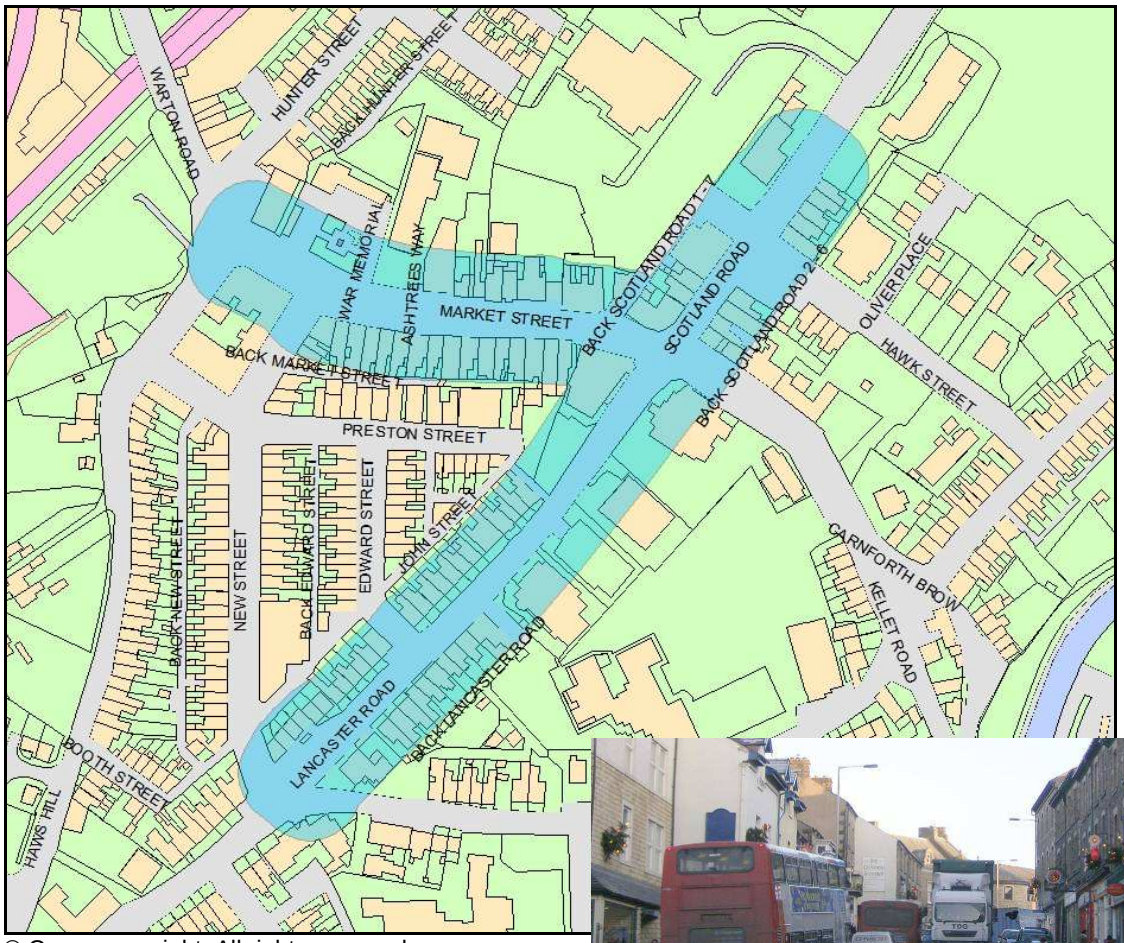
LANCASTER CITY COUNCIL

Promoting City, Coast & Countryside

Air Quality Action Plan for Carnforth

Consultation draft

Carnforth air quality management area (centre of map, shaded blue)



Prepared by Environmental Health Services

Draft version 1.01

This document was prepared by the Pollution Control Team at Environmental Health Services in conjunction with a multi-agency air quality steering group.

For more information about local air quality see our website:

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Public consultation

This draft plan is open for public consultation between 15 June and 31 August 2010. The council would be pleased to receive your views on it, in particular:

1. **Are you satisfied that the draft plan accurately reflects the causes of poor local air quality in central Carnforth?**
2. **What additional actions would you like to see included in the draft plan?**
3. **What actions do you feel should be removed from the draft plan?**

A brief summary document is available on the council's website or by post.

Please send your comments to the council by post or email (contact details appear above on this page).

Thank you.

This edition: Consultation draft v1.01

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Abbreviations

AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
HDV	Heavy duty vehicle (also known as heavy goods vehicle)
LDF	Local Development Framework
LDV	Light duty vehicle
LTP	Local Transport Plan
NO_2	Nitrogen dioxide
NOx	Oxides of nitrogen
PM_{10}	Fine particulate matter with reference to air quality objectives

1. Executive Summary

This Action Plan has been developed in recognition of the legal requirement of the local authority to work towards air quality objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part.

Lancaster City Council is required to produce an Air Quality Action Plan (AQAP) following the declaration of an Air Quality Management Area (AQMA).

This air quality action plan:

- Identifies and assesses potential air quality options for improving local air quality where it exceeds the maximum permissible annual average concentration of nitrogen dioxide as set in an air quality objective.

- Proposes for implementation those suggested options that are relevant to Local Air Quality Management, capable of bringing about improvements or enabling further actions to be brought forward that might do so.

The shortlist of actions within the AQAP was taken from a long list of actions compiled following widespread consultation with the public, residents living within the AQMA and partner agencies within the air quality steering group.

2. Background

2.1 Duties for Local Air Quality Management

This Action Plan has been developed in recognition of the legal requirement of the local authority to work towards air quality objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part.

The Act is largely enabling and gives local authorities the flexibility to take forward local policies and actions that suit local needs. Local circumstances will also determine needs for declaring Air Quality Management Areas (AQMAs) and the content of Air Quality Action Plans (AQAPs).

Local authorities have a duty to declare as AQMAs those parts of their areas where the air quality objectives are not likely to be met. This applies only to locations where members of the public might reasonably be exposed for the period of the objective, whether an hour or a year.

A local authority declaring an AQMA must carry out a further, detailed assessment of local air quality before drawing up an AQAP. The AQAP must set out what the local authority intends to do in pursuit of the air quality objectives.

2.2 Requirements of air quality action planning

Where Stage 4 'Further Assessment'[1] confirms that any of the air quality objectives are unlikely to be achieved the local authority responsible for Local Air Quality Management is required to prepare a written Air Quality Action Plan for its Air Quality Management Area. This action plan must set out the actions it intends to take in pursuit of the air quality objectives, including a timetable for implementing the plan. Guidance on action planning is contained in Defra guidance notes[1,2]. Further guidance is provided by the National Society for Clean Air[3,4].

The Action Plan should contain the scenarios that have been modelled in the Stage 4 review and assessment. It should contain a summary of the air quality improvements that might be possible for each of the scenarios identified. The Stage 4 review and assessment provides the technical justification for the measures an authority includes in its Action Plan.

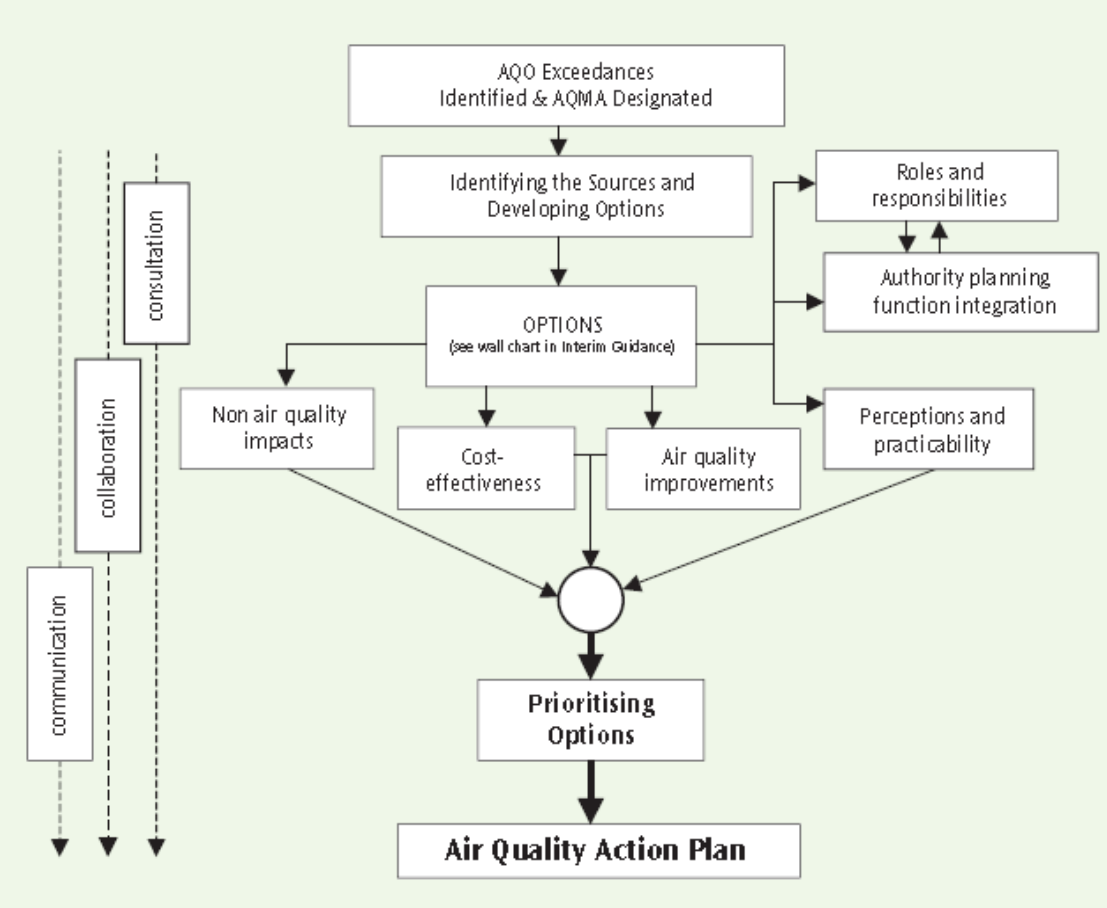
The Action Plan should also contain simple estimates of the costs and feasibility of implementing those scenarios. The Action Plan may also consider the non-health benefits of implementing scenarios in the Action Plan, for example, reductions in road traffic accident deaths as a result of road improvements that also reduce vehicle emissions.

The LA can then identify which scenario(s) offer the most cost-effective or cost-beneficial way of improving air quality.

Public consultation should be undertaken on the draft AQAP. This is important for establishing buy-in to the need for change to tackle unacceptable local air quality.

An outline of the action planning process is shown in Figure 1 below.

Figure 1. Outline of process for developing Air Quality Action Plans



Source: NSCA[4]

2.3 Review and assessment of local air quality in Carnforth

This section summarises the process followed, key actions and conclusions reached by Lancaster City Council during review and assessment.

2.3.1 Screening reviews and assessments of local air quality

The Council undertook a Detailed Assessment[12] in 2006 following the results of earlier diffusion tube monitoring that showed a likely exceedence of the annual average nitrogen dioxide objective of 40µg/m^3 in the area now contained within the Carnforth AQMA. The Detailed Assessment determined that air pollution sources other than road transport were unlikely to cause exceedences of any air quality objective. This has been confirmed by a subsequent Further Assessment of local air quality in Carnforth[14] completed in 2008.

2.3.2 Declaration of an Air Quality Management Area in Carnforth

An Air Quality Management Area for Carnforth came into force on 10 April 2007 following the Council's Stage 3 Local Air Quality Management (LAQM) Review and Assessment report, which found risks of the annual mean air quality objective for nitrogen dioxide being exceeded on Market Street. The AQMA is shown in Figure 2 and extends 20m from the roadside and includes any property partially encompassed by this area.

Following this declaration the council extended its air pollution monitoring and placed a number of passive monitoring sites adjacent to residential properties

within the AQMA and an additional site just outside of the AQMA on the junction of the A6 and Tesco.

2.3.4 Stage 4 Further Assessment of local air quality in Carnforth

The Stage 4 Further Assessment for Carnforth was undertaken by consultants from the University of the West of England's Air Quality Management Research Centre and completed in 2008. The findings are reported in section 3.1.2

2.3.5 Physical monitoring of air pollution in Carnforth

The council monitors air pollution using a continuous monitoring station at Water Street in Lancaster together with three diffusion tubes co-located with the Water Street automatic analyser. In Carnforth there are 10 diffusion tubes in total, nine of which are located within the AQMA and one located close to the Tesco junction south of the AQMA. Two of the tubes on Market Street are not located at 'relevant locations' for purposes of annual mean concentrations of nitrogen dioxide.

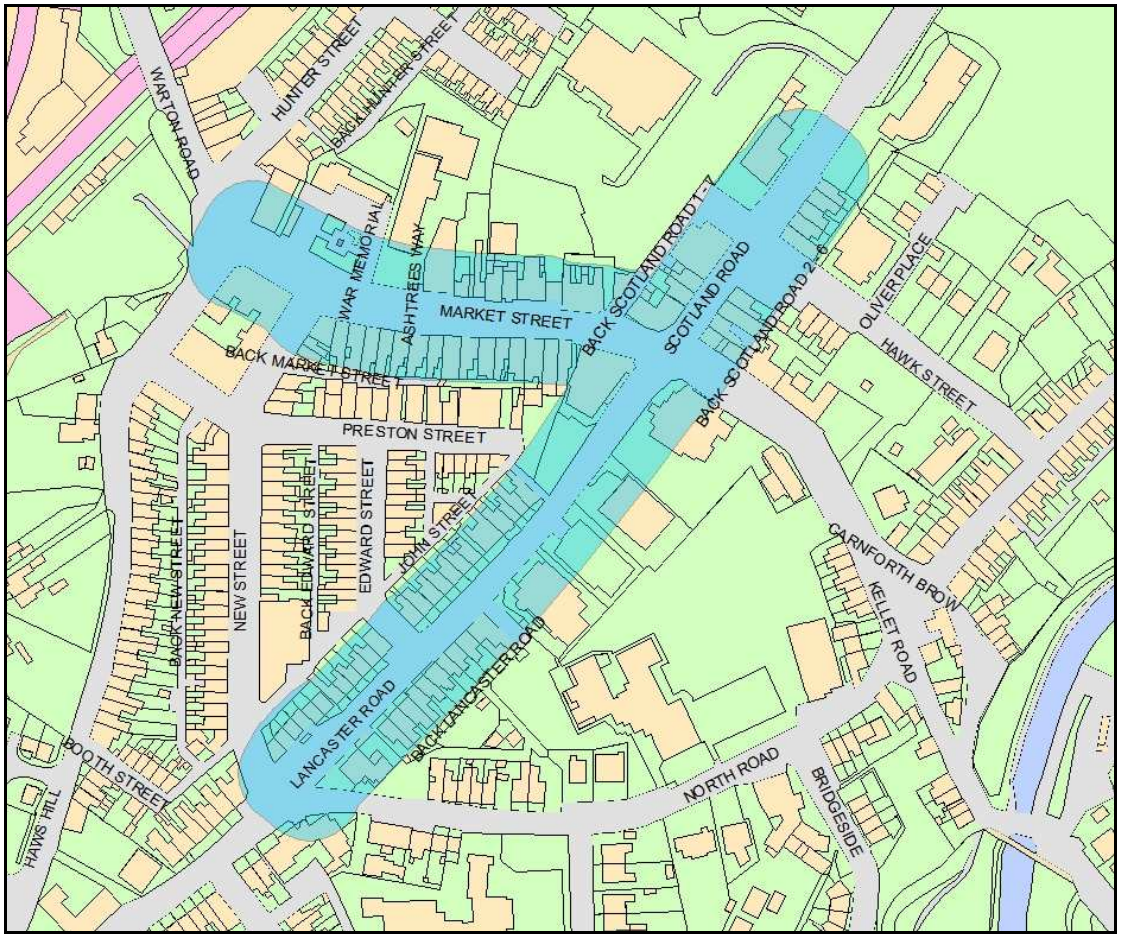
The results for the diffusion tubes within Carnforth indicate significant exceedences of the nitrogen dioxide (NO_2) annual mean objective concentrations at relevant locations in Market Street. The results also indicate concentrations approaching the objective limit (i.e. between 36 and 40 $\mu g/m^3$) being recorded at relevant locations on the A6 within the declared air quality management area.

The council intends to maintain existing monitoring locations within the AQMA. Monitoring will also help to assess the effectiveness of actions to reduce air pollution exposure within the AQMA.

2.3.6 Air quality management activity elsewhere in the Lancaster district

The council's review and assessment activity[7, 10, 16] has also identified likely exceedence of an air quality objective in Galgate and a third AQMA has been declared. In Lancaster the AQMA will be revised following the Upgrading and Screening Assessment 2009 which highlighted a likely exceedence of the one hour nitrogen dioxide objective, and the Lancaster AQAP is being revised accordingly. A second continuous monitoring station will shortly be deployed within Lancaster. These are not related to the air quality problem in Carnforth and therefore not considered further in this action plan.

Figure 2. Map of Carnforth air quality management area (shaded blue)



3. Statement of air quality problem

3.1 Main sources of air pollution within Carnforth AQMA

3.1.1 Background concentrations of air pollutants in the Lancaster district are relatively low by comparison with other parts of the country. Whilst they are elevated in Lancaster, they remain comparatively low compared with many parts of the south east and with major conurbations.

Review and assessment has confirmed that road traffic sources are causing the likely exceedence of the annual mean air quality objective for nitrogen dioxide in Carnforth entirely due to local road traffic emissions.

The proportions of road traffic by vehicle type that were employed for dispersion modelling purposes in the Further Assessment report are shown in Figures 3 and 4 below.

Figure 3. Percentage of Emissions by Vehicle Type – Market Street

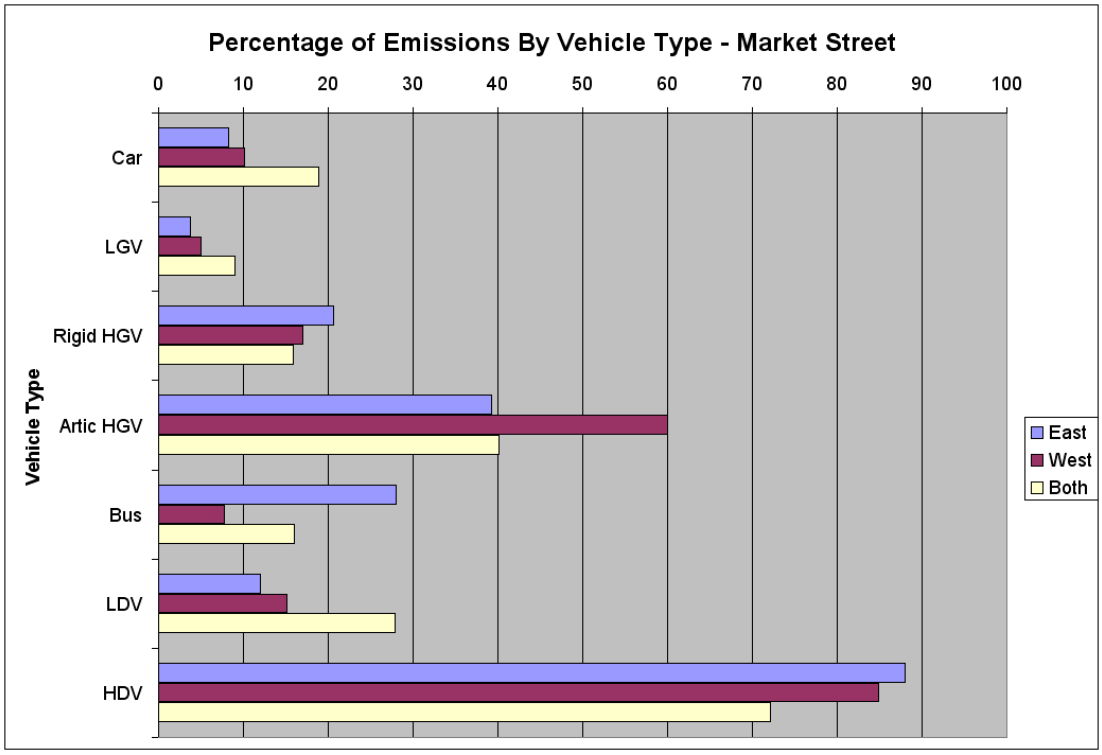
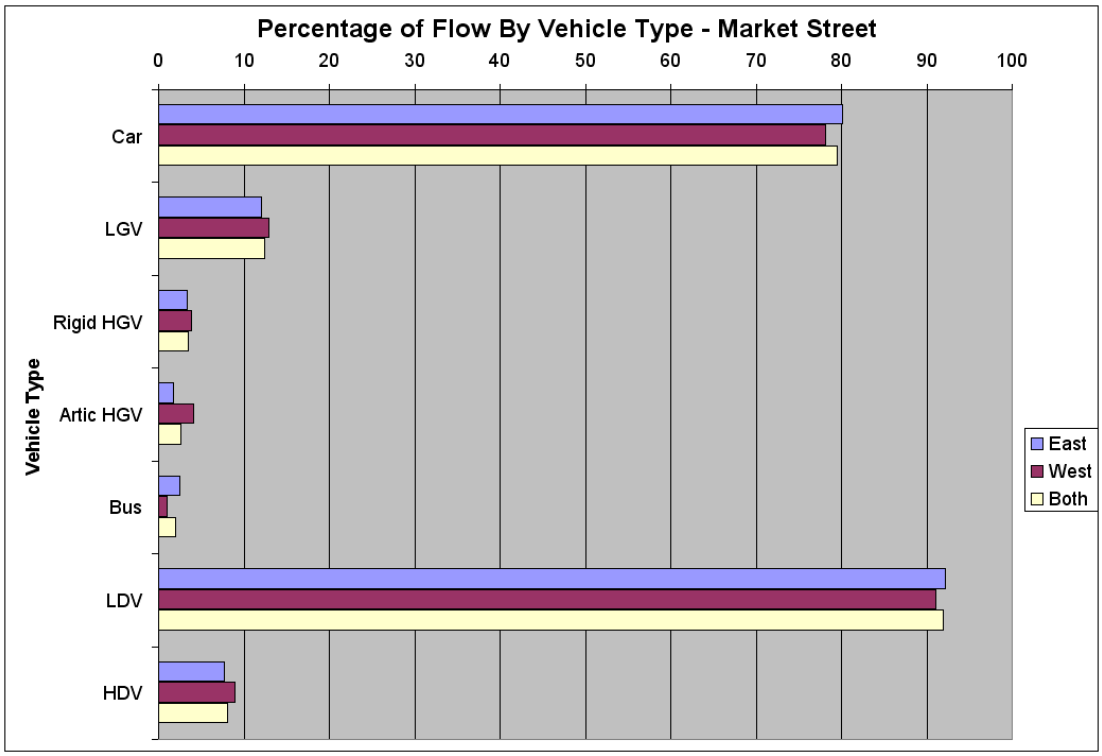


Figure 4. Percentage of Flow by Vehicle Type – Market Street



3.1.2 The findings of the Stage 4 review and assessment can be summarised as follows:

- There are significant exceedences of the 2005 NO_2 annual mean objective occurring in Market Street, Carnforth at locations where there is relevant exposure as defined by guidance (principally residential properties)
- Whilst the monitoring exceedences in 2006/7 occurred entirely within Market Street, the early indications from monitoring in 2008 suggested that sites on the A6 may be likely to exceed the objective. As all the predicted exceedences were within the AQMA there was no need to extend the current boundaries
- There is also no evidence to suggest that the boundaries could/should be reduced.
- At the worst case monitoring location in Market Street, estimates suggest that local emissions of nitrogen oxides would need to be reduced by around 55% in order to meet the statutory air quality objectives
- It is thought that the effects of congestion in Market Street are having a significant effect on vehicle emissions. Therefore it is not expected that a 55% reduction in emissions relates to a 55% reduction in vehicle movements as lower flows would lead to more freely flowing traffic
- Despite Heavy Duty Vehicles only contributing to around 8% of vehicle flows on Market Street (8% weekdays, 5% weekends), their large size and respectively greater emissions mean that this relatively small number of vehicles contributes over 80% of the nitrogen oxide emissions within Market Street.
- Pollution concentrations in Market Street appear to be dominated by the morning peak hour traffic.
- Between 20% and 30% of Heavy Duty Vehicles travelling along Market Street and Haws Hill are related to the goods depot on Warton Road.

3.1.3 Required reductions in NOx air pollution

The Further Assessment report analysed the reductions in oxide of nitrogen air pollution that would be required in order to achieve the annual mean air quality objective for nitrogen dioxide in the Carnforth AQMA.

Without accounting for any reduction of background concentrations in future years, and based on the 2005 objective year scenario modelled in the Further Assessment, it is predicted that reductions in nitrogen oxide emissions of 55% would be needed to achieve the air quality objectives.

Figure 5. Required NOx and NO_2 concentration reductions at each receptor point (µg/m^3 and %) 2006

	Estimated Concentration						Required Reduction							
	NO_2			NOx			NO_2				NOx			
Site	Total	Bkgrnd	Roads	Total	Bkgrnd	Roads	Total		From Roads		Total		From Roads	
	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	%	µg/m^3	%	µg/m^3	%	µg/m^3	%
O	**50.7**	12.5	38.2	**162.5**	14.9	**147.6**	10.7	**21**	10.7	**28**	51.6	**47**	51.6	**54**
S	**40.2**	12.5	27.7	**111.8**	14.9	**96.9**	0.195555556							
U	**50.5**	12.5	38.0	**161.4**	14.9	**146.5**	10.5	**21**	10.5	**28**	50.5	**46**	50.5	**53**
CF1	**32.4**	12.5	19.9	**78.9**	14.9	**64**	No Reduction Required							
CF2	**43.9**	12.5	31.4	**128.9**	14.9	**114**	3.9	**9**	3.9	**12**	18.0	**16**	18	**19**
CF3	**35.1**	12.5	22.6	**89.8**	14.9	**74.9**	No Reduction Required							
CF4	**37.7**	12.5	25.2	**100.8**	14.9	**85.9**	No Reduction Required							
CF5	**34.5**	12.5	22.0	**87.4**	14.9	**72.5**	No Reduction Required							
CF6	**33.9**	12.5	21.4	**84.9**	14.9	**70**	No Reduction Required							
Required Concentration				**Total**	**Bkgnd**	**Roads**								

Figure 6. Required NOx and NO2 concentration reductions at each receptor point (µg/m^3 and %) 2007

	Estimated Concentration						Required Reduction							
	NO_2			NOx			NO_2				NOx			
Site	Total	Bkgrnd	Roads	Total	Bkgrnd	Roads	Total		From Roads		Total		From Roads	
	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	µg/m^3	%	µg/m^3	%	µg/m^3	%	µg/m^3	%
O	**45.3**	12.2	33.1	**136.2**	14.3	**121.9**	5.3	**12**	5.3	**16**	23.2	**21**	24.4	**25**
S	**32.6**	12.2	20.4	**80.2**	14.3	**65.9**	No Reduction Required							
U	**42.2**	12.2	30.0	**121.5**	14.3	**107.2**	2.2	**5**	2.2	**7**	8.5	**8**	9.7	**10**
CF1	**30.0**	12.2	17.8	**70.0**	14.3	**55.7**								
CF2	**42.4**	12.2	30.2	**122.5**	14.3	**108.2**	2.4	**6**	2.4	**8**	9.5	**8**	10.7	**11**
CF3	**30.7**	12.2	18.5	**72.7**	14.3	**58.4**	No Reduction Required							
CF4	**36.3**	12.2	24.1	**95.4**	14.3	**81.1**	No Reduction Required							
CF5	**33.3**	12.2	21.1	**83.0**	14.3	**68.7**	No Reduction Required							
CF6	**30.9**	12.2	18.7	**73.5**	14.3	**59.2**	No Reduction Required							
Required Concentration				**Total**	**Bkgnd**	**Roads**								

3.2 Local factors to be taken into account

3.2.1 Congestion

Road traffic through the AQMA, both the A6 and Market Street, is prone to congestion, queuing and delayed journey times especially at morning and afternoon peak times.

3.2.2 Source Apportionment on Market Street

The vast majority of emissions in Market Street (>80%) come from Heavy Duty Vehicles despite them constituting less than 10% of the total flow in either direction. Articulated and Rigid Heavy Goods Vehicles make up about 46% and 18% of the emissions respectively. Buses make up about 19%.

Figure 7. Percentage of Emissions by Vehicle Subclass on all links

	North or Eastbound					South or Westbound					Both Directions				
	Car	LGV	Rigid HGV	Artic HGV	Bus	Car	LGV	Rigid HGV	Artic HGV	Bus	Car	LGV	Rigid HGV	Artic HGV	Bus
Haws Hill	17	23	51	7	2	One-way									
Warton Rd1	11	30	25	33	1	15	17	26	41	2	10	18	29	42	2
A6 Scotland Rd (N)	17	14	28	38	3	11	12	29	43	5	12	11	31	43	4
A6 Lancaster Rd (S)	13	18	35	26	8	23	23	31	16	6	21	25	29	19	6
Kellet Rd	21	26	41	11	1	11	20	54	12	3	13	18	54	13	2
North Rd	One-way					13	23	50	11	3	One-way				
Market St	8	4	21	39	28	10	5	17	60	8	19	9	16	40	16

3.2.3 Topography

Eastbound traffic queuing at the traffic lights on Market Street is on an uphill section. Traffic under stop-start driving conditions on this road section will produce greater emissions than it would on level or downward sloping road sections.

3.2.4 Road ‘canyons’

Several sections of the AQMA are relatively narrowly confined on both sides by buildings three storeys tall. In certain locations termed road ‘canyons’ these physical constraints are believed to limit the dispersion of locally generated air pollution from vehicle exhaust emissions. This may be one explanation for localised higher concentrations of nitrogen dioxide measured by the council. Queuing heavy duty vehicles (HDVs) on Market Street create even narrower, temporary street canyons whilst waiting at the traffic lights.

4. Existing and recent policies and strategies

4.1 Lancaster City Council

The council is already engaged in a range of policy and strategy areas relevant to the Carnforth AQAP, both individually and working together with partner agencies, stakeholders and the community.

4.1.1 Community Strategy

The Community Strategy was produced by the Lancaster District Strategic Partnership. Membership of this Local Strategic Partnership (LSP) includes representatives from community groups, the voluntary and business sectors and organisations in the public sector, such as the City Council, the County Council, Parish Councils, the Police, Fire Service, Health Service, local colleges and the University.

One of the stated priorities of the Community Strategy is to "Protect and improve air, water and land quality and use resources sustainably with due regard to the interests of the wider community and the environment."

The Community Strategy contains a range of relevant objectives listed in Appendix A.

Implications for AQAP:
The AQAP will help to deliver against Community Strategy objectives and targets although it is noted that the Community Strategy addresses transport, access and economic prosperity issues as well as environmental and sustainability ones. No specific conflicts have been identified.

4.1.2 Local Plan

The existing Local Plan has a policy statement concerning local air quality:

"The City Council will seek to maintain or improve air quality wherever possible by resisting development which would result in unnecessary journeys."

This is not a formal policy but a statement designed to present an indication of corporate direction.

A new Local Development Framework is being prepared and the Core Strategy document was formally adopted on 23 July 2008. This contains a specific policy E2 which states that the strategy proposes the regeneration of Carnforth as a market town and a visitor destination focused on its railway heritage. It proposes reclaiming derelict sites and moving poorly located uses. It proposes to maintain the town's population and services with attractive new housing on previously used sites. The impact of lorry traffic will be addressed by rationalising land uses and using road capacity freed by the Heysham/M6 link. A copy of policy E2 is contained in Appendix C.

In addition, through Development Control the council has identified air quality as a material consideration in a number of proposed developments, requiring air quality assessments to be undertaken and imposing planning conditions where necessary to protect the health and comfort of future occupants. Planning conditions relating to car parking space restriction, cycling facilities

and pedestrian site access have also been imposed. These are in line with some of the suggested air quality actions proposed during consultation and stakeholder engagement.

Implications for AQAP:
The AQAP will help to deliver against Local Plan aims although it is noted that the Local Plan addresses transport, access and economic prosperity issues as well as environmental and sustainability ones. No specific conflicts have been identified. The AQAP will deliver directly against policy E2 of the Local Development Framework due to replace the existing Local Plan.

4.1.3 Parking Strategy

Lancaster City Council's cabinet approved a Parking Strategy in October 2008. The strategy seeks better utilisation of existing space and a shift from long-term to short-term parking. It sets out a hierarchy for the strategic management of parking priorities :

1. Residents
2. Businesses, shoppers and visitors
3. Daily commuters

However, since the hierarchy was established, it is now clear that shoppers and local business needs are crucial to the local economy and their status is now viewed as approaching equal first within the hierarchy with commuters being the last priority.

There are specific aims for Carnforth, namely:

- To protect the existing parking facilities in the town
- Maintain the car parking facility at the railway station
- Review the level of on-street parking in Market Street
- Discuss local needs with the railway station car park operator and other stake holders and develop a dual use parking charge to encourage short stay parking.

Implications for AQAP:
The AQAP will help to deliver against the Parking Strategy aims, although a potential conflict may arise with the level of parking on Market street.

4.1.4 Cycling Strategy and Cycling Demonstration Town project

Lancaster City Council first published its Cycling Strategy in 1997. This was last reviewed in November 2002 and contains the following vision statement:

"A District within which cycling is a popular mainstream mode of travel for local journeys with safe and accessible routes through its urban centres."

The strategy aims to achieve this vision through the following aims:

1. Provide the corporate policy framework proposed by Lancaster City Council to promote cycling as a viable mode of transport.
2. Set out the strategic framework for seeking external funding for cycle improvements both from public funding agencies and through planning agreements in association with new development.

3. Co-ordinate all programmes of action both within and outside the Council which help promote cycling.
4. Set targets against which the effectiveness of the policies and associated action may be judged.
5. Outline potential and proposed cycle routes within Lancaster district which address deficiencies in the existing network.

More recently Lancaster became one of six 'cycling demonstration' towns attracting funding for three years through a successful application made by the Lancaster & Morecambe Economic Development Zone (EDZ) and Lancashire County Council to the Department of Transport / Cycling England. The Cycling Demonstration Town project[A] aims to show how increased investment can encourage more cyclists to get on their bikes. The funding provided will be spent on a range of measures including filling in the missing links in the district's cycle path network, better signage, training in bike confidence and cycle maintenance, and better promotion of cycling, although most of the initiatives are centred around Lancaster and Morecambe.

Implications for AQAP:
Cycling strategy and this AQAP do not share any specific objectives. No potential conflicts have been identified.

4.1.5 Sustainability Partnership

Lancaster City Council's Sustainability Partnership works in support and delivery of the Local Strategic Partnership's aims and objectives. Its overall aim is to promote sustainable development across the district. In outline its objectives are to:

- Ensure the principles of sustainable development are understood and applied
- Encourage sustainability assessments in new and revised plans and policies
- Promote best practice sustainable development
- Support implementation of the Community Strategy objectives concerning sustainability

The Sustainability Partnership is supported by a Sustainable Transport Forum. The purpose of this forum promotes an integrated, sustainable, low-cost transport infrastructure for the district. Recent initiatives have involved:

- Helping to form a local Walking Strategy
- Steering the County Council's production of a cycling and walking map of the district
- Considering potential improvements to public transport

Implications for AQAP:
The AQAP will help to deliver against these aims and objectives. No potential conflicts have been identified.

[A] For more information follow the 'Cycling & Walking' link from the home page of Lancaster City Council's website www.lancaster.gov.uk.

4.1.6 Business Travel Plan

Lancaster City Council has prepared a Business Travel Plan in consultation with employees and members. The aim of the City Council's Business Travel Plan is to bring together a number of actions that will change the travel arrangements of its employees. The change being sought is to reduce car usage in favour of more sustainable methods of transport, such as walking, cycling and the use of public transport.

A supporting Business Travel Action Plan is being prepared and this may contain actions for:

- Reducing single occupancy vehicle travel
- Increasing cycling and walking rates
- Fleet management and driver awareness
- Use of public transport
- Changing the way employees and members work (e.g. video and remote teleconferencing, home working and hot desking)
- Marketing and promotion of alternative modes of transport for council business and commuting

Implications for AQAP:
An option has been suggested for the AQAP through which the council's own Business Travel Plan can be seen to set an example for other significant employers within the district. No conflicts have been identified.

4.1.7 Smoke control areas

The council has previously declared eight Smoke Control Areas within Lancaster. These do not impact directly on the AQAP which deals only with nitrogen dioxide within Carnforth.

Implications for AQAP:
The smoke control areas and this AQAP do not share any specific objectives. No potential conflicts have been identified.

4.1.8 Industrial pollution prevention and control

The council regulates pollution control standards and emissions from a range of industrial processes. However none have been identified individually as significant contributors to elevated nitrogen dioxide concentrations in the Carnforth AQMA.

Implications for AQAP:
Industrial pollution control and this AQAP do not share any specific objectives. No potential conflicts have been identified.

4.1.9 Carnforth Area Regeneration Partnership – Carnforth Urban Design Uplift Final Report 2005

Lancaster City Council and Carnforth Area Regeneration Partnership commissioned Austin-Smith:Lord to undertake a study as part of the Market Town Initiative. One of the aims of the study was to find ways to alleviate current traffic problems including parking and HGV movement through the town centre.

Implications for AQAP:
The AQAP will help to deliver against these objectives. No potential conflicts have been identified.

4.2 Lancashire County Council

Lancashire County Council has responsibility for highways management, road and public transport policy within the Lancaster district. It maintains and/or supports travel advice, information, marketing and promotion of public transport.

4.2.1 Local Transport Plan (LTP)

In 2006 Lancashire County Council finalised and published its Local Transport Plan for 2006 to 2011. Sections relevant to Lancaster AQMA are reproduced in Appendix D. The plan was published before the declaration of the Carnforth AQMA.

The Local Transport Plan identifies a number of possible actions:

- Heysham M6 Link road
- Cycling Demonstration Project (no effect in Carnforth)
- Personalised Travel Planning
- Morecambe West End Neighbourhood Scheme (no effect in Carnforth)
- Park and Ride
- Intelligent Transport Systems (no significant effect presented)

No specific measures for Carnforth have been identified within the current Local Transport Plan, however Carnforth is still likely to benefit from some of the proposed initiatives, especially the construction of the Heysham/M6 link road.

The Carnforth Further Assessment report addendum, prepared for Lancaster City Council, has modelled two specific scenarios, namely the relocation of the transport depot away from Warton Road and the construction of the Heysham / M6 link road, and predicted the likely impact of these two schemes on Market Street and the A6 within the AQMA. The results of the modelling will inform and help to develop actions for Carnforth's AQMA that can be fully integrated with the actions planned by the county council.

Implications for AQAP:
The Local Transport Plan is one of the primary strategy vehicles for delivering improvements in the planning of road traffic, and therefore the causes of poor local air quality within the Carnforth AQMA. Through the work of the steering group the options considered in this AQAP reflect some of the LTP considerations of air quality. Opportunities for further integrating the AQAP and LTP may arise in the future however it is recognised that some aspects of the AQAP extend more widely than road transport and care will be needed.

4.2.2 The North West of England Plan Regional Spatial Strategy to 2021

No identified policies or strategies that directly concern the AQAP have been identified in the Government Office for the North West Regional Spatial Strategy. This strategy has replaced the county council's structure plan.

Implications for AQAP:
No specific shared objectives have been identified. No conflicts have been identified.

4.2.3 Minerals & Wastes Plan

No identified policies or strategies that directly concern the AQAP have been identified in the county council's Minerals & Waste Plan.

Implications for AQAP:
No specific shared objectives have been identified. No conflicts have been identified.

4.2.4 Lancashire Environment Strategy

In December 2003 the Lancashire Local Agenda 21 Strategy was dissolved and absorbed within the community planning process. Many of the social and economic elements of sustainable development have now been framed within other strategies and programmes and then absorbed within community strategies.

The Lancashire Environment Strategy[5] was developed as a similar approach for objectives relating to environmental sustainability, providing an over-arching framework to protect and enhance Lancashire's environment.

This contains the following objectives and actions which may be relevant to the AQAP:

Reducing dependence on private car use

1.5.1 Provide a more integrated transport network with even provision across different locations
1.5.2 Provide accurate and up-to-date travel information including real-time information at rail stations and bus stops
1.5.3 Ensure cycle and pedestrian provision is integrated into highway improvement schemes and is well monitored and maintained
1.5.4 Provide appropriate well maintained facilities for non-car users, e.g. bus shelters, cycle parking
1.5.5 Encourage the development and implementation of green travel plans, particularly school travel plans
1.5.6 Reduce the need to travel, e.g. promotion of teleworking, video conferencing, provision of council services electronically
1.5.7 Promote 'good health' via sustainable transport
1.5.8 Promote the 'Road User Hierarchy'
1.5.9 Promote local tourist destinations for local groups to reduce dependence on travel and stimulate the local tourist economy

Reducing the levels of air pollution from transport

2.2.1 Promote responsible car use and maintenance to minimise emissions from motor vehicles
2.2.2 Develop Air Quality Management Plans where appropriate
2.2.3 Encourage uptake of alternative fuels in commercial vehicle fleets
2.2.4 Encourage rail freight and other alternative freight delivery methods
2.2.5 Reduce food miles through local food projects

Implications for AQAP:
The AQAP will help to deliver against objectives and targets in the Lancashire Environment Strategy as far as the Carnforth AQMA is concerned although it is noted that the Community Strategy addresses transport, access and

economic prosperity issues as well as environmental and sustainability ones. No specific conflicts have been identified.

4.2.5 Travel Plan

Lancashire County Council has a Travel Plan in place for employees and members.

Implications for AQAP:
The county council's own Travel Plan sets an example for other significant employers within the district insofar as the county has local employment bases. No conflicts have been identified.

4.3 Highways Agency

The Highways Agency has been consulted and, routine highway management activities aside, it has no identified policies or strategies that would have any significant implications for local air quality in the Lancaster district. The major roads in the Lancaster district that fall under the jurisdiction of the Highways Agency do not have significant direct implications for the Carnforth AQAP.

Implications for AQAP:
No specific shared objectives have been identified with explicit reference to the Carnforth AQMA. No conflicts have been identified.

4.4 Environment Agency

The Environment Agency has been consulted and, routine pollution control activities aside, it has no identified policies or strategies that would have any significant implications for local air quality in the Lancaster district. The industrial sites subject to Environment Agency air pollution regulation do not have significant emissions of nitrogen dioxide so as to have significant implications for the Carnforth AQAP.

Implications for AQAP:
No specific shared objectives have been identified with explicit reference to the Carnforth AQMA. No conflicts have been identified.

4.5 Neighbouring local authorities

Lancaster City Council is bounded by four neighbouring district tier local authorities: Craven District Council, Ribble Valley District Council, South Lakeland District Council and Wyre Borough Council.

None have any identified policies or strategies that would have any significant implications for local air quality in the Lancaster district. None have major new developments proposed that would have significant implications for local emissions of nitrogen dioxide air pollution.

Implications for AQAP:
No specific shared objectives have been identified with explicit reference to the Carnforth AQMA. No conflicts have been identified.

4.6 North Lancashire Primary Care Trust

The primary care trust has been consulted and it has no identified policies or strategies that would have any significant implications for local air quality in the Lancaster district. It is, however, a substantial employer within the district and may be considered in a Travel Planning context.

Implications for AQAP:
No specific shared objectives have been identified with explicit reference to the Carnforth AQMA. No conflicts have been identified.

The primary care trust's travel planning provides an opportunity to set an example for other significant employers within the district insofar as the trust has local employment bases.

5. Air quality measures considered

5.1 Sources of identified air quality measures

5.1.1 Guidance on preparing AQAPs[1] does not specify which measures should be included or excluded. It only requires that they should be 'available' and meet standard tests for inclusion. These state that options should be clear, reasonable, workable and achievable.

5.1.2 Suggested measures were sought through public consultation, direct contact with residents within the air quality management area, from officer suggestions and contact with partner agencies. The results of public consultation are summarised in Appendix E.

5.2 Short-listed options for reducing air pollution in the Carnforth AQMA

The council working with partner agencies has decided, following initial public consultation, to take forward the following 8 options for improving air quality within the Carnforth AQMA. The options have been chosen from the original long list of options in Appendix E.

Figure 8. Draft Shortlisted Actions for the Carnforth AQAP

Short List	Long List	Action	Supported Y/N	Lead Partner /Department	Completion date
1	1	Relocate the heavy goods vehicle depot accessed via Market Street (West) to a location where it will not have to travel through the AQMA	Yes (Lancashire County Council, Lancaster City Council)	Lancaster City Council Planning Services	2012
2	2,3	Implement M6 Heysham link road and re-route through traffic avoiding AQMA	Yes (Lancashire County Council, Lancaster City Council)	Lancashire County Council,	2014
3	3	Change Tesco entrance junction from traffic lights to a mini roundabout	No (Lancashire County Council, Lancaster City Council)	-	
4	2,3,4, 6,9,11 ,12,18	Review highway traffic flow in/through Carnforth to identify opportunities for reducing total NOx emissions in AQMA	Yes (Lancashire County Council, Lancaster City Council)	Lancashire County Council Transport and Development Team	2015
5	7,10,1 5,17	Review car parking permission in Carnforth to identify opportunities for reducing total NOx emissions in AQMA	Yes (Lancashire County Council, Lancaster City Council)	Lancaster City Council Planning and Property Services	End 2010
6	14	Implement school and	Yes	Lancashire	On-going

Short List	Long List	Action	Supported Y/N	Lead Partner /Department	Completion date
		business travel plans to minimise travel by car	(Lancashire County Council, Lancaster City Council)	County Council School Travel Planning Team and Business Travel Planner	
7	19	Modernise local bus fleet to low emission technology minimising NOx emissions in AQMA	Yes (Lancashire County Council, Lancaster City Council)	Lancashire County Council Public Transport Policy Group Manager	(TBC)
8	21,24	Pedestrianise/introduce a westbound one-way system on Market Street (West)	No (Lancashire County Council, Lancaster City Council)	-	

The draft shortlisted options were circulated to all steering group members who were asked to indicate their support, or not, for each option and from the information supplied a final shortlist was selected. All options except 3 and 8 were considered feasible and supported.

5.3 Additional actions for measuring the effectiveness of the AQAP

The following measures are proposed to help measure reductions in road traffic volumes and emissions in order to gauge the effectiveness and progress of the AQAP and individual measures.

Maximise passive monitoring of air pollution within the AQMA to inform decisions and monitor progress towards achieving the air quality objective currently exceeded in the Carnforth AQMA. *Source: Lancaster City Council*

6. Assessment of air quality measures

Figure 9. Final shortlist for Carnforth AQAP

Short List	Long List	Action	Lead Partner /Department	Completion date
1	1	Relocate the heavy goods vehicle depot accessed via Market Street (West) to a location where it will not have to travel through the AQMA	Lancaster City Council - Planning Services	2012
2	2,3	Implement M6 Heysham link road and re-route through traffic avoiding AQMA	Lancashire County Council	2014
3	2,3,4, 6,9,11 ,12,18	Review highway traffic flow in/through Carnforth to identify opportunities for reducing total NOx emissions in AQMA	Lancashire County Council - Transport and Development Team	2015
4	7,10,1 5,17	Review car parking permission in Carnforth to identify opportunities for reducing total NOx emissions in AQMA	Lancaster City Council - Planning and Property Services	End 2010
5	14	Implement school and business travel plans to minimise travel by car	Lancashire County Council - School Travel Planning Team and Business Travel Planner	On-going
6	19	Modernise local bus fleet to low emission technology minimising NOx emissions in AQMA	Lancashire County Council - Public Transport Policy Group Manager	(TBC)

6.1 Assessment of Actions 1 to 6

The council working with partner agencies is required to assess the impacts and costs of proposed actions for reducing air pollution in working towards meeting the air quality objectives. This process has been conducted as in the action checklist contained in Appendix F.

6.1.1 Anticipated air quality improvements

Figure 10. Potential impacts of option, estimated cost and estimated timescale

Short List Action No.	Brief description of option	Potential indirect air quality impact of the option	Estimated Cost	Estimated Timescale
1	Relocate heavy goods vehicle depot to avoid travel through AQMA	✓✓✓✓	£££££	2012
2	Heysham – M6 link	✓✓✓✓	£££££	2014
3	Review highway traffic flows	✓✓	£££	2009-2015

Short List Action No.	Brief description of option	Potential indirect air quality impact of the option	Estimated Cost	Estimated Timescale
	in/through Carnforth			
4	Review car parking provision	✓✓	££	2011
5	School and business travel plans	✓	££	Ongoing
6	Modernise local bus fleet	✓✓✓	£££	(TBC)

The potential indirect air quality positive impact of each action, both within and outside the Carnforth AQMA, have been rated using the following key:

✓✓✓✓	Large
✓✓✓	Moderate
✓✓	Small
✓	Very small
-	None / negligible

Costs have been estimated for each action using the following key:

> £10 million	£££££
£1 – 10 million	£££££
£100k – 1 million	££££
£10 – 100k	£££
£1 – 10k	££
> £1k	£
None / negligible	-

The potential impact of options, estimated costs and estimated timescales were provided by Lancashire County Council and Lancaster City Council following consultation. All other members of the air quality steering group were invited to comment on the draft shortlist but had no further comments to make on its content.

6.1.2 Scale of air quality improvements

Consideration was given to all the shortlisted actions and how best to assess their effectiveness in reducing nitrogen dioxide levels within the AQMA.

Options 1 and 2 of the shortlist were modelled as an addendum to the Further Assessment[15] based on revised traffic flow figures from Lancashire County Council. The reduction in nitrogen dioxide levels at the seven relevant receptors for each of the three modelled scenarios is shown in table below.

Table 1. Total NO_2 concentrations at receptors ($\mu g/m^3$ and % reduction)

Total NO_2 concentrations at receptors ($\mu g/m^3$ and % reduction)									
Receptor		Base		Scenario 1		Scenario 2		Scenario 3	
		Total NO_2	% Reduction	Total NO_2	% Reduction	Total NO_2	% Reduction	Total NO_2	% Reduction
Market St	O	49.5	-	34.1	31.2%	48.9	1.3%	33.2	33.0%
	U	48.1	-	30.4	36.9%	47.4	1.4%	29.3	39.1%
	CF3	32.2	-	22.2	31.1%	31.6	1.8%	21.5	33.3%
	CF4	47.9	-	32.8	31.6%	47.4	1.0%	32.0	33.1%
Junction	CF2	40.4	-	31.9	21.2%	38.1	5.9%	28.9	28.4%
A6(N)	S	36.2	-	31.7	12.4%	31.2	13.8%	26.2	27.7%
	CF1	31.0	-	27.9	9.9%	27.0	12.8%	23.7	23.5%
A6(S)	CF5	33.5	-	26.3	21.7%	30.2	10.1%	22.3	33.5%
	CF6	37.4	-	28.0	25.1%	32.4	13.4%	21.8	41.8%

Table 1 shows the predicted total NO_2 concentrations at each of the seven receptor points for the three scenarios. The shaded rows indicate those monitoring locations where the 40 $\mu g/m^3$ annual mean NO_2 objective concentration was breached in 2007.

Scenario 1 (relocate the HGV depot on Warton Road) shows a reduction in total NO_2 by more than 30% at all four monitoring locations in Market Street. This brings concentrations at all monitoring locations well below the objective concentration, and also well within an uncertainty margin of 10% (i.e. 36 $\mu g/m^3$). This scenario also reduces concentrations by between 10% and 25% at receptors along the A6.

Scenario 2 (M6/Heysham link road) brings concentrations at all receptors along the A6 down by over 10% (other than at receptor CF2 at the junction). However, its impact on concentrations in Market Street is minimal, as might be expected as it does not alter traffic flows there). Concentrations in Market Street decline by less than 2%. Concentrations in Market Street are still therefore expected to exceed the annual mean NO_2 objective.

Scenario 3 (combining the measures from Scenario 1 and 2) achieves very significant reductions in concentrations at all receptors, from around 23% to 41%. Concentrations at all receptors are well within the objective and the 10% safety margin.

The results of the modelling found that “On the basis of the modelling, Scenario 2 alone may bring concentrations of NO_2 safely within the objective concentration for properties along the A6, even at the junction with Market Street. However, the reduction in traffic solely along the A6 will not make a significant contribution to reducing concentrations in Market Street.

Conversely, the relocation of TDG, and the consequent reduction in Heavy Goods Vehicle movements in Market Street is likely both to reduce concentrations of NO_2 in Market Street below the annual mean objective, and bring concentrations along the A6 well within this objective.

The combined impact of both measures will lead to an even greater reduction in concentrations. “

The modelling shows that a reduction in traffic is not directly proportional to the benefits to be expected to nitrogen dioxide concentrations within the AQMA. Although a reduction of 20 to 30% in traffic flows along the A6 through Carnforth are predicted for option 2 this brings about less benefits than a smaller reduction of HDVs on Market Street as in option 1. Both options together are predicted to reduce the levels of nitrogen dioxide to well under the national objective of 40µg/m^3.

The benefits to air quality of other shortlisted options were less easily quantified. The modernisation of the bus fleet was assessed to have a moderate impact on air quality, the review of highway traffic flows to have a small impact and the introduction of school and business plans to have a very small impact. Although individually these measures may have a smaller impact on air quality they will help to contribute towards an overall reduction in nitrogen dioxide levels, whilst at the same time monitoring the effectiveness of other measures to reduce traffic flows and to educate and inform members of the public to consider their own actions in relation to air quality.

Apart from the modernisation of the bus fleet all the shortlisted schemes either have started, or are due to start, in the next 18 months.

7. Air quality actions to be taken forward in this Action Plan

7.1 The council working with partner agencies has considered all the actions that have been identified and that appear appropriate to take forward in this action plan.

7.2 The council working with partner agencies is satisfied that none of the proposed actions has disproportionately negative wider impacts so as to rule it out. Similarly, no shortlisted action has been ruled out due to disproportionately high cost compared to benefit

7.3 The final list of actions to be taken forward in the draft Air Quality Action Plan is that at section 6. The nominated lead organisation and the timescale for implementing each action are identified against it in Figure 9.

7.4 The council will carry out public and stakeholder consultation on this AQAP and seek to encourage public participation. The AQAP will be reviewed in line with statutory guidance.

8. Conclusions

The 2008 Further Assessment for Carnforth predicted that a reduction in local emissions of nitrogen dioxide in the region of 55% would be required in order for the exposure of relevant receptors at the worst case sites on Market Street to fall below the national annual objective of 40µg/m^3. The Further Assessment identified the most likely causes of the exceedence as the congestion of traffic on Market Street, coupled with the movement of HDVs on Market Street.

The shortlisted actions include two actions, namely the relocation of the heavy duty goods vehicle depot on Warton Road and the construction of the M6/Heysham link road, for which it was possible to estimate the reductions in traffic and therefore model the impact on air quality. The Addendum (2009) to the Carnforth Further Assessment undertook modelling on these two scenarios plus a third scenario that modelled the impact on air quality if both actions are implemented.

The results of the modelling concluded that the relocation of the heavy duty vehicle depot on Warton Road would reduce concentrations of nitrogen dioxide in Market Street by an estimated 30% and bring them below the annual mean air quality objective. Concentrations on the A6 would be reduced by between 10% and 25% to bring the levels well within the objective.

The construction of the M6/Heysham link road would not in itself make a significant contribution to reducing nitrogen dioxide annual average concentrations on Market Street, the modelling only predicting a 2% reduction. However concentrations on the A6 would be reduced by approximately 10%, bringing them safely within the objective concentrations.

Combining both of the above options achieved very significant reductions between 23% and 41% at the relevant residential locations bringing them well within the objective and the suggested 10% safety margin.

It was not possible to model the other actions on the shortlisted action plan to gain a clearer idea of the likely benefits to air quality that each action would bring about. However actions 3 to 6 would compliment actions 1 and 2 as well as bringing about further reductions in vehicle movements, especially at peak times.

Action 5 (school and business travel plans) has already begun and is on-going with no time limit. The timescales for implementation of the other actions are between 2011 and 2015. It is recognised that external factors causing some of these completion dates to be revisited may be encountered in future years.

Appendices

Appendix A

Environment: Priorities and Objectives contained in the Community Strategy

Priority 1: To reduce our impact on and adapt to the consequences of climate change

Objectives

- Make us less vulnerable to the consequences of climate change (including flooding) and ensure that we can respond to major incidents. We will do this by making sure that our LDLSP partners' strategies for emergency response, and the way we manage our services and our flood defences are in line with current and emerging best practice
-
- Reduce the greenhouse gas emissions we emit, the energy we use and the waste we produce by ensuring that all LDLSP partners have effective and comprehensive strategies in place to reduce the harmful impact of their carbon emissions

- Achieve new development which is more sustainable and which minimises environmental harm

Priority 2: Protect and improve air, water and land quality and use resources sustainably with due regard to the interests of the wider community and the environment

Objectives

- Improve the way in which we manage our rural landscapes by caring for our rural landscapes in a more sustainable way

- Improve air quality and reduce air pollution by ensuring that air quality management strategies are in place in the district where needed

- Reduce the impact of waste on the environment by promoting waste reduction, reusing waste, recycling and composting

Priority 3: Promote and enhance sustainable forms of transport and reduce private car use in urban areas throughout the district

Objectives

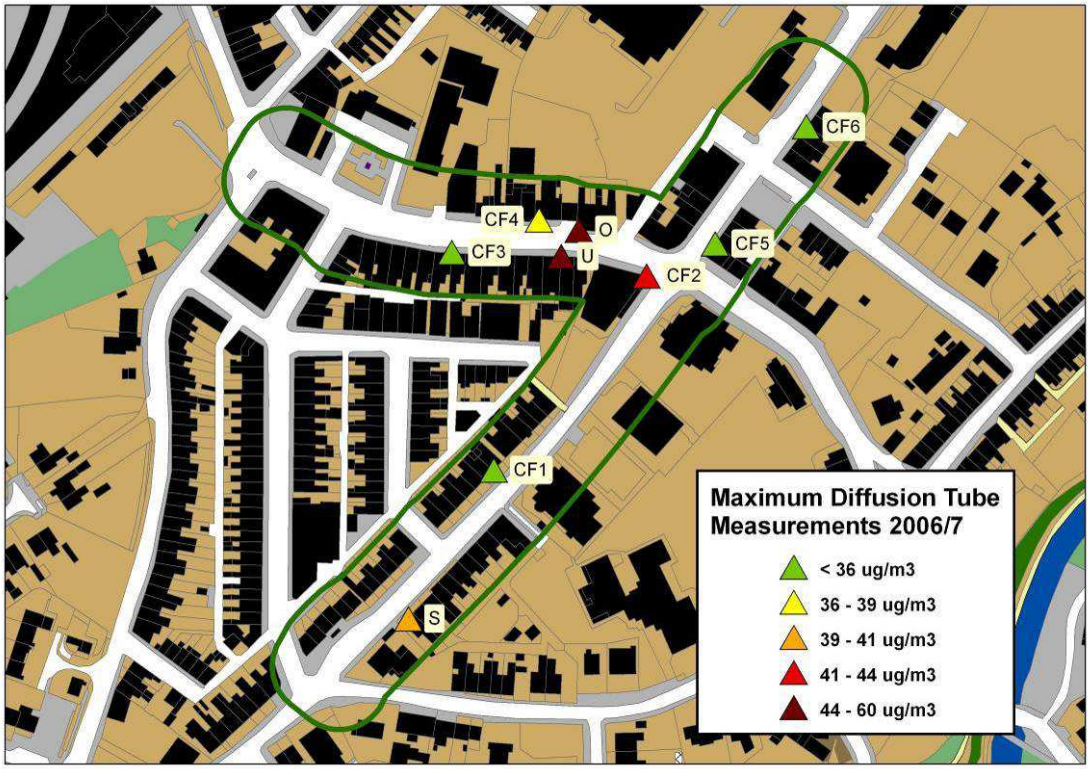
- Reduce vehicle traffic and deliver better public transport and cycling and walking routes

- Increase the number of people cycling in the district by implementing the Cycling Demonstration Town project

- Reduce commuting and business travel by car by ensuring that a significant number of major employers have effective travel plans in place

Appendix B

Figure 11. Carnforth Diffusion Tubes (maximum concentration 2006-7) in relation to AQMA boundary.



Appendix C

Extract from Local Development Framework Core Strategy

Policy E2

TRANSPORTATION MEASURES

<u>Purpose</u>: To support the District's regeneration, improve residents' quality of life and minimise the environmental impacts of traffic.

The Council will minimise the need to travel by car by:

- Focusing development on town centres and locations which offer a choice of modes of transport and resisting major development in car dependent locations;
- Improving walking and cycle networks, creating links and removing barriers and ensuring that development is integrated with pedestrian and cycle networks;
- Protecting land for strategic transport improvements such as the Heysham-M6 Link;
- Monitoring vehicle technological change and providing for low-emission vehicles;
- Reducing local traffic impacts through the Lancaster Air Quality Management Plan;

Ensuring all major development proposals are accompanied by enforceable measures to minimise the transport impacts of development.

The Council will work with partners to promote the following transportation measures:

- Better access to White Lund, South Heysham and its Port via the Heysham/M6 link;
- Better public transport between Heysham, Morecambe, Lancaster City Centre and University, more 'Quality Bus' services and, after completion of the Heysham/M6 link, more road space for buses, and other innovative solutions;
- Innovative rural transport initiatives such as Carnforth Connect;
- Integrating the provision and management of car parking and park and ride in Lancaster and Morecambe and managing parking (including disabled parking) in association with development;
- Innovative traffic management solutions such as Intelligent Transport Systems;
- Addressing the problems of lorry traffic in Carnforth by rationalising land uses and using road capacity freed up by the Heysham/M6 link;
- Investment in local freight and passenger rail services and additional halts.

(continued overleaf)

MILESTONES	IMPLEMENTED BY	MEANS
LMV Transport Study Completed Autumn 2007 *Local Transport Plan Approved January 2007* *Cycling Strategy Reviewed 2009* *City Centre Cycle Strategy completed Autumn 2007* *Heysham-M6 Link – Permission Granted Spring 2008;* *Heysham-M6 Link – Work Commences Spring 2010;* *Heysham-M6 Link – Completed – Summer 2012;*	*LancashireCounty Council;* *Private/Public partnership;* *LancasterCity Council;* *Lancaster and Morecambe Vision;* *Rail and Bus Operators;* *Cycling and Walking Groups;* *One Voice;*	*Local Transport Plan* *Cycle Strategy* *Walking Strategy* *Planning obligations* *Parking Strategy*

Appendix D

Extract from Local Transport Plan (2006) concerning local air quality in Lancaster

The following information extracted directly from the Lancashire County Local Transport Plan is as referenced in the council's Further Assessment report for Lancaster[1]. There is no direct reference to Carnforth as this plan was implemented before the declaration of the Carnforth AQMA. It does, however, contain actions pertinent to the Carnforth AQAP.

The following table is the summary of the air quality and traffic data within AQMAs. Where available, individual trajectories are shown. To indicate the overall level of success in improving air quality within Lancashire, combined air quality within Lancashire's AQMAs has been calculated, giving a Lancashire trajectory. A graphical representation of the Lancashire average exposure per resident to oxides of nitrogen is included in the AQMA section in the District chapters.

Table 9.7.4 Air Quality and Traffic Flows on Primary Links within AQMAs

Air Quality and Traffic Flows on Primary Links within AQMAs									
Location and Population within AQMA	**Traffic Flow and Air Quality**	**2003/4 Observed**	**2004/5 Base year**	**Trajectory**					
				2005/6	**2006/7**	**2007/8**	**2008/9**	**2009/10**	**2010/11**
Lancaster (Action Planning not complete)									
City Centre Gyratory	NOx mg/m^3	43	41	41	40.8	40.6	40.4	40.2	40.1
	AADF NB		20200	20200	20031	19862	19693	19524	18024
	AADF SB		16190	16110	15941	15772	15603	15434	16934
Population 455	7-10am		3620	3560	3445	3330	3215	3100	3427

Notes

AADF = Annual Average Daily Flow 2 way, except Lancaster which operates as a gyratory
7-10am = Inbound flow only
DO = Do nothing (applies the Lancashire average current rate of air quality change)
RR = Required reduction to satisfy National Air Quality Strategy objectives
(1) Measures include only those indicated in the Lancaster chapter. Further measures that will be included in the developed Action Plan.
(2) AQMAs excluded from average exposure calculation as they would artificially reduce overall values.
(3) Values estimated.
(4) Average Exposure per AQMA resident uses the following equation and is applied to each assessed year.

$$\frac{\sum_{i=1}^{n} (NO^{x}_{i} \times Pop_{i})}{\sum_{i=1}^{n} Pop_{i}}$$

where n = number of AQMA
and Pop = population of each AQMA.

9.7.5 LTP8: Lancaster Mean Resident Exposure Reduction within AQMA

The following table indicates the calculated air quality impacts from packages of work on the City Centre AQMA. The impact of other schemes will be included when the Action Plan is accepted. A number of the identified schemes in the District Chapters have secondary benefits to air quality. In Lancaster, the Heysham M6 link benefits particular corridors including both river crossings but has only a slight impact on town centre movements and air quality.

Table 9.7.5a Lancaster: Annual Mean Resident Exposure Reduction within AQMA

Lancaster: Annual Mean Resident Exposure Reduction within AQMA	
Package/Scheme	**Reduction NO_2 µg/m^3**
Heysham M6 Link	0.1
Lancaster City Centre Air Quality Zone	To be determined
Cycling Demonstration Project	0.1
Personalised Travel Planning	0.3
Morecambe West End Neighbourhood Scheme	Not Applicable
Park and Ride	0.4
ITS	Not Applicable
Total	**0.9**

The above impacts have been included in the ‘do-something’ trajectory which assumes that traffic growth is restrained and that the measures implemented reduce the AADF. The ‘do-nothing’ trajectory assumes the AADF growth will occur at the same rate as per the previous 5 years. Currently this is 0.2% increase per year.

Improvements to vehicle and fuel technology should make an important contribution to the improvement of air quality within AQMAs. However, their contribution is not being relied upon and their benefits are not included. If the technology benefits were taken into account, they would have sufficient impact to meet air quality objectives in a number of Lancashire’s AQMAs.

The following summary table contains Lancaster's observed annual mean exposure concentration and trajectories for both 'do nothing' and 'do something' situations. The 'do nothing' includes a factored Lancashire trajectory as a comparison. The table also includes the percentage change from base year. The year on year changes will be included in the Annual Progress Reports to showing the level of success in achieving the required change that satisfies the air quality objectives.

Table 9.7.5b

LTP8 Air Quality in Lancaster									
Annual Mean Resident Exposure Reduction within AQMA µg/m^3									
	2003/4 Observed	2004/5 Base year	Trajectory						Notes
			2005/6	2006/7	2007/8	2008/9	2009/ 10	2010/11	
Lancaster observed	43	41	N/A						Observed data 2005 not yet available
Lancaster do nothing		41	41.0	41.1	41.1	41.1	41.2	41.2	Observed base value with calculated year on year traffic growth using DMRB
Lancashire do nothing		41	43	44	46	48	50	52	Lancashire average trend factored to Lancaster's base year
Lancaster do something		41	41	40.8	40.6	40.4	40.2	40.1	Includes the impacts of the identified Lancaster District packages/schemes. Assumes uniform reduction over time.

Changes in Annual Mean Resident Exposure within AQMA % change from base year										
	2004/5	2005/6	Trajectory					% Increase per year		
			2006/7	2007/8	2008/9	2009/10	2010/11	Min	Max	Ave
Lancashire do nothing	0	3.7	7.3	12.2	17.1	22	26.8	3.6	4.8	4.5
Lancaster do nothing	0	0	0.2	0.2	0.2	0.5	0.5	0.0	0.3	0.1
Lancaster do something	0	0	-0.5	-1.0	-1.5	-2.0	-2.4	-0.4	-0.5	-0.4

Changes in Annual Mean Resident Exposure within AQMA % change from base year

Appendix E

Results of public consultation on suggested air quality actions for consideration when developing the AQAP

AQAP CARNFORTH

LONG LIST OF SUGGESTED MEASURES ARISING FROM CONSULTATION

Following the declaration of an Air Quality Management Area in Carnforth members of the public and partner agencies were given the opportunity to comment on the AQMA and to suggest measures for improving air quality in Carnforth. All suggestions received are included in the long list below.

Seven members of the public responded with suggestions, including the Clerk to Carnforth Town Council who responded on its behalf. In total 22 different public suggestions were put forward for inclusion in the long list. Two additional measures were suggested by Lancaster City Council for consideration when short listing.

For shortlisting purposes the following assessment criteria were used. Short listed measures should be:

1. Relevant to Local Air Quality Management.
2. Significantly beneficial to local air quality (nitrogen dioxide concentrations) within the Carnforth AQMA.
3. Feasible to implement.

	Suggestion	Source of suggestion	Assessment criteria not met	Taken forward to short list?	Comments
1	Re-locate TDG	Public, Lancaster City Council	None	Yes	HGV movements associated with TDG are identified as a principal source of local NOx emissions
2	Change Pelican Crossing at the top of New Street to a Zebra crossing	Public	2 (?)	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of highway traffic flow'
3	Change traffic lights at Tesco to a mini roundabout	Public, Lancaster City Council	2 (?)	Yes	Concern has been raised about tailbacks of southbound traffic on the A6 due to recent introduction of this light controlled junction
4	Move the timed Southbound bus stop from New Street to Crag Bank Road	Public	2 (?)	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of highway traffic flow'
5	Build new road from Truckstop over the railway to lorry depot	Public	3	No	Building of such a new road is not considered to be feasible
6	Put in filters, or change sequencing, of traffic lights at junction of Market Street and A6	Public	None	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of highway traffic flow'
7	Create resident only parking on Hawes Hill, Hunter Street and Ramsden Street	Public	1, 2 (?)	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of car parking'

	Suggestion	Source of suggestion	Assessment criteria not met	Taken forward to short list?	Comments
8	*[Subject to relocation of TDG]* at vacant site create car park with Park and Ride facility	Public	2	No	Introduction of Park & Ride west of Carnforth town centre would increase local traffic which is contrary to intentions for the AQAP. However the potential for increased parking capacity including rural community access to rail travel is noted.
9	Install a pedestrian centric Pelican crossing on Market Street	Public	2 (?)	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of highway traffic flow'
10	Enforce parking regulations	Public	1, 2 (?)	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of car parking'
11	Increase traffic calming e.g. priority to on-coming traffic on Market Street	Public	None	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of highway traffic flow'
12	Make North Road access only to stop it being used as a rat run	Public	1, 2 (?)	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of highway traffic flow'
13	Direct traffic onto M601 and A6 and away from Kellet Road	Public	2	No	This proposal would not improve local air quality within Carnforth AQMA
14	Encourage schools and local businesses to use an alternative to the car to ease peak time congestion	Public	2 (?)	Yes	Extent of air quality benefit arising from this proposal depends on potential for reduction in car journeys when travel distances to this market town may be substantial
15	Stop free parking at Tesco and Booths	Public	2 (?)	Yes *	This can be grouped with other proposals calling for 'review of car parking'
16	Introduce a weight and height restriction on traffic travelling through Carnforth	Public	3	No	There will be a need for HGV access to Carnforth even if measures to minimise local HGV traffic are successful
17	Remove the resident parking from the A6 by the tanning studio and re-locate to the side of the church	Public	2 (?)	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of car parking'
18	Remove traffic lights by Sue Shields and replace with zebra crossing for the schoolchildren	Public	2 (?)	Yes *	Although this is a minor measure it can be grouped with other proposals calling for 'review of highway traffic flow'
19	Modernise and raise the standard of the bus fleet to reduce	Public	2 (?)	Yes	Extent of air quality benefit arising from this proposal

	Suggestion	Source of suggestion	Assessment criteria not met	Taken forward to short list?	Comments
	emissions				depends on proportion of emissions arising from buses
20	Reduce weekend tourist traffic travelling to or through Carnforth e.g. to stock car racing at Warton	Public	3	No	Contradicts local economic regeneration strategy
21	Pedestrianise Market Street (West)	Public	3 (?)	Yes	21 & 24 can be grouped together as alternative options
22	Stop cutting down trees in Market Street	Public	1, 2	No	No significant contribution to reducing local NOx concentrations
23	Implement M6 Heysham Link road and re-route through traffic onto it	Lancaster City Council	None	Yes	Link road scheme underway
24	Make Market Street (West) a one-way westbound road	Lancaster City Council	3 (?)	Yes	21 & 24 can be grouped together as alternative options
25	Introduce a one way system including Hawes Hill, Market Street West, and the A6, combined with the introduction of a mini roundabout at Tesco and a traffic filtering system.	Environment Agency	2? 3?		

Notes
** Taken forward on basis that it forms part of a wider review of highway traffic flow constraints / opportunities*
*** Taken forward on basis that it forms part of a wider review of car parking constraints / opportunities*

Appendix F

Checklist for proposed air quality actions

No.	Description	Cost of measure	Person / Org. responsible	Benefit on declared pollutant within AQMA	Wider benefit outside AQMA	Target transport modes	Completion date	Non-air quality negative impacts identified	Other issues / problems / comments	Realistic to implement measure ?
1	Relocate Heavy Goods Vehicle depots accessed via Market Street (West) to alternative location where travel through the AQMA is avoided	£££££	Lancaster City Council Planning Services)	✓✓✓✓	No	Road transport (HDVs)	March 2012	No	Aspiration in Lancaster District Core Strategy	Yes
2	Implement M6 Heysham link road and re-route through traffic avoiding Carnforth.	£££££	Lancashire County Council	✓✓✓✓	Yes	Road transport (all vehicles)	2014	No		Yes
3	Review highway traffic flows in/through Carnforth	££	Lancashire County Council (Highways)	✓✓	Yes	Road transport (all vehicles)	2015	Yes		Yes

No.	Description	Cost of measure	Person / Org. responsible	Benefit on declared pollutant within AQMA	Wider benefit outside AQMA	Target transport modes	Completion date	Non-air quality negative impacts identified	Other issues / problems / comments	Realistic to implement measure ?
4	Review car parking provision	££	Lancaster City Council	✓✓	Yes	Road transport (cars and LDVs)	2011	-		Yes
5	Implement school and business travel plans to minimise travel by car	££	Lancashire County Council (Highways)	✓	Yes	Road transport (cars)	Ongoing	No		Yes
6	Modernise local bus fleet to low emission technology minimising NOx emissions in AQMA	£££	Lancashire County Council (Public Transport Policy)	✓✓✓	Yes	Public transport (bus)	?	No		Yes

References

[1] Defra Policy guidance note LAQM.PG(09)

[2] Defra Technical guidance note LAQM.PG(09)

[3] NSCA *Air Quality Action Plans - Interim Guidance*

[4] NSCA *Planning for Action*

[7] Lancaster City Council (1999) *Stage 1 Review & Assessment of local air quality*

[8] Lancaster City Council (2000) *Stage 2 Review & Assessment of local air quality*

[9] Lancaster City Council (2004) *Updating & Screening Assessment of local air quality*

[10]Lancaster City Council (2006) *Updating & Screening Assessment of local air quality*

[11] Lancaster City Council (2002) *Stage 3 Review & Assessment of local air quality*

[5] Lancashire County Council *Lancashire Environment Strategy 2005 – 2010*.

[14] Lancaster City Council (2008) *Further Assessment of local air quality in Carnforth*

[15] Lancaster City Council (2009) *Addendum to Carnforth Further Assessment 2008*

[16] Lancaster City Council (2009) *Updating and Screening Assessment of local air quality*