – Environmental Policy Group

Environment Agency

Stagecoach

Eden District Council

Allerdale District Council

Dumfries & Galloway District Council

North Tyneside District Council

Public

To reach a wide audience and maximise feedback from residents and stakeholder a full consultation will be available on the Carlisle City Council's website for submitting comments. In addition the neighbourhood forums in and around the Air Quality Management Areas will also be attended in person by officers from Environmental Quality Section.

All comments from both statutory and non statutory consultees received on the Draft Action Plan will be considered and incorporated where possible into the final Action Plan.

## **CHAPTER 8 - Actions to improve air quality**

This chapter sets out the measures that will be introduced by Carlisle City Council and its partners to improve air quality. The results of the source apportionment study and the consultation, detailed in chapter 3 and 7, have been used in the production of the Plan.

As will be shown many of the actions to be implemented in order to improve air quality are taking place through existing plans and strategies. In particular many of the actions are contained in Cumbria County Council's Local Transport Plan (LTP2) and Carlisle City Council's Movement Strategy. Both Carlisle City Council and Cumbria County Council are committed to taking action to improve air quality in the area and believes that many of the actions contained in the Plan will also have a beneficial effect by improving the quality of life for residents and making activities in the area more sustainable.

Government guidance requires local authorities to have regard to the cost effectiveness and feasibility of measures in their Air Quality Action Plan.

The Government does not expect local authorities to undertake any complex, full cost/benefit analysis, instead it accepts that in most cases only indicative assessments can be made.

Estimates of cost and benefits and timescale for all forty action measures have been briefly summarised in the table at the end of this chapter. Carlisle considers that all measures in this Action Plan are feasible but due to their different natures it is impossible to rank each action measure in order of relative effectiveness in improving air quality and so this has not been done.

### **Likely Impact of Air Quality Action Measures**

The table includes a column which estimates the likely air quality improvement of the action. This gives an indication of whether the impact of the proposed action is expected to be high, medium or low. The determination of likely air quality improvement is not straight forward. Carlisle City Council has however commissioned consultants to provide a specific air quality impact assessment of one of the key action measures i.e. the CNDR (awaiting results). It has been most difficult to assess the air quality improvement arising from 'soft' measures e.g. those that encourage people to use alternative modes of transport but an indicative assessment has been made of these measures.



## **Responsibilities for Ensuring Actions are Carried Out**

The table sets out who has responsibility for ensuring that the actions are carried out.

## **Implementation of the Action Plan**

The timescale for implementing the actions contained in the plan varies for individual schemes. The table summarises the likely timescale for implementation of the key initiatives being introduced.

## **The Cost of Implementing Schemes**

The costs have been ranked as high, medium or low (high = >£1 million), (medium = £100 k to £1 million) and (low = <£100 k).

## **Monitoring and Evaluation**

Monitoring and evaluation of the actions contained in the Plan are essential to quantify its effectiveness. Chapter 9 sets out how Carlisle City Council intends to assess and monitor the ongoing implementation of the Plan.

## Road Network Alteration

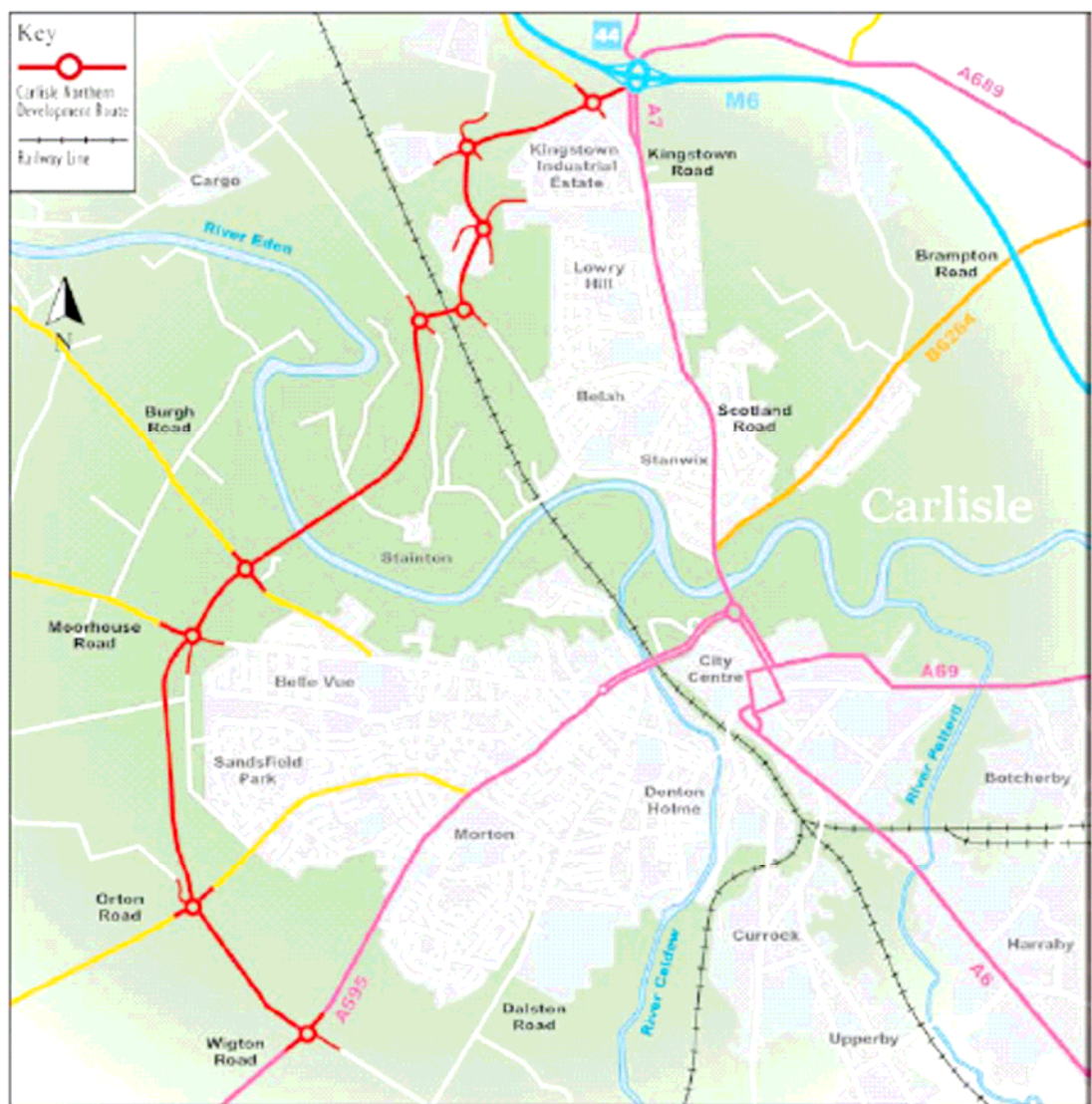
### New Road - Carlisle Northern Development Route

A new road known as the Carlisle Northern Development Route (CNDR) is to be built around Carlisle.

The CNDR is the single major scheme in the LTP (2) and in this Air Quality Action Plan. The County Council and City Council are both fully committed to this project.

The new road will be just over 5 miles long. It will pass by the west of the City from the A595 near Newby West to Junction 44 of the M6 near Kingmoor Park.

**Figure 9 – Carlisle Northern Development Route**



It will involve constructing three bridges including a totally new crossing over the River Eden. The route will also have cycle ways along its entire length.

The whole project has been approved at a public inquiry and planning permission has been granted. Funding for the project was finally approved by the Treasury in May 2007. Work on the new road, which will take around 2 years, is scheduled to begin towards the end of 2008 and finish in 2010.

The County Council has been preparing this scheme for some years and it is one of its top priorities during the LTP(2) period due to the numerous benefits it will bring to the City. The importance of the CNDR to Carlisle was also reflected during the Carlisle Renaissance Public Consultation.

The CNDR addresses one of the key issues facing Carlisle i.e. enabling non Carlisle trips to miss the City and subsequently will reduce congestion on the radial routes to the North (i.e. A7, AQMA No 1) and West (A595) of the City. The Carlisle Northern Development Route will:

- Ease congestion (and improve journey times) in Carlisle by taking commercial and other through traffic out of the City.
- Improve air quality along the A7 and the A595.
- Improve transport links between West Cumbria, Scotland and the North East by connecting the M6/A69/A74/A595 without sending traffic through Carlisle.

Both the City Council and County Council are mindful to ensure that the traffic reduction derived from the introduction of, and the opportunities presented by, the CNDR will not be lost. Reallocating road space to buses and cycles will be a priority as will be shown later on in this action plan.

**The predicated reductions in NOx emissions that will result are being modelled by AEA Technology. The data will be presented below:**

### **Awaiting Consultants Report**

**Action 1 : A new major road, the Carlisle Northern Development Route will be constructed to the West of the City which will remove approximately 25% of through traffic from the A7 (AQMA No 1) and the A595.**

## **South Eastern Environmental Route/South Western Inner Relief Road**

2 of the 48 proposals put forward in the Movement Strategy relate to improvements to the inner corridor route to the South West of the City (incorporating Crown Street, Currock Street (AQMA No 2), Victoria Viaduct, Charlotte Street and Junction Street)

The proposal relates to the development of a stronger route between the A6 and the A595 either via a series of junction improvements or a new route entirely to ease congestion which is currently leading to exceedances of the NO<sub>2</sub> air quality objective along part of this inner corridor.

This scheme was again considered by members of the public to be one of the top 5 schemes which should be taken forward during the Carlisle Renaissance Public Consultation.

Studies into the feasibility of this proposal will take place during the period of the LTP(2). The outcome of this study/investigation will be reported in our future Progress Reports.

**Action 2: The possibility of providing a stronger route to ease congestion between the A6 and the A595 (either by a series of junction improvements, south western inner relief road or a new route entirely) will be investigated.**

## **Traffic Management Scheme**

An important factor influencing the level of vehicle emissions is the degree of congestion faced by vehicles as they make their way through the city. Congestion results in stop/start driving, increasing emissions levels and the amount of time needed to complete a journey.

On a day to day basis the volume of traffic using the roads is the main cause of congestion. However other factors such as road closures, broken down vehicles or road works can make the situation worse.

Traffic Management involves the use of traffic signals, signs and traffic regulations to minimise congestion and keep the network moving.

Capita Symonds have been commissioned to undertake a study of possible measures to improve traffic flows at signals along the A7 (AQMA No 1) and the A595 during Summer 2007. This will include the effects of real time changes monitored against real time measured NO<sub>2</sub> levels at traffic signals.

The system will for the first time allow data on traffic flows and air quality to be valued simultaneously in real time and in this way will allow the development of traffic management scenarios specifically at reducing pollution levels. The results and outcome of this study will be reported in our next Air Quality Progress Report.

Action 3: Investigations to improve traffic flows in the City, particularly at signals along the A7 and the A595, will take place during summer 2007.

## Land Use and Development Control

Land use planning has a significant role to play in improving and protecting air quality within the city. Planning decisions can have a significant, longer term impact on travel behaviour and traffic levels. The City Council through its function as a planning authority, can influence new development to ensure that it is designed and located so as to reduce the need to travel. It may also influence a range of travel options encouraging alternatives to car use in accordance with national policy. The integration of land use, transport and highways is key to the Council facilitating delivery of sustainability and is at the heart of the Carlisle Renaissance prospectus. Carlisle's main planning policy is set out in the Carlisle District Draft Local Plan.

### Carlisle Draft Local Plan

The Council's Draft Local Plan sets a number of guiding planning policies that relate to the location of development, traffic generation, accessibility to public transport and other sustainable modes of transport, which will contribute to protecting/improving air quality. Examples of some of these policies are shown below:

#### Policy CP12 Pollution

Development will not be permitted where it would generate either during construction or completion significant levels of pollution (from contaminated substances, odour, noise, dust, vibration, light, heat) which would not be satisfactorily mitigated within the development proposal or by means of planning conditions.

DP01 /CDLP - All proposals for development will be assessed against their ability to promote sustainable development.

CDLP/EC 20/2 – All developments must take into consideration opportunities for promoting pedestrian and cycling access.

CDLP/DP05 - Where transport assessments are required for major development proposals they will be assessed against their impact on the safe and efficient operation of the Trunk Road Network.

CDLP/ EP15 – New sites should be able to be reached sustainably and be accessible by public transport.

CDLP/ CP15 –	Applicants will be expected to submit a Transport Assessment for large scale developments demonstrating how the proposal seeks to minimise the need to travel and encourage journeys by sustainable modes. A Green Travel Plan promoting sustainable transport solutions should also be included in the assessment, or on its own for smaller scale non residential projects not requiring a transport assessment but likely to generate a significant increase in traffic. (Criteria is set out in the Cumbria and Lake District Joint Structure Plan).
CDLP / EP15 –	All development proposals will be assessed against their ability to protect, promote and enhance existing provision for cyclists and pedestrians.
CDLP / CP15 –	All new development, accessible by the public should include provision for safe and convenient pedestrian and cycle access, including secure cycle parking.
CDLP / CP08 -	Development proposals should take into account the needs for energy conservation in design layout and choice of materials.
JST/ST3 -	All proposals will be required to promote energy and water efficient design and use of recycleable materials and renewable energy technology.
CDLP / EC 07 –	Neighbourhood shops. Facilities will be encouraged within or adjacent to district centres to enable residents to walk to facilities and reduce the need to travel.
CDLP / CP15 -	Where appropriate contributions from developers will be required for provision of, or improvement to public transport by S106 agreements.

## Development Control

Air quality as a material consideration has now been incorporated into the local planning process.

As part of the Councils planning application validation process developers are now required to submit an air quality impact assessment if the proposed development has the potential to result in significant emissions of pollutants. In this context the term 'potential' means either.

- (i) residential development in excess of 100 units; or

- (ii) employment uses in excess of 5,000 m<sup>2</sup> gross floorspace; or
- (iii) other developments in excess of 1000m<sup>2</sup> gross; or
- (iv) hotel developments in excess of 100 bedrooms; or
- (v) caravan or similar holiday units in excess of 100 units; or
- (vi) any developments that either generates in excess of 100 heavy goods vehicles per day or 100 vehicles movements in any hour; or
- (vii) any development that materially adds to local congestion; or
- (viii) any developments than may impact on the trunk road network.

Similarly any proposals to introduce sensitive receptors into the AQMA's will be required to produce an air quality impact assessment.

Specific guidance 'Air Quality Land Use Guidance' based on the guidance produced by the NSCA has now been provided for both planners and developers to assist them with this requirement. This planning guidance will be revised to incorporate a checklist of mitigating measures which could be included in Section 106 agreements based on emerging best practice. Examples of actions taken nationally to minimise adverse transport impacts includes:

- requirements for travel plans
- possible developer contributions for public transport infrastructure

It should be noted that as part of the key priorities arising from the Carlisle Renaissance Movement Strategy in taking the Strategy forward the Council, in partnership with the County Council, is in the process of producing Supplementary Planning Guidance on developer financial contribution. The SPG will enable more effective use of developer contributions and allow the inter linkage of the proposed schemes set out in the Movement Strategy not to be lost by ensuring that development contributions are targeted towards achieving wider goals rather than just answering specific needs of a site. The requirement for and the outcome of, air quality impact assessment must and will be an important consideration within this SPG.

**Action 4:** Within the emerging draft local plan, the City Council has set policies which target a number of areas such as Travel Plans and accessibility by different modes of sustainable transport. These policies will also contribute to improving air quality.

**Action 5:** The Environmental Quality Section will continue to work with the Planning Department with regard to new developments and ensure that air quality is taken into account in the planning process.



Action 6: A city council a guidance document "Air Quality and Land Use" has been produced for developers submitting planning applications on where and in what form an air quality impact assessment will be required. This has now been incorporated into the Councils planning validation process. This will be reviewed to include a suitable mitigating measures based on national best practice.

Action 7: Supplementary Planning Guidance will be produced on planning obligations to financial contributions from developers to movement and public realm projects set out in the Councils Development Framework & Movement Strategy.

## **Promoting and Encouraging More Sustainable Transport**

Carlisle City Council and Cumbria County Council will work on a number of fronts to provide and encourage greater use of sustainable transport including the implementation of Travel Plans, encouraging the use of public transport, and encouraging walking and cycling.

### **Encouraging and Increasing Use of Public Transport**

Buses are the most important public transport option for local journeys and are essential in providing an integrated transport system. By getting more people to use public transport as an alternative to car travel, total vehicle emissions can be reduced. The need to encourage and increase use of public transport is paramount in addressing air quality issues and will become even more essential as a tool to counteract potential rises in traffic volumes associated with future development.

One of the principle aims of the Carlisle Renaissance Movement Strategy is to enhance and develop the public transport provision in Carlisle. Schemes 21 – 28 (see chapter 6) put forward in the strategy aim to build towards this and includes Park and Ride, providing a 'Cross city transit system' and developing bus priority measures. Several of the schemes complement measures already included in the LTP (2).

One of the key priorities of the LTP (2) is to improve the performance of the passenger transport service and information in and around the City and encourage its use. This work involves major infrastructure projects such as the provision of Park and Ride facilities, bus priority measures and better public transport information.

The baseline study undertaken by Fauber Maunsell as part of the Movement Strategy concluded that the public bus transport provision is in fact a strength of Carlisle, it has a relatively good bus network for a city of its size. What lacks is the ability to provide effective access from the wider hinterland by this mode and the volume of activity to ensure economic viability of services off peak. In addition there is limited bus priority on radial routes in to the City and subsequently limited ability to achieve consistent bus journey times and waiting facilities outside the City Centre are of poor quality. Issues that were raised during the public consultation in 2006. Over 50% of the people who completed the questionnaire during the first consultation exercise stated that they would support initiatives to improve bus facilities and routes.

In addition the majority of people stated that they would be encouraged to use public transport if the cost was more attractive than using the car.

In order to improve and encourage the use of public transport Cumbria County Council and Stagecoach North West have entered a voluntary Quality Bus Partnership. Quality Bus Partnerships are agreements between local authorities and the bus operators to work together to secure bus improvements. As a result of this partnership investment to provide better bus route infrastructure will be prioritised on those city routes identified jointly with Stagecoach that will give the best patronage growth. Through the agreement passenger waiting facilities and bus service information will be improved throughout the identified routes. Raised kerbs and bus boarders will also be provided to improve bus accessibility. In addition a programme has begun to implement real time information on key routes and at key interchange points, this will be giving users accurate details of their next bus and any delays.

To help address the problems of congestion impacting on bus reliability Cumbria County Council through the LTP(2) will develop bus priority measures on Scotland Road (AQMA No1), Wigton Road and London Road; this will include traffic signal priority. Bus Priority measures will be part of the measures implemented to maximise the benefits of the CNDR once in place. It should be noted that these action measures complement schemes (No 27 & 28) in the Movement Strategy i.e. improvements to general bus infrastructure and development of bus priority measures on radial routes.

**Action 8: The County Council has entered a Quality Bus Partnership with Stagecoach to improve bus route infrastructure**

**Action 9: Bus priority measures will take place on Scotland Road, (AQMA No1), Wigton Road and London Road including traffic signal priority.**

There are also plans to improve bus ticketing arrangements including the development of Smart Card ticketing. Multimodal Smartcard ticketing is intended to enhance the appeal of public transport by benefiting passengers in terms of wider ticket availability, ease, speed and use. Stagecoach in partnership with Cumbria County Council is in the process of installing contactless smart card readers onto their bus fleet in Carlisle.

**Action 10: Smart Card Ticketing Solutions will be developed on public bus services.**

Cumbria County Council and Stagecoach are also embarking on a campaign to increase bus patronage through improved marketing of the local bus network by increasing bus and roadside publicity and through ongoing telemarketing schemes targeting non bus users.

**Action 11: Roadside publicity and telemarketing will be used to encourage bus patronage.**

Carlisle currently has no Park and Ride facilities. A key priority in the LTP (2) is to develop Park and Ride on the radial routes into and out of the City on the A7 (AQMA No 1), A6 and A595 during the plan period. The development of park and ride is an integral part of the overall Movement Strategy in developing an integrated transport system for Carlisle and this action measure will clearly be key in taking this forward. The provision of well sited park and ride sites using high quality buses encourages greater use of the service by motorists. Essential factors to address in developing a successful park and ride scheme include:

- Well sited quality sites some distance away from town centres ideally on radial routes.
- Bus priority measures and traffic restraint measures to complement park and ride services (discussed above)
- Clear and conspicuous signing
- Ease of access to the site
- Competitive bus based park and ride tariffs to central parking tariffs
- Provision of a high quality frequent and reliable transit service
- Journey time advantages over the car
- Site facilities such as passengers information and security

Linked to this both the City and County Council, along with Stagecoach, are currently working together to produce a comprehensive Parking Strategy that will consider the parking needs of the City over the next 15 years including the provision of park and ride (discussed further on)

**Action 12: Development of Park and Ride will take place during the LTP (2) plan**

The City Council has also introduced a concessionary bus fare scheme which is having a significant impact in encouraging those eligible (senior citizens) to travel by bus as an alternative to the car.

Action 13: A concessionary bus fare scheme has been introduced by Carlisle City Council to encourage use of public transport.

## Encouraging Walking and Cycling

Those who use cycling and walking as a means of travel can contribute many environmental and health benefits to the local transport mix, as well as having a positive impact in terms of helping to reduce traffic congestion, pollution and noise. Cycling and walking are both a strong option for short local journeys, either on their own or in combination with public transport.

Issues and opportunities in respect to cycling and walking within the city has been subject to detailed analysis both by Cumbria County Council and the Carlisle City Council Renaissance team.

Carlisle lends itself to being a truly walkable and cycleable city; no one lives more than 5 km from the centre. However its potential to date has not been fully utilised. This is recognised in both the LTP (2) and the Carlisle Renaissance Movement Strategy.

Walking and Cycling can be encouraged by providing direct routes which are well sign posted, well maintained and safe to use. Provision also needs to be made for end of journey facilities such as safe cycle parking and storage facilities.

At present the cycle network in Carlisle is discontinuous and not to a consistent high standard with significant deficiencies on key routes particularly the A7 (AQMA No 1) and London Road. There are also difficulties in accessing the city centre and the main transport interchanges and poor links to schools and major employment sites. In addition the 2 physical characteristics of the City i.e. the three rivers and the railway lines have led to limited crossing points.

Similarly there are also gaps and obstacles in the pedestrian network that inhibit making journeys on foot particularly for travel to school.

These problems were reflected during the Carlisle Renaissance Public Consultation which found that there was considerable public support for better use of off roads for both walking and cycling especially along the green corridors and strong support for developing and improving cycle lanes on existing routes and improving cycle parking. In addition the main barriers quoted as putting people off from walking and cycling included heavy road traffic, that cycle paths needed to be improved and that pavements were poorly maintained.

Several initiatives are already in place or are planned which will address these issues.

Cumbria County Council has developed a Cycling Development Action Plan (CDAP) which has been recognised by the English Regions Cycling Development Team as best practice.

The plan forms an agreed and evidence based approach to increasing the number of trips made by cycle. A target has been set to increase the number of cycling trips by 10% by 2012 from the 2003/4 baseline measured on key urban routes in Carlisle. The plan will be implemented over the period of the LTP by a Cycle Development Working Group.

Under the CDAP a key issue is that the road network should be safe for cyclists. Resources will be targeted on identifying and improving route networks from residential areas to the city centre, retail centres, major employers, bus and railway stations, hospitals and education and leisure facilities. Specific attention will be given to the A7 (AQMA No 1) corridor link from Kingmoor to the City Centre. Relocation of highway space on radial routes and within the City centre to cycles and pedestrians will be part of the measures implemented to maximise the benefits to the city of the CNDR once in place.

As part of the plan cycling promotional programmes will be developed as part of school and work travel plans to emphasise the health benefits of cycling to work and school.

Provision of secure sheltered storage and appropriately located and signed cycle parking will be brought in through the plan at educational establishments, retail centres, suitable car parks, public transport interchanges and leisure facilities. Companies will be required to make adequate and secure cycle parking provision at work places through travel plans.

**Action 14: A Cycle Development Action Plan will be implemented through LTP(2) which will provide safer and better maintained cycle routes, more secure cycle parking, promotional programmes and improved signage.**

Many of the 48 schemes in the Movement Strategy are long term requiring significant pre planning and resources. However a series of schemes related to pedestrian/cycle modes of transport and to signing initiatives across the city provide 'early wins' and many of these schemes complement the LTP(2) aims of Cumbria County Council.

Carlisle City Council has given its commitment to create/attract funding to these schemes e.g. through the planning process (S106 agreements) or from external sources such as the North West Development Agency.





A significant amount of work has already been undertaken by the City Council and County Council to develop a Cycle Network for the City providing better cross city cycle and pedestrian routes. The proposed network is shown above.

The black lines show the existing routes and the blue, green and pink lines show the proposed routes. One of the key aims of the Movement Strategy is to make better use of the city's 'green corridors' and the proposed cycle network clearly shows cycle routes along these corridors i.e. the Rivers Petteril, Caldew and Eden, as well as the development of cycle routes along the main arterial roads.

Funding is already in place for the River Petteril's Cycleway and work will start on this site this year. In addition work has already started on sections of the network along the Rivers Petteril and Eden as part of the flood defence work being undertaken by the Environment Agency.

The Kingmoor and Caldew Cycleway (the proposed North – South route shown in the map above) is particularly important in respect to this Air Quality Action Plan as the routes run parallel to the two AQMAs within the City i.e A7 and Currock Street. This cycle way will be funded from a joint project between Sustrans and Carlisle City Council and is known as 'Carlisle Connect 2 Project'. It aims to build a new foot and cycle bridge over the River Eden to connect communities in North Carlisle to the City Centre. The new bridge will provide a direct and safe crossing over the river (completely avoiding traffic on the A7). The time taken to travel between Kingmoor and the South West of the city will also be much shorter. It also plans to create links to the Caldew Riverside Path where a new Currock Bridge will connect communities to the City Centre.

**Action 15: A proposed Cycling Network has been developed for the City.**

Cycling and Walking will be encouraged through promotional campaigns run jointly between the City Council and County Council e.g. Bike Week June 2007 and will regularly feature in Carlisle Focus Magazine and on the Councils website.

**Action 16: Cycling and Walking will be encouraged through promotional campaigns e.g. Bike Week, (June 2007) and through regular features in Carlisle Focus Magazine and on the Councils Website.**

In addition the City Council and County Council along with our partners will be publishing a cycling and walking and guide book for the city by the end of 2007.

**Action 17: A cycling and walking guide for the city will be published by the end of 2007.**

Both Carlisle City Council and Cumbria County Council will ensure they set an example as a walking and cycle friendly employer by adopting a series of initiatives that are designed to encourage walking and cycling to work and on works business through their own travel plan.

Planning policies that promote cycling and walking (as well as the use of public transport) have been included in the Draft Carlisle Local Plan to ensure that new developments encourage cycling and walking.

## **Travel Plans**

As discussed in Chapter 5 Carlisle's traffic movements tend to be tidal in nature with peak congestion occurring during work and school opening and closing times. An important part of LTP (2) is to promote Travel Plans to schools, businesses and other organisations

## **Workplace Travel Plans**

A travel plan is typically a package of practical measures to reduce reliance on the car for journeys to work or during work. In addition to commuting and business travel, a Travel Plan can aim to reduce the environmental impact of travel by customers and visitors and of vehicle fleets.

Travel plans should be tailored to a particular site and can include measures such as car sharing schemes, improvements to public transport services, offering cheaper public transport fares through subsidence or operator schemes, improving walking and cycling facilities, offering flexible working practices such as working from home, switching to alternate cleaner fuels, ensuring vehicles are regularly serviced, fitting emission reducing technology and offering driver training.

A programme is being pursued that will produce Travel Plans for major employers and appropriate groups of employers in and around Carlisle.

Developing travel plans will be managed through 3 main strands of activity:

- Firstly plans will be developed with major employers through a Travel Plan Co-ordinator (now appointed)
- Secondly clusters of employers such as key services areas or employment site including Kingmoor Park, the hospitals and colleges will be encouraged to produce plans together. Improved access to Kingmoor Park from residential areas and the City Centre by all modes of transport will be a key priority.

(Organisations in Carlisle that have produced Travel Plans include Kingmoor Business Park, Capita Symonds, Rural Payments Agency, Lanes Shopping Centre, Carlisle College, Send the Light. There are several local companies in the process of developing travel plans.)

- Thirdly as well as encouraging businesses to engage in travel planning voluntarily, all large scale planning proposals will be required to submit a Travel Plan promoting sustainable transport solutions as part of the City Councils planning requirements. Planning policies have been developed to ensure that new development encourages cycling, walking and use of public transport as an alternative to cars. (See planning policy section).

Each Travel Plan will be required to include:

- An action plan to increase the number of people walking, cycling and using public transport or car sharing.
- A monitoring plan to assess modal shifts.
- Review mechanisms to highlight continuing improvement and how information and best practice can be assessed and to ensure the plan is regularly updated.

It is important that the implementation and delivery of Travel Plans are monitored when part of a planning condition or agreement to ensure that they are being effectively carried out.

**Action 18:** Existing businesses will be encouraged to implement, monitor and review Travel Plans and promote more sustainable travel to their staff.

**Action 19:** Travel plans will be required to be implemented and monitored through S106 agreements through the Development Control Process for all new developments that meet the criteria for travel plan preparation.

## **School Travel Plans**

With a significant number of schools located within the City, and in particular a concentration of secondary schools located in the eastern section (which draws pupils from across the city), the school run is a significant contributor to morning and afternoon congestion problems. Reasons for parents driving their children to school includes concerns about 'stranger danger' and the safety of routes for children who could walk or cycle. Throughout Carlisle a series of initiatives will be implemented through the 'Better Ways to School Programme' to try and ease congestion and improve safety at schools through

the implementation of school travel plans. The scheme is run by Cumbria County Council through a dedicated Better Ways To School (BWTS) Co-ordination Team who work closely with schools to encourage and promote walking, cycling and the use of public transport. As well as educating children about the environmental and health benefits of using more sustainable modes of transport there is a strong emphasis on providing children with the practical skills they need to use roads safely. Travel plans have already been developed for some primary schools and secondary schools in Carlisle. Initiatives include traffic calming near schools, organised walking buses & cycling trains, training, education and promotional campaigns e.g. Cumbria County Council has also recently taken part in the national 'Walk to School' campaign which focuses on reducing the pollution caused by driving to school, asking pupils and staff to consider how they travel to school and encourage walking to school.

The BWTS Co-ordination team will monitor the impact and outcomes of the school travel plans and there will be available on a new Cumbria BWTS website ([www.bwts.net](http://www.bwts.net)). The website provides information on good practice and advice that can be shared with schools throughout the County and other local authorities and practitioners across the Country. A link to this website will be available on the City Councils website.

It is proposed that all schools in Carlisle (and Cumbria) will have a school travel plan by 2011.

**Action 20: Local schools will be encouraged and supported in taking up the School Travel Plans through the 'Better Ways to School Programme'**

### **Car Share Club**

Car sharing is when two or more people share a car and travel together and offers a simple way to cut the costs of fuel and parking, cuts congestion and pollution and cut the stress of driving.

Carlisle City Council will set up a car share club for members of the public in 2007. The scheme will provide a free car sharing service for all those who live work and travel in and around Carlisle.

The price of setting up a branded site for Carlisle is approximately £10,000. This includes branding of the website to make it look and feel local and includes information on all forms of sustainable transport in the area. It would also enable the Local Authority to monitor the number of people subscribed,



CO<sub>2</sub> reductions, mileage reductions and modal shift patterns. The price includes a set up fee of £5,000 and a 2 year licence charged at £25,000 per annum. (The minimum licence period is 2 years) Alternatively, instead of a branded scheme the Councils website could have a link free of charge to the car share scheme's but the local authority would not be able to obtain any feedback or statistics on take up.

The scheme will be published in the press and the quarterly Carlisle Focus Magazine and by flyers left at the Civic Centre and libraries.

This scheme has a national promotion day each year and the City Council will take part in this promotion day.

**Action 21: A car share scheme will be set up for the use by the public.**

### **Carlisle City Council: Green Travel Plan**

As one of the major employers in the City, Carlisle City Council is in the process of developing a Green Travel Plan for staff and the organisation. Issues include improved facilities (i.e. showers, changing facilities and storage) to encourage cycling to work, exploring the potential for subsidised public transport, developing car share schemes, introducing car parking charges, reviewing car allowances, greater management control and planning of journeys, reviewing policy on use of public transport for longer journeys considering the adoption of 'local' mileage rates including cycling, flexible homeworking, video conferencing and procurement, maintenance and operation of the Councils fleet. A draft Green Travel Plan will be available in July 2007.

**Action 22: The City Council will develop and implement a Travel Plan for the organisation and promote the initiative to major employers.**

## Reducing Emissions from Road Vehicles

Road Transport is the largest source of air pollution from within the city contributing to (awaiting results) % of NOx emissions. Carlisle source apportionment work has estimated the contribution of different vehicle types to NOx emissions in 2006. Results are shown in Chapter 3 and indicate (awaiting results).

Improvements in the emission levels of new vehicles continues through standards set under the European Auto Oil Programme (See Chapter 4). For example a car built in 2001 produces approximately 5% of the pollutants of a car built in the 1970's. In addition there are now many cost-effective alternative fuelled vehicles. These vehicles either produce no pollution (electric, hydrogen fuel vehicles) or much lower levels (gas powered).

### Alternative Fuel Infrastructure

While Carlisle City Council will aim to encourage people to think about alternative modes of transport, there will still be extensive use of cars. Conventional fuelled vehicles are now cleaner than older vehicles but alternative fuelled vehicles are even cleaner, offering significant reductions to NOx and carbon dioxide emissions. One of the key reasons for the slow rate of adoption of cleaner fuels or emission reduction methods is not the technology but barriers such as shortage of fuelling and servicing infrastructure in the UK. In this local authority there is only 1 LPG refuelling station available to the public. Carlisle City Council is therefore keen to increase the number and types of refuelling infrastructure in the borough and will lobby with key organisations to achieve this.

Carlisle City Council will work with major new developments to encourage them to consider installation of LPG filling station where it is possible.

**Action 23: The Council will seek to improve the availability of cleaner fuels by encouraging new service stations to stock alternative cleaner fuels.**

To promote the use of alternative cleaner fuels the government has backed the Transport Action Powershift Initiative which is independently run by the Energy Savings Trust. This initiative provides grants, sets standards and makes information available on clean fuel vehicles. Powershift will fund:

- A percentage of the cost of converting existing vehicles up to one year old.
- A percentage of the difference in cost between a clean fuel vehicle and its petrol or diesel equivalent.

The initiative also aims to generate vehicle orders from businesses, transport operators and local authority partners and individuals.

The use of alternative fuels can lead to a significant reduction in emissions e.g. a large van run on LPG releases around 11% of NOx emissions compared to a diesel fuelled version.

Carlisle City Council will promote the use of cleaner fuels and wherever possible raise awareness regarding Powershift and grant availability.

Information on alternative fuelled vehicles will be placed on the City Council's website. In addition there will be a link to the Energy Savings Trust Powershift Programme. The Council will also contact and encourage businesses and major fleet operators and promote the accelerated use of cheaper vehicle technology.

**Action 24:** The Council will develop partnerships with businesses and major fleet operators to encourage the accelerated use of cleaner vehicle technologies and cleaner fuels and promote improved maintenance and considerate and economical driving.

## **Setting an Example - Council Vehicle Fleet**

The City Council also has a role to play in reducing emissions from our own Council fleet and is currently undergoing a review of its own fleet with a view to setting its own targets to reducing vehicle emissions. The review will be completed in 2007 and the outcome of the review will be documented in the next Air Quality Progress Report.

**Action 25:** The Council will introduce a policy of replacing its vehicle fleet with greener types of vehicle.



## Roadside Emission Testing

Roadside Emission Testing is currently carried out by the Vehicle Inspectorate (VI) under regulation 61 of the Road Vehicle (Construction and Use) Regulations 1986 which lays down maximum permitted levels of emission of regulated pollutants from vehicles. Although vehicle emissions are checked by the MOT test, they can exceed acceptable levels due to low levels of service and maintenance by owners as well as a degree of wear and tear between MOT tests. The VI concentrates mainly on heavy goods vehicles, buses and coaches. Under Regulation 98 of the same Act it is also an offence for drivers to leave engines running while stationary without good reason. The Government has now given powers to local authorities with AQMA's to check vehicle exhausts at the roadside and to take action against stationary idling vehicles.

Very few local authorities have however adopted these powers to carry out vehicle emissions testing. The scheme is very labour intensive, expensive and requires police assistance. It also tends to target the less well off. This potential air quality action measure is not considered appropriate, necessary or proportional in addressing air quality issues in Carlisle, which are not widespread.

Some local authorities have however carried out voluntary vehicle emission testing as part of promotional events. The aim of these events is to increase public awareness of vehicle pollution and to provide advice on vehicle servicing and driving styles. This will be investigated further with the Vehicle Inspectorate.

**Action 26: The Council will carry out campaigns to raise awareness of vehicle pollution, including discouraging drivers from allowing their engine to idle and possible voluntary vehicle emission testing.**

As stated it is currently an offence to leave a vehicle idling unnecessarily whilst parked under the Road Vehicle (Construction and Use) Regulations. Local authorities can enforce this legislation. Authorised officers can ask drivers to switch off their engines if they are deemed to be letting them idle unnecessarily. If the motorist refuses to turn the engine off, a fixed penalty notice of £20 can be issued.

**Action 27: The City Council will consider authorising its officers under the Road Vehicle (Construction and Use) Regulations for the purposes of issuing fixed penalty notices where motorists refuse to turn off idling engines.**

## Congestion Charges

Congestion Charging was one of the Lord Mayors proposals in the Transport Strategy for London in 2001 and was implemented in 2003. London currently has levels of air pollution among the worst in Europe and road transport related emissions account for around half of the total emission of PM10 and NOx in the capital. So far London is the only city where congestion charging is in place. However the Government is considering the introduction of congestion charging at several other heavily congested urban conurbation's within the UK such as Manchester. The role of congestion charging is to deter those people who use their vehicles from the charging zone e.g. the AQMA's. A charge is made for people who do drive into the area. Enforcement of the scheme in London is through automatic number plate recognition by fixed and mobile cameras. Penalty charges are given to drivers who do not pay.

## Low Emission Zones

A Low Emission Zone (LEZ) is an area which certain categories of vehicle can only enter if they meet specified emission standards. Again enforcement would be through automatic number plate recognition.

Both LEZ's and congestion charging schemes are 'area wide schemes' designed to cover large AQMA's. The enforcement costs of introducing congestion charging and/or LEZ's are huge and both these potential air quality measures are not considered appropriate, necessary or proportional in addressing the air quality issues in Carlisle, which are not widespread. However the application of both schemes elsewhere in the UK will be kept under review.

## Car Parking Strategy

Car Parking Management however is a powerful tool in influencing vehicle access into the city centre and can be seen as a milder form of congestion charging. The City Council, in consultation with the highways authority, is in the initial stages of preparing a comprehensive Parking Strategy for Carlisle.

The purpose of the Strategy is to "deliver a vision for parking, provision and management in the City that ensures short and long term economic viability of the City Centre, attract inward investment to the sites identified in the Local Plan and Renaissance Development Framework and achieves **the highest standards of air quality, public realm and quality of life for the people of Carlisle**". (Project Report April 2007).

The Working Group includes officers from the City and County Councils and Stagecoach North West.

The following are key issues that will be addressed in the Strategy:

- Assessment of future overall demand for parking in the city over a range of development scenarios and over 5, 10 and 15 year terms.
- Assessment of locations for short and long term on and off street parking in the City.
- Assessment of sites on radial routes on the city fringes and in surrounding settlements.
- Assessment of potential charging and management regimes for public and private off street, on street and park and ride provision.
- Assessment of informal park and ride in Longtown, Dalston and Brampton (possibly extending to Wigton, Armathwaite, Penrith and Dumfries).
- The impact and scope of employers travel plans and school travel plans.
- Impact of planning policies on parking demand and provision.
- Potential to support the strategy through developers contributions (S106 agreements).
- Potential influence through agreements and regulation over employers parking provision and over privately managed public off street parking.

The Parking Strategy will be developed over the next 6 months and will be reported on in our next Air Quality Progress Report.

**Action 28: The City Council and the County Council will develop and implement a comprehensive Car Parking Strategy.**

## **Freight Quality Partnership**

HGVs can be a significant source of exhaust emissions. Through the LTP(2) the existing Cumbria Freight Quality Partnership will be extended and developed. The partnership includes representatives from both the haulage industry and the local authority who are working together to minimise the environmental impact of road freight, including emissions to air. The partnership is looking at ways/opportunities to transfer freight traffic to more sustainable modes of transport. Such as encouraging a shift to the use of rail for freight transport deliveries and so to reduce the amount of freight on the road network and encourage lorries to use routes that reduce adverse impacts on the communities.

**Action 29: The movement of goods by rail will be encouraged through freight quality partnerships.**

## Targeting Specific Smoking Vehicles

Diesel vehicles that are old or poorly maintained are prone to producing large quantities of thick, heavy dark smoke. This smoke can make buildings dirty and also increases the amount of small particles in the air.

Local authorities do not currently have direct powers to deal with these smoky vehicles however the Governments Vehicle Inspectorate does.

The public can report a smoky diesel (lorry, bus, coach or other public service vehicle) by contacting Tel: 08706060440. To make a report, the following details will be required:

- Vehicle Registration
- Type of Vehicle
- Date smoky vehicle seen
- Time smoky vehicle seen
- Exact location vehicle was seen (road and town)
- Name of vehicles operator (company or individual)

**Action 30: The City Council will promote the reporting of smoky vehicles through information leaflets, information in Carlisle Focus Magazine and through the City Councils website.**

## **Reducing Emissions from Non Transport Related Sources**

As traffic is the main source of air pollution in Carlisle the vast majority of the Air Quality Action Plan measures are aimed at reducing emissions from transport. There are however other sources of nitrogen dioxide in the city which need to be addressed within the Air Quality Action Plan.

Source apportionment work has shown that in the areas of technical breach of the air quality objective levels, emissions from industrial processes make up around (awaiting results) of the total No<sub>x</sub> emissions. There is a greater contribution (between (awaiting results)) from 'other sources'. These other sources consist mainly of emissions from domestic and commercial space heating but also include contribution from minor roads.

## **Regulation of Part A and B Process in Integrated Pollution, Prevention and Control & Pollution Prevention and Control**

Emissions from the majority of large industrial processes in Carlisle are already subject to strict control under the Integrated Pollution Prevention and Control (IPPC) regime and the Pollution Prevention & Control Regime. Under this regime certain industrial processes are required to be inspected on a regular basis by either Carlisle City Council staff or the Environment Agency (the type and size of the process determines the relevant regulating authority). Carlisle City Council currently permits 67 Part B and 2 A2 Processes. In addition there are 12 A1 processes located throughout the District regulated by the Environment Agency. As well as regular inspection each process is required to operate in accordance with a set of permit conditions, which includes controls on the level of emissions allowed and the type of abatement equipment to be used. Guidance notes are provided to regulating authorities to ensure an uniformed approach to emissions control across the UK.

**Action 31: The Council will continue to provide comprehensive control over all Part A and B Processes located within the local authority.**

## Bonfires

Bonfires can be a nuisance to people living or working nearby primarily by adding to levels of fine particles (smoke) but also by releasing other pollutants and odours, especially when plastic is burnt. The Environmental Quality section often receives complaints and is able to take enforcement action under the Environmental Protection Act 1990 to stop the bonfire and prevent its recurrence. This applies to both garden bonfires and commercial bonfires such as on building sites.

The Council discourages the disposal of waste on bonfires and instead promotes composting and offers free collection of garden waste. Composting bins are also available from the Council at a reduced price.

Information about these services is available to the public on the Council's website and through information campaigns.

**Action 32: The Council will improve information and advice given to residents and companies about problems caused by bonfires, and continue enforcement action against persistent offenders who break the law.**

**Action 33: An extensive publicity campaign has recently taken place on green waste collection schemes provided by the Council**

## **Industrial Smoke Control – Clean Air Act 1993**

Carlisle City Council also controls emissions from certain industrial processes or trade premises which fall outside the provisions of IPPC using the provisions of the Clean Air Act 1993 which includes powers to:-

- Prohibit black smoke (Subject to certain exemptions)
- Require notification of installations of industrial furnaces
- Approve chimney height of certain installations

## **Statutory Nuisance Legislation – Environmental Protection Act 1990**

Local Authorities have powers to deal with domestic as well as industrial emissions that by definition are prejudicial to health or a nuisance.

Where a local authority is satisfied that a statutory nuisance exists the Councils enforcement officers have a duty to take enforcement action requiring the abatement of the nuisance.

**Action 34: The Council will continue to investigate complaints of black smoke and smoke nuisance and take enforcement action when appropriate.**

## Smokeless Zones

Some areas of the City are subject to the requirements of smoke control orders that prevent the burning of solid fuels such as coal and wood inside premises. These orders were put in place by the City Council mainly during the 1970's to combat the smoke induced smogs that were common place prior to the widespread availability of electricity and natural gas for heating purposes.

There are 5 smoke control areas within the local authority, all of these are located within the city. In a smoke control area it is an offence to emit smoke from any chimney. It is also an offence to acquire for use, or sale any fuel, other than a authorised smokeless fuel unless it is to be burned on a fireplace exempted from the smoke control area.

**Action 35: The Council will continue to ensure that only authorised fuels are used in smoke control areas.**



## Energy / Heating

Buildings contribute directly and indirectly to the consumption of energy and resources; to environmental pollution from materials used in construction, to energy consumed from heating, lighting and ventilation and to waste generated during construction and demolition. Energy efficient buildings and those incorporating sustainable design principles are now recognised as important ways to help control emissions from domestic and commercial properties and to encourage people to use less energy.

The City Council Energy Efficiency Advice Centre has an ongoing programme of offering energy of advice and access to grants through a variety of different projects and information campaign e.g. through promotions, (display at local shows) through Home Energy Surveys (individual advice given to householders) and centrally funded Energy Savings Schemes.

The Council measures the improvement of energy efficiency of housing in the district and reports this each year (HECA Report). We have a target of 30% reduction of CO<sub>2</sub> by 2010 and Carlisle has achieved 30% during 2006/07 financial year – 2 years early. The targets are currently being reviewed and are expected to be increased for the next target period (post 2010).

As part of this Air Quality Action Plan an energy efficiency advice project will be targeted specifically at reducing local emissions of NO<sub>x</sub> by actively promoting energy efficiency within adjacent the AQMA's. An energy efficiency survey of residential properties will take place by October 2007 following which energy saving advice and grants will be provided to relevant residents.

**Action 36: An Energy efficiency advice survey will be targeted at residential properties within/adjacent to the AQMA's. Energy savings advice and grants to be provided.**

The Draft Carlisle District Local Plan contains several policies that encourages energy efficiency development and development that uses renewable energy.

In line with our corporate aim for a Cleaner, Greener and Safer Carlisle, Carlisle City Council will take responsibility for managing the environmental impact of our activities and aim to continually improve our 'in house' environmental performance.

In order to achieve this we will:

- Identify the significant environmental impacts of our activities.
- Develop suitable objectives, targets and programmes to manage and reduce our environmental impacts.
- Comply with relevant environmental legislation.

- Implement actions to manage and reduce our greenhouse gas emissions, through energy conservation, greater use of renewable energy and sustainable transport.
- Reduce consumption of resources whilst endeavouring to re-use or recycle where practicable.
- Conserve the natural environment and enhance the biodiversity of our land holding.
- Implement initiatives that seek to minimise the environmental impact of our procurement of goods and services, working with our suppliers and contractors to help achieve this.
- Raise awareness and motivate staff and members to conduct their activities in an environmentally responsible manner, making sure that environmental responsibilities are defined, communicated and understood at all levels across the council.
- Encourage our partner organisations, developers and the general public to adopt sustainable principles and undertake sound environmental management, taking advantage of educational opportunities where possible.
- Carry out regular reviews and monitor progress of our environmental policy to enable us to strive for continual improvement.

## **Raising awareness of air quality issues and education**

Information, education and promotion are considered to be important ways of influencing travel behaviour and improving air quality. For the air quality action plan to be successful it is vital that the public is provided with information regarding air pollution and its likely effects on health and the environment. It is also important that the public is advised of the air quality improvement actions proposed for Carlisle and also the actions that they can take as individuals.

Building public support to improve air quality and to protect the environment will be an integral part of this Action Plan. In the long term improving and sustaining air quality will require behavioural change by individuals and businesses. Individuals can help improve air quality by reducing car use and changing drive styles. Businesses can help improve air quality by implementing travel plans and reducing vehicle emissions.

Raising awareness and providing information on air pollution and transport will be achieved in a number of ways:

### **Improving Public Information**

It is important that we provide information on air quality and its impact on health and the environment in a clear and accessible way. We will provide a much larger range of information on our website. This will include information on locations of the cycle/pedestrian routes in the city and a link to travel line which gives up to date information on buses and train times for local and national travel. In addition features on air quality issues and what people can do to help will regularly feature in the Carlisle Focus Magazine.

An annual report on air quality with analysis of local pollution levels, progress with this Air Quality Action Plan and comparison with air quality targets will be published on the website.

**Action 37: We will establish a method to introduce more regular publicity events and promotion of air quality and sustainable transport issues**

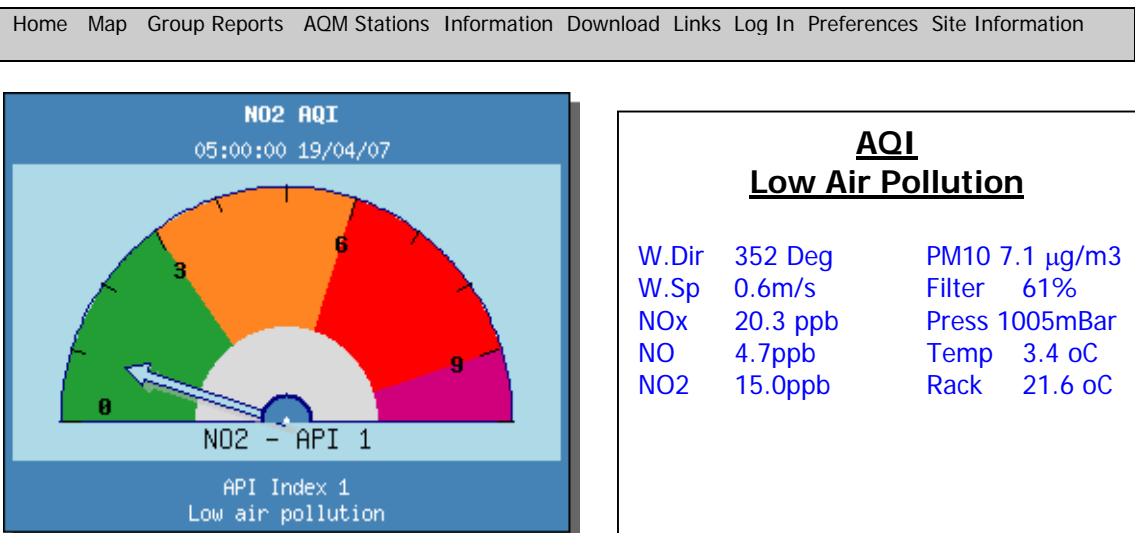
**Action 38: The City Council will improve access to information regarding transport options by publishing up to date bus and rail times on the Councils website**

## Provide up to Date Monitoring Information to the Public

The website will also contain information updated hourly about the real time NO<sub>x</sub> levels from our two automatic monitoring stations (updated every 15 minutes) located within the city and there will be links to other sites with information about pollution's levels nationally. This will provide a 'data' source for air quality past and present for interested people and environmental education. An example of what the website site will look like is shown below:

### **Air-Quality.Net**

#### Low Air Pollution – Carlisle, Cumbria – AQI Reading



Action 39: The City Council will publish more local air quality monitoring data on its website

## **Don't Choke Britain Publicity / Car Free Day**

Local campaigns to promote awareness on environmental pollution from vehicles and alternatives will be increased.

The City Council will promote annual campaigns, such as Bike Week (June 2007) and Car Free Day (September 2007)

## **New Teaching Packs for Schools in the Local Authority on Reducing Air Pollution**

Carlisle City Council intends to increase the awareness and understanding of air quality and environmental issues by designing and circulating school teaching packs. These will be distributed to each school in the District. In addition talks will also be available upon request.

**Action 40: The City Council will produce a teaching pack on air quality and reducing air pollution. These will be circulated to schools in the District.**























## **Increase the Monitoring Undertaken With Regard to the AQMA**























Carlisle City Council was the first Council in Cumbria to install a continuous monitor in its district to measure air pollution.

We also have a comprehensive network of passive monitoring using NOx tubes.





















Following on from the declaration of the AQMA (No 1) a new roadside continuous monitor has been purchased and is located within this AQMA.























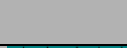

Action 41: We have expanded our monitoring network to incorporate a new continuous monitoring site for nitrogen dioxide installed within AQMA (No 1)

<p>KEY</p> <p><b>Financial Cost</b> L = &lt; £100,000 M = £100,000 - £1 million H = &gt; £1 million</p> <p><b>Air Quality Impacts</b> The likely potential air quality improvement was considered for each action and a rank order has then been given.</p> <p>  - Most positive   - Medium   - Less positive </p> <p><b>Feasibility</b> The feasibility of each action was considered in relation to the ease of implementation within the District</p> <p>  - Most positive   - Medium   - Less positive </p>								
<b>Table -- Air Quality Action Plan - Summary</b>								
Action Plan Ref No	Action Plan Measure	Cost	Responsibility	Feasibility	Date to be achieved	Likely AQ Improvement	Non Air Quality Impacts	Compatibility with existing policies
1	A new major road, the Carlisle Northern Development Route will be constructed to the West of the City which will remove approximately 25% of through traffic from the A7 (AQMA No 1) and the A595.	H	Cumbria County Council		2010		Free up space for alternate modes of transport. Reduce congestion , reduced traffic noise	Yes
2	The possibility of providing a stronger route to ease congestion between the A6 and the A595 (either by a series of junction improvements or a new route entirely) will be investigated	M	Cumbria County Council		Unable to specify		Reduced inner city congestion	Yes
3	Investigations to improve traffic flows in the city particularly at signals along the A7 and the A595 will take place during summer 2007.	L	Cumbria County Council		2010		Reduced congestion	Yes
4	Within the emerging draft local plan, the City Council has set policies which target a number of areas such as Green Travel Plans and accessibility by different modes of sustainable transport. These policies will also contribute to improving air quality.	L	Cumbria County Council Carlisle City Council		Ongoing		Reduced congestion General health improvements Increase green travel awareness Increase use of public transport	Yes
5	The Environmental Quality Section will continue to work with the Planning Department with regard to new developments and ensure that air quality is taken into account in the planning process.	L	Carlisle City Council		Ongoing		Prevention rather than cure Increased awareness of air quality issues amongst departments and developers. Joined up working Introduction of mitigating measures by way of S106 agreements may enable development to take place which might otherwise be refused.	Yes
6	A guidance document "Air Quality and Land Use" has been produced for developers submitting planning applications on where and in what form an air quality impact assessment will be required. This has now been incorporated into the Councils planning validation process. This will be reviewed to include a suitable mitigating measures based on national best practice.	L	Carlisle City Council		2007			
7	Supplementary Planning Guidance will be produced on planning obligations to financial contributions from developers to movement and public realm projects set out in the Development Framework & Movement Strategy	L	Cumbria County Council Carlisle City Council		2007		Provide real choice in sustainable transport options	Yes
8	The County Council has entered a Quality Bus Partnership with Stagecoach to improve bus route infrastructure	H	Cumbria County Council Stagecoach		Ongoing		Reduce congestion Increase public transport patronage by improving publics perception	Yes

9	Bus priority measures will take place on Scotland Road, (AQMA No1), Wigton Road and London Road including traffic signal priority.	H	Cumbria County Council Stagecoach		2011		Reduce congestion Increase bus reliability Increase public transport patronage	Yes
10	Smart Card Ticketing Solution will be developed on public bus services.	H	Cumbria County Council Stagecoach		2007/08		Reduce congestion Increase bus reliability Increase public transport patronage	Yes
11	Roadside publicity and telemarketing will be used to encourage bus patronage.	H	Cumbria County Council Stagecoach		Ongoing		Reduce congestion Increase public transport patronage	Yes
12	Development of Park and Ride will take place during the LTP (2) Plan	H	Cumbria County Council		2009/2010		Reduce Congestion Increase public transport patronage Significant issues relating to land requirements and unwanted environmental effects	Yes
13	A concessionary bus fare scheme has been introduced by Carlisle City Council to encourage use of public transport.	M	Carlisle City Council		Ongoing		Reduce congestion Increase public transport patronage	Yes
14	A Cycle Development Action Plan will be implemented through LTP(2) which will provide safer and better maintained cycle routes, more secure cycle parking, promotional programmes and improved signage	H	Cumbria County Council		Ongoing		Reduce congestion Improve health	Yes
15	A proposed Cycling Network has been developed for the City.	M	Cumbria County Council		Ongoing		Reduce congestion Improve health	Yes
16	Cycling and Walking will be encouraged through promotional campaigns e.g. Bike Week, (June 2007) and through regular features in Carlisle Focus Magazine and on the Councils Website.	L	Cumbria County Council Carlisle City Council		Ongoing		Reduce congestion Improve health	Yes
17	A cycling and walking guide for the City will be published by the end of 2007.	L	Cumbria County Council Carlisle City Council		2008		Reduce congestion Improve health	Yes
18	Existing businesses will be encouraged to implement, monitor and review Travel Plans and promote more sustainable travel to their staff.	L	Cumbria County Council		Ongoing		Reduce congestion Improve environmental image of businesses	Yes
19	Travel plans will be required to be implemented and monitored through S106 agreements through the Development Control Process for all new developments that meet the criteria for travel plan preparation.	L	Cumbria County Council Carlisle City Council		Ongoing		Reduce congestion Improve environmental image of businesses	Yes



20	Local schools will be encouraged and supported in taking up the School Travel Plans through the 'Better Ways to School Programme'	M	Cumbria County Council		Ongoing			Yes
21	A car share scheme will be set up for the use by the public	L	Carlisle City Council		2007			Yes
22	The City Council will develop and implement a Green Travel Plan for the organisation and promote the initiative to major employers.	M	Carlisle City Council		2007		Yes	Yes
23	The Council will seek to improve the availability of cleaner fuels by encouraging new service stations to stock alternative cleaner fuels.	L	Carlisle City Council		Ongoing		Reduce congestion Increase green travel awareness Share travel costs	Yes
24	The Council will develop partnerships with businesses and major fleet operators to encourage the accelerated use of cleaner vehicle technologies and cleaner fuels and promote improved maintenance and considerate and economical driving.	L	Carlisle City Council		2008		Lead by example	Yes
25	The Council will introduce a policy of replacing its vehicle fleet with greener types of vehicle.	M	Carlisle City Council		Ongoing		Increase in alternative fuelled vehicles on the road Increase public awareness	Yes
26	The Council will carry out campaigns to raise awareness of vehicle pollution, including discouraging drivers from allowing their engine to idle and possible voluntary vehicle emission testing.	L	Carlisle City Council		2008		Increasing cleaner alternative fuelled vehicles on the road Increase public awareness Operators fuel bill should be reduced	Yes
27	The City Council will consider authorising its officers under the Road Vehicle (Construction and Use) Regulations for the purposes of issuing fixed penalty notices where motorists refuse to turn off idling engines.	M	Carlisle City Council		2008		Lead by example Improve vehicle efficiency Better public perception	Yes
28	The City Council and the County Council will develop and implement a comprehensive Car Parking Strategy.	M	Cumbria County Council Carlisle City Council		Ongoing		Raise public awareness of vehicle pollution issues	Yes
29	The movement of goods by rail will, wherever possible, be encouraged through freight quality partnerships.	L	Cumbria county council		Ongoing		Controversial Cost of manpower/workload high Increase public awareness Increases cold start emissions	Yes

30	The City Council will promote the reporting of smoky vehicles through information leaflets, information in Carlisle Focus Magazine and through the City Councils website.	L	Carlisle City Council		2007/08		Reduce congestion encourages shift to sustainable modes of transport Reduced income?	Yes
31	The Council will continue to provide comprehensive control over all Part A and B Processes located within the local authority.	L	Carlisle City Council		Ongoing		Reduce congestion	Yes
32	The Council will improve information and advice given to residents and companies about problems caused by bonfires, and continue enforcement action against persistent offenders who break the law.	L	Carlisle City Council		Ongoing		Raise public awareness of vehicle pollution issues	Yes
33	An extensive publicity campaign has recently taken place on green waste collection schemes provided by the Council	M	Carlisle City Council		2007		Regulation also controls the release of pollution to land Can also reduce possible visual impact of emissions and noise	Yes
34	The Council will continue to investigate complaints of black smoke and smoke nuisance and take enforcement action when appropriate.	L	Carlisle City Council		Ongoing		Could lead to fewer complaints about smoke nuisance	Yes
35	The Council will continue to ensure that only authorised fuels are used in smoke control areas.	L	Carlisle City Council		Ongoing		Avoid smoke nuisance through burning Promotes an environmentally friendly lifestyle Reduces amount of road trips made by individuals	
36	An Energy efficiency advice survey will be targeted at residential properties within/ adjacent to the AQMA's. Energy savings advice and grants to be provided.	L	Carlisle City Council		Ongoing		Reduction in smoke nuisance from burning and NO2 emission from reduced use of domestic fuels. Financial savings, reduces fuel poverty Helps tackle climate change Assist with HECA targets	Yes
37	We will establish a method to introduce more regular publicity events and promotion of air quality and sustainable transport issues	L	Carlisle City Council		Ongoing			Yes
38	The City Council will improve access to information regarding transport options by publishing up to date bus and rail times on the Councils website	L	Carlisle City Council		2007		Makes journey planning (particularly visitors to city) easier	Yes
39	The City Council will publish more local air quality monitoring data on its website	L	Carlisle City Council		2007		Will highlight commitment of Carlisle City Council and Cumbria County Council to improve air quality and the environment	Yes
40	The City Council will produce a teaching pack on air quality and reducing air pollution. These will be circulated to schools in the District.	L	Carlisle City Council		2007/08		Will highlight commitment of Carlisle City Council and Cumbria County Council to improve air quality and the environment Encourages use of public transport	Yes
41	We have expanded our monitoring network to incorporate a new continuous monitoring site for nitrogen dioxide installed within AQMA (No 1)	L	Carlisle City Council		2007		Provide comprehensive database of information Allows success rates to be evaluated Educational	Yes

## **CHAPTER 9 – Effect of Action Plan Measures on Nitrogen Dioxide Concentrations Within The Air Quality Management Areas - (Action Plan Scenarios)**

Carlisle City Council along with its partners has identified a range of measures that will reduce traffic congestion and heavy-duty vehicle emissions identified in Chapter 3 as being the main contributing factors to NO<sub>2</sub> concentrations within the AQMA. The Action Plan measures are discussed in the previous Chapter.

### **Scenarios**

#### **A7 (AQMA 1)**

A new road referred to as the Carlisle Northern Development Route (CNDR) is to be built around Carlisle. The County Council and City Council are both fully committed to this project. The new road will be just over 5 miles long and will pass west of the city from the A595 to Junction 44 of the M6. The CNDR enables non Carlisle trips to avoid the City and subsequently will reduce congestion on the radial routes to the North (A7) and West (A595) of the City. Work on the new road, which will take around 2 years, is scheduled to begin towards the end of 2008, therefore should be completed by 2010. It is anticipated that the CNDR will remove approximately 25% of through traffic from the A7 and A595 and, in particular, reduce the flow of HDVs through the City.

Capita Symonds were commissioned to undertake a study of possible measures to improve traffic flows at signals along the A7 and A595 during Summer 2007. The outcomes of this study will be published in Carlisle District Authority's next Air Quality Progress Report.

Encouraging public transport is one of the key components of both the Local Transport Plan (LTP) covering Carlisle and the Carlisle Renaissance Movement Strategy. The County Council has entered into a Quality Bus Partnership with Stagecoach to improve bus route infrastructure and bus priority measures will take place on the A7 Scotland Road, including traffic signal priority.

The current cycle network in Carlisle is discontinuous with particular deficiencies on key routes such as the A7. Therefore the LTP will implement a Cycle Development Action Plan, which will provide safer and better maintained cycle routes, more secure cycle parking, promotional programmes and improved signage. A proposed on road/ off road Cycling Network has been developed for the City.

In order to combat peak congestion occurring during work and school opening and closing times, an important component of the LTP is to promote Travel Plans to schools, businesses and other organisations.

A number of scenarios have therefore been modelled in order to quantify potential benefits

that should arise from these measures. All scenarios consider a 25% reduction in daily traffic flows to represent the reduction to traffic travelling through the city as a result of the proposed road network developments. For this reduced traffic flow, the following levels of congestion were considered, to represent the impact of reduced traffic flows and Travel Planning, increased use of public transport, cycling and walking:

- No congestion. To represent the optimal reduction of congestion;
- Reduced congestion. To represent a partial reduction of congestion, peak queue lengths are limited to the current off-peak lengths. Off peak queues are reduced in length by approximately 25% to reflect the smaller volume of traffic and move faster as a result of better traffic flow at signals;
- Reduced congestion and proportion of HDVs. To represent the additional reduction of HDVs travelling through the City, should the proportion of HDVs is reduced by 50%.
- Current congestion. A worst case scenario, in which the measures other than the CNDR have no impact upon the congestion around junctions and signals despite a 25% reduction in traffic flow as a result of road network developments.

### **Currock Street (AQMA 2)**

In addition to the efforts to encourage use of public transport, walking, cycling and the implementation of transport plans mentioned above, the Action Plan also identifies possible improvements to the South West Inner Corridor e.g. through a series of junction improvements to ease congestion entirely along the inner corridor route to the South West of the City (incorporating Crown Street, Currock Street (AQMA No. 2, Victoria Viaduct, Charlotte Street and Junction Street). Studies into the feasibility of this proposal will take place during the period of LTP (2). It should be noted that scenario testing is still being undertaken by AEA Technology for Currock Street. However even without any improvements along this road the base line results shown in table 4 indicate that NO<sub>2</sub> concentrations will fall below the objective level within the term of this Action Plan.

## Scenario results

Table 4 shows the results of modelling undertaken for the NO<sub>2</sub> concentration within both AQMA's at the receptor locations discussed in Chapter 3. It considers scenarios for both 2006 and 2010.

**Table 4 : Predicted nitrogen dioxide concentrations at selected receptors for the Action Plan scenarios**

Receptor	Year	Base	Scenarios (includes the reduction of traffic by 25% as a result of the CNDR)			
			Current Congestion	Reduced Congestion	Reduced Congestion, 50% HDVs	No Congestion
North Kingstown Road, A7	<b>2006</b>	43.45	37.21	35.42	28.04	20.69
South Kingstown Road, A7		38.80	33.13	32.65	25.66	17.80
Scotland Road, A7		46.98	40.22	40.17	31.51	23.86
Stanwix Bank, A7		41.59	35.62	34.15	26.99	20.60
Brampton Road		46.29	39.65	39.52	31.25	25.12
Currock Street		37.00				
North Kingstown Road, A7	<b>2010</b>	37.76	32.39	30.88	24.84	18.85
South Kingstown Road, A7		33.67	28.87	28.47	22.79	16.43
Scotland Road, A7		40.89	34.99	34.95	27.75	21.44
Stanwix Bank, A7		36.13	31.03	29.80	23.96	18.75
Brampton Road		40.31	34.52	34.41	27.55	22.47
Currock Street		32.38				

Table 4 shows that the construction of the Carlisle Northern Development Route has the potential to substantially reduce the nitrogen dioxide concentrations at relevant receptors in Carlisle. Reductions in nitrogen dioxide concentrations of  $6 \mu\text{g m}^{-3}$  are possible along the A7 (on average) as a result of the 25% reduction to traffic flows. Reducing congestion along the A7 could reduce concentrations by  $7 \mu\text{g m}^{-3}$  if, in addition, the proportion of HDVs travelling along the route was halved. In an optimal scenario where congestion was removed entirely from the A7, nitrogen dioxide concentrations are potentially reduced by  $21 \mu\text{g m}^{-3}$ .

Overall the results of testing of all these scenarios indicate that the action plan measures discussed above in chapter 8, will be effective in reducing nitrogen dioxide concentrations in the AQMA's.

## **CHAPTER 10 - Monitoring and Evaluation**

Air quality, within this local authority has been monitored routinely since the early 1960's following the introduction of the Clean Air Acts. Smoke and sulphur dioxide were the pollutants of concern at that time and the main indicators of air quality. Daily monitoring undertaken by Carlisle City Council recorded initial dramatic reductions in air borne concentrations, followed by continuing downward trends over the next 3 decades. During our Updating and Screening Assessment in 2003 it was decided to cease operating our sulphur dioxide and smoke monitoring station due to concentrations being so low.

Today the pollutant of most concern in Carlisle is nitrogen dioxide. The primary objective of this Action Plan is to reduce nitrogen dioxide levels in Carlisle and improve air quality generally. In order to evaluate the effectiveness of the Action Plan, Carlisle City Council will continue to monitor nitrogen dioxide levels in Carlisle with the use of diffusion tubes and the continuous analysers. This will show whether the expected and required reduction in levels is occurring and whether the nitrogen dioxide objective is likely to be met by 2010 (awaiting confirmation from consultants report).

The next Review and Assessment Progress Report of Air Quality will be undertaken in April 2008 and this will show the trends in pollutant levels. Progress in implementing the Action Plan will also be assessed by reviewing the extent to which planned actions have been carried out. If it appears that the reduction in NO<sub>2</sub> will not be sufficient then this Action Plan will be reviewed and any possible further measures investigated and implemented where possible.

The government has produced guidelines on how action plan measures can be assessed for their effectiveness by using a range of quantifiable indicators. Examples of the types of indicators that could be used are shown below:

<b>Indicator</b>	<b>Measure</b>	<b>Use</b>
Traffic Flow	Number of vehicles per time	Reduced flow = reduced air pollution, but traffic may be re-routed to another area
Journey time	Length of journey versus distance	Reduced journeys may result from reduced vehicle numbers and increased speed
Road density	Number of vehicles in a given area	Reduced density through reduced vehicles is likely to lower emissions. Useful for monitoring changes in town centres
Fleet Mix	<ul style="list-style-type: none"><li>- Proportion of Euro classes/vehicle age</li><li>- Proportion of fuel type</li><li>- Proportion of vehicle type</li></ul>	Indicative of changes in total emissions from road vehicles and contribution to air pollution
Fuel Sales	<ul style="list-style-type: none"><li>- Proportion of fuel types sold</li><li>- Changes in amounts of fuel sold</li><li>- Number of LPG stations</li></ul>	Reduced sales of fuel = fewer road vehicles – lower emissions
Road capacity	Amount of vehicles a road can hold compared to number of vehicles on the road	If road capacity is lower than actual traffic flow this is likely to result in congestion and higher pollution
Emission density	Emissions per given area	Indicate spatial variations and changes in pollution concentrations

Public Transport Use	Numbers of people and revenue from bus, trains, tubes etc	Increased use of public transport may give some indication of reduced use of private vehicles
Industry density	Number of processes per given area	Lower density = Lower emissions
Industry types/emissions	Emissions each year, meeting targets	Reduction or increase over time
Other environmental indicators	Related parameters e.g. noise levels	Indirect measure of improvements in air quality
Number of Green Travel Plans	Number of companies/schools with GTP's	Indicate a likely increase in use of public transport/reduced number of private cars used
Length of cycle/walking network	Changes in length of network	Increased cycle lanes/improved footpaths likely to result in higher use and reduction in other forms of transport

These indicators will be used where possible to demonstrate the effectiveness of the action measures with the baseline being taken in 2006 wherever possible in future Progress Report.



## Appendix 1




### Delivery of the Overall Transport Strategy

A final list of 48 schemes have been tabled in order to develop the wider transport strategy following discussion with relevant key stakeholders and have been subject to a substantial public consultation (see next chapter). The schemes are shown below along with an indication of whether each will contribute to an improvement in air quality.





No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
1	Cycle, Pedestrian	River Petterill Corridor	Cycle/Pedestrian improvements and route creation along the River Petteril corridor	H	S	L	LTP	200	✓
2	Cycle, Pedestrian	River Caldwew Corridor Connections	Cycle/Pedestrian improvements along the River Caldwew Corridor in particular connection to adjacent sites/neighbourhoods	H	M	L	LTP	200	✓
3	Cycle, Pedestrian	Currock to Denton Holme Connection	Cycle/pedestrian links between Currock and Denton Holme areas, linking with scheme 2 and creating better crossing of the Carlisle to West Cumbria Railway in particular.	L	S	L	LTP	200	✓
4	Cycle, Pedestrian	West Walls to River Eden Connection	Improvements to the section of cycle/pedestrian route from West Walls to the River Eden (the Northern end of the Cladew corridor)	M	S	L	LTP	200	✓
5	Cycle, Pedestrian	Hadrians Bridge	Potential cycle/pedestrian upgrade of disused railway bridge for cycle/footway route between Willow Holme and Etterby/Stainton areas	L	M	L	LTP/ OTHER	300	✓

No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
6	Cycle, Pedestrian	Kingstown Business Park to River Eden Connection	Creation of cycle/pedestrian route away from the A7 corridor between major business areas and River Eden. Mixture of segregated cycle routes and new links between quiet roads	M	M	L	LTP	200	
7	Cycle	City Centre Cycle Parking	Creation of city Centre parking strategy both within new developments and by major employers current sites. Some new cycle parking initiatives in City Centre public areas.	H	S	L	LTP/DEVELOPER	200	
8	Cycle, Pedestrian	Upperby Bridge Connection	Improved cycle and pedestrian connection between Upperby and Harraby area, upgrading current routes across the Petteril and West Coast mainline railway and providing improved links to such crossing	L	S	L	LTP	200	
9	Cycle, Pedestrian	Memorial Bridge to Botcherby link & upgrade towards Hardwicke Circus	Creation of high quality cycle route between Memorial Bridge and Hardwicke Circus for both leisure and commuting (connects with scheme 1 in particular) Potential future extension eastward	H	S	L	LTP	200	
10	Cycle	Cycle Provision and Measures on Radial Corridors	Creation appropriate measures for cyclists along core corridors – for example advanced stop lines, toucan crossing or improved cycle parking at local shops/amenities.	L	L	M	LTP	200	
11	Cycle, Pedestrian	Cycle & Pedestrian Directional & Information signing Preview	Full review and upgrade of current city wide directional and information signing for both these modes.	L	S	L	LTP/OTHER	100	

No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
12	Cycle, Pedestrian	City Centre Tourist Circuit Including Signing	Creation of a city centre tourist route ensuring items like signing link with issues such as improvements to footways, dropped kerbs and encouragement to cross roads at appropriate points.	H	S	L	OTHER	100	
13	Cycle, Pedestrian	Controlled Crossings (City Centre)	Creation of improved pedestrian facilities at city centre road junctions – considering more direct routes where applicable and generally upgrading the ability for pedestrians to cross efficiently and directly.	H	M	L	LTP/ DEVELOPER	400	
14	Pedestrian	City Centre to residential zones walk routes	Improvements to footway links between City Centre and key residential areas, particularly to the east and south through measures such as local widening of footways, raised carriageways at key junctions and crossing opportunity improvements.	H	M	L	LTP	400	
15	Cycle, Vehicular	A69/J43 Park and Cycle	Potential facilities for cyclists within any park and rise site at Junction 43 of M6, possibly through cycle hire and parking linked to cycle routes into and out of city.	L	M	L	OTHER	75	
16	Vehicular, pedestrian	Speed and Traffic Signal Enforcement	Area wide speed and signal enforcement regime targeting key locations across the city and reducing propensity and possibility to speed through appropriate traffic engineering measures	H	S/M	M	LTP/ OTHER	500	

No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
17	Rail, Vehicular	Dalston Park and Ride	Upgrade to Dalston Station Car Park to support the current informal use of this station aiding its long term viability.	L	M	L	LTP/ OTHER	250	
18	Rail	Wetheral Rail Station upgrades	Upgrades to station infrastructure to aid ease of access by all modes to support is long term viability.	L	M	L	LTP/ OTHER	250	
19	Rail, Pedestrian	Rail Gateway and Corridor Visual Upgrade (including forecourt)	Creation of a stronger frontage for Citadel Station including better non-car access and stronger image on arrival of Carlisle Possible public square.	H	M	M	DEVELOPER / OTHER	400	
20	Vehicular, pedestrian, Cycle	Removal of rail freight bypass corridor	Consideration of options related to the Citadel Avoiding line, which runs to the west of the station along the Caldew corridor. At Carlisle level this creates a barrier and severance.	M	M	H	OTHER	N/A	
21	Vehicular, Bus	Morton Park and Ride	Creation of a West Cumbria facing Park and Ride site on the A595 at the urban edge in the Morton Area, possibly linked to development opportunities in this area.	L	L	M	LTP/ OTHER	1000	
22	Vehicular, Bus	A69/J43 Park and Ride	Creation of an A69 facing Park and Ride site at the urban and in close priority to the A69/J43 intercepts both local traffic from the east and strategic traffic on the A69 and M6.	M	M	H	LTP/ OTHER	1000	



No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
23	Vehicular, Bus	A7/J44 Park and Ride	Creation of a South of Scotland facing park and ride site close to the A7/J44 M6 junction to intercept long term stay traffic from this area.	M	M	H	LTP/ OTHER	1000	
24	Bus, Coach, Vehicular	A69/J43 Coachway Interchange	Potential creation of an out of town coachway to allow National Express and other long distance coaches to avoid the journey into Central Carlisle.	L	M	M	LTP/ OTHER	300	
25	Bus, Rail	Bus Station City Centre – Station Hub Scheme	Consideration of whether or not an improved bus station can be provided, including exploration of whether and interchange between rail and bus can be created at Citadel Station.	H	M	H	DEVELOPER	400	
26	Bus	Cross City Transit Bus Routes	Linked with park and ride creation of high quality 'core route' cross town bus routes servicing key corridors and running throughout extended day at high frequency.	M	M/L	M	OTHER	1000	
27	Bus	Radial Route Bus Priority / Alternative Corridors	Development of appropriate bus priority measures on core corridors to support faster, more frequent and direct bus routes. Consideration of measures such as priority at signals, bus cut throughs (where appropriate) and off-highway routes where viable.	M	M/L	M	DEVELOPER	500	

No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
28	Bus	Out of Centre Bus Infrastructure improvements	General bus infrastructure improvements across the city primarily upgrades to bus stops to support accessibility and DDA	L	M	M	LTP	500	
29	Vehicular	South Western Inner Corridor	Development of a stronger route between the A6 and A595 either via a series of junction improvements or new route to cater more appropriately for the currently detrimental traffic flows along this corridor and improve air quality issues.	H	L	H	DEVELOPER / OTHER	5000	
30	Vehicular	Eastern Inner Corridor	Creation of improvements and route from A6 Corridor south of Botchergate towards Spencer Street to complete the south eastern section of the City Centre inner ring.	M	L	H	DEVELOPER / OTHER	3000	
31	Vehicular	Carlisle Northern Development Route	Development and implementation of the CNDR route from M6 J44 round the north west of the city to the A595 to provide alternative route from South of Scotland to West Cumbria in particular.	H	S/M	H	LTP/ OTHER	N/A	
32	Pedestrian, vehicular, Bus	Reducing Severance effect of Lowther Street	Phased reduction and removal of impact of through traffic on Lowther Street, with the key aim of reducing the current severance and negative impacts of traffic flow, in particular through traffic.	H	M	M	LTP/ DEVELOPER / OTHER	1000	

No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
33	Pedestrian, vehicular, Bus	Reducing Severance effect of Castle Way	In conjunction with CNDR and other proposals to reduce the negative 'Urban Motorway' feel of Castle Way and create better linkage across to the Castle and Bitts Park	H	M	M	LTP/ DEVELOPER / OTHER	500	
34	Pedestrian, Cycle	Hardwicke Circus Non-Car improvements	Improvements to the above key junction for pedestrians and cyclists, providing better links from City towards the Sands Centre, Stanwix and Bitts Park. Measures range from new routes to lighting and signing improvements.	M	M	M	DEVELOPER	100	✓
35	Pedestrian, Cycle, Bus, Vehicular	Bridge Street Area Improvements	Environmental and Traffic Schemes for improving the area between Church Street Roundabout and the West Coast Mainline. To create a more legible traffic scheme and improve walking routes to/from the City.	M	L	M	LTP	100	✓
36	Pedestrian, Cycle	Environmental Improvement Schemes Radial Corridors	Upgrades along each core radial corridor in the City – for example upgrading landscaping with improved parking layouts along the route.	L	L	M	OTHER	1000	✓
37	Vehicular	Directional information Signing City Wide Upgrades	Vehicular signing across city – creation of a stronger Carlisle signing strategy and consideration of more flexible (Variable Message signing) for car parks and route choice, responding to fluctuations in demand	M	M	L	LTP/ DEVELOPER / OTHER	500	✓
38	Air	Carlisle Airport Airfreight Opportunities	Local improvements to support the operation of Carlisle Airport for freight - for example local junction improvements	L	L	M	OTHER	N/A	✓

No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
38	Air	Carlisle Airport Airfreight Opportunities	Local improvements to support the operation of Carlisle Airport for freight - for example local junction improvements	L	L	M	OTHER	N/A	
39	Air	Carlisle Airport Intra-UK Flight Opportunities	Broad support to Intra-UK flight creation from Carlisle Airport by general support and assistance for matters such as access to airport and applications for parking/public transport improvements.	L	L	M	OTHER	N/A	
40	Vehicular, Pedestrian	Upgrade of West Walls Car Park	Creation of a stronger visual image in and around the car park to amalgamate landscape with parking and in particular to act to provide a more positive image of Carlisle from the railway	H	S	L	LTP/OTHER	250	
41	Vehicular	Rickergate Gateway Parking	Provision of a strong gateway car park in the Rickergate area to act as a key destination from the north. To be incorporated within development options	H	M	L	DEVELOPER	3000	
42	Vehicular	Viaduct Estate Road Gateway Parking	Provision of strong gateway car park within the redevelopment of the Viaduct estate road redevelopment to act as a key gateway from the west.	L	M	L	DEVELOPER	2000	
43	Vehicular	City South Car Park (William Street or Station)	Creation of a strong car park in the Southern end of the City Centre connecting to the A6 and potentially providing substantial longer stay provision in relation to the Railway Station.	M	M	M	DEVELOPER / OTHER	3000	
44	Pedestrian, Cycle	River Eden Bridge Pedestrian Cycle Improvement	Improvements for pedestrians and cyclists across and approaching the River Eden Bridge – local footway widening, improved signing and better protection from motorised traffic adjacent.	M	M	L	LTP	150	
45	Pedestrian	City Centre 'Clutter' Reduction	Review of street furniture provision across the city centre and removal/consolidation of it where applicable	H	S	L	LTP/ OTHER	150	



No	Target Mode	Scheme	Description	Scheme importance to overall strategy H = High M = Medium L = Low	Timescale (Light = Major planing pre planning) S = Short M = Medium L = Long	Cost L = Low M = Medium H = High	Funding Potential	Potential Cost	Potential Air Quality Improvement
46	Pedestrian	City Centre Pedestrianisation Upgrades	Improvements across the city centre to provide for pedestrians giving stronger priority and better public realm on core pedestrian demand streets and links	H	S / M	L	LTP/ DEVELOPER/ OTHER	500	
47	Pedestrian / Other	City Centre Access for all	General upgrades to accessibility for all, ranging from greater emphasis on mobility impaired access within development applications to potential mobility bus route around city centre (possibly in conjunction with tourist trails)	H	S / M	L	LTP/ OTHER	250	
48	Vechicular	Denton Holme to CNDR Link Route	Longer term option for link from Denton Holme/Willow Holme areas towards the CNDR possibly suing Hadrians Bridge (former rail alignment) to remove unnecessary and intrusive HGV movements from city centre	L	L	H	DEVELOPER/ OTHER	3500	