Transport Asset Management Plan

DARLINGTON BOROUGH COUNCIL

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1. Executive Summary

The Middlesbrough Transport Asset Management Plan (TAMP) is the framework for an integrated asset management approach to the Council's transport assets. The County Surveyors' Society (CSS) document "Framework for Highway Asset Management" provides the following definition of the process as applied to transport networks:

"Asset management is a strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highway infrastructure to meet the needs of current and future customers."

The Transport Asset Management Plan is a strategic document that is intended to develop and improve the way that the highway management and maintenance functions are carried out within the Borough. It will allow the authority to take a longer term approach to highway management and allow for the optimal allocation of resources based on customer needs and demands.

For the purposes of this document the assets have been broken down into a number of relevant groupings:

Carriageways
Footways
Cycleways
Structures
Drainage
Street Lighting
Traffic Signals and Telematics
Public Rights of Way
Trees, Hedges, Verges & Planted Areas
Unlit Signs & Street Furniture
Barriers and Safety Fences
Road Markings & Studs

Asset	Length or Quantity	Estimated Value
Carriageways	577.61km.	£212,000,000
Footways & Kerbs	614.05km.	£95,166,000
Cycleways	38.02km.	£2,000,000
Structures	251No.	£250,000,000
Drainage	25929No./ 64.828km.	£16,302,500
Street Lighting	25054No.	£25,100,000
Traffic Signals and Telematics	117No.	£27,300,000
Public Rights of Way	38.0km.	£2,736,000
Trees, Hedges, Verges & Planted Areas	30000no./ 51.0km.	£5,880,000
Unlit Signs & Street Furniture	1290No.	£645,000
Barriers and Safety Fences	5941+ 8777	£1,401,966
Road Markings & Studs	147.33km + 2576	£110,486
Total		**£638,641,952**

Table 1.1 – Asset Groups

It is further intended that the implementation of the plan will necessarily involve the active participation of all the key stakeholders within the

borough of Middlesbrough including; staff, management, council members, other interested bodies and perhaps most importantly the people of Middlesbrough.

The Tees Valley authorities have set up an Asset Management working group charged with the production of this document along with the implementation of the improvement actions identified as part of this process. The group comprised of Council Officers with the assistance of an external consultant aim to drive forward the asset management process within the council.

It is the council's intention to develop the plan over a number of years which will enable systems to be established to manage all transportation assets on a long-term basis using whole life costing within a framework of statutory requirements, customer expectations and sustainable funding.

The key drivers for the adoption of asset management for transport networks include:

- **Linkage with the Council's Local Transport Plan (LTP).**

  It was a requirement of the Provisional LTP that the Council submit a TAMP progress report. Middlesbrough Council submitted such a report, which outlined the contribution that transport asset management will make to strategic LTP objectives and how the TAMP is intended to be produced.

  Local Transport Plan 2 Guidelines include a requirement to demonstrate effective asset management.

  Section 3 of this Plan details how the TAMP will help the Council meet it's LTP objectives.

- **The Prudential Code**

  It is likely that future borrowing under this Code will have to be supported by sound asset management information.

- ***Whole Government Accounts and Asset Valuation***

  The progressive introduction of Whole Government Accounts will place an onus upon local authorities to value their transport assets. The CSS has produced the "Guidance Document for Highway Infrastructure Valuation" to help drive this process. Asset management will help Middlesbrough Council produce the key inputs to enable valuation in accordance with this guidance.

The TAMP will increasingly become the tool the authority will use to ensure effective targeting of budgets.

2. Introduction

2.1 Purpose of the Transport Asset Management Plan

The purpose of this document is to set out an approach for Middlesbrough Council for the management of its transport asset. It is based upon the CSS framework document for Highway Asset Management Plans.

The Transport Asset Management Plan pulls together all the relevant strategies, goals, objectives, plans and methods in use within the Council.

The development process of the TAMP assesses the strengths and weaknesses of existing systems and methods in managing the transport and highway asset and the highway network. The plan will enable an asset management system to be developed for managing transport and highway assets on a long-term basis using whole life costing within a framework of statutory requirements, customer expectations and sustained funding.

2.2 What is Asset Management ?

Asset management represents more than simply an integration of existing management systems and data. It builds on existing processes and tools to form a continuous improvement framework that complements and supplements existing practice.

Definition

Asset management means different things to different people. The CSS adopted the following definition for the purpose of their framework document and for application to UK highway networks.

"Asset management is a strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highway infrastructure to meet the needs of current and future customers."

The definition brings together themes that define an asset management approach:

- **Strategic Approach** - a systematic process that takes a long term view
- **Whole of Life** - the whole-life/life-cycle of an asset is considered
- **Optimisation** - maximizing benefits by balancing competing demands
- **Resource Allocation** - allocation of resources based on assessed needs.
- **Customer Focus** - explicit consideration of customer expectations

2.3 Why Asset Management ?

The Value of Road Networks

It is widely accepted that transport infrastructure is vital to the economic well being of the country. For most local authorities their road network is the most valuable community asset under their control. Despite this there is a growing realisation that the management of these vital and valuable assets is not receiving the attention or funding required for the provision of the optimal state of repair and operation.
The asset groups that are considered in this plan are:

Asset Groups	Group Elements
Carriageways	Road Infrastructure,Kerbs,Traffic Calming,Cattle Grids
Footways	Footway Infrastructure, Edgings,Markings
Cycleways	Cycleway Infrastructure, Edgings,Markings
Structures	Bridges,Retaining Walls,Footbridges,Sign Gantry, Culverts (greater than 1.5m),Embankments
Drainage	Ditches,Grips,Pipes,Culverts (less than1.5m), Gullies,Sewers,Entry Points,Catch Pits,Soak Aways
Street Lighting	Street lights, illuminated signs
Traffic Signals & Telematics	Traffic signals,CCTV
Public Rights of Way	Hard Areas,Fences,Gates,Stiles,Signs
Trees, Hedges, Verges & Planted Areas	Grass Verges,Trees,Hedges,Flower & Shrub Beds,Planters
Unlit Signs & Street Furniture	Non Illuminated Signs, bollards etc.
Barriers & Safety Fences	Safety Barriers,Fencing & Guard Rail
Road Markings & Studs	Road Markings & Studs

Table 2.1 Asset Groups and Elements

Transport assets constitute the most valuable infrastructure that Middlesbrough Council manages. The extent and estimated value for the key assets is set out below:

Asset	Length or Quantity	Estimated Value
Carriageways	577.61km.	£212,000,000
Footways & Kerbs	614.05km.	£95,166,000
Cycleways	38.02km.	£2,000,000
Structures	251No.	£250,000,000
Drainage	25929No./ 64.828km.	£16,302,500
Street Lighting	25054No.	£25,100,000
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Barriers and Safety Fences	5941+ 8777	£1,401,966
Road Markings & Studs	147.33km + 2576	£110,486
Total		**£638,641,952**

Table 2.2

The estimated value is based on a set of generic rates for the Tees Valley Authorities

Challenges Facing Highway Authorities

Highway authorities exercise their duties to maintain, operate and improve their highway assets under increasing pressures that include:

- Limited resources
- Mature networks
- Increased accountability
- Increasing public expectations

Whilst individual responses to these challenges vary there is a trend towards a more structured approach to the management of road assets. The Tees Valley highway authorities are implementing asset management principles as a means of delivering improved transport and highway services to the public.

2.4 The Drivers for the use of Transport Asset Management

The 2005 Code of Practice for Highway Maintenance Management

The new Code was launched in July 2005. It recommends the use of an Asset Management Plan.

Local Transport Plan

The Local Transport Plan is a statutory document through the Transport Act 2000. Each highway authority produces a Local Transport Plan every five years and an Annual Progress Report for each of the years between. These are submitted to Government so that they can decide how much funding to allocate to each authority.

The Local Transport Plan describes the transport strategy and implementation programme and sets the strategic direction and framework for its delivery. It is largely a performance management approach where the funding has to be used in a way that will ensure the strategic targets are met. Clearly an important part of progress towards targets will be using the funding available in a way that will maximise effectiveness and outcomes. Effective asset management is an essential part of this.

A second LTP for 2006/7 to 2010/11 has been developed and the strategic objectives reviewed in view of the national priorities of congestion, accessibility, safety, environment and sustainable growth. In addition the LTP2 places much greater emphasis on achieving value for money and a good asset management system will be essential to deliver this.

The Government guidance on the second LTP stipulated that evidence about the quality of asset management would form part of its assessment. Therefore the LTP2 contained evidence that the TAMP is being developed.

The Prudential Code

The government has introduced the Prudential Code to govern the way in which local authorities manage their assets. The code requires local authorities to have explicit regard to option appraisal, asset management planning and strategic planning when making capital investment decisions and to demonstrate that their plans are affordable, prudent and sustainable.

The code enables authorities to choose between revenue and capital funded options for service delivery, undertake 'spend to save' capital schemes and undertake additional self-funded capital investment where they can afford to do so.

The code, therefore, enables the introduction of more sophisticated application of asset management than is possible under the previous financial regime. A robust asset management plan will be a valuable tool to any authority wishing to explore the potential benefits that the code enables.

Whole of Government Accounts

The government is working towards the production of whole of government accounts (WGA). WGA accounts will be commercial-style accounts covering the whole of the public sector including local authorities. WGA will be produced on an accruals basis and will use Generally Accepted Accounting Principles (GAAP), adapted where necessary for government. This form of accounting is known as Resource Accounting and Budgeting (RAB). Under these requirements local authorities will be required to value their highway assets.

The Guidance Document for Highway Infrastructure Asset Valuation was published in July 2005. It recommends a timeframe for the implementation of highway infrastructure asset valuation to support Asset Management and Whole of Government Accounts as follows:

- Interim valuation of a sample of assets
- Benchmark valuation in Financial Year 2007-8
- Calculate in-year movements (e.g. depreciation) in following Financial Years.

The valuation will be required to not only assess replacement value but also to assess the level and rate of depreciation in order to record current value in their accounts. Experience internationally and locally (with other government departments) shows that meeting these accounting requirements demands a detailed knowledge of the asset (including condition and maintenance backlog). This in turn drives a need for robust processes, based around asset management plans, backed by databases providing valid, relevant and up to date core data on the assets. It is anticipated that the introduction of these requirements in this country will provide a similar demand for improved asset information.
In many other countries the introduction of legislation requiring asset valuation has been the catalyst for the development of asset management practice and in particular for the publication of asset management plans.

2.5 Benefits of Transport Asset Management Plans

Asset management facilitates better decision-making by supplementing instinctive engineering judgement and supposition with analysis (financial, economic and engineering). It thereby enables an authority to better understand and manage the relationship between cost and performance.

This will deliver an improved level of service with the resources available, i.e.,

- The same or better level of service at a reduced cost.
- A better level of service at the same or marginally increased cost.
- Or; where, owing to budgetary constraints, it is not possible to maintain the level of service, the effects of the reduced level of service is mitigated through the efficient use of resources.

Specific benefits of an asset management approach are:

- Reduced life-cycle costs
- Defined levels of service
- The ability to track performance
- Improved transparency in decision making
- The ability to predict the consequences of funding decisions
- Decreased financial, operational and legal risk
- Ability to discharge statutory valuation and financial reporting responsibilities

2.6 Scope of the Transport Asset Management Plan

This document represents an evaluation of asset management practices in the Borough and sets out a way forward. It has been prepared using the CSS Framework for Highway Asset Management.

A generic Asset Management System is illustrated in Table 2.3 that follows.

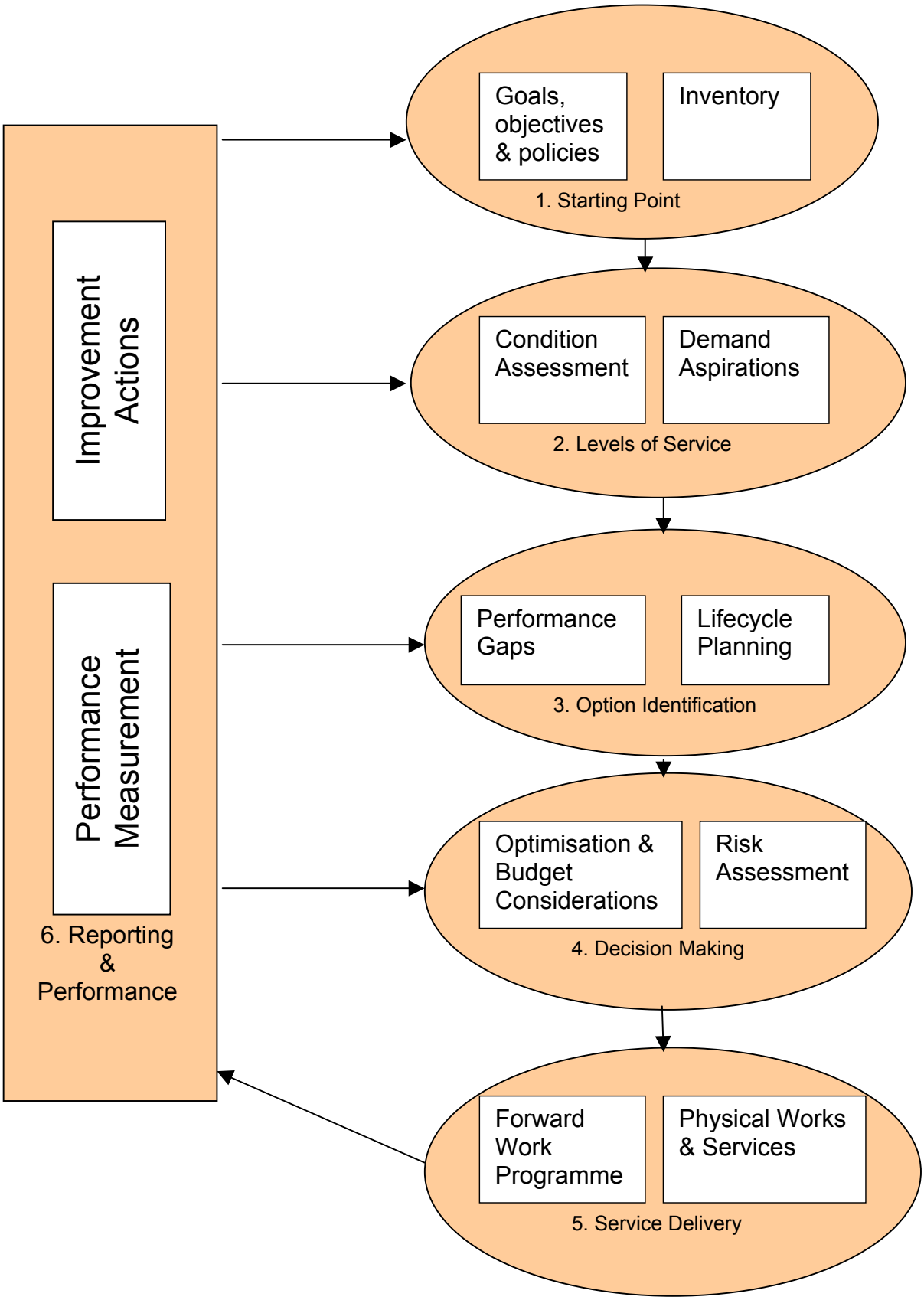


Table 2.3 (Fig 2 from CSS Document)
There are two internationally recognised styles of asset management – basic and advanced.

The differences between the two models are illustrated in Table 2.4 following.

Basic and Advanced Asset Management Planning

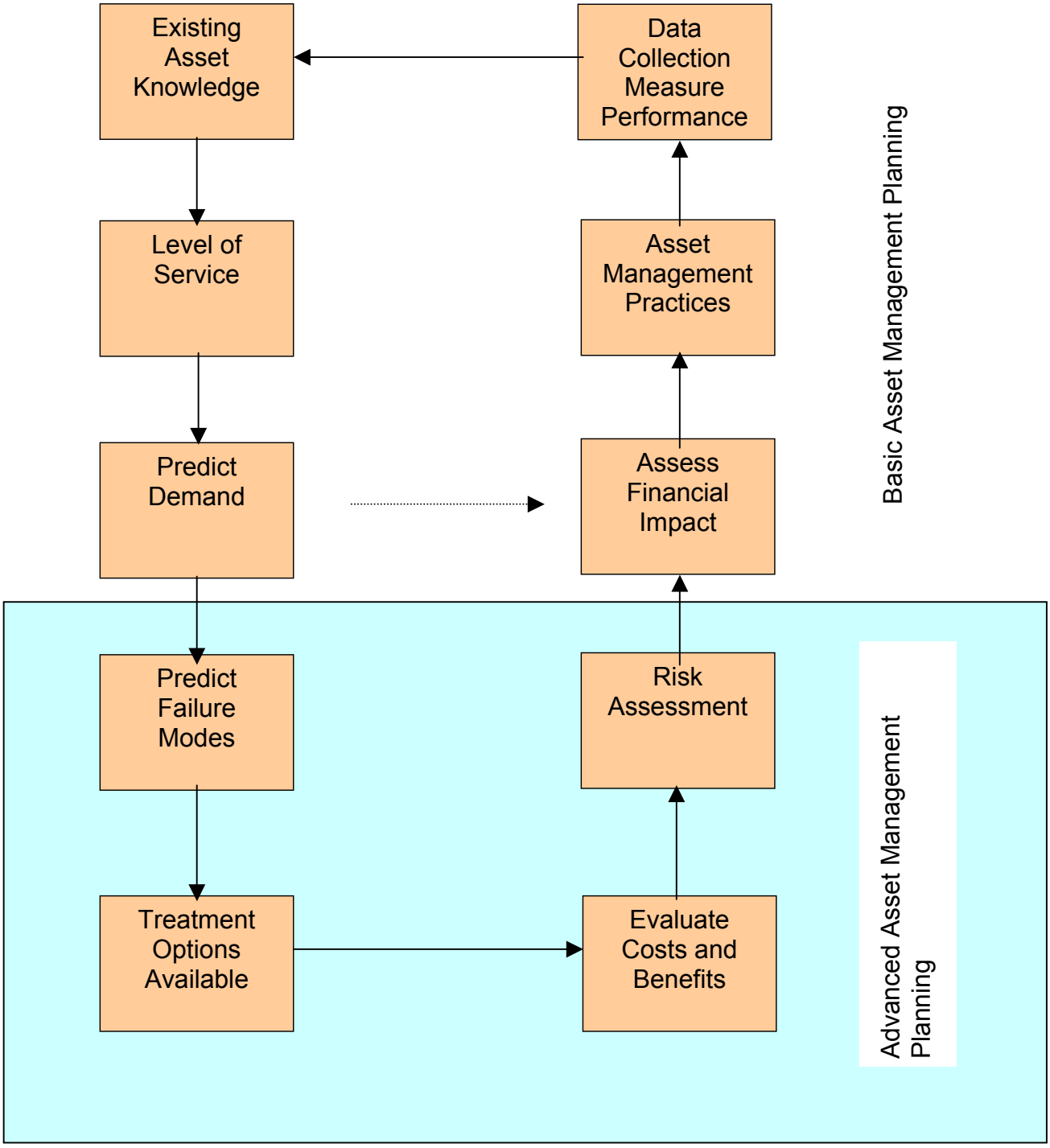


Table 2.4

The authority is currently developing the basic asset management approach. As the TAMP is developed over the coming years it will evolve to include the elements of a more advanced system. Initially Middlesbrough Council is considering ways of using the collected information more effectively.

A GAP analysis will determine what additional data is required to improve the methodology for budget allocation, identification and prioritisation of works. At each review of the Plan the costs will be considered against the potential benefits.

Advanced Asset Management builds on the basic approach by engaging prediction modelling, risk management and optimised renewal decision making techniques. These facilitate long-term financial forecasts and programmes that minimise lifecycle costs whilst delivering required levels of service. Accurate and detailed data on assets is essential to gain the benefits of advanced asset management.

This necessitates taking a lifecycle approach to asset management and developing TAMP's based on:

- Best available current information
- Condition sample
- Existing service levels
- Calculating cash flow predictions for asset maintenance, rehabilitation and renewal based on local knowledge
- Providing service performance measures against which improvement could be monitored
- Contrast existing approaches with opportunities for improvement.
- Seek the views of asset group users on appropriate service levels.

2.7 Aim of Middlesbrough's Transport Asset Management Plan

Middlesbrough are seeking to enhance the current approach to transport asset management, thereby becoming more effective and improving the ability to meet national and local objectives and customer needs. The intention is to develop 5-year programmes, the first two years of which will be in some detail and the latter three being indicative.

As the plan is developed it will;-

- Continue to identify improvements in the information and systems necessary to refine this process.
- Include all highway and transportation assets.
- Adopt best practice.
- Monitor the condition and performance of assets.
- Prioritise greatest need.
- Use optimisation tools to develop options for current and future service delivery, forward financial planning and investment and asset renewal programmes.

- Provide value for money by optimising the long-term life cycle costs of assets and through improved system and practices.
- Achieve corporate objectives.
- Enable the Council to meet the government's future requirements for financial planning for transport.
- Demonstrate effective management of assets on behalf of customers and stakeholders.
- Planning for future asset requirements based on projected demand and service levels.
- Seek the views of asset group users on appropriate service levels.
- Increase confidence in future planning and programmes.

The adoption of a formalised asset management approach builds on the foundations of existing practices. This plan will set out practices in regard to these elements as far as is possible. Where changes are identified in the information and systems necessary to refine this process they are set out in the improvement plan.

The TAMP is a 'living document' and therefore will be reviewed and updated regularly. However, its performance as an asset management tool will be primarily improved through the development of optimisation processes. This must be done through an ongoing process of programmed development that will continually seek best practice.

2.8 TAMP Structure

The Transport Asset Management Plan is divided into 2 volumes, each containing a number of sections.

The sections in Volume 1 constitute the main Asset Management Plan and are described below:

Section 1: Executive Summary

Sets out the rationale for the Plan, its key components and the means by which it has been approved.

Section 2: Introduction

Provides an overview of the asset management process and the way that it's approached in the TAMP.

Section 3: Policy Framework

Describes the contribution of asset management to the priorities set out in developing the vision for Middlesbrough in line with the Mayor's "Raising Hope" Agenda.

Explains the relative contributions of each of the transport assets to the LTP shared priorities of reducing congestion, improving safety, improving air quality and increasing accessibility.

Sets out how the asset management approach will be a key factor in ensuring that the Council maximises its achievements in each of these areas.

Section 4: Life Cycle Planning

Contains synopses of life cycle plans for each of the assets and the key conclusions to be drawn from them.

Section 5: Levels of Service

Identifies the various service levels applicable to the assets. For each asset, 4 differing levels of service are defined:

- **Statutory** (i.e. that which is required by law)
- **Existing** (that which the Council currently provides)
- **Requested** (that which is requested/desired by service users, political commitments etc)
- **Optimum** (the level of service that represents best engineering practice)

Estimated costs are provided for the varying levels of service. An **attainable** level of service will be developed in the light of likely available budgets.

Section 6: Risk Management

Provides an objective assessment of the risks associated with the various levels of service. These assessments will aid trade offs between service levels (i.e. service prioritisation).

Risks are assessed in terms of:
- Safety
- The reputation of the Council
- Finance
- Environment
- Loss of network availability and congestion

Section 7: Service Priorities

This is a key section of the Plan. Contains a set of tools to enable service prioritisation. These techniques will be further developed and hence applied to the 2008/9 budget allocations. These techniques include:

- Whole Life Costing
- Investment Profiling
- Formulation and analysis of works programmes and their implications in terms of finance and performance measures.

Section 8: Forward Works Programming

Details methods to be used to formulate forward works programmes, including a mathematical modelling approach for roads.

Section 9: Performance Monitoring

Sets out how the Council currently measures its performance in relation to the management of transport assets and contains proposals for new performance indicators, designed to help the authority monitor its progress with implementation of the TAMP.

Section 10: Improvement Actions

This section contains proposed improvement actions, together with associated timescales and costs, to help the Council better manage its assets in line with the asset management philosophy.

Volume 2 of the Plan comprises a number of appendices, each containing detailed asset management information that is supplementary to the main sections of the Plan.

These appendices are:

Appendix A **– Glossary of Terms**
Appendix B **– Inventory Data**
Appendix C **– Levels of Service**
Appendix D **– Detailed Lifecycle Plans**
Appendix E **– Risk Analysis Results**
Appendix F **– Forward Works Programmes**
Appendix G **– Performance Indicators and Reporting**
Appendix H **– Improvement Action Plan and Programme**

3. Policy Framework

The planning and delivery of services will be integrated within the wider aims and objectives of the corporate vision and coordinated with other business objectives. This is crucial in ensuring a high quality service that offers good value for money to the people of Middlesbrough.

3.1 Strategic Objectives

In developing the vision for Middlesbrough in line with the Mayor's "Raising Hope" Agenda the Council has identified the Community Strategy themes as follows;

- **Supporting Children and Learning**
- **Promoting Healthier Communities for All and Effective Social Care for Adults**
- **Creating Safer and Stronger Communities**
- **Transforming our Local Environment**
- **Meeting Local Transport Needs More Effectively**.
- **Promoting the Economic Vitality of Middlesbrough**.

We can contribute to achieving the Council objectives by focusing on the achievement of four specific objectives. These have been developed to maximise the contribution towards the "Raising Hope" Agenda and Community Strategy themes.

The four objectives are: -

- To keep the highway network safe and well maintained at all times of the year
- To reduce congestion on the network by co-coordinating the works programmes of all those organisations affecting the network
- To apply the principles of Local Agenda 21 via the increased use of low noise surfacing, recycled materials and by the adoption of a whole life costing strategy for treatment identification and selection
- To manage and monitor service performance and improvement through the effective use of performance management tools

These objectives will form the basis in the development of policy and strategy, however four other elements shall also be taken into consideration: - Integrated Transport Strategy, Best Value principles including Promoting Continuous Improvement, Risk Management principles and Legislation.

The theme of strategic policy integration is continued in Government transport policy. The Ten Year Plan for Transport is intended to support and contribute to long term Government objectives within which highway maintenance is placed as a key priority for investment.

Although highway maintenance is a contributory element to some of the objectives and targets in the Plan, the key objectives will be:

- Better Road and footpath conditions
- Reduced casualty numbers
- Reduced noise
- Enhanced personal safety

The Middlesbrough Highway Maintenance Plan will endeavour to achieve these objectives by

- Progress longer term, non adversarial and sustainable contracts
- Seek opportunities to Invest to save
- Seek funding from other organisations for Crime reduction and Environmental improvements
- Work with all partners to deliver additionality to projects
- Improve public perception of road works by early informative consultation with all stakeholders
- Highway Management Policies and objectives based on the recommendations within the new Codes of Practice
- Base priorities on reviewed hierarchies, technical requirements and whole life costing
- Maintain accurate and updated inventory details, necessary for Asset Management valuation
- Inform developers of sustainable requirements
- Apply Environmental Management Strategy throughout to save energy and mitigate effects of climate change.

Highway maintenance policy should be developed integrally with the overall management of the network so that the whole is managed holistically to provide consistent and appropriate levels of service through all the modes of transport and their constituent activities. It is essential that consistency exists across all the service boundaries.

Managing highway maintenance needs to be consistent with arrangements for managing an authority's wider asset base such as land and property set within the context of an asset management regime. The key principles of asset management are:

- focus on lifecycle costing
- management strategies for the long term
- establishing and monitoring levels of service
- managing risk of failure or loss of use
- sustainable use of physical resources
- continual improvement.

3.2 Integrated Transport strategy

In accordance with the requirements of the Local Transport Plan 2 guidance the Council has prepared a Local Transport Strategy for Middlesbrough. This sets out details of how transport can contribute towards the longer term (10-15 years) vision for Middlesbrough.

To ensure that the Transport Strategy and the LTP puts transport users' priorities at the heart of these services a series of public meetings have been undertaken. These meetings have promoted a close understanding between the public and council as to what are the key transport issues in the town.

There are a number of challenges raised by these consultations and these have been distilled into four objectives.

Objectives

- Promoting economic growth and regeneration by providing accessibility improvements to underpin economic development and social inclusion.
- Reducing the number of accidents and causalities by making our streets safer and more attractive and therefore encouraging healthier lifestyles.
- Reducing the number of journeys made by car and thereby arresting the growth in problems brought about by traffic congestion relating to air quality and the environment.
- Encouraging investment to deliver public transport improvements to reverse declining patronage, creating modal shift, improve safety and ensure reliable journey times.

The transport strategy supports the aims of the emerging LDF in promoting Middlesbrough's economic and social development and improving the environment, and is in line with other corporate policies.

From these key objectives five key transport priorities have been developed for the Community Strategy.

Priorities.

Priority 1 The whole transport network will facilitate the local community (including disadvantaged or vulnerable groups) to have access to work and important services including education, healthcare, leisure, and shopping.

Priority 2 Congestion will not hinder economic development, impair the quality of the local environment or cause severance in our communities.

Priority 3 Reduce the number of people killed and seriously injured in road traffic accidents and reduce accidents and casualties overall, especially in disadvantaged communities where casualties are higher.

Priority 4 The environmental impact of transport on air quality, noise and climate change is reduced as far as possible when balanced against our economic and social objectives.

Priority 5 Highways maintenance is undertaken in a sustainable manner and prioritised to assist with our other objectives. We will encourage, as a priority, the increased use of cycling and walking through appropriate maintenance and access improvements.

3.3 Delivering Best Value

From 1 April 2000 the new duty of Best Value was placed on local authorities in respect of the funding, procurement and delivery of all services. It requires authorities to:

- ensure that services are responsive to the needs of the community not the convenience of service providers
- secure continuous improvement in the exercise of all functions, whether statutory or not, having regard to a combination of economy, efficiency and effectiveness.

The Government stated that Best Value could lead to "genuine and long term improvements in the social, economic and environmental well being of communities", which is reflected by the requirement to produce a community strategy.

The principles of Best Value are particularly relevant to highway maintenance for the following reasons:

- highways are a major public asset highly valued by the community
- maintenance attracts a high level of public interest and concern
- performance indicators have historically been difficult to quantify
- there has tended to be no robust framework for local comparison
- there has been an inefficient approach to whole life costing
- there is a wide and developing range of service delivery options.

Best Value has developed through the process of Comprehensive Performance Assessment (CPA) which focuses on the corporate and service performance of the authority, promising greater flexibility in return for performance improvement. The involvement of highway users and the community during a Best Value consultation exercise is both desirable and relevant and is essential in generating understanding in order to pursue Best Value. Consistency of standards is also an important element in delivering Best Value. There must be consistent standards demonstrated by the Council and, moreover, there should also be reasonable consistency with the networks maintained by housing authorities or other agencies. The Council has adopted a standard computer system throughout to record inspections, which can then be assessed by insurance/legal services to deal with claims.

Best Value reviews are built on the 4 C's (Challenge, Compare, Consult and Compete) and each of these must be fully examined and incorporated into the process. Authorities need to show that for every review their process is:

1) Challenge - How and why are particular services being provided. Are we doing it right?
2) Compare - The Council's performance against other authorities.
3) Consult - Investigate the communication channels held between the Council and service users.
4) Compete - Ensure that all services are open to fair competition.

It is important that reviews should

(a) identify all areas of interaction of highway maintenance with each of the key corporate objectives of the Council
(b) investigate and pursue added value when opportunities arise through these interactions and ensure sustainability is considered throughout.
(c) investigate and resolve conflicts which arise through these interactions.

The goal of Best Value to secure continuous improvement will only be effective in an organisation that is able to embrace change, encourage risk and innovation, and is able to learn from both its successes and failures. As continuous improvement will be measured through performance indicators, benchmarking and targets, these will clearly need to be appropriate and meaningful.

The authority embraces the principles of competition in procuring the delivery of services taking into account both price and quality. Comparison and consultation shall be exercised to ensure efficiency.

The Council's Standards and Policies are being developed through consultation and will take into account local needs. Information on these is being made available through the Council's website. The website is also being developed to show information on both authority and utility road works, which will help to alleviate inconvenience and disruption. Procedures are also in place to manage all calls to the council, via a call centre.

The Council and service providers embrace the requirements of equal opportunity, and the philosophy of "investors in people" processes including appraisal, training and development.

3.4 Legislation

Much of highway maintenance activity is based upon statutory powers and duties contained in legislation and precedents developed over time as a result of claims and legal proceedings. It is crucially important that all those involved in highway maintenance, including Council Members, have a clear understanding of their powers and duties, and the implications of these.

Even in the absence of specific duties and powers, authorities have a general duty of care to users and the community to maintain the highway in a condition fit for its purpose. This principle should be applied when developing policy and strategy.

In addition to a general Duty of Care, there are a number of specific pieces of legislation which provide the basis of powers, duties, and responsibilities relating to Highway Maintenance, regulating the environmental affects of operations, and Health and Safety:-

The Highways Act 1980
The New Roads and Street Works Act 1991
Road Traffic Regulations Act 1984
Traffic Signs and General Directions 2005
Road Traffic Act 1991
Road Traffic Reduction Act 1997
The Local Authorities (Transport Charges) Regulations 1998
The Transport Act 2000
Traffic Management Act 2004
Railways and Transport Safety Act 2003
National Parks and Access to the Countryside Act 1949
Countryside Act 1968
Wildlife and Countryside Act 1981
The Environmental Protection Act 1990
The Weeds Act 1959
Ragwort Control Act 2003
Control of Pesticides Regulations 1997
Hedgerow regulations 1997
Occupiers Liability Act 1957
Rights of way Act 1990
Countryside and Rights of Way Act 2000
European Water Framework Directive 2000
The Clean Neighbourhoods and Environment Act 2005
The Environmental Assessment of Plans and Programmes Regulations 2004
The Health and Safety at Work Act 1974
Management of Health and Safety at Work Regulations 1999
Construction (Design and Management) Regulations 2007

There is also further legislation, not specifically related to highways, street and traffic functions, but dealing with wider community issues that may affect the service we provide: -

Crime and Disorder Act 1998 (Section 17)
Disability Discrimination Act 1995
Criminal Justice and Public Order Act 1994
Human Rights Act 1998
Freedom of Information Act 2000
Local Government Act 2000
Civil Contingencies Act 2004

In the development of policy and strategy the first priority will always be to ensure compliance with our statutory duties and fulfil our duty of care.

Furthermore it is the duty of every authority when determining policy to give due consideration in undertaking Equality Impact Assessments in accordance with the following legislation:

Sex Discrimination Act 1975
Disability Discrimination Act 1995
Race Relations (Amendment) Act 2000
Equality Act 2006
Age Discrimination (pending)

4. Life Cycle Planning

4.1 Introduction

Transport assets have life cycles that include the following phases:

- Creation/Acquisition
- Maintenance
- Renewal or Replacement
- Upgrading
- Disposal or Decommissioning

Consideration of each of the above phases for the Council's transport assets will help drive a shift towards longer-term asset management and planning. Such a longer-term approach is a key element of the asset management approach.

The present management of these phases for the Council's transport assets' lives will be critically reviewed and opportunities for improving current practice identified. The improvement actions derived from this process appear in Section 10 and Appendix H.

4.2 The Life Cycle Planning Process

Detailed life cycle plans have been produced for the following transport assets:

1. Carriageways
2. Footways
3. Cycleways
4. Structures
5. Drainage
6. Street Lighting
7. Traffic Signals & Telematics
8. Public Rights of Way
9. Trees, Hedges, Verges & Planted Areas
10. Unlit Signs and Street Furniture
11. Barriers & Safety Fences
12. Road Markings & Studs

For each of these assets, the following aspects were considered in detail:

Inventory: Information detailing the extent of the asset, split into relevant groups. Includes important data deficiencies or systems issues. Based upon this data, an estimate of the value (Gross Replacement Cost) of each asset has been made.

Condition: Sets out the current condition of each asset. Details the inspection methods and survey regimes used, the data collected, where it is stored and the degree of confidence in the data. Where appropriate this section includes

statements and standards that define the desired condition of the asset.

Option Appraisal: Details how options are identified and appraised for each phase of an asset's life.

Budget Optimisation: Reviews how budgets are currently distributed between assets and the processes in place for assessing competing demands upon available budgets.

Performance Gaps: The gaps between present condition and that which is desired. Detailed life cycle plans appear for each asset in Appendix D. Some of the key points from each of these detailed life cycle plans are summarised in this section.

4.3 Carriageways

The main purpose of the carriageway network is to provide safe and unobstructed flow for all categories of road user.

Inventory

Middlesbrough Council as a Highway Authority is responsible for 578 km of roads with a gross replacement cost (GRC) estimated at approximately £212 million.

For maintenance management purposes, the network of carriageways is divided into sections. These sections enable the accurate location of condition data, defects and inventory items. Network referencing data is robust and reliable, since it is used frequently to facilitate the collection of carriageway condition data.

Inventory data is collected on a rolling programme and this will serve to maintain the information.

For a detailed breakdown of the Council's carriageway inventory, please see Appendix B.

Condition

Assessing Condition

There are a number of performance measures used to assess the condition of carriageways. Best Value Performance Indicators (BVPI's) enable the condition of the Council's carriageways to be compared with those managed by other authorities. The Best Value Performance Indicators for carriageways are:

- BVPI 223 – Condition of Principal ('A') Roads
- BVPI 224(a) – Condition of non-principal, classified ('B' and 'C') Roads
- BVPI 224(b) – Condition of Unclassified ('U') Roads

These indicators are used throughout England and enable comparisons between authorities.

Each of these indicators provides a measure of the percentage of carriageways that are in need of further investigation and/or repair. Therefore the lower the figure for these indicators, the better the condition of our carriageways.

BVPI 223 is derived from surveys of the 'A' road network carried out by a machine called a SCANNER. This measures a number of defects, including rutting, texture depth, cracking and ride quality.

BVPI 224a is also derived from SCANNER surveys. However, up to year 2005/6 the condition of 'B' and 'C' roads was measured by visual surveys called Coarse Visual Inspections (CVI). These surveys record such defects as potholes, cracking, rutting etc.

BVPI 224b is derived from CVI surveys of a minimum 25% sample of the Unclassified road network each year. From 2006/07 the length of network used to calculate the BVPI has changed. Previously, only that current year's survey data was eligible (based on a minimum 25% network coverage per annum) but from 2006/07 the figure will be based on 100% network coverage. All CVI data collected since 31st March 2003 is valid but a minimum of 25% must be no older than 31st March 2006.

For more detail on the assessment of the condition of carriageways, please see Appendix D.

Current Condition

Condition surveys suggest that the condition of the Council's 'A' roads is currently at an approximately steady state and is in the upper quartile when compared to mother Unitary Councils. The condition of the Council's non-principal 'B' and 'C' roads is slightly improving from 2005/6.

It is the aspiration of the authority to maintain top quartile performance (for Principal and non-principal carriageways) in comparison with other Councils. Performance for years 2005/06 and 2006/07 places Middlesbrough's Principal and non-principal carriageways at the upper threshold when compared with other English Councils.

It should be noted that the method of measurement for Principal and non-Principal roads has changed annually in recent years and there have also been issues over the calibration of the machine based surveys.

Desired Condition

Middlesbrough Council is striving to maintain top quartile performance for all classes of road, in comparison with other English unitary authorities.

A comparative performance shows that we have to maintain our current level of service to achieve this aim.

The derivation of the optimum level of service for carriageways (i.e. that which is best engineering practice) is detailed in Appendix D.

Option Appraisal

Creation/Acquisition

Most new carriageways are built by developers and are subject to the development control process before they are adopted by the authority as being maintainable at public expense. The development control procedure enables the Council to be sure that new carriageways have been constructed to the requisite specification. Maintenance issues are considered as part of this process, with commuted sums being charged for items that attract particularly high maintenance overheads.

Processes are in place to ensure that new carriageways are placed on the Council's street gazetteer and are network referenced. New carriageways then become subject to the relevant inspection and cyclic maintenance regimes, as well as being integrated into the inventory data collection rolling programme.

Maintenance, Renewal or Replacement and Upgrading

The maintenance treatment for carriageways may be categorised as:

- Cyclic: e.g. sweeping
- Reactive: e.g. emergency rectification of dangerous defects, removal of dangerous litter / detritus and zonal repairs arising from safety inspections.
- Planned: e.g. surface dressing, plane and inlay. These treatments are largely preventative.

Planned maintenance also includes works designed to upgrade or renew carriageways and increase their residual life. These treatments may include major structural overlays and full depth reconstruction.

Descriptions of carriageway maintenance and renewal treatments appear in Appendix D, together with their relative merits and suggestions on how to improve upon the way that these treatments are currently managed.

Disposal or Decommissioning

In the vast majority of cases, carriageways need to last forever. The only way that a carriageway can cease to be highway is via the formal legal process called Stopping Up. It is rare for carriageways to be stopped up; therefore the duties in terms of maintaining carriageways continue to rest with the authority.

Budget Optimisation

Funding for carriageways maintenance, upgrade and renewal is split into revenue and capital.

Capital

Capital expenditure for maintenance is used to improve the life of carriageways by strengthening or replacing the asset, e.g. overlaying a carriageway surface.

Capital funding comes from central government via the Local Transport Plan (LTP) process topped up by Council borrowing. LTP funding is allocated on the basis of a split between integrated transport and maintenance, with the latter divided up between principal roads, non-principal roads, bridges and lighting.

Revenue

Revenue expenditure is used for recurring routine maintenance such as patching and surface treatments.

The capital and revenue allocations for carriageways for financial year 2006/07 are shown below:

Summary of Capital & Revenue Budget Allocation (2006/07) (£000's)

	Principal Roads	Non-Principal Roads	Total
Capital			
Revenue	*Financial Data is currently under review*		

Table 4.1

The Council may supplement this capital allocation by using prudential borrowing. Whilst such borrowing may provide capital funds, it has associated debt charges.

During the lifetime of the LTP many Local Authorities have benefited from increased Capital funding and Middlesbrough has maintained a steady position in revenue funding, but as a fairly small Unitary Authority this has not had a significant effect on the maintenance back-log.

Whilst there has been a Capital resource to invest in the Classified Hierarchy, an investment decision determined by the outputs and required through performance indicators, there has continued to be a decline in the Network condition at the lower end of the hierarchy. Although this is not currently measured through a statutory indicator the position has been confirmed in the

findings of the Middlesbrough “Voiceover Panel” survey.
The Council will undertake consultation exercises to enable the decision making process of programmes of investment and the setting of service standards. Future investment needs to maximise the life cycle of the assets and to minimise the revenue implications both in terms of works and debt charges.

Further details on the allocation and use of budgets associated with carriageways can be found in Appendix D. Suggested improvement actions and associated performance measures for carriageway budgets can be found in Section 10 and Appendix G respectively.

Performance Gaps

One method of defining performance gaps in terms of carriageway condition is to utilise BVPI values. However, these gaps will continue to be somewhat difficult to monitor until such time as consistency in measurement of BVPI’s is achieved.

Given these caveats, some performance gaps can be determined through comparison between current condition of carriageways and the desired condition.

Similarly, performance gaps can be determined in terms of Middlesbrough’s position relative to other authorities and its desired position in terms of carriageway condition based BVPI’s.

A key performance gap is the difference between where the Council is now and the optimum level of service. As detailed in Appendix D, the Council is not currently providing the optimum level of service for its carriageway network.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.4 Footways

Footways are located beside carriageways to provide safe and unobstructed access for pedestrians. These also include the access links between footways on separate carriageways.

Inventory

Middlesbrough Council as the Highway Authority is responsible for 614km of footway with a gross replacement cost (GRC) estimated at approximately £67 million. The breakdown of this asset by footway classification is shown in the table below:

Summary of Footway Inventory by Classification

Footway Class	Length (km)	Width	Area (m^2)	Footway replacement cost (£M)
Cat 1	9.64	1.8	17,352	1.041
Cat 1a	1.56	1.8	2,808	0.168
Cat 2	56.34	1.8	101,412	6.085
Cat 3	95.70	1.8	172,260	10.336
Cat 4	450.80	1.8	811,440	48.686
Total Cost				£66.316

For a detailed breakdown of the Council's Footway inventory see Appendix B

Condition

Assessing Condition

The condition of busier footways (hierarchies 1, 1a and 2) are assessed via Detailed Visual Inspection (DVI). This is a walked, visual survey that records such defects as potholes, trips, cracked slabs etc. A 50% sample of these footways is surveyed each year, such that 100% of the network is surveyed every 2 years.

This DVI data is used to produce BVPI 187. The indicator is the percentage of category 1, 1a and 2 footways in need of further investigation and/or repair. The lower the value for BVPI 187, the better the condition of the Council's footways.

The Council inspects footways for defects, with the frequency of inspections dependent on footway hierarchy. These inspections enable the recording of dangerous defects, which are then scheduled for repair. Further details on all of these survey regimes can be found in the Council's Highway Network Management Plan and in Appendix D of this document.

Current Condition

The current condition of the category 1, 1a and 2 footways as measured by BVPI 187 is 9.0% (2006/7 value). This is a small increase on Middlesbrough's 2005/6 figure of 8.15%.

Both the 2004/5 and 2005/6 figures place the condition of Middlesbrough's busier footways at the top quartile when compared with other unitary authorities.

Over recent years the Council has undertaken full DVI surveys on a percentage of the lesser-used (category 3 and 4) footways. This represents a significant data resource when seeking to manage this asset.

For more details regarding the current condition of the Council's footways, please see Appendix D.

Desired Condition

The optimum condition of the Council's footways from an engineering and minimum whole life cost perspective would be to achieve a steady state situation based upon timely intervention. For a detailed explanation of this optimum level of service, please see Appendix D.

The authority is committed to improving the condition of the Borough's footways.

In terms of BVPI values, Middlesbrough has published targets and trajectories for BVPI 187 as part of the LTP process.

The targets and trajectories for BVPI 187 (the condition of busier footways) are as below:

2004/5 (actual)	2005/6 (actual)	2006/7 (actual)	2007/8 (target)	2008/9 (target)	2009/10 (target)	2010/11 (target)
17.40%	8.15%	9.00%	8.00%	8.00%	8.00%	8.00%

These figures reflect the policy of maintaining in a steady state the condition of the Council's Category 1, 1a & 2 footways.

The desired condition of footways may also be expressed in terms of relative performance with other Councils. It is the aspiration of the authority to maintain top quartile performance (for category 1, 1a and 2 footways) in comparison with other Councils. Performance for years 2004/05 and 2005/06 places Middlesbrough's category 1, 1a and 2 footways at the upper thresh hold when compared with other English Councils.

Option Appraisal

Creation/Acquisition

Many new footways are built by developers and are subject to the development control process before they are adopted by the authority as being maintainable at public expense. The development control procedure enables the council to be sure that new footways have been constructed to the requisite specification.

New footways may be requested by councillors, residents and other bodies such as Parish Councils. These requests are prioritised on the grounds of need and safety. Details of this prioritisation process appear in Appendix D.

Maintenance, Renewal or Replacement and Upgrading

A typical footway has a design life of 20 years. With appropriate surfacing treatments, such as slurry sealing, many footway lives can be extended to 25-30 years. However, it should be noted that the type of construction and location of footways can cause significant variation to their life expectancies. Flagged footways may have a significantly reduced life expectancy as, to a lesser extent, may concrete footways as a result of excessive vehicle trespass. It is bituminous footways that typically exhibit lives of 25-30 years.

The maintenance treatments for footways may be categorised as:

- Cyclic: e.g. sweeping and weed control
- Reactive: e.g. rectification of dangerous and other defects, edgings
- Planned: e.g. slurry sealing and patching. These treatments are largely preventative.

Planned maintenance also includes works designed to upgrade or renew footways to their original design lives. These treatments may include replacement of flagged and concrete footways with bituminous materials.

Descriptions of footway maintenance and renewal treatments appear in Appendix D, together with their relative merits and suggestions on how to improve upon the way that these treatments are currently managed.

Disposal or Decommissioning

In the vast majority of cases, footways need to last forever. The only way that a footway can cease to be highway is via the formal legal process called Stopping Up. It is very rare for footways to be stopped up other than those associated with new developments. Therefore the duties in terms of maintaining footways continue to rest with the authority.

Budget Optimisation

Capital

Capital funding is derived via the LTP process. The capital block allocation may be used for footway works although most footway works are funded from revenue.

The use of Capital funding has been directed towards areas of most need and has been apportioned to both footway and carriageway hierarchies.

Revenue

The vast majority of footway work is funded via revenue.

The distribution of revenue funds for footway works is based on condition surveys and carriageway lengths.

Other Funding Sources

The Council is often able to supplement footway revenue funding with contributions from other sources.

Every opportunity is taken to participate in SRB's, NRF's and partnerships with other funding Agencies to maximize any opportunities to maximize the Capital and Revenue resources.

Summary of Capital & Revenue Budget Allocation for Footways (2006/07) (£000's)

	Total
Capital	
Revenue	

Financial Data is currently under review

Performance Gaps

One method of defining performance gaps for the condition of category 1, 1a and 2 footways is to use BVPI 187 values. BVPI targets and trajectories tend to use past BVPI performance as a basis, rather than absolute aspirations in terms of footway condition. Given these caveats, a performance gap can be defined as below.

- Current condition of Cat 1, Cat 1a & Cat 2 footways = 9.00%
- Desired condition of Cat 1, Cat 1a & Cat 2 footways = 8.00%
  (i.e. the target for 2010/11 in LTP2)

There is also a performance indicator in terms of Middlesbrough's current and desired position for the condition of category 1, 1a and 2 footways when compared with other unitary authorities.

- Current quartile = Top
- Desired quartile = Maintain top

A key performance gap in terms of condition will be that between the desired steady state and where the Council is now. This gap is not readily quantifiable and the Council will initially have to rely upon informed opinion and experience.

Condition data indicates that there is a significant performance gap between current and desired condition of the category 3 & 4 footways.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.5 Cycleways

Cycleways are the paved routes provided specifically for cyclists. Some cycleways are simply delineated from the carriageway by means of white line markings, but the majority are links between carriageways often shared with pedestrians.

Many of the policies and practices associated with the management of cycleways are the same as those for footways. **This Life Cycle Plan will identify those areas in which the management of cycleways differs from that for footways.**

Inventory

Cycleways constructed as part of new housing estates are added to the relevant footway inventories.

Cycleways may be created via legal orders and are sometimes added to footway inventories, but the process is inconsistent.

There is currently incomplete inventory data for the Council's cycleways.

The value of shared cycleways (i.e. those within the carriageway or footway) will be included in the valuations for these asset elements.

Based upon an estimated length of 38km of remote cycleways within the Borough, these will have a Gross Replacement Cost of approximately £4.0 million.

For a detailed breakdown of the Council's Cycleway inventory see Appendix B

Condition

Assessing Condition

Cycleways within the carriageway or shared with the footway are inspected with the shared asset. This is applicable to condition surveys used to produce BVPI's and safety inspections.

Cycleways that are not associated with a carriageway or footway are inspected in accordance with the frequencies and intervention levels for lower category footways, as identified in the Highway Network Management Plan.

New cycleways adopted as part of new housing developments are inspected as footways.

Current Condition

Category A and B cycleway condition is taken to be that of the shared carriageway or footway surface. There is little information on the condition of Category C cycleways.

Desired Condition

All cycleways, regardless of their category, should be in a condition commensurate with their use.

Option Appraisal

Creation/Acquisition

New cycleways are created from time to time as part of developments. Such cycleways are subject to development control procedures and hence become highway maintainable at public expense.

Cycleways are also created by the Council's Transport and Policy Group directly and via Sustrans (a charity that promotes sustainable transport). Most of these are adopted but some are subject to leases and are therefore not technically highway.

Under the Cycle Tracks Act, 1984, the highway authority may designate a footpath, or part of a footpath, as a cycle track. This has the effect of converting the relevant section of footpath into highway maintainable at public expense. Cyclists are entitled to use bridleways.

Maintenance, Renewal or Replacement and Upgrading

The maintenance treatments for cycleways may be categorised as:

- Cyclic: e.g. sweeping and weed control for those cycleways that share a common surface with carriageways and footways.

At present there is no cyclic maintenance regime for cycle trails

- Reactive: e.g. emergency rectification of dangerous defects, removal of dangerous litter / detritus and repairs arising from safety inspections. This applies to those cycleways that share a common surface with carriageways and footways.

  Emergency rectification of dangerous defects and removal of dangerous litter / detritus on cycle trails.

- Planned: e.g. plane and inlay, surface dressing, slurry sealing and patching. These treatments are largely preventative and apply to those cycleways that share a common surface with carriageways and footways.

  Provision, replacement and repair of surfacing, signs, posts and markings on cycle trails. This is subject to sufficient funding being identified.

A typical remote cycleway has a design life of 20 years. With appropriate surfacing treatments, many cycleways' lives can be extended to 25-30 years. However, it should be noted that the type of construction and location of cycleways causes significant variation to their life expectancies.

Disposal or decommissioning

In the vast majority of cases, cycleways that share a common surface with carriageways and footways need to last forever. The only way that a carriageway or footway can cease to be a highway is via the formal legal process called Stopping Up. It is very rare for highways to be stopped up other than those associated with new developments. Therefore the duties in terms of maintaining highways continue to rest with the authority.

Budget Optimisation

Capital

Funding to provide new or upgrade the existing cycleway infrastructure is available through the Local Transport Plan.

Revenue

The vast majority of cycleway work is funded from revenue and funding for works to cycleways is taken from the relevant footway budgets.

The comments regarding budget optimisation and footways are applicable to cycleways. For further details on the life cycle of cycleways, please see Appendix D.

Performance Gaps

Details of the location and condition of all Category C cycleways needs collecting.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.6 Structures

Structures are mainly bridges or culverts over or under highways including PROW (public rights of way) bridges. Culverts under 600mm diameter are deemed to be drainage structures also include retaining walls owned by the Council.

Inventory

Middlesbrough Council is responsible for approximately 174 bridge structures of varying types and sizes, 56 drainage culverts and approximately 2.4km of retaining walls, with a combined gross replacement cost (GRC) estimated at just under £250 million.

The majority of inventory data was gathered in the late 80's and is checked / updated at each general inspection. The extent and reliability of the inventory data varies, but generally is good.

For details of structures inventory data, please see Appendix B.

Condition

Assessing Condition

Structures are inspected in four ways:

- General Inspections -All structures are visited once every two years, for a general inspection during which Bridge Condition Index Data and inspection parameters are gathered and recorded for each bridge.

- Principal Inspections – these are scheduled every 6-10 years on a set of significant structures – generally those exceeding 5m in span, where a more detailed inspection is undertaken, which could also include material testing being carried out.

- Special or Monitoring Inspections – where only partial inspections have been possible, further special inspections are set up. These might include: confined space entry, CCTV, boat access, scaffold/platform access, team access or structures over railways.

- Emergency Inspections – these usually arise as a result of a road traffic accident, where a quick response is required to check for structural damage and to make the bridge safe for the highway user.

With each type of inspection, data is collected using the historic Cleveland County system and is analysed in-house. It is anticipated that the Authority will move towards data analysis within the Symology “Insight” system, which uses the CSS Bridge Condition Index criteria.

The Bridge Condition Index for each construction form and span is determined from parameters that are gathered during the inspection. These parameters will then be combined and modified according to the size of element and its importance in the structure to produce an index for each bridge. These are then combined to produce an index for the entire bridge stock. There is an average index, which covers all elements of each structure, and a critical index that includes only data from the high importance elements of each structure.

Middlesbrough Council will produce its own BCI report for 2007/08.

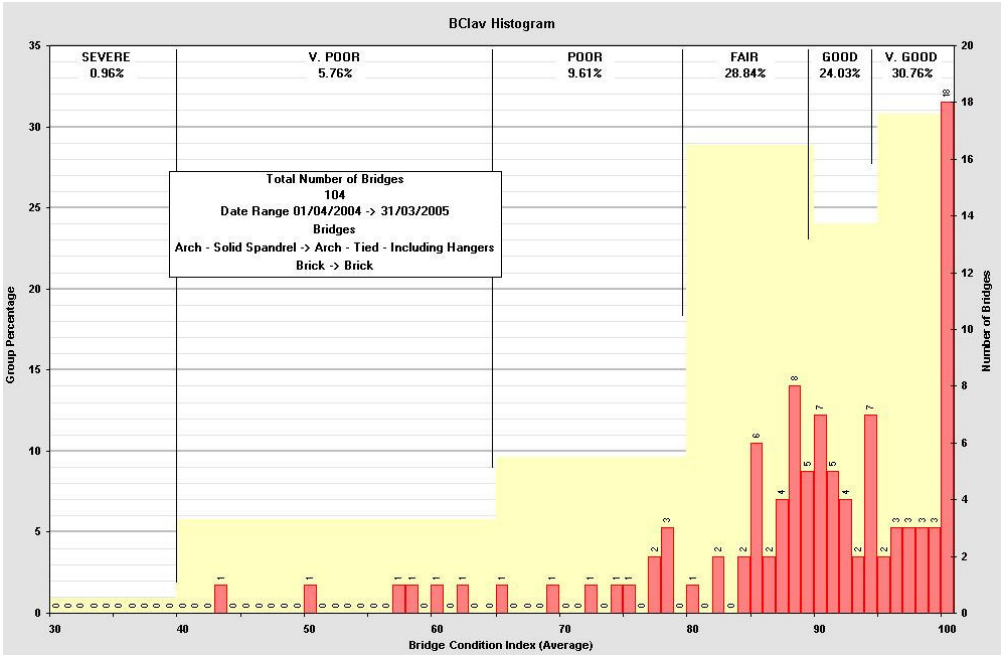
For further details of structures condition assessment, see Appendix D.

Current Condition

The Average Condition Index for Bridges is summarised below:

Very Good	%	
Good	%	
Fair	%	*B.C.I. currently under development*
Poor	%	
Very Poor	%	
Severe	%	

An illustration of how this data can be used is shown in the graph below, for brick arched bridges:



Another local performance indicator records the percentage of bridges that are not substandard. Currently the number of structures that are not substandard =

A further local indicator is the number of weight restricted bridges carrying A, B, C, and U class roads. Our policy is to reduce the number of weight restricted bridges each year.

Desired Condition

Rounding the existing values slightly would give a target for maintaining the steady state, although caution must be exercised in making such an assumption until several years bridge condition data has been collected and trends established.

Figures in the Best Practice and Optimum columns represent the Council's first attempt at setting targets and will need to be reviewed over the first 4 years of operation as data is collected.

Average Condition Index for Bridges

Level	Current %	Steady State %	Best Practice %	Optimal %
Very Good				
Good				
Fair				
Poor				
Very Poor				
Severe				

B.C.I. currently under development

For details of the derivation of the optimum level of service for structures, please see Appendix D.

Option Appraisal

Creation/Acquisition

Middlesbrough Council acquires responsibility for structures via the following processes:

- Adoption of new structures that are constructed as part of new highways schemes, e.g. the A66 Middlehaven interchange. MC typically has input into the design process and such structures become the responsibility of the authority after the expiry of a maintenance period.

- New structures on the Public Rights of Way network become the responsibility of MC to maintain.

- Structures are from time to time transferred from private ownership to that of MC. Typical transfers are from the Environment Agency and Network Rail. Before MC accepts responsibility for such structures, they are usually strengthened to the appropriate standard. Commuted sums are usually paid to the authority to offset the cost of future maintenance.

Maintenance, Renewal or Replacement and Upgrading

The maintenance treatments for structures may be categorised as:

- Cyclic: e.g. painting, cleaning and the removal of vegetation

- Reactive: e.g. response to vandalism, repairing flood damage
- Planned: e.g. replacement of joints and bearings, brick and concrete repairs.

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Upgrading consists of the major works that improve an asset beyond its existing design capacity. This includes the widening of an existing structure to allow additional road space, the strengthening of an existing structure in order to cope with increased vehicle weights, the introduction of roundabouts or traffic lights, with associated kerb and road realignment and parapets to modern standards.

Asset Upgrading

Activity / Scheme	**Comments**	**Impact on assets whole life cycle and or other maintenance activities**
Strengthen an existing structure	Improve the capacity of the structure by strengthening key elements or by providing additional support.	Increase in residual life. May reduce inspection frequency May reduce maintenance costs
Replace an existing structure	New structure to current standards to carry full loading including any special requirements.	Full life cycle available. Early maintenance costs during the first few years, likely to be low.
Refurbish an existing structure	Refurbishment of the fabric of certain types of structure, can lead to improvement in the load carrying capacity e.g. brick and masonry arches.	Increase in residual life. May reduce inspection frequency May reduce maintenance costs
Provide a temporary structure as an interim measure	Temporary structure to carry increased loading including any special requirements.	Full life cycle available (15-20 yr for a temporary modular steel bridge). Reduced maintenance costs.
Introduce traffic management measures i.e. priority system.	Restrict the area of bridge deck that is used and thereby improve the load carrying capacity.	Improve capacity at the expense of possible increased traffic delays. Increase in residual life.
Inspection and assessment	Calculations to determine the asset condition	Determines life cycle strategy.

It is worth noting that cyclic, reactive and planned maintenance and upgrading are carried out simultaneously whenever possible. This has financial and environment benefits.

Disposal or Decommissioning

Structures may be decommissioned because they are no longer required (e.g. those associated with disused railway lines).

Structures are occasionally disposed of if their condition has deteriorated to such an extent that they are no longer safe and if the level of usage does not warrant the structure being replaced. Either a stopping up or a diversion of the highway would be required.

Budget Optimisation

Capital

Capital funding for structures has been largely historically based, with allowances being made for growth of the asset and inflation. The asset management approach will enable needs based bids for funding to be formulated, via the LTP process.

LTP funding relates to the Regional Principal Road Network, which only provides special consideration to a limited number of structures, non of which are a benefit to Middlesbrough Council. Therefore all other structural considerations have to be drawn from the final Capital Settlement along with all the other maintenance requirements.

Revenue

The revenue funding allocated to the maintenance of structures has not been based on condition measures or the demands placed on the network.

The vast majority of the revenue budget is spent on remedial maintenance arising from bridge inspections routine Highway inspections and incident/accident damage. A breakdown of the current revenue budget is shown in the following table.

Summary of Structure's Maintenance Budget (FY 2006/07)

Activity	Cost (£000's)
Revenue -Cyclic (Preventative) Maintenance; Includes cleaning, vegetation removal, drain clearance, painting and testing or servicing.	
Revenue -Reactive (Ad hoc) Maintenance; Includes accident repair, vandalism, graffiti removal, brick & concrete repairs, flood damage and scour repair.	
Revenue -Planned Maintenance (renewal and replacements); Includes joint and bearing replacement, waterproofing, surfacing replacement and other more substantial structural repairs.	
Revenue -Sub-Total	
Capital – Asset Upgrading; Includes the strengthening, refurbishment or replacement of the structure	
Total	

Financial Data is currently under review

Performance Gaps

Development and use of the Structures module within the Insight System will improve the accuracy and reliability of the Bridge Condition Index.

In the area of highway support, inventory data is weak. The number of known retaining walls is 2.4km, but there could be a similar number of walls that are not known.

Bridges are dealt with in accordance with the policy set out in the LTP. This has traditionally been based on replacing all sub standard bridges within a ten year program (ending in 2010).

At present there is a backlog of remedial maintenance work. For instance the Longlands Bridge which may be subject to strategic network decisions.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.7 Drainage

This covers the entire infrastructure that plays a part in draining surface water from the highway.

Middlesbrough Council has been subject to fluvial and alluvial flooding at the low end of the Tees Valley catchments area, which has impacted on the Highway Network as a result of an aging network, climate change and new developments.

Decisions on future programmes of Drainage Works are taken after consideration of Middlesbrough Councils' Climate Change Document.

Inventory

Middlesbrough Council was the Drainage Authority until the mid 1990's and since that time has maintained close working relations with Northumbrian Water Limited and The Environment Agency, as a result the dependencies and shortfalls are well known.

MC is responsible for a drainage asset with a gross replacement cost (GRC) estimated at approximately £16.3million. This includes approximately 26,000 gullies.

The majority of inventory information (where available) was collected some years ago and has not been consistently updated in recent years. The degree of accuracy is still reasonable, although the position of individual elements such as drainage runs is not complete.

The number of gullies is listed per length of road. There is no data to confirm the length or location of ditches, whether highway or private, although the Highway Inspectors are generally aware of where these are located. The Council also has very little information to confirm the position, size, depth, gradient, outfall or ownership details of piped highway drainage systems.

There is no formalised system for managing inventory data relating to manholes, catchpits and soakaways. The Council has some information on the number per road but there is no indication as to the type, size or exact location of the units.

A detailed inventory of what is known about Middlesbrough's drainage asset is given in Appendix B.

Condition

Assessing Condition

Damaged gullies are recorded during safety inspections, routine cleansing activities, other surveys or from public reports. Blocked ditches or roadside grips are, however, seldom noticed during safety inspections and problems

are frequently discovered during the course of other works and/or via reports received from the public.

Piped systems, manholes, outfalls, attenuation systems, catchpits, soakaways and SUDS (sustainable urban drainage systems) do not have a regular inspection regime. Faults are only discovered following detailed inspections of the highway, reports by the public or when the system is in need of clearance or repair.

Pumps are maintained on a regular basis and are generally in a good state of repair.

Current Condition

The condition of the visible, regularly visited sections of the network (e.g. gullies) is generally known and in reasonable order. However, the condition of the remainder of the network, which is largely underground, is less well known.

Desired Condition

The frequency of cleansing is designed to prevent water from accumulating on the highway, within the constraints of the Council's budget. The service would be improved by targeting sites of known flooding with a higher frequency of cleansing.

Ideally, piped systems should be jetted on a cyclic basis to keep them clear and free flowing, rather than waiting for problems to occur. Grips should be fully functional whether connected to a ditch or as a soakaway. Outfalls should also be inspected on a cyclic basis and any necessary work completed on a planned basis.

For a detailed consideration of the optimum level of service, see Appendix D.

Option Appraisal

Creation/Acquisition

The drainage asset is added to when new roads are constructed, such as the A66 Middlehaven Interchange. New developments that are adopted by the Council as highway maintainable at public expense include drainage infrastructure.

Major maintenance schemes carried out on existing carriageways and footways often include enhancing the drainage of the highway and thus also add to the asset. Additional gullies are provided to deal with specific drainage problems.

Maintenance, Renewal or Replacement and Upgrading

The life of a gully, or kerb offlet, will vary depending on the location, volume of HGV traffic, quality of outfall system, etc. Experience suggests that the life of the ironwork should be 40 years, although the chamber of the gully may well last longer.

If well-maintained, a roadside grip will have an indefinite life span. Conversely, if not maintained, the effective life will probably be as low as 2 years.

The life span of a ditch will depend upon soil condition, susceptibility to silting, stability of side slopes, growth of vegetation, effectiveness of outfall, etc. On average, most roadside ditches will require maintenance every 5 years.

The maintenance of highway drainage may be categorised as:

- Cyclic: e.g. gully emptying and cleansing of grips
- Reactive: e.g. clearing blocked gullies and repairing damaged ironwork.
- Planned: e.g. renewals and replacements of existing infrastructure. Very little planned maintenance is carried out for purely drainage purposes; it is usually associated with the maintenance of carriageways and footways.

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Disposal or Decommissioning

Drainage items may be decommissioned because they are no longer

required, for instance where a carriageway or footway is realigned, thus rendering existing gullies redundant. Where existing highway is Stopped Up, the drainage elements within that length of highway cease to be maintainable at public expense.

Budget Optimisation

Capital

When capital budget is used to improve the drainage asset, this is normally undertaken as part of major highway maintenance schemes.

Schemes developed to specifically improve drainage are assessed for priority against competing demands for capital funding. Drainage improvement schemes represent a small proportion of the total capital allocation.

Revenue

The revenue budget supports routine maintenance of the asset. The budget is allocated annually and is largely historically based. Revenue expenditure is monitored monthly against the relevant budget headings.

The average expenditure on drainage for financial years 2005/6 and 2006/7 is shown in the table below:

Average Drainage Network Maintenance Expenditure (£000's)

Asset sub-element	Revenue	Capital
Gullies Roadside Grips Ditches Pipes Catchpits Soakaways Pumps French Drains Outfalls Drainage Other		
Total		

Financial Data is currently under review

Performance Gaps

Reports of flooding are reducing which would suggest that most parts of the network are in a reasonable condition. Without regular inspections and cleaning cycles for piped systems, manholes, catchpits, soakaways and ditches taking place, the condition of this part of the asset is largely unknown.

Grips and ditches are only cleaned when necessary or as a result of Public dissatisfaction.

Footway drainage provision is not currently part of any cyclic maintenance activity.

Drainage ironwork in the carriageway and footway is assessed during safety inspections and cleansing but only obvious defects are recorded. Ironwork in verges is not inspected, but problems are frequently reported by the public.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.8 Street Lighting

This covers all highway lighting associated with carriageways, footways, illuminated signs and bollards, zebra crossings and car parks.

Inventory

Middlesbrough Council's street lighting asset, which includes just over 23,000 lighting columns has a gross replacement cost (GRC) estimated at just over £25 million.

The inventory is held in a database within a bespoke application called "Insight", a computer system designed specifically to provide an integrated solution for the management of highways. Confidence in this data is high.

Accurate information is held regarding the age of equipment installed after 1990, but the ages of equipment installed before then are not as accurate.

There is only limited information on the location of buried cables. As part of the cyclic maintenance activities, private cable networks are identified and recorded, on a 6 year cycle.

A detailed inventory of Middlesbrough's street lighting assets appears in Appendix B.

Condition

Assessing Condition

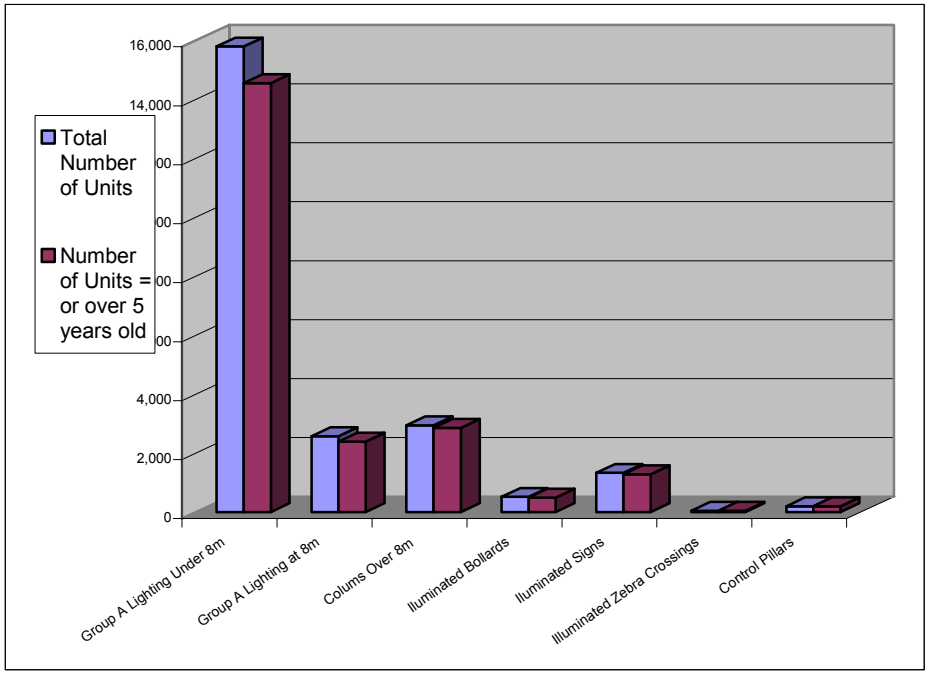
The Insight database has the facility to schedule annual detailed inspections of lighting equipment. A sixth of the asset is electrically tested each year. These tests are carried out by the street lighting contractor.

Each component is visually inspected and given a rating of one to four based on it's condition. From this an overall rating is given to each asset. The final rating for each asset falls into the three conditions:

- High Priority
- Medium Priority
- Acceptable

Current Condition

The current condition, in terms of lighting columns over 5 years old is shown in the graph below:



Desired Condition

From a safety point of view all equipment with less than medium priority condition needs to be replaced in order to maintain the asset in a steady state. This would cost in the region of £31m.

Type of unit	Number of units = < 5 year	Total cost per unit type £M
Group A lighting > 8m	14545	23.27
Group A lighting = 8m	2388	3.34
Columns < 8m	2852	2.85
Illuminated Bollards	489	0.39
Illuminated Signs	1284	1.16
Illuminated Zebra Crossings	41	0.10
Control Pillars	195	0.16
Totals	**21794**	**£31.273**

Option Appraisal

Creation/Acquisition

Middlesbrough's lighting asset is increased when new roads are built. For instance, the A66 Middlehaven Interchange will add approximately 40 new street lighting units to the lighting inventory.

But acquisition does not always mean an increase in assets, works to the A66 included the provision of 30 new high mast lighting columns which resulted in the removal of approximately 250 roadside columns with consequential Capital and Revenue savings through reduced Energy Costs.

New developments that are adopted as highway maintainable at public expense usually add to the lighting asset. Developments such as Grey Towers Farm and Nunthorpe Gardens typically have more than 80 new street lighting units.

New developments are generally covered by Section 38 or 278 agreements The street lighting team plays a significant part in ensuring the specification for all new developments meet the required standards to allow the local authority to adopt these assets.

Maintenance, Renewal or Replacement and Upgrading

The maintenance of lighting may be categorised as:

- Cyclic: e.g. visual inspection, cleaning of lanterns, painting of columns, bulk lamp changes and electrical tests of approx. 15% of stock.

- Reactive: e.g. repairing faulty lamps and photocells and reacting to accident damage.

- Planned: e.g. obsolete column and lantern replacements and illuminated sign post replacements. Forward planning by the Councils Street Lighting Partner has resulted in a programme of 100% bulk changes and re-painting during 2007/2008.

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Disposal or Decommissioning

Lighting may be removed when parts of the highway are Stopped Up. Lighting is also decommissioned when changes to the highway network require the reduction in number or relocation of lighting.

Budget Optimisation

A summary of street lighting revenue and capital budgets for financial year 2006/07 is shown in the table below:

Summary of Street Lighting Maintenance Budget (FY 2005/06)

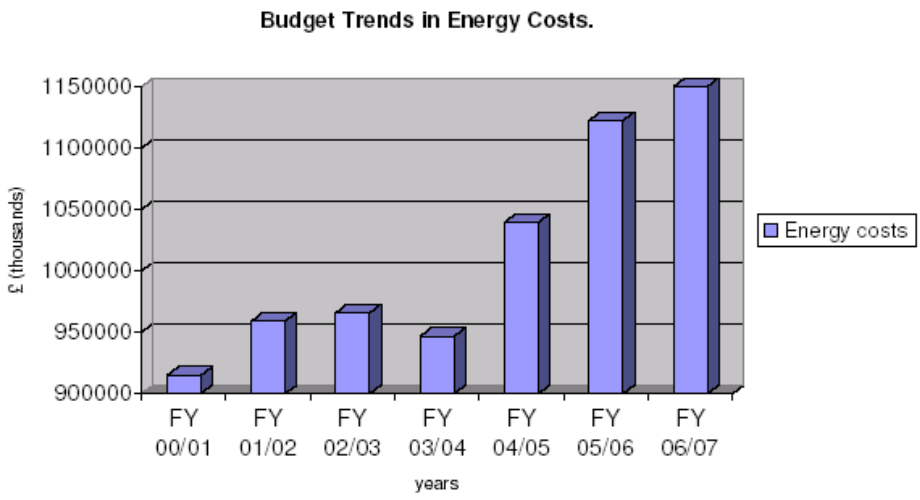
Activity	Cost (£000's)
Routine Maintenance The budget heading is used to fund routine maintenance carried out under the contract, including bulk lamp change, electrical testing structural inspections etc	
Non - Routine Maintenance To cover items that are not included within the routine contract, for example the replacement of equipment no longer obtainable. Also includes any reactive maintenance.	
Column replacements Column replacements highlighted from the structural inspection results	
Lantern replacements Replacing failed lanterns that have reached the end of their life expectancy or are replaced with more energy efficient ones.	
Energy Used to fund energy consumption for street lighting equipment.	
Revenue Total	
Capital (column replacements) Column replacements highlighted from the structural inspection results.	
Total	

Financial Data is currently under review

The Revenue budget for the maintenance and upgrade of street lighting remains at a steady state with an annual inflation provision for each financial year.

Capital investment through the LTP process has also been steady since 2001/02 at approx. £330k. per annum, which has been supported by an inward investment of £2.0m by our Partners.

In recent years the budget has been placed under further pressure from the sharp increase in energy costs. These trends in energy costs are shown in the graph below:



Performance Gaps

There are gaps in the inventory data held for this asset. This includes the installation dates (and hence age) of lighting columns in the Insight database and information on the Council's cable network.

The method of banding column ages restricts the accurate determination of individual equipment; this is being addressed and will be resolved over time.

From a safety point of view all equipment with a negative condition index needs to be replaced in order to maintain the asset in a steady state. In subsequent years this will also need to include equipment that currently has a high priority index.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.9 Traffic Signals and Telematics

This covers traffic controlled by signals, some of which are linked together into an Urban Traffic Control (UTC) system, some others are remotely monitored and pedestrian crossing facilities controlled by signals.

Inventory

Middlesbrough Council's telematics asset, which includes some 49 junctions and 68 pedestrian crossings has a gross replacement cost (GRC) estimated at approx. **£27.3million.**

The general details of the installations are maintained on an Access database. More detailed information on the sites as well as histories of amendments and improvements are contained on paper files.

Current confidence levels on the asset data are:

- Access database 90%
- MC paper files 75%

Many of the recent alterations to equipment have been included on the paper files but this information is not held in alternative formats.

The Access database does not hold data on the specific items on each site, some paper files hold more detailed information, but this is inconsistent. The older the installation the less information is held on file.

Full details on Middlesbrough's telematics equipment are given in Appendix B.

Condition

Assessing Condition

Many of the signalised junctions and controlled crossings are connected to either the remote monitoring system or the urban traffic control system. The automatic reporting provided by this system allows the Council to assess trends and determine if remedial measures are needed to deal with recurring faults.

In addition the maintenance contractor carries out periodic inspections of all sites, Streetscene undertake bulk lamp changes on all signals on a six monthly basis. These checks cover all items not automatically reported back.

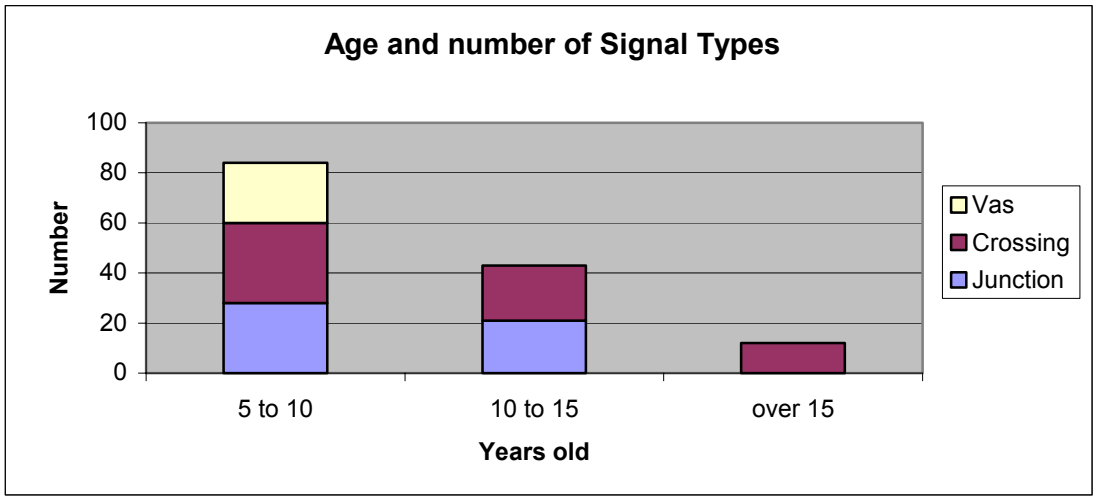
It is proposed that as part of the new Maintenance Contract (out to tender 2007), the contractor will carry out an audit to verify equipment and condition at each site. These reports will comprise a condition questionnaire and a printout of the settings for the installation.

The maintenance contract also allows for the reactive maintenance of one off faults and damage due to road traffic accidents on a chargeable basis.

Current Condition

Signalised junctions and the like are generally considered to have a design life of about 10 years. Department for Transport London and the Regions (DTLR) rules oblige manufacturers to keep parts for each design for 10 years after manufacture ceases. In practice they tend to be available for less time than this. Replacement is therefore necessary at about 15 years otherwise faults can take much longer to repair.

The current age profile of the asset is shown in the graph below:



There is a significant percentage of transport telematics over the designed 10 year life span, 48%, and 11% over 15 years. Maintenance strategies and methods of funding needs to be developed to keep the equipment in the best condition possible.

Desired Condition

Although the best practice industry standard is a maximum age of 10 years, 15 years is not unreasonable and considerably reduces the risks associated with older installations.

This reduction of the asset age could form the basis of a target for improvement of this asset, for example reduce maximum asset age to 15 years in 3 years.

- An immediate cash injection of £110,000 would bring the age of the oldest equipment down from over 15 years to 10 to 15 years old.
- A follow on budget of £560,000 would bring the age of the oldest equipment down from over 10 years to 5 to 10 years.

Option Appraisal

Creation/Acquisition

New telematics equipment is created when new roads are constructed, such as the A66 Middlehaven/ North Ormesby Interchange.

Integrated transport improvements, safety schemes, major schemes and new developments also add to the inventory of such equipment.

Maintenance, Renewal or Replacement and Upgrading

The maintenance of telematics may be categorised as:

- Cyclic: e.g. signals lamp changes every 6 months.
- Reactive: e.g. replacing blown lamps and replacing equipment damaged in accidents.

- Planned: e.g. upgrading equipment on the basis of age (Annual funding requirement needs to be identified to address the programme of replacements as a result of the increase in number of installations)

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Disposal or Decommissioning

Equipment is removed and decommissioned when it is no longer necessary. For instance, the installation of a new signalised junction with pedestrian crossing facilities may render a nearby pedestrian crossing unnecessary.

Budget Optimisation

Capital

Funding for new and improvement schemes may be generated through a bid as part of the LTP process.

Revenue

A summary of the telematics revenue budget for financial year 2005/6 is given in the following table:

Summary of Transport Telematics Maintenance Revenue Budget
(FY 2005/06)

Activity	Cost (£000's)
Routine Maintenance Cyclic Maintenance covers the contract costs with the maintenance contractor, contractual maintenance payments to other providers, communication costs	
Non - Routine Maintenance Covers reactive and planned maintenance	
Un-recovered vehicle damage Any costs for repairs needed as a result of impact damage that cannot be recovered through insurance (see Emma Yates).	
Energy Used to fund energy consumption	
Revenue Total	

Financial Data is currently under review

Budgets have been set historically, with some allowance for inflation.

The increased number of installations has had a major impact on the maintenance budget and the need for a programme of planned maintenance.

Performance Gaps

There is a significant percentage of transport telematics over the designed 10 year life span, 48%, with 11% being over 15 years old.

There is always demand for more signalised crossings and signalised junctions. Government guidance is steering local authorities to upgrade Pelicans to Puffins to remove the flashing amber and the associated pedestrian vehicle conflict. No funding has been made available for this.

There is an existing funding gap. The current routine maintenance budget is insufficient to cover any replacements or renewals; the shortfall is currently due to a lack of non-routine (planned) maintenance budgets.

- Last Years Budget (06/07)
- Actual Expenditure

Financial Data is currently under review

- This Years Budget (07/08)
- Expected Expenditure

An increase in the number of installations over the last 20 years has not been reflected in an increase in resources to undertake maintenance activities.
The existing maintenance contract is due for renewal in April 2008. The new contract figures may increase over the old contract.
Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.10 Public Rights of Way (PROWs)

These cover all categories of PROWs included on the Definitive Map. This includes footpaths, bridleways, Roads Used as Public Paths (RUPPs) and Byways Open to All Traffic (BOATs).

Inventory

Middlesbrough Council is responsible for 38km of public rights of way with a combined gross replacement cost (GRC) estimated at just under £2.75million. The network covers both urban and rural areas.

The path network is recorded on the MC Definitive Map and statement (often referred to as simply the “Definitive Map”). The Definitive Map is paper based with parts not updated for over 10 years. The Council has digitised and is updating the Map and is classed a s a working copy.

The majority of inventory data is based on an 80% sample of BVPI results from surveys undertaken in May and November, annually across Middlesbrough.

Condition

<u>Assessing Condition</u>

BVPI 178 surveys – 80% of the network is surveyed annually (40% in May, 40% in November). Each path is surveyed completely against pass/fail criteria. Condition scores are determined based on national criteria set out in the BVPI standard (Good, Missing, Attention and Replacement required). Bridges/Culverts of less than 6m spans are inspected at the same time.

Bridge Records - for bridges greater than 6 metres in length, the Built Environment Group undertakes inspections. Bridges receive a general inspection once every two years. Please see the Structures life cycle plan for further information.

Reactive / Ad hoc Surveys - MC responds to reports on the state of the path network from a number of sources such as user/pressure groups, Parish Councils, the general public and parish based volunteers. Staff also undertake additional ad hoc condition surveys.

Current Condition

BVPI 178 data has been gathered since 2002. The 'ease of use' result for 2005 is 80% across the county, 85.3% for 2006 and 94.2% for 2007. This gives a mean of 86.5% over the 3 years. Conversely only 13.5% of the network did not satisfy the easy to use criteria detailed above over the same period. These BVPI results include the following:

- 5 (100%) bridges are in a good condition
- 0 (0%) bridges are missing
- 0 (0%) bridges require attention
- 0 (0%) need to be replaced.
- 1500 (100%) waymarks are in a good condition.
- 0 (0%) waymark posts are missing
- 0 (0%) waymarks require attention (e.g. waymark discs need replacing)
- 0 (0%) posts need replacing.
- 201 (91%) roadside signposts are in a good condition
- 0 (0%) signposts are missing
- 1 (4.5%) signposts require attention
- 1 (4.5%) signposts need replacing.

There is also circumstantial evidence from the general public that the state of the network is generally good. The source of this information is the RoW Improvement Plan (consultations with the parish councils, user groups and the general public).

Desired Condition

Evidence from BV178 sampling, requests from the public, user groups and parishes, and information gathered from recent consultations suggest strongly that the current condition of the asset very near the desired condition, particularly in respect of the more visible parts of the asset. This includes

signposting, waymarking and cutting. Structure defects tend not to be reported unless they are obvious, e.g. a missing footbridge handrail.

There are no standards nationally for RoW for asset condition – the only requirement being the legal one that all paths should be signed where they leave the metalled road. For BV178, MC is towards the top of the first quartile when compared with other unitary authorities.

Option Appraisal

Creation/Acquisition

New paths can be created via a legal process that will add a route to the Definitive Map. Once added to the Map, the path becomes the responsibility of Middlesbrough Council. Such processes are rare. Legal diversions of routes effectively create new rights of way.

Maintenance, Renewal or Replacement and Upgrading

The maintenance of rights of way may be categorised as:

- Cyclic: e.g. surface clearance
- Reactive: e.g. repairs to damaged signs, stiles and path furniture
- Planned: e.g. replacement of small bridges and waymarks

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Disposal or Decommissioning

Rights of way cease to exist via Stopping Up or extinguishment. These are legal processes that remove a path from the Definitive Map. It must be shown that the path is no longer needed for public use.

Budget Optimisation

Summaries of RoW budgets and expenditure are given in the following tables:

Summary of PROW's Maintenance Budget

Budget	£ per year		
	2005/6	2006/7	2007/8
Revenue			
Capital			
CROW			
SCP			
Total			

Summary of PROW's Maintenance Expenditure

Activity	£ per year	
Bridges		
Cutting		
Signing		
Surfacing		
Waymarking		
Other (e.g. steps, heavy clearance		
Total		

Financial Data is currently under review

Revenue

Primarily based on previous year's budget. Budget prioritisation processes exist to bid for additional funding as well as programme budget reductions. These have not resulted in additional funding in recent years. Revenue funding covers mainly cutting, waymarking and minor structural works.

Capital

A bid is made annually to the MC LTP allocation, mainly for bridge installations and major refurbishments, surfacing works and creation of new bridleways. The bid comprises a mix of essential maintenance and improvements often originating in requests from local communities (e.g. for surfacing paths giving access to services).

Countryside and Rights of Way Act (CROW)

Additional central government funding was made available to highway authorities on the introduction of this legislation in 2000 to cover new duties. Which included the setting up of a Local Access Forum and investigating the effects of Open Access Land. In Middlesbrough's case this amounts to £15,000 per year of which an allocation has been made for RoW maintenance improvements to reduce the backlog of works, pending initiation of improvements arising from the publication of the Rights of Way Improvement Plan.

Performance Gaps

Feedback from defect reports and consultations demonstrates a significant gap between users' expectations and the condition of the asset. Performance gaps for rights of way can be divided into 2 main areas:

- **Condition** - In most cases surface condition, roadside signposting, gates and stiles provision is currently abreast of deterioration of the asset. For the rest of the asset types, provision falls short of deterioration. The main area of concern is suitability for users with disabilities.

- **Inventory** - Although most of the RoW asset data is sample based there is no clear indication of a gap in knowledge of the asset condition. A gap can be identified in that the Definitive Map is out of date and there is a need for the information to be digitised whilst producing an updated Definitive Map and Statement.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.11 Trees, Hedges, Verges & Planted Areas

The verges are the margins between the highway boundary and the paved surfaces. Any trees, hedges or planted areas that lie within the verges are the council's responsibility.

In relation to this asset element, all actions are undertaken with reference to the Tees Valley Bio-Diversity Action and the duties Middlesbrough has as a local authority to protect and enhance the natural environment.

Inventory

There are a considerable number of trees, hedges, verges and planted areas contained within the council's highway network. Although a full inventory does not exist, a "ballpark" estimate has been made on the quantity of council trees (30,000), hedges (51km) with a gross replacement cost (GRC) estimated at approximately £5.9 million.

Verge, tree and hedge records exist on a variety of GIS and paper records.

Verge and landscaped areas are updated from the S38 Agreement plans at the time new highways are handed over by the developer. The Roadside Nature Reserves (RNR) are well documented and updated on spreadsheets annually.

For a detailed breakdown of this asset's inventory, see Appendix B.

Condition

Assessing Condition

Reports of dangerous or nuisance trees and hedges are received from highway inspectors, councillors and the general public. Trees maintained on the council's behalf are inspected and if their condition is in doubt they will be given a detailed assessment by an arborist.

Current Condition

The overall condition of the tree stock is not known.

Most verges are cut a minimum of thirteen times annually, usually starting at the beginning of May. Additional cutting will be undertaken if necessary, on safety grounds. There is a problem with overrunning of verges, which is unsightly and can lead to third party claims for wheel damage to vehicles. A further concern is the creeping of road width due to carriageway edge patching.

Roadside Nature Reserves (RNR), specific maintenance regimes apply to these areas that are sensitive to breeding cycles, growing seasons and other environmental considerations, they are usually cut once a year in the autumn.

The Council also maintains planted areas.

Desired Condition

All council highway trees to be in a sound and safe condition

All hedges cut back so that there is no obstruction to the highway or footway. Cutting back to be done outside the bird-nesting season unless it constitutes an immediate hazard.

Rural verges to be cut a minimum of 2 times a year and visibility splays more often if they become a hazard.

For a detailed explanation of this optimum level of service, see Appendix D.

Option Appraisal

Creation/Acquisition

Most new trees, verges and landscaped areas are planted by developers and are subject to the development control process before they are adopted by the authority as being maintainable at public expense. The development control procedure enables the Council to be sure that new trees, verges and landscaped areas have been planted to the requisite specification. Maintenance issues are considered as part of this process, with commuted sums being charged for items that attract particularly high maintenance overheads.

Not all trees, verges and landscaped areas become the responsibility of the highway authority, as some are designated public open space.

Processes are in place to ensure that new trees, verges and landscaped areas are placed on the Council's records. These new trees, verges and landscaped areas then become subject to the relevant inspection and cyclic maintenance regimes, as well as being integrated into the inventory data collection rolling programme.

Maintenance, Renewal or Replacement and Upgrading

The maintenance for this asset group may be categorised as:

- Cyclic:

  Urban trees are scheduled to be pollarded as required dependant on growth.

  For urban verges, the full highway verge width receives approximately 13 cuts per year.

All rural verges receive a minimum of 2 cuts per year, for the first 1.2 metre swathe and visibility splays at junction, bends and signs. Additional localised cutting may be undertaken where required for safety reasons.

Roadside Nature Reserves receive a single cut generally in autumn in accordance with the recommendations of the Grounds Maintenance Manager.

The Council carries out cyclic maintenance on planted areas.

- Reactive:

  Maintenance on highway trees is often a reactive service.

  For privately owned trees that pose a risk to safety, the owner will be contacted to undertake the work at their expense.

  Hedges will be cut back if they are dangerous on report from the public. Most hedges are owned by the adjacent landowner and if they fail to make the hedge safe the Council will carry out the work. (Note: hazards can exist with overgrown hedges)

  The Council generally maintains planted areas in urban areas and housing estates.

- Planned:

  Very little planned maintenance (renewals or replacements etc) is undertaken on these assets. Where the verge is over 1.2m wide, then the Council will plan to cut back the scrub and vegetation to the highway boundary.

  Trees are planted in some urban areas to replace those that have to be removed due to “die-back” or because of likely property damage.

  Where evidence exists of persistent damage to highway verges consideration will be given to hard landscape.

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Disposal or Decommissioning

Trees will generally be disposed of on safety grounds i.e. due to disease or damage.

In the vast majority of cases, verges and landscaped areas are expected to last in perpetuity. The only way that verges and landscaped areas can cease to be highway is via the formal legal process called Stopping Up. It is very rare for verges and landscaped areas to be stopped up other than those associated with new developments. Therefore the duties in terms of maintaining verges and landscaped areas continue to rest with the authority.

Removal of any hedgerow or part of a hedgerow will be subject to the terms of the Hedgerow Regulations 1997 and its subsequent amendments (see exemptions).

Budget Optimisation

Capital

There is usually a small annual allocation of capital funding for these assets. This comes about when planting or other maintenance is part of a capital scheme.

Revenue

The revenue budget supports routine maintenance of the asset and is based on inventory for verges and landscaped areas and historical precedence for trees and hedges.

A summary of current capital and revenue expenditure is shown in the table below:

Summary of Average Revenue Expenditure FY05/06 & FY06/07 for Tree, Hedges, Verges & Planted areas (£000's)

Asset sub-element	Revenue	Capital
Trees Hedges Verges Planted Areas		
Total		

Financial Data is currently under review

Performance Gaps

A full inventory and condition survey for this asset group (especially highway trees) is currently being undertaken.

The current condition of highway trees is not recorded, but it is known that some of these are not in a desirable condition.

There is a low level of annual expenditure on the maintenance of highway trees and hedges.

There are numerous requests from residents for lowering the height of trees or hedge cutting.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.12 Unlit Signs and Street Furniture

This covers all the official non-illuminated street furniture that is intended to guide, inform or control the travelling public.

Inventory

The Unlit Signs component of the Council's highway network, (more than 1290 in number) is small in overall value, but never less an important asset group with a gross replacement cost (GRC) estimated at approximately £0.65 million.

There is very little inventory data available for unlit signs, reflective markers and bollards. Data that does exist is held on the Insight system or in hardcopy format and is not easily manipulated. There are video survey lists of signs on A & B roads, but unfortunately the size and type of sign is not recorded.

Traffic Regulation Orders (TRO's) are also held in hardcopy format.

For a detailed breakdown of this asset's inventory, please see Appendix B.

Condition

Assessing Condition

Highway Inspectors and other staff may note the need for repair or replacement as part of their normal day to day highway duties, but there are no detailed condition inspections undertaken on unlit signs anywhere on the network or on reflective markers or bollards.

Signs are included in highway safety inspections, but in practice it can be difficult to assess their condition when the prime objective of the inspection is to protect users of the highway from dangerous defects mainly in the carriageway or footway surface. Only obvious problems, such as dangerous signs and missing or damaged signs, are likely to be recorded during these safety inspections.

Current Condition

In most cases the condition of the signs on A & B roads will be checked and reported back to the Council. In some areas this is also true for C & U roads. However the majority of signs on C & U roads, reflective markers and bollards go unchecked. Therefore the condition of these assets is not known.

Desired Condition

All signs are visible and legible at distances which allow them to be read by highway users, as they pass at speeds appropriate to the type of road, during day or night. All missing or defective signs are to be repaired promptly.

Existing signage should be reviewed when completing an improvement on any given site. An inventory needs to be created and new assets added with a record of the type of asset and preferably a photograph. There should also be an on going review of all materials being used.

For a detailed explanation of this optimum level of service, see Appendix D.

Option Appraisal

Creation/Acquisition

Amendments to the existing highway network may generate the installation of new unlit signs.

Middlesbrough's Unlit Signs asset is increased when new roads are built. For instance, the A66 Middlehaven Interchange will add approximately 20 new unlit signs to the highway inventory.

New developments that are adopted as highway maintainable at public expense usually add to the unlit signs asset.

Maintenance, Renewal or Replacement and Upgrading

The maintenance treatments for unlit signs may be categorised as:

- Cyclic:

  At present there is no cyclic maintenance regime.

- Reactive:

  Unlit Signs are cleaned and repaired upon report, although most signs are neither inspected nor cleaned.

  Reflective Markers and Bollards are only cleaned and repaired upon report.

  Missing or illegible signs are replaced, subject to budget, when reported by police, council staff or the public.

- Planned:

  Very little planned maintenance (renewals or replacements etc) is undertaken on signs, reflective markers and bollards. In some cases signs and bollards may be replaced/upgraded as part of traffic management or safety schemes.

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Disposal or Decommissioning

Unlit signs may be removed when parts of the highway are Stopped Up. Unlit signs are also decommissioned when changes to the highway network require the reduction in number or relocation of signing.

Budget Optimisation

Capital

When capital budget is used to improve or add to the asset, this is normally undertaken as part of a Traffic Management or Safety Scheme, e.g. speed restriction or accident prevention. These types of schemes represent a small portion of the overall annual capital allocation, but can add a considerable quantity of new signs to the highway inventory with no corresponding increase in the revenue budget to maintain them.

Revenue

The revenue budget supports routine maintenance of the asset and is based on experience of previous expenditure.

A summary of current capital and revenue expenditure is shown in the table below:

Summary of Average Revenue Expenditure
FY03/04 & FY04/05 for Unlit Signs (£000's)

Asset sub-element	Revenue	Capital
Signs Reflective Markers Bollards		
Total		

Financial Data is currently under review

Performance Gaps

A full inventory and condition survey for all unlit signs, reflective markers and bollards across all road classes has not been undertaken.

The current condition of all unlit signs across the network is not known, but it is recognised that a proportion of this asset is not in a desirable condition.

The provision of speed restrictions across the Borough and other traffic management and safety schemes are all funded from the capital budget, but with no corresponding increase in the revenue budget to maintain them.

Accident damage, vandalism and theft have all increased substantially in recent years, which means that many signs have to be replaced well before the end of their serviceable life. In many cases, there is no revenue budget available to fund their replacement and therefore many sign plates are left missing from posts.

Unlit signs are not inspected regularly; therefore damaged or missing assets will not be replaced unless noted by staff or reported by the public.

There is no check undertaken on sign “loss of reflectivity” at either installation or subsequent cleaning / inspection.

There is a lack of funding for renewals of unlit signs, markers and bollards when they become damaged or are missing. This can lead to a poor impression of the maintenance of this asset in some locations.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.13 Barriers and Safety Fences

Barriers and safety fences are provided to separate and protect various categories of highway user from each other, e.g. guardrails near traffic lights separate pedestrians from vehicles; safety barriers on central reservations of dual carriageways separate opposing flows of traffic. Barriers may be provided to protect the highway user from specific hazards, e.g. bridge parapets, embankments.

Inventory

Although the fences and barriers component of the Council's highway network, (approximately 15.0km) is small in overall value, it is never the less an important asset group with a gross replacement cost (GRC) estimated at approximately £1.4 million.

Inventory records are limited. There is little data on the length or location of safety fences, pedestrian barriers or any other highway maintainable fencing. There is also no formalised system for managing or updating the inventory data.

There are only limited records of pedestrian barriers. Some boundary fences are recorded on purchase agreements for land needed for road improvements.

For a detailed breakdown of this asset's inventory, see Appendix B.

Condition

Assessing Condition

Safety fences require a full inspection every 5 years and a tension check where applicable every 2 years. Other guardrails and fences (other than those associated with a bridge or retaining wall) are not routinely inspected. They will only be repaired if safety defects are reported and they are still required as a protection measure.

All other types of fences are not inspected and therefore the condition of these assets is only known from observation by council staff or public report.

Current Condition

Safety fencing has been erected to changing standards over the last 40 years. It is generally kept in good condition by the 5-year inspection process discussed above. Wooden posts are now sub-standard and, where identified, they are changed to the current specification.

There are a number of types of pedestrian barriers (guardrails) used for differing circumstances. Some of those that serve to protect the public from vehicles at junctions or other constrictions are vulnerable to vehicle impact and are repaired if in a dangerous condition. Timber barriers and fences are subject to vandalism and may need repair or replacement.

Desired Condition

Fences and barriers should be in a serviceable condition and fit for their purpose. All substandard safety fencing should be replaced. Where required, barriers should be re-painted at appropriate intervals to extend components expected life.

For a detailed explanation of this optimum level of service, see Appendix D.

Option Appraisal

Creation/Acquisition

Amendments to the existing highway network, or changes in legislation, may generate the installation of new barriers and safety fences.

Middlesbrough's barriers and safety fences asset is increased when new roads are built. For instance, the A66 Middlehaven Interchange will add approximately 200m of new barriers and safety fences to the highway inventory.

New developments that are adopted as highway maintainable at public expense usually add to the barriers and safety fences asset.

Maintenance, Renewal or Replacement and Upgrading

The maintenance treatments for barriers and safety fences may be categorised as:

- Cyclic:
  Full inspection (5 yearly) and tension check (2 yearly) of safety fences.

- Reactive:
  For safety fences and pedestrian barriers, dangerous sections will be made safe within 24 hours and permanent repairs are targeted for completion within 2 weeks.

- Planned:
  Very little planned maintenance (renewals or replacements etc) is undertaken on safety fences or barriers.

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Disposal or Decommissioning

Barriers and safety fences may be removed when parts of the highway are Stopped Up. Barriers and safety fences are also decommissioned when changes to the highway network require their reduction in number or relocation.

Budget Optimisation

Capital

The capital budget is derived from central government as part of the LTP process. The Council may allocate capital funds in order to fund improvement

or maintenance works that upgrade the asset. The Traffic Management or Road Safety Teams will usually generate any proposal for significant additional fencing (excluding that undertaken as part of larger road schemes).

Revenue

The revenue budget supports routine maintenance of the asset and is based on historical precedence.

A summary of current capital and revenue expenditure is shown in the table below:

Summary of Average Revenue Expenditure FY03/04 & FY04/05 for Barriers & Safety Fencing

Asset sub-element	Revenue	Capital
Safety Fences Pedestrian Barriers		
Total		

Financial Data is currently under review

Performance Gaps

A full inventory and condition survey, other than on the A66, of safety fences, acoustic barriers and pedestrian barriers across the highway network has not been undertaken. The current condition of all safety fences and pedestrian barriers is not known, but it is assumed that a proportion of this asset is not in a desirable condition.

There are areas where fencing is inadequate or non-existent, dictating the need to develop a comprehensive register of highway hazards in high risk areas in order to assess the need for additional safety fencing and barriers.

It is often not possible to complete reactive repairs to safety fences and pedestrian barriers within the standard 2-week timeframe.

The current process for recording damage to barriers and safety fences caused by vehicle accidents, assists in the recovery of costs in many cases.

There is a lack of funding for renewals of barriers and safety fences when they become damaged or are missing. This can lead to a poor impression of the maintenance of this asset in some locations.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

4.14 Road Markings & Studs

Road markings cover all forms of white and yellow lines or symbols and may be thermoplastic screed or paint. Road studs are the “cats eye” equivalents used to indicate the centre or edge of a carriageway.

Inventory

Although the road markings and studs installed on the Council’s carriageways (including some 147km of line and 2567 studs) may be small in overall value, they are never the less an integral highway asset with a gross replacement cost (GRC) estimated at approximately £0.11million.

There is no formalised system for collecting, maintaining or updating inventory data relating to road markings and studs. There is, however some limited information in respect of regulatory markings.

For a detailed breakdown of this asset’s inventory, please see Appendix B.

Condition

Assessing Condition

The Highway Network Management Plan requires that all road markings and studs on the principal road network (A & B classes) and all mandatory markings on the non-principal road network (C & U classes) must be maintained according to the following standards.

- Road markings and reflecting studs must undergo an annual nighttime inspection in the spring for a check on visibility and any special repairs or renewals that may be required.

- They should also be checked during periodic daytime road inspections, one of which must be timed for early spring to detect any damage caused by winter snow clearing operations if applicable. (Note: Any loose road studs must be reported and repaired immediately)

NB
Due to the very small percentage of Network that is not lit, there is no rigid inspection regime for this part of the asset.

Current Condition

Due to the maintenance regime noted above, the condition of road markings and studs on the principal road network would be to a higher standard than those found on the non-principal road network. Mandatory markings are also in a better condition than non-mandatory road markings for a similar reason.

Desired Condition

All of the asset should be maintained in accordance with the standards laid out in the Highway Network Management Plan.

The layout of road markings and studs should always be assessed prior to renewal and following road resurfacing or surface dressing.

For a detailed explanation of this optimum level of service, see Appendix D.

Option Appraisal

Creation/Acquisition

Amendments to the existing highway network, or changes in legislation, may generate the installation of new road markings and studs.

Middlesbrough's road markings and studs asset is increased when new roads are built. For instance, the A66 Middlehaven Interchange will add new such assets to the highway inventory.

New developments that are adopted as highway maintainable at public expense usually add to the road markings and studs asset.

Maintenance, Renewal or Replacement and Upgrading

The maintenance treatments for road markings and studs may be categorised as:

- Cyclic:
  The repair / renewal of existing road markings and studs on the highway network is undertaken following safety and scouting inspections.
- Reactive:
  Reinstatement of existing road markings and studs. Sites are inspected following a report from the public, council staff or police and repair work may then be programmed depending on budget.

- Planned:
  Very little planned maintenance (renewals or replacements etc) is undertaken on road markings and studs. In most cases this work is only undertaken on parts of the network when re-surfacing or surface dressing is completed.

Full descriptions of all maintenance activities, together with proposed improvements to the current regime are given in Appendix D.

Disposal or Decommissioning

Road markings and studs may be removed when parts of the highway are Stopped Up. Road markings and studs may also be decommissioned when changes to the highway network as a result of legislation, mandatory requirements or road safety schemes are required.

Budget Optimisation

Capital

When capital budget is used to improve the asset, this is normally undertaken as part of a highway maintenance or traffic safety scheme.

Revenue

The revenue budget supports routine maintenance of the asset. The predicted need is based on experience of previous expenditure.

A summary of current capital and revenue expenditure is shown in the table below:

Summary of Average Revenue Expenditure FY03/04 & FY04/05 for Road Marking & Studs (£000's)

Asset sub-element	Revenue	Capital
Road Markings Road Studs		
Total		

Financial Data is currently under review

Performance Gaps

A full inventory and condition survey of all road markings and studs has not been undertaken. There are also incomplete records on the location and type of TRO markings.

The maintenance standards listed in the Highway Network Management Plan adopt a priority system for the reinstatement of markings. Consequently a large proportion of the asset on the non-principal road network is not in a desirable condition. Regular reports from the police and public, together with our own safety inspections, confirm this.

Further details relating to Forward Works Planning, Demand and Performance Management can be found in Appendix D.

5. Levels of Service

5.1 Why Levels of Service ?

The creation of levels of service should reflect and support user aspirations which are a key element in the adoption of an asset management plan. This section describes the basis on which levels of service (service standards and performance targets) have been established. These standards need to take into account statutory duties of the Council as a highway authority, the Council's strategic transportation goals (as detailed in the Local Transport Plan) and the expectation of our customers.

The target levels of service contained in this plan have been determined by applying the generic service options described in Section Four to all asset groups. These have been applied in detail to individual asset groups. These steps are detailed in the lifecycle plans and are leading towards the development of long term plans for the forward work programme.

Once a suite of 'levels of service' and 'performance measures' are put in place, it will then be possible to obtain some understanding of the relationship between the cost and the level of performance against each level of service. This information can then ultimately be used to inform decisions on the allocation of resources between competing demands.

The ability to rationally assess competing demands is at the core of an asset management approach. The information collected against levels of service is the base data that can be used for optimisation and measured against a raft of performance indicators and targets.

5.2 What are Levels of Service ?

Levels of service describe the quality of services provided by the asset for the benefit of the customers. They are composite indicators that reflect the social, economic and environmental goals of the community. In relation to the TAMP, levels of service are therefore the manner by which the highway authority engages with the customer and are about reflecting the customer's interests in terms that can be measured and evaluated.

Levels of service may relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.

5.3 Use of Levels of Service

Levels of service are a way in which a highway authority can determine whether or not it is meeting customer expectations and its statutory obligations in the delivery of its highway service.

The levels of service defined in this section will be used:

(a) To inform customers of the proposed type and level of service to be offered and to provide more detailed information to customers about the level of service they can expect. In some instances this will outline what they cannot reasonably expect unless they are prepared to pay more, e.g. localised variations of frequencies in street cleaning.

(b) As a focus for the strategies developed to deliver the required levels of service and to be seen to directly influence how priorities are assessed. This will determine how funding needs are identified, how funding is distributed and how the effectiveness of that spend is subsequently assessed.

(c) As a measure of the effectiveness of this plan it will create a means of assessing the benefit of using asset management planning as opposed to current methods. Key service targets will be identified and monitored to ensure the effectiveness of the plan.

(d) To identify the costs and benefits of the services offered. This will be used to assess the costs of delivering differing levels of service and to make more informed choices between the options available.

(e) To allow customers to assess suitability and affordability of the services offered and to provide better information through consultation. This will enable customers to incorporate not only questions of personal preference and how satisfied they are, but also about what they would be prepared to pay more for, or to sacrifice in order to pay for higher levels of service elsewhere e.g. less gully cleaning if more roads were gritted in Winter.
Any such decision would be determined through consultation in order to understand the implications of various choices.

It should be noted that levels of service cannot drop below minimum statutory requirements.

5.4 Key Considerations

Factors affecting levels of service are:

Customer expectations

The purposes of any actions taken by the highway authority are in the interests of its customers. Their views should therefore be considered when developing levels of service. This means more than simply surveying areas of interest and levels of satisfaction. It also means being able to demonstrate a tangible link between customer preferences and the levels of service provided.

Ultimately this may mean consideration of customer's preferences. For example, consider whether or not customers are prepared to pay more for a

higher level of service on verge maintenance rather than the condition of footpaths. This type of consultation will take place when costed alternative options are available on which to consult.

Refer to Appendix C for customer survey results.

Legislative requirements

Statutory duties apply to many highway maintenance activities. These are often not absolute, but put the onus on authorities to demonstrate they have taken “reasonable” actions to maintain the highway.

This plan identifies the key legislation that a highway authority must adhere to and identifies how they impact on the levels of service which councils are required to provide as a statutory minimum.

These statutes are open to a degree of interpretation and in developing service options a legislative minimum has been identified.

See Appendix C for options

Organisations mission and objectives

The Council has a series of organisation goals and objectives that influence the way in which the highway network is managed. This plan identifies what these are and considers how the targeted levels of service will contribute towards their delivery.

Best Practice Guidelines

A number of best practice guidelines exist that directly influence the levels of service provided. Whilst these best practice guidelines are not statutory duties they do represent a description of accepted good practice and can, for example, form part of a reasonable defence against a liability claim if the authority is able to demonstrate compliance with them.

The main documents relevant to this plan are:

- **Well Maintained Highways** – Code of Practice for Highway Maintenance Management
- **Well-Lit Highways** – Code of Practice for Road Lighting Management
- **Management of Highway Structures** – A Code of Practice

This plan highlights how these documents have been taken into consideration throughout the development of levels of service.

The plan will typically identify where these codes are being applied and in instances where they are not being adopted, the rationale behind the decision not to apply the guidance given in the codes will be clearly stated.

Affordability

The service options described below identify, amongst other options, an economically optimum level of service which is the most economically efficient way of delivering an acceptable level of service over the long term. Due to other pressures on Council funding and other pressures on the network it may not be possible to deliver the funding required to deliver the optimum solution. This is one of the primary reasons for presenting service options. In doing so decision makers will be able to decide upon the relative merit of competing funding needs based upon improved data on both existing and predicted future performance, risk and cost.

Availability of resources, skills and appropriate delivery mechanisms

Availability of suitably skilled resources is currently an issue within the construction industry, including road maintenance.

Rapid significant changes in programme can be difficult to deliver and this has to be considered when establishing levels of service, in particular any services that are vastly different to the current levels of service.

5.5 Current Levels of Service

What is the current level of service?

The schedule in Appendix C gives details of the Council's current Level of Service Framework. This schedule identifies current methods for recording performance against service areas. It also identifies areas where little or no performance data or measurement systems exist. The improvement action plan identifies how and when it is planned to plug these information gaps.

5.6 Customer Expectations

Guiding Principles for Community Consultation

Middlesbrough Council is committed to consulting with our citizens and other key stakeholders in the delivery of services and to promote participation in the democratic process. To fulfil this commitment, our community consultation activities are designed around the following guiding principles:

Effective The outcomes of consultation inform decision-making and service delivery.

Appropriate There should be an identified need for consultation. It should be proportionate and undertaken with the relevant sections of the community. Duplication should be avoided.

Inclusive Every citizen of Middlesbrough, including hard-to-reach groups, should have the opportunity to express their views and have them considered.

Co-ordinated There should be a consistent and co-ordinated approach to consultation.

The Environment department is responsible for managing consultation activities that fall within the service area responsibility. These activities are managed within the overall corporate consultation strategic framework.

To achieve consistency with guiding principles for community consultation, a strategic approach has been built by establishing cross-organisational structures to plan, co-ordinate and integrate consultation activities.

Effective planning and evaluation helps to ensure that consultation processes used are user-focused, open and transparent and improve communication both within the Council and with our citizens. A strategic approach also allows us to share information more effectively with our partners. This facilitates joint working to support information and evidence for service improvements, performance reporting and project/funding bids.

Middlesbrough Neighbourhood Survey 2005

The Neighbourhood Survey is a 6,000 resident, town-wide, face-to-face survey that explores perceptions about quality of life and service delivery in Middlesbrough.

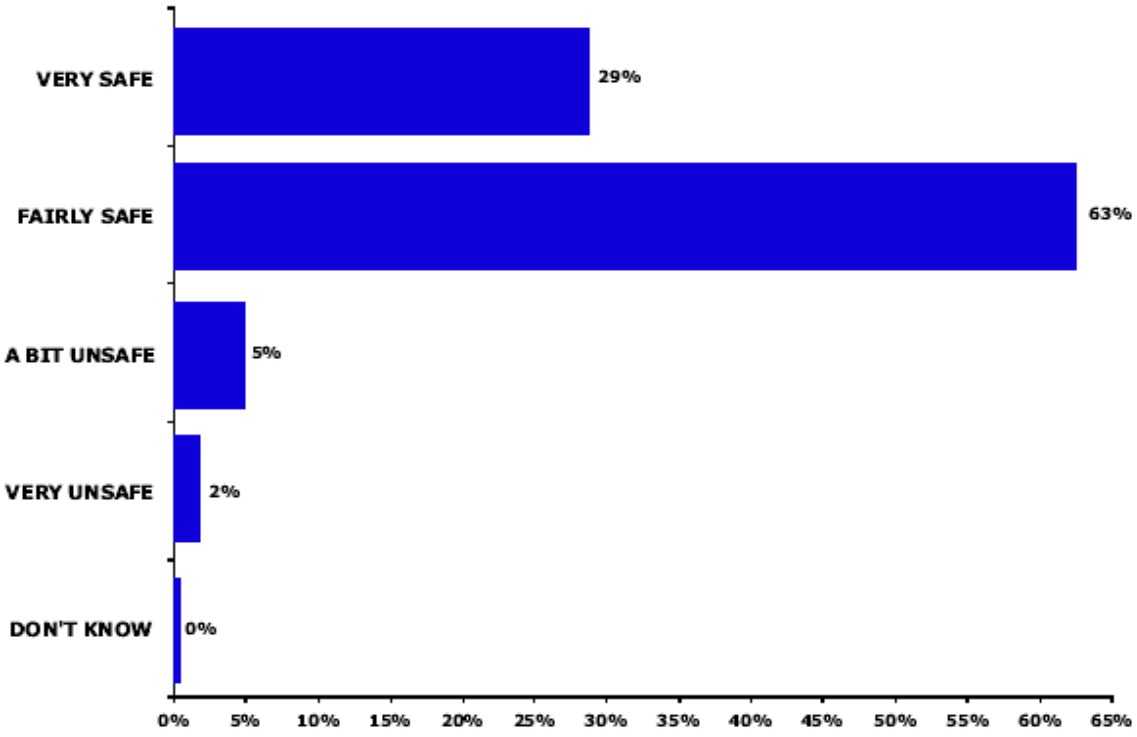
The Neighbourhood Survey is used to inform a variety of data and information needs for our partners and us. These surveys have been held in Middlesbrough in 1999, 2001, 2003 and 2005. The survey is managed in collaboration with key stakeholders.

The surveys in 2001, 2003 and 2005 shows there is a perception of improvement in many areas of life in Middlesbrough.

Most recently in October 2005 Middlesbrough Council commissioned BMG Research to undertake a face-to-face survey amongst a random sample of 6,178 residents. Comparisons are made with previous surveys undertaken in 2001 and 2003. In 2003, a significant improvement was observed in the proportion feeling their neighbourhood was very or fairly safe (75%) from the 2001 result (60%).

The 2005 result represents a further significant improvement from 2003 and the majority of residents now feel that their neighbourhood is very or fairly safe. This is a key Neighbourhood Renewal Strategy indicator. The 2005 results are represented in the following figure.

How safe or unsafe residents feel their neighbourhood is



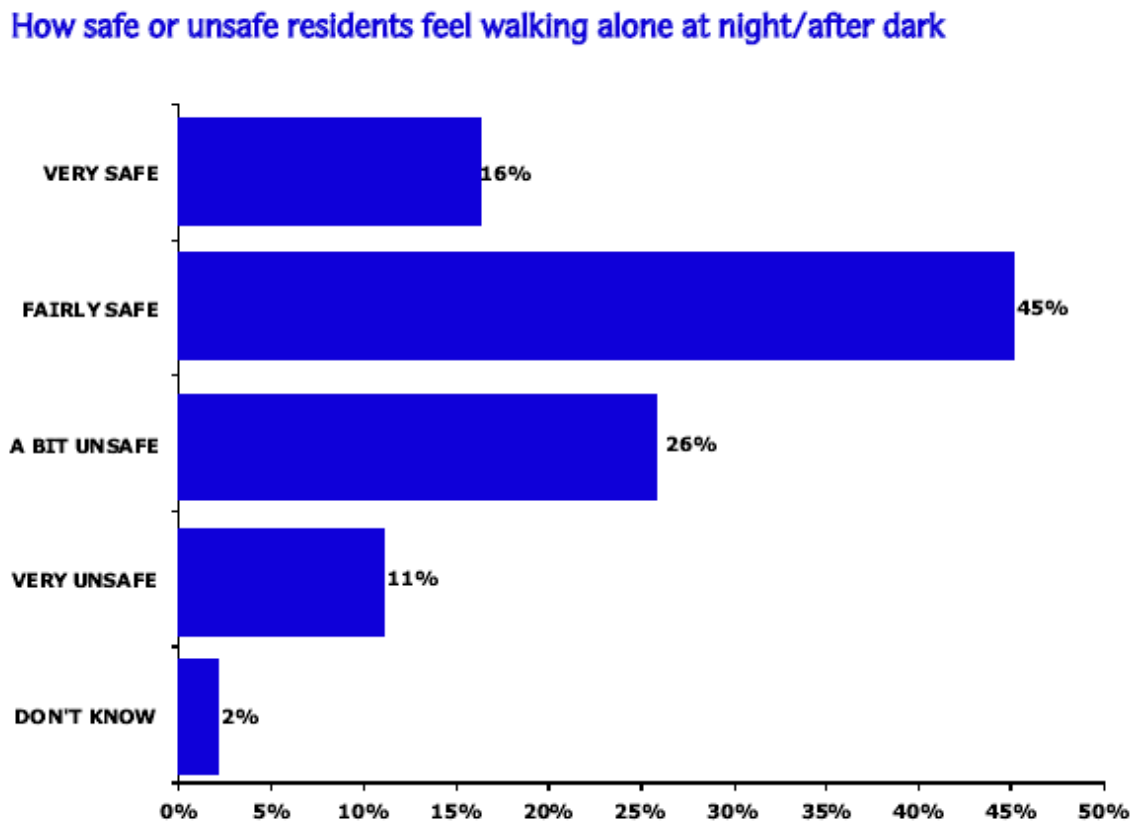
The recent Neighbourhood survey (2005) showed that three in five (61%) residents feel safe when walking alone in their neighbourhood at night or after dark compared with 51% in 2003.

This is attributable to a range of measures, however improved street lighting is considered a significant factor in raising feelings of safety in and around neighbourhoods. The Council were successful in obtaining joint funding from the Neighbourhood Renewal Fund to improve street lighting within disadvantaged communities through the "Lighting for Safety" project, areas targeted were where crime and fear of crime tends to be higher.

The LTP1 has enabled the delivery of improved external lighting at 114 bus waiting facilities, which has increased feelings of safety on the public transport network as reported by The Civilising Cities survey in 2003. This showed that there was a strong relationship between "feelings of safety walking to/from bus stops from home and "satisfaction with condition of bus stops", 64.6% of those who were very satisfied with the condition of bus stops/shelters reported feeling very safe walking to/from the bus stop.

Throughout LTP1 6.9 km of adopted footpath/cycleway have now got lighting/ improved lighting, the programme of works was developed in conjunction with cycling and walking strategies and their respective user groups.

Three in five (61%) residents feel safe when walking alone in their neighbourhood at night or after dark while 37% feel unsafe. This represents a significant increase in the proportion feeling safe in 2003 where 51% felt safe. This result is still below that recorded in the 2003 British Crime Survey where 67% felt safe when walking alone in their neighbourhood at night/after dark.



In the 2005 Neighbourhood Survey all residents were provided with a list of 10 environmental statements and asked to rate how satisfied or dissatisfied they were with each one.

Where reference has been made to 'balance scores'; these are calculated by subtracting the negative score from the positive score.

With regard to those three areas relating to the highway network, i.e. street furniture, road surfaces and pavement condition, all areas score a satisfaction level in excess of 50%. The following table shows that positive balance scores have been achieved with all three aspects relating to the condition of the highway.

SATISFACTION LEVELS WITH ENVIRONMENTAL ISSUES IN RESIDENTS LOCAL NEIGHBOURHOOD						
		SATISFIED	NEITHER	DISSATISFIED	BALANCE SCORE	DON'T KNOW
The maintenance of the grassed areas/open green spaces	%	68	19	12	+56	1
The maintenance of shrubs/woodland	%	59	28	9	+50	4
The local parks and open spaces	%	52	37	9	+43	2
The condition of street furniture (e.g. railings, seats etc)	%	51	35	11	+40	3
The cleanliness of Middlesbrough town centre	%	48	39	11	+37	2
The condition of road surfaces	%	55	23	21	+34	2
Middlesbrough council has kept your neighbourhood clear of litter and refuse	%	50	33	16	+34	1
The condition of pavements	%	52	21	25	+27	1
The maintenance of play equipment	%	42	27	19	+23	13
The provision of play equipment for children	%	41	29	18	+23	12

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5.7 Legislative Requirements

The role of the Highway Authority as asset manager is governed by an extensive range of legislation. In relation to highway maintenance, much is based on statutory powers and duties contained in legislation and precedents developed over time as a result of claims and legal proceedings. Even without specific powers and duties, highway authorities have a general duty of care to users and the community to maintain the highway in a condition fit for its purpose. Legislative requirements include duties and powers:

- Duties: tasks the authority must carry out by law
- Powers: tasks the authority may exercise by law if it so determines

Where the council elects to exercise its powers, these generally incur a duty, e.g. Council's power to erect road signs, creates a duty to maintain them.

These considerations directly affect the levels of service that the council provides by establishing the Statutory (or minimum) level of Service that must be provided.

A comprehensive list of Key legislation applicable to maintaining the Highway is included in Appendix C -Level of Service Supplementary Information.

5.8 Organisational Objectives

Section 3 describes the linkages between the TAMP and the Council's strategic goals and objectives.

These are taken into consideration, together with customer expectations and available funding, to identify through annual plans the appropriate levels of service for the transportation infrastructure and enables annual programmes and practices to be developed.

5.9 Scope of Service Groupings

The following table shows the service groups and the scope of each group. Where performance measures do not exist, they will be developed over time.

Levels of Service	Scope
Safety (SA)	Accident Reduction Education,Training & Publicity Safety Related Defects
Condition (CA)	Footways/Cycleways Lighting, Signs and Signals Roads Structures
Availability / Accessibility of the Asset (AA)	Congestion Levels Disabled Facilities Modal Shift Network Restrictions
Environmental Impact (EI)	Waste & Energy Reduction Pollution Reduction Environmental Enhancement
Customer Service	Information & Involvement Responsiveness User Perception

Table 5.1

5.10 Current Service Levels

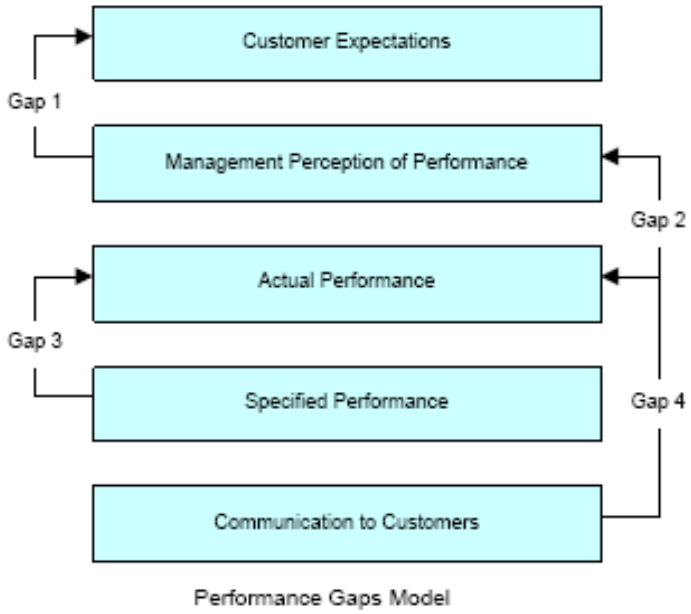
The service is currently managed around the PI's within the service groupings most notably BVPI's and those from the LTP.

These are stipulated in Appendix C, the LTP2 and the Service Action Plan.

5.11 Performance Management

Levels of service and the measurement of supporting performance indicators are used to provide information on the difference between current and desirable performance. Where they exist, the examination of these performance gaps will in turn enable the identification of options for improvement. An initial evaluation of performance gaps can be undertaken by simply identifying those performance measures where the target measure has not been met.

It should be noted that a performance gap could exist for a number of reasons as follows:



Performance Gaps Model

Gap 1: Customer Expectations – Management Perception: The customer's expectations of the service provided do not match the service provider's management perception of what is to be provided.

Gap 2: Management Perception – Actual Performance: The management perception of the service quality does not match the actual quality of service being provided

Gap 3: Actual Performance – Specified Performance: The service is not being delivered to the quality specified in the relevant standards and/or contracts.

Gap 4: Actual Performance – Communication to Customers: There has been inadequate communication with the customers resulting in them having a skewed perception of the service delivered.

All of these possibilities should be considered in establishing what performance gaps exist. The reason for the gap will significantly influence the plans for addressing the issue.

When this is carried out for the first time there will inevitably be an element of judgement involved in establishing targets. Once the process becomes established and the inputs, performance measurement and outcomes are fully understood then reviewing targets becomes a relatively routine task.

An annual review is undertaken of all BVPI and LTP indicators. As part of this performance review an improvement plan is determined for each PI. This includes targets, related indicators and factors affecting progress together with improvement actions.

Dependent on the scope of the performance indicator and the improvement actions being implemented, there can be a delay before any outcomes are significantly improved. In these instances the annual trend needs to be documented through the review cycle in relation to the target. If the nature of performance indicators is modified too often the trend data becomes more difficult to assess and confidence in the ability to demonstrate performance is reduced.

As part of this process life cycle plans for each asset should be re-appraised and the budget and programme for each service area established.

The process of optimisation and the development of a forward works programme are tools that will help manage the competing demands.

5.12 Service Options

A developed asset management approach is intended to facilitate better decision making by providing enhanced information to support the decision making process. In practical terms this means the identification and assessment of Service Options.

Once the requirements driving the asset group's service level have been identified it is necessary to develop service options around these and evaluate them. This process should clearly identify the service options applicable to the particular asset group and state the basis on which the preferred option(s) is selected.

Service Option Identification

The following are the service option categories selected by the Council for inclusion in the TAMP

- **Statutory** (Minimum) Meeting statutory or legislative requirements only
- **Existing** Is the effect of a continuance of current funding levels
- **Requested**: is one based on customer expectations and political aspirations

- **Optimum Service:** Assesses constraints as well as desires to identify an economically optimal Level of Service. This option is determined from the life cycle planning process.
- **Attainable Service:** Re-interprets the optimum option in the light of available resources. (E.g. budget constraints). **Note** that this service option has not yet been considered at this stage.

From information gained during the preceding section on Requirements, Asset Owners were able to develop specific service options applicable for each of their individual asset groups.

Service Option Evaluation

Once the service options for each of the asset groups had been identified they were evaluated against an agreed common set of criteria. These criteria include the following:

- The Benefit (or adverse affect) of the service option
- The Risk implications on adopting the service option
- Financial considerations, i.e. the overall cost of adopting the service option

All asset management decisions result in a combination of cost, benefit and risk. Historically, of these three elements, cost has been the most readily communicated and understood.

Understanding cost is however an incomplete picture. Many authorities have in the past adopted a process of budget evaluation that is based largely upon historical precedence.

In this early version of the TAMP a maintenance backlog has been identified and a 10 year Maintenance Plan produced to assist in prioritisation and consideration for funding. However in future it would be expected that this information be rationalised by means of Life Cycle Planning.

To enable robust evaluation of these options, it was necessary to use the life cycle planning process to quantify indicative work packages that would be necessary to deliver each of the service options. This ensured that sufficient supporting information was produced to rank the options on cost and overall impact on the assets life cycle criteria. (E.g. an increase or decrease in the asset's age profile or overall condition etc).

Once evaluation of service options has been completed, it is possible to present for approval "a menu" of network wide options, which have been summarised in Appendix C.

Determination of Final (Attainable) Service Option

It is anticipated that following evaluation of the selected service options and their subsequent review and approval by senior council officers and Cabinet, a "Final" or Attainable Service Option will be determined for each asset group. This of course could be a mix of options that makes the most efficient use of

current funding and resources, but provides the best long-term solution for the management of the asset.

Once this has been undertaken, the life cycle planning process is again utilised to develop the Forward Works Programmes necessary to deliver the Final service option and performance measures (as discussed below) put in place to monitor actual asset performance against desired.

Measuring Asset Performance

For levels of service to be measurable, realistic service standards with corresponding performance targets need to be set and measured using appropriate indicators. This is done with a mix of both existing national BVPIs and local key performance indicators (KPIs).

Proposed new local KPIs for each asset group have been developed under the following LoS groupings proposed for inclusion in the TAMP.

- Safety
- Availability
- Accessibility
- Condition
- Environmental
- Customer
- Financial

A list of these proposed new local indicators (alongside the existing ones) can be found in Appendix G.

6.0 RISK MANAGEMENT

6.1 Introduction

The role of risk management in the context of asset management:

The assessment of comparative risk is a key asset management tool. It can be used at a tactical level within the asset management process to assist with option appraisal and selection via assessment of the comparative risks of:

- Providing differing levels of service
- Funding works on different assets or
- Funding improvements to the network as opposed to maintenance works

Risk Analysis framework currently used at Middlesbrough Council

Middlesbrough Borough Council already has in place a comprehensive corporate document for managing risk across the whole organisation, entitled Risk Management Strategy – " a sense of proportion", (ver. 2 August 2006). This document, however, tends to lend itself to managing higher level corporate / strategic risks rather than the tactical / operational risks encountered in the asset management process.

It is not the intention of the Transport Asset Management Plan to either repeat or replace the processes and detail contained within the above document, hereby referred to as the "MC Risk Management Strategy ", but to supplement and add detail where necessary.

Full details of the risk analysis can be found in Appendix E .

6.2 The Risk Management Process

In summary, the four main steps of Risk Management can be broken down into:

- Identifying Risks
- Assessing Risks
- Managing and Controlling Risks
- Reviewing & Reporting Risks

The Transport Asset Management Plan has dealt mainly with the first two sections: Identifying Risks and Assessing Risks. In particular regarding Assessing Risk, an updated "Impact Description Table" that better fits with the tactical level risks encountered in asset management has been provided.

6.3 Identifying Risks

The "MC Risk Management Strategy " has identified the main tactical risks that could affect each of the assets.

Once these risks were identified, it was determined how the different Service Options (statutory, existing, optimum & requested) would impact upon these

risks in either an adverse or positive way (i.e. decreases or increases the likelihood or severity of the risk).

Two examples of typical risks are:

i) Carriageways - Condition Worsening, leading to need for major structural strengthening

ii) Drainage - Gullies becoming blocked, leading to flooding on the highway.

6.4 Assessing Risks

Once the risks were identified, an assessment of their likelihood and impact was carried out. This was done in a consistent manner to give a balanced view of the risk levels associated with the different service options.

Please refer to the following tables of LIKELIHOOD and IMPACT taken from "MC Risk Management Strategy ". Note that as discussed earlier, the impact table has been modified for use on the lower level tactical risks encountered in the asset management process.

Table 1: Description and definitions of LIKELIHOOD of the risk occurring:

Likelihood	Risk Rating Score	Description
Rare	1	Likely to occur once every 25 Years/Up to a 1% chance of occurrence
Unlikely	2	Likely to occur every 10 years/Up to a 10% chance of occurrence
Possible	3	Likely to occur every 5 Years/Up to a 50% chance of occurrence
Likely	4	Likely to occur every 3 Years/Up to a 90% chance of occurrence
Almost Certain	5	Likely to occur each year/Over a 90% chance of occurrence

Table 2: Modified Descriptions and definition of IMPACT of the risk should it occur

Risk Rating Score	*Impact*	Health and Safety	Social	Service Delivery	Cost	*Reputation*
1	Insignificant	Minimal safety implications (single event)	Nil – will have an negligible impact on the community	Minimal disruption to a single service	Up to £5,000	Managed/reported to Business Unit Local Media (Short Term duration)
2	Minor	Property damage only (single event)	Low – will have a small impact on the community	Significant disruption to a single service	Up to £50,000	Managed/reported to Departmental Management Team Local Media (Medium/Long Term duration)
3	Moderate	Slight injury (single event)	Medium – will significantly impact on the community	Significant disruption to multiple services	Up to £250,000	Managed/reported to Corporate Management Team Regional Media (Short Term duration)
4	Major	Serious injury (single event)	High – will have a major impact upon the community	Major disruption to multiple services	Up to £1m	Managed/reported to Members Regional/National Media (Medium/Long Term Duration)
5	Catastrophic	Fatality or Permanent Disability (single event)	Extreme – will impact on the community to an excessive amount	Complete breakdown in multiple service provision	Over £1m	Third Party Intervention Public Interest Report

NOTE:

1. When selecting an “Impact” category, the descriptions for that category should be selected on an “OR” basis, i.e. it is only necessary that the risk matches one of the descriptions within the box for the corresponding Impact to be selected.

6.5 Risk Ranking

Once the likelihood and impact for each of the service options has been determined, the scales for both of these items can be multiplied together to provide a “final” score for that option which can then be used to rank the four service options.

For example:

Table b) Service Option Risk Ranking

Service Option	Likelihood	Impact	Score	Ranking	Comments
Statutory	X	Y	(X x Y)	1st	
Existing	X	Y	(X x Y)	2nd	
Requested	X	Y	(X x Y)	3rd	
Optimum	X	Y	(X x Y)	4th,etc	

NOTE: The scores can also be plotted on the Risk Prioritisation Matrix below, taken also from the "MC Risk Management Strategy "

Table c) Risk Prioritisation Matrix – Managing the Risk

		Likelihood				
		Rare (1)	Unlikely (2)	Possible (3)	Likely (4)	Almost certain (5)
Impact	Catastrophic (5)	5	10	15	20	25
	Major (4)	4	8	12	16	20
	Moderate (3)	3	6	9	12	15
	Minor (2)	2	4	6	8	10
	Insignificant (1)	1	2	3	4	5

Risk Categories

	Very High Risk	NB for explanation of risk categories -refer to "MC Risk Management Strategy "
	High Risk	
	Medium Risk	
	Low Risk	

6.6 An example of Risk Assessment

Carriageways - Condition Worsening**,** leading to need for major structural strengthening:

Service Option	Likelihood	Impact	Score	Ranking	Comments
Statutory	4	4	16	1st	i.e. possibility of cat 2 road closure
Existing	2	3	6	2nd	
Requested	1	2	2	3rd	
Optimum	1	2	2	3rd	

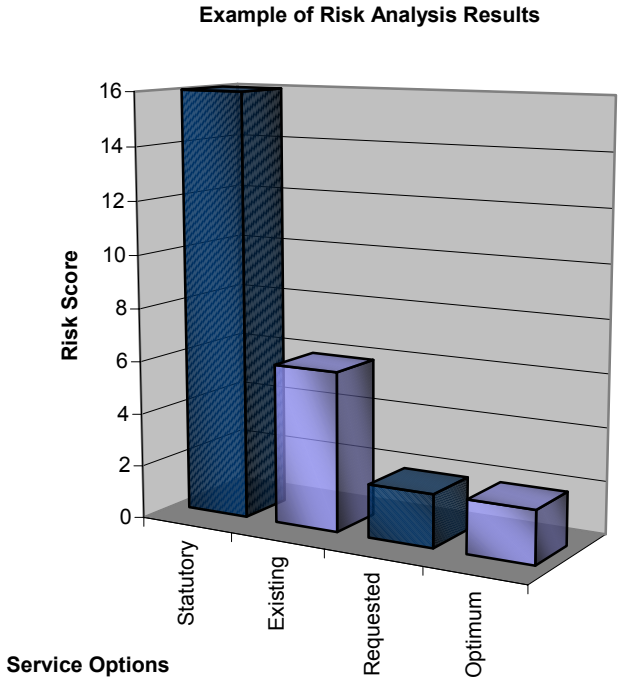
Carriageways - Plot of each service option for risk of Condition Worsening:

		Likelihood				
		Rare (1)	Unlikely (2)	Possible (3)	Likely (4)	Almost certain (5)
Impact	Catastrophic (5)	5	10	15	20	25
	Major (4)	4	8	12	16 -Stat	20
	Moderate (3)	3	6 -Exist	9	12	15
	Minor (2)	2 – Req. / Opt	4	6	8	10
	Insignificant (1)	1	2	3	4	5

Overall Assessment

To significantly reduce the need for increased major structural strengthening works, it is necessary to move from the existing Level of Service towards that which is requested.

The results from this analysis can also be represented graphically, as shown below:



Condition Worsening - leading to major structural strengthening

Middlesbrough Council Risk Manager to audit the Risk Assessments in the best interests of the Council and give an independent opinion of the Risk.

6.7 The Risks Associated with the Assets

The key tactical risks associated with Carriageways are:

- Level of maintenance of the network leading to very poor performance as measured nationally by the BVPI and CPA processes, possibly resulting in intervention by central government.
- Level of maintenance leading to the necessity for full depth reconstruction of parts of the network, which is the most expensive treatment.
- An increase in the number of people killed or seriously injured due to carriageway surface condition.
- Failure to demonstrate improvement in performance, leading to a lower CPA assessment.
- An increase in the carriageway maintenance backlog, with the attendant decrease in the value of the asset.
- Low levels of public satisfaction with the condition of carriageways.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Footways are:

- Level of maintenance of the network leading to very poor performance as measured nationally by the BVPI and CPA processes, possibly resulting in intervention by central government.
- An increase in the number of successful third party claims associated with trips, falls and the like.
- Failure to demonstrate improvement in performance, leading to a lower CPA assessment.
- An increase in the footway maintenance backlog, with the attendant decrease in the value of the asset.

- Low levels of public satisfaction with the condition of footways.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Cycleways are:

- An increase in the number of successful third party claims associated with surface defects and falls.
- An increase in the cycleway maintenance backlog, with the attendant decrease in the value of the asset.
- Low levels of public satisfaction with the condition of cycleways.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Structures are:

- Structure fails owing to inadequate maintenance.
- Structure fails owing to flood or extreme weather conditions.
- More expensive repairs due to inadequate maintenance.
- Third Party damage from flooding due to a waterway blockage at a bridge or culvert.
- Weight restriction needs to be applied to a structure.
- Strengthening/refurbishment of bridge leading to traffic disruption.
- Failure or severe damage to a substandard bridge (but subjected to frequent monitoring inspections) where full traffic loading is still permitted.
- Injury sustained by Highway user as a result of a defect.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Drainage are:

- Blocked gullies, piped systems, soakaways and pumped systems leading to flooding of the highway and/or private property.
- Structural condition of the drainage network deteriorating.
- Inadequate/damaged drainage network causing deterioration of carriageway.
- Third Party claim from Highway user due to flooding resulting from blocked drainage network

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Street Lighting are:

- Low level of maintenance and replacement resulting in poor performance as measured by BVPI and CPA processes possibly resulting in intervention by central government.
- Reduced road safety due to poorly maintained lighting, leading to increased accidents and increased numbers of people killed or seriously injured.
- Increase in accidents suffered by pedestrians in poorly lit areas.
- Increased accidents and numbers of people killed or seriously injured due to poor structural condition of street lighting columns.
- An increase in the street lighting maintenance backlog, with the attendant decrease in the value of the asset.
- Increased crime and disorder associated with poor street lighting.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Traffic Signals and Telematics are:

- Low level of maintenance leading to the necessity for full site replacement.
- Increased accidents and numbers of people killed or seriously injured due to the failure of the equipment.
- Failure to demonstrate improvement in performance, leading to a lower CPA assessment.
- An increase in the maintenance backlog, with the attendant decrease in the value of the asset.
- Low levels of public satisfaction with the operation of telematics equipment.
- Low level of maintenance leading to poor performance against requirements of Traffic Management Act, possibly resulting in intervention by central government.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Public Rights of Way (PROWs) are:

- Low level of maintenance and replacement resulting in poor performance as measured by BVPI and CPA processes.
- Bridge damage or failure leading to possible personal injury or closure of the highway.
- Bridge asset deterioration due to inadequate maintenance.
- Failure to cut paths brings the council into disrepute with land managers and public and makes enforcement difficult.
- Surface deterioration can deny use of a path.
- Surface deterioration resulting in injury to public, damage to vehicles, harm to the Council's reputation and closure of the highway.
- Asset deterioration due to inadequate maintenance.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Trees, Hedges, Verges and Planted Areas are:

- Falling trees or dropping branches leading to injury/damage to the Highway user and/or private property.
- Falling trees or dropping branches leading to blockage of the highway.
- Obstruction to highway visibility can increase risk of accidents.
- Debris build-up at edge of carriageway leading to accidents due to reduced carriageway width and loss of surface texture.
- Landscape areas and verges become overgrown and unkempt leading to low levels of public satisfaction.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Unlit Signs and Street Furniture are:

- Missing or illegible signs that will reduce safety or cause delay and disruption to the Highway user.
- Asset deterioration due to inadequate maintenance.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Barriers and Safety Fences are:

- Poorly maintained safety fencing allowing vehicles to reach hazards.

- Pedestrians not being fully protected when using the highway.

- Damage to verges, paved areas and property by inappropriate vehicle use.

- Asset deterioration due to inadequate maintenance with the attendant decrease in the value of the asset.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

The key tactical risks associated with Road Markings and Studs are:

- Missing or unreadable markings or road studs that will reduce safety or cause delay and disruption to the Highway user.

- Asset deterioration due to inadequate maintenance.

When reviewed against the different Service Options the risks above can be scored and the results of this have been displayed graphically below (a full analysis is contained within Appendix E).

7. SERVICE PRIORITIES

7.1 Background

There will always be limited funds available to manage the Council's transport assets. Therefore it is vital that funds are used to best effect.

Choices have to be made for the complete range of transport assets and the timing of investment. Being able to make informed decisions will help get the best possible value for money from the available funding.

Due to the limited budgets available it is important to be able to objectively assess impacts when allocating funds.

Alongside investment priorities, the timing of investment is important. Informed decisions regarding when to invest in maintenance treatments help ensure that longer-term value for money is achieved.

Two techniques to help with service prioritisation are outlined here: whole life costing and investment profiling. It is proposed to further develop and apply these techniques to each of the assets, in the light of future budgetary allocations.

7.2 Whole Life Costing

Whole life costing is a means of establishing the total cost of ownership of an asset.

All costs associated with the asset are considered, from creation to decommissioning. Such costs will include those associated with building or acquiring new assets, routine maintenance, replacement, renewal or enhancement and disposal.

Whole life costing will enable informed decisions about competing demands for funding, as there will be an improved awareness of the total cost of managing assets.

The Council will be better equipped to forecast future cost demands, based upon the life expectancies of assets and the effect upon assets' lives made by improvement and maintenance treatments.

The process will help assess the cost of various maintenance treatments in the light of the effect upon the condition of assets and the risks associated with the varying levels of service.

It is imperative to achieve value for money when constructing and maintaining assets. Value for money is a key theme of the Council's LTP and whole life costing will help ensure that the funds available to the authority are used as efficiently as possible.

Whole life costing will help decide what maintenance treatments to use and at

what point in an asset's life the appropriate treatment should be applied. Often treatments such as painting lamp columns, waterproofing bridge decks or surface dressing carriageways can avoid the necessity for more expensive treatments at a later date. The key is in the selection and timing of the treatment and it is here that whole life costing is pivotal.

Example of Whole Life Costing

Based upon knowledge of the Council's unclassified carriageways, their condition and ages, the authority may embark upon a programme of investment designed to minimise the whole life cost of maintaining these carriageways.

To help preclude the necessity for deeper, more expensive treatments (e.g. reconstruction) additional funds could be made available to help carry out preventative treatments to the unclassified carriageway network. Preventative treatments include inlays, overlays and surface dressing to help seal the carriageways against the ingress of water and to restore their surface texture. Knowledge of these carriageways, their normal life expectancies and the lives of the treatments suggest that the need for deeper treatments could be significantly reduced by such measures, if applied at the appropriate time. They also considerably reduce the incidence of potholes and thereby save on reactive repairs. Improvement to the camber of the carriageway and better falls can enhance drainage and save on maintenance.

An assessment can be made of the effect of these early treatments upon the condition of the Council's unclassified carriageways, as measured by the appropriate BVPI. This is presented graphically as an example of *investment profiling* below.

The development of the TAMP will result in further input to Council on the options of Best Value of a Future Investment Programme targeted at Highway Maintenance intended to maintain the Levels of Service and Asset Value.

Future Work on Whole Life Costing

Whole Life Costing is contained within a number of the detailed life cycle plans for the assets (see Appendix D) but needs to be developed further as the TAMP is implemented.

A number of more sophisticated works programming techniques are available that utilise the whole life costing philosophy, especially for carriageways. One such technique is outlined in the Forward Works Programming section of the TAMP.

The application of whole life costing does require data about assets, such as current condition and rates of deterioration. To apply the technique to some other asset groups, further data collection will be required.

7.3 Investment Profiling

To further assist with service prioritisation and the targeting of available funds, profiles can be constructed showing the effect of investment strategies upon such measures as performance indicators and the remaining lives of assets.

The authority has published targets and trajectories associated with Best Value Performance Indicator values in the LTP and it is imperative that the Council assess the effects of funding decisions in these terms.

Examples of Investment Profiles

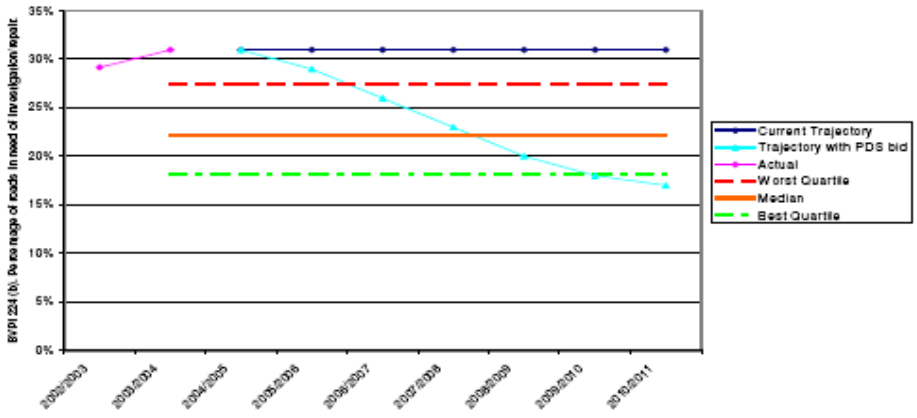
N.B. In most cases, the profiles contained in this section are illustrative and serve as examples of techniques for further development. Investment profiling is more applicable to capital spending than revenue.

Carriageways

As mentioned in relation to whole life costing, early investment may be provided for the Council's network of unclassified roads. To help gauge the benefits of such early intervention, profiles can be produced showing the effects of different investment strategies upon the BVPI. The performance indicator is given the number 224b and is a measure of the percentage of these carriageways in need of investigation and/or repair.

The graph below shows an example of the comparative benefits of different investment strategies.

BV 224b - Condition of Unclassified Carriageways

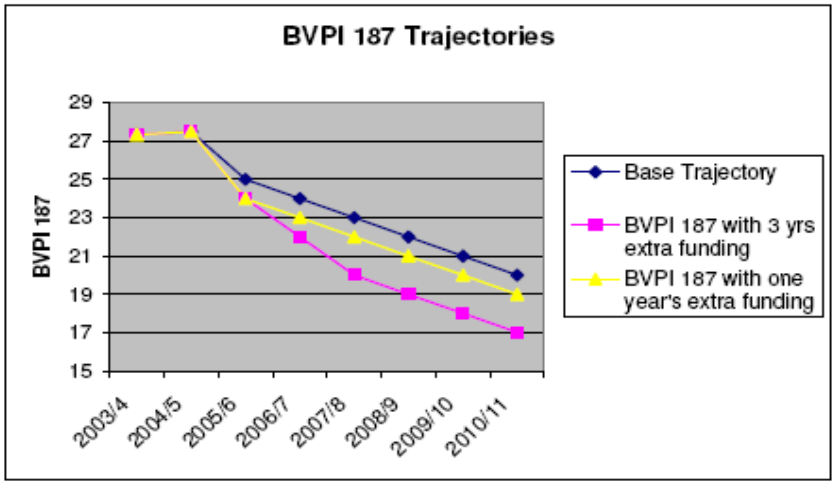


Further studies need to be undertaken but the table above is indicative of the progress that can be made.

Footways

The requested level of service for footways is to achieve an improvement in condition of all the Council's adopted footways. There is no national performance measure for little used footways; the relevant BVPI only measures the condition of the more heavily used footways. This indicator is given the number BVPI 187. The BVPI is an indication of the percentage of footways requiring investigation and/or repair.

The possible benefits of an additional investment programme can be profiled against the indicative effect upon the Council's value for BVPI 187. This is illustrated by the following graph.



Note:
This profile is illustrative only. It is based upon a number of assumptions regarding investment, its effect upon condition and BVPI calculation methodologies. Such methods change frequently.

Such profiling cannot currently be applied to the Council's lesser-used footways, as there is no suitable condition data. This represents a major deficiency in the data that the Council holds and should be addressed via the TAMP Improvement Plan.

Traffic Signals and Telematics

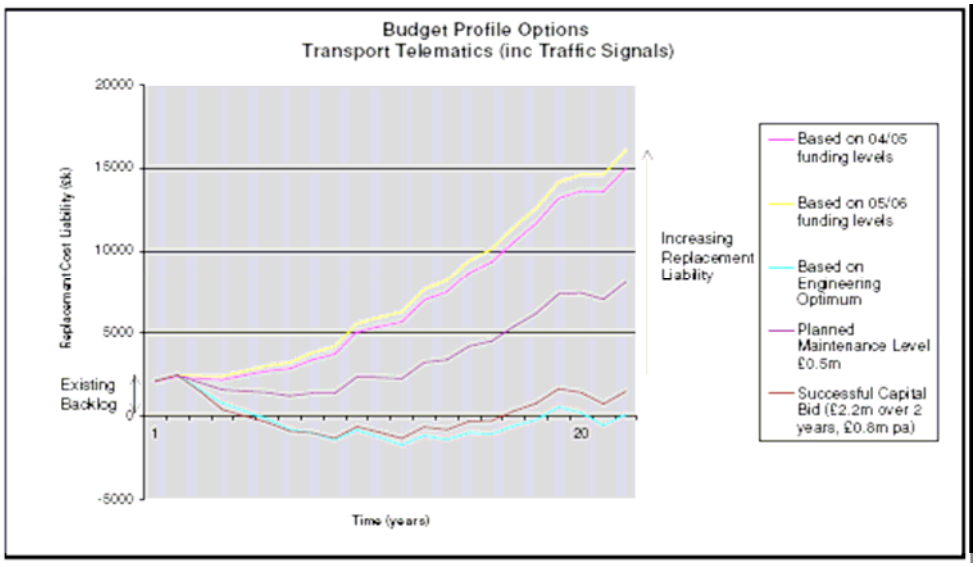
a) The industry best practice standard is a maximum age of 15 years. 20 years is not an unreasonable maximum and considerably reduces the costs associated with older installations.

b) Estimates are based on 2005 prices and are for replacement and renewals only. Routine maintenance, energy and communications costs are not included.

c) No allowance has been made for any works associated with the Traffic Management Act.

d) The figures are based on existing asset levels and known expansion. No allowance has been made for future growth in the asset base.

e) The profiles are based on actual asset age.



Street Lighting

From the structural condition information held for street lighting columns, it is possible to determine the number of street lighting columns that will need to be replaced over the next twenty-five years. This is estimated at 25,000.

The age profile of these columns is not known in detail but there is known to be an existing backlog of column replacements and there will be a continuing number of columns reaching the end of their life.

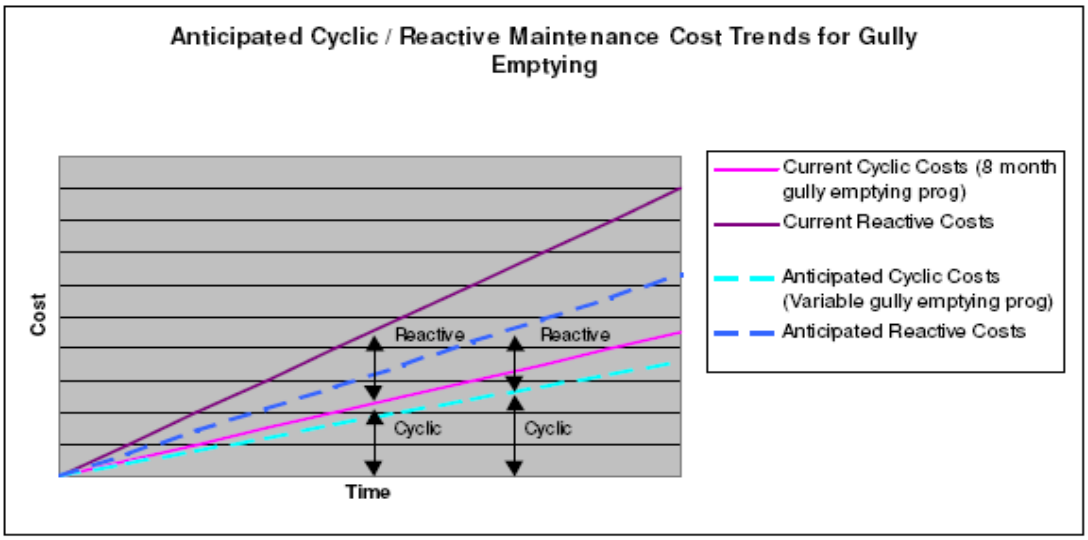
The rate of replacement of columns will determine whether the backlog increases, decreases or stays the same. On the basis of replacements costing approximately £1,000, the backlog at current costs would be £25m over the 25 year period, or approximately £1.0m per year.

More work needs to be done to confirm the current condition and the rate of deterioration of the columns. A balance needs to be struck between the cost of replacing the lanterns to improve the efficiency of the carriageway lighting and the benefits of reducing both light pollution and energy consumption. The use of lanterns that consume less power has a positive effect on the energy budget.

A similar situation exists with approximately 4,000 illuminated signs and bollards, but with less data on current condition.

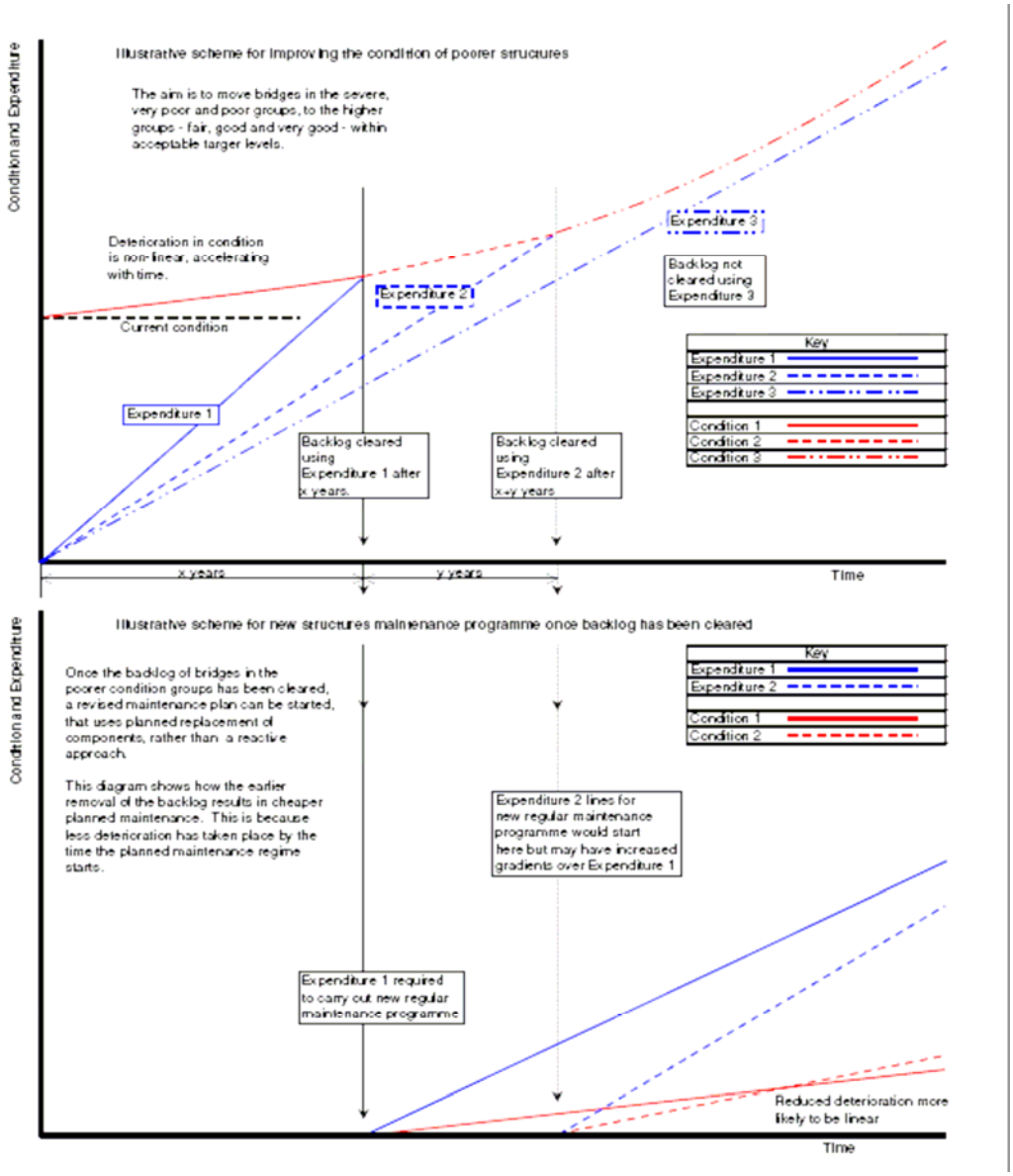
Drainage

This is an illustration of how adjusting gully emptying frequencies might not only reduce cyclic maintenance costs but also reduce reactive maintenance costs. Initial thoughts are that changing gully emptying from once every 8 months to emptying 80% annually and the other 20% of gullies (those that are known to fill up more quickly) every 6 months, would achieve the savings and provide at least as good a service. The unit cost rates might rise slightly because of greater amounts of detritus having to be removed and disposed of and possibly a higher proportion of non-productive time travelling between gullies on the 6 monthly round.



Structures

Below are some graphs showing the effects of different levels of funding on reducing the backlog of bridge maintenance and the ongoing maintenance requirements after the backlog has been removed. The upper diagram shows how Expenditure level 1 intersects the deterioration curve after x years, Expenditure level 2 is a lower rate of expenditure and intersects the curve y years later, while Expenditure level 3 never meets the deterioration curve and results in an ongoing backlog of repairs.



7.4 Future Work on Investment Profiling

As the TAMP is developed, detailed investment profiles will be constructed for each of the assets for which there is sufficient data and performance measures. These will be developed in the light of future budget allocations and hence used to assist with service prioritisation.

8. FORWARD WORKS PROGRAMMING

8.1 Background

The development of forward works programmes is a process that can be carried out once a decision has been made upon how much money is to be spent upon each of the assets in any given financial year. A systematic approach to works programming will ensure that funds are targeted at where they will achieve maximum benefit, both in terms of asset condition and the minimisation of whole life costs.

Works Programming has been developed for the Tamp although consideration has not been given to Whole Life costing which will be realized over time.

For those assets which have comprehensive condition data, it is also possible to use works programming techniques to help decide upon the allocation of funds and to gauge the effects of differing programmes of work upon performance measures.

Middlesbrough Council is currently using works programming techniques both to develop programmes of work for carriageways and to estimate the effects of different budgetary scenarios upon the Best Value Performance Indicators used to measure carriageway condition. This technique is outlined here.

8.2 Works Programming for Carriageways

Good, comprehensive condition data is available for the Council's carriageways. As set out in the life cycle plan for carriageways (see Section 2 of Appendix D) this data is derived from CVI & DVI surveys, SCANNER surveys and is supplemented by Deflectograph and Griptester surveys. This condition data provides the location of various defects within the Council's carriageway network. These defects include rutting, cracking, loss of surface texture and other defects, which will trigger maintenance treatments.

Each defect, or combination of defects, will require different maintenance treatments for rectification and it is possible to mathematically model the decision process for deciding upon what treatments to apply at which locations. This is the basis for the development of programmes of work.

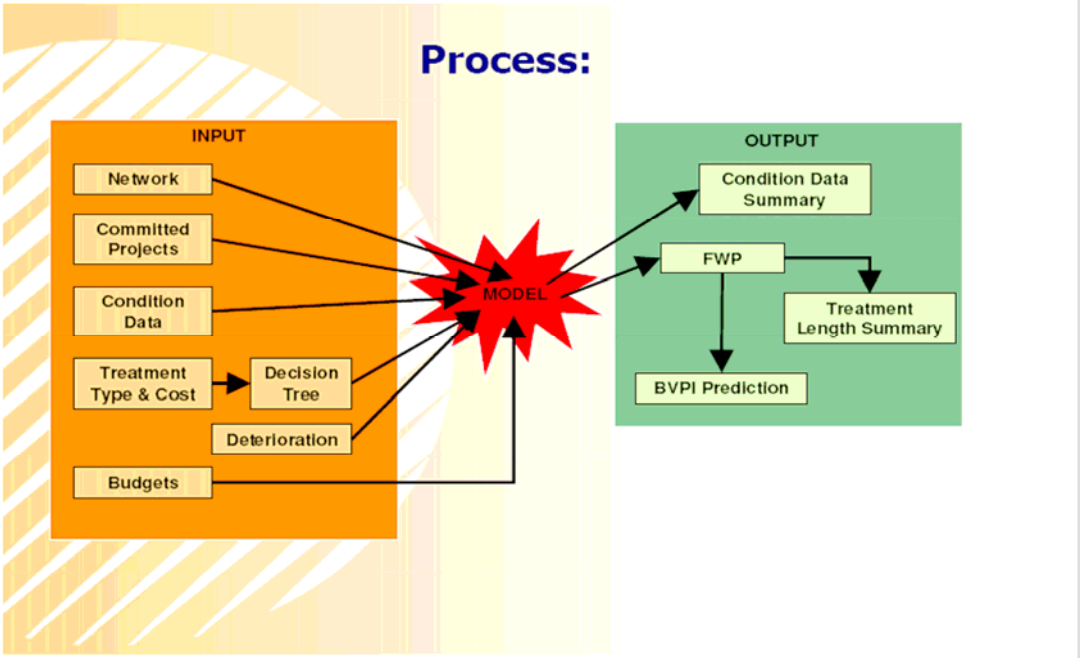
The costs of treatments can be used to assess the overall costs of different programmes of work and to judge how much work can be done for differing budgetary scenarios.

Typically, carriageways consist of a number of layers and these layers require replacement at different intervals of time. For instance, replacement of the upper, surfacing layer of a carriageway will be required more frequently than for the lower, structural layers. The Council is able to estimate these replacement intervals and hence assign rates of deterioration to each layer of the carriageway. This deterioration of the carriageway is then weighed against

the benefits of the treatments applied.

The above data and assumptions constitute the primary inputs into a mathematical model that the Council is currently implementing to help derive programmes of works for the authority's highway network.

The key elements of this modelling process are depicted below:



The mathematical model outputs programmes of work, based upon the carriageway condition data and available budget. The impact of these programmes of work upon Best Value Performance Indicators is calculated, thus enabling projections of these values to be determined.

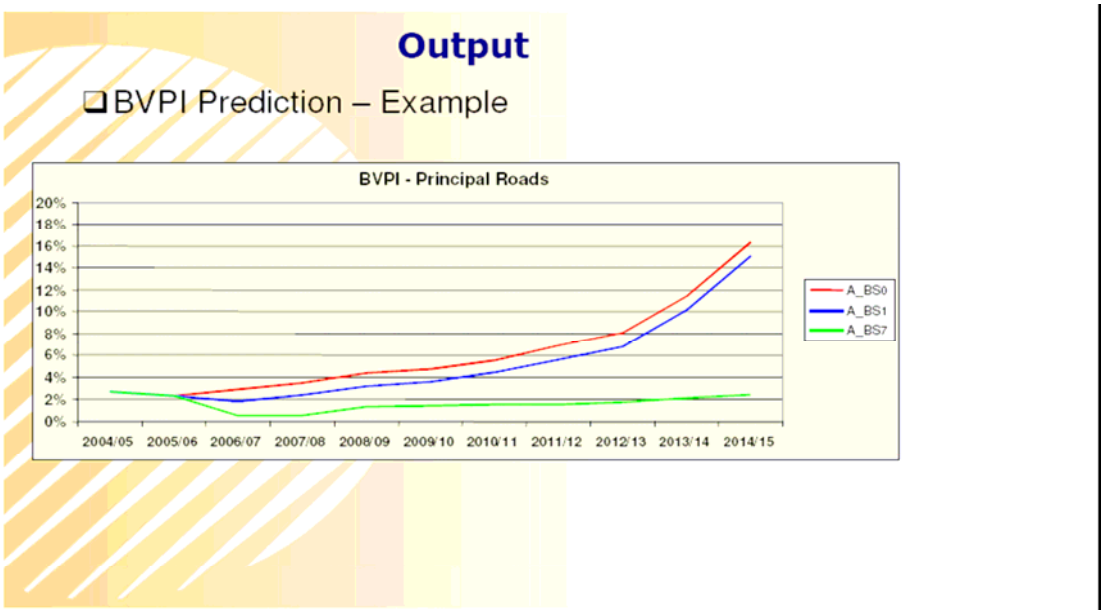
The establishment of the relationships between available funding, the works to be carried out and the effects upon BVPI values is pivotal. The authority publishes targets and trajectories for these BVPI values in the LTP and the use of such models will enable the Council to gauge progress towards achieving targets.

The technique will also help the Council determine what budgetary adjustments may be necessary to stay on course to achieve the objectives. For example, if it were the aspiration to achieve a steady state BVPI value for one or more class of carriageway, this could be set as an input to the model. The process would then derive the programmes of work and their overall cost to achieve this objective.

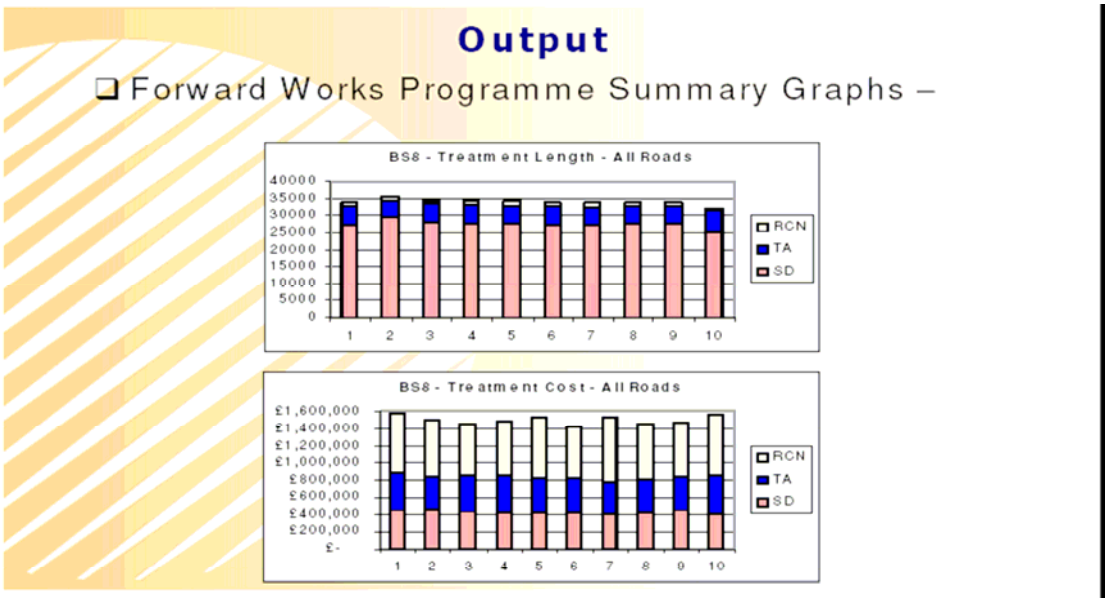
The example output below shows the likely effects upon a BVPI value of three different budget scenarios.

The BVPI values represent the proportion of the 'A' road network requiring further investigation or repair.

BSO, BS1 and BS7 represent three budgetary scenarios, with BS7 being the highest level of funding and BS0 the lowest.



The picture below shows a summary of a works programme generated from the model. The lengths and costs of three generic maintenance treatments are shown. These treatments are total reconstruction of the carriageway (RCN), the application of a thin asphalt layer (TA) and surface dressing (SD).



The illustration of treatment lengths and costs demonstrates an important point. The lengths of total reconstruction in the works programme are a very small proportion of the total length of treatment. However, these small lengths account for a large proportion of the overall cost of the works programme. Reconstruction is very expensive and such full depth treatments should be

minimised. It is a key component of this model that lengths of reconstruction are kept to a minimum, with less expensive, preventative treatments being favoured. This represents a move away from the “worst first” philosophy of works programming and is a significant step in the management of the life cycle of carriageways to achieve minimum whole life cost.

8.3 Future Work on Programming

Work will continue on developing detailed programmes of work for the Council’s carriageways. Exploration of different likely budgetary scenarios will be used to help assess the effects upon BVPI values. The Council will also relate target BVPI values to their budgetary implications.

It is hoped to pursue the use of such modelling techniques with other assets. Those assets for which there is good condition data would be most suited to this process, for example structures and busier footways.

9. PERFORMANCE MONITORING

Some of the assets already have performance indicators (BVPI or local indicators) for certain aspects that show how these assets are changing year by year. Other performance measures have been proposed for each of the assets. Many of these measures are to help monitor progress towards the proposed improvement actions.

The performance measures that are implemented will depend upon which of the improvement actions are adopted and which of the identified data gaps are addressed.

Prioritisation of the improvement actions, data gaps and hence performance measures will need to be undertaken in the light of financial implications.

Details of all the proposed performance measures appear in Appendix G.

10. IMPROVEMENT ACTIONS

Proposed improvement actions have been developed for each of the assets. Some of these involve changes to business processes and some are associated with addressing the identified data gaps; some will slow the deterioration, maintain current condition or improve the assets.

Prioritisation of the improvements will need to be undertaken in the light of financial implications, and the setting of Service Delivery Standards that have the explicit approval of the Councils Executive. Upon completion of the full infrastructure condition analysis Executive approval will be sought for delivering the Councils preferred medium term financial planning strategy that will deliver those required Service Standards

Details of all the proposed improvement actions and the measures necessary to address the data gaps appear in Appendix H.