CHAPTER 9

Transport asset management

Introduction

9.1 This chapter describes our strategy to deliver the LTP objective of:

> **Managing transport assets** in the most cost-effective way, through robust condition monitoring, timeliness of intervention and economies of scale in repairs and renewal.

9.2 It includes:

- An overview of our strategy
- Details of how we have developed our Transport Asset Management Plan (TAMP)
- Details of how we will plan and programme maintenance for specific asset groups
- Outline of a proposed supplementary bid for additional funds for 2007-08 to tackle maintenance needs on the roads de-trunked in 2004-05
- The performance indicators we will use to measure and monitor progress
- A summary of the contribution our strategy for tackling congestion will make to our other LTP objectives and to other quality of life issues.

Overview of our strategy for transport asset management

9.3 Well maintained highway assets are important not just for minimising long-term costs but also because they contribute significantly to the delivery of other objectives. For example, cycle tracks with bumps and ruts become rapidly unusable, footways with trip hazards will deter people from walking, and poor road surfaces have a magnified effect for bus passengers and can make travelling by bus an unpleasant experience. Such defects can undermine the effectiveness of the alternatives to car travel. Similarly, emergency repairs to poorly maintained roads or structures, or poor planning of routine repairs, can contribute significantly to worsening traffic congestion.

9.4 Maintenance and renewal of carriageways, footways, and highway structures has benefited from increased DfT funding during LTP1. For LTP2 we have developed a broader and more strategic approach in conjunction with the production of a TAMP. The main purpose of this chapter is to set out our strategy for transport asset management and describe our progress towards developing an effective TAMP. This sets out:

- How we work with our partners to share best practice
- How we use appropriate management systems to manage and improve our assets
- How we work with other stakeholders and communicate with our customers
- How we use condition based information systems for maintenance and renewal to minimise whole-life costing
- How we are continuing to improve our procurement processes to increase our efficiency and effectiveness
- How our programmes for LTP2 will continue the steady improvement in condition we achieved in LTP1.

9.5 Effective maintenance also contributes significantly to the wider quality of life objectives described in Chapter 10. In particular, the good appearance of well maintained infrastructure can be a real asset in the appearance of our towns and villages as well as in the rural landscape.

9.6 In addition to managing existing assets, we have to take account of additions to the asset base arising from the transport investment described elsewhere in this LTP. These implications for asset management are considered towards the end of the chapter. Chapter 11 draws together the measures to manage our transport assets, with those needed to deliver other objectives, into a prioritised capital and revenue programme.

9.7 This chapter also includes a summary of our supplementary bid for additional funds for 2007-08 to tackle maintenance needs on the roads de-trunked in 2004-05. These are in addition to government-funded schemes for de-trunked roads for 2006-07 and form part of our forward programme. The full details of this bid will be submitted by 31 July 2006 as required.

9.8 The chapter demonstrates how we work with our partners to deliver our strategy, including statutory authorities, Leicester City Council, the Highways Agency, public transport operators and neighbouring authorities. It demonstrates the importance we attach to revenue funding to complement our LTP capital implementation programme. It also explains how we ensure best value by monitoring the effectiveness of our measures, seeking additional resources to supplement our own and introducing new and innovative techniques.

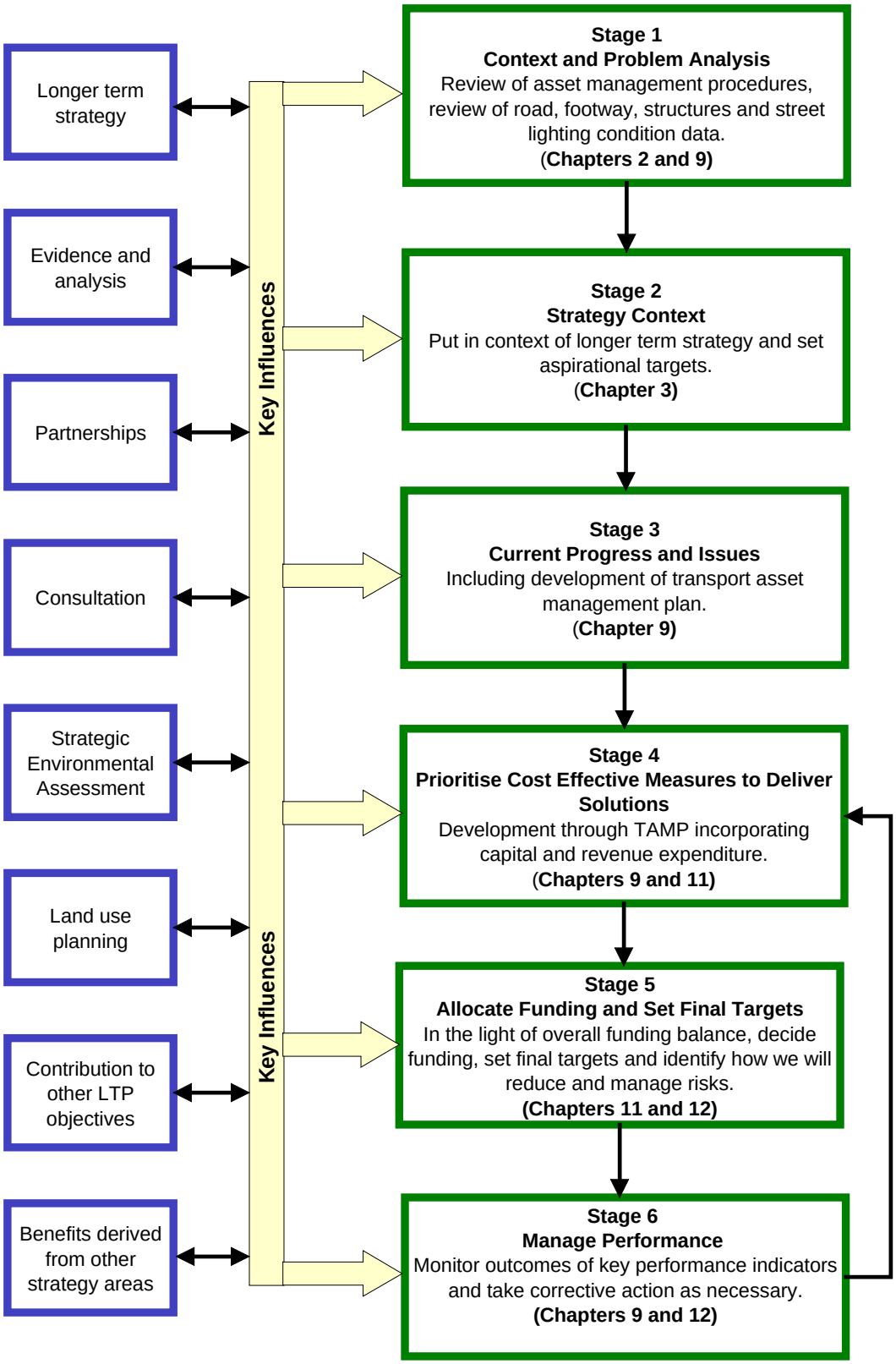
9.9 Finally we explain how we will monitor and manage our performance through a range of performance indicators and show how our transport asset management strategy will contribute to the achievement of our other LTP objectives and will help improve other aspects of quality of life.

9.10 The overall approach we have adopted in the development and delivery of our transport asset management strategy is shown in Figure 9.1.

Indicators and targets

9.11 Targets and indicators for meeting other LTP objectives can only be fully set out once a balance has been drawn between them, as described in Chapter 12. For maintenance, there is a separate allocation of government funding and so the assessment of spending against targets is substantially separate from that for the other objectives. This chapter therefore contains an analysis to show how much we can improve the condition of our different assets if available finance is spent to best effect. The targets against individual types of assets, if taken together, show how close we can come to meeting our initial aspirational target. Chapter 12 sets out the targets in detail and draws conclusions about our overall success in meeting the aspirational target.

Figure 9.1 Development and delivery of the transport asset management strategy



The Transport Asset Management Plan

Introduction

9.12 We have developed our TAMP to meet the challenge of managing our transport assets in a way which is produces optimum cost-effectiveness against defined standards through the long term as well as recognising shorter term priorities for routine maintenance. This section describes how we have set about this task.

9.13 To govern the way assets are generally managed, the Government introduced the Prudential Code in 2004. Amongst other things, this code requires us to have explicit regard to asset management planning in capital spending decisions. The code enables us to consider revenue and capital options for expenditure, and to borrow additional capital funding where the repayments can be affordable from the savings we can make. The introduction of prudential borrowing is expected to contribute to transport asset management where asset renewal options can significantly reduce future maintenance. .

9.14 An important stage in the TAMP process is the valuation of all transport assets for the introduction of Whole Government Accounting in 2006. This has required a calculation of the replacement value of assets, together with the level and rate of depreciation, in order to place a current value on the assets for accounting purposes. Meeting the accounting standards will require detailed information on the assets held.

Partnership working

9.15 In taking the TAMP process forward, we continue to work in collaboration with a group of thirteen LTP authorities, mostly in the East and West Midlands regions, who belong to the Midland Service Improvement Group (MSIG). Through this group we have adopted a partnership approach to highways maintenance which aims to develop, share and promote best practice. One example of this is work done in collaboration with Staffordshire County Council to investigate the link between CVI and SCANNER survey data and restoration costs, subsequently used to inform our lifecycle planning for carriageways.

9.16 Assisted by an expert consultant, the MSIG members have shared a common approach in developing TAMPs in accordance with the Framework for Highway Asset Management produced by the County Surveyors Society. This has seen a review of current practice in each authority, and work towards the formulation of an asset information strategy and a generic document structure for first edition TAMPs. The generic document structure has been used in producing the first edition of our TAMP which covers the four key asset groups of carriageways, footways, bridges and street lighting. These asset groups represent the majority of the asset in both physical and financial terms. Future editions of the plan will include all transport asset groups, including carriageways, footways, cycleways, rights of way, structures, street lighting, bus infrastructure, drainage, safety fencing, soft landscaping, street furniture, traffic signs and traffic signals.

Link to the Strategic Environmental Assessment

9.17 The consultation on the Strategic Environmental Assessment resulted in recommendations that environmental objectives should be integrated into the TAMP, that information on the quality of roadside verges for nature conservation should be gathered and monitored and that the use of recycled materials and the recycling of waste should be maximised in transport works wherever possible. We will ensure that our TAMP incorporates these recommendations.

Project management

9.18 The preparation and implementation of the TAMP is being managed by a project board operating to PRINCE2 procedures. This process has, amongst other things, helped to ensure that the plan is consistent with other policy objectives, notably the transport objectives of this LTP but also wider corporate objectives including those for corporate asset management. Progress to date has taken us through the main stages detailed below.

Asset register

9.19 The first stage involves full compilation of the asset register, including a detailed breakdown of each asset by geographical referencing and the listing of attributes for each individual component part. For example, information on any individual bridge contains typically around 70 individual data items ranging from land ownerships and services information to dimensions and ages, and this is accompanied by photographs and other records. The database is accessible to all bridge engineers and basic bridge data is accessible to all staff in GIS format.

9.20 Our asset register is almost complete, and includes the UKPMS database, which provides the register of all carriageways and footways in the county. The 3000 km network of public rights of way is fully detailed in a purpose-built GIS database and longstanding databases are fully up to date for bridges, street lighting and traffic signals. Further work will be required on asset groups such as drainage where the existence of an asset is not obvious and we have previously relied on ad-hoc data.

Asset inventory and valuation

9.21 Inventory involves full compilation of the up to date survey and inspection results giving the physical condition and state of repair of every individual component part recorded in the asset register. As an example, the inventory data for bridges includes inspection reports, condition measurements and maintenance history.

9.22 We now have good quality information on the condition of our four key asset groups and the other assets covered by the LTP indicators and targets (rights of way and traffic signals). The extent of completion of our inventory for the various asset groups is described under the headings that follow later in this section, together with our approach to achieving the 10 LTP asset management targets detailed in Chapter 12.

9.23 The inventory is used for asset valuation. This involves the assessment of replacement costs, together with expected residual life, to calculate the depreciated value of each component part. We have undertaken an initial valuation exercise based on the Guidance Document for Highway Infrastructure Valuation produced by the County Surveyors Society and the Local Government Technical Advisors Group. This exercise has been done in partnership with other highway authorities in the region and beyond. We have worked towards a common approach on unit rates and how they can be applied to asset groups. This co-operative approach has enabled us to learn from others' experience, share our knowledge and reduce the effort needed by all of us. It will also mean that there can be direct comparison between the valuation exercises for different authorities.

9.24 To arrive at a complete inventory for asset valuation and management, we still need to collect and collate information on other transport assets, including signs, landscaped areas, earthworks, safety fencing and drainage. This work will be programmed over several years, since the information is not critical to managing our key assets or guiding high level investment.

9.25 In the meantime we are completing work on Life Cycle Plans for the four key asset groups, describing in detail how we optimise the different maintenance intervention measures, for example from patching and surface dressing of carriageways through to full reconstruction, to minimise whole-life costs. This process is already well advanced and has influenced the strategies for maintenance described later in this chapter.

Management systems

9.26 Management of individual assets and asset groups is assisted by the use of appropriate management systems and the paragraphs below describe the main ones we use.

9.27 Many of our core activities are covered by our Highways Management System. This has been expanding since 2003 when phased rollout of the system was started. The system is designed for the maintenance management of all highways and engineering assets and is currently used predominantly for:

- Customer care
- Inspection management
- NRSWA (Street Works)
- Street lighting
- Inventory management.

9.28 We will extend the use of this system over the next 3 years in combination with the further implementation of our TAMP. It delivers improved resource allocation and management, supporting the management of our highway network by improving inspection processes and work planning. This can be measured against increased throughput and faster responses.

9.29 Another significant management system is our UKPMS pavement management system. This combines carriageway and footway inventory and condition information and helps to inform maintenance investment decisions both at a policy level and for individual lengths of road.

9.30 Winter maintenance operations are planned, implemented and monitored using the Icecast system. This entails round the clock monitoring of real-time weather information between the beginning of October and the end of March, using our own weather stations and others in the region. We operate a night shift arrangement for our gritting vehicles which means that we are well placed to respond instantly to changing weather conditions.

9.31 Following the publication of the revised national code of practice *Well Maintained Roads* we are reviewing our policies and updating our practices. The review is scheduled for completion in spring 2006 with implementation of changes in autumn 2006. This is in parallel with work on bridges and street lighting, both of which now have up to date national codes of practice. We have assessed how our current approach compares with these codes and, as part of the work on our TAMP, will be reviewing and implementing appropriate changes where they are justified. Initial work has shown that there will be little necessity to change our policies or practices in order to be fully compliant with the code.

Levels of service

9.32 As part of our work on levels of service, we are participating in the UK Roads Board's research project into highway service levels, to be conducted by TRL over the coming year. The objective of this research is to establish road users' expectations of the highway and to relate them to engineering standards. The project cover the entire range of users including pedestrians, cyclists, motorcyclists, horse riders, bus users and goods vehicle drivers. It will look at those elements of highway use which may be expected to make a difference to user perceptions, including surface condition but excluding structural condition.

9.33 Our work for the four key asset groups identified an initial range of levels of service for each. The lowest level is that required to meet statutory requirements, but other levels of service take into account user demands and expectations, service objectives and whole life costs. Work so far has identified that there is generally a gap between the current level of service provided and the optimum level. For example, we consider that the optimum condition for our footways is for around 10% to need structural maintenance work. At this level we provide a consistent, reliable surface to walk on and, by minimising reactive maintenance, reduce the inconvenience caused by works; this level also minimises whole-life costs. In practice, the amount of structural maintenance investment that we have been able to afford means that footway condition is not at the optimum level so there are more defects than users would like and our reactive maintenance costs are higher than they could be. As we develop the TAMP further we will refine our levels of service, taking greater account of user expectations and fully developing lifecycle plans.

Performance management

9.34 As well as the asset management indicators and targets contained in this LTP, further performance indicators are used to quantify the other renewal and routine maintenance services to be covered by the TAMP, particularly reflecting user expectations established through consultation. These cover a wide range of our maintenance activities. One current example relates to gully emptying, where we are moving from a frequency based operation (each gully emptied twice in 3 years) to an outcome specification which requires that highway drainage systems are kept clean and serviceable so that instances of water standing on the carriageway, footway and cycleway are, as far as is reasonably possible, avoided. The service performance is measured by the number of customer reports recorded through our Roadline service and Highway Management System.

9.35 We have recently appointed Standards Officers to monitor and improve standards across all activities carried out by our own workforce. They operate across the county and provide an impartial and independent service to improve safety and quality standards. They will monitor and check on-site activities, including health and safety, quality and standards of work. This will allow us to improve standards by collecting and passing on best practice and so achieving a uniform approach to working practices. They cover in-house activities including general maintenance, cyclic maintenance, mini construction, construction services and lighting and signs. They are also involved in monitoring our roadworks protocol and the high speed roads permit system. Another aspect of their role is to seek from the public and other customers their perception of the service we provide and any suggestions for improvement. The job requires close working relationships with all concerned in the maintenance of the highway network and will become an increasingly important area of work.

9.36 Later sections of this chapter describe our asset management condition indicators. The baseline figures indicate the proportion of the asset that is currently in need of renewal. In most cases, this proportion has reached the point where the effective life of the asset can no longer be prolonged by routine maintenance, and these are the priority for renewal. We have also carried out an assessment of the rates at which satisfactory assets deteriorate each year to the point at which they also require renewal. For longer-term asset management, we need to predict future condition by understanding fully the relationship between rates of deterioration and the condition data. Our work includes bridges where we have analysed our Bridge Condition Index data and, using the work commissioned from WS Atkins by the County Surveyors Society, have determined the long term maintenance investment needs.

9.37 For carriageways we have realised the need for condition data which paints a reliable picture of deterioration from year to year. The changes in methods of measuring BVPIs, both in terms of technique (deflectograph, CVI, SCANNER) and detail between years has been problematical. In order to overcome this, we have continued to produce deflectograph-based

BVPIs for principal roads and CVI-based BVPIs for all roads. This has helped to give us consistent series of data which assist in budget and target setting. For footways, working with our UKPMS supplier, we have developed a performance measure for category 3-4 footways which represent 97.5% of our footway stock.

9.38 Street lighting column condition has been a significant concern for some years. As a result of analysing the test and inspection data and the numbers and types of columns that have needed replacement over the last 6 years, we have been able to predict more closely what funds are needed and they where should be allocated during the LTP2 period.

Option evaluation

9.39 This involves option evaluation of potential changes to current maintenance practices, together with whole-life resource implications for each asset group, taking account of renewal backlogs and future maintenance liabilities of new LTP assets. We have already made substantial progress in this area in, for example:

- A thorough review in the last twelve months of techniques for maintenance of carriageways and footways, including a new approach to maintenance programming
- An in-depth examination of the renewal requirement for street lighting columns, based on measured condition rather than age and including re-evaluation of some maintenance techniques such as regular repainting of certain column types
- A re-assessment of the criteria for replacement of traffic signal installations, with a particular focus on the life of the signal controller.

Optimisation and risk assessment

9.40 Optimisation and risk assessment is carried out to arrive at a balanced and budgeted forward programme of work across the entire range of asset management activities with specified arrangements for reporting and review. We have already used the principles of this approach in allocating funding for the for key asset groups for this LTP and in preparing annual programmes within each budget heading. Our programmes are managed through regular meetings of our Works Programme Monitoring Group which comprises staff dealing with policy, design, procurement and construction. This enables our capital works to be designed with construction and works programming in mind and allows construction staff to be fully aware of the objectives and requirements of individual schemes. Completing our TAMP will enable us to exploit fully the benefits of this approach, which we are already expanding to cover revenue funded works.

Forward work programme

9.41 Having analysed the data we hold on the condition, use and function of our roads, together with the long term investment need for the whole network, we have already improved our method of preparing forward and annual programmes. Our performance measurement framework is first used to determine the relative need of each asset group or sub-group, for instance principal roads, bridges etc. For carriageways, any road which has lengths below the condition threshold indicator is considered for inclusion in the forward programme (currently a two-year programme but extending with the development of our TAMP). We assess annually all potential schemes in the forward programme. They are ranked according to the priority assessment system which, for carriageways, gives precedence to potential schemes with the poorest condition as indicated by our pavement management system. Where there are specific road safety benefits which a maintenance scheme could deliver, or where programming of a scheme with other works would give added value, these factors also feed into its priority. An example of this is where an accident reduction scheme is programmed and the resurfacing of

that length of road is scheduled to coincide with it to reduce traffic management and works costs and to minimise delays and inconvenience. As our TAMP is further developed, we will refine the system and expand it to cover other asset groups.

Working with our stakeholders and cross-boundary working

9.42 We add value by careful co-ordination of maintenance programmes with neighbouring authorities. Although we now have a specific network management duty under the Traffic Management Act 2004, we have always had good links with neighbouring highway authorities and, through regular co-ordination meetings, we explore the potential for working closely together. A recent example relates to planned work on the A5 trunk road, which marks the boundary not only of Leicestershire and Warwickshire but also of the East and West Midlands Regions. We have worked with both the Highways Agency, who are promoting the work, and Warwickshire County Council to ensure that suitable traffic diversions are implemented, both to reduce delays to drivers and to have as little adverse effect on both counties' local road networks as possible.

9.43 As we further develop levels of service within our TAMP, we will be consulting our stakeholders on their needs and expectations. We will also continue to use existing communications to ensure that our stakeholders are aware of what is planned on the highway, the reasons behind it and how they might be affected.

Communicating with our customers

9.44 Effective communication with our customers is key to successful maintenance practice and we have committed considerable resources to improving this. Our **Roadline** freephone telephone number for defects is now well established and handles on average over 1,000 calls a month. Last year, after extensive local consultation, we issued a **Highways Charter** setting out our commitments in terms of standards and response times to requests. To assist further we now give details of all future road works on the County Council web-site, and we have set up a system which allows highway defects to be reported on-line.

9.45 To ensure that we can respond quickly and effectively to defect reports, we have set up a comprehensive system of '**Highway Patrols**' countywide. These small gangs, in clearly identified vehicles, offer a rapid response time for all defects, with target times depending on the severity. The work of the Highway Patrols is much influenced by the extensive contacts that our area-based staff have with parish councils and local residents. In 2006/07 we will be increasing the number of patrols operating. Working within a whole service management organisation, the Highway Patrols enhance our existing service by:

- Providing a 24 hour guaranteed rostered emergency callout
- Removing, protecting or repairing serious hazards within 2 hours, and other hazards within 24 hours
- Liaising with parish and town councils and other community representatives before main inspections, giving the opportunity for particular problems to be highlighted for inspection and correction.

9.46 Starting with our Best Value review in 2002, we have conducted a series of **attitudinal surveys** amongst our customers, to assess what they think of our services and where their priorities lie. This was instrumental in our decisions to introduce the freephone Roadline service and to restructure the way we deliver the local defect remedial service through Highway Patrols.

9.47 Almost all sectors of the community are stakeholders in our road network, including many who neither live nor work in the county. As traffic volumes increase and user expectations rise, we are keenly aware of the need to inform all interested parties of our intentions, listening to their concerns and suggestions and incorporating their views into our schemes and working methods. In rural areas, the parish councils act as a useful focal point for local interaction. Our Area Managers and District Engineers provide them with weekly 'What's On' bulletins detailing all significant work planned for a particular area, with details of road closures, temporary signals and so on. During 2005 we introduced a formal roadworks protocol to help us improve our communications, including standard questionnaires to ascertain people's views on our works. For several years we have been undertaking a similar exercise with respect to surface dressing, and we have found that informing residents and businesses about the process – what it entails and why we do it – and asking them for feedback has resulted in a high level of satisfaction with a service that is not often considered popular. We will be developing these techniques further in our TAMP.

9.48 Our **Roadworks Protocol,** mentioned above, informs customers about individual highways schemes with work over a week's duration. Key aspects are as follows:

- Annual schedules of works are prepared for the forthcoming year and entered on the 'schemes database'
- The Health and Safety Executive is notified if necessary
- Road space is booked with the relevant District Engineer, including a high speed road permit where required
- The District Engineer will co-ordinate works with those of the statutory utilities and add the scheme to the 'What's On' list of roadworks on the web
- If there is a road closure, public transport operators will be informed and arrangements made for necessary re-routing
- For all works, notification is given to local residents and businesses, as well as local councils, Councillors and anyone else who may be affected
- Appropriate works boards are placed on site at least a week before works commence
- We carry out a customer feedback survey for a sample of schemes.

9.49 To ensure consistency and continuous improvement in service delivery two **Standards Officers**, as noted above, have been appointed to monitor not only safety and quality but also customer satisfaction with the service, as detailed in paragraph 9.37.

Condition-based maintenance and renewal and whole-life costing

9.50 Maintenance and renewal of transport assets takes place for two distinct reasons:

- To meet the day to day requirements of all current users of the assets
- To safeguard the long term physical integrity of assets for future users.

9.51 For both types of maintenance we have developed best practice over many years, and we reassess that regularly both in Best Value groups in the region and through assimilating national guidance. We are leading members of the 'Construction Excellence East Midlands Local Government Steering Group' and this adds further to our ability to stay fully up to date.

We use this process of continuous review and comparison to ensure that the measures we use for asset management are always those that offer best value for money.

9.52 For day to day requirements we have, amongst numerous examples:

- A winter maintenance service which is fully integrated with our Leicestershire Highways delivery arm's other operations
- Grass-cutting arrangements which include trial joint contracting with district councils
- Our newly introduced Highway Patrols which, as noted above, link to our Roadline freephone defect reporting service and provide quick response for blocked gullies, minor repairs and other defects
- A series of 'green' initiatives, including disposing of gully emptyings through our own reed-bed system rather than to landfill, dedicated tree inspectors to ensure safety but at the same time maintain the visual enhancement of roadside trees, and careful timing of rural grass cutting to encourage biodiversity.

9.53 For longer-term maintenance we invest substantially in resurfacing, major structural maintenance, street lighting column replacement and other techniques. Equally, however, we spend large amounts of mainly revenue funds on low-cost measures to extend the life of assets. For example:

- We have extensive programmes of surface dressing to extend the life of carriageways; this seals the surface and restores skid resistance
- We have extensive similar programmes of slurry sealing to extend footway life
- We have scheduled programmes of bridge repainting to the same end
- We are looking to extend the life of sound, but ageing, lamp columns by painting steel columns and metal sleeving for concrete columns.

9.54 Minimising whole-life cost will lie at the centre of our TAMP. In addition to the major decisions about the timing and scope of capital investment we are already active in a number of ways to reduce whole-life costs, including:

- The use of life-extending treatments as noted above
- Timing of works to integrate maintenance with improvement works so as not only to reduce cost but also to ensure best overall structural approach
- Choice of materials to suit local circumstances, for example decisions on the use of block paving or macadam for footways depend on the likelihood of over-riding by vehicles and of frequent disruption to the surface by statutory undertakers
- Trials we have carried out into new techniques such as in-situ rejuvenation of surfaces, no-fines concrete in haunches and surface dressing on footways.

9.55 We have invested increasingly in noise-reducing surfacing materials and recently collaborated with the Transport Research Laboratory on work to identify the noise characteristics of different materials: TRL Published Project Report PPR023 : Comparison of tyre/road noise for a range of surfaces on the A47, A447, A511 and B582 in Leicestershire. Before the research was undertaken, low noise surfaces generally comprised thin surfacings with relatively expensive whole life costs. As a result of this work we have been able to use road surfacing materials which have low noise characteristics but which also have long service lives and represent excellent value for money. We now use low noise surfacing on around 75% of our carriageway maintenance schemes - a pattern which we intend to continue through the LTP2 period.

9.56 Substantial maintenance work is carried out for both short term and long term benefit and a key challenge for us is to ensure we strike the right balance between renewal, preventative maintenance and all the other routine work needed for day to day functionality, appearance and user satisfaction. Our current arrangements stem from the 2002 Best Value review of highway management, which involved wide consultation with a strong emphasis on user requirements and expectations. This was supplemented in early 2005 by the adoption of a revised code of practice for highway management. This in turn will be further modified to take account of the revisions embodied in the new national code of practice. Already within this code we are inspecting transport assets at revised frequencies designed to relate more closely to the relative risks of different road characteristics.

9.57 As consideration of the whole life costs of assets is a fundamental principle of asset management, we will be building on this work considerably. This will not be a quick process since we need to build up comprehensive models of how condition changes over time as a result of different interventions at different times for each asset group. Our TAMP will be continuously developed and refined through the LTP2 period.

Procurement

9.58 We continually seek opportunities to improve our business processes and therefore increase our efficiency and cost-effectiveness. A major initiative is the development of a procurement strategy for all highway services, as detailed in Chapter 3, which will be completed during 2006.

9.59 One element which has already been adopted is our approach to the procurement of design services. We are collaborating with Nottinghamshire and Derbyshire County Councils, which like us are 4 star rated authorities and have in-house highways design and build capabilities, in seeking an external partner for highway professional services. This approach, strongly promoted by the Office of the Deputy Prime Minister and the East Midlands Centre of Excellence, will enable us to share best practice and technical expertise, allow better use of resources to deal with peaks and troughs in workload, share development and management costs and secure economies of scale.

9.60 Procurement of highway works is an area which is kept under continual review. We have a strong in-house capability for most aspects of work on the highway and, through many years of compulsory competitive tendering, have showed that the presence of an in-house contractor plays a significant role in keeping market prices down locally. The rigours of competitive tendering, however, resulted in duplication of internal systems in order to keep ‘client’ and ‘contractor’ separate and we have now moved to a more focused approach to works procurement. This entails regular, but limited, market testing to ensure that in-house costs remain competitive. Closer links between former client and contracting staff have yielded benefits in greater collaborative working towards the joint goal of quality product at the best price. We are increasingly using target costing as a method of managing work, and this allows improved cost predictability and reduced overall costs.

9.61 The best value approach to highway works procurement is, we believe, offering consistently good value for money. Despite this, it represents a major area of spending, and therefore needs periodic fundamental testing against alternative models. This will form the central part of our procurement review in 2006, with the results featuring as an important element of the TAMP.

Best practice

9.62 We are fully committed both to learning from others and to sharing our own best practice. We are actively involved in best practice and benchmarking groups across the region and officers regularly attend a wide range of seminars, conferences and working groups; this provides excellent opportunities for sharing and learning. Details of our best practice work in asset management are provided in Appendix F, and examples include:

- Introduction of a single Roadline telephone number for main highway services to improve customer contact arrangements
- The highway patrol initiative, which was launched in 2005, has enabled us to improve further our rapid response service and improve communications with local communities
- Recycling initiatives developed by our operations organisation, Leicestershire Highways, producing a national reputation for innovation. Initiatives include the recycling of surface dressing chippings, which are recovered during the after care of surface dressing sites
- Increasing use of sustainable urban drainage techniques on our new highway schemes. A good example of this is the Rearsby Bypass, where one substantial balancing pond was developed as a wildlife area.

TAMP progress

9.63 Table 9.1 sets out the progress that we have made on the first edition of our TAMP compared with the specific recommendations of the CSS framework. This shows that the majority of the tasks associated with the first edition of the document are complete. Publication is scheduled for summer 2006.

9.64 Substantial progress has already been made towards the next version of the document. This will expand the scope beyond the four key asset groups, build further on consultation, expand our performance measures, further develop needs-based funding mechanisms, and promote longer-term programmes. The second edition will be used to inform the budget and maintenance planning process for 2007-08.

9.65 Development of the TAMP has influenced the development of LTP2. Although we have only covered the four key asset groups with the first edition of the TAMP, these represent the majority of our assets both physically and financially, and they have the greatest need for ongoing investment. We already have good inventory and condition data for these groups and, through the TAMP, we have derived life cycle plans for each which take account of the existing condition, and trends in condition and expenditure. Together with the levels of service which we have established, this has allowed us to predict the investment that will be required to minimise whole life costs. This is the basis for our planned expenditure on asset management during the LTP2 period.

9.66 The TAMP has also influenced other aspects of LTP2. Many modern techniques for traffic management and casualty reduction can have significant maintenance costs over their lifetime. A particular example is anti-skid surfacing which costs as much to maintain as to provide in the first place. Work associated with the TAMP has included evaluation of alternatives such as surface dressing with high psv (polished stone value) aggregate. In many cases this can be as effective as anti-skid surfacing but with lower whole life costs. We treat asset management audits of proposed works, both our own and by third parties, as an essential tool in the design process.

Table 9.1 Leicestershire Transport Asset Management Plan – first edition: progress matrix

CSS Framework Recommendation	Required for first edition TAMP?	Completed?	Required for 2nd edition TAMP?
Ensure alignment with corporate aims	Yes	Yes	Complete
Ensure alignment between TAMP and current strategy documents	Yes	Yes	Complete
Inventory data review	Yes	Yes	Complete
Establish data improvement programme	No	In progress	Yes
Ensure that data validation processes are in place	4 Key Asset Groups only	Yes	For most asset groups
Establish a full set of levels of service	4 Key Asset Groups only	Yes	Yes
Undertake focused consultation on levels of service	No	Historical consultation used	For most asset groups
Identify performance gaps	4 Key Asset Groups only	Yes	For most asset groups
Explicitly document the reasons for the performance gap	4 main asset groups only	Yes	For most asset groups
Develop lifecycle plans for each asset group	4 Key Asset Groups only	Yes	Most asset groups
Establish processes for allocating needs based funding	4 Key Asset Groups only	Yes	Most asset groups
Evaluate and document the risk profile	4 Key Asset Groups only	Yes	All assets
Establish a process for evaluating improvement projects	No	In progress	Yes
Produce and manage a 10 year forward works programme	No	2 year programme for 4 main asset groups	3 year programme for most asset groups
Review service delivery methods	Optional	For some asset groups	For some asset groups
Evaluate potential for contractor data collection	Optional	For some asset groups	Most asset groups
Develop performance measurement regime	4 Key Asset Groups only	Yes	For most asset groups
Develop performance reporting regime	4 Key Asset Groups only	Yes	For most asset groups
Produce an improvement plan	No	No	Yes

9.67 Work on the TAMP has also touched on our objectives regarding tackling congestion and the impact of traffic. Road maintenance work can be disruptive, particularly if road closures are needed. We include these factors when assessing the impact of different maintenance strategies. For example, in terms of disruption alone, it is often better to surface dress as a preventative technique rather than wait until resurfacing becomes necessary.

Specific TAMP programme and performance management issues

9.68 Other programme chapters of the LTP focus on the choice and combination of measures to bring about improvement. The situation is somewhat different for asset management, where the range of measures is more limited and their choice and combination is subject to continuous review as noted earlier in this chapter. The following sections therefore describe in more detail the approach to deciding investment programmes for each of the main asset categories, with performance indicators and monitoring procedures. The carriageway key asset group has been divided into the three sub-groups of principal roads, non-principal classified roads and unclassified roads, each of which has separate Best Value Performance Indicators. The footway key asset group has been similarly divided into sub-groups of category 1 & 2 and

category 3 & 4 footways. The other asset groups covered here are rights of way, bridges, street lighting, bus infrastructure and cycleways.

9.69 Our work on condition, indicators and targets has all been undertaken using TAMP principles, adopting national advice where available and collaborating with other highway authorities to share best practice. The detailed programme showing how we will use the available funds in managing and maintaining our transport assets is covered in Chapter 11. Our indicators and targets relating to asset management are described in Chapter 12, which also details how we will manage risks associated with these targets.

Principal road carriageways

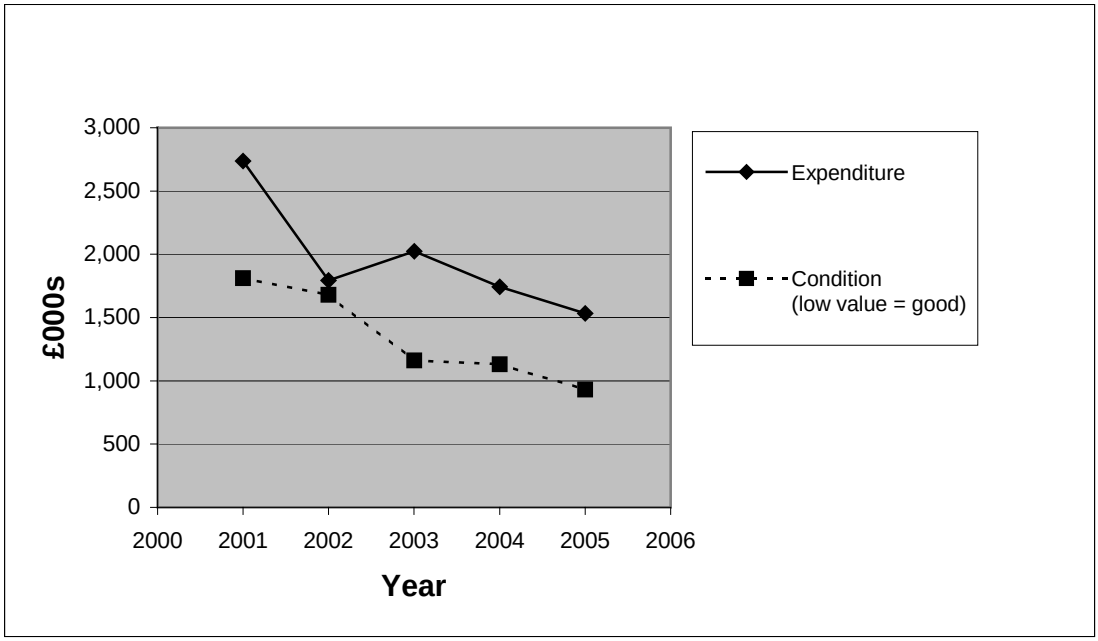
9.70 During LTP1 we have carried out annual deflectograph surveys covering every length of principal road in the County. By applying a surface load and measuring the downward movement of the carriageway, this quantifies the underlying strength and expected life before renewal is required. The increase in capital maintenance funding during the LTP1 has enabled us to reduce the defective proportion steadily from 23.3% in 1999/00 to the current baseline of 11.3% in 2004/05. This survey method will continue throughout the LTP2 period, and includes the recently de-trunked roads. Deflectograph measurement is an important aspect of our asset management since it provides data for many years using a consistent measurement method. This enables us to target resources where most appropriate and to ensure that well-informed decisions are taken between options of surface dress, resurface and overlay.

9.71 The SCANNER method of survey is completely different in looking only at surface features. However, underlying strength is quantified by the extent and combination of the rutting, cracks and other defects in the road surface. The baseline figure of 19.7% in 2004/05 comes from the first annual surveys, without condition threshold weightings which reflect the reasonable requirements of principal roads. We have been involved in the work of both the UKPMS Steering Group and the UK Roads Board's SCANNER Defects Index Working Group. The latter includes consideration of re-setting and fine tuning of the SCANNER thresholds and weightings. This work should help give more appropriate future results, but indications from DfT suggest that a year or two may be needed to establish this new survey method firmly so that year on year changes are reliably detected. The revisions to the method of producing BVPI 223 for 2005-06 mean that there can be no direct comparison with the figure produced for 2004-05. To overcome this problem, we also intend to produce figures for 2006-07 using the 2005-06 rule set and for 2005-06 using the 2006-07 rule set.

9.72 Because of the difficulties in establishing trends from the SCANNER information available to date, we have adopted deflectograph-based indicators and targets which have the benefit of a sound historical time series of data. We have however complemented these with SCANNER-based indicators and targets which we believe should be comparable. Initially these are based on 2004/05 rule sets. We will revisit this target once we have sufficient consistent SCANNER information to draw reliable conclusions.

9.73 Figure 9.2 shows that during LTP1 the condition of our principal roads has been steadily improving. This is demonstrated in deflectograph and coarse visual inspection surveys and reflects the views of maintenance engineers and the travelling public. This has enabled us to reduce the level of capital expenditure year on year without experiencing any overall deterioration in condition. Although condition is not at steady state, the rate of improvement appears to be slowing. We therefore consider that the level of investment in 2004/5 will deliver continued modest improvement in condition towards our target.

Figure 9.2 Principal roads – expenditure and condition



9.74 Our target of 10% for the deflectograph-based indicator reflects our intention to continue to improve the condition of these roads over the LTP2 period. Recent advice from DfT is that 10% to 12% is currently seen as near optimum for local road condition. We expect this modest continued improvement to be reflected in the SCANNER-based condition indicator, but with changing methods of producing this indicator it is not clear whether SCANNER will eventually give comparable results to deflectograph surveys: when the SCANNER figures are clear we will adjust the target accordingly. Whilst SCANNER may require us to give marginally more attention to surface treatment, the increased spending during the period of the LTP1 has consolidated the steady improvement in condition.

9.75 The proposed LTP2 spending will bring condition to a near optimum level for steady state renewal in the longer-term. Although investment is needed in other asset sub-groups, the principal roads, by definition, are a vital part of our network. They carry the greatest volumes and weights of traffic and would prove very costly to repair if not maintained at an appropriate standard.

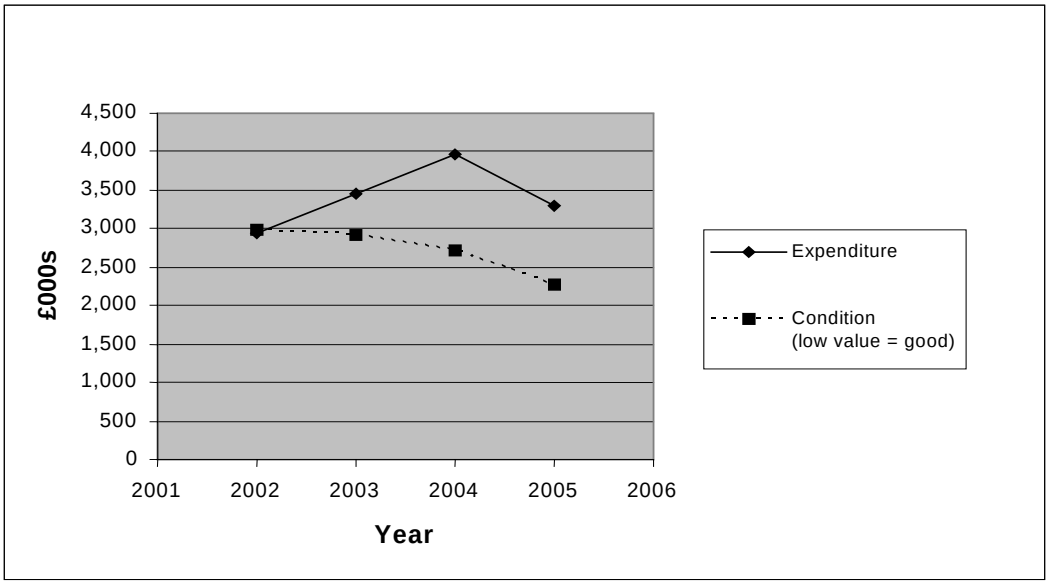
9.76 All sections of road are recorded in our UKPMS database with full condition data from the annual surveys of every section of road. We draw renewal priorities directly from these survey results. Subject to the SCANNER results in the next year or two, we expect our whole-life plans for the principal road sub-group to be close to current levels of activity for the foreseeable future. However, we will continue to seek economies of scale and savings in unit rates of output.

Non-principal classified (B and C) carriageways

9.77 Through the period of LTP1 we carried out annual visual inspection surveys of these roads. These are logged in our UKPMS database and have been subject to national criteria and thresholds when calculating the proportion of defective carriageways. With some inconsistency of measurement between authorities, there have been changes in threshold settings in most years of LTP1. The move from Coarse Visual Inspection (CVI) to SCANNER will help address this in the medium term.

9.78 From 2005/06, SCANNER surveys of condition will help us to develop an appropriate LTP2 indicator. However, as for principal roads, time will be needed to establish the new survey method firmly so that year on year changes are reliably detected. We intend to continue our annual visual inspections surveys alongside SCANNER for the LTP2 period, to give continuity and to inform our management strategy for this asset sub-group. We have not set a formal indicator and target for the condition of these roads based on CVI inspections, but will use the CVI trends, as noted below, to set a SCANNER-based target when we have sufficient consistent SCANNER information to draw reliable conclusions. Only a consistently measured condition indicator can demonstrate year on year changes which, when combined with information on annual expenditure levels, enables us to predict the investment needed to reach our targets.

Figure 9.3 B and C roads – expenditure and condition



9.79 Figure 9.3 shows that during LTP1 the condition of our non-principal classified roads has been steadily improving. This is reflected in the coarse visual inspection surveys and outputs from our pavement management system, with CVI results for 2004 and 2005 respectively (single year figures) at 12% and 10.3%. This improvement has been achieved by increasing the level of investment in capital maintenance work during LTP1 up until 2004/05, when we adjusted the budget to optimise improvement levels across the board. Condition data suggested that we could afford to do this but still expect an improvement in condition. This appears to have been borne out by our survey work. The CVI figures indicate that we are close to optimum steady-state, but other indicators are telling us that we cannot afford any significant further cutback in funds for these road categories if we are to continue to maintain them in this condition. We therefore believe that capital spending of around £2.9m a year is necessary to keep these roads in close to optimum condition, and will set an equivalent SCANNER target when we have the necessary data.

9.80 During LTP1 we increased the renewal programme for this asset sub-group by diverting expenditure from principal roads. Spending plans based on visual inspections will continue until the SCANNER results provide a robust basis for life cycle plans with optimised programmes of renewal. As with principal roads, it may take a year or two for the new survey method and thresholds to settle down. The levels of spending planned for LTP2 are expected to maintain conditions within the 10% to 12% range, measured by visual inspection. This is close to steady state but, once our TAMP is completed, we will review again to assess whether we have correctly estimated the steady state level and, if necessary, adjust our spending and target accordingly.

9.81 These roads typically carry relatively high volumes and weights of traffic and have often evolved, mainly from country lanes, rather than being designed. This leads to a need for significant investment to allow intervention before significant deterioration occurs. As a result of our analysis of condition, spend and maintenance need, we have directed a greater proportion of our expected asset management funding towards this road category. This has helped in improving the condition of these roads and bringing them close to the steady state figure of 10% to 12% which is likely to be optimum, as with principal roads.

Unclassified road carriageways

9.82 We have a longstanding approach to planned maintenance of unclassified carriageways which, in urban areas, are generally kerbed roads that have been built as part of housing developments. Other than excavation by the utility companies, they suffer little structural damage provided that their surface is sound. We therefore target revenue funding to surface dress such roads on an average of a 12 year frequency. This prolongs their life and keeps the need for resurfacing or other more expensive work to an absolute minimum. This is the core of our management strategy for this asset sub-group.

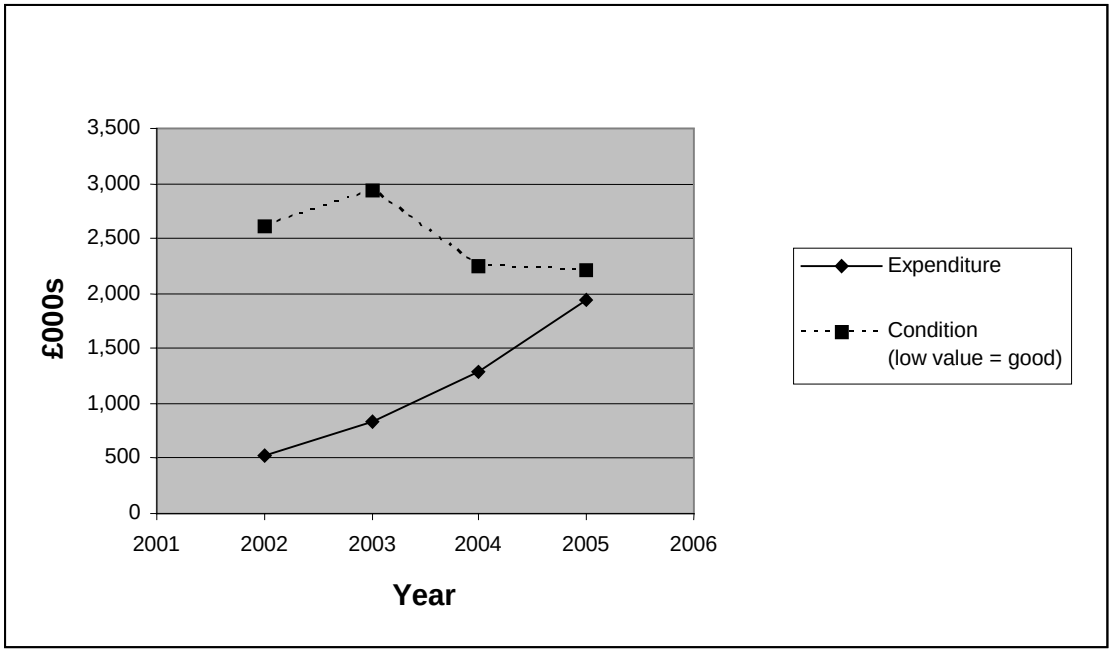
9.83 Rural unclassified roads are very different in nature: They are usually unkerbed, have evolved rather than been built, and can suffer significant damage from heavy vehicles. Our approach here has been first to concentrate through lorry movements onto the most appropriate routes. We have designated A and B class roads as through lorry routes and introduced weight restrictions on most other rural roads and our county-wide lorry routing network is now complete, a process complemented by appropriate targeting of maintenance works. We use surface dressing as a preventative maintenance treatment with rural unclassified roads also. Our whole life costing approach results in surface dressing of these roads on an average of a 9 year frequency. This is supplemented by a thin macadam surfacing at the less than 1% of sites where surface dressing is no longer cost-effective. Both types of road are fully recorded in the UKPMS database with details of condition.

9.84 We have developed a reasoned basis for setting priorities for these roads, based on survey results and follow-up inspections combined with local judgement. As part of asset management planning, in collaboration with other LTP authorities, there is scope for improving information gathering and optimising activities on this class of roads and we expect this to be a significant area of attention in implementing our TAMP.

9.85 The condition of this class of road is currently considered appropriate in terms of whole life costs, with a baseline for BV223a in 2004/05 of 9.6%. We have set a steady state target for 2010/11 of under 10%, based on visual inspections. Whilst the SCANNER survey method may eventually be used on country lanes, the use of this method of survey may never be justified on residential roads where relatively low cost repairs may be all that is generally required. As with all our other programmes and targets for maintenance, we will review these conclusions once the final TAMP is complete. Keeping condition at this level will require less investment than was envisaged in the Provisional LTP, allowing a transfer of funds to other asset categories.

9.86 Figure 9.4 provides evidence for this conclusion and shows that during LTP1 the condition of our unclassified roads has been generally improving. This also reflects the views of maintenance engineers and the travelling public. This condition is predominantly a result of many years of programmed surface dressing as a preventative maintenance technique. We now have a condition level which, subject to further TAMP work on levels of service and whole life costs, we consider satisfactory for the type and volume of traffic these roads carry.

Figure 9.4 Unclassified roads – condition and expenditure



Category 1 and 2 footways

9.87 Although only 2.5% of our footway network, these are the important busy footways in urban areas and near shops which have been the subject of increasing attention in recent years. After some inconsistency in earlier surveys, the target of 8.2% was met in 2004/05 and provides a robust baseline for LTP2. Visual inspection surveys are conducted monthly on all footways in this category to ensure quick repairs of hazardous defects which could potentially result in pedestrians tripping or falling.

9.88 Our maintenance regime for bituminous footways allows for preventative maintenance in the form of slurry sealing at around 8-year intervals. This addresses the oxidisation of the bitumen which is a precursor to failure of the surface. The treatment significantly prolongs the useful life of a footway at around 5% of the cost of resurfacing. Where footways require resurfacing or reconstruction, we use recycling techniques whenever possible. This has both financial and environmental benefits.

9.89 Many of our category 1 and 2 footways are block paved. This construction method can result in low whole life costs provided that attention is paid to specification and construction. There is very little deterioration over time and blocks are generally good at tolerating vehicle over-riding. One area of difficulty is around utility works. These can result in uneven or even dangerous surfaces if reinstatement is not adequate. Non-standard colours or shapes can also prove problematical when replacement is required and our TAMP work will help to inform design choices regarding footway materials.

9.90 Our target of 7% is related to the cyclical nature of footway works and is consistent with steady state renewal on average every 15 years or so. We consider this scale of general renewal to be realistic, supported by short-notice repairs, and this is allowed for in recent and continuing levels of spending. Given the importance of these footways, we believe spending to maintain this steady state is justifiable against the claims of other assets.

9.91 Details of all these footways and their condition are recorded in the UKPMS database. Priorities for renewal are directly based on the database information.

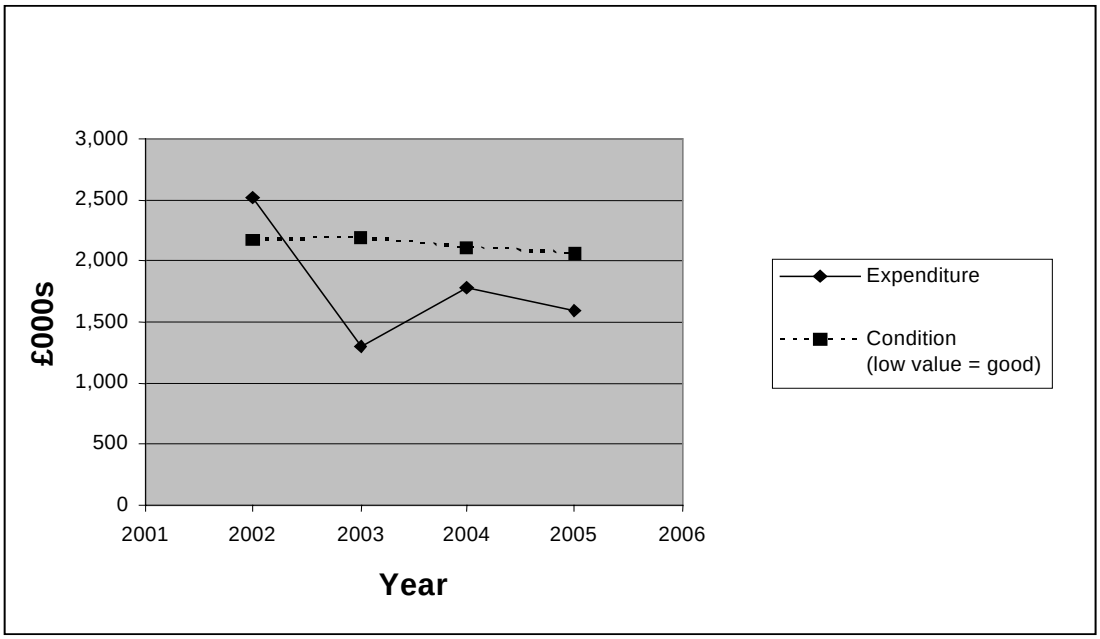
Category 3 and 4 footways

9.92 Most footways in the county are in these categories. They are less well-used but important to many people, particularly in rural areas. In contrast with assets already described, there is currently no best value performance indicator for them and less detailed information is available about their condition. We have therefore developed a local performance indicator with our UKPMS provider, Faber-Maunsell. This is based on the CVI information that we have been collecting over recent years. The condition data has a good level of reliability since it is gathered from walked inspections.

9.93 Having analysed the change in condition over several years and compared this with levels of investment in this asset sub-group, we have established a baseline for 2004/05 of 20.7% of category 3 and 4 footways having an Overall Condition Index (OCI) less than 20. Although not directly comparable with the indicator for category 1 and 2 footways, which is based on Detailed Visual Inspection rather than Coarse Visual Inspection, we believe that the two indicators are broadly equivalent. The target of 15% is provisional, pending more detailed TAMP investigations and costings.

9.94 As shown in Figure 9.5, recent levels of spending appear to be resulting in small improvements in overall footway condition, suggesting that, although we have been investing enough to prevent footway condition becoming worse, a greater level of expenditure may be needed during the LTP2 period to bring the overall condition closer to an optimum steady-state. We anticipate that a figure of 10-12% should be a long term goal, but the other pressures for investment mean that we will not be in a position to achieve this during the LTP2 period.

Figure 9.5 Category 3 and 4 footways – expenditure and condition



9.95 The historical approach to renewal has been to undertake much footway reconstruction in conjunction with work on carriageways. This has been an efficient basis for renewal and has ensured steady progress throughout the county. Recent progress has seen the compete recycling of footway materials, with major economic and environmental benefits.

9.96 We have also carried out substantial preventative maintenance with the slurry sealing surface treatment, which significantly extends effective life by sealing the footway surface so preventing water and frost damage and loss of aggregate. The level of funding for preventative maintenance is based on whole life costing for the footway network. We aim to seal footways on average every eight years but individual footways are treated as informed by condition surveys.

9.97 We expect that additional inspections, our new performance indicator and the TAMP will introduce a more refined and cost-effective approach to targeting funding within this asset sub-group. The main progress towards the TAMP has been the complete recording of all these footways in the UKPMS database.

9.98 Pending the completion of further work on the TAMP, the LTP2 capital and preventative revenue spending will continue at recent year levels. Because these footways, though important, are less vital than other assets, and because our performance indicator has only recently been produced, we are not at this stage proposing to spend at an increased level in this area. This position will be reviewed during the course of the LTP2 period in light of changes in recorded condition.

Public rights of way

9.99 The condition of the rights of way network is monitored by random surveys of 5% of the network each year for the BVPI indicator for ease of use, as well as by many individual inspections. The sample size gives fluctuating results and the baseline figure of 72% is the average of the last three years. The target for the LTP2 period is to increase this figure to 80%, which will require an additional 240 km of the network to be kept at the standard required for ease of use, together with the maintenance of the currently satisfactory parts of the network. We believe the level of spending necessary to achieve this is consistent with the relative importance of these assets against others.

9.100 We have compiled a major inventory over recent years and are using this for developing the TAMP. All rights of way are geographically coded and many thousands of items of information are held in the database, which has been built in accordance with Part 4 of BS7665 for rights of way. Every section of the network is inspected on a five yearly cycle and sufficient information is held for asset valuation purposes.

9.101 Renewal works are required where sections of the network have become difficult to use or impassable, for example:

- Crossing points such as stiles and routes over ditches have become unusable
- Waymark posts have disappeared and the route alignment has lost all definition
- The route has become completely blocked by vegetation or other obstruction
- Planting has obstructed the route making it unusable without damage to crops.

9.102 We will give priority to removing these breaks, which reduce the value of the network as a whole. As with rights of way improvement schemes, we will increasingly focus maintenance on the sections of network near larger residential areas where actual and potential usage is greatest. We expect this to be a key feature of our approach to the asset management of rights of way.

9.103 As detailed in Chapter 5, we have produced a draft rights of way improvement plan and are currently consulting on it. The plan explains in more detail our rights of way maintenance policies relating to monitoring, reactive management, crops and vegetation, and way marking. The TAMP will be updated to incorporate the final rights of way improvement plan.

Bridges

9.104 Our bridge stock contains 617 bridges with a total of nearly 1000 individual spans. Table 9.2 shows the total number of bridges of each type.

Table 9.2 Bridge stock

Bridge type	Road classification				Total
	A	B	C	U/C	
Masonry	36	20	133	78	267
Steel	18	0	21	11	50
Concrete	97	19	81	103	300
Total	151	39	235	192	617

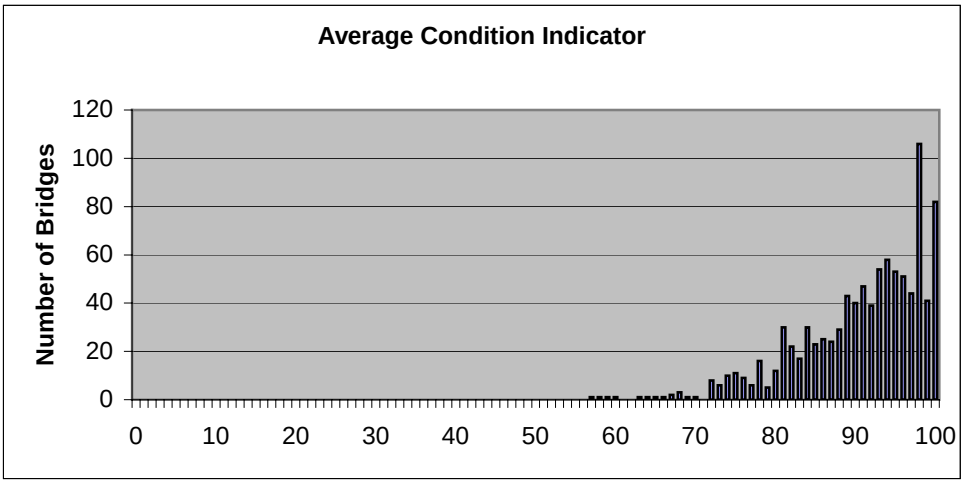
9.105 Having undertaken a thorough bridge strengthening exercise over a number of years, all our bridges are now either capable of carrying 40 tonne lorries or have had weight limits imposed. We now concentrate our capital investment in the maintenance of bridges and other structures to minimise whole life costs and maximise their serviceability. Our management of this asset group has been greatly assisted by the development of national condition data.

9.106 We assess the condition of bridges by inspection using standardised Bridge Condition Indicators (BCIs). This method of assessment has been developed by the County Surveyors' Society and the BCIs were formally issued in 2002. Since then every County Council bridge has been inspected using the BCI system and a major asset inventory has been established. The BCI system assesses bridges on both average and critical indicators. Work commissioned by the County Surveyors Society from W.S.Atkins recommended long term goals for both the overall bridge stock and for specific bridges. These, together with our current position, are shown in Table 9.3 and Figure 9.6.

Table 9.3 Bridge condition indicators

	Current position	CSS long term goal
% of Bridges with average condition indicator below 70	2%	<10%
% of Bridges with average condition indicator below 60	0.6%	0%
Average condition indicator for whole stock	90	90

Figure 9.6 Average bridge condition indicator



9.107 These show that the majority of our bridges are in a good or very good condition, with only a small proportion in the poor category (CSS Bridge Condition Indicators, Vol 3) as indicated by the Average Condition Indicator. We already meet the standards proposed by CSS for the number of bridges below thresholds, reflecting the continued good work that has gone into managing and maintaining the stock, supported by appropriate levels of investment. We have been able to take advantage of our significant programme of strengthening work to include maintenance work at marginal costs, maximising the benefit of contractual arrangements and road closures. We also undertake preventative maintenance where this represents a cost-effective means of extending the life of bridge components. This includes work such as painting steel parapets on an average 15 year frequency. Since our average condition indicators are already virtually at the CSS 'long term goal' levels, we have not set LTP2 targets for average condition, but will concentrate on critical condition as explained below.

Critical condition indicators

9.108 Work commissioned from W.S. Atkins by the CSS identifies critical condition indicators which relate to the condition of only critical structural elements of each bridge. Thus for a brick arch bridge, only the condition of the arch itself contributes to the condition indicator. Elements such as parapets and wing walls are not measured. Again there are recommended long term goals for both the overall bridge stock and for specific bridges. These, together with our current position, are shown in Table 9.4. We have adopted critical condition targets, also shown here.

Table 9.4 Critical bridge condition indicators

	Current position	LCC 2010/11 target	CSS long term goal
% of Bridges with critical indicator below 75	19%	10%	10%
% of Bridges with critical indicator below 65	19%	0%	0%
Average critical indicator for whole stock	83	86	95

9.109 The Critical Condition Indicator shows that 19% of our bridges have one or more structural elements which need repair or maintenance.

9.110 Although we have condition data for all our bridges, we do not yet know how the condition will change over time or with different levels of investment; this is an area that our TAMP will address over the medium to long term. Data from CSS work elsewhere suggests we could expect an annual deterioration of 2.5% in the BCIs after allowing for basic revenue-funded maintenance. This would suggest that, in the absence of other intervention, by the end of the LTP2 period there would be 32% of our bridges with a critical condition indicator below 65.

9.111 We consider that the CSS long term goals for individual bridges are appropriate targets for LTP2. The CSS long term goal for the whole bridge stock, however, is not considered a realistic target for us. The reason for this is the high proportion (43%) of our bridges which are masonry. Brick arch bridges which have been maintained to an excellent standard can only achieve a maximum critical condition figure of 81%. This means that the highest possible condition for our whole stock (everything perfectly maintained) is only 91. We have therefore adopted a 2010/11 target condition for the whole bridge stock of 86, which takes account of this position and represents a modest improvement over the LTP2 period.

9.112 In order to achieve our targets, we intend to undertake maintenance schemes on 19% of our bridges, or 40 per year. We predict that this will be a sufficient rate to compensate also for continuing decline of the existing stock, but will check its adequacy by the second and subsequent rounds of BCI inspections to be completed in 2006/07 and every two years thereafter. Our new programme compares with recent levels of investment which have provided for annual programmes of around 30 significant maintenance schemes with smaller programmes of maintenance on around 40 other bridges.

9.113 Having considered the condition of the overall bridge stock, we have set the following asset management priorities:

- All bridges must be capable of carrying general road traffic (this will generally be to 40 tonnes except where weight limits have been imposed);
- All bridges will be inspected on a 2 year cycle to provide information on their condition, to identify urgent maintenance needs and to identify where major work will be required at a future date;
- All bridges on A and B roads and other designated lorry routes will have a minimum $BCI_{(crit)}$ of 75 and a minimum $BCI_{(ave)}$ of 70;
- All bridges on other roads will have a minimum $BCI_{(crit)}$ of 65 and a minimum $BCI_{(ave)}$ of 60.

9.114 In addition to these basic operational requirements, through our LTP2 targets we aim to improve the condition of the bridge stock. Achieving these targets by 2010/11 will result in a reduction in whole life costs of our stock.

Street lighting

9.115 There are some 62,700 street lighting columns in the county, of which more than a third are over 30 years old. We have detailed information about columns which are less than 30 years old, but the ages of older columns are not known precisely. Although the average life of a lamp column is often quoted at 30 to 35 years, this varies hugely between column types and locations and we believe that many of our columns are much older than this.

9.116 We have been undertaking routine testing and replacement of columns since 1998 and current renewal is aimed at the bulk replacement of concrete columns. Where the inspection of

individual columns leads to urgent replacement, our normal practice is to replace groups of concrete columns in the same street, giving significant economies of scale.

9.117 We have developed a new indicator for lamp columns. This shows that in 2004/05 19.8% (12,500) of our lamp columns need renewal. This information has been obtained following a detailed analysis of our testing and other records over the past 6 years as part of our asset management work.

9.118 Steel columns are subject to a six yearly cycle of structural inspection and testing and the results can show considerable variability in any one location. The main cause of failure is internal corrosion where the older ungalvanised columns are poorly protected. Our standard practice is to replace only those steel columns which fail the tests, as shown in Table 9.5, and our analysis has revealed that around 0.5% of our painted steel columns fail each year. It was presumed that the proportion would be increasing annually as the stock ages, but no particular year on year trend has emerged. In the absence of any data to the contrary, and following a risk assessment, we have assumed that this rate of failure will continue throughout the LTP period, representing 32 columns per year. This will not be a steady state rate of replacement, since that would suggest a life of 200 years for a steel column; it simply hides the fact that 80% of our steel stock is less than 30 years old. The longer-term replacement of steel columns is considered further below.

Table 9.5 Street lighting column testing – failure rates

Steel lighting column testing - failure rates								
Year	99-00	00-01	01-02	02-03	03-04	04-05	05-06	Average
% fail	0.25	1.27	0.89	0.03	0.34	0.47	0.38	0.52

9.119 We have also identified that failures in steel columns are most prevalent around the base. We are therefore reviewing our approach to preventative maintenance to target columns where painting could prolong effective column life.

9.120 Analysis of our concrete column stock has suggested that, whilst there are still many columns in need of replacement, the situation is not quite as bad as it had previously seemed. Consideration of the details of column types, ages and rates of failure shows that we will need to replace all of the 4000 or so type 1805 columns. These are known to suffer from unseen corrosion of the reinforcing steel and, following instances of collapse, many were previously sleeved with galvanised steel 'base corsets', but they can no longer be relied upon to stand for the next 5 years. Another common design, the type 10, is of slender construction and has been shown to be prone to failure, and we anticipate that around half of the 8,095 columns of this type will need replacement during the LTP2 period. On a more positive note, the other concrete columns, of which we have around 4700, continue to perform well. We anticipate that the majority of these will not need replacement during the LTP2 period. Where cracks do appear in this type of column they will, in most cases, be sleeved where such a repair can be expected to extend the life of a column by 5 years or more and so be cost-effective. Annual failure rates of concrete columns, as shown in Table 9.6, show no clear year on year trend, although an overall failure rate of 12% appears typical. This represents the poor condition of the type 10 columns referred to above and the relatively healthy situation of the other types, although they still show annual failure rates of 2 to 5%.

Table 9.6 Concrete lighting columns - failure rates

Concrete lighting columns - failure rates							
Year	00-01	01-02	02-03	03-04	04-05	05-06	Average
% fail	13.3	n/a	6.4	11.6	8.1	17.2	11.3

9.121 Our assessment of the relative needs for column replacement is shown in Table 9.7.

Table 9.7 Column replacement needs during LTP2

Column type	Total no.	No. of life expired	No. to be replaced during LTP period	No. of life expired at end of LTP period
Painted Steel	31846	32	160	32
Galvanised Steel	12949	0	0	0
Concrete 1805	4269	4269	4269	0
Concrete 10	8095	8095	2980	5115
Other	5583	18	90	18
Total	62742	12414	7519	5165

9.122 With our substantial renewal programme of over 1500 replacement columns each year, we have set our target to have only 8.2% of columns in need of replacement by 2010/11, which is significantly closer to the position we expect to reach with long term steady state renewal of around 3% of columns each year.

9.123 For the LTP2 period, we will significantly improve the rate of renewal that we have managed in recent years. Some of this will be achieved as part of transport improvement schemes, but most of the work will be funded from LTP2 capital maintenance and additional County Council spending. We believe this extra funding is required because of the particularly serious backlog with this asset, but even so the requirements for other assets mean that we still cannot justify investing enough to remove the backlog fully by the end of the LTP2 period. Whilst the proportion of columns awaiting renewal will be reduced, much further replacement in the longer-term will be required to achieve a steady state condition.

9.124 To achieve our planned rate of replacement we need to be resourceful in finding other funds to supplement that from the LTP. We already spend above our highways FSS level and will continue to use capital receipts. For 2006/7 £250,000 of LTP2 reward money is being channelled into column replacement, and we plan to supplement this further with initiatives for raising money through sponsorship and advertising. We may be able to continue at this rate of spend long term, thus enabling us to replace a higher proportion of steel columns (our TAMP will clarify the actual need), but this level of spend will limit the investment we can make in other asset groups. All possible funding opportunities are therefore being reviewed, including partnerships with the private sector and PFI. Exploratory work has revealed that a stand-alone street lighting PFI for Leicestershire is unlikely to be successful and we are undertaking exploratory discussions with other city and county authorities, particularly Nottinghamshire, to see if a combined PFI is a viable proposition for the longer-term.

Traffic signals

9.125 We have a total of 335 traffic signal installations consisting of 138 traffic signal junctions and 197 traffic signal crossings of all types away from junctions. The contract for maintaining these installations has different annual charges according to the age of the controller in the on-street cabinet which determines the signal sequence, switching, lamp monitoring and safety-critical functions. Premium maintenance rates apply to the older traffic signal installations with the most fault-prone controllers and installations.

9.126 The typical life of a traffic signal installation has been around 20 years, but earlier renewal may be required where signals regularly switch themselves off due to cable or controller faults which cannot be resolved by conventional component replacement. Analysis of our current stock, both in terms of age and condition (as measured by the fault history and maintenance records) together with improving quality of equipment, has indicated that a target of 4%

renewals per year is appropriate. This is commensurate with an average life of 25 years in the long term. This rate of replacement will prevent an increase in the average age of the traffic signals. A number of installations are prioritised for renewal based on high fault rates and savings in the contract maintenance rates. The investment required for this, compared to the demands of other assets, is thought appropriate to safeguard these assets for the future.

9.127 Table 9.8 below shows the current age profile of our installations.

Table 9.8 Ages of traffic signal controllers

Installation	1984 - 1985	1986 - 1987	1988 - 1989	1990 - 1991	1992 - 1993	1994 - 1995	1996 - 1997	1998 - 1999	2000 - 2001	2002 - 2003	2004 - 2005
Signal Junctions	4	3	1	12	10	15	17	17	16	18	9
Crossings	0	6	6	18	14	19	18	21	22	24	12
Total	4	9	7	30	24	34	35	38	38	42	21

Bus infrastructure

9.128 Bus infrastructure in Leicestershire is variously owned. The County Council is directly responsible for provision of bus stops, waiting areas (including raised kerbs and road markings), star trak intelligent signs and some bus shelters. Most rural and many urban bus shelters are the responsibility of parish and district councils. The only off-street bus station in the county, in Hinckley, is owned by the Borough Council. A structured approach to the management of these assets will feature in the second edition of our TAMP. At present much of our infrastructure is relatively new and is only in need of routine servicing and reactive maintenance following damage. Older infrastructure is maintained in conjunction with the footway or carriageway. Our TAMP will address the long term implications and will include preventative maintenance regimes and arrangements for upgrades and replacement. It will be important in this to ensure integration with the maintenance policies of parish and district councils, so that all bus infrastructure is maintained to a uniformly high standard.

Cycleways

9.129 We have been steadily expanding our network for cyclists over many years, both by directly investing in new facilities and by requiring appropriate construction as part of new development, both residential and commercial. This increasing network has been absorbed into our maintenance regime. The use of cycles to undertake routine inspections has allowed staff to take particular notice of aspects of the network that could impede, inconvenience or endanger cyclists, such as overgrown vegetation, route discontinuities and conflict with other traffic.

9.130 Cycleways that are within the carriageway are maintained with that carriageway since they are often subject to use by all classes of traffic. Separate cycleways and joint footway/cycleways are very similar to footways in terms of structural maintenance needs. Deterioration is predominantly by oxidation of the bituminous surface but also due to over-run by motorised vehicles. Although we have yet to expand our TAMP to cover this asset group, we anticipate that the long term maintenance needs will continue to be met by slurry sealing as preventative maintenance with recycling of the surface when condition dictates. It is likely that we will adopt levels of service similar to those for category 1 & 2 footways.

Transport improvements

9.131 Any addition to our transport infrastructure is likely to affect future maintenance requirements. Some of these features, for example traffic calming features and anti-skid surfacing, can be relatively expensive to maintain over the longer-term. To help reduce the

impact on future maintenance budgets, we have for many years chosen materials and methods which are designed to minimise whole-life cost whilst still meeting the objectives of the improvement scheme. We have also, more recently, developed a standardised approach to securing commuted sums from developers in locations where we adopt new roads which have non-standard surfacing, lighting or other features. This approach is now being successfully applied in a number of cases.

9.132 We will develop this approach in depth as we further progress our TAMP. In particular, we will ensure that the justification for future improvement schemes includes not only the capital cost but also the whole-life revenue costs, so that decisions between options can be made in the light of the full information.

Programme indicators and targets

9.133 As explained above, in producing LTP2 we have used the work that has gone into developing our TAMP to inform our investment and programming decisions and to establish indicators and targets. The asset management elements of our programme are detailed in Chapter 11. Chapter 12 deals with our indicators and targets including the trajectories and assessment of risks.

Capital maintenance funding for de-trunked roads in 2007/08

9.134 It is the DfT's intention that de-trunked roads will be incorporated into the standard local government funding mechanisms at the earliest practical opportunity. However, the next opportunity to do so will not arise until 2008/09. The Department, therefore, will consider supplementary bids from authorities for funds to assist in the capital maintenance of these roads in financial year 2007/08. This applies to those roads transferred to local authorities as part of the current de-trunking programme before 30th June 2005: in the case of Leicestershire, the A6 and A47 east.

9.135 Our bid for 2006/07 was met in full and we have included the schemes in our works programme. For 2007/08, we have identified a need for essential capital maintenance schemes, with a total bid of over £1 million. If funds are not provided in 2007/8, the cost of these works would not be met by a subsequent increase in the capital maintenance formula. There would therefore be a seriously detrimental impact on the remainder of our programme, with a consequential impact on our ability to achieve our LTP2 targets.

9.136 In line with guidance from the DfT, we will submit a detailed bid by 31st July 2006. An outline of our proposed bid is given below.

A6 Great Glen Bypass – landscaping

9.137 Responsibility for maintenance of the landscaped areas of the A6 Great Glen Bypass passes to the County Council on 1st April 2006. Although revenue funding is available for day to day maintenance, this scheme has had the benefit of extensive tree planting. The landscaping scheme is not yet fully established and so will require additional work, particularly during the next 3 years. This will take the form of weed control, thinning out and strimming. The cost in 2007/8 is estimated at £20,000.

A6 Quorn / Mountsorrel Bypass – Soar viaduct bridges completion

9.138 Bridge inspections had determined that these bridges required maintenance painting in accordance with Standard BD 87/05. This work, which had originally been proposed as long ago as 1997, is now programmed for 2006/07, funded from the de-trunking capital grant.

Recent inspection and detailed estimates show that the work required has increased due to the delay in provision of funding by the Highways Agency. The bid for 2007/08 will therefore include a sum of £100,000 for the completion of the work.

Resurfacing and surface dressing schemes

9.139 Resurfacing and surface dressing schemes include ten sites at a total cost of around £900,000. These are of smaller value, but are still in need of priority treatment. Typically they suffer from severe crazing and cracking of carriageway surface, repeated patching of failed areas, deteriorating carriageway reinstatements and minimal past maintenance.

Performance management

9.140 We have identified a range of outcome performance indicators which, with our monitoring at the detailed scheme level, will reflect the issues and areas of concern raised in the development of our strategy. We have kept the number of indicators for monitoring and managing our performance to the minimum we consider necessary to ensure there is a clear focus on what we need to achieve over the next five years.

9.141 The indicators we propose are:

- Principal road condition from SCANNER surveys
- Principal road condition by deflectograph
- Non principal road Condition by SCANNER surveys
- Unclassified road condition by visual inspection
- Category 1 & 2 busier footway condition
- Category 3 & 4 less busy footway condition
- Rights of way signposted and easy to use
- Bridges below critical condition thresholds
- Street lighting columns needing replacement
- Traffic signal installations needing renewal.

Contribution to other LTP and quality of life objectives

9.142 Whilst our asset management strategy has been developed specifically to achieve its stated objectives, it will also contribute to other LTP and quality of life objectives. The contribution it can make has been borne in mind in the development of the strategy. Table 9.9 summaries these contributions.

Table 9.9 Asset management strategy contribution to other LTP and quality of life objectives

Objective	Contribution of our asset management strategy	
Tackling congestion.	✓	Better asset planning and co-ordination of work by different agencies across all modes will lead to less disruption and delay for all road users and better road and footway surfaces will make the alternatives to car travel more attractive.
Improving access to facilities	✓✓	Better management of facilities for pedestrians, cyclists and bus users and integration of new infrastructure within the TAMP will increase their modal share, which will improve accessibility.
Reducing road casualties	✓✓✓	The TAMP will ensure that every opportunity is taken when carriageway maintenance schemes are implemented to improve safety at the same time through measures such as high skid surfacing. By improving the condition of the transport infrastructure we will reduce maintenance related accidents.
Improving air quality	✓	Delivering a well structured programme of highway maintenance will reduce unnecessary delays which will help to improve air quality by minimising increased emissions caused by stop/start traffic.
Reducing the impact of traffic	✓✓	Appropriate low noise surfaces can significantly reduce the impact of traffic in communities.
Quality of public spaces and better streetscapes	✓	By assessing the future maintenance needs of our planned new infrastructure we will make sure that the security and comfort of pedestrians, cyclists and public transport users is given a high priority.
Landscape and biodiversity	✓✓	The TAMP will cover the maintenance, spraying and cutting of roadside verges to enhance biodiversity where this doesn't compromise road safety.
Community safety, personal security and crime	✓✓	Improved management of our assets, in particular street lighting, will encourage people to walk, cycle and use public transport by reducing the perceived fear of crime
Healthy communities	✓	Better management of facilities for pedestrians, cyclists and bus users will increase their modal share, which will encourage healthier and more sustainable travel choices.
Sustainable and prosperous communities	✓✓	An effectively maintained road network can impact positively on the economic vitality of our communities.
Noise	✓✓✓	Following comprehensive joint research with TRL, we now use the most appropriate low noise surfacing as indicated by the published report at all sensitive sites throughout the County.
Climate change and greenhouse gases	✓	Delivering a well structured programme of highway maintenance will reduce unnecessary delays, which will reduce CO_2 emissions caused by stop/start traffic.

✓ = Modest contribution
✓✓ = Moderate contribution
✓✓✓ = Significant contribution