

Leicester City Council

**Air Quality Action Plan for
Leicester**

Draft Report

September 2004

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Executive Summary of the Air Quality Action Plan

- Leicester will fail to meet the statutory Air Quality Objective for Nitrogen dioxide, at the end of 2005
- This Objective is based on risk to human health
- This pollution is caused by emissions from motor vehicles on the major road network
- No City Council policies or projects currently in hand or being planned will remotely approach the Objective.
- Therefore radical, long-term measures need to be adopted
- Leicester therefore had an explicit “policy gap”, not only in terms of Local Air Quality Management but also under:
 - *The Corporate Plan 2003 - 2006*
 - *The Community Plan and Neighbourhood Renewal Strategy*
 - *Best Value Planning*
 - *Local Transport Plan*
 - *Eco-Management Audit Scheme*
 - *LEP Environment Strategy*
- This Air Quality Action Plan sets out 3 time-based Packages of actions for working towards improved air quality:
 - *Short term and feasible, with very small air quality impact*
 - *Within the life of the next Local Transport Plan (2006 -2011), which will achieve a measurable but insufficient air quality impact*
 - *Beyond 2010, which will require radical measures, still to be defined*
- The next Air Quality Action Plan will be produced in 2005; this will:
 - *Assess the air quality impacts of measures to be contained in the Local Transport Plan 2006-2011.*
 - *Identify the remaining shortfall in air quality improvement, which will need to be addressed by further Air Quality Action Planning.*

1. Introduction and Aims of the Plan

1.1 The Background

KEY FACTS

- Under the Environment Act 1995 Leicester assessed its air quality against national Objectives and declared an AIR QUALITY MANAGEMENT AREA in 2000
- Air Quality Objectives are health-based
- A more detailed assessment was completed in 2003
- The Council must produce an AIR QUALITY ACTION PLAN based on these findings
- This ACTION PLAN must consider available options and time frame for implementation

This document has been developed by Leicester City Council to comply with duties under Part IV of the Environment Act 1995, hereinafter referred to as “the Act”. The report is based on the findings of the report *Local Air Quality Management in Leicester, 2003 - Air Quality Reviews and Assessments*, which represented Leicester’s further Review and Assessment of air quality in the Leicester Air Quality Management Area, 2000, in accordance with Section 84 of the Act.

That report should be read in conjunction with this document.

For brevity, the latter document will hereinafter be referred to as the *Review and Assessment Report, 2003*. For consultation purposes and final report publication, the two documents will be published together so as to provide a single, overall picture of Local Air Quality Management in Leicester.

That study confirmed earlier findings, that there was going to be a failure to meet the statutory Objectives for Nitrogen dioxide at the end of 2005. The assessment process established the principal source as emissions from motor traffic on the major road network and estimated the amount of reduction required to meet the Objective limit value.

1.2 Review and Assessment: the nitrogen dioxide problem

KEY FACTS

- **Leicester will fail to meet the Objective for nitrogen dioxide (NO₂) in 2005**
- **NO₂ is toxic, and high concentrations in the environment aggravate respiratory conditions**
- **Approximately 95% of measured NO₂ can be attributed to NO_x from road traffic**
- **Leicester's Air Quality Management Area therefore includes the City Centre and narrow zones along the major roads, where people are likely to be exposed.**
- **To meet the Air Quality Objectives, Leicester must achieve a reduction of about a quarter of existing levels in these affected areas**
- **Even at non-roadside locations, the contribution of road traffic to the ambient levels of NO₂ is dominant:**

The statutory air quality Objectives for nitrogen dioxide are as follows:

Annual mean: 40 µg.m⁻³

31st Dec 2004

Hourly mean: 200 µg.m⁻³ (No more than 18 exceedances per year): 31st Dec 2004

Leicester City Council has, over recent years, determined the locations across the city where specific air quality objectives for seven pollutants are likely to be breached. The objectives are health-based, and objectives for six of the seven regulated pollutants are not predicted to be exceeded. However, the long-term objective for nitrogen dioxide (NO₂) is expected to be breached across a wide area of the city by the target date of the end of 2005. This is due to emissions from vehicles. In order to mitigate the problem, Leicester City Council is tasked with identifying specific options that will reduce emissions of nitrogen oxides (as a precursor to the formation of nitrogen dioxide) from vehicles, and thereby reduce concentrations of NO₂ experienced locally.

Nitrogen dioxide (NO₂) is a toxic gas. In elevated environmental concentrations, it exacerbates respiratory conditions. It is formed from atmospheric nitrogen, either directly or as its precursor nitric oxide, in combustion processes but especially where there are very high temperatures and pressures. For this reason, NO₂ is an important by-product of the internal combustion engine. Both NO₂ and nitric oxide (NO) are included together as oxides of nitrogen (NO_x), which are produced by all combustion processes. Usually, NO predominates initially but then reactions take place in the atmosphere with oxidants such as ozone (O₃) to produce NO₂. In addition to being harmful in its own right, NO₂ is implicated in the cycle of atmospheric ozone chemistry and thus indirectly in global warming. It is therefore of both local significance (health effects) and global importance (sustainability and climate change).

1.2.1 Major sources and areas affected by NO₂

Elevated concentrations of NO₂ close to the main road network are the focus for this Action Plan. However, concentrations of NO₂ decline to background levels with increasing distance from the carriageway, so the most significant problem arises

where people are exposed within a distance of approximately 10 metres of the road. Since it is at the focus of the radial road network, the whole City centre is also affected.

The *Review and Assessment Report 2003* illustrates that breaches of the annual mean criterion are predicted within the 10m zone. Statutory Guidance requires any designated Air Quality Management Areas to encompass residential and other sensitive property within the area of air quality objective exceedances. As such, Leicester's AQMA encompassed all residential and similar property within at least the 10m zone alongside the main roads in the city.

It should, however, be noted that the solutions proposed in the Action Plan need not, and should not, be confined to the areas where exceedances and relevant exposure coincide. The nature of the problem indicates that network wide solutions should be considered.

1.2.2 The Amount of Improvement Required

A more detailed analysis of the amount of improvement required in levels of NO₂ is given in the *Review and Assessment 2003*, the material being summarised here:

The study indicates that existing national policy measures will result in a 27% fall in NO_x emissions between 2001 and 2005 but this will not be sufficient to achieve compliance with the Objective for Nitrogen dioxide. Maximum annual mean values are predicted to be about 53 microgrammes per cubic metre in the most polluted areas by 2005 against a prescribed value of 40 microgrammes per cubic metre.

It is estimated that approximately 95% of measured Nitrogen dioxide in Leicester is attributable to road traffic. The overall contribution of heavy vehicles to the urban NO_x emissions is around 60%.

The secondary formation of a large proportion of NO₂, referred to in the previous section, complicates the prediction of levels: Prevailing concentrations depend upon the proportion of NO₂ to NO found in the initial emission and on the availability of atmospheric oxidants. The implication of this for the Air Quality Action Plan is that a given reduction in emissions of NO will not necessarily yield a corresponding reduction in the burden of NO₂.

The principal measures to achieve this must be directed towards reducing:

- Motor vehicle-kilometres travelled within the City; or
- Emissions of NO_x (including NO₂) per vehicle-kilometre travelled.



Figure 1

Air Quality Management Area (in force 29th December 2000)

THE CITY COUNCIL AIR QUALITY MANAGEMENT AREA IS SHOWN IN BLUE

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1.3 The Aims of the Air Quality Action Plan

KEY FACTS

- **The AIR QUALITY ACTION PLAN sets out any LOCAL ACTION, in addition to national measures, needed to meet the air quality objectives**
- **The Plan must state the times within which the measures are to be implemented**
- **The Plan can call on the full range of functions of the City Council**
- **The costs, benefits and wider-effects of individual options and packages of options should be assessed**
- **There must be full consultation with all stakeholders**
- **The Plan must be monitored and regular progress reports submitted**
- **The Plan can be updated as local and national circumstances change**

This section explains the aims and nature of an Air Quality Action Plan. For further information, reference should be made to *Local Air Quality Management – Policy Guidance LAQM. PG (03)*.

The Action Plan is directed at moving towards compliance with *health-based* air quality objectives, which specify maximum, local ambient exposures to a specified pollutant over appropriate time-periods (annual mean and hourly mean values for NO₂). It is not, therefore, primarily concerned with the reduction in emissions of pollutants implicated in global environmental problems, such as climate change - policies aimed at the latter may, of course be complementary, although occasional conflicts may also present themselves (for example, see Section 2.2.2 on City Council fuel policy).

The Action Plan is focused upon *specific sources* (principally road traffic) of a *specific pollutant* (nitrogen dioxide) in *specified locations* (within the Air Quality Management Area). This is because the Review and Assessment process has eliminated other pollution issues as being of health significance, although the Council must continue to review these. (See *Review and Assessment 2003*, Section 4.1 and Appendix 2).

Under the terms of the Act, it must be *time-based*, i.e. it must specify times by which each of the measures proposed in the Plan will be implemented. The costs and benefits of options considered should be assessed, together with any wider environmental, social or economic impacts. Importantly, the Plan should deploy any relevant powers or functions of the City Council in order to achieve improved air quality, with a judicious balance of regulatory and non-regulatory powers. However, it should not be simply a local authority exercise, but should enlist the support of partners and stakeholders, wherever possible.

All functions within the Council should support the Air Quality Action Plan and effective mechanisms of corporate governance should be in place to ensure an integrated approach. (*Policy Guidance LAQM. PG (03)*, paras. 3.08 to 3.11). An effective Steering Group is required: In Leicester City Council, this role is played by the Sustainable City Officers' Group (SCOG).

The Act requires that the Action plan is subjected to full consultation with all relevant stakeholders. These include:

- Elected Members
- The various professional disciplines within the Council
- Partners of the City Council
- Other Local Authorities, at County, and potentially at regional level
- Other agencies and statutory bodies
- Representatives of local business
- The general public.

Finally, the Air Quality Action Plan should be periodically monitored, reviewed and updated as necessary. The statutory Guidance requires the submission of annual progress reports to DEFRA.

1.4 Progress in Leicester

KEY FACTS

- **Leicester City Council wishes to make the Leicester West Transport Scheme (LWTS - park-and-ride sites) the heart of the City's Air Quality Action Plan. This would have a quantifiable effect in improving air quality**
- **Because of delays to LWTS, DEFRA has requested the City Council to produce an Air Quality Action Plan anyway**
- **LWTS, if executed, would be a step in the right direction. However, it WILL NOT achieve anything like the necessary improvement in air quality by itself**
- **Therefore, the ongoing development of the Air Quality Action Plan will also need to focus on radical, long-term options**

The Leicester West Transport Scheme (LWTS) is a major transport scheme, which along with other objectives, aims to decrease levels of congestion and provide environmental improvements such as air quality. As indicated in *Review and Assessment 2003*, it had been intended that this system of peripheral park-and-ride sites should be a cornerstone of the Air Quality Action Plan. Modelling done in support of the LWTS indicates that a scheme along those lines would effect a perceptible improvement in nitrogen dioxide levels in the relevant areas.

However, at the time of developing the Action Plan, the LWTS is not finally committed. A bid for funding through the Local Transport Plan has been submitted to the Department for Transport, the outcome of which is expected later this year. In addition, the outcome of a Local Planning Enquiry to secure approval for consequent changes in the replacement City of Leicester Local Plan is still awaited. The current best estimate of the time scale for this is not earlier than Spring 2005. If the Planning Inspector's determination with respect to the required variations of assigned land use were adverse, the future of LWTS would be very uncertain indeed.

Following discussions with DEFRA, it was nonetheless agreed that, following their acceptance of the findings of *Review and Assessment 2003* that an Air Quality Action Plan would follow, represented by the present document.

However, *Review and Assessment 2003*, (Section 3.2.3.2) makes it clear that even a scheme like LWTS, which, if committed, would take several years to be fully "on line", will not by itself bring about the necessary improvement in air quality. Further, radical traffic or transport measures need to be developed and executed. Options are considered in this Action Plan, with a view to initiating development work in this direction.

Leicester City Council is under no legal obligation to achieve compliance with the relevant air quality objective. Indeed, given the short period remaining to do this (up to 31st December 2005), it is not now realistic to expect that this will happen. However, the Council is obliged to develop a package of measures intended to "work towards" meeting the objectives at some point in the future and this must be time-based.

1.5 The Air Quality Action Plan in the context of Corporate Policy

Leicester City Council, together with its partners, has produced a range of interlocking Policies and Strategies, the air quality content of which are considered in detail in Section 2, below.

It will be noted that many of them set compliance with the statutory Air Quality Objectives as an explicit target. The predicted failure of the City of Leicester to meet the Objectives for Nitrogen dioxide therefore not only affects Local Air Quality Management but also creates an explicit "policy gap", within a number of the Council's core strategies. These include:

- The Corporate Plan 2003 - 2006
- The Community Plan and Neighbourhood Renewal Strategy
- Best Value Planning
- Local Transport Plan
- Eco-Management Audit Scheme
- LEP Environment Strategy

Some of these documents aim to produce defined actions or schemes which have the effect of improving air quality, often amongst other aims like road safety or addressing global pollution issues. Others are "soft" initiatives in the sense that they set out important goals and aims but do not have any executive force, in the development of defined, costed measures or packages of measures, which will improve air quality.

Other difficulties, from the perspective of Local Air Quality Management are:

- The long time-scale over which they will achieve any positive effect on air quality.
- The difficulty in precisely quantifying any effect which they might have.

In the absence of any "hard" traffic and transport measures they are highly unlikely, in themselves, to achieve the necessary improvement in nitrogen dioxide levels by the due date of the relevant air quality objective.

In contrast, it is the purpose of the Air Quality Action Plan to develop specific, time-based measures to move incrementally towards improvement in air quality.

In practice, for the reasons explained in Section 1, this will be a long-term process during which radical options will be developed to the point of political acceptance, definition, funding and commitment. In view of the radical nature of a complete solution to the air quality problem in Leicester, it is inevitable that this first draft of the Air Quality Action Plan will not set forth a complete, time-based programme sufficient to do the job.

The approach has therefore been taken, in Section 3, where future actions are considered, of giving options a time-base by organising them into packages along a spectrum of being:

- Cheap or expensive;
- Immediately possible or presenting significant barriers to progress;
- Being feasible in terms of political acceptability, availability of enabling legislation and availability of sources of funding.

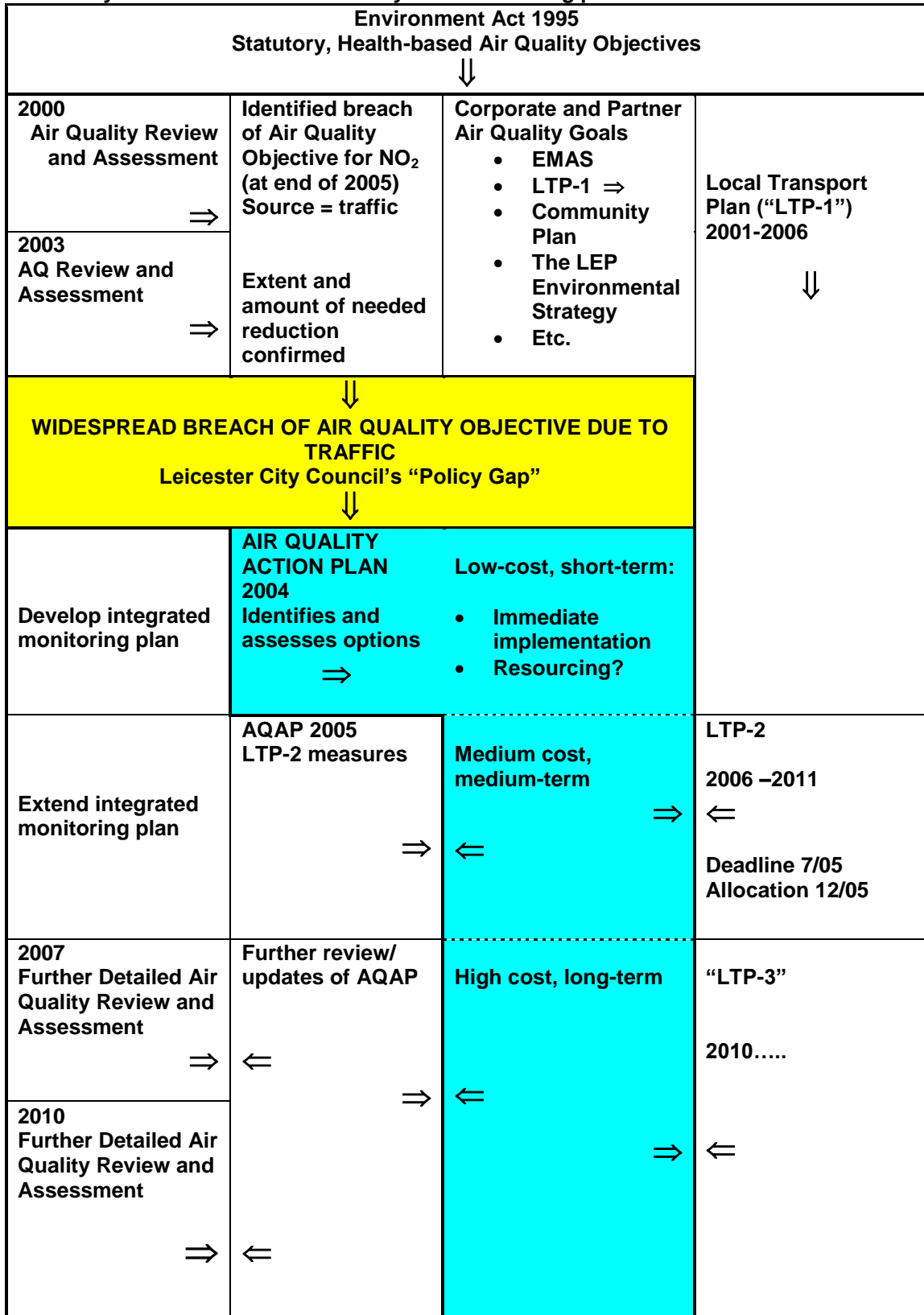
Some of the time-based “actions”, which flow from this document will thus be in the nature of:

- Conceptual exploration;
- Feasibility studies;
- Lobbying to change legislation or obtain funding streams.

In that sense, this document bridges the gap between those strategies set out below which explore the way ahead in aspirational terms and those which map out the allocation of real expenditure, in particular the Local Transport Plan.

AIR QUALITY ACTION PLANNING IN LEICESTER

Summary schematic of the Air Quality Action Planning process



2. Existing Strategies and Plans relevant to air quality

2.1 Environmental strategies

This Section considers existing City Council strategies, policies, and programmes placing them in the context of Local Air Quality Management. The Local Transport Plan (LTP) is the prime policy document that will provide measures to deliver the air quality improvements required. For this reason the LTP will be dealt with separately in section 2.3.3.

2.1.1 Corporate Plan 2003-2006

This document, published in October 2003, sets out the overarching Strategic Objectives and Key Priorities of Leicester City Council. The keynote phrase of the document is,

“...Making Leicester more attractive for our diverse communities to live, work and invest in”.

The two, key Objectives of the Strategic Direction are:

- Environment
- Education

Within these, key Priorities and actions of relevance to this AQAP are to:

- *Make our City’s developments sustainable so that we do not close down choices for our children and grandchildren.*

Specific action B2: Make continuous, measurable progress in our environmental performance and reduce our environmental impact.

Headline targets: Meet EMAS targets for environmental improvement. (See Section 2.2.1).

- *Regenerate the City’s housing, open spaces, public transport and access to work and services.*

Specific action G6: Develop a transport system, which enables everyone to take part in all aspects of everyday life at a reasonable cost, by:

- Improving access via public transport; promote alternative transport leading to reduced car use.
- Developing safer routes to schools schemes.
- Implementing traffic calming initiatives.

Headline targets: Reduce car use to the City centre by 4% in peak periods by 2006

- *Promote prosperity and new jobs, while safeguarding peoples’ health and development interests.*

Specific action H2: Provide effective regulatory services, in accordance with our statutory responsibilities in the areas of...Environmental Health.

Headline target: To develop and implement Air Quality Action Plan by June 2004. (See Section 1.4).

2.1.2 Leicester's Community Plan

The first *Community Plan* was introduced in 1999 when service providers and local people worked together to agree on the priorities for Leicester. The current modified plan was developed in 2003 by the Leicester Partnership which was set up in 2001. The *Leicester Partnership* is a collaboration of statutory agencies, businesses, voluntary and community groups. The aim of the partnership is bringing these groups together to improve neighbourhoods, public services and the quality of life for local people. The Plan is due to be reviewed in 2005 through a consultation process that will include residents of Leicester.

In terms of environmental best practice for the city, the plan encourages all sectors of the community to contribute to Leicester's development while meeting the challenge of reducing the city's local and global environmental impact.

The environmental goals of the Community Plan that are relevant to air quality are:

- reduce car travel to the city centre and to encourage and develop more journeys by cycling, walking and public transport;
- ensure that national air quality standards are met, and to increase awareness and understanding of air quality issues, and
- promote and deliver sustainable use of energy and resources.

2.1.3 Leicester's Neighbourhood Renewal Strategy

Leicester Partnership also agreed Leicester's Neighbourhood Renewal Strategy in November 2002. It is intended to deal with inequalities and make sure that residents within Leicester are not put at serious disadvantage by where they live. The Renewal Strategy, arising from the development of the Community Plan has the aim to build stronger, sustainable local communities. The strategy's priorities for air quality are:

To improve air quality within the city and reduce the quantity of pollutants produced by:

- Reducing car travel into the City centre and encouraging more journeys by cycling, walking or public transport.
- Ensuring that national air quality standards are met.
- Increasing awareness and understanding of air quality issues through both the formal education system and amongst the wider community.

Funding has been made available via the Neighbourhood Renewal Fund to achieve progress against these key targets within deprived wards in the city. So far NRF funding has been used to develop the Breathe Easy project and to roll out the EMAS programme in schools.

Where a floor target is seen to be failing, additional funding may be diverted to improve performance. Thus, funding for 2004/06 is to be allocated to address the projected failure to achieve the air quality objective for NO₂.

The Leicester Environmental Partnership has gone on to develop an overarching Environment Strategy for stakeholders in Leicester. (See next Section).

2.1.4 The Aalborg Commitments

Leicester signed these ten years ago and they were revisited and reaffirmed at a conference in May 2004.

The commitments, which are mirrored in the Community Plan, cover the themes of:

- Governance
- Urban Management towards sustainability
- Protection of natural common goods
- Responsible consumption and lifestyle choices
- Planning and design
- Better mobility, less traffic
- Local action for health
- Vibrant but sustainable local economy
- Social equity and justice
- Local action for global sustainability.

2.1.5 Leicester's Environmental Strategy (Leicester Environmental Partnership)

The City's Environmental Strategy is a strategy document produced under the Leicester Environmental Partnership, which brings together fifteen organisations having a key role in the environment in Leicester. The environmental charity and consultancy Environ, is the partner with responsibility for drafting the document. It is an overarching Strategy with the overall aim of enhancing Leicester's sustainability for the benefit of people living in and visiting the City, and to minimise Leicester's global environmental footprint.

This is very much a high-level strategic exercise which explores the long-term way ahead:-

- It is based on a long-term vision, unhindered by existing political and technical constraints.
- It collates, on a non-executive basis, the relevant objectives of the various partners.

A seven-point vision statement covers:

- Increasing awareness and understanding
- Eliminating all forms of pollution, including air pollution
- Reducing the need to travel and making transport environment-compatible
- Energy and resource efficiency
- Minimising waste and maximising recycling
- Protection of wildlife habitats
- Access and enjoyment of the environment

From these are developed objectives and targets and, finally, an action plan, which will bring together the initiatives and projects of each of the partners.

The key items in the vision statement, which are of relevance to Local Air Quality Management are these:

Minimising Pollution:

VISION

Leicester will have a clean and healthy environment, free from pollution to air, water and land.

Specific Aims and Objectives indicating progress towards meeting those aims are:

- To reduce and eliminate harmful emissions from vehicles (referred to in the Transport Section)
- To monitor air quality to identify pollutant levels and sources and to make this information available to the public.

Achieving Sustainable Transport

VISION

Leicester will have widespread local amenities and all residents and workers will have a choice of convenient and non-polluting transport options.

The Chapter on transport includes the attainment of the statutory air quality objectives as a target. Also included are groups of objectives aimed at:

- Reducing the need to travel
- Reducing vehicle emissions
- Promoting modal shift
- Reducing the distance over which goods and services are delivered.

These sections of the Environment Strategy are closely co-ordinated with the Air Quality Action Plan. The full version of Leicester's Environment Strategy will be formally launched in October 2004.

2.1.6 City of Leicester Climate Change Strategy

This is a strategic document, which takes a long-term view of the problems and solutions to climate change caused by the emission of greenhouse gases.

The main elements of the Strategy are:

- An assessment of Leicester's contribution to climate change;
- An assessment of past and future climate change emissions affecting Leicester;
- Review of progress towards the targets contained in the 1984 Leicester Energy Strategy and possible update;
- Review of the best approaches to reduce greenhouse gas emissions in Leicester;
- Provide the foundations of an action programme based on the above, and
- Establish a framework to monitor progress.

Measures proposed or developed in the Climate Change Strategy are intended to reduce emission of greenhouse gases in general and may well reduce emissions of nitrogen oxides also. The Air Quality Action Plan therefore complements the Strategy at the strategic level. Formally launched in October 2003, the next phase of the Climate Change Strategy will be the development of an action programme, to set specific targets for the delivery of its strategic aims.

2.1.7 Best Value Planning 2003-4

Best Value is a key part of the Government's proposals to reform local government and is a vital part of how Leicester City Council is managed. Best Value is about improving the quality of public services and making them as efficient as possible. The process is designed to make sure local authorities respond to the needs of the people who use its services and the community as a whole by setting standards and measuring our performance against the standards.

The Best Value Performance Plan is produced every year to give Leicester residents, businesses and community organisations an indication of the Council's performance in delivering services.

The current basket of Performance Indicators stated within the Plan for the Regeneration and Culture Department includes, "*the number of days per year on which the national air quality standards are exceeded.*"

2.1.8 Leicester Better Buildings Project

This project is aimed at providing a guide for developers, which will lay down appropriate environmental and other standards for building construction. Included in the standard will be design measures to protect the occupiers of buildings from adverse air quality, for example where a residential development takes place in close proximity to a major road.

These will include consideration of:

- Location, arrangement and orientation of buildings.
- Internal arrangement of buildings.
- Engineering controls.

The project is to be formally launched on 23rd November 2004.

2.2 Leicester City Council setting the example

Leicester City Council is a major consumer of energy, as a transport and service provider and through the vast public buildings maintained by the authority. The Council is therefore in a position to influence local air quality directly, including emissions of nitrogen oxides and other pollutants. The following initiatives are in place:

2.2.1 Eco-Management Audit Scheme (EMAS)

The ECO Management Audit Scheme (EMAS) is the mechanism by which Leicester City Council keeps its own house in order as an organisation having significant influence upon the local environment. For many years Leicester City Council has played an active role in encouraging and supporting measures which protect our environment. In 2000, Leicester City Council was awarded Beacon Council status for 'Maintaining a Quality Environment'.

The City Council has adopted a number of 'green' policies, ensuring that its own services and activities meet the high standards it encourages others to adopt. To ensure that these standards are monitored, maintained and improved wherever possible, the council has adopted the Local Authority Eco-Management and Audit Scheme or EMAS in short. This Europe-wide scheme helps the council to manage and improve its own environmental performance, allowing the authority to move further towards its goal of achieving sustainable development.

The EMAS Environmental Statement reports objectives and targets that have been set for improvement. An action programme to achieve the targets is monitored by Officers of the Sustainable City Officers Group every six months and annually by Councillors. There is an internal audit team to carry out a programme of audits of all elements of the system.

During the recent EMAS audit (2003/4) a number of non-conformities were identified relating to the City Council Travel Plan and targets to reduce vehicle fleet emissions.

Leicester's Environmental Statement has recently been reviewed and a number of performance indicators require revised targets to be set, and actions to be agreed for achieving them. These targets and their programme for implementation will be co-ordinated with the key actions within this plan.

Summary of progress towards EMAS targets, which are related to the AQAP

Target no.	Target	Progress against base year	Progress toward target	Commentary
THE COUNCIL'S CONTRIBUTION TO AIR POLLUTION				
3.1	Reduce vehicle fleet emissions	Target to be developed		All diesel vehicles within the Council fleet started to use a 5% blend of ULSD biodiesel from July 2002. Alternative fuel options for the Council's fleet are still being discussed.
AIR QUALITY IN LEICESTER.				
4.1	To achieve national air quality objectives within the City by 2005.	Numerous long term and short term exceedances on roads with heavy traffic	Negative trend	There will be a failure to meet the national air quality objectives within the City centre and along the major road corridors at the end of 2005. This is likely to be the case with all large urban areas within the UK, partly due to a national policy gap and a lack of radical action locally. The key action for reducing car journeys to the City centre is the proposed Leicester West Park and Ride Transport scheme.
4.2	To reduce car trips to the City centre. (4% reduction of 2001 level)	3.2 % increase	Negative trend	The key action for reducing car journeys to the City centre is the proposed Leicester West Park and Ride Transport scheme.
4.3	Reduction in proportion of car journeys to school (25% reduction of 2001/2 level by 2011))	4% decrease	Insufficient data to establish clear trend.	This trend is not conclusive as the comparative sample only includes 21 schools across two data points. A school travel plan officer has been appointed. In addition, the expansion of EMAS into schools could cover 50% of all city schools and this will address transport as a key issue.
EDUCATION AND AWARENESS RAISING IN LEICESTER				
13.1	To improve awareness of environmental issues amongst Leicester residents (Target to be developed using People Panel to monitor).	Target to be developed		Awareness raising campaigns relating to climate change have been developed that link EMAS objectives, including energy use and air pollution. This is a three year programme designed to encourage change in individual behaviour. The "Keep Leicester Cool" campaign was launched in October 2003. Continuation of the campaign is dependent upon extra resources being identified. Education and awareness raising is theme contained within the Leicester Environment Strategy.

2.2.2 Council Vehicle Fuel Policy

The Council operates a fleet of approximately 800 vehicles, the majority of which use a 5% bio-diesel/diesel fuel blend. This fuel offers benefits in reducing CO₂ emissions and improving fuel efficiency, as well as the possibility of obtaining the bio-diesel from local farmed crops. An evaluation exercise has been carried out into the opportunities for increasing the bio-diesel blend, to achieve further reductions in emissions, however the benefits in reducing CO₂ are offset by an increase in local emissions of NO_x and PM₁₀, and the requirement for engine modifications. For the moment, it is therefore considered a 5% blend presents the best environmental option, however this will be kept under review as technology develops.

In addition there are 27 LPG vehicles in the fleet, and 2 electric pool vehicles which when recharged using renewable sources of electricity, produce zero emissions.

2.2.3 Travel Plans

Staff travel is increasing: during 2002/3 there was an overall 9.6% increase in miles driven whilst at work. As one of the major employers within the city, more action is required to reduce emissions associated with travel. Progress is being made, and proposals will shortly be in place for the City Council to adopt a Mobility Management Plan, which among other measures will consider ways of reducing emissions and fuel usage for staff travelling to/from work and journeys whilst at work. Some measures are already in place to allow flexibility and encourage other modes of transport: electric pool vehicles, showers and changing facilities for cyclists, mileage allowance for cyclists at work, flexi time. There is scope for development however, to encourage more flexible working hours, homeworking, provision of public transport information on the intranet, a review of car parking policies and provision of driver training.

It is important that the City Council has an implemented travel plan not only to contribute fully to reducing emissions across the city, but also to demonstrate commitment and as a model for other major employers across Leicester.

2.3 Traffic and transport measures

2.3.1 Generic Strategies

Clearly, emissions from road traffic using the major road network are the most significant source of nitrogen dioxide in Leicester. The air quality assessment work undertaken by the Council indicates a generalised problem across the road network, and the focus of the air quality action plan is to therefore reduce motor vehicle kilometres travelled and emissions per motor vehicle kilometre. Therefore in order to improve air quality within the AQMAs, attention should be paid to the following variables:-

- A. Numbers of vehicles flowing past critical points in the City (i.e. locations where people are exposed to excessive concentrations of traffic pollutants in the AQMA, over the relevant averaging periods).
- B. Reduce miles travelled within the Local Transport Plan area.
- C. Emissions per vehicle/mile.

Appropriate generic strategies to achieve each of these can be tabulated as follows:

Strategy	A	B	C
Transport modal shift	√	√	
Elimination of unnecessary travel / transport	√	√	
Redistribution of traffic flows	√		
Reduction in congestion / queuing			√
Reduction in old / poorly-maintained vehicles in all / part of the area			√
Promotion of appropriate automotive technologies in all / part of the area			√
Avoidance of development where relevant exposure can occur in close proximity to major roads.	√		

2.3.2 Contribution of traffic congestion to local air quality

Work carried out for the Stage 4 Review of air quality in Leicester identified that emissions from road traffic in Leicester will account for 68% of nitrogen oxides (NOx) by 2005. This picture is reflected nationally, with proportions being higher in urban areas due to high volumes of traffic and congestion playing an important role.

Air quality modelling completed to date indicates that the areas of exceedance are across the major road network indicating a generalised problem of traffic volume and congestion rather than isolated or discrete hotspots. Targets within the LTP relating to congestion are focussed on reducing peak hour trips; since 2001 the am peak trips have increased by 0.3%. By 2011 the target is an 8% reduction in am peak car trips; this modal shift would achieve a direct reduction in vehicle emissions. In addition, less congestion during the peak periods will cause fewer emissions from stop-start traffic.

2.3.3 Local Transport Plan

A framework for transport policy is already in existence within the Central Leicestershire Local Transport Plan (LTP) 2001-2006. This Plan aims to deliver an Integrated Transport System by 2006, with policies incorporated that will provide a positive impact on air quality.

- ❖ **Quality public transport network : real time information at bus stops via StarTrak /Star Text**
 - : park and ride at some main access routes to city**
 - : integrated ticketing for all bus companies**
 - : bus priority measures on corridors**

- ❖ **Completion of safe network of cycle and pedestrian routes**
- ❖ **Extended pedestrianised areas within city centre and suburban shopping areas**
- ❖ **Low Emission Zone within city centre excluding older, more polluting vehicles**
- ❖ **Development of more Safer Routes to Schools and school travel plans**
- ❖ **Use of urban traffic management systems to optimise traffic flows and manage road occupancy efficiently to reduce congestion**
- ❖ **Agree Travel Plans with major employers to reduce car dependency for commuters**
- ❖ **Real-time travel information using Variable Message Signs, local media and other travel information facilities**
- ❖ **Parking management and restrictions to promote sustainable transport**
- ❖ **Promote sustainable freight distribution system**

Progress on the LTP is reported within an Annual Progress Report (APR) submitted to the Department for Transport (DfT) and available widely for public information. The fourth Annual Progress Report (July 2004) has reported that the authority is performing well in delivering a number of schemes within the current LTP.

The timeframe for the current LTP is to 2006 that is beyond the date for achieving the statutory air quality objectives for NO₂ of 2005. The schemes and proposals identified within this current LTP have been incorporated within air quality modelling where possible, and our best estimates using precision monitoring and modelling indicate that these policies alone will be insufficient to deliver the improvements in air quality needed to meet the statutory objectives. The objectives of this AQAP will be complementary to objectives within the LTP to reduce traffic flows, reduce congestion and encourage the use of public transport.

It is clear that in order to progress towards meeting the statutory objective for NO₂, the AQAP must be a key consideration in formulating the next LTP that will set out the strategic transport plan for the period 2006-2011. The next LTP is dealt with in 2.3.4.

(a) Leicester West Transport Scheme (LWTS)

The key scheme identified within the LTP (2001-2006) which can deliver demonstrable air quality improvements is the LWTS. As previously mentioned the bid outcome for this scheme is still awaited. Whilst the scheme would not have been operational within the 2005 timeframe, further delays now mean that if the LWTS does proceed, it will not be operational for several years.

The LWTS incorporates a package of measures to provide an alternative to car travel into the city centre. The corridors to be affected are all within the designated AQMA.

The key elements of the proposal are:

- Three Park and Ride sites serving the A426, A6 and A50 corridors
- Bus priority measures along these corridors
- Level bus access and improved stops
- Real time passenger information
- Intelligent bus priority
- Variable message signing for air quality and congestion information

The scheme aims to reduce car journeys into the city centre by 6% from 1998 levels, and would reduce congestion at the morning peak along the corridors served, as well as within the central area. As part of the evaluation of the scheme, detailed air quality modelling of various Park and Ride scenarios was undertaken using traffic model input data which reflected the predicted reductions in traffic flow. A small improvement in air quality can be seen along the corridors where the sites are located as a result of the reduced car journeys, and a small reduction in the size of the AQMA within the city centre due to reduced congestion can be predicted.

Whilst this scheme cannot alone deliver the necessary air quality improvements, it can help reduce emissions from car journeys as a result of motorists using the Park and Ride sites, and as a result of reduced congestion. The improvements in air quality will therefore be seen beyond those corridors directly affected. As such, it is an important policy option for inclusion within the AQAP.

(b) Public Transport Improvements

Public transport improvements are designed to encourage modal shift from private vehicles to bus travel. Such measures are difficult to model in terms of air quality impact, until a behavioural change is reflected in the reduction in journeys travelled by car, and hence in emissions from road traffic. Patronage figures for bus routes are routinely collated as part of the LTP monitoring strategy. It has been suggested that an increase of up to 21% in bus patronage could be achieved by 2011, if quality bus contracts and corridor improvements are introduced rapidly, additional park and ride is introduced and other service and ticketing improvements were made. If cleaner and greener buses were required within specifications for bus contracts or could be achieved via the Quality Bus Partnership then additional benefits for reduced emissions would be seen. In addition, benefits to air quality would be seen in reduced queuing and congestion on the network.

Schemes within the LTP include:

- Continued Provision of level access at bus stops
- Extend StarTrak/StarText real-time bus information across network
- Extend Quality bus corridor improvements

- Bus prioritisation schemes: Belgrave Corridor, London Road
- Passenger Transport Interchange

(c) Urban Traffic Management Control (UTMC)

Urban Traffic Management and Control (UTMC) is a way of monitoring, operating and controlling traffic lights via computer. The computer uses information gathered from sensors in the road to determine levels of congestion on a particular road. When the road becomes congested, the computer changes the timing of traffic lights to let traffic move more freely and reduce hold-ups. Measures to control the flow of traffic particularly at peak times will result in reduced vehicle emissions; less 'stop-start' traffic, shorter queue lengths and therefore less time spent with engines idling.

Examples measures that smooth traffic flows included within the LTP are as follows:

- Extension of SCOOT system which optimises traffic flows at signalised junctions.
- Parking Guidance system using Variable Message Signs to provide real-time parking information for city centre multi-storey car parks.
- Improved road signage.
- Traffic and Travel information.

(d) Cycling and Walking

Measures designed to promote alternatives to the car, and provide safe and accessible routes for cyclists and pedestrians. These measures include the promotion and awareness raising of such schemes, as well as the provision of safer routes. Schemes that have the potential to affect local air quality within the LTP in relation to cycling and walking include

- Safer Routes to Schools Programme
- Local Safety Schemes including pedestrian and cyclist improvements
- Traffic Calming Schemes

(e) Breathe Easy Project

This project is a collaboration between the Pollution Control and Traffic Impact teams of the Council, which received funding from the Neighbourhood Renewal Fund (NRF) up until 2004. The project is targeted at primary schools within the Belgrave and Latimer wards, which are encompassed within the AQMA. The objectives are to assist the schools in developing their own Travel Plans, by providing safer routes for walking and cycling to the schools, and to monitor the effectiveness of this by measuring the improvement in air quality, and the reduction in emissions associated with the school journeys. Each of the schools is undertaking their own air quality monitoring to monitor their progress, and officers have assisted the schools through helping to raise awareness and understanding of the issues.

This is a good example of an initiative that brings together traffic and air quality disciplines. The Breathe Easy model could be applied across the AQMA in conjunction with the Safer Routes to School programme within the LTP.

(f) Roadside Vehicle Emission Testing

In 2003, Leicester became the first local authority to use statutory powers to enforce vehicle emission standards within the AQMA, with other local authorities nationally later adopting the same powers. The powers were used to identify the most polluting vehicles within the AQMA, and fixed penalty notices were served where vehicles failed the test.

As part of the initiative, a number of free emission check days were organised, and these events were well attended by the public. An accompanying publicity campaign was very successful in raising public awareness of the links between local air quality and exhaust emissions.

The funding stream for this work ended in 2004, and if this work is to continue within the AQAP alternative funding sources will need to be identified.

Emission Testing is an important element in the package of measures contained in the AQAP. Studies have indicated that 10% of vehicles tested can emit up to 55% of the total emissions. Rectifying grossly polluting vehicles or taking them off the road is therefore an effective strategy in reducing emissions of nitrogen oxides. The campaign in Leicester has also proved effective at raising awareness of air quality, and reinforcing the link between health and vehicle emissions. Future work could build upon this.

(g) Provision of Information

A key aspect of policy is provision of information about air quality so that people can make informed choices about their life-style and travel behaviour. Specifically, people need to be informed about the impact of car use on local air quality and how this can be reduced.

Leicester has been involved in a number of European projects (HEAVEN, EMMA, EFFECT) which link real-time traffic information obtained via the SCOOT system, air monitoring data from the network and air quality modelling using the AIRVIRO system. A website has been set up (in the final stages of evaluation currently) that will provide forecast predictions for air quality across the city, and will inform key actors (including the public) on the state of air pollution and noise levels and their potential effects on health. This information will be accessible to the public via www.leicester.gov.uk.

2.3.4 The Next Local Transport Plan (2006 – 2011)

At the time of writing, the next Local Transport Plan (LTP) which will operate from 2006-2011 is under development. It will be submitted in July 2005 and funding allocation determined by December 2005. This LTP will include a Transport Strategy for the next 30 years as well as a list of traffic and transport schemes for inclusion over the 2006-2011 timeframe.

This presents some difficulty, in that the programme being developed and submitted to the Department for Transport for allocation of funding is not available for this version of the Air Quality Action Plan.

At the same time, the draft revised Guidance for Local Transport Plans makes it clear that air quality is one of four key priorities for the next round of transport planning. The shared priorities are accessibility, congestion, air quality and safety. Air quality action planning should be closely co-ordinated with, if not fully integrated into, the Local Transport Plan.

The statutory Air Quality Objective for Nitrogen dioxide (target date, 31st December 2005) will not be met within the lifetime of the current Local Transport Plan (2001 – 2006). With reference to working towards its attainment within the next round of Local Transport Planning (2006 – 2011) it should be noted that Local Transport Plans must now, *inter alia* -

- Build on local air quality Review and Assessment work and local air quality strategies;
- Quantify the source of contributions to the predicted air quality exceedances;
- Set out how measures contained within the LTP will enable air quality Objectives to be met and identify measures specifically targeted at this.
- Report on what options have been considered, including non-transport related options and justify the approach adopted in terms of value for money.
- Quantify the expected air quality impacts of measures that are to be implemented and, where possible, indicate whether they will be sufficient to meet the air quality Objectives.
- Set out, where possible, a 2004/5 baseline and a 2010/11 target for air quality and a trajectory between the two.
- Indicate how progress with air quality will be monitored and reported through Annual Progress Reports, and how the effectiveness of actions planned will be evaluated.

(Draft Statutory Guidance on Local Transport Planning, 2004)

With reference to setting a target for air quality in 2010/11, it is likely that the annual mean standard of 40 microgrammes per cubic metre of nitrogen dioxide will be adopted as the target for 2010 both in Leicester and in inner and outer Leicestershire.

However, it must be stated that the Air Quality Objective will not be met by the next LTP without the provision of radical measures, not now being actively planned.

Work will be undertaken, concurrently with this phase of transport planning work, to model the air quality impacts of schemes actually under development. The end product will be a fresh series of defined and costed transport schemes and programmes, together with robust estimates of their air quality impacts. This will be submitted in July 2005, however funding allocation will not be confirmed until December 2005.

2.3.5 Consequent Air Quality Actions in the Context of the Local Transport Plan 2006-2011

To state an explicit, time-based action within this edition of Leicester's Air Quality Action Plan, and produce a revised Action Plan in the first half of 2005 containing:

- Substantially updated information both on new schemes to be included within LTP-2, which will improve air quality, and on the specific air quality impact that they will have.
- Based on that, an explicit, time-based air quality target, together with an estimated trajectory to it.
- Review any changes necessary in early 2006 as a result of the LTP funding allocation received.

2.3.6 City Centre Access Strategy (CCAS)

Part of the ongoing work within LTP II is the CCAS, currently being developed to consider the integrated transport system and focussed on the city centre. This strategy is needed to address the existing congestion issues experienced by the city and emerging issues of increased demand for transport within the city centre: regeneration and development within the Leicester Regeneration Company Master Plan areas, and major developments such as The Shires Extension.

Under the CCAS there are various proposals, including:

- Reallocation of road space
- Enlarged pedestrian preference zones and improved cycle facilities
- A Low Emission Zone
- Intra-City Centre public transport interchanges
- Demand management measures

The CCAS integrates with the LTP II to deliver objectives in the congestion theme. Feasibility and scoping studies will be undertaken to identify schemes for inclusion within the LTP.

The outcomes of these proposals are complementary to achieving the air quality objective, and as a package of measures would provide attractive alternatives to car use within the city centre and a reduction in congestion. However, conflicts with air quality objectives may arise if certain options are implemented in isolation, and this will need to be kept under review.

With respect to the Master Plan, there is the potential to restrict car parking associated with new development within the city centre to encourage use of the improved public transport infrastructure within the city centre. Where commercial development is proposed, implementation of Green Travel Plans could be required as part of the planning process.

Delivery of a Low Emission Zone (LEZ) inside the inner ring road would be a key contributor to improving air quality and reducing the overall extent and size of the AQMA. Enforcement of emission standards for vehicles entering the zone would have a direct effect on emissions per vehicle kilometre travelled, and improvements would also be seen elsewhere on the network.

2.3.7 Summary

- **LTP and AQAP objectives are complementary and formulation of the second LTP is being co-ordinated with the AQAP process.**
- **Policy interventions need to be road network-based: focussed on reduction of emissions per journey and reduction in vehicle miles.**
- **Some options have been identified for inclusion within the AQAP such as LWTS, “Breathe Easy” and Vehicle Emission Testing.**
- **Additional measures need to be identified and included within the AQAP to meet the statutory air quality objective for NO₂**

2.4 Pollution from Static Sources

2.4.1 Regulatory powers

It has been demonstrated in *Air Quality Reviews and Assessments, 2003* that emission of Nitrogen dioxide from fixed installations comprises a relatively insignificant proportion of the emissions inventory and does not, of itself cause predicted failures to comply with the relevant air quality Objectives. The key issue in that respect is nitrogen dioxide from traffic, concentrating in close proximity to the point of emission or formation, i.e. the major road network.

There are no major sources of nitrogen dioxide within Leicester, to which regulatory emission limits are applied under the IPC or IPPC regimes. Combustion plant tends to be subject to regulatory activity when problems occur, e.g. a dark smoke or other emission giving rise to complaint. Activity relating to combustion emissions is more associated with energy efficiency. This is mainly aimed at emissions of carbon dioxide, although reductions in fuel consumption and improved plant efficiency will have a beneficial effect on the background nitrogen dioxide levels. This is examined in more detail in the following section.

2.4.2 Energy management

As mentioned previously, the main source of nitrogen oxides in Leicester is from vehicle traffic.

However, nitrogen dioxide resulting from stationary combustion sources is a significant component of the emissions inventory used for predictive dispersion modelling (see Part A). Therefore, whilst not significant in delivering substantial reductions in nitrogen oxides, a rigorous energy policy will lead to lower overall nitrogen oxide and resulting nitrogen dioxide concentrations locally.

(a) Energy Policy

The Energy Action Plan for the City of Leicester has a clear target of 50% energy reduction of the 1990 levels by 2025 and the 1994 Energy Strategy calls for 20% of our energy supply to come from renewable energy sources.

The Energy Action Plan thereby fits with the regional energy strategy of:

- Reducing Energy Use
- Promoting Energy Efficiency
- Using Renewable Energy
- Any further use of Fossil Fuels to use best technology (CHP)

(b) Opportunities in Energy Supply

Leicester is developing a City Wide approach to Energy Services through an Energy Service Company (ESCO) which has secured backing from the Government and the East Midlands Development Agency. By generating electricity within the City, the Council can utilise heat locally for homes and businesses as well as public buildings. For every kilowatt of energy generated locally, the Council saves a kilowatt nationally and avoids losses over the national grid. The utilisation of the heat makes the Council's Combined Heat & Power (CHP) stations 85% efficient compared to between 30-45% with national generation.

The ESCO in Leicester will utilise generating sets that can maximise the use of biomass fuel oil and natural gas, giving sustainable electricity at point of use. It will also through private wire (own its own electricity cable network) provide the City Council and University with security of supply.

Whilst generating electricity locally can increase pollution, this can be mitigated with clean-burn technologies and flue gas emission filters and controls to provide a low emission technology. However, this will not be achieved without designing in the solution during the specification of the plant and starting from the premise that the lower emissions are the key to the objectives of the Air Quality Action Plan.

The major benefit of the Leicester ESCO approach is that as each building connects to the district heating network (operating at 83% efficient), the Council reduces the overall pollution of the existing boiler plant in these buildings and remove these emissions from the local community as well. It is well known that most existing buildings in Leicester have low efficiency heating plant (about 63%) which create emissions of greenhouse gases and disperse these directly into the air. Monitoring and maintaining these heating plants in private sector buildings is impossible as there is no statutory requirement for boilers below 10 megawatts capacity. In public buildings, plant tends only to be replaced on a “needs must” reactive approach due to costs and in most cases the best and cleanest technology is not always adopted.

(c) Further Benefits of the ESCO approach to air quality in Leicester

The ESCO, whilst expanding the district heating network and connecting to homes and businesses will also be promoting better buildings standards. (The Leicester Better Building Standard – see section 2.1.5).

The object is to improve the energy efficiency of each building prior to it being connected to district heating. In this way buildings have to obtain the right to connect through certification and energy improvement. In so doing, we can make significant savings in all greenhouse gases by saving energy and then have the benefit of the building being connected to a sustainable heat network, operating at high efficiency.

As technology improves, the Council will upgrade the heat generation stations to the best available and most sustainable systems which will ensure low emissions and maximum energy efficiency at all times. All the buildings on the heat network would benefit from this process without any action having to be taken in the buildings but at the same time achieving lower emissions. In this way it is most important to provide a quality information system about the quality of the energy network heat and power to all customers, based on real-time data.

In summary, while local generation will produce nitrogen dioxide at relatively low levels and within the centre of population, compared with remote, traditional generating plant, this will be more than offset by the reduction of inefficient boiler plant and by the upgrading of the energy performance of connected buildings. Also, the performance of CHP engine plant can be specified to the highest standards and appropriate gas cleaning plant incorporated in the installation. Furthermore, once the distribution system is in place, the generating plant to which it is connected can be upgraded later, as and when technology advances.

(d) Intelligent Metering

Leicester is the only city in the UK to operate “Intelligent Metering”: This system collects data from the City Council buildings and for SMEs and provides a monitoring service. This ensures that buildings use only the correct amount of energy and water and that the buildings are continuously and automatically monitored. This data is used to enable buildings to make savings and maintain energy and water efficiencies at all times. It also provides an excellent monitoring process for emissions and will be one of the most significant ways to ensure air quality compliance and maintenance in future.

The intelligent metering system has been in operation in Leicester for the last three years and has proven the technology and the benefits to businesses and public sector buildings. The ESCO will benefit from this metering system and will offer all businesses in Leicester the opportunity to gain lower emissions from this monitoring system.

It is calculated that 28% of the emissions in Leicester come from the business sector and it has been proven that on average 8% of energy and water use can be saved through this intelligent metering monitoring process. Indeed, 50% savings have been achieved in energy just through the metering monitoring being installed in one Leicester SME.

This low cost approach should form part of a city-wide Air Quality strategy for all businesses. The benefits in lower emissions will be obvious but the benefit to the business will be profit and viability as well as environment best practice.

(e) Regional and Government Help

The CHP generation stations would benefit from help and guidance in emitting lower emissions particularly when operating on biomass oil fuels. Identification of the most viable energy source crops to be grown within the region and government guidance and assistance would help stimulate the local farming community and provide reassurance. Issues that need to be addressed would be:

- Crop options providing lowest emissions when combusted.
- Grants and encouragement to grow energy crops.
- Carbon take-up of crops.
- Regional wood processes facility to maximise energy crops.
- Long-term research for future options linked to energy production.
- Support for the Intelligent Metering solution on a regional basis.
- Development of a Regional Air Quality Action Plan – help to resource this.
- Specific help with obtaining low emission generation CHP plant and the technology to reduce the emission beyond the normal manufactures process.
- Carbon Trading certificates to allow Leicester to recover the investment in carbon mitigation.
- Support for initiatives at the local level with necessary resources.

2.5 Land-Use Planning and Regeneration

Land-use planning frameworks extend over a much longer time-scale than that laid down in the current air quality objective for nitrogen dioxide. The built environment turns over by approximately one percent each year. Although this may sound insignificant, planning is responsible for gradually re-shaping the City of Leicester, so can have profound implications for managing local air quality in the longer-term.

The local planning process is a local decision-making process requiring the consideration of often mutually incompatible environmental and socio-economic factors, taking into account the overall vision of what Leicester is going to be in years to come. In this sense, the interface between Planning and Local Air Quality Management (LAQM) needs to be positively managed at the corporate level.

2.5.1 Land-use Planning Framework

As with any unitary authority, land-use planning in Leicester operates at a number of different levels, as outlined below. All have the potential to impact upon local air quality over various temporal scales.

(a) Development Plans

The Development Plans Group has just completed the procedures leading to the *Replacement City of Leicester Local Plan (RCLLP)*. This document sets out the broad, strategic planning policies of Leicester City Council.

Following the publication of the Stage 3 Air Quality Review and Assessment Report in December 2000, there has been close co-ordination of the production of the RCLLP with the requirements of Local Air Quality Management.

The manner in which air quality considerations have been integrated into policies contained in the RCLLP can be summarised as follows:

RCLLP Reference	Policy Provision
ST06. PROTECTION FROM POLLUTION	<p><i>Proposals which have the potential to pollute air, ground or water by reason of noise, dust, vibration, smell, light, heat, radiation or toxic discharge will not be permitted unless the health and amenity of users, neighbours and the wider environment can be assured.</i></p> <p><i>Proposals that occur within, or which would significantly affect, Air Quality Management Areas (see map) will be scrutinised closely. In such areas, the aims and requirements of any Air Quality Action Plans will be taken into consideration and proposals only allowed where they do not affect the fulfilment of the plan.</i></p> <p><i>Proposals that are sensitive to pollution will not be permitted close to existing polluting uses, unless by doing so developers can demonstrate that adequate measures have been taken to prevent or minimise the effect of pollution.</i></p> <p><i>Proposals associated with alternative fuels and technology (such as refuelling and recharging infrastructure) will be supported.</i></p>
ST11. TRANSPORT STRATEGY	<p><i>To develop an efficient relationship between different land uses and to foster the most sustainable form of transport linkages:</i></p> <ul style="list-style-type: none"> <i>a) Facilities of City wide and greater importance should be concentrated within the City Centre;</i> <i>b) Other travel intensive developments should be located where accessibility by walking, cycling and public transport is, or can be, maximised;</i> <i>c) Improvements to walking, cycling and public transport networks should be made;</i> <i>d) Preference should be given to non-motorised transport over the private car;</i> <i>e) Diversity and animation should be promoted as features of mixed use developments;</i> <i>f) Some residential accommodation will be required in the regeneration of appropriate PDA's</i> <i>g) Development should achieve maximum appropriate density standards.</i>
AM01	Incorporating the needs of pedestrians and of people with limited mobility.
AM02	Meeting the needs of cyclists.
AM03	Citywide pedestrian and cycling networks
AM04	Safeguarding of specified bus priority measures, contained in the Local Transport Plan.
AM05	Bus facilities for large scale developments
AM06	Safeguarding land for strategic park and ride schemes.
AM07	Provision of hackney carriage ranks.
AM08	Safeguarding rail services and infrastructure.
AM09	Promoting and safeguarding Mass Rapid Transit schemes.
AM10	Measures to reduce the need to travel. Transport Assessments of large developments to be required.
AM11	Road safety and vehicle speed restraints.
AM12 – AM18	Proposals controlling the provision of parking.
SPA09	Improved public transport interchange in the City centre
SPA10	Further pedestrianisation around the Clock Tower
SPA11	Management of traffic access and flow across the Central Ring Road.

Clearly, the application of some of these policies will affect nitrogen dioxide concentrations although they will tend to operate over an extended time frame and their effects will be difficult to quantify. The key issue is how these general policies are applied in practice and whether they are rationally balanced against other, potentially conflicting Planning Policies, discussed below.

(b) Urban Design (Supplementary Planning Guidance)

This Group within the Planning function is tasked with producing Special Planning Guidance for different areas of the City over time. This guidance sets out in more detail how the development of these areas is envisaged. Since this guidance influences development on a “street-by-street” or “block-by-block” basis, it is important that air quality considerations, which can vary over a few tens of metres, are taken into account as the guidance is developed.

(c) Development Control

This sub-function regulates individual development through the Planning Permission process. Essentially, it applies the policies formulated at the higher two levels to individual planning applications. The Development Control Sub-Committee is the final decision-making body. The key issue is how policies relating to air quality considerations are applied in reaching a balanced judgement on each planning application.

Leicester City Council has procedures in place to ensure that the Environmental Health function is consulted on planning applications having perceived significant air quality implications.

2.5.2 Leicester Regeneration Company Master Plan

The Replacement City of Leicester Local Plan also details the planning policy links with the Master Plan of the Leicester Regeneration Company. This sets out a Strategic Framework for regeneration, comprising five key projects aimed at creating:

- A Central Office Core around the railway station
- A science and technology based business near the National Space Centre
- A strengthened retail circuit within the Central Shopping Core
- A major residential and employment community in St. Georges North
- A (river-) waterfront development.

Additional schemes now approved include:

- An extension of the Shires shopping centre
- A Master Plan for de Montfort University.

Implications of these proposals include the provision of large car parks and the realignment and capacity reduction of the Inner Ring Road.

2.5.3 Noise in Air Quality Management Areas

There will be many situations in which air quality considerations will parallel those relating to noise.

Proposals for residential development in close proximity to major roads need to be assessed in terms of the noise exposure categories laid down in Planning Policy Guidance PPG 24, *Planning and Noise*. In an analogous way, noise considerations may reinforce air quality indications for:

- Refusal
- Redesign/rearrangement, or
- Introduction of engineering protection measures.

The proposed EC Directive, “...*Relating to the Assessment and Management of Environmental Noise*” [COM (2000) 468] is likely to be introduced into UK legislation with the requirement for urban agglomerations with more than 250,000 inhabitants to carry out noise mapping by 2005.

The noise maps will be published and, in a parallel with Air Quality Management Areas, will form the basis for local, remedial action plans. Again, it is likely that this process will be complementary to Local Air Quality Management, inasmuch as similar kinds of developments will be affected in many cases, especially close to major roads. Also, similar protective measures may apply.

2.5.4 Implications for Local Air Quality Management

A number of potential conflicts between land-use planning and LAQM can be identified. Some examples are outlined below.

- The ongoing regeneration of the City centre has led to a burgeoning of new-build and converted residential accommodation. This is taking place in one of the areas encompassed within the Air Quality Management Area (AQMA) and so has the potential to expose residents to nitrogen dioxide exceedences. Care will therefore need to be taken with some proposals in terms of the positioning and arrangement of buildings and their internal design.

While the short-term effect is to increase exposure, in the longer term benefits may be derived from reduced need to travel into the City centre.

- Proposals for City centre development, for example the extension of the Shires shopping centre and the Leicester Regeneration Company's (LRC) Office Core Redevelopment include extensive car parking facilities. In other policy areas, the strategic aim is to reduce (rather than increase) the number of car journeys made into Leicester, with the aim of, *inter alia*, reducing levels of pollution.
- Proposals are under development in connection with the LRC Master Plan, under the heading of the City Centre Access Strategy (LCCAS), (see 2.3.6). This strategy is intended to consider the impacts of regeneration and to identify the necessary transport measures to support the Master Plan regeneration and other strategic aims such as the AQAP. The focus of the LCCAS will be tackling congestion, and the air quality impact of proposed measures will need careful consideration.

As the city evolves over time, there will inevitably be conflicts and trade-offs between different requirements and priorities. The environment must be safeguarded and enhanced but not at the expense of economic or social vitality, an issue of particular significance in the City centre.

The key point is that these conflicts are addressed openly. The inclusion of, perhaps temporary, trade-offs against air quality in the Air Quality Action Plan is acceptable, provided these are first considered in a coherent way and at an appropriate level. In this way, they become an integral part of the AQAP, provided that they are identified, addressed and justified.

Possible, hierarchical decision processes in relation to proposed development which might adversely affect, and which might be adversely affected by, poor air quality are as follows:-

Factors Relevant to Developments likely to have an Adverse Effect on Air Quality:

- ❖ The strategic, economic and social benefits of the proposal.
- ❖ The location of the proposal in relation to housing and other sensitive development.
- ❖ The potential of the proposal to generate emissions from fixed plant.
- ❖ The potential of the proposal to generate or redistribute traffic within the Air Quality Management Area or elsewhere.
- ❖ The traffic, pollution or other environmental information which it is appropriate to request from the developer.
- ❖ The possibilities of linking the development to transport modal shift or improvements in public transport.
- ❖ The possibility of securing relevant improvements through the negotiation of Section 106 agreements, and their future equivalents.

Factors Relevant to Developments likely to be Adversely Affected by Air Quality:

In recommending approval or refusal:-

- ❖ The economic and social benefits of the development in relation to the City Council's strategic planning objectives.
- ❖ The availability of alternative locations for the proposal and/or the existence of preferred uses for the site of interest.
- ❖ The extent to which the operation of the Air Quality Action Plan will effect a significant improvement in air quality within the area of interest and over what timescale.
- ❖ The existence of other contraindications to the development, such as an adverse noise exposure category under PPG 24.



Within this framework, if development is not excluded, careful attention should be paid to design. The following matters should be considered in descending order of preference/scale. These matters are relevant both in giving advance guidance to prospective developers and in seeking the modification of unacceptable applications.

- ❖ On a large scale, guidance on, for example, PDA's should be framed so that sensitive uses are positioned in the most non-polluted zones of the area.
- ↓
- ❖ Consideration might be given to the co-ordination of a large scheme with measures designed to achieve local improvement in air quality, e.g. traffic re-routing, traffic calming, pedestrianisation, Low Emission Zones.
- ↓
- ❖ On the scale of individual mixed developments, the arrangement of buildings/uses within the site should similarly be considered.
- ↓
- ❖ The establishment of a buffer zone should be considered, to separate areas of relevant exposure from the highway. This might only need to be a few metres wide and could be used to enhance amenity through the use of landscaping, or simply through more open layout. In very polluted areas, consideration may need to be given to treating even retail, leisure, industrial or office facilities in this way.
- ↓
- ❖ Consideration should be given to the orientation and internal layout of buildings: Habitable rooms might be placed away from the elevation fronting onto a major road. Similarly placement of such accommodation on the ground floor might be avoided, in favour of, e.g., retailing or residents' garaging.
- ↓
- ❖ Engineering solutions such as double-glazed, non-opening windows and mechanical ventilation may be feasible: However, these should only be considered as a last resort, where the scheme is desirable in the overall policy context but other measures are impracticable, and the only other option would be...

...refusal.



3. Further, specific measures for delivering air quality improvements in Leicester

3.1 Methodology

It has been shown in Section 1 that the policies and programmes now in place (detailed in Section 2) will not attain an improvement in nitrogen dioxide levels sufficient to meet the limit values for the relevant air quality Objective. Therefore, further possible options are considered in this Section of the Action Plan for Leicester.

This part was developed, largely using the principles put forward in the guidance published by the National Society for Clean Air and Environmental Protection¹. Specifically, the following steps were taken:

- 1. Identification of suitable options** – this was undertaken through a workshop with key officers of Leicester City Council and Leicestershire County Council on 23 June 2004.
- 2. A public consultation exercise** -- via questionnaire and leaflet to all residents in Leicester based upon the findings of the Review and Assessment of air quality and carried out under Section 84 of the Environment Act 1995, in 2003.
- 3. Evaluation of the options** – with regard to air quality impact, cost, feasibility and timescales. This was undertaken by the project team (Leicester City Council in partnership with the AQMRC, University of the West of England, Bristol) in consultation with transport and land-use planners within Leicester City Council.
- 4. Prioritisation of the options** – this was undertaken by the same project team as above. The vast majority of the options put forward at the workshop were considered feasible, therefore the prioritisation was based on a series of three packages, explained in section 3.3.

The Action Plan, in line with current legislation and guidance, will be subject to extensive consultation, which will be outlined in chapter 4.

Once the plan is implemented, a monitoring strategy will also be implemented which will run in parallel to the monitoring of the LTP. This will be outlined in Chapter 5.

¹ Guidance on Air Quality Action Plans can be found at:
http://www.nasca.org.uk/pages/topics_and_issues/local_air_quality_management.cfm

3.1.1 Identification of options

A number of participants from different sections of the Council (a full list of participants is included in Appendix 1) attended a full day's workshop on 23rd June. The attendees were split into five groups covering options on:

- Emissions management
- Information and education
- Land-use planning
- Managing the road network
- Promotion and provision of alternatives

The initial exercise of the day was for groups to come up with as many actions as possible under their own groups heading. They were, as a starting point, given some actions put forward in the document 'Transport in Central Leicestershire' written as part of the DfT's *Engaging with Local Authorities* project. Following work on their own group's options, each group was given the opportunity to add to each of the other 4 groups work.

A rationalised list of the options was then progressed to the next stage of the assessment.

3.1.2 Evaluation of options

The identified options were considered qualitatively against four specific criteria. The criteria are as follows:

- air quality impact as a result of the option being implemented (i.e. air quality improvement afforded);
- cost of measure;
- feasibility or practicability of option (including the wider non-air quality impacts);
- time scale of specific option

(a) Air Quality Impact

With respect to local air quality impacts, an evaluation is made as to whether the impact is low, medium or high. The following definitions have been used as far as possible when evaluating the air quality impact of options. However, in the time available for this draft of the Action Plan, dispersion modelling was not possible. Therefore the evaluation has been based on the opinion of the authors of the report inevitably, and on those consulted. It should be noted that the packages of measures put forward in this report, will, where possible, be modelled for any air quality improvements to be more accurately estimated.

Low: *imperceptible* (a step in the right direction). Improvements cannot be detected within the uncertainties of monitoring and modelling.

Medium: *perceptible* (a demonstrable improvement in air quality). An improvement of up to $2\mu\text{g}/\text{m}^3$ could be shown by a modelling scenario. Improvement is not likely to be shown by monitoring due to confounding factors of the weather.

High: *significant*. Improvement of more than 2 ug/m³ .can be clearly demonstrated by modelling or monitoring (A significant improvement is likely to be delivered by a package of options rather than by a single intervention).

(b) Cost

In line with current government guidance, with respect to the cost of implementing an option, an evaluation of the cost and benefit will not be undertaken, and instead a judgement will be made as to whether options present low, medium or high cost options. Low cost is taken to be <£500K, medium cost is £500K - £3 million and high cost is over £3 million. This integrates with the document 'Transport in Central Leicestershire' written as part of the DfT's *Engaging with Local Authorities* project.

(c) Feasibility

Feasibility is difficult to quantify, the factors which have been considered as part of this evaluation are:

- Alignment / synergies with other Leicester City Council strategic initiatives.
- Wider non-air quality impacts (social, environmental or economic).
- Stakeholder acceptance / "political" feasibility.
- Availability of enabling legislation.
- Source of funding available or possible.

Some elements of feasibility such as complimentary to existing LCC policies, whether legal powers are available etc. have been included in the descriptions of the options. Wider (non-air quality) impacts include an option's ability to affect other environmental criteria (noise, visual amenity and climate change gas emissions) and non-environmental parameters (social and economic issues). Qualitative, rather than quantitative descriptors have been provided, following an evaluation of each option in relation to the said non-air quality impacts.

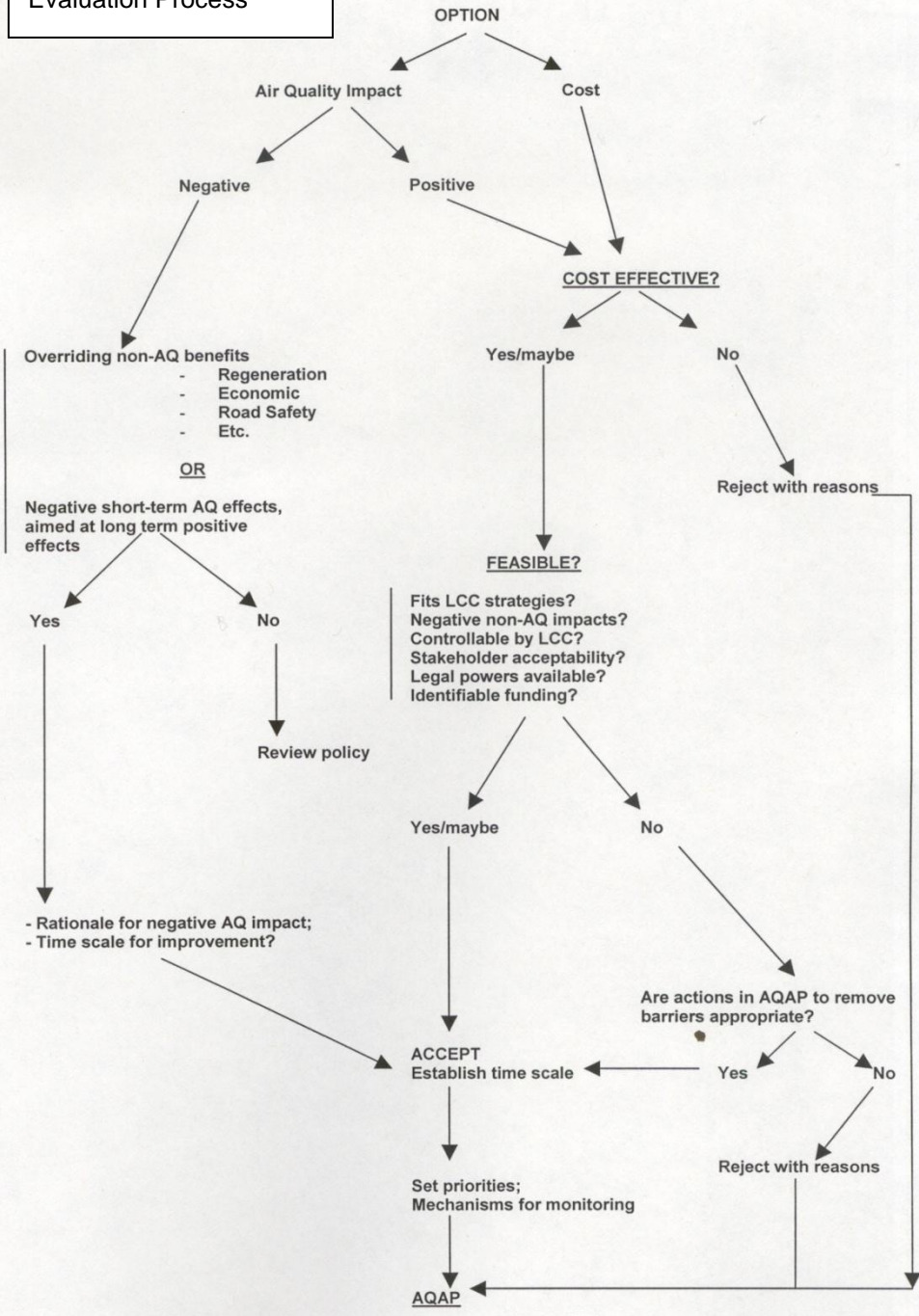
The feasibility section of the evaluation will also consider whether other options need to be considered along with the option in question (or conversely some options may not require implementation). The outcomes of the workshop, which included a brief evaluation of the options, also informed the process of identifying evaluation.

(d) Timescale

Finally, consideration will be given to the longevity of options. An evaluation as to whether an option can feasibly be started, and therefore begin to deliver air quality improvements in the short, medium or long-term will be made. This has implication for an individual option's ability to assist with the delivery of the national air quality objectives.

In terms of timescales, short-term relates to those measures that can be implemented within 1-2 years. Medium-term relates to those implemented within a 3-5 years (i.e within the lifetime of the second LTP 2006-11). Long-term options are those which are 6+ years (i.e. those which may following feasibility studies etc drive the formulation of LTP-3).

Schematic of Evaluation Process



3.2 Options

The following section briefly outlines a number of options put forward during the workshop and describes their feasibility. Following which a summary table is included. This table is then used to identify the packages of measures included in section 3.3.

3.2.1 Emissions management

(a) Regulation

(i) Roadside Emissions Testing

Poor vehicle maintenance can increase levels of emissions by ten times or more. It is estimated that 75% of pollution on the roads is caused by 25% of the vehicles, and the vast majority could be re-tuned within 15 minutes. Around 5% of vehicles have catalysts that are not working properly. The importance of regular vehicle maintenance could be promoted as part of the Information and Education options, however a roadside emission scheme would further enhance public awareness of the issues and potentially decrease the numbers of excessively polluting vehicles on Leicester's road network.

Powers have now been granted to all local authorities with declared AQMAs to undertake roadside emissions tests. In the past, funding was available for a limited period through DfT however this funding stream has now ceased. The costs of the scheme are largely revenue relating to hiring the police to stop vehicles and staff time for testing. The costs of the police can be overcome by undertaking free voluntary testing at locations such as supermarket car parks, environment fairs etc.

The experience in Leicester mirrors that in other local authorities; the scheme is not self-financing and the benefits incurred have been largely related to increased publicity and awareness rather than reducing significantly emissions. The scheme however is still considered to have a key role as part of a wider emissions management and education/awareness strategy.

(ii) Campaigns to eliminate old and poorly maintained vehicles

For the reasons outlined above, old and poorly maintained cars produce disproportionate amounts of pollution. Car scrappage schemes have operated in other countries with varying success. Work by the Transport Research Laboratory has indicated that by taking 50% of older cars without catalytic converters (pre-1993) off the road, a reduction of approximately 5% in average urban concentrations of NO₂ and PM₁₀ could be achieved. Local scrappage schemes could offer public transport tickets in return for scrapping an old vehicle. It is unlikely that cash incentives could be provided other than at a national scale. A national evaluation of the action planning process recommended that Defra consider a national scrappage or 'retrofit' scheme in order to clean up the vehicle fleet. It was thought that national action to deal with older and more polluting vehicles is likely to be more cost-effective than numerous local initiatives. Defra are currently considering this with DfT, HMT and other government departments.

(iii) Campaigns to influence driving styles and short journeys

Short car journeys cause up to 60% more pollution per mile than longer journeys because an engine does not run efficiently and the catalytic converter does not work properly until the engine is hot. In Leicester, 41% of journeys made by car are less than 2 miles, and 77% are less than 5 miles². Campaigns to encourage a modal shift for these journeys (in theory at least walking, cycling or public transport should be a viable alternative for some of these trips) could disproportionately improve air quality if successful. Likewise, promoting more economical driving styles and other simple pollution saving tips could, if widely taken up, have a relatively large impact on air quality as well as saving the motorist money. A national evaluation of the action planning process recommended that Defra consider a national advertising campaign on vehicle maintenance and driving styles as a more cost-effective way forward than numerous local campaigns. Defra are currently considering this with DfT and other government departments.

(iv) Low Emission Zone

Low Emission Zones (LEZs) are defined areas that can only be entered by vehicles meeting certain emissions criteria or standards. The objective of LEZs is to accelerate the introduction of cleaner vehicles into the fleet and reduce the number of polluting vehicles in order to improve local air quality. Such zones have been successfully operated in other European Countries such as Sweden for many years. LEZs are currently being considered for London and some other UK cities. In the UK, feasibility studies are furthest advanced in London. There are a large number of different options for implementing an LEZ and the cost and potential timescale for implementation will be largely dependent on which option is decided upon. If an LEZ is implemented in London it is likely that at the outset it will only target lorries, buses and coaches, expanding to later include vans and taxis. The feasibility study for the London LEZ does not recommend that cars are included in the scheme. A policy to not include private motor vehicles avoids issues of equity (i.e. members of the population less able to buy newer vehicles being excluded from the city centre). An LEZ is one of the options under consideration within the LTP

(v) Managing vehicle size in the City Centre (such as through a freight hub or node)

Large vehicles such as lorries and buses are responsible for a larger proportion of emissions than others. It is estimated that 58% of NO_x emissions on the whole network in Leicester and 60% of emissions on the inner ring road are attributable to HGVs and buses. Buses are dealt with separately in this document. Distribution depots outside the city where large lorries (HGVs) transfer loads to smaller, cleaner vehicles for distribution within the city could reduce congestion and emissions in central Leicester. Some large stores within the city such as Marks & Spencer, BHS already operate a policy of consolidating loads to reduce delivery journeys. A freight hub could be considered for small-medium sized businesses which do not currently consolidate.

(vi) Encouraging through traffic and heavy traffic to avoid the inner ring road

A further way of managing vehicle size in the city centre is to encourage through-traffic and in particular heavy goods vehicles to use the most suitable routes for travel around the city. This can be done through effective signing of appropriate routes: a Freight Quality Partnership exists across Leicestershire and they have developed a strategy for providing user friendly and logical signing, for example provision of a user friendly map to all companies in Leicester and to provide to their suppliers. This work will continue, with targets for effective signing being set for LTP II.

(b) Fleet Management

(i) Minimum emissions standards for buses

European emissions standards mean that new buses are increasingly emitting fewer emissions. There are still large numbers of old buses on the road network that emit high levels of pollution. There are grants available for retrofitting buses (such as the Government's *Powershift* Programme). This can be encouraged through voluntary schemes, or implemented through Bus Quality Partnerships for the commercial bus services. On some 'quality' routes, restrictions on age, size and requirements for level access have been applied to ensure newer, more attractive vehicles operate, with resulting benefits in reduced emissions also. One way of encouraging operators to retrofit old buses is to include minimum emissions standards into Council contracts for supported bus services, for example those funded via Education for the school bus services. To date, no age or emission restrictions have been applied to contracts on school services. As a result it is the older vehicles with higher emissions that are used on these routes: the majority are pre-EURO to EURO I standard, and it is unlikely that fleet operators would consider it economically viable to retrofit technology to these vehicles.

The estimated additional costs for applying emission standards to the contract specification for supported bus services would be £0.5 million.

(ii) Fleet Purchase for Leicester City Council favouring low emissions vehicles

As an organisation with a large vehicle fleet and even greater numbers of vehicles operated via contract, Leicester City Council will lead by example by favouring low emissions vehicles when purchasing vehicles for its own fleet. A key policy within the EMAS statement is that Leicester City Council will aim to purchase lowest polluting vehicles that will meet emission targets and service requirements.

The fleet size is approximately 800 vehicles, 157 of which are HGV and specialist vehicles. The fleet also contains 27 LPG vehicles, and 2 electric pool vehicles. There is an ongoing replacement programme with a turnover for each vehicle of 7-8yrs. As new vehicles are purchased they meet current emission standards, ie EURO III. However, for the City Council to set an example of good practice to other fleet operators locally, and to meet its pledges under EMAS, more progress must be made to specify lower emission vehicles.

One option being considered is to retrofit the existing fleet with emissions reducing technology. An evaluation of options available has already been undertaken, and Selective Catalytic Reduction (SCR) is recommended. SCR can be fitted to light and heavy goods vehicles, and can achieve 30-70% reduction in NOx emissions, depending on the age of the vehicle. The approximate cost of fitting SCR to light vehicles is £2 000, and to heavy goods vehicles £ 5 -10 000. At this stage, an implementation plan has yet to be prepared, and funding options are being investigated via the *Powershift* Programme which could offer up to 75% grant.

(iii) Partnerships and advice for other fleet operators

Leicester City Council is in a position to facilitate and provide advice and support for other local fleet operators through printed material and seminars to encourage 'greener' fleets to operate in the city. Existing partnerships such as Leicester Environment Partnership will be used and new links developed where necessary,

with large fleet operators to promote reduced emissions. Small to medium sized businesses will also be targeted.

(iv) Promotion of alternative fuels

Petrol and diesel make up about 99% of the road fuels market. Although alternative fuels are technically feasible, they struggle to improve their market share, despite their impact on local air pollutant emissions, CO₂ emissions and the reliance on oil producers.

Gas fuels, for example, have the advantage that the smaller molecules burn more completely – but carrying a useful amount of gas under pressure means having a special strong (and heavy) container in the car. Liquid Petroleum Gas can be bought at about 1,300 outlets in the UK. Conversions are available for a range of popular petrol engines as well as original equipment offerings from some manufacturers. LPG is relatively cheap thanks to fuel duty concessions, and toxic emissions are lower than current (pre-Euro IV) engines.

Compressed Natural Gas (methane) offers reduced toxic and CO₂ emissions but there are only about a dozen outlets in the UK, and very few vehicles are sold with CNG engines. It is more suited to commercial vehicles working from a depot.

Fuels from biological sources have the potential to cut effective emissions of CO₂ as the CO₂ is taken up during the crop growth phase. Biodiesel can be made from oil seed rape, and blended with fossil diesel – up to 5% can be used without necessitating any engine modifications. The City Council has already made the switch to this biodiesel blend.

Many types of battery electric car have been made for trials and a few are now available on the UK market. The main problems are the weight, cost and limited range of the batteries. The effective emissions of carbon dioxide are not much reduced, as in the UK the electricity generation accounts for a significant amount. They are clean at the point of use.

The fuel-cell is a device that produces electricity from combining hydrogen and oxygen and can be used to power an electric car, with high efficiency and low emissions. The overall 'carbon efficiency' of course depends on how the hydrogen is generated – if grid electricity is used for this, there will be consequent CO₂ emissions. At present, fuel-cell cars are under trial and development, but are extremely expensive. The technology is very promising for the long-term, but a great deal of progress has to be made before they are going to be a practical alternative.

Hybrids combine a small petrol or diesel engine with smaller capacity batteries than seen on a pure electric vehicle. Depending on speed and load, drive may be electric only or a combination of electric and internal combustion. Batteries are recharged under braking or via a generator driven by the engine. Emissions and CO₂ are greatly reduced but cost and complexity increase significantly. A few commercial examples are available.

It is unlikely that Leicester City Council, could on their own impact on a new fuel type. They could however, through example, encourage others to try alternative fueled vehicles, and also lobby central Government to introduce policies encouraging the use of alternative fuels.

Theme 1: EMISSIONS MANAGEMENT												
Option	Effects					Cost		Practica- a- -bility	Feasibility			Time scale
	Vehicle flow	Impact on Exposur e	Vehicle- miles within AQMA	Emissio ns per vehicle mile	AQ impact	Cost to Council	Cost to others		Wider impacts			
									Social	Environ- mental	Economic	
A. Regulation												
Roadside emissions testing				+	L	L	L	H	(-)	+		L
Campaigns to eliminate old / poorly maintained / illegal vehicles				+	M	L / H	L	H	(-)	+		L
Campaigns to influence driving style/ short journeys				+	L	L	L	H		+	+	L
Low Emission Zone	+		+	+	M	H	L	H	-	+	- / +	M - H
Managing vehicle size in City centre / Freight hub/node	+		+	+	M	H	H	M	+	+	+	H
Making through / heavy traffic avoid Inner Ring Road	+	+	+		H	M	L	H		+	+ / -	M
B. Fleet Management												
Minimum emission standards for buses (Bus Quality Partnership)				+	H	M	M	M		+	-	M
Fleet Purchase favouring low emissions vehicles for City Council Fleet				+	H	M	M	M		+	-	M
Partnerships with (and advice for) other fleet operators				+	L	L / M	L	H		+		M
Promotion of alternative fuels				+	L	L	L	L		+	-	L

3.2.2 Information and Education

The success of many of the Air Quality Action Plan measures, in particular the provision of alternatives to private vehicles, will depend on the involvement and support of the public and stakeholder groups. The Action Plan is likely to be far more effective if people are well informed about the air pollution problems and solutions. Some information and education initiatives are already underway. For example, the 'Breathe Easy Campaign' which is described in Chapter 2. If successful, information and education measures are generally a cost-effective way of encouraging a modal shift. Specific campaigns to educate the wider public on the need to improve air quality through various methods can be undertaken in conjunction with other educational campaigns relating the Local Transport Plan, community planning and energy efficiency, for example. Utilising different, though related, education, promotional or awareness raising campaigns provides a cost-effective mechanism for raising the profile of air quality locally, and may convey the information necessary in a more comprehensible and understandable way.

(a) General Public

(i) Real time air quality information (including Variable Message Signs, or VMS)

There are a number of examples of how VMS can be used to convey real time air quality information. It may be used purely for air quality information dissemination, to attempt to change driver behaviour, however this may prove less effective as it is often too late since the air pollution episode will already have occurred. VMS can also be used as part of an 'Intelligent Transport System' whereby roadside VMS are used to show incidents on the highway network and alternative routes, the location and number of available car parking spaces, current journey times by car and public transport and public transport information.

Swansea City Council is implementing a traffic management programme to improve air quality and traffic congestion in the lower Swansea Valley. Available car parking space both in the inner city parking places as well as the authority's Park and Ride sites will also be broadcast to VMS strategically sited along the road network. This will allow drivers to make informed decisions on alternative routes and/or encourage commuters to use the authority's Park and Ride services. Eventually the system will predict air pollution concentrations in real time and convey this information through VMS in order that car drivers are encouraged to either use a different route or use Park and Ride.

In Leicester an intelligent transport system is linked to SCOOT controlling and smoothing traffic at major junctions. Car parking information is provided via VMS, StarTrak/StarText public transport information. VMS is currently used in conjunction with the existing Meynells Gorse Park and Ride site to alert drivers to air quality conditions and attempt to influence their decision to use the site. If Leicester West scheme goes ahead, it is anticipated that VMS would be automatically linked with similar information.

(ii) Improved information about links between poor air quality and health

The potential health impacts from traffic emissions are well documented. However, facts concerning relevant exposure are not always made clear, for example many people are not made aware that motorists in congested traffic are exposed to much higher levels of pollution than pedestrians and cyclists. Publicising this type of health

information could help to provide a better understanding of the issues and risks involved. Also, by encouraging alternative modes of transport, such as walking and cycling, exercise could be encouraged thereby addressing other major health issues as well as a reduction in air pollution.

(iii) Using the website as a medium for information dissemination

The web is a useful medium for up-to-date air quality and transport information dissemination. However, the internet is not accessible to all and so other information sources and media must be considered and also made available. Websites need to be clear and simple to navigate around for maximum usage.

A website is under development that will aim to deliver near real-time air quality monitoring information from the monitoring network, together with access to an archive of monitored data that will be available to the general public, as well as interest groups such as academics, industry, health professionals.

(iv) Targeting house buyers

People moving into a new area may have specific requirements or needs. If information about alternative modes of transport such as pedestrian routes and cycle paths in the area is made available to them, it increases the likelihood of them being taken up. In order to make this option more easily implemented estate agents and house builders could be targeted in order to include information about public transport, walking and cycling into existing local information packages.

(v) Promoting and rewarding car free days

Car Free Day has been running throughout Europe since 1995. Car Free Day aims to show people how much cleaner and more pleasant their streets could be when they are free from cars - even if it is just on this one day. Just as importantly it can encourage people to think about their overall car use and look at selecting the right mode of transport for a particular journey. Companies and employers can help to encourage car free days by offering incentives. This can work well for employers as a way of raising their profile and people are generally more willing to try something new if they know they will be rewarded for their effort. For instance, during car free days people could be offered free breakfasts at or near their work place if they cycle to work.

(vi) Mobility Management Strategy

Mobility Management or travel planning is primarily an information and co-ordination based approach, which can be implemented in the short-term at relatively low cost. Mobility Management refers to passenger transport and aims to reduce the number, length and need for private vehicle trips. It supports trip planning and seeks to influence modal-split towards sustainable modes such as public transport, cycling and walking.

(vii) Targeting short journeys

Short car journeys cause up to 60% more pollution per mile than longer journeys. If these journeys are targeted it could reduce congestion and pollution considerably. Again, awareness of the impact of short journeys needs to be raised through information events, posters, flyers, websites etc.

Practical improvements to encourage a modal shift for short journeys include reallocation of space to cyclists and pedestrians and provision of safe road crossings,

together with enforcement of speed restrictions and illegal parking. These measures will also have benefits in reducing accidents. Improving the street environment and making it more attractive with good art, design, planting and maintenance may encourage more pedestrians.

(b) Schools

(i) School curriculum (young people)

Environmental education is already covered in the school curriculum, and by addressing local issues and problems, the subject becomes more relevant for children. Young people are also open to change and can be enthusiastic advocates for alternative life patterns, which in turn can affect their parents and guardians. They are also the adults of the future and need to be informed and made aware of issues concerning their health and environment. In many cases schools themselves suffer from congestion during specific times of the day. Information as part of the school curriculum can therefore be made relevant to the location of the school.

(c) Corporate

Elected Members are required to endorse the Council's Air Quality Action Plan, and as such require an up to date knowledge of the Action Plans requirements. Officers throughout the Council, in particular those working in transport planning, land-use planning and economic development will require further knowledge about how air quality impacts upon their decision-making processes and conversely how their decision-making process impact upon air quality. This awareness raising can be undertaken in a number of ways from articles in internal publications and email bulletins to lunchtime seminars.

Theme 2: Information and Education												
Options	Effects					Cost		Practi- cability	Feasibility			Time scale
	Vehicle flow	Impact on Exposur e	Vehicle- miles within AQMA	Emissio ns per vehicle mile	AQ impact	Cost to Council	Cost to others		Social	Environ- mental	Economic	
A. General Public												
Real time AQ information	+		+	+	L	L	L	H	+	+	(+)	L
Improved links between air quality and health issues	+		+	+	L	L	L	H	+	+	(+)	L
Website as a medium	+		+	+	L	L	L	H	(-)	+	(+)	L
Target house movers/buyers	+		+		L	L	L	H	+	+	(+)	L
Promote and reward car free days	+		+		L	L	L	H	+	+	(+)	L
Mobility management Strategy	+		+		?	L	L	H	+	+	+	
Targeting short journeys	+		+	+	L	L	L	H	+	+	(+)	L
B. Schools and Council												
School curriculum (young people) Breathe Easy	+		+	+	L	L	L	H	+	+	(+)	L
Education of Officers / Members	+		+	+	L	L	L	H	+	+	(+)	L

3.2.3 Land-use planning

Local planning decisions have the potential to affect local air quality significantly, as discussed previously. This section is split into two, the first covering strategic planning within Leicester, the second incorporating the day-to-day decision-making of planning applications, i.e. development control.

(a) Strategic/ Urban design

(i) Increase officer and member awareness through (for example) lunchtime seminars

As described in the previous section, there is a need for awareness raising generally, but specialist matters need to be covered within certain disciplines. In terms of land-use planning, information needs to include building layout, orientation and design for example to discourage canyons and ensure that development provides a more open aspect to encourage pollution dispersion. Long term planning of mixed-use and sustainable developments or area zoning can minimise the need to travel between work, home and leisure uses. In conjunction with quality public transport facilities, this could reduce the need for car travel.

Demand for car travel could be reduced with a strategy of imposing parking restraints on developments within the AQMA and the use of section 106 agreements to provide funding for monitoring the effects of large-scale developments and provide funds for mitigating or offsetting increases in emissions from transport.

(ii) Input into Strategic Area Planning Guidance

Leicester City Council already has a policy on air quality within the Replacement City of Leicester Local Plan.

Proposals that occur within, or which would significantly affect, Air Quality Management Areas (see map) will be scrutinised closely. In such areas, the aims and requirements of any Air Quality Action Plans will be taken into consideration and proposals only allowed where they do not affect the fulfilment of the plan.

Proposals that are sensitive to pollution will not be permitted close to existing polluting uses, unless by doing so developers can demonstrate that adequate measures have been taken to prevent or minimise the effect of pollution.

In order for the Council to have a coherent and consistent policy on dealing with planning applications which may have an adverse impact on air quality it is suggested that specific reference, by way of a specific policy on air quality is included in the Strategic Area Planning Guidance.

(b) Development Control

(i) Pre-application involvement

This action is already underway in that environmental health maintain a good working relationship with planners and have pre-planning application involvement in significant major developments, and it is these that are most likely to have an air quality impact. It is therefore *extremely important* that air quality professionals are involved in such discussions. The final shape of the development may be influenced as much by the outcome of these decisions as by the formal development control process. Therefore, if air quality problems can be addressed at this stage, the need

for expensive and time consuming retrospective re-design or mitigation could be avoided.

(ii) Development Control procedures

In order that development control decisions are consistent and fully informed it was suggested that development control procedures should be written in which Leicester City Council can clearly state when and how air quality assessments for developments should take place. This may take the format of a specific Supplementary Planning Guidance document (SPG) or a planning protocol. Any procedures should also include policies relating to sensitive developments, as well as those that directly, or indirectly increase emissions.

National guidance co-ordinated by the National Society for Clean Air is currently under consultation, which aims to tackle these issues specifically and should be of use to Leicester when implementing its own local protocol.

(iii) Tree Planting

There is a general perception that tree planting has only positive impacts on local air quality. In fact, some tree species can have a negative effect, actually forming pollutants in the atmosphere. Trees can emit volatile organic compounds (VOCs) which in combination with oxides of nitrogen (NO_x), can contribute to the production of other pollutants, especially ozone and particles, affecting human health.

Work done in the West Midlands has shown that Ash, Common Alder, Field Maple, Larch, Norway Maple, Scots Pine and Silver Birch are most likely to improve air quality. The study concluded that trees remove airborne pollutants at three times the rate of grassland. Trees at the edge of woodland are more effective at removing atmospheric pollutants than trees in the centre of woodland. This is due to both larger leaf areas and greater exposure to the wind. For more information see: <http://www.es.lancs.ac.uk/people/cnh/Default.htm>

Planting trees would also have other positive aesthetic and environmental impacts. Funding for tree planting relating to new developments could be made available through section 106 agreements at the development control stage of the planning process.

Theme 3: LAND USE PLANNING												
Options	Effects					Cost		Practicability	Feasibility			Time scale
	Vehicle flow	Impact on Exposure	Vehicle-miles within AQMA	Emissions per vehicle mile	AQ impact	Cost to Council	Cost to others		Wider Impacts			
									Social	Environmental	Economic	
A. Strategic/ Urban Design												
Increase officer / member awareness	+	+	+	+	M	L	L	H		+	(+)	L
Input into strategic/ area planning guidance (SPGs)	+	+			H (in the long term)	L	L	M	+	+	+	L
B. Development Control												
Pre-application involvement, LRC etc.	+	+	+		H	L	L - M	H	+	+	+	L
Development Control procedures: Protocol for AQ assessment where development adversely affects air quality or development is sensitive to air quality	+	+	+		M	L	L	H	+	+	+	L
Tree planting					L	L	L	H	+	+		L

3.2.4 Managing the Highway Network

(a) Regulation

(i) Increase parking restrictions or costs

Reducing areas for parking and increasing the costs for parking (particularly for long stay parking in order to deter commuters from driving) provide incentive for commuters and others to change travel mode. It is likely that this measure would not be feasible without good quality public transport in order that an alternative was made available. One of the key principles to attract the public to use park and ride in the proposed Leicester West scheme is combining competitive pricing and restricting the supply of parking within the city. Increased enforcement of parking controls within the city would restrict the availability of parking: This measure does have feasibility issues in that the Council does not control much of the off-street parking.

(ii) Reallocation of road space

There is an increasing demand for the limited space on the roads. When buses are stationary through congestion or experience stop-start traffic they produce double the NOx emissions than when travelling at 20 mph. Creating bus lanes may make bus journeys more desirable to prospective passengers due to their efficiency and reduced journey times, as well as reducing pollution in congestion. Reallocation of road space to pavements may make walking more attractive (in combination with other improvements).

(iii) Enforcement of speed limits and access restrictions

Fast driving and hard acceleration greatly increases vehicle emissions. Enforcement of speed limits would encourage more moderate driving, which would reduce NOx emissions as well as improve safety on the roads for drivers, cyclists and pedestrians and therefore potentially making alternative modes of transport more appealing. It would also reduce traffic noise and save drivers money on their fuel bills.

(iv) Traffic calming and blocking rat runs

Some residential areas suffer from speeding and rat-running traffic. This results in these areas being affected by high levels of emissions as well as safety being put at risk. Introducing traffic calming measures, such as 20mph zones in conjunction with road humps, and the use of markings on roads that change the appearance and character of roads can induce more moderate driving techniques. This can both reduce the speed of vehicles, and therefore emissions, as well as deterring drivers from using areas as rat-runs. The result is improved safety, and more appeal for cyclists and pedestrians.

Traffic calming schemes generally incorporate a wide range of measures designed to complement each other in both speed reduction and environmental terms. Schemes are designed to be self-enforcing, although the effectiveness of this varies according to the measures employed. Implementing traffic calming and blocking rat runs may be beneficial for both speed, road safety and air quality in the treated area, however by deterring through vehicles from using these zones, this traffic will return to the major roads. The result of this could be further congestion particularly at peak times unless there is capacity on these corridors.

(v) City centre and other area 20mph zones

20 mph zones are implemented currently for road safety aims. One of the aims of the Government is to make speeding traffic as socially unacceptable as drinkdriving has become. The Government suggests creating more 20mph speed zones around schools and adjacent residential areas could achieve reductions, as drivers will automatically slow their vehicle to a more appropriate speed. Experience in Leicestershire however suggests that signage alone gives limited success, only achieving 1-2mph reduction.

(b) Traffic Flow

(i) Signing and route guidance (including parking information) (VMS)

Clear and accurate signing around the city could assist in reducing unnecessary miles and travelled and congestion. A new VMS system has recently been implemented to guide drivers to the nearest car parking space. The system comprises 30 signs that were designed in conjunction with Derby and Nottingham in order to share expertise and development costs.

This option could prevent extra travel within central Leicester but does not incorporate any modal change (away from private vehicles). As such it is unlikely to cause a major improvement in air quality.

(ii) County co-ordination (with LTP partners)

Co-ordination with respect to transport planning as well as air quality issues will be critical to ensure that measures implemented in one local authority are consistent with those transport measures of policies in neighbouring authorities. The LTP covers an area wider than Leicester City Council and with regards to air quality, the County liaise closely with Leicester City providing modelling services for the other local authorities, and thus providing County wide consistency.

Theme 4: MANAGING THE HIGHWAY NETWORK												
Option	Effects					Cost		Practica- -bility	Feasibility			Time scale
	Vehicle flow	Impact on Exposure	Vehicle-miles within AQMA	Emissions per vehicle mile	AQ impact	Cost to Council	Cost to others		Wider Impacts			
									Social	Environmental	Economic	
A. Regulation												
Increase parking restrictions / costs	+		+		M	-ve	L	H		+	+	L
Reallocation of road space	+		+		M	M	L	H		+	- / +	M
Enforcement of speed limits and access restrictions	+			+	M	M	L	M	+	+	-	L
Traffic calming/ Blocking rat runs	+/-		-	-	L	M	L	H	+ / -	+ / -	-	M
City centre /other area 20 mph zones	(+)			+	M	L	L	H	+	+	(+)	L
Pedestrian and cycle priority			+		L	L	L	H	+	+		L
B. Traffic Flow												
Signing and route guidance. Variable message signs			+		L	H	L	H		+	-	M
Parking information VMS			+		L	L	L	H		+		L
County and Regional co-ordination	+				L - M	L	L	H		+	+	L

3.2.5 Promotion and Provision of Alternatives

(a) Public Transport

(i) *Leicester West Transport Scheme (LWTS)*

LWTS provides an opportunity to deliver modal shift to public transport within the AQMA. The scheme has already been described fully in Chapter 2. If the scheme goes ahead, quality bus initiatives combined with priority bus measures along the three corridors would allow an increase of up to 25% in bus patronage for each of the corridors, not including the park and ride passengers themselves.

At the time of writing, the authority is still awaiting news on whether the bid to Department for Transport has been successful; thus the timeframe for sites to be operational is very much unknown.

(ii) *Public transport information (real time)*

Real Time Passenger Information allows passengers to know exactly when the next bus will arrive and if there are any delays. The Star Trak system uses satellite technology, which tracks the buses and sends a signal to the bus stop (and the internet) saying how far away the bus is. A display on the bus stop counts down until the bus arrives and the same information can be viewed over the internet. The StarTrak system has been implemented across 30 routes in the city so far, and uses information displays at bus stops as well as mobile phone based SMS service. 75% of passenger journeys in Central Leicestershire are now covered by the StarTrak system. The system has been introduced as part of a package of measures including newer buses, level access and improved bus stops and with traffic signal priority. Passenger numbers on these improved routes have increased in the range of 8-26%.

(iii) *Subsidised bus fares*

Subsidised bus fares would be one method of encouraging modal shift, by making public transport more economically attractive. Whilst this could prove effective in reducing road traffic dramatically, it would prove to be a high cost measure for the City Council to intervene in this way. Such radical measures have been successfully implemented elsewhere.

In Hasselt, Belgium the mayor made all public transport free (see <http://www.globalideasbank.org/site/bank/idea.php?ideald=2414> for details). At the same time, the mayor closed one of the two existing ring roads, planted trees in its place, laid more pedestrian walkways and cycle tracks, and increased the frequency and quality of the bus service. Public transport increased by 800% in one year.

This city needed extreme measures to turn it around; faced with insufficient funds to expand the road network, politicians made the decision to adopt the cheaper alternative of providing free bus services. The city had been slowly losing population, but since the new measures were adopted, there has been rapid population growth. The same day that the town made the buses free, they also slashed local taxes. More people are now attracted to Hasselt because it is easier to get there and the extra income has reduced the local taxes.

(iv) Off Bus Ticketing

At present in Leicester, tickets for travel are generally purchased on the bus. This leads to delays at the bus interchange as drivers deal with each passenger, and increases the period of time that the bus must stand whilst passengers board. This also means that available pavement space particularly in the city centre is at a premium, as buses spend extended times standing. A more efficient way of reducing this standing time, and commonly used in European countries, is for tickets to be purchased prior to travel at automatic machines located near to the bus stops. This means that when the bus arrives, passengers can board more quickly and the bus can then move off, leaving the space clear for the next bus. This will also reduce the time spent by the bus' engine idling and creating emissions, as well as improving the service for the passengers.

A pilot is shortly to be implemented on a limited number of bus routes, and if successful it is hoped the programme can be implemented across the city.

(v) Electric and guided buses

Guided buses are an *off road* technology that involves the creation of a special *trackway* physically removed from the public highway. The first *kerb guided busway* opened in Essen, Germany in 1980. The special track it uses consists of two parallel sets of 10 metre long 'L' shaped prefabricated concrete panels laid 2.60m between inside vertical faces, which whilst it was being laid were bent as required for curved sections. These are supported every 1.35 metres by sleepers. To make it easier for buses to enter the trackage the entry points are fitted with steel box girders which funnel in from 3.50m down to 2.60m.

Kerb guidance uses ordinary buses (motorbus, trolleybus, etc) fitted with extra horizontal guide-wheels (one per side, mounted immediately in front of the front road wheels) which steer the vehicle via guide-arms attached to the steering knuckle. Whilst on the track the driver retains full control of the vehicle except that he or she no longer needs to use the steering wheel. Away from the track the bus uses the normal road, just like any other road vehicle. A guided bus scheme is proposed for Huntingdon to Cambridge and is to be considered by a public inquiry in September. The route is proposed for the former St Ives to Cambridge rail line.

Electric buses have been proposed as an alternative mass transit system. Some advantages include improved hill climbing capabilities, minimal noise and vibration, no idling motor energy losses and better overall performance. The journey experience for passengers is more comfortable and smoother than with a conventional bus.

The buses have lower overall lifetime costs, there are fewer moving parts and the electric traction packages allow simpler and cheaper maintenance. There is a high cost in initial investment for vehicles and infrastructure than simply buying more motorbuses. Bus operator's benefit from a longer vehicle life and the vehicles are extremely energy efficient as regenerative braking allows energy to be recycled back into the wires instead of being wasted as friction / heat via the brake pads. The buses are zero pollution on the street if the electricity is generated from renewable sources.

(vi) Trams

A number of cities in the UK are currently putting in place new tram systems. The Manchester metro link is now well in operation and new systems have recently opened in Nottingham and Sheffield. Trams represent a large-scale investment, which may be more effectively spent on improving buses. However, a tram system

does give public transport a high impact statement; they are zero emission at the point of use and provide efficient service to those they benefit. Whilst a tram system could be an option within Leicester, there are no existing proposals and so this would be a more long term consideration.

(b) Commuter management

(i) Travel Plans

Both the City and County Councils are committed to promoting the development and implementation of workplace and schools travel plans. The City Council currently employs a dedicated Schools Travel Plans Officer and a Travel Plans Officer who deals with businesses.

In terms of workplace travel plans all but one has been achieved as part of the planning process through Section 106 agreements. Leicestershire County Council has recently developed a workplace travel plan for County Hall and Leicester City Council is in the process of developing a travel plan as part of its ongoing transport review. Two significant examples of organisations that have recently developed a travel plan are Leicester City hospitals (10,981 employees over three main sites) and De Montfort University covering 2,804 employees over two sites).

Travel Plans require a substantial amount of maintenance, monitoring and support. Developing and implementing a travel plan is relatively easy for an employer, particularly if the incentive is to fulfil a planning condition. The effectiveness of the plan will be dependent on the promotional work, the maintenance of the travel plan and continued motivation.

(ii) Council to encourage and promote home working and flexible hours

If large numbers of people worked at home, congestion could be reduced particularly during peak periods, which would have a positive impact on air quality within the AQMA. For many people, depending on the types of jobs they do, are not able to home work. There would be both positive and negative social impacts, generally home working could enable people to work more flexibly, thereby encouraging recruitment and staff retention. However, isolation of staff may have negative social implications and some people will not have the space or environment to work from home.

(c) Schools

(i) Safer routes to school and exclusion zones

Safe Routes to Schools projects are in operation all over the UK in all types of schools. There are a variety of different methods and approaches to improving the school journey for young people. The overarching aim is to work together as a community to make the school journey safer and healthier for everyone. This can be done in a variety of ways depending on local circumstances. Initiatives range from school travel planning, creating safer routes for cycling, training for cycling (including bicycle maintenance), public transport improvements as well as highway measures such as traffic calming.

Leicester already has a successful Safer Routes to School strategy, and an ambitious target is to be set for cycling and walking trips to school to be 37% by

2011. This is combined with a target for all schools to have travel plans by 2011. To deliver these targets however, additional resources will be required.

(ii) School 'walking buses'

The walking bus is the latest safe, fun and healthy way to travel to and from school. Each walking bus has an adult 'driver' at the front and an adult 'conductor' bringing up the rear. The children walk to school in a group along a set route picking up additional 'passengers' at specific 'bus-stops' along the way.

Walking buses can operate in different ways to suit the needs of the children and their parents at a particular school. It may be that some schools can support (through enough volunteers) a number of walking buses and some may only need or be able to support one walking bus. Depending on resources walking buses could operate only on certain days, or at certain times of the day. The long term success of these schemes is very dependent on the commitment of the schools and the parents or volunteers to continue: volunteer parents may lose interest once their own children have left the school. However where the catchment area is relatively small for a school this could be a real option.

(iii) School 'yellow bus' scheme

The concept of the School Yellow bus scheme originates from America and is based on the idea of a bus being dedicated to school children and designed in accordance, for instance each seat has a seatbelt. The driver also has a list or register of each child that uses the service meaning that children are not left behind. There is one driver assigned to each bus who receives relevant training. The aim is that children and parents should feel safe and secure using the service that in turn could discourage the individual school runs that parents make for their children. A number of schemes are now in place elsewhere in the UK.

This method of reducing numbers of school car trips will be much more costly than that relating to safer routes to school or school walking buses. An evaluation of pilot schemes by DfT² has suggested that in Hebden Bridge and Runnymede where the yellow buses were introduced to achieve modal shift, change appears to have resulted initially in a shift from car to yellow bus. In Hebden Bridge there was an increase in the proportion of pupils travelling by bus from 5% prior to the scheme to 13% in September 2002. In Runnymede, the proportion travelling by bus has increased from 15% prior to the introduction of the yellow buses to 18% in September 2002.

In both these pilot areas, yellow bus take up appears to have continued to rise throughout the school year, but by May 2003, the modal split figures suggest that this continued growth is due to a shift from walking and cycling to yellow buses, rather than a shift from car. In Runnymede, overall car use appears to have returned to pre-yellow bus levels and in Hebden Bridge is again rising, suggesting that if yellow buses' initial impact is to be maintained, measures to discourage replacement car journeys will have to be introduced. Other schemes also report increased bus use and decreased car use, including in Ilkley and Wokingham.

² see: http://www.dft.gov.uk/stellent/groups/dft_sustravel/documents/page/dft_sustravel_025636.hcsp for details.

(d) Cycling and Walking

(i) Promote and facilitate cycling

The potential exists for air quality improvements to be made through increasing the proportion of trips made by cycle, as mentioned previously. A balance between the needs of both pedestrians and cyclists must, of course, be struck. Any cycling promotion will build on that already underway in Leicester. Leicester Bike Park is the UK's largest secure bike parking facility with space for 120 cycles, showers, changing facilities, equipment lockers and a bike shop that includes workshop facilities and bike hire. It was developed as a partnership project between Websters Cycles, Leicester City Council and Environ. . It is located in the city centre within five minutes walk of the Leicester's main shopping areas and many of the centre's major businesses. The Park has proved to be very successful with over 13,000 bikes being parked each year and an average usage level of 350 bikes per week though in the summer months this can rise to 500 users. It used by both commuters and casual users such as shoppers.

There are proposals to extend the Bike Park in the city centre, and as part of the Leicester West Scheme there would be a bike park facility located at the Aylestone site, allowing a short cycle ride into the city centre via the existing Great Central Way.

(ii) Promote and facilitate walking

The National Guidance on Encouraging Walking, which was published in March 2000 by DETR, provided a working guide to help Local Authorities develop a strategy to make walking easier, more pleasant and safer than it is now, to encourage walking as an alternative to the car, and to maximise its potential within an integrated transport system. The Government White Paper in 1998, 'Saving lives: Our Healthier Nation' put a high priority on the health of the population as a whole and the importance of reducing air pollution and increasing exercise. An increased role for walking and cycling as a transport choice could help to reduce the effect that road transport plays in creating pollution as well as improving the personal fitness and health of the population. Walking is clearly the lowest cost of all transport choices

Practical initiatives to encourage walking and cycling can be found in Leicestershire's Walking and Cycling Strategy. This Action Plan endorses and supports work currently underway to encourage more of Leicestershire's population to walk and cycle. <http://www.leics.gov.uk/pdf/highways/planspolicies/walkingcycling1.pdf>

Theme 5: PROMOTION OF ALTERNATIVES												
	Effects					Cost		Practicality	Feasibility			Time scale
	Vehicle flow	Impact on Exposure	Vehicle-miles within AQMA	Emissions per vehicle mile	AQ impact	Cost to Council	Cost to others		Wider Impacts			
									Social	Environmental	Economic	
A public transport												
Leicester West Transport Scheme	+		+		H	H	M	H		+	(+)	M
Improved buses			+	+	M	M	M	H	+	+	+	L
Public transport information (real time)			+		M	M	L - M	H	+	+	+	L
Subsidised bus fares			+		M - H	H	L	L	+	+	---	M
Electric / guided buses				+	M	H	H	M	+	+	---	H
Trams			+	+	L - M	HHH	H	L	+	+	---	HH
B. Commuter Management												
Travel Plans	+		+	(+)	L - M	L	L - M	M	+	+	(+)	L
Council to encourage and promote home working	+		+		L	L	L	M	+ / -	+	+	
C. Schools												
Safer routes to school (Breathe Easy) / exclusion zones	+		+		M	L	L	H	+	+	-	L
School 'walking buses'	+		+		L	L	L	H	+	+		L
School 'yellow bus' scheme	+		+		M	H	H	M		+	-	M
D. Walking/ cycling												
Promote / facilitate cycling	+		+		M	L	L	H	+	+		M
Promote / facilitate walking	+		+		M	L	L	H	+	+		M

3.3 Packages

The options set out in section 3.2 have been amalgamated into packages in order that the large number of measures put forward can be more logically evaluated in terms of possible air quality improvements. Following the evaluation of each specific measure in section 3.2 in terms of cost, effectiveness, feasibility, and whether the option is likely to be short-term, medium-term or long-term in their implementation and effect, the following packages (or scenarios) have been proposed.

PACKAGE	FEASIBILITY / TIMESCALE / COST	STATUS
Package 1	Low cost / short-term Up to end of 2005	<u>Small effect on air quality</u> “A step in the right direction” Now, if resources available
Package 2	Medium cost / medium-term 2006 - 2011	<u>Measurable effect on air quality</u> Will only achieve ‘progress’ towards objective Could be included within next round of LTP (2006 – 2011) To be tested for air quality impact and included in next round or Air Quality Action Plan (2005)
Package 3	High cost / long-term 2011 onwards...?	<u>Measures achieving total, effect required on air quality: Radical and long-term</u> Unattained so far:- <ul style="list-style-type: none"> • Definition/Scoping of measures • Testing for stakeholder acceptability • Identification of funding source Feasibility studies can be initiated in short / medium term as actions within Air Quality Action Planning (2005 or subsequent rounds)

The asterisks indicate measures that are included within the current LTP.

Package 1: Low cost, short-term, high feasibility

This scenario or package includes the measures which are low cost (<£500 000), short-term (assuming funding could be implemented almost immediately) and as such are highly feasible. The measures to be included are incorporated under the 5 headings used in section 3.2.

Emissions

- Roadside emissions testing
- Targeting idling engines – including buses and taxis
- Campaigns to influence driving style (i.e. to encourage more consistent driving behaviour), and campaigns to reduce short journeys by car (i.e. through encouraging uptake of cycling, walking and different school transport)
- Run Seminar/Conference and provide guidance packs for other fleet operators to reduce emissions
- Develop an implementation plan for and investigate funding for SCR to Council Fleet. This builds upon feasibility studies already undertaken showing retrofitting as the preferred option.

Information and education

- Real time air quality information provision for the public
- Improve information about links between poor air quality and health, through targeted information campaigns
- Use the internet as a medium for disseminating information on air quality and transport
- Targeting house movers with local information on public transport (to be done through estate agents and developers).
- Promote and reward car-free days
- Mobility management strategy
- Targeting short journeys (schools, businesses and residents) for example develop a vehicle pollution index for households and businesses in Leicester based on the age of vehicles/miles travelled/length of journeys. This could be done via questionnaires to schools and with online website calculators to allow individuals to calculate the vehicle emissions they produce: compare their emissions with the average advise what measures they could take to improve their performance.
- Promote air quality on the school curriculum (target young people)
- Education of local authority officers and Members through providing interactive seminars, workshops and briefing meetings etc

Land-use Planning

- Integration of environmental themes in to Supplementary Planning Guidance (SPGs) and into LRC area design briefs
- Raise awareness among local authority officers and Members
- Encourage tree planting through planning agreements and obligations to assist with improving local air quality

Highway Network

- Increase parking restrictions and costs
- Develop further speed zones (20 mph zones) combined with traffic calming and block rat runs
- Pedestrian and cycle priority
- Co-ordinate highway and utility works
- Provide real-time parking information via VMS
- Increase the co-ordination and collaboration between neighbouring authorities within LTP area with respect to efforts to improve local air quality

Promotion of Alternatives

- City Council to implement their own Travel Plan
- Travel plans for other large organisations
- Implement home-working and flexi-time to more council staff and promote to other employers
- Safer routes to school/ Breathe Easy and exclusion zones
- School “walking buses”
- Pilot school yellow bus scheme
- Pilot off bus ticketing scheme
- Promote and facilitate cycling
- Promote and facilitate walking

Evaluation of the package

Package 1 encompasses a huge range of specific and thematic options and measures that collectively will assist in the long-term in improving air quality across the city. Many of the options outlined are already proposed as part of the LTP or other transport or land-use strategies, or are in the process of being piloted. Options intended to inform, educate and generally raise awareness are themselves unlikely to lead to significant improvements in local air quality, and any improvement would be very difficult to quantify. However, such initiatives are an important aspect of this action plan, with information on any specific transport or traffic proposal (in the LTP) likely to impact favourably on air quality requiring dissemination to the public at large.

This package offers the most cost-effective way of improving local air quality. Many of the measures and options provide an opportunity for action immediately (i.e. some of the information initiatives and campaigns) and all offer opportunity for improvements over the longer-term.

It should be noted that this package, although feasible in the short term, does have resource implications.

Package 2: Medium cost, medium-term

This scenario or package includes the more costly measures (£500K - £3 million), and those which can be implemented over the course of LTP 2 period (i.e. 2006 to 2011). As before, they are listed within subgroups used in section 3.2.

Emissions

- LEZ-feasibility study and limited implementation
- Encourage heavy through traffic to use most suitable routes such as A46/Western Bypass and M1 rather than enter the city centre. This can be done by using effective signing and providing maps of designated routes to all companies in the city.
- Further enhance Freight Quality Partnership
- Feasibility study for movement of freight vehicles on network – Freight hub
- Implementation of a minimum emission standard for buses in the city, through a Quality Bus Partnership
- Council fleet purchase to consider emissions
- Implementation of action plan for retrofitting SCR to Council Fleet
- Voluntary schemes for scrapping old vehicles i.e. in relation to a specific local authority scheme in future or a national campaign. Subsidised Public transport could be offered as an incentive locally. The Authority could also lobby government for a national scheme/legislation to address older vehicles.

Land-use Planning

- Development Control procedures – including aspects of building design, mixed use development, assessments for developments sensitive to air quality as well as those which adversely affect it
- Develop and implement policy for restricting parking provision for new developments via sec106 agreements

Manage network

- Reallocation of road space
- Enforcement speed limits access restrictions (short-term)

Promotion of Alternatives

- Improve bus services (frequency, attractiveness, disabled and level access etc)
- Provide improved public transport information
- Implement off-bus ticketing
- Leicester West Park & Ride scheme to proceed with associated corridor improvement

Evaluation of the package

This package includes specific options that are likely to bring about clear improvements in air quality. Reductions in vehicle emissions associated with an implemented LEZ, removal of HGV traffic from the inner ring road can be measured, allowing changes in air quality to be estimated. As well as the specific options included, the feasibility studies outlined are important to help illustrate whether further investment in a particular measure or option is feasible.

In its entirety, this package is more likely to cause a reduction in the area of the AQMA in the city than the previous package, though at greater cost. Many of the options encompassed in this package have implication for transport and traffic movement across the whole of the city area, and not just the designated AQMA area.

It is considered (although not through any detailed examination of the impacts of these measures) that these measures alone will not provide the improvements required to achieve the air quality objectives throughout Leicester.

Package 3: High cost, long-term (Post LTP-2: 2006-2011)

This scenario or package of measures represent the high cost initiatives, less feasible options, which necessitates them to be implemented over the longer-term. For example, there may be barriers which need to be overcome, funding sources which need to be investigated and feasibility studies which need to be undertaken before any particular option, or suite of options, are viable for implementation.

It should be noted that, in its present form, this package does not represent a cluster of measures that will result in the objective for nitrogen dioxide to be met by the end of 2010.

(a) Generic Strategies

Clearly, emissions from road traffic using the major road network are the most significant source of nitrogen dioxide in Leicester. Whilst the air quality assessment work undertaken by the Council is intended to identify key pollution hot spots, the Action Plan seeks to address the issue of elevated pollutant concentrations more generally across the city.

The main focus of air quality action planning must therefore be to reduce motor vehicle kilometres travelled and emissions per motor vehicle kilometre. Of these, emissions from road traffic are the key air quality issue in the city. Therefore in order to improve air quality within the AQMAs, attention should be paid to the following variables:-

- D. Numbers of vehicles flowing past critical points in the City (i.e. locations where people are exposed to excessive concentrations of traffic pollutants in the AQMA, over the relevant averaging periods).
- E. Vehicle/miles within the Local Transport Plan area.
- F. Emissions per vehicle/mile.

Appropriate generic strategies to achieve each of these can be tabulated as follows:

Strategy	A	B	C
Transport modal shift	√	√	
Elimination of unnecessary travel / transport	√	√	
Redistribution of traffic flows	√		
Reduction in free-flowing traffic speeds			√
Reduction in congestion / queuing			√
Reduction in old / poorly-maintained vehicles in all / part of the area			√
Promotion of appropriate automotive technologies in all / part of the area			√
Avoidance of development where relevant exposure can occur in close proximity to major roads.	√		

Unlike the previous packages described, this package consists of a single list of the specific measures and options identified as delivering clear improvement to local air quality. All of the options will affect overall emissions positively, and many will encourage a modal transition from private car use to other forms of transport.

(b) List of Measures

- Implementation of a scrappage scheme with financial incentives
- Full implementation of a Low Emission Zone (LEZ) with effective enforcement
- Implementation of a designated Freight hub for the city centre
- Provision and enhancement of VMS real time route guidance
- Subsidised bus fares
- Electric guided buses
- Trams – MRT
- Implementation of School ‘yellow bus’ scheme

Evaluation of the package

This package of measures and options encompasses a more ‘aspirational’ suite of options compared to the other packages outlined. The options have been drawn together to illustrate those options that are likely to offer the most effective way of ensuring emissions from transport across the city is reduced, and thereby local air quality improved. However, the options listed are amongst the more costly measures to implement, and some require extensive feasibility studies before any further consideration can be taken. Such options, which include the development of an LEZ for the city, subsidised bus fares and trams will also require overriding political and city-wide support that if not forthcoming will prevent any further consideration of the option.

Whilst a detailed evaluation of the options in this package, as with other packages, is impossible to undertake, it can be assumed that the options outlined here offer the greatest potential benefits to air quality across the city, but within the constraints of very high costs, other potentially detrimental socio-economic and environmental effects, and practical difficulties.

3.4 Summary of proposed measures, timescales for implementation and responsibilities

Package 1

Measure	Progress	Main responsibility	Support needed from
Emissions Management			
<ul style="list-style-type: none"> Roadside emissions testing Target idling engines – including buses, taxis 	Annual rounds of testing completed. Pilot study required	Pollution Control Group, LCC Transport, Traffic and Highways, LCC	Police (for statutory scheme).
Prepare Action Plan for implementing SCR to Council fleet	Preliminary investigations indicate substantial funding could be obtained via Powershift programme	Fleet Management, LCC Environment Team	Pollution Control Group, LCC
Advice for other fleet operators		Pollution Control Group, LCC	Leicester Environment Partnership Environment Team Fleet Management
Education & Information			
Real time air quality and transport information provided via the web	Already underway but could be enhanced	Pollution Control Group, LCC	Special Projects Team IT Services, LCC
Information campaigns targeted at specific groups: <ul style="list-style-type: none"> House Buyers Young people via school curriculum Council officers and members via briefings 	Briefings to be arranged during AQAP consultation process	Pollution Control Group Education Services	Estate Agents Developers
Information campaigns targeted at general groups <ul style="list-style-type: none"> Promote and reward car free days Target short journeys Health and air quality Driving style 		Pollution Control Group, LCC Environment Team (corporate)	Transport, Traffic and Highways, ENVIRON Primary Care Trust
Promotion of			

Alternatives			
<p>Mobility Management Strategy.</p> <p>This could include:</p> <ul style="list-style-type: none"> • Increase parking restrictions and costs • Extend pedestrian and cycle priority • Travel plans for schools and businesses • Implement Home-working and flexi-time for council staff and promote to others 	<p>Scoping study underway.</p> <p>Timescale not yet defined but for inclusion within LTP II.</p> <p>Additional staff resourcing may be required.</p>	<p>Traffic Group Environment Team (corporate)</p>	<p>Pollution Control Group Leicester Environment Partnership ENVIRON</p>
<p>Promote and facilitate walking and cycling</p>	<p>This is already underway – current LTP has target to triple number of cycling trips from 2000 base</p>	<p>Transport, Traffic and Highways, LCC</p>	
<p>School “walking buses”</p>		<p>Transport, Traffic and Highways, LCC</p>	<p>Education, LCC</p>
<p>Pilot school yellow bus scheme</p>		<p>Transport, Traffic and Highways, LCC</p>	<p>Education, LCC</p>
<p>Pilot off bus ticketing scheme</p>	<p>Piloting to commence shortly on 3 routes. If successful proposals to implement on all city centre routes</p>	<p>Transport, Traffic and Highways, LCC</p>	
<p>Safer routes to school/exclusion zones</p>	<p>This is already under way for example, Beaumont Lodge primary School and Heatherbrook Primary School have already had schemes implemented.</p> <p>Target of 67% by 2011 for school trips walking + cycling</p>	<p>Transport, Traffic and Highways, LCC</p>	<p>Pollution Control Group, Education, LCC</p>
Land Use Planning			
<p>Input on environmental</p>		<p>Planning</p>	<p>Pollution Control</p>

matters to SPG and LRC area design briefs			Group, LCC
Highways Management			
Parking information-VMS	Fully operational in 2003 – includes 30 variable message signs. It is designed to cut out unnecessary mileage.	Transport, Traffic and Highways, LCC	
Co-ordinate with neighbouring authorities in LTP area		Traffic and Highways, LCC, Pollution Control Group, LCC	

Package 2: medium cost, medium-term (to be included within next round of LTPs)

Measure	Progress	Main responsibility	Support needed from
Emissions Management			
Encourage City Council fleet purchase to consider cleanest emissions		Fleet Management	Environment Team
Implement Action Plan for retro-fitting SCR to City Council fleet		Fleet Management	Environment Team
Encourage through heavy traffic to avoid inner ring road through signing	Freight signing is programmed as target within current LTP	Transport, Traffic and Highways, LCC	Quality Freight Partnership
Feasibility study for movement of freight vehicles on network – Freight hub		Transport, Traffic and Highways, LCC	Quality Freight Partnership
LEZ-feasibility study and limited implementation	Feasibility study for City Centre Access Strategy will consider LEZ	Transport, Traffic and Highways, LCC	
Implement minimum emission standards for buses – Quality Bus Partnership	Quality Bus Partnership meets regularly. QBP allows bus companies and LCC to work together on implementation of StarTrek, low floor buses, level access bus stops	Bus operators & Transport, Traffic and Highways, LCC	Education
Voluntary schemes for scrapping old vehicles : incentives could include season tickets for buses		Transport, Traffic and Highways, LCC	Pollution Control Group, LCC. Bus operators
Highways Management			
Reallocation of road space		Transport, Traffic and Highways, LCC	
Enforcement speed limits access restrictions (short term) and traffic calming		Police Transport, Traffic and Highways, LCC	
Development Control procedures		Planning & Pollution Control Group, LCC	

Promotion of Alternatives			
Implement improved bus services Frequency <ul style="list-style-type: none"> • Attractiveness • level access • Travel information • Implement off bus ticketing 	Already underway via Quality Bus Partnership Start Trak /Startext being used on some routes already	Public transport operators Quality Bus Partnership	Transport, Traffic and Highways, LCC
Leicester West Park & Ride scheme to proceed with associated corridor improvement	Awaiting result of bid to DfT and Local Plan Enquiry	Transport, Traffic and Highways, LCC	DfT
Land Use Planning			
Develop planning protocol for development that will impact on or be impacted by air quality in the AQMA		PCG Urban Design Development Control LCC	
Develop and implement policy for restricting parking provision for new developments		PCG Urban Design Development Control Travel Plans Officer LCC	

Package 3 : long-term, high cost (post LTP2, potential for feasibility studies to be carried out in the short to medium-term).

Measure	Progress	Main responsibility	Support needed from
'Scrappage' scheme with financial incentive	Report prepared for DEFRA recommended national approach to implement	Central government (DfT)	Transport, Traffic and Highways, LCC To lobby DFT/DEFRA
LEZ – fully implemented and enforced	If recommended by CCAS feasibility study	Transport, Traffic and Highways, LCC	
Implementation of freight hub/node or other ways to manage vehicle size in city centre		Transport, Traffic and Highways, LCC	
VMS real time route guidance: congestion, air quality		Transport, Traffic and Highways, LCC	
Subsidised bus services	Some bus fares currently subsidised on some routes/ times of day	LCC	
Electric guided buses		Transport, Traffic and Highways, LCC	
Trams – MRT		Transport, Traffic and Highways, LCC	
School 'yellow bus' scheme implementation		Transport, Traffic and Highways, LCC	

3.5 Financing

The ability and opportunity for implementing this AQAP depends primarily upon securing adequate funding and sufficient revenue resources to fund the staff required to deliver the programme of measures. For the purpose of this Action Plan, the costs involved have been estimated broadly, and banded as being low, medium and high. At present, most of the measures included in this action plan do not have funding attached and as such this document should be used as a bidding document to lever financial support from various funding mechanisms to improve air quality. Some of the measures are currently in place and therefore funded through local authority activities or other mechanisms such as European project funding. For some options, their maintenance or expansion will be dependent upon future levels of funding identified.

Many of the measures, particularly those outlined in package 2 will seek funding through the LTP Round process, due to be submitted to DfT in July 2005. The consultation processes for LTP 2 are underway and through liaison with working groups for the LTP process, the outcomes of the action planning process will be included within decisions on those measures included in LTP bidding processes. It is hoped that once local authorities are legally able to integrate the two processes (i.e. LTP and Action Planning), then Leicester City Council will integrate this AQAP into the next Round of LTPs. Therefore it is likely, subject to consultation with the transport planning team, that the two processes will become more aligned after July 2005. In this way it is hoped that many of the measures can be funded through the LTP. Although DfT have indicated that air quality should be one of the key priorities for the second Round of LTPs, the government has yet to clarify whether additional, larger funding settlements will be made to local authorities who have declared AQMAs and are therefore developing Action Plans. If funding for identified measures cannot be secured through funding settlements, then Action Planning measures will require scaling down, which will reduce the overall effectiveness of the Action Plan. The funding allocation for LTP 2 will not be confirmed until December 2005 and clearly the Action Plan will need to be reviewed in the light of this.

Other potential sources of funding include:

New Deal for Communities – New Deal has funded a number of transport projects including two new bus routes in and around Braunstone, increasing the number of bus stops with real time information and improved street lighting on footpaths

Developer contributions – through section 106 agreements and similar voluntary arrangements, developers can and have contributed to improvements which are relevant for this Action Plan. For example, enhanced cycling schemes have been funded through developer contributions as well as funding from Environ (publicity material) and from the neighbourhood Renewal Fund. Contributions for air quality modelling and/or monitoring will be sought for developments that will influence air quality within the AQMA.

Neighbourhood Renewal Fund— The NRF has a floor target for air quality objectives to be met in line with the statutory objective. Where an NRF floor target is failing, Leicester Environment Partnership may have a strategic role to play in assisting progress towards the objective.

District Councils – District Councils are active partners in the delivery of LTP objectives and have provided funding as well as staff resources (for example for travel planning) in order to deliver LTP objectives.

Heritage Lottery Fund – the New Walk Restoration scheme is being funded in partnership with the Heritage Lottery Fund, EMDA and property owners on New Walk. Local targets include improving air quality.

Europe – a number of transport projects are being funded through a variety of EU funded projects. These include the EQUAL project relating to traffic and travel information funded by an EU grant of £103K.

As mentioned, a number of the measures included in Package 3 will require feasibility studies to be undertaken before any potential funding can be identified and secured subsequently. Leicester City Council will continue to investigate potential funding sources through the LTP process and other mechanisms as the action plan progresses to implementation.

4. Consultation

Consultation in the form of active participation and information provision and dissemination will be vital for the effective implementation of options identified as part of the Action Plan. Any individual option, or package of options, to improve local air quality will require the backing and support of stakeholders (i.e. business and members of the public). As such, stakeholders will need to take 'ownership' of the action planning process and feel part of the overall decision-making process.

Leicester City Council began consulting on air quality matters when the process of managing local air quality was first initiated. More recently, the City Council has been proactive in seeking the opinions across the Council and wider stakeholders of the potential options for improving local air quality. Public consultation began with a questionnaire leaflet that asked people about broader policies they wish to see implemented in Leicester in order to improve air quality. The response rate was acceptable (3%) which indicated a relatively high level of awareness of the issues relating to local air quality. This survey provides a useful indication of public opinion on issues such as congestion charging and Park and Ride, and also generated a further list of suggestions from the public. The survey also identified that public awareness was poor with respect to certain transport options considered within the LTP or City Centre Access Strategy (CCAS): for example responses indicate that the public are unsure of the implications of a LEZ. Further work would therefore be required to inform the public of the benefits of a LEZ in further consultation.

To progress further with the action planning process, the City Council is required to consult more widely on the possible options for improving air quality within the AQMA. This has already been identified through the appraisal of the interim AQAP submitted to Defra in June 2004.

The key objectives for consultation on the AQAP process are:

- To deliver a draft AQAP to Defra by end of summer 2004.
- To consult fully with key stakeholders and the public on options for improving air quality within the timescale constraints.
- To integrate consultation processes with those underway for LTP 2

Consultation on this document will be undertaken from September to November and will involve:

- Presentation to Members and specific or targeted groups
- Presentations to key groups
- Leaflet distributed via LINK
- Publicity via Mercury and Website
- Copies of leaflet and report provided at Council Buildings

This process will produce a consolidated list of options for evaluation and inclusion within the second draft of the LTP in February 2005. Concurrently, the Pollution Control Group at Leicester City Council will be kept informed of other and related consultation events, such as that for the CCAS, LTP and Leicester's Regeneration Plan, in order to inform air quality action planning processes.

As far as possible, and within the time constraints of LTP and AQAP processes, opportunities for joint consultation will be explored. The Pollution Control Group will monitor the consultation process for the LTP through attendance at meetings and continued liaison with members of the LTP Participation Project Team.

Opportunities for collaboration and consultation already identified include:

- LINK articles for AQAP and LTP during Autumn 2004

Joint local transport planning and air quality action planning presentations to key stakeholder groups have been identified through the LTP process already. Although these presentations have yet to take place, recipients include the following:

- Leicestershire Together (the Leicestershire Strategic Partnership) including the Leicester Environment Partnership
- District and Leicester Strategic Partnerships
- District Highway Forums
- City Area Committees (when set up)
- Local Access Forums (currently in development)
- Forum for Older People
- Leicester 'Cycle City' Workshop
- Transport Interest Group Meetings
- Centre for Integrated Living (disability group)

In addition to the above, the production of a leaflet providing information on the LTP and AQAP process are proposed in future, as a mechanism for informing the public on the links between air quality action planning and transport planning processes. Opportunities also exist for joint press releases to the Mercury in future, and a plasma screen display at Leicester's Libraries, which could include information on air quality.

5. Implementation and Monitoring

It is important that in finalising the Action Plan, the effectiveness of actions is monitored as they are implemented. For example,

- Does the Action Plan framework provide the necessary reduction in air pollution?
- How do the public and community at large perceive the Action Plan?
- Is it cost-effective?
- What are the wider, non-air quality impacts and overall community impacts now that measures are being implemented?

The main target of the Action Plan is to reduce air pollution in the AQMA in Leicester. However, in the shorter-term this may be difficult to judge (mainly due to fluctuations in concentrations due to other factors such as local meteorology). Other indicators can also be used. The Council's evaluation of the LTP will be utilised for its analysis of traffic flows, public transport use, modal share of journeys into town and so on.

The Air Quality Action Plan for Leicester City Council will require the Council to undertake the following in order to monitor the effectiveness of the Plan:

- Air quality monitoring currently undertaken both within, and external to, the AQMA, shall remain in place for the foreseeable future to ascertain the justification for the existence of the AQMA. Only when there is evidence of concentrations $< 36\mu\text{mg}^{-3}$ over a prolonged period of 24 months will a monitoring location be considered for removal or relocation.
- Air quality monitoring before and after the implementation of a specific option, or suite of options, is essential for determining the impact of an option on local air quality. Air quality monitoring of specific schemes must therefore be included in the overall budget.
- Specific indicators for monitoring the overall effectiveness of the Action Plan, for inclusion in the LTP 2 might include:
 - Number of Travel Plans developed in a 12-month period;
 - Number of Schools with Travel Plans;
 - Reduction in car-parking space allocation in planning developments and proposals;
 - % of journeys by public transport, cycling, walking, private vehicle etc (person trips and vehicle flows currently measured i.e. vehicle flows into inner transport zone at key points, occupancy rates, surveys of bus, cycle and walking trips)
 - some indication of awareness of issues (air quality/ transport) through opinion polls undertaken over the course of the LTP period
 - Congestion
 - % of car journeys associated with school travel
 - % of car journeys less than 2-5 miles
- EMAS indicators for corporate performance monitoring. The specific indicators will match those targets which are emerging within the revised Environmental Statement:
 - Reduce the fuel use by staff vehicles at work
 - Reduce fleet vehicle emissions
 - Reduce car trips to the city centre
 - Reduce proportion of car journeys to school

This Action Plan will build on and utilise these indicators, whilst providing information on air quality targets for LTP reporting processes.

The effectiveness of actions using indicators identified as well as air quality monitoring itself will be reported to stakeholders through the annual Action Plan Progress Report.

6. Appendices

Appendix 1 – workshop participants

Appendix 2—Stage 4 leaflets

Appendix 2: Stage 4 Consultation Leaflet



Leicester's air is polluted

...so what are we going to do about it?




What policies would you like to see to improve air quality in Leicester?

		Strongly agree	Agree	Disagree	Strongly Disagree	Don't know
It does not need improving – it's fine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Initiatives to encourage cycling and walking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Walk to School Schemes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Travel Plans and Car Share Schemes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Roadside Emission Testing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improved bus services: Level access to buses	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improved bus shelters and timetable information	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
More frequent services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Promote green fuels for vehicles eg LPG, electric	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Park and Ride	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Light Rail or Tram Systems	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Congestion charging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Low Emission Zone	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>