Chapter 3

Local Transport Objectives

Chapter Overview

This chapter sets out the County Council's general approaches to delivering the Local Transport Plan objectives. For each of the five objectives the current level of problem in the county is discussed and then a series of Actions which the Council will be taking to resolve these problems is set out. The impact of the Actions on the Government's other Quality of Life objectives is discussed.

Introduction

The objectives of this Local Transport Plan are:

- Tackling Congestion
- Delivering Accessibility
- Safer Roads
- Better Air Quality
- Improving the Street Environment

Putting these objectives at the heart of its Local Transport Plan will deliver quality of life improvements to people in Oxfordshire. These objectives will therefore be the focus for transport improvements in Oxfordshire for this plan period.

Other Quality of Life Objectives

Significant opportunities exist for transport improvements to contribute to other *quality of life objectives* such as traffic noise reduction, tackling climate change, and promoting healthier communities. Although such objectives will never be the only, or even the primary, justification for transport improvements over the next five years, the County Council will actively look for opportunities to make contributions to other quality of life objectives as part of other transport schemes wherever possible. More details of how the County Council's actions will help to achieve the five objectives of this Plan can be found in the "Other Quality of Life Objectives" section towards the end of this chapter.

The Approach to Achieving the LTP Objectives
The actions proposed to deliver the Plan objectives are set out in this chapter. These actions have been developed from the various Strategies that the Council has developed to support the Plan (see chapter 4 for more details). The main benefits of each action are summarised below. Of course, every problem is unique and will therefore require different action, based on a detailed assessment of the exact nature of the problem and its causes.

Value for Money
The actions set out in this chapter have been developed with the knowledge that resources are limited. Some are significantly more resource-intensive than others, and these more expensive solutions will therefore be used only where they have the potential to deliver benefits that justify their cost. The Council will make careful assessments of the value for money that different approaches represent before deciding on a particular course of action, and recognises that certain actions (for example, measures to make walking and cycling more attractive or school and work place travel plans) can represent exceptional value for money when used in a targeted way. Comments on value for money are included for each action below.

Environmental Impact
The County Council has prepared an environmental report on the LTP scheme programme the delivery of which the actions outlined in this chapter will contribute towards. The exact impacts of any action will depend greatly on the way in which that action is implemented, but a brief summary of some of the likely impacts of each approach is included below.

Strategies and Priorities for Action
The Actions identified in this chapter are supported by a range of County Council transport strategies, covering more specific areas, such as buses, travel plans, development control and so on. The details of these strategies, and how they will support the Actions and therefore the Local Transport Plan Objectives, are set out in Chapter 4.

Tackling Congestion

Congestion in Oxfordshire

Congestion - characterised by queues of stationary, stop-start or slow moving traffic – is frustrating for everyone, however they travel. Moreover, the effects of traffic jams on bus, car and freight journey times and their reliability inevitably impact on the county's economy.

For most people, for most of the time, the road network in Oxfordshire functions well. However, there are some places – such as on the approaches to major junctions or in town centres - where queues build up regularly. In

most of these locations, congestion is generally only present during the morning and evening rush hours, but on some of the busiest roads in the county queues can remain for large parts of the day.

The impact of one-off incidents such as accidents or road works can contribute significantly to congestion occurring on the network. Minor interruptions, which would cause limited local impact on free-flowing roads, can have major and widespread impact on roads which are already under stress. More significant interruptions, such as major road works, can have network-wide impacts.

Although congestion trends are currently hard to measure, daily experiences suggest that congestion in Oxfordshire is getting worse. For example, it appears that peak periods are beginning to spread: both the morning and evening peaks start earlier and last longer, meaning congestion is experienced for longer periods of the day. As the population grows and people drive more it is likely that congestion around the county will continue to worsen unless action is taken to address it.

Understanding and Measuring the Problem

The Department for Transport and the Local Government Association, as part of their Transport Shared Priority Pathfinder Project, has asked Oxfordshire County Council to establish a clear definition of congestion in order to guide the County Council's approach to intervention and prioritisation of resources.

The Pathfinder Project has enabled the County Council to understand better the congestion problems that Oxfordshire faces and identify a methodology for establishing at what point congestion should be tackled.

Congestion Pathfinder Project

In 2004, the County Council was invited to join the joint Local Government Association/Department for Transport Shared Priority Pathfinder Project. The proposal from Oxfordshire was to establish a clear definition and methodology for measuring congestion as it relates to the particular local characteristics of a Shire County.

Guidance already exists for those transport authorities governed by the mandatory indicator on congestion, principally focusing on network-wide congestion monitoring in larger urban areas. This approach is difficult to follow in Shire Counties as congestion is often confined to specific parts of the network. This means that in areas like Oxfordshire there is a need to develop additional advice on how best to monitor congestion to demonstrate clear progress towards LTP objectives and hence assist in decision-making.

continued overleaf >>

<< continued from overleaf

Working with consultants Halcrow, the project has involved a comprehensive review of current thinking and best practice and an examination of how suitable different measures would be in the Shire County context, considering in particular:

- How well the measures reflect national and local policy;
- How well the measures show changes over time; and
- How intuitive and relevant to scheme prioritisation the results are.

The study has recommended that a two level monitoring network should be adopted. Firstly, a base network would be defined using existing data from traffic monitoring points across the county. This information, along with data from consultation and studies, has already been used to help identify the worst problems in the Council's prioritization framework.

Secondly, where specific problems are identified and measures are proposed to tackle this, more detailed monitoring will be carried out. This will include the use of journey time information (through Automatic Number Plate Recognition) and separate monitoring of bus reliability where this is affected. These data will be used to set targets and measure progress.

The Study has also informed the development of the local indicators for congestion outlined in Chapter 15.

Congestion in the Wider Context

Long-term Local Transport Strategy
Tackling congestion in Oxfordshire is a key objective of the County Council's Longer Term Transport Strategy, as outlined in Chapter 1, and measures to tackle congestion implemented as part of the Local Transport Plan will contribute towards the achievement of this longer term goal. In addition, the objectives of the Regional Transport Strategy and the Regional Spatial Strategy will be directly supported by measures to improve the operation of Oxfordshire's road network.

Economy
Through its strategy for tackling congestion the County Council can help to create the conditions for continued local economic development by facilitating the efficient and reliable movement of goods and people. It is estimated that congestion costs the UK economy some £20 billion per year, so the potential for a freer-flowing road network to contribute to sustained prosperity should not be underestimated.

Housing and Sustainable Development
Congestion in some parts of the county is currently at a level that prevents significant levels of housing being located in those parts of the county.

Tackling congestion in Oxfordshire will therefore help to provide more opportunities for housing growth in the county, supporting the local and national need to increase the provision of housing for an ever-growing population.

Tourism
Congestion can have an adverse impact on tourism and leisure, and tackling congestion in Oxfordshire will enable the County Council to improve access to many of the tourist and leisure amenities in the county. Queueing traffic is unsightly and can result in poor local air quality, making areas which suffer from congestion less attractive to visitors.

Cross-boundary Planning
Oxfordshire County Council's strategy for tackling congestion will continue to consider cross-boundary congestion issues. The County Council will ensure that neighbouring authorities' strategies for tackling congestion are integrated as far as possible into its own strategies in order that cross-boundary congestion is tackled effectively.

Impact of Congestion on Other LTP Objectives

Air Quality
Congestion can be a major cause of high levels of localised pollution, particularly when traffic moves in a stop-start fashion within built up areas – although the layout of the area will have a major influence on whether this creates a problem.

Road Safety
High levels of congestion can lead to drivers 'rat running' to avoid the congestion. These 'rat runs' are often through residential areas, where traffic can have a negative impact on road safety in the affected areas (particularly on walking and cyclists).

Accessibility
Congestion affects the reliability and attractiveness of alternative modes of transport to the private car, especially buses. This can make it difficult for people to access employment, hospitals and other key services.

Quality of the Street Environment
High congestion levels can result in an unattractive environment for pedestrians and cyclists. Queueing traffic is intrusive and, coupled with the noise and fumes that accompany traffic jams, this can make for a very poor street environment.

A Strategy for Tackling Congestion

The County Council will tackle congestion by means of an approach which combines managing traffic growth (e.g. by improving public transport provision) with limited targeted network capacity increases (e.g. junction

improvements). The actions listed below give more detail about what this approach will mean in practice as schemes are delivered to address identified congestion problems during the Plan period.

Congestion Action 1: *Make public transport faster, more reliable and more user-friendly*	
Supporting Strategies	Bus, Rail, Network, Travel Plans
Typical Measures	Junction improvements (including traffic signal bus priority), Bus Lanes, Better bus stops and rail station waiting facilities, Real-time information, Park & Ride development
Examples from Programme	Kidlington and Eynsham Premium Routes, London Road Corridor, Oxford Park & Ride Extensions

For many people, bus or rail travel has the potential to be a real alternative to the use of a private car for part or all of their journey. However, for many people public transport is currently not an attractive option. Increasing the appeal of these modes will mean more and more people will want to choose these modes over car travel, helping to manage pressure on congested parts of the county's road networks.

To improve the attractiveness of bus and rail travel relative to travel by private car, the County Council will provide facilities that make travelling by these modes (and access to them) a better experience. The impact of congestion can be particularly severe for bus and coach passengers, affecting both the travel and waiting times. Measures such as bus lanes will therefore bring significant quality of life benefits to *existing* bus users as well encouraging *new* bus users. The County Council's Bus Strategy gives details of these and other facilities and initiatives which will be pursued to encourage bus use.

Value For Money
Although some public transport facilities require new road infrastructure, measures such as bus lanes and bus priority signals can often be introduced by reallocating existing road space, which is usually a far more cost-effective option. Unless the anticipated benefits for congestion are substantial, constructing completely new road infrastructure may often represent poor value for money.

Environmental Impact
The effects of any major new road infrastructure on landscape, biodiversity and habitats are usually high, and the benefits of any such infrastructure will therefore need to be clear for such environmentally intrusive works to be justified. However, an effective scheme will help to reduce emissions and other negative impacts of high levels of car traffic by transferring trips

from car to bus, and this may offset the harmful effects of infrastructure in these cases.
Smaller schemes to improve the attractiveness of bus and rail travel (such as bus stop enhancements and real-time information) will be less damaging environmentally, so the County Council will always endeavour to introduce effective smaller-scale improvements before considering more major works.

Congestion Action 2:	
Manage, develop and maintain the county's road network to reduce the impact of bottlenecks (including road works) and make better use of existing road capacity to improve the flow of traffic	
Supporting Strategies	Network
Typical Measures	Junction improvements, New road links, Linking traffic signals, Better route signing
Examples from Programme	A40 North of Oxford Improvement, A40 Headington Roundabout, Cogges Link Road

Many parts of Oxfordshire's road network (especially key corridors) suffer from congestion, particularly in the morning and evening peak hours. Developing the network, for example by junction improvements or building new sections of road, to improve the flow of traffic through junctions and other bottlenecks will help to minimise delays for car and bus users. Managing the county's road network more effectively through improved route planning, signing and information for drivers will also help the County Council to tackle congestion problems.

The Traffic Management Act 2004 places a Network Management Duty on Local Traffic Authorities. This requires that traffic authorities manage their road network to ensure the safe and efficient movement of traffic. Fulfilling this duty will contribute significantly to tackling congestion on the county's roads.

The County Council is fulfilling its Network Management Duty by:

- Developing a Network Management Plan to allow the Council, in partnership with other agencies to plan effectively for the short, medium and long term operation of the county's road network;
- Having appointed a Traffic Manager and a Network Co-ordinator to ensure the Duty is effectively implemented; and
- Ensuring the Duty is fully supported by a combination of organisational and procedural change and the use of appropriate technology.

For more detailed information on how the County Council will fulfil the Network Management Duty, please refer to the Network Strategy in Chapter 4.

Targeted, well-planned and high quality maintenance will help to prevent congestion by avoiding the need for repeated patching and minor repairs to poor road surfaces. Improving the road network in this way will sometimes cause congestion in the short term, but effective management of such works will help us to minimise disruption.

Value For Money
Major infrastructure enhancements such as rebuilding junctions or creating new link roads are usually extremely expensive. Given the limited resources available to the Council for transport improvements, measures such as these will normally only be considered where significant congestion benefits can be clearly demonstrated, and where other options are not deemed to be effective. However, smaller-scale schemes such as new or improved traffic signals or better route signing are much more likely to be achievable, and can often demonstrate significant benefits despite their lower costs.

Environmental Impact
The impacts of any major new infrastructure on landscape, biodiversity and habitats are usually high, and the benefits of any such infrastructure will therefore need to be clear for such environmentally intrusive works to be justified. Again, smaller schemes to enhance or make better use of network capacity will be less damaging environmentally, and so the County Council will endeavour to introduce smaller-scale improvements before considering major works.

Congestion Action 3: *Make walking and cycling safer and more convenient*	
Supporting Strategies	Active Travel, Casualty Reduction, Travel Plans, Rights of Way Improvement
Typical Measures	Cycle lanes and tracks, Cycle parking, New crossing points, Better route signing and information, Footpath and bridleway improvements
Examples from Programme	Oxford Cycle Network Improvements, Fairfax Ave/Purcell Rd cycle link, Plain Roundabout improvements

Many of the car trips in Oxfordshire are short local journeys, often less than five kilometres in length, and can place a significant strain on the road networks. This is particularly the case in or close to the larger urban areas. If even a small additional proportion of these local trips were walked or cycled, rather than driven, some of the pressure on those networks could be

relieved. Increasing levels of walking and cycling will therefore contribute towards tackling congestion, so the County Council will implement measures and develop initiatives to increase the attractiveness of these modes where they will clearly contribute to delivering the objectives of this Plan.

Value for Money
New walking and cycling routes often represent excellent value for money. Apart from relatively inexpensive maintenance, such facilities will serve communities for many years with virtually no on-going investment. However, the congestion benefits of such facilities are unlikely to be substantial compared to other interventions, such as bus priority and any significant investment in walking and cycling will need to be carefully targeted to maximise the benefits.

Promotional efforts such as travel plans and better information provision which require little or no investment in infrastructure can represent extremely good value for money, and can add considerable value to investment in infrastructure.

Environmental Impact
Where new cycle and pedestrian routes are built close to existing roads, they are likely to have only a limited impact on the surrounding environment. Improvements to stretches of the rural rights of way network can often be achieved by using surfacing materials which are sourced locally and which are sympathetic to the appearance of the surrounding environment. Promotional activities will normally have little or no adverse environmental impacts.

Congestion Action 4: *Enable people to make better informed travel choices*	
Supporting Strategies	Travel Plans, Bus, Rail, Active Travel, Network
Typical Measures	Intelligent Transport Systems/Variable Message Signing, Supporting promotion by schools and employers, Travel loan schemes, Better route signing and promotion for all modes, Public Transport information (e.g. Traveline)
Examples from Programme	Variable Message Signing, Better Ways to School, Real Time Information System

With few opportunities likely to be available to increase the capacity through building additional infrastructure the need to get the most out of the current network becomes ever more important. Intelligent transport systems aim to make the operation of the road network responsive to the

traffic conditions and to communicate information to drivers on a real time basis. Investing in infrastructure to make walking, cycling and public transport more attractive to people may achieve only limited results if the benefits of these modes are not widely publicised and supported by other incentives. This part of the County Council's approach therefore aims to promote the benefits and use of these modes, particularly where such promotion supports new or underused infrastructure. Travel Plans are an excellent way of working in partnership with employers and schools to ensure that they do what they can to encourage people to walk, cycle or use public transport to get to school or work.

Value For Money
Promotional efforts such as travel plans and better information provision which require no investment in infrastructure can represent extremely good value for money, and can add considerable value to investment in infrastructure.

Environmental Impact
Promotional activities requiring no new infrastructure will normally have little or no adverse environmental impacts.

Congestion Action 5: *Manage parking to support transport improvements and initiatives*	
Supporting Strategies	Parking
Typical Measures	Controlled parking zones, Park & Ride development, Better management of car parking
Examples from Programme	Controlled Parking Zones in Oxford, Oxford Park & Ride Extensions

Management of parking is essential to the success of strategies to encourage more people to use public transport, walk or cycle. It is important that parking caters adequately for those who need to use a car e.g. those with mobility or visual impairments, and to help maintain economic competitiveness. However, the availability of parking must take into account the capacity of the connecting road networks and the need to prevent dangerous or inconsiderate parking in inappropriate places. Managing car parking is an essential tool in helping to manage traffic levels and thereby reducing the effects of congestion, but must be supported by public transport, walking and cycling improvements to ensure access is maintained.

Value For Money
Controlled parking zones and any associated signing or equipment are relatively inexpensive to introduce, and have the potential to make a

significant improvement to congestion problems if used strategically. Moreover, the reductions in traffic that careful management of parking can bring about may well mean that expensive infrastructure-based measures to tackle congestion are not required. Any parking-related revenue raised by the County Council will also help to increase the value for money of parking measures, and may in some cases allow complimentary transport improvements to be delivered that might otherwise be unaffordable.

Environmental Impact
The management of parking rarely requires any construction or additional land use, and the slight visual intrusion of new signs and lines will generally be offset by the benefits of improved local air quality and the removal of unnecessarily parked cars.

Congestion Action 6: *Ensure that new development is planned in such a way as to minimise congestion problems.*	
Supporting Strategies	Development Control
Typical Measures	Negotiation of contributions to and provision of transport improvements, Targeted advice to planning authorities
Examples from programme	Measures not delivered through capital programme, see Development Control Strategy for how the County Council will deal with development proposals to ensure that transport and land use planning are fully integrated.

Over the period of this Local Transport Plan, a significant amount of new development will need to be accommodated in the county. As the strategic planning authority for the county, the County Council sets out the general location of development in relation to existing settlements and other infrastructure in its Structure Plan. However, as highway authority, the County Council has a very important role in ensuring that the exact location and layout design of new development will not cause new congestion or worsen existing problems. For example, developments which might ordinarily generate significant numbers of additional car trips in already congested areas are likely to be considered unacceptable unless they are able to show how they will minimise the number of car trips generated by their development.

Value For Money
This is a process which is currently undertaken by the County Council as highway authority, and any shift in policy to support LTP Objectives will therefore not require additional investment. Developer contributions

secured through the development control process can be used to introduce facilities that might otherwise have been unaffordable.

Environmental Impact
Transport improvements provided by developers to support new development will inevitably have some negative environmental impacts if they involve the construction of new infrastructure on previously undeveloped land. However, such improvements will normally only be sought by the County Council to prevent transport problems occurring or being made worse as a result of new development, and as such any negative impacts of such measures should be offset by the benefits they bring about.

Delivering Accessibility

Accessibility in Oxfordshire

Access to jobs and services is essential to a good quality of life. For people who own or have access to a car, getting around Oxfordshire is relatively straightforward, albeit time-consuming in congested areas. The county's road network is well-developed, and provides car users with direct links to all major destinations. However, for those people who do not have access to a car for all or part of the time, getting to key destinations is often far from easy. The coverage of the public transport network is significantly less comprehensive than the general road network, leaving some people who rely on buses and trains with severely limited access to jobs and services.

Oxfordshire has a rich environment and cultural heritage combined with educational and scientific excellence. Yet despite this widespread affluence and success, there are areas of localised urban deprivation and dispersed rural deprivation, with an increasing gap between rich and poor. As it is more difficult to tackle these dispersed pockets of poor accessibility in a cost effective way these problems have persisted.

In many areas services are being concentrated in the main towns of Oxfordshire and in particular into Oxford. Shops and services have been closed down in many villages, and education and health services centralised. Many jobs have gone from the rural economy which has meant people have had to move out of rural areas, making services far more difficult to maintain in these areas.

To improve accessibility in Oxfordshire, the County Council will focus on four key services which profoundly affect people's quality of life: education, health, employment, and food. With particular priority being given to access to healthcare and access to employment and training.

Access to Education and Skills
At their worst, problems accessing education centres such as schools and colleges at the required times can prevent people from fully participating in learning. More commonly, though, people may find that their ability to

choose a type, quality, and level of education that meets their needs is restricted.

Access to Employment
Inadequate or expensive transport is rarely the only barrier to employment, but it can be a significant factor. Poor transport can prevent people from taking up, and keeping, employment opportunities and can restrict their choice of jobs. For some jobseekers it is a lack of available transport opportunities which limits their employment opportunities, whilst for others it is the prohibitive cost of transport fares. In recent years there has been a growth in employment opportunities in non-central locations in Oxfordshire. These locations are difficult to serve with public transport compared to major centres.

Access to Health
Ultimately poor access to health services affect people's standard of health. Although health is generally good across the county, there are some areas of poorer health in the main urban areas. Like many other areas of the country, Oxfordshire has an ageing population which creates increasing challenges for health provision. In recent years there has been a centralisation of health provision in the county, in particular to sites in the Headington area of Oxford. However, there have also been initiatives to make health services locally accessible including drop-in centres, minor injuries units at local hospitals, and the NHS telephone advice line, 'NHS Direct'. Engaging with partners in the health sector will be key to ensuring that issues relating to access to health are addressed.

Access to Healthy Affordable Food
A combination of bad diet and lack of exercise is making obesity a serious threat in the UK. Having limited access to high quality produce makes it very difficult to sustain a healthy diet, so improving access to town centres and/or supermarkets is an important part of planning for better accessibility.

Understanding and Measuring the Problem

The County Council has used *Accession*, an accessibility mapping software package developed for the Department for Transport, to undertake a strategic analysis of accessibility issues in Oxfordshire. The analysis assessed journey opportunities related to the four key services mentioned above. The first step in this was to conduct workshops with service providers and members of the public, along with the collection of transport network information for both public transport services, roads, and the locations of origins and destinations. Additional data was sourced from the County Council's own records, such as education establishments, consultations previously undertaken, published sources and limited survey work.

The initial *Accession* results have highlighted a number of accessibility issues in particular locations in Oxfordshire. A more detailed local assessment of each of these identified issues is being carried out and Local Accessibility

Action Plans developed in partnership with local people, service providers and transport operators. This work consists of a number of different elements:

- Sourcing, reviewing and identifying the lessons from other detailed studies and reports;
- Refining mapping and other analysis to include factors such as travel cost, information, reliability, community transport, bespoke services, security and other locally important factors; and
- New surveys and public consultation to understand the local significance of particular problems and obtain data on services and facilities not covered by existing data sources.

Accessibility in the Wider Context

Improving access to services such as employment, education, health care and food will naturally directly support a range of other objectives. The potential of improved accessibility to help achieve economic and social benefits is alluded to above: healthier communities through better access to GPs, hospitals and healthy food, more learning opportunities for all through better access to education centres, and greater choice and opportunities in employment through better access to work places.

Pilot Accessibility Action Plan

Since publication of the Provisional Local Transport Plan and the Framework Accessibility Strategy, the County Council has sought to refine and test the most appropriate process for taking forward the accessibility strategy in the County. As such, a Pilot Accessibility Action Plan has been developed.

In the first instance, the Accessibility Action Plan is linked to the public transport review process, which targets subsidised public transport services to settlements included in each review area. The County Council intends that accessibility assessments should help to inform the public transport review process. The Abingdon & Oxford area is the subject of the current review, which may lead to changes to the public transport network in June 2006.

Within the broad area covered by the Abingdon & Oxford review, specific areas were identified upon which to focus the Pilot; strategic accessibility mapping and previous consultation with partners were used to identify priority locations and associated access needs. These were identified as access to healthcare from Berinsfield and the South East Oxford Arc.

As part of taking forward the Pilot Accessibility Action Plan, the County Council has established a Local Accessibility Partnership. Membership of the

Partnership includes officer representatives of services such as health, economic development and education within the County Council and partner organisations from external organisations, including healthcare providers such as the Primary Care and Hospital Trusts.

In order to inform the process, a series of analyses were carried out to identify the extent of problems in the target areas. Principal among these were detailed assessments using Accession. These built on work carried out in the strategic audit, refining inputs and assumptions to reflect the Pilot areas' requirements and issues. A series of tests were carried out looking at access from Berinsfield (by public transport) and the South East Oxford Arc (walking, cycling and by public transport) to each of the main hospital sites in Oxford (Churchill and John Radcliffe Hospitals and Radcliffe Infirmary), both with and without allowing people to change buses en-route, as well as access to GP Surgeries for residents of the South East Oxford Arc. The bus-related tests were targeted at key times for appointments at the hospitals and surgeries. As an initial indication of the potential scale of the problem, the locations of people who cited 'transport' as a reason for missing hospital appointments were also plotted in GIS.

Whereas the locations of missed appointments are spread across the Pilot areas, results of the Accession analyses indicated that access is possible for all residents of the pilot areas within reasonable journey times, albeit this generally requires interchange between bus services. Discussions with Partnership members indicated, however, that the need to interchange is a key part of the problem for many people. Indeed, in Berinsfield, the need to change bus was reported by health workers as a major deterrent to patients using bus services to get to hospitals, to the extent that voluntary car schemes from the village are heavily used in preference.

Potential solutions being examined include:

- Improvements to interchanges onto hospital-bound buses – this could include provision of specific information describing interchange locations and arrangements, as well as enhancements at bus stops themselves
- Enhanced and specific public transport information showing potential access opportunities to the hospitals – to be made available at GP surgeries and tailored to address the needs of the catchment area of the surgery
- Supply of specific and targeted public transport information to patients when appointments at the hospitals are issued
- Enhanced bus services – as part of development of the John Radcliffe Hospital, the Hospital Trust is planning enhancements to some bus services that provide direct links to a number of areas within Oxford, including the South East Oxford Arc.

Of the potential measures being considered, only the first is a task for the County Council alone, though there is clearly a role for the County Council

across all the potential measures. As such, these other measures will only succeed through Partnership working with the health service providers, in particular in seeking to incorporate the provision of public transport information into the normal process of hospital appointment organisation.

The Pilot Plan has also identified some potential indicators and targets that are related to the problems in the target areas studied in the Pilot and the potential measures being considered.

Future Accessibility Action Plans

The County Council intends to proceed with a similar process to that developed in the Pilot Accessibility Action Plan throughout Local Transport Plan period, in a series of Accessibility Action Plans based on the on-going public transport review process.

The programme of Action Plans is to be as follows:

Autumn 2005 – Spring 2006	Berinsfield (health)
	South and East Oxford (health)
Spring – autumn 2006	Rural Areas (health and employment & skills)
Spring 2007	Chinnor (employment & skills)
Spring 2008	Didcot (health and employment & skills)
Autumn 2008	Charlbury & Chipping Norton (health)
Spring 2009	Banbury (health and employment & skills)
	Bicester (employment & skills)
Spring – Autumn 2010	Witney/Carterton (health)
	Abingdon (employment & skills)
	South Oxford (employment & skills)
	Berinsfield (employment & skills)

In essence, the public transport review process will set the scene by defining an area within which priority locations, and thus priority journeys and issues, will be identified based on analysis and consultation with partners.

Perhaps the clearest lesson from the Pilot, to be incorporated into future Plans, is the value of Partnership working, recognising the sometimes difficult (particularly) initial engagement of Partners in the process. However, now that the County Council has set up the Local Accessibility Partnership, there is every intention that this will only develop further as an integrated and established part of the on-going process.

Safer Roads

Safer Roads in Oxfordshire

Although daily experiences of road safety problems are usually confined to 'near misses' and delays arising from accidents involving others, many people are rightly concerned over the often very high human and financial costs placed on individuals, families and the wider community by traffic accidents. The cost placed on the accidents that occur on Oxfordshire's roads each year - estimated to be around £200 million – gives a measure of the problem.

The numbers of road deaths and injuries in recent years in Oxfordshire has shown a general improvement. This reflects not only the effects of the road safety work carried out by the County Council over many years, but also other measures – for example, more stringent regulation of drivers and the ongoing improvements to vehicle design.

Despite this, there is no complacency over what is still a major problem – the risk of travelling by car or motorbike far exceeds that of rail or air transport. The County Council continues to place a high priority on improving road safety. Improved safety will reduce the heavy burden placed on the individuals who might otherwise have been involved directly in accidents, on the health and other public services, and lessen the fear of accidents. It will also directly benefit motorists who currently suffer significant delays due to accidents, and improve freedom of choice for those who wish to walk or cycle but who are presently deterred due to concerns over safety.

Understanding and Measuring the Problem

The County Council processes and analyses the reports of injury accidents received from the police to identify problem sites, routes and areas meriting further investigation for remedial measures. In addition to this analysis of the geographical spread of accidents, the Council also analyses the data to establish behavioural and demographic patterns to help target its education, training and publicity programmes.

Concerns over traffic speeds feature very highly in the surveys of Community Safety in 4 of the 5 district council areas in the county; successfully addressing these genuine safety and quality of life concerns will continue to be a priority for the County Council.

Focus group research and wider public and stakeholder consultation conducted in Autumn 2004 confirmed that road safety is of significant public concern. Participants were particularly keen that road safety should be improved for vulnerable road users, recognising that real or perceived safety problems can be a significant barrier to increased walking and cycling. There was also significant concern for child safety; strong support was given for reducing traffic speeds in areas where children are likely to be at risk,

and for education of youngsters to raise awareness of the dangers posed by motor traffic.

Specific Road Safety Policy Issues
To understand fully the road safety problems in Oxfordshire, a number of trends and societal factors which affect the type and concentration of accidents that occur in the county need to be considered.

Disadvantage
Research has demonstrated a strong link between accident involvement risk and disadvantage. Analysis of accident data in Oxfordshire does bear out this finding, although perhaps because Oxfordshire is a relatively prosperous county, this is not as evident a problem as in other areas. Many of the areas of disadvantage have already benefited from safety improvements (such as extensive traffic calming) and there are now comparatively few clusters of accidents in disadvantaged areas. In the future, other strategies – such as directing education, training and publicity measures to more disadvantaged areas - will become increasingly important.

Children
Oxfordshire's child injury rate is relatively low. While this is likely to reflect in part the comparative prosperity of the county, the County Council has also played its part by using practical skills based training programmes for child pedestrians and cyclists for many years, and also promoting the correct fitting and use of child restraints in cars. A child road safety audit was carried out in 2000 and the County Council is currently in the process of updating this, applying the guidance issued by the Department for Transport, in 2005.

Urban Areas
Approximately 50% of Oxfordshire's road casualties result from accidents on urban roads. As would be expected, although the average severity of such accidents is lower than on rural roads, the great majority of pedestrian and cyclist casualties are sustained on urban roads. Oxford in particular stands out in having appreciably higher accident rates both for all road users and for pedestrian and cyclist casualties, probably because of the high flows of all kinds of traffic and the fact that this traffic shares often very limited space on the city's road network. Particularly high concentrations of casualties (including those to pedestrians and cyclists) are found in shopping streets and those areas with high levels of night time activity.

Rural Areas
The average severity of injury is appreciably higher on rural roads reflecting the higher average speeds on such roads. The great majority of injuries on rural roads are to motor vehicle occupants, as this is the main means of rural travel.

Approximately 20% of the county's rural road injuries are sustained on the M40 and A34 and A43 trunk roads which are the responsibility of the Highways Agency. Elsewhere on Oxfordshire's road network, a large number

of site specific safety improvements have been carried out in past years which appear to have been very effective in reducing the number and severity of injuries. Although there are still many sites where remedial measures are being investigated, increasing emphasis is now being directed to route action measures in conjunction with a speed management strategy.

Motorcyclists
Riders and passengers of powered two wheel vehicles experience particularly high risks of fatal and serious injury. While the number of such injuries declined substantially during the 1980s, in recent years there has been very little change in both total casualties and those killed and seriously injured. Accidents involving motorcyclists are generally dispersed on the road network therefore site specific engineering measures are rarely justified. Working with partners to direct education to these users is therefore of high importance.

Safer Roads in the Wider Context

Longer-term Transport Strategy
Improving the safety of travel is one of the County Council's longer term transport objectives.
Health
The linkage between improving road safety and the health of Oxfordshire's residents is clear, and improving the safety of the county's roads will make a direct contribution to safeguarding and improving the health of communities.

Economy
In addition to the immediate costs to people's health, each road safety accident generates a substantial cost in terms of resources, lost production, health-care, and social benefits. Indeed, road accidents have been estimated to cost the country over £16 billion per year. Costs to Oxfordshire's economy as a result of road casualties will therefore be reduced as road safety is improved.

Impact on other LTP Objectives

Congestion and Air Quality
Even minor accidents can cause major congestion, particularly if they happen on busy roads and at peak times. This congestion can in turn create local air quality problems though, apart from roads which experience a very high frequency of accidents, these isolated increases in emissions are extremely unlikely to have any direct impact on health.

More indirectly, road safety problems deter many people from walking or cycling, meaning they often choose to use the car for trips which they might otherwise have walked or cycled. This extra burden on the road network can only add to congestion and air quality problems.

Accessibility
If people do not feel that the road network is safe, their travel choices may be significantly limited. For people without a car, the knowledge that road safety problems exist on a particular route can be seriously restricting, particularly if public transport along that route does not meet their needs. This can affect people's access to, or choice of, employment, health, education and food.

Improving the Street Environment
A dangerous road environment is unpleasant to spend time in and will prevent people from relaxing in their surroundings. In shopping streets or other areas with a high concentration of leisure facilities, traffic dangers can have a major impact on the vitality of the area, affecting its economic performance and hampering people's enjoyment of the space.

A Strategy for Safer Roads

The County Council will reduce road casualties by combining three general approaches – Engineering (e.g. altering and improving the road layout to prevent accidents), Enforcement (e.g. introducing new speed limits and associated measures to encourage drivers to stick to them) and Education (e.g. training programmes aimed at specific road user groups to encourage safer use of the road network). The actions listed below give more detail about what this strategy will mean in practice as schemes are delivered to address identified road safety problems during the Plan period.

Road Safety Action 1: *Improve the design and layout of the highway where necessary to address known safety problems*	
Supporting Strategies	Casualty Reduction, Active Travel
Typical Measures	Junction improvements, signalisation, Lining and signing, Traffic calming
Examples from Programme	A40 Headington Roundabout, A4074 Woodcote Crossroads, other Lower Cost improvements

Layout and design can often be the cause of road accidents and if so, this will be revealed by the statistics collected by the County Council. Changes to the design and layout of problem stretches of road or specific junctions will therefore often be the most appropriate solution.

A large number of engineering schemes addressing the design and layout of known accident problem sites have already been progressed in Oxfordshire. The lessons learned from the schemes implemented in the past will be applied to any new schemes that are progressed. This is possible because of the comprehensive monitoring of accident statistics that is undertaken by

the County Council which enables a clear assessment of the effectiveness of the full range of engineering solutions available to the council.

Value For Money
The social and economic costs of road accidents are extremely high, so even expensive road safety schemes may represent excellent value for money if they successfully address significant problems. Engineering measures need not be expensive, however, and simple schemes have often proved highly effective in reducing casualties at problematic sites. Road safety problems can sometimes be addressed through the careful design (at no extra cost) of a scheme being developed for other reasons, and these opportunities represent excellent value for money. For example, a junction improvement scheme whose primary aim is the relief of congestion can, with careful design, address a known accident problem simultaneously.

Environmental Impact
Engineering measures to improve road safety do not usually impact significantly on the environment. Junction improvements sometimes require localised widening and/or traffic signals and traffic calming that requires new signing, lining, or street lighting may have some visual impact on rural areas. The County Council will ensure that lining and signing is kept to a minimum, and that any new lighting minimises light pollution.

Road Safety Action 2: *Better management of vehicle speeds*	
Supporting Strategies	Casualty Reduction
Typical Measures	New and extended speed limits, Traffic calming, Speed-reactive signs
Examples from Programme	Vehicle Activated Signs, 50mph speed limits

Speed is a major factor in both the number and severity of accidents. A few miles per hour can make a big difference to whether a pedestrian hit by a car survives, and excessive speeds on rural roads can cause drivers to lose control, often with fatal consequences. Managing vehicle speeds will therefore be an essential component of the County Council's approach to improving the safety of Oxfordshire's roads for everyone – however they choose to travel.

The County Council's approach to speed management includes:

- Better speed enforcement demonstrated through its active membership of the Thames Valley Safer Roads Partnership
- Strategic deployment of Speed Indicator Devices
- Agreement of new and altered speed limits

Physical traffic calming can be controversial, and will generally only be introduced where a need to manage vehicle speeds has been identified through accident reports, where such measures are supported locally and will help to solve the problem.

Value For Money
Many speed management initiatives involve measures such as new signage or speed reactive signs. These are usually inexpensive, but rely on road users responding voluntarily to be effective. More direct forms of speed control, such as traffic calming, are clearly more expensive - but well-designed features can physically prevent vehicles from exceeding the speed limit.

Environmental Impact
Speed-management measures do not usually require significant physical works, and any works required can nearly always be carried out within the existing highway. As such, the only environmental impacts likely to arise from speed-management initiatives are those associated with signing and lining installed to support existing or new speed limits.

Road Safety Action 3: *Provide effective road safety education, training and publicity*	
Supporting Strategies	Casualty Reduction
Typical Measures	Promotional material, Roadshows, Training programmes
Examples from Programme	Better Ways to School, Revenue funded Training programmes

The overall level of road accidents in Oxfordshire would undoubtedly be reduced if all residents of the county were more aware of how to use the road network more safely – however they choose to travel. In particular, there is a need to communicate more clearly the very close relationship between traffic speeds and the frequency of accidents.

Value For Money
The benefits of road safety training and education are difficult to quantify in terms of casualty reduction, but the County Council considers that these initiatives represent excellent value for money. Although staff-intensive, education and training generally require no capital investment. Research has shown that cyclist training and other similar programmes equip people with the skills and knowledge to travel more safely, and all educational and promotional activities help to raise awareness and contribute to a culture of safe road use.

Environmental Impact

Promotional activities requiring no new infrastructure will normally have very little or no adverse environmental impacts.

Road Safety Action 4:	
Ensure that new development is planned in such a way as to prevent road safety problems being created.	
Supporting Strategies	Development Control, Casualty Reduction
Typical Measures	Negotiation of contributions to and provision of transport improvements, Targeted advice to planning authorities
Examples from Programme	Measures not delivered through capital programme, see Development Control Strategy for how the County Council will deal with development proposals to ensure that transport and land use planning are fully integrated.

As a highway authority, the County Council has a very important role in ensuring that the location and layout design of new development is safe – particularly when new roads are built as part of a development. Preventing problems is nearly always significantly cheaper than developing solutions for them after they have arisen. The County Council will ensure that developers consider the safety of all road users when planning developments, and recommend refusal of applications which create clear road safety hazards. Specific design solutions for new residential roads such as Home Zones will continue to be promoted by the County Council when giving advice to local planning authorities on new housing developments.

Value For Money

This is a process which is currently undertaken by the County Council as highway authority, and any shift in policy to support LTP Objectives will therefore not require additional investment. Developer contributions secured through the development control process can be used to introduce facilities that might otherwise have been unaffordable.

Environmental Impact

Transport improvements provided by developers to support new development will inevitably have some negative environmental impacts if these improvements involve the construction of new infrastructure on previously undeveloped land. However, such improvements will normally only be sought by the County Council to prevent transport problems occurring or being made worse as a result of new development, and as such any negative impacts of such measures should be offset by the benefits they bring about.

Better Air Quality

The quality of Oxfordshire's air is generally very good. However, in the few locations where there are air quality problems in the county, the main cause is motor traffic.

In Oxfordshire, air quality problems - defined as locations where one or more national Air Quality Objective is currently exceeded or where one is likely to be in the near future - are almost exclusively confined to roads in built-up areas that carry a high volume of traffic. In most cases only the road itself, the pavements either side and any properties which front directly onto the road fall within the area of exceedence so relatively few people are exposed to pollution levels which may affect their health.

However, although air quality problems in Oxfordshire are not widespread, they need to be taken seriously where they are occurring. As motor traffic is the only significant source of emissions at these problem locations the County Council recognises that, as a transport authority, it must play a leading role in delivering improvements.

Understanding and Measuring the Problem

Air quality monitoring in Oxfordshire is carried out by the county's five district authorities. These authorities all follow a review and assessment process set out by the National Air Quality Strategy. Air pollution levels are calculated using data from diffusion tubes and automatic monitoring stations, supported in some cases by modelling based on the data from monitoring sites.

Pollution levels are not monitored everywhere: locations likely to experience high concentrations of pollutants are identified using traffic flow data, and these locations are then monitored to investigate the possibility of exceedences. If levels are above or close to the exceedence level for any pollutants, more detailed monitoring and data analysis is carried out to get a better idea of the severity of the problem. This detailed assessment can lead to the designation of an Air Quality Management Area (AQMA) if levels are found to exceed national objectives.

In areas where an AQMA is designated and it is established that the main cause is related to the level of traffic, the County Council will work with the relevant District Council to develop an Air Quality Action Plan to address the problem.

Air Quality in the Wider Context

Health

It is widely accepted that poor air quality can have a negative impact on people's quality of life. Continual exposure to polluted air can lead to

negative impacts on health. Improving air quality in areas where people live, work and shop will help to improve their health and so have a positive impact on their quality of life.

Economy
Poor air quality can have a negative impact on the economy in any given area by making it a less attractive place for offices and shops to locate. High levels of exhaust emissions from motor traffic make streets less pleasant to spend time in, and may ultimately cause people to avoid such streets and any shops and businesses located there. Improving air quality in such areas therefore has the potential to encourage more inward investment by making them more attractive to people looking for somewhere to locate shops, offices or other amenities.

Tourism
Air quality problems have the potential to make centres for tourism and leisure less attractive and in doing so reduce visitor numbers. Improving air quality in such areas should reverse this trend, encouraging more visitors and having a related positive impact on the local economy.

Climate change and greenhouse gases
Improving local air quality and addressing the global issues of climate change and greenhouse gases are not always complementary goals: a by-pass, for instance, can improve local air quality by removing traffic from a populated area but, by increasing vehicle mileage, could result in greater global emissions.

However, measures that tackle local air quality problems by reducing traffic or by encouraging the use of vehicles that produce fewer greenhouse gas emissions would contribute to efforts to curb climate change and cut global greenhouse gas emissions. When developing solutions to local air quality problems, the County Council will therefore consider the global context alongside local concerns, to ensure a mutually beneficial approach is taken wherever possible.

Impact of Poor Air Quality on Other LTP Objectives

Poor air quality does not directly affect congestion, road safety or accessibility. However, pollution does affect the *quality of the street environment*: traffic fumes can make a place unpleasant to spend time in, deterring pedestrian activity and undermining the vibrancy of the street. Often the combination of fumes, noise and the physical intrusion of motorised traffic in a street makes it a genuinely poor public space. In addressing air quality problems, the County Council will take every reasonable opportunity to ensure that these related problems of noise and intrusion are considered alongside pollution levels to ensure measures to improve air quality also contribute as much as possible towards improving the quality of the street environment.

A Strategy for Air Quality

The County Council's strategy for improving air quality consists of a range of actions which fall broadly into the following categories:

- changing how people travel to and through problem areas by introducing measures to encourage more use of public transport, walking and cycling
- improving traffic flow to ensure individual vehicles pollute less
- encouraging the use of vehicles which produce cleaner emissions
- encouraging people to avoid problem areas altogether

This strategy will be supported by the formal Air Quality process in which the County Council will participate fully through the development (jointly with the relevant District Council) of Air Quality Action Plans for areas that are officially designated as having air quality problems.

Air Quality Action 1: *Make public transport faster, more reliable and more user-friendly*	
Supporting Strategies	Bus, Rail, Network, Travel Plans
Typical Measures	Junction improvements, Bus Lanes, Better bus stops and interchanges, Real-time information, Park & Ride development
Examples from Programme	Air Quality Action Plans, Kidlington and Eynsham Premium Routes, London Road Corridor, Oxford Park & Ride Extensions

Improvements to public transport have the potential to contribute, sometimes significantly, to a reduction in traffic volumes (and an accompanying improvement in flows) in areas of poor air quality. Emissions per passenger from public transport are significantly lower than from private cars, and further improvements in bus engine technology will ensure that this benefit becomes increasingly significant (see below). To improve the attractiveness of bus and rail travel relative to travel by private car, the County Council will provide facilities that make travelling by these modes (and access to them) a better experience. The County Council's Bus Strategy gives details of the facilities and initiatives which will be pursued to encourage bus use.

Value For Money

Although some public transport facilities require new infrastructure, measures such as bus lanes and bus priority signals can often be introduced by reallocating existing road space, which is usually a far more cost-effective option. Unless the anticipated benefits for air quality are substantial, constructing significant completely new infrastructure may often represent poor value for money.

Environmental Impact
The effects of any major new infrastructure on landscape, biodiversity and habitats are usually high, and the benefits of any such infrastructure will need to be clear for such environmentally intrusive works to be justified. However, an effective scheme will help to reduce emissions and other negative impacts of high levels of car traffic by transferring trips from car to bus, and this may offset the harmful effects of infrastructure in these cases. Smaller schemes to improve the attractiveness of bus and rail travel (such as bus stop enhancements and real-time information) will be less damaging environmentally, so the County Council will always endeavour to introduce effective smaller-scale improvements before considering more major works.

Air Quality Action 2:	
Manage, develop and maintain the county's road network to reduce the impact of bottlenecks (including roadworks) and make better use of existing road capacity to improve the flow of traffic through polluted areas	
Supporting Strategies	Network
Typical Measures	Junction improvements, Linking traffic signals, New links, Better route signing
Examples from Programme	Air Quality Action Plans, Cogges Link Road, Bridge Street Area (Witney)

Improving the flow of traffic through an area may result in a sufficient reduction in pollutant concentrations to meet national air quality objectives, as traffic moving erratically or queuing for long periods generally produces greater emissions than smooth-flowing traffic.

Value For Money
Major infrastructure enhancements such as rebuilding junctions are usually extremely expensive. Given the limited resources available to the Council for transport improvements, measures such as these will normally only be considered where significant air quality benefits can be clearly demonstrated, and where other options are not deemed to be effective. However, smaller-scale schemes including new or improved traffic signals or better route signing are much more likely to be achievable, and can often demonstrate significant benefits despite their low costs.

Environmental Impact
The effects of any major new infrastructure on landscape, biodiversity and habitats are usually high, and the benefits of any such infrastructure will need to be clear for such environmentally intrusive works to be justified. Again, smaller schemes to enhance or make better use of network capacity will be less damaging environmentally, so the County Council will endeavour to introduce smaller-scale improvements before considering major works.

Air Quality Action 3: *Make walking and cycling safer and more convenient*	
Supporting Strategies	Active Travel, Casualty Reduction, Travel Plans, Rights of Way Improvement
Typical Measures	Cycle lanes and tracks, cycle parking, new crossing points, better route signing and information, Footpath and bridleway improvements
Examples from Programme	Air Quality Action Plans, Oxford Cycle Network Improvements, Fairfax Ave/Purcell Rd cycle link, Plain Roundabout improvements

Many of the car trips in Oxfordshire are short local journeys, often less than five kilometres in length – journeys which could easily be walked or cycled. Improvements to walking and cycling infrastructure to increase the attractiveness of these modes relative to motorised modes will contribute to better air quality in a similar way as public transport improvements: by reducing traffic volumes (and also thereby improving the flow of traffic) in areas of poor air quality. Walking and cycling are pollution-free modes as far as local air quality is concerned, and a shift to these modes will therefore be beneficial.

Value for Money
New walking and cycling routes often represent excellent value for money. Apart from relatively inexpensive maintenance, such facilities will serve communities for many years with virtually no on-going investment. However, the air quality benefits of such facilities are unlikely to be substantial compared to more radical interventions, and any significant investment will need to be carefully targeted to maximise the benefits.

Promotional efforts such as travel plans and better information provision which require no investment in infrastructure can represent extremely good value for money, and can add considerable value to investment in infrastructure.

Environmental Impact
Where new cycle and pedestrian routes are built on or close to existing roads, they are likely to have only a limited impact on the surrounding environment. Promotional activities will normally have little or no adverse environmental impacts.

Air Quality Action 4: *Enable people to make better informed travel choices*	
Supporting Strategies	Travel Plans, Bus, Rail, Active Travel, Network
Typical Measures	Supporting promotion by schools and employers, Travel loan schemes, Better route signing and promotion for all modes, Public Transport information (e.g. Traveline)
Examples from Programme	Air Quality Action Plans, Better Ways to School

Making walking, cycling and public transport more attractive may achieve only limited benefits if those benefits are not widely known. This part of the strategy therefore aims to promote the benefits of these modes, particularly where such promotion will support new facilities.

Value For Money
Promotional efforts such as travel plans and better information provision which require no investment in infrastructure can represent extremely good value for money, and can add considerable value to investment in infrastructure.

Environmental Impact
Promotional activities requiring no new infrastructure will normally have little or no adverse environmental impacts.

Air Quality Action 5: *Manage parking to support transport improvements and initiatives*	
Supporting Strategies	Parking
Typical Measures	Controlled parking zones, Park & Ride development, Better management of car parking
Examples from Programme	Air Quality Action Plans, Controlled Parking Zones in Oxford, Oxford Park & Ride Extensions

Managing car parking is an essential tool in helping to manage traffic levels and thereby reduce the impact of traffic on air quality, but must be supported by public transport, walking and cycling improvements to ensure that access is maintained. Whilst it is important that parking caters adequately for demand to protect the economy and to prevent dangerous or inconsiderate parking in inappropriate places, the availability of parking must take into account the capacity of the connecting road networks. Managing car parking is an essential tool in helping to manage traffic levels

and thereby reduce the impact of traffic on the air quality, but must be supported by public transport, walking and cycling improvements to ensure access is maintained.

Value For Money
Controlled parking zones and any associated signing or equipment are relatively inexpensive to introduce, and have the potential to make a significant improvement to air quality problems if used strategically. Moreover, the reductions in traffic that careful management of parking can bring about may well mean that expensive infrastructure-based measures to improve air quality are not required.

Any parking-related revenue raised by the County Council will also help to increase the value for money of parking measures, and may in some cases allow complimentary transport improvements to be delivered that might otherwise be unaffordable.

Environmental Impact
The management of parking rarely requires any construction or additional land use, and the slight visual intrusion of new signs and lines will generally be offset by the benefits of improved local air quality and the removal of unnecessarily parked cars.

Air Quality Action 6: *Encourage the use of vehicles with lower exhaust emissions*	
Supporting Strategies	Bus
Typical Measures	Quality Bus Partnerships, Low Emission Zones
Examples from Programme	Air Quality Action Plans

In some areas of poor air quality, opportunities to reduce traffic or make it flow more smoothly may be very limited. In these cases, finding ways to encourage the use of vehicles with lower exhaust emissions may be the only solution. Reducing emissions from vehicles may be an effective approach in areas where other approaches are possible, but where there is a need to reinforce the benefits of traffic volume and flow improvements.

Value For Money
Initiatives to encourage bus operators to improve their fleets are likely to be fairly cost-effective, as long as the investment required of bus operators does not undermine the commercial viability of the services they provide and lead to increased pressure on subsidy budgets. Clearly, measures targeted at reducing emissions from buses will only contribute where buses are a significant contributor to a problem. A low-emission zone that excludes vehicles of any type that do not meet certain emission standards would have the potential to make an immediate and dramatic contribution

to reduced emissions, and such a zone could therefore represent very good value for money.

Environmental Impact
The overall impact of reducing emissions from vehicles should be positive. However, a low emission zone may cause excluded traffic to divert to inappropriate routes so the impacts of any such scheme would need to be carefully considered.

Air Quality Action 7: *Restrict vehicles from areas of poor air quality*	
Supporting Strategies	Bus, Active Travel
Typical Measures	Selective traffic order restrictions, Pedestrianisation
Examples from Programme	Air Quality Action Plans

One obvious way to reduce emissions from traffic is to remove some or all of the motor traffic from a route. Weight limits, for example, can help to reduce the number of HGVs passing through an area of poor air quality. Full pedestrianisation is highly effective in improving air quality but many of Oxfordshire's air quality problems are on key routes which are unlikely to be suitable for such treatment. The involvement of key stakeholders, such as the District Councils, freight and public transport operators, will be key in the development of such treatments.

Value For Money
Vehicle restrictions are unlikely to be expensive and since they can be a very effective way of reducing traffic emissions they may well represent excellent value for money in some circumstances. The implementation of restrictions is often highly controversial so although the capital costs of introducing such a scheme may be low, staff and other procedural costs may be high.

Environmental Impact
Any restriction is likely to have local air quality benefits, though the negative effects of noise, visual intrusion and increased carbon dioxide and other pollutants of global concern caused by traffic diverted to longer, inappropriate alternative routes may negate these if improperly managed.

Air Quality Action 8: *Provide alternative routes for traffic to avoid areas of poor air quality*	
Supporting Strategies	Network Development
Typical Measures	Improved route signing, new road links
Examples from Programme	Air Quality Action Plans

Often it is through-traffic that causes air quality problems, and providing alternative routes can be a good way of reducing traffic levels in a polluted street. This need not necessarily mean building new roads, but may be as simple as redirecting traffic to existing more suitable routes.

Value For Money
The construction of new road links is usually extremely expensive, and this will only normally be considered where other less radical options have failed or where significant benefits across a range of objectives can be demonstrated. Simpler solutions like route signing often give better value for money, even if their benefits are less dramatic.

Environmental Impact
Although solutions such as by-passes help to solve local air quality problems, often such links result in traffic going faster and further than before to avoid areas of poor air quality. This will bring local air quality benefits by removing traffic from built-up areas, but carbon dioxide and other emissions of global concern may sometimes be increased. Clearly, new road construction may also result in significant environmental effects in itself.

Air Quality Action 9: *Ensure that new development is planned in such a way as to minimise negative impacts on local air quality*	
Supporting Strategies	Development Control
Typical Measures	Negotiation of contributions to and provision of transport improvements, Targeted advice to planning authorities
Examples from Programme	Measures not delivered through capital programme, see Development Control Strategy for how the County Council will deal with development proposals to ensure that transport and land use planning are fully integrated.

Over the period of this Local Transport Plan, a significant amount of new development will need to be accommodated in the county. As the strategic planning authority for the county, the County Council sets out the general

location of development in relation to existing settlements and other infrastructure in its Structure Plan. However, as highway authority, the County Council has a very important role in ensuring that the exact location and layout design of new development will not cause new or exacerbate existing air quality problems. For example, developments which might ordinarily generate significant numbers of additional car trips in already polluted areas are likely to be considered unacceptable unless they are able to show how they will minimise the number of trips generated by their development.

Value For Money
This is a process which is currently undertaken by the County Council as highway authority, and any shift in policy to support LTP Objectives will not require additional investment. Developer contributions secured through the development control process can be used to introduce facilities that might otherwise have been unaffordable.

Environmental Impact
Transport improvements provided by developers to support new development will inevitably have some negative environmental impacts if these improvements involve the construction of new infrastructure on previously undeveloped land. However, such improvements will normally only be sought by the County Council to prevent transport problems occurring or being made worse as a result of new development, and as such any negative impacts of such measures should be offset by the benefits they bring about.

Improving the Street Environment

The Street Environment in Oxfordshire

Streets that are dominated by traffic or poorly designed can be unpleasant to spend time in, particularly for pedestrians. A high-quality street environment, on the other hand, can add to the vitality of a street, attracting visitors, boosting businesses and creating a pleasant public space for people to relax in and enjoy.

Oxfordshire's towns are generally historic market towns whose road network was not designed to carry high volumes of motorised traffic. In many of the county's towns, main roads pass directly through the main shopping areas, meaning pedestrians have little choice but to share often narrow streets with motor traffic. The noise, intrusion and pollution caused by traffic in such streets sometimes makes them highly unattractive places to spend time in.

However, traffic volumes are not the only factor in reducing the attractiveness of a street. The design and layout of a street and the materials used for road and footway surfacing can also have a major bearing on its attractiveness and suitability for use for all. Although Oxfordshire has some highly attractive streets, there are places where the location and quality of street furniture and signing, the amount of space available for pedestrians, and the type and design of surfacing materials do little to enhance the street environment.

Improvements to the street environment have been implemented in a number of locations acropss the county in recent years. These have usually been the result of a partnership between County, district and local Councils. It is expected that such arrangements (for consultation, design, and construction) will continue to be the basis for such improvements during the course of the Plan. The details of the arrangements to be used for any particular scheme will be the result of consideration of the nature of the scheme.

Understanding and Measuring the Problem

Identifying those areas where transport contributes to an overall problem in quality of street environment is not an easy task and to a degree will always be a subjective matter. In this Plan the assessment has focused on areas where there are a high proportion of buildings with public access (mostly shops) and where there is a high level both of pedestrian and vehicular activity. Those areas that have been identified as having a poor street environment are those with high volumes of traffic and a layout, design and finish that appears to detract significantly from the overall appearance of the street.

Street Environment in the Wider Context

Economy
Poor street environments can have a negative impact on the economy in an area by making it a less attractive place for offices and shops to locate. High volumes of traffic and poor street design make streets less pleasant to spend time in, and may ultimately cause people to avoid such streets and any shops and businesses located there.

Improving the street environment in such areas therefore has the potential to encourage more inward investment by making them more attractive to people looking for somewhere to locate shops, offices or other amenities.

Tourism
Unattractive streets have the potential to make centres for tourism and leisure less welcoming and in doing so impact negatively on visitor numbers. Improving the street environment in such areas should reverse this trend, encouraging more visitors and having a related positive impact on the local economy.

Impact on other LTP Objectives

Whilst the attractiveness of street environments is not likely to impact directly on congestion, air quality, road safety or accessibility, poorly designed and hostile streets will do little to encourage people to walk, cycle and use public transport. Improving the street environment will therefore contribute – albeit indirectly – to encouraging people to use modes that cause fewer congestion and air quality problems.

A Strategy for Improving the Street Environment

The County Council's strategy for improving the street environment consists of a range of actions which fall broadly into the following categories:

- changing how people travel to and through problem areas by introducing measures to encourage more use of public transport, walking and cycling
- improving traffic flow to ensure individual vehicles pollute less
- encouraging the use of vehicles which produce cleaner emissions
- encouraging people to avoid problem areas altogether

Street Environment Action 1: *Improve the design and layout of streets with poor quality environment, using high quality materials and street furniture wherever possible.*	
Supporting Strategies	Highway Maintenance
Typical Measures	Re-surfacing in high quality materials, appropriate for the area; reducing clutter (for example by rationalising signing); improving street furniture; improvements to street lighting; new planting
Examples from Programme	Oxford High Street, Abingdon Town Centre

The County Council will take every reasonable opportunity to improve the design and layout of streets as part of other transport improvements or maintenance. The County Council has worked successfully in partnership with town and district councils in the past to develop street enhancement schemes, and the County Council is keen that this partnership approach continues. The materials used for schemes will be carefully chosen so as to minimise their impact on all users.

Value For Money
Street environment improvements can be very expensive – particularly where, high quality materials are used. However, street enhancements implemented as part of other transport schemes will usually represent good value for money, particularly when the economic and social value that can result from attractive public spaces is considered. Such schemes can often be taken forward with partnership funding from local councils and other bodies.

Environmental Impact
Street improvement schemes will normally have only limited environmental impacts. By definition, such schemes involve improving the quality of the existing highway infrastructure, and as such no land is likely to be required to improve a street's appearance. Materials and resources will clearly be required, but if street enhancements are implemented as part of a traffic scheme, the *additional* materials required will normally be minimal, though probably more expensive.

Street Environment Action 2: *Restrict vehicles from areas with a poor street environment*	
Supporting Strategies	Bus, Active Travel
Typical Measures	Selective traffic order restrictions, Pedestrianisation
Examples from Programme	Oxford Central Area Bus Gate Enforcement

In many streets – particularly in town centres – it is the presence of large volumes of intrusive motorised traffic that makes the environment unpleasant. Reducing traffic volumes or removing certain classes of vehicle such as HGVs can therefore make a major contribution to the enhancement of a street. Full pedestrianisation brings dramatic street environment benefits, but reduces access and can have negative impacts on other parts of the road network.

Value For Money
Traffic restrictions are usually inexpensive as long as substantial measures are not required to protect the road network from the effects of displaced traffic. As such, restrictions have the potential to represent excellent value for money where street environment problems are caused largely by high volumes of traffic.

Environmental Impact
The overall effects of traffic restrictions will normally be positive, though the effects of displaced traffic on the surrounding road network will need to be carefully considered to ensure that traffic does not divert to inappropriate routes.

Street Environment Action 3: *Make walking and cycling safer and more convenient*	
Supporting Strategies	Active Travel, Casualty Reduction, Travel Plans, Rights of Way Improvement Plan
Typical Measures	Cycle lanes and tracks, Cycle parking, New crossing points, Better route signing and information, Footpath and bridleway improvements
Examples from Programme	Oxford Cycle Network Improvements, Fairfax Ave/Purcell Rd cycle link, Plain Roundabout improvements

Many of the car trips in Oxfordshire are short local journeys, often less than five kilometres in length – journeys which could easily be walked or cycled.

Improvements to walking and cycling infrastructure to increase the attractiveness of these modes relative to motorised modes will contribute to creating a better street environment by reducing volumes of motorised traffic. Increased levels of walking and cycling help to create a vibrant and attractive street scene, and the promotion of these modes will therefore contribute directly to the enhancement of the street environment.

Value for Money
New walking and cycling routes can represent excellent value for money, particularly in urban areas where new construction is often not required. Apart from relatively inexpensive maintenance, such facilities will serve communities for many years with virtually no on-going investment. However, the street benefits of such facilities are unlikely to be substantial compared to more radical interventions such as traffic restrictions, and any significant investment will need to be carefully targeted to maximise the benefits.

Promotional efforts such as travel plans and better information provision which require no investment in infrastructure can represent extremely good value for money, and can add considerable value to investment in infrastructure.

Environmental Impact
Where new cycle and pedestrian routes are built on or close to existing roads, they are likely to have only a limited impact on the surrounding environment. Promotional activities will normally have little or no adverse environmental impacts.

Street Environment Action 4: *Enable people to make better informed travel choices*	
Supporting Strategies	Travel Plans, Bus, Rail, Active Travel
Typical Measures	Supporting promotion by schools and employers, Travel loan schemes, Better route signing and promotion for all modes, Public Transport information (e.g. Traveline)
Examples from Programme	Better Ways to School, Real Time Information System

Making walking, cycling and public transport more attractive may achieve only limited benefits if those benefits are not widely known. This part of the strategy therefore aims to promote the benefits of these modes, particularly where such promotion will support new facilities.

Value For Money

Promotional efforts such as travel plans and better information provision which require no investment in infrastructure can represent extremely good value for money, and can add considerable value to investment in infrastructure.

Environmental Impact
Promotional activities requiring no new infrastructure will normally have little or no adverse environmental impacts.

Street Environment Action 5: *Manage parking to support transport improvements and initiatives*	
Supporting Strategies	Parking
Typical Measures	Controlled parking zones, Park & Ride development, Better management of car parking
Examples from Programme	Controlled Parking Zones, Oxford Park & Ride Enhancements

Management of parking is essential to the success of strategies to encourage more people to use public transport, walk or cycle. Whilst it is important that parking caters adequately for demand to prevent dangerous or inconsiderate parking in inappropriate places, the availability of parking must take into account the capacity of the connecting road networks. Managing car parking is an essential tool in helping to manage traffic levels and thereby reduce the impact of traffic on the street environment, but must be supported by public transport, walking and cycling improvements to ensure access is maintained. Accessible parking bays will be provided as appropriate.

In addition, better management of on-street parking can help to protect residential streets, and other streets in which large numbers of parked cars are inappropriate, from the effects of car parking (and the associated vehicle movements) on the street environment.

Value For Money
Controlled parking zones and any associated signing or equipment are relatively inexpensive to introduce, and have the potential to make a significant improvement to air quality problems if used strategically. Moreover, the reductions in traffic that careful management of parking can bring about may well mean that expensive infrastructure-based measures to improve the street environment are not required.

Any parking-related revenue raised by the County Council will also help to increase the value for money of parking measures, and may in some cases allow complimentary transport improvements to be delivered that might otherwise be unaffordable.

Environmental Impact
The management of parking rarely requires any construction or additional land use, and the slight visual intrusion of new signs and lines will generally be offset by the benefits of traffic reduction and the removal of unnecessarily parked cars which previously had a detrimental effect on the street scene. Care will need to be taken when implementing parking management measures to ensure that displaced parking does not adversely affect other streets.

Street Environment Action 6: *Provide alternative routes for traffic to avoid streets with a poor environment*	
Supporting Strategies	Network
Typical Measures	Improved route signing, New road links
Examples from Programme	Oxford Ring Road Signing, Variable Message Signing

Often it is through-traffic that causes street environment problems, and providing alternative routes can be a good way of reducing traffic levels in a street dominated by traffic. This need not necessarily mean building new roads, but may be as simple as redirecting traffic to existing more suitable routes.

Value For Money
The construction of new road links is usually extremely expensive, and this will only normally be considered where other less radical options have failed or where significant benefits across a range of objectives can be demonstrated. Simpler solutions like route signing often give better value for money, even if their benefits are less dramatic.

Environmental Impact
Clearly, new road construction will result in significant environmental harm and will normally only be considered as a solution to a street environment problem where a new link also demonstrates a range of other significant benefits in terms of LTP objectives. Simpler routeing measures will be far less damaging, and these will normally be considered in favour of new infrastructure as a way of encouraging traffic to avoid streets with a poor environment.

Other Quality of Life Objectives

The objectives above will be the focus of the Council's efforts for improving transport in Oxfordshire between 2006 and 2011. However, there are a

number of other secondary 'quality of life' benefits that well-considered transport schemes and initiatives can achieve, and these are outlined below.

Climate Change and Greenhouse Gases

Carbon Dioxide (CO_2) accounts for around 80% of the UK's greenhouse gas emissions with transport now being responsible for over a quarter of these CO_2 emissions. The level of emissions is related primarily to the total mileage travelled by vehicles but also to the speed of vehicles. The main focus for measures to contain the amount of CO_2 emissions produced by road traffic in Oxfordshire should therefore be measures to control traffic growth.

Whilst addressing climate change and greenhouse gas emissions are not primary objectives of this Plan, many of the Council's key actions proposed above in order to deliver the LTP objectives will contribute significantly to the management of traffic growth – particularly actions which promote the use of public transport, walking and cycling as alternatives to the car. Such actions are quite likely to have at least as significant an impact on greenhouse gas emissions in Oxfordshire as a whole compared to those actions that would be proposed if addressing climate change was one of the key objectives of the LTP. The actions in this Plan (particularly those that relate to congestion, air quality and street environment) are necessarily focused on areas where the problems are most severe and often where the greatest improvements can be brought about. Such action will therefore have a greater overall impact on how people travel in the County and consequently on the production of greenhouse gases.

Landscape and Biodiversity

Almost 75% of Oxfordshire is designated as Green Belt, Area of Outstanding Natural Beauty or Area of High Landscape Value.

Areas of Outstanding Natural Beauty in Oxfordshire

There are three designated Areas of Outstanding Natural Beauty (AONB) in Oxfordshire. (Chilterns, Cotswolds and North Wessex Downs). Section 85 of the Countryside and Rights of Way (CRoW) Act 2000 requires the County Council (along with all other public bodies) to 'have regard to the purpose of conserving and enhancing the natural beauty of the Area of Outstanding Beauty'.

In order for this obligation to be more effective, the Department for Food, Environment and Rural Affairs (DEFRA) has created Conservation Boards bearing statutory duties to ensure the needs of AONBs are protected.

Conservation Boards for the Cotswolds and the Chilterns AONBs were formed in 2004. These two AONB Boards now have a statutory duty 'to conserve and enhance the AONB and to increase understanding and enjoyment of it'. Both Boards have adopted Management Plans which direct the activity of the

County Council in these Areas. The North Wessex Downs AONB Council of Partners has also adopted a Management Plan.

Oxfordshire County Council took part in the production of these Management Plans and has adopted their proposals. The Council looks forward to promoting the special nature of the three AONBs, incorporating their transport policies into this LTP. Broadly speaking, the three AONB Management Plans have the following requirements:

Conserve and enhance the natural beauty of the AONBs by the:

- adoption of strategies to encourage more sustainable, and environmentally less damaging forms of transport, including walking, cycling, horse riding and public transport;

- creation of new road designs which are sympathetic to the rural character of the AONBs, together with appropriate maintenance regimes and reductions in signage;

- marked reduction in the noise, intrusion and danger to vulnerable non-motorised road users caused by motorised traffic by creating a physical environment that will reduce speed and also discourage volume where possible; and

- adoption of strategies to provide improved accessibility for non-car users, both resident and visiting.

The County Council supports these broad objectives, and will look for opportunities for transport improvements driven by the LTP objectives to contribute to achieving them.

Examples of transport improvements which will help to protect and enhance landscape and biodiversity include:

- The trialling of a "cut and collect" grass cutting process which also collects litter and enables the green waste to be composted;
- Congestion relief on rural roads which reduce rat-running on inappropriate routes through sensitive areas;
- Walking, cycling or public transport improvements that improve access to rural areas and reduce reliance on private cars in those areas; and
- New or lower speed limits designed to improve road safety which reduce noise.

Community Safety, Personal Security and Crime

The County Council is committed to improving the safety of pedestrians and public transport users. It aims to improve the quality of bus stops along the designated Premium Routes network and further enhance security at Park & Ride sites. The Council has been awarded Secured Car Park status for the

Water Eaton Park & Ride car park which includes a terminal building with all round vision, landscaping which has been designed with security and visibility in mind and supported by 24 hour CCTV coverage. The County Council will seek to apply these principles to other Park & Ride sites.

The County Council is already working with train operators to improve the quality and ambience of railway stations and aims to achieve the national "safer stations" accreditation where appropriate.

Other examples of transport improvements which will help to reduce crime and fear of crime include:

- Street lighting improvements installed for road safety reasons
- Increasing levels of walking, cycling and public transport use which result in improved 'natural policing'.
- New or lower speed limits or traffic calming designed to reduce casualties which also contribute to community safety by helping to reduce fear of accidents.

Healthy Communities

The County Council is developing an 'Active Travel' strategy to replace the separate strategies covering walking and cycling which were produced in 2001. The promotion of walking and cycling remains a key part of the Council's approach to delivering the LTP objectives, but a secondary benefit of this promotion will be improvements in health and fitness for people who start to walk and cycle regularly.

Other examples of transport improvements which will help benefit health include:

- Reductions in local air pollution
- Better access to healthcare and healthy food.

Sustainable and Prosperous Communities

The general strategy of the County Council's draft Structure Plan to 2016 and its advice to SEERA on the South East Plan to 2026 is to provide a framework for development to sustain economic prosperity, meet housing and other requirements, protect and enhance the environment, reduce the need to travel and make best use of previously developed land. This can be achieved most effectively by having the main focus for development in the larger urban areas.

To this end the Council will seek to locate development where it can reduce the need to travel and encourage walking, cycling and the use of public transport while providing development to meet the economic needs of the county's residents and businesses.

The delivery of the LTP objectives will help to support sustainable economic development in a number of ways, as outlined in the sections on each objective above.

Tourism forms an important and growing part of the local economy within many areas of Oxfordshire. Improvements to the street environment, to air quality, and to reducing congestion and barriers to accessibility will have a positive impact on the attractiveness of the county to visitors.

Noise

Traffic is one of the most important source of unwanted noise for most of Oxfordshire, particularly in the rural areas. Noise from vehicles comes from two main sources – engines and the running of tyres along the road surface. The overall levels of noise is therefore related to the numbers of vehicles on the road and the properties of the road surface itself.

Noise levels have been a major issue in communities alongside the A34 Trunk Road and the M40 motorway. The County Council welcomes the Highways Agency's resurfacing of the A34 between Oxford and the M40 to reduce traffic noise from this road.

The County Council has regard to the need to reduce noise from vehicles when it plans and implements highway and traffic management schemes including:

- Seeking noise reductions when carrying out resurfacing schemes
- Including noise intrusion in the assessment of new schemes
- Taking account of guidance and established practice on noise monitoring