Transport Asset Management Plan Part 2

Transport Asset Management; Planning highway maintenance efficiencies in Middlesbrough

V3June 2020

Middlesbrough Council
Transport Asset Management Plan - Part 2
Planning highway efficiencies in Middlesbro

Version Control

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1.0 OBJECTIVES OF THE PLAN

As outlined in our TAMP Part 1, the Middlesbrough Transport Asset Management Plan Part 2, contains the detailed framework for an integrated asset management approach to the Council's transport assets.

This Transport Asset Management Plan is a strategic document that is intended to develop and improve the efficiencies and levels of satisfaction in the way that the Environment Service functions are carried out throughout Middlesbrough. It will enable the authority to take a longer-term approach to highway maintenance management, and allows for the optimal allocation of resources based on 'whole life costing' and customer expectations.

This plan includes the following highway asset types :-

Roads - Footways - Cycleways - Structures, e.g. bridges and viaducts - Drainage - Street lighting - Traffic signals and telematics - Public Rights of Way - Barriers and safety fencing - Road markings - Verges, planted areas, hedges and trees - Vehicle Restraint Systems and Pedestrian Guardrails - Street furniture e.g. benches and road signs.

However, the plan will be developed to include all forms of transportation assets in Council ownership, and continue to develop the linkages that will help facilitate all modes of transport.

Although the revised TAMP Part 2 takes account of the latest guidance available to local authorities, the Council proposes to continue to develop this plan, working with others to ensure as far as possible that best practices are known, understood and embedded into everyday practice. This will enable systems to be established to manage all transportation assets, linking to wider ranging transport modes, and regional transport strategies.

The plan necessarily involves the active participation of all key stakeholders within the borough of Middlesbrough. This plan will include guidance for appropriate levels of training for staff, management, elected representatives, other interested bodies including the residents of Middlesbrough and its highway users.

2.0 INTRODUCTION

2.1 BACKGROUND

Recently imposed austerity measures have created financial challenges to be faced by both central and local government. As a result, highway asset management has become increasingly important in ensuring that we deliver best value, right first time, highway services that meet both public and political aspirations.

Central government strongly supports asset management as the more efficient and effective approach to management of highway infrastructure assets. Guidance has been provided through the following documents:

- Code of Practice for Highway Maintenance 'Well Managed Highways', October 2015.
- Code of practice for highway lighting management, 'Well-Lit Highways', October 2015
- Code of Practice, Management of Highway Structures, October 2015
- Highway Infrastructure Asset Management Guidance Document
- Code of Practice, Management of Electronic Traffic Equipment, 2011, (latest revision)
- The Audit Commission report 'Going the Distance'
- The Potholes Review, Prevention and a Better Cure
- The CIPFA Code for Transport Infrastructure Assets
- The Highway Maintenance Efficiency Programme (HMEP)

Local highway authorities are urged to consider the guidance provided, however, this is not a prescription for each authority to follow in the delivery of its services. Middlesbrough Council has set out to review its highway services delivery process, this document will detail fully how we propose to do this, taking account of the recommendations provided below in section 3.2.

Part 1 of our Transport Asset Management Plan (TAMP) explained in simple terms, the processes of highway asset management, and what the Council hopes to achieve by adopting the latest guidance and using long term maintenance planning.

Part 2 of our TAMP will explain in detail the way in which we shall embrace the asset management techniques in order to deliver our highway services to meet expectations. Working in collaboration with others, and by using latest innovation and technology to its utmost, we aim to achieve the greatest efficiencies and maximum outcomes for the residents and highway users throughout Middlesbrough.

3.0 RECOMMENDED APPROACH TO HIGHWAY INFRASTRUCTURE ASSET MANAGEMENT

3.1 KEY DRIVERS

Key drivers used in our asset management approach for transport networks, and developing this TAMP include; the need to identify 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. In addition, we must also provide government with accurate returns of data and

valuations, summarising the highway infrastructure assets, both as replacement values and depreciated values.

In order to achieve the above, we have been provided with the following suite of recommendations. If considered properly, they will enable this authority to both manage its assets in the best way possible and also deliver the outcomes expected of it.

3.2 SCHEDULE OF RECOMMENDATIONS

(HMEP Highway Infrastructure Asset Management Guidance 2013)

Recommendation 1

An Asset Management Framework should be developed and endorsed by senior decision makers. All activities outlined in the Framework should be documented.

Recommendation 2

Relevant information associated with asset management should be actively communicated through engagement with relevant stakeholders in setting requirements, making decisions and reporting performance.

Recommendation 3

An asset management policy and a strategy should be developed and published. These should align with the corporate vision and demonstrate the contribution asset management makes towards achieving this vision.

Recommendation 4

A performance management framework should be developed that is clear and accessible to stakeholders as appropriate and supports the asset management strategy.

Recommendation 5

The quality, currency, appropriateness and completeness of all data supporting asset management should be regularly reviewed. An asset register should be maintained that stores, manages and reports all relevant asset data.

Recommendation 6

Lifecycle planning principles should be used to review the level of funding, support investment decisions and substantiate the need for appropriate and sustainable long term investment.

Recommendation 7

A prioritised forward works programme for a rolling period of three to five years should be developed and updated regularly.

Recommendation 8

Senior decision makers should demonstrate leadership and commitment to enable the implementation of asset management.

Recommendation 9

The case for implementing the Asset Management Framework should be made by clearly explaining the funding required and the wider benefits to be achieved.

Recommendation 10

The appropriate competency required for asset management should be identified, and training should be provided where necessary.

Recommendation 11

The management of current and future risks associated with assets should be embedded within the approach to asset management. Strategic, tactical and operational risks should be included as should appropriate mitigation measures.

Recommendation 12

Asset management systems should be sustainable and able to support the information required to enable asset management. Systems should be accessible to relevant staff and, where appropriate, support the provision of information for stakeholders.

Recommendation 13

The performance of the Asset Management Framework should be monitored and reported. It should be reviewed regularly by senior decision makers and when appropriate, improvement actions should be taken.

Recommendation 14

Local and national benchmarking should be used to compare performance of the Asset Management Framework and to share information that supports continuous improvement.

3.3 REVIEW ARRANGEMENTS

We shall review our current Asset Management practices to ensure and ensure that we adopt and incorporate all of the above recommendations into our practices.

Where we identify any shortfall, or changes required to be made to current practices, then these measures will be clearly identified and brought into practice through the 'Implementation Plan' shown in section 12.

Throughout this process, we shall engage with all key stakeholders to inform them of our proposals to implement any necessary changes, and ensure that there is a clear understanding of the reasons behind our decisions.

3.4 KEY STAKEHOLDERS

The following are considered to be Key Stakeholders in terms of consultation concerning changes to the standards, aims and performance levels relating to highway service levels provided for the people of Middlesbrough and its highway users:

Key Stakeholders:

Middlesbrough Elected Mayor *

The Executive, the Council's principal decision making body *

Chief Executive Officer and Corporate Management Team *

Local MP's and MEP's

Parish Councils

Residents of Middlesbrough

North East Chamber of Commerce

Tees Valley Unitary Authorities

Tees Valley Combined Authority *

Regional TAG Committees

DfT

Highways England

Network Rail

DEFRA

Environment Agency

Local Utility Service providers

Officers Transport Group

Specialist Service Deliverers

* ***Strategic Policy Making Group***

4.0 ASSET MANGEMENT POLICY, STRATEGY, & LEVELS OF SERVICE

4.1 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.

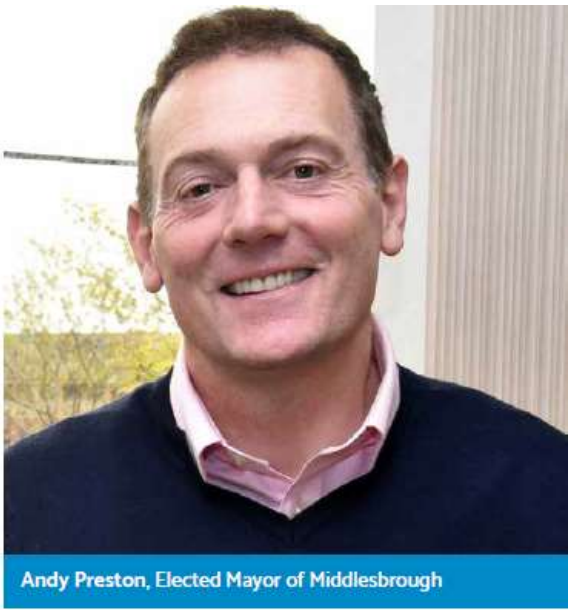
This then results in an economically affordable 'Optimum Level of Service', determined through life cycle planning and whole life costing processes. It looks at maximising the life cycle of each individual highway asset at the minimum cost.

The processes later described will show how we carry out a 'Gap Analysis' between the current guidance and existing policy, and also between existing Council practices against preferred practices.

By using this Policy Framework, It will help inform the public, senior decision makers, elected members, practitioners and service providers, of the importance of highway asset management, and show how it is relevant to achieving the Councils aims and objectives.

4.2 STRATEGIC OBJECTIVES

The highway network assets are, in terms of finance, the most valuable assets that Middlesbrough Council owns; so managing the asset well is a key priority for the authority. Good asset management practices will ensure that these key assets help the town achieve its goals and objectives.


Andy Preston, Elected Mayor of Middlesbrough

The Elected Mayor, Andy Preston, has identified nine key priorities for Middlesbrough which have been published in the Council's Strategic Plan 2020-23. They centre around three main areas:

- **PEOPLE**
- **PLACE**
- **BUSINESS**

STRATEGIC PRIORITIES 2020-23

People 	• Tackling crime and anti-social behaviour head on • Ensuring Middlesbrough has the very best schools • Ensuring our town is an absolute leader on environmental issues
Place 	• Transforming our town centre with new buildings that inspire awe • Building more town centre homes – and protecting our green spaces • Making Middlesbrough look and feel amazing
Business 	• Winning investment and creating jobs • Introducing a new era of Council transparency and openness • Creating positive perceptions of our town on a national basis

The strategic plan sets out clearly how the Mayor's agenda will be supported and delivered over the coming three years, and the priorities are reflected in the Highway Infrastructure Maintenance Plan.

STRATEGIC OBJECTIVES: ENVIRONMENT and COMMERCIAL SERVICES 2020-23

The strategic plan specifies a number of objectives that are specifically deliverable by the Environment and Commercial Services Directorate, namely:

Priority
We will tackle crime and anti-social behaviour head on, working with our partners to establish a stronger and more visible presence in the town centre and in local communities, tackling the harm caused by drugs and imposing tougher penalties on persistent offenders to ensure local people feel safer.
We will ensure our town is an absolute leader on environmental issues, working with local people to protect and create public and green spaces, and promote sustainable lifestyles.

We will work with local communities to redevelop Middlesbrough's disadvantaged estates, and introduce locality working with our partners, placing services at the heart of communities.

Place

Priority
We will transform our town centre, tackling crime anti-social behaviour, improving accessibility, developing Centre Square as an iconic Tees Valley office, leisure and residential location, and creating other iconic spaces for digital, media and leisure businesses.
We will make Middlesbrough look and feel amazing, working closely with local communities to make sure that our roads, streets and open spaces are well-designed, clean and safe, and revitalising unused buildings and heritage assets.

Business

Priority
We will introduce a new era of Council transparency and openness, giving local communities a real say in the future of the town, and how our services are developed and delivered.
We will develop and deliver balanced budgets every year, protecting front-line services wherever possible, and dealing with the projected shortfall in our budget to 2023 through improved commissioning and procurement, increasing our commerciality, digitising our services and working more closely with local businesses and communities.
We will make sure that our business management practices, including how we manage finance, performance, projects, risks and assets, compare with those of the best-performing councils, and achieve good outcomes for our communities.

These objectives will form the basis in the development of policy and strategy; however other elements shall also be taken into consideration such as the Integrated Transport Strategy, Best Value principles, Promoting Continuous Improvement, Asset Management Guidance, Risk Management principles and Legislation.

Government transport policy is intended to support and contribute to long term objectives where highway maintenance is placed as a key priority for investment. To help local authorities plan and manage the road networks, the Government has set up the Highways Maintenance Efficiency Programme (HMEP), which exists to support the sector on its journey to transform highway services.

Overall, it helps Local Highway Authorities make the best use of limited resources now and in the future by:

- Focusing on outcomes that help to prioritise future funding decisions
- Reducing inefficient and expensive short-term repairs, which allow more defects to develop and is more costly in the longer term. Research shows that reactive repairs are four times more costly than preventative treatments.
- Helping to make the best use of public money
- Providing a clear evidence base to justify the need for future or new investment in highways management, for example through prudential borrowing.

This in turn is a contributory element to some of the objectives and targets in the Plan, including:

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

The outcomes and aims of this TAMP will inform our ‘Middlesbrough Highway Maintenance Plan’ and will further endeavour to achieve these objectives by:

- Procurement of longer term, non-adversarial and Partnering Service Delivery contracts
- Seeking opportunities to ‘Invest to Save’
- Seeking funding by working with other organisations in relation to ‘Crime Reduction’ and ‘Environmental Improvements’
- Working with all partners to deliver additionality to projects
- Improving public perception of road works by early informative consultation with all stakeholders, giving clear and accurate information
- Producing highway management policies and objectives, based on the recommendations within the latest revised Codes of Practice
- Basing priorities on reviewed hierarchies, technical requirements and whole life costing

- Informing all stakeholders of the importance of Asset Management and by maintaining accurate and updated inventory details, necessary for Asset Management valuation
- Informing developers of our sustainability requirements
- Applying our 'One Planet Living' Environmental Management Strategy throughout, to save energy and mitigate effects of climate change.

Highway maintenance policy should be developed to consider the overall management of the network, so that the whole is managed in a way that provides consistent and appropriate levels of service through all the modes of transport and their constituent activities. It is essential that this is carried out in collaboration with other agencies so as to ensure that consistency exists across all the service boundaries.

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

- A strategic approach over the long term
- Meeting stakeholders' needs
- A systematic approach
- Optimal allocation of resources
- Managing expenditure over the asset lifecycle
- Meeting performance requirements in the most efficient way
- Managing risk
- Operational delivery

4.3 INTEGRATED TRANSPORT STRATEGY 2018-2028

4.3.1 Key Plans and Strategies

As previously mentioned, the Strategic Plan sets out the aspirations for the town.

The Local Plan includes an aim that 7,000 new homes will be built over the coming 15 years, 1,230 of which will be built within the next three years. This will put a great strain on the existing infrastructure. The majority of these housing sites are identified in the south of the town and major new highway infrastructure will be required to manage the additional traffic likely to be generated. The service will need to be in a position to effectively develop and deliver this new infrastructure along with delivery of a range of other infrastructure improvement projects.

In accordance with the requirements of the Local Transport Plan 2 guidance, the Council has published an Integrated Transport Strategy 2018-2028 for Middlesbrough. This sets out details of how transport will contribute towards a

longer term 10 year vision for Middlesbrough.

4.3.2 **The Integrated Transport** Strategy 2018-2028 aims to deliver a fully integrated transport network, which not only provides ease of access within the authority boundary, but also provides a gateway to the rest of the Tees valley; brining centres closer together. The following objectives have been identified:

- To develop an efficient and capable transport network to attract investors, allowing them to develop business cluster areas appropriate to their business and customer needs.
- To identify how different modes of travel can be integrated together to provide a seamless transport network which will facilitate economic growth.
- To set out high-level initiatives for each mode of travel, which can be individually delivered, in addition we aim to provide those using the network the ability to switch travel mode easily.
- To seek to actively manage the available network more effectively, including measures to achieve modal shift.
- To reduce the dependence on the private car to reduce congestion, improve air quality, and assist with both social and economic regeneration.
- To provide an integrated transport network, which: promotes and incentivises sustainable travel, reduces the dependence on the private car, which releases the capacity on the road network without relying on expensive highway improvement schemes, to further develop and enable economic growth to occur.
- To seek to balance the competing demands placed upon the transport network and maximise the use of finite resources, while providing the necessary infrastructure to enable all transport users to make informed decisions.
- To promote and make the heart of everything we do, a hierarchy of highway users that identifies the network of existing and proposed strategic networks for non-car accessibility (walking/ cycling/ public transport).
- To develop walking and cycling routes that will connect to public transport infrastructure at key points, and that which will have higher quality facilities such as bus super stops.

LEVELS OF SERVICE

Why Levels of Service?

The creation of levels of service need to 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 in Middlesbrough. These standards take into account statutory duties of the Council as the highway authority, the Council's

strategic transportation goals (as detailed in the Local Transport Plan) and the expectation of our customers, as derived from consultations.

4.4

4.4.1 The target levels of service contained in this plan have been determined by applying the generic service options described in Section 4.4.11 to all asset groups. These have then been applied in detail to individual asset types. These steps are detailed in the lifecycle plans, and are aiming towards the development of long term plans for the forward work programme.

The developing suite of 'levels of service' and 'performance measures' are being put in place, They will then enable us to obtain some understanding of the relationship between the cost and the level of performance against each level of service. This information can then be used by key decision makers 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

4.4.2 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.

4.4.3 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:

- to inform our customers of the proposed type and level of service to be offered and to provide more detailed information to our 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.

- 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.
- 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 historic methods previously used. Key service targets will be identified and monitored to ensure the effectiveness of this plan.
- 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.
- 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 treated in winter.

Any such decision made would be determined through consultation with our key stakeholders, in order to understand the implications of various choices. It should be noted however that levels of service cannot drop below minimum statutory requirements.

4.4.4 Key Considerations

Factors affecting levels of service are:

- **Customer expectations**

  The purposes of any actions taken by the Council as highway authority are in the interests of our 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 will mean consideration of customer's preferences, and whether or not customers are prepared to pay more for a higher level of service in one activity of maintenance rather than another. This is explained in further detail in section 4.4.6

  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 highway authorities to demonstrate they have taken “reasonable” actions to maintain the highway.

  Further details are provided in section 4.4.8

- **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 optimum levels of service will contribute towards their delivery.

- **Best Practice Guidelines**

  A number of best practice guidelines exist that 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. Alternatively, a suitable alternative standard has been agreed and formally approved by the Council.

  The main documents relevant to this plan are:

  - Code of Practice for ‘Well Managed Highway Infrastructure (Oct 2016) [This code of practice replaces the three previous codes of practice: the well maintained highways; management of highway structures; and well-lit highways]
  - Highway Infrastructure Asset Management Guidance Document
  - Code of Practice, Management of Electronic Traffic Equipment, 2011, (latest revision)
  - The Audit Commission report Going the Distance
  - The Potholes Review, Prevention and a Better Cure
  - The CIPFA Code for Transport Infrastructure Assets

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

  The plan typically identifies 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 and have Council approval.

- **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 desired 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.

  The more critical and significant areas of service delivery have been considered in our decision making when awarding our new partnering service delivery contracts.

4.4.5 Historic Levels of Service

What was the historic level of service?

The schedule in Appendix B gives details of the Council's former Level of Service Framework. This schedule identifies the methods used for recording performance against service areas. It also identifies areas where little or no performance data or measurement systems existed. The Improvement Action Plan identifies how and when it is planned to fill these information gaps.

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

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

This revised version of our TAMP will explain in detail how we arrive at future Optimum Levels of Service.

4.4.6 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 Highways and Transportation Service 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, including the ability to influence decision making, a strategic approach has been adopted. This has been based upon the results derived from NHT and CQC surveys, relating to overall performance and achievements. This is supported locally by local Voiceover surveys using weighted, consistent survey techniques to establish levels of satisfaction and to determine expectations where satisfaction falls short. Project specific consultations also take place, however these are not considered indicative of public expectation levels when considering setting Optimum Levels of Service.

In addition to the above, highway related policy and management documents from draft stage onwards, are published on the Council web site for all to see and return comments if required. More general information is now also published through Twitter and Facebook media.

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.

NHT Public Satisfaction Survey:

The Council Takes Part in the National Highways & Transport (NHT) public satisfaction survey and the Environment service is a member of a regional and national CQC Efficiency Network. These enable us to understand levels of satisfaction, and where we need to improve. We also use consultation surveys to determine our customers' expectations.

The main purpose of the survey is to show how well the people of the town are satisfied with the highway network and services. We are able to compare year on year which areas we have improved upon and which areas we need to work on.

An example of the local survey results for 2019 below show the green areas where the public are more satisfied and the amber areas where they are less satisfied compared to the previous year:

We can use these results to target and improve services where we see a decline in satisfaction.

The analysis also undertakes a national comparison. An example: looking at accessibility - which shows that even though locally we have seen a slight decline in satisfaction, we are actually above average when compared nationally to all the other local authorities. So overall the people of Middlesbrough are happier with accessibility than the national average

Authorities, including our own, can benchmark against the other towns and cities to see how they achieve good results and make improvements to our own service areas by following their example

The results of these surveys are available on the Council's web site.

4.4.7 Satisfaction Levels and Rankings

The NHT Surveys identify customer satisfaction levels. In addition to this, in conjunction with our service delivery partners and service providers, project satisfaction survey questionnaires are also provided to residents and occupiers affected by our maintenance and project activities.

These results all assist in decision making for future levels of service to be provided by the Council.

4.4.8 Legislative Requirements

The role of the Highway Authority as asset manager is governed by an extensive range of legislation, Codes of Practice and guidance documents. 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 B – Level of Service Supplementary Information.

4.4.9 Organisational Objectives

Within section 4 we describe the linkages between the TAMP and the Council's strategic goals and objectives.

These have been 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 has enabled annual programmes and practices to be developed.

4.4.10 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	Contribute towards the statutory duty to provide a safe highway network through 'Accident Reduction', 'Education', and 'Training & Publicity'.
Serviceability	Ensure that the following highway assets perform to the best of our ability to meet stakeholders expectations; Roads , Footways, Cycle ways, Public Rights of Way, Lighting, Telematics and Signals, Signs and furniture, Drainage, Structures, Barriers and Safety fences, Road markings, Verges, planted areas, trees and hedges.
Accessibility	Contribute towards reducing Congestion Levels, Network Restrictions, and Modal Shift, and provide where possible Disabled Facilities and Access for all.
Sustainability	Ensure all highway activities, including those services provided by others, contribute towards reducing Waste, Carbon & Energy, Noise & Water Pollution, and where possible enhance the Environment and Water Quality.
Financial Performance	Ensure service delivery arrangements are focused upon optimum choice of materials, delivering best value through whole life planning and maximising benefits available through partnership working.

Table 4.1

4.4.11 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 effect) 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, out 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 updated version of our TAMP, a maintenance backlog has been identified and a 5 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 and long term budget setting. (see section 10)

To enable robust evaluation of these options, it is 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 ensures that sufficient supporting information is 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 B

Determination of Final (Attainable) Service Option

It is anticipated that following evaluation of the selected service options, and their subsequent review and approval by the Council's key decision makers, an 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 can again be utilised to develop the Forward Works Programmes considered to be necessary to deliver the future 'Optimum' service option for assets now being upgraded or restored. This then allows performance measures (as discussed below) to be put in place to manage and monitor actual asset performance against expectations of the Life Cycle Plans for the assets.

Measuring Asset Performance

For levels of service to be measurable, realistic service standards with corresponding performance targets need to be set and measured for each asset category, using appropriate indicators. This is done with a mix of both utilising former national BVPI's and new additional locally agreed performance indicators, to establish our suite of Key Performance Indicators (KPI's).

The new local KPI's for each of our asset groups have been developed under the following groupings proposed for inclusion in the TAMP:

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

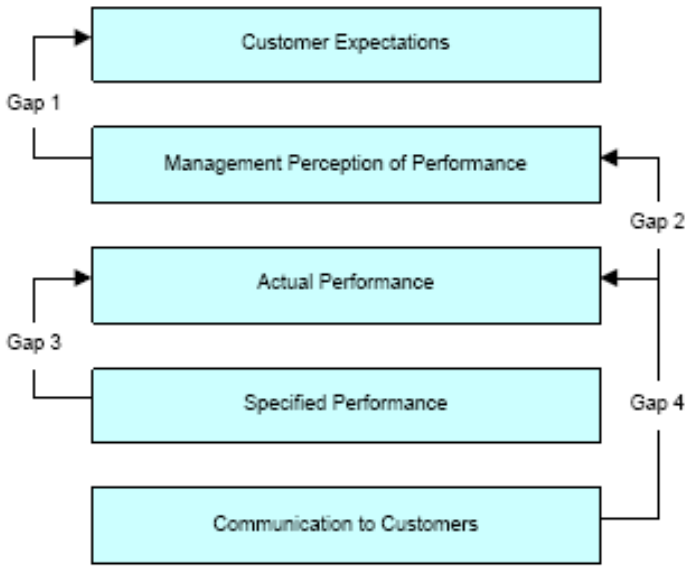
A full list of our proposed new local indicators can be found in Appendix F.

5.0 PERFORMANCE MANAGEMENT

5.1 PERFORMANCE GAPS

Levels of service and the measurement of supporting performance indicators are used to provide information on the difference between current and desirable performance. This is considered to be a Performance Gap. Where these 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 will be considered in establishing what performance gaps exist. The reason for the gap will significantly influence the plans for addressing the issue.

When we carry out this for the first time with any particular asset, there will inevitably be an element of judgement involved in establishing future targets. Once the process becomes established and the inputs, performance measurement and outcomes are fully developed, then reviewing targets becomes a relatively routine task.

5.2 PERFORMANCE INDICATORS

An annual review is undertaken of all key performance indicators. Linked in with our Benchmarking processes, we shall consider reviewing performance indicators, and if considered necessary introduce an improvement plan for each PI. This will include 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. In such circumstances, the Level of Service achievable for the particular asset will be referred to as the Attainable Level of Service. 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. This in turn will impact upon our ability to undertake effective Benchmarking.

As part of this process life cycle plans for each significant asset type or group 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; these will be clearly explained to key decision makers and other stakeholders.

5.3 CQC Performance Management Efficiency Network:

The CQC Efficiency Network benchmarks the cost of carriageway maintenance in local authority areas on a like for like basis. The improvement of each authority is

measured, and our efficiency savings are quantified over time. The best performing authorities are identified and encouraged to share their good practice.

The CQC analysis is undertaken by the Institute for Transport Studies at the University of Leeds who are a leading transport research centre worldwide. Their analysis shows that Middlesbrough's cumulative efficiency savings over the last five years on carriageway maintenance is:

Cumulative Efficiency Savings (since 2013/14)

£449,904

This represents the total amount of money we have saved by adopting more efficient practices since 2013/14, it is the amount of extra funding our authority would have paid over the period had we not made these efficiency savings.

The CQC Efficiency Savings reports are also available on the Council's website.

6.0 ASSET INFORMATION & DATA

6.1 WHAT IS ASSET DATA?

Asset data describes what highway infrastructure assets an authority has, where they are and how they perform. The Asset data comprises information including number, location, performance, financial value and public opinion.

The data is used to support the overall requirements for asset management including:

- Defining network inventory and asset performance;
- Supporting statutory requirements;
- Making effective and informed decisions;
- Understanding the impact of decisions on the asset and the subsequent level of service and performance;
- Assessing and managing risk;
- Determining investment requirements;
- Assessing and reporting financial value; and Reporting performance.

6.2 TYPES OF ASSET DATA

To obtain most benefit from our Asset Management System, we collate the following asset data:

Inventory – describing the full extent of an asset and includes location, type, size and construction. This data also supports our calculation of Gross Replacement Cost;

Performance – condition information related to aspects of performance, lifecycle planning, identifying programmes of work, and to financial requirements, such as calculation of the Depreciated Replacement Cost. In addition it informs on: public satisfaction, public enquiries, third party claims, traffic flows, accident records, maintenance history, energy consumption and environmental impact;

Financial – this supports budgets and financial planning, determining value for money in delivering overall performance and prioritising maintenance activities. It includes unit rates for asset management activities and data to support WGA requirements, including calculation of the Depreciated Replacement Cost (DRC) and Gross Replacement Cost (GRC).

6.3 USES OF ASSET DATA

Asset data is used to provide information on the extent of the asset and its potential maintenance liabilities, as well as supporting any critical decisions that need to be made relating its management. For our Asset Management Strategy to be fully effective, it needs to be clearly understood and then acted upon by the Council's key decision makers. Other factors such as maintenance history are also be used when assessing performance, and planning for future maintenance activities.

The required accuracy, reliability and repeatability of data has been considered when determining the purpose of the data and how it is used, as these factors are likely to affect the cost of data collection.

Sometimes coarse data from driven inspections may be sufficient for informing our needs, whilst for other purposes sophisticated techniques such as mobile mapping, confined space entry and specialist engineers inspections may be necessary. For data to be effective, the level of accuracy and quantum we aim to achieve is considered to be appropriate for the investment and risk associated with that asset.

7.0 LIFE CYCLE PLANNING

7.1 INTRODUCTION TO LIFE CYCLE PLANNING

Transport assets have life cycles that include the following phases:

- Creation/Acquisition
- Maintenance
- Renewal or Replacement
- Upgrading (to be considered when proposing re-generation)
- Disposal or Decommissioning

Consideration of each of the above phases for the Council's transport assets helps us drive a shift towards longer-term asset management and planning. Such a longer-term approach is a key element of the asset management approach, influencing some life cycle plans in the light of future development and re-generation proposals.

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

7.2 THE LIFE CYCLE PLANNING PROCESS

Detailed Life Cycle Plans have been produced for the following transport assets:

- Carriageways – 7.3.1
- Footways – 7.3.2
- Cycleways – 7.3.3
- Structures – 7.3.4
- Drainage – 7.3.5
- Street Lighting – 7.3.6
- Traffic Signals & Telematics – 7.3.7
- Public Rights of Way – 7.3.8
- Trees, Hedges, Verges & Planted Areas – 7.3.9
- Unlit Signs and Street Furniture – 7.3.10
- Barriers & Safety Fences – 7.3.11
- Road Markings & Studs – 7.3.12

For each of these asset types, 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 based upon customer feedback on expectations.

Option Appraisal – Details how options are identified and appraised for each phase of an asset's life, offering where possible best value proposals.

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. Where this has a significant impact upon an asset and its performance; this will be made clear to our key decision makers when we submit our annual report.

Detailed life cycle plans appear for each asset in Appendix C. Key points from each of these detailed life cycle plans are summarised in this section.

7.3 LIFE CYCLE PLANS

7.3.1 Carriageways

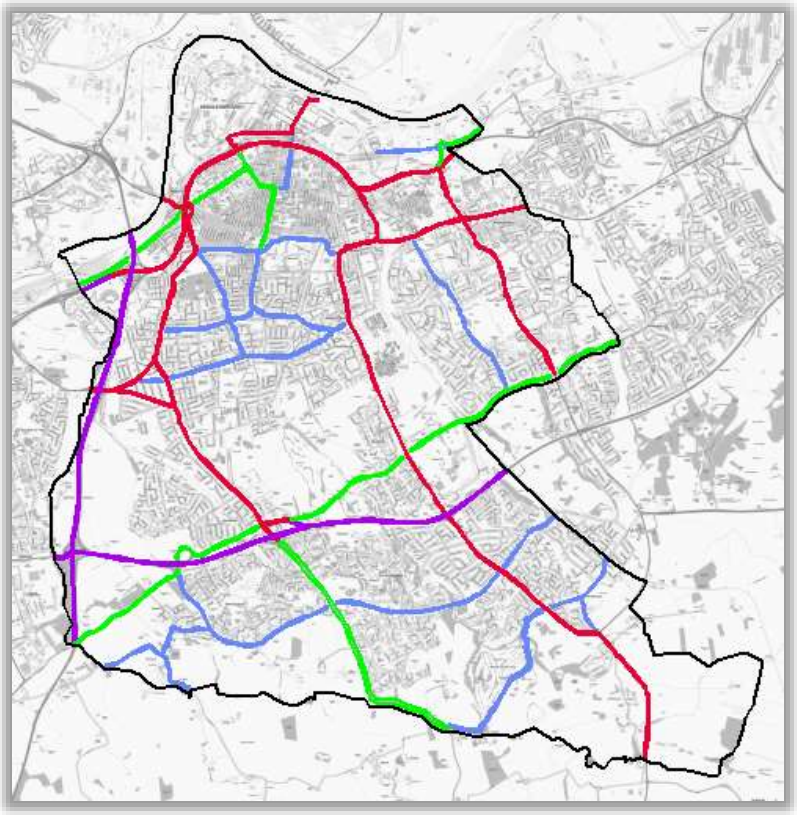
The main purpose of the carriageway network is to provide safe and unobstructed use for all categories of road user.

Inventory

Middlesbrough Council as the local Highway Authority is responsible for 479 km of roads with a gross replacement cost (GRC) estimated at approximately £405.2 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 to be recorded. 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 accuracy of the information.



Key: Black – Council Boundary

Purple – A Roads Highways England Responsibility

Red – A Roads MBC
Green – B Roads MBC
Blue – C Roads MBC

Diagram: Middlesbrough Council Classified Road Network

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

Summary of Carriageway Inventory by Classification (Middlesbrough Council)

Road Class	Length (km)	Width (m)	Area (m^2)	HAMFIG Default GRC Rate (£/m^2)	Carriageway Replacement Cost (GRC) (£M)
A Urban	21.4	7.6	162,640	136.04	22,126
A Rural	10.7	8.0	85,600	107.73	9,222
B Urban	8.3	8.6	71,380	126.86	9,055
B Rural	8.2	6.4	52,480	100.16	5,256
C Urban	23.1	8.8	203,280	104.70	21,283
C Rural	3.3	8.6	28,380	79.92	2,268
U/C Urban	404.0	8.6	3,474,400	96.69	335,940
U/C Rural	0.0	8.6	-	74.87	-
				Total Cost	£405,150 M

(based on whole Government Accounting/ Life Plans 2015)

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

Condition;

Assessing Condition

There are a number of performance measures used to assess the condition of carriageways. Previously reported Best Value Performance Indicators (BVPI's), enable the condition of the Council's carriageways to be compared with those managed by other authorities, and are a valuable Benchmarking tool for us to use. Other information derived from Grip Tester is also useful in ensuring safety of our network.

The former 'Best Value' Performance Indicators for carriageways are:

- BVPI 223 (later NI 168) – Condition of Classified ('A') Roads
- BVPI 224(a) (later NI 169) – Condition of Classified ('B' and 'C') Roads
- BVPI 224(b) – Condition of Unclassified ('U') Roads

These indicators can still be useful to enable comparisons between authorities' carriageway conditions to be compared.

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 (NI 168) 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 (NI 169) 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 minimum 25% network coverage per annum) but from

2006/07 the figure was based on 100% network coverage. All CVI data collected since 31st March 2003 is valid but a minimum of 25% of the data used must be no older than one year old.

From 2009 we have subscribed to take part in the NHT survey. This survey is based upon a suite of condition and satisfaction surveys relating to all aspects of highway and transportation issues carried out nationally, that are directly comparable.

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

Current Condition

Condition surveys suggest that the condition of Middlesbrough Council's 'A' roads fell slightly in 2011/12, but is currently at a steady state, and is in the upper quartile when compared to other Unitary Councils. The condition of the Council's other classified 'B' and 'C' roads is also at a steady state.

However, due to the current impact upon highway authorities of the national austerity measures, the authority needs to reconsider its past aspirations of maintaining top quartile performance (for Principal and non-principal carriageways) in comparison with other Councils.

Condition data for our unclassified carriageway network is shows no great deviation, however the longer term trend does indicate a deteriorating condition for this part of our network.

Available survey data can be seen in Appendix C.

Desired Condition

Middlesbrough Council has aimed to maintain top quartile performance for all classes of road, in comparison with other English unitary authorities. As austerity measures have impacted upon highway maintenance funding, authorities need to reassess their aims and aspirations when deciding upon their future intended future

levels of service that can realistically be achieved. This is a key decision, and when determined, needs to be made known to all of our stakeholders, and public at large.

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

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. The new infrastructure and all of its associated assets are recorded in the Council's Asset Management system. New carriageways then become subject to the relevant inspection and cyclic maintenance regimes and are allocated a 'life cycle plan', 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, gully emptying, grass cutting etc.
- Reactive: e.g. emergency rectification of dangerous defects, removal of dangerous litter / detritus / spillages and zonal repairs arising from safety inspections.
- Planned: e.g. surface dressing, plane and inlay, and reconstruction.

Planned maintenance also considers early intervention to hold off deterioration, this is known as preventative treatment. It 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 C, 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 for the foreseeable future. The only way that a carriageway can cease to be highway is through the formal legal process called 'Stopping Up'. Other than through major redevelopment of an area, 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 allocations

The Government announced in June 2013 that it would be making available £5.8 billion of capital - £976 million each year - over the course of the next parliament to tackle highway maintenance on the local highway network. This is a significant increase on past levels and presents an opportunity to make a real difference to the condition of our highway infrastructure.

Highway maintenance funding can be allocated from capital or revenue sources. Capital is primarily for structural renewal of highway assets (including roads, footways, bridges, drainage and lighting). Maintenance expenditure, principally funded by revenue, is mainly for reactive purposes and covers repair of worn or damaged roads and facilities, either short term patching or a permanent replacement. In addition to maintenance of the road surface itself, it also includes the cost of lighting, footway repair and cyclical maintenance such as cleaning activities (of assets such as the drainage system), grass cutting and vital services such as snow and ice clearance, and salt spreading.

From 2015/16, local highway authorities receive capital funding from central Government for highways maintenance through the Highways Maintenance Capital Block Grant. The greatest element of the maintenance funding comes as a needs based element (or formulaic maintenance).This is capital funding provided to help local highway authorities in England (outside London) plan and manage the road networks for which they have a statutory duty under the Highways Act 1980 (as

amended) to maintain. This funding covers major resurfacing, maintenance or replacement of bridges (including tunnels) and other assets such as footways and drainage systems, as well as occasional reinstatement of roads following natural disasters. It also covers street lighting provision.

Many of the existing highway assets are now moving to more costly stages of their natural life-cycle with some components already reaching the end of their serviceable life. To address this situation which often incurs disproportional expenditure on certain elements of highway infrastructure, the Government decided to assign a proportion of the highways maintenance budget to a new Challenge Fund. Such a Fund would be available to local highway authorities in England to bid for major maintenance projects that are difficult to fund through the normal block allocations they receive.

Further to these changes, and aiming to encourage a full asset management approach to the national highway assets, a further Incentive Fund has been introduced, based upon highway authorities' self-assessment and sign off by the authorities Section 151 Officer. This funding is based upon staged improvements being achieved by highway authorities over a period of time. Failing to achieve the set required standards, will result in a reduced budget being made through the Incentive Fund element.

In adopting national guidelines on asset management of our highways, we commit to undertaking regular specialist cyclic condition assessments, Grip Tester, NHT and FNS surveys, and CQC assessment. This currently requires a budget element of around £25,000 per annum to ensure the consistency and quality of our survey data.

This new funding formula can be a means of tackling some major carriageway issues through the Challenge fund element, but it is a bidding process and has no certainty of being successful, especially as the national maintenance backlog is now so large.

The Council may supplement this capital allocation by using prudential borrowing. Whilst such borrowing may provide capital funds, it has associated debt charges that the Council has to be able to repay. Under normal circumstances, to take this option, it would require a sound 'invest to save' case to be established.

New strategic infrastructure may also be achieved through contributions from developers' section 106 contributions, Local Growth Fund (LGF) and also Local Enterprise Partnership (LEP) funding contributions.

In the past, LTP enabled many Local Authorities to benefit from increased Capital funding. Middlesbrough also 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 was a continued decline in the Network condition at the lower end of the hierarchy. Although this was not measured through a statutory indicator, the position was confirmed in the findings of the Middlesbrough "Voiceover Panel" survey.

In the future, Middlesbrough Council will undertake consultation to enable the decision making process for carriageway maintenance programmes and priorities, to be based upon the Optimum or Attainable Levels of Service. Future investment will aim 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 C. Suggested improvement actions and associated performance measures for carriageway budgets can be found in Section 10 and Appendix F respectively.

Performance Gaps

One method of defining performance gaps in terms of carriageway condition is to utilise condition survey data derived by SCANNER and CVI's, resulting in former BVPI values... NHT surveys and customer satisfaction and expectations are also a means of determining if there is an action requirement.

Given these caveats, some performance gaps can be determined through comparison between current condition of carriageways and the user's desired condition. Similarly, performance gaps can be determined in terms of Middlesbrough's position relative to other authorities through benchmarking processes, and its desired position relative to other authorities.

Once the Council has established the present position, we can develop our Action Plan to bridge the gap and achieve our required level of service, as detailed in Appendix G.

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

7.3.2 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 987.1km of footway with a gross replacement cost (GRC) estimated at approximately £185.439 million (based on life plans 03/02/2014). 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 1a	7.2	5.3	42,480	9.604
Cat 1	58.1	3.7	214,970	17.702
Cat 2	251.5	2.7	679,050	51.372
Cat 3	197.4	2.5	493,500	33.280
Cat 4	472.7	2.4	1,134,940	73.481
			Total Cost	£185.439 M

(based on whole Government Accounting/ Life Plans 2015)

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

Condition *Assessing Condition*

The condition of busier footways (hierarchies 1, 1a and 2) were assessed through Detailed Visual Inspections (DVI's). This was a walked, visual survey that recorded such defects as potholes, trips, cracked slabs, open joints etc. A 50% sample of these footways was surveyed each year, such that 100% of the network was surveyed every 2 years.

The condition of busier footways (hierarchies 1, 1a and 2) were assessed through Detailed Visual Inspections (DVI's). This was a walked, visual survey that recorded such defects as potholes, trips, cracked slabs, open joints etc. A 50% sample of these footways was surveyed each year, such that 100% of the network was surveyed every 2 years.

This is now considered unaffordable due to the impact of austerity measures. We now rely upon UKPMS Footway Network Surveys (FNS), combined with NHT and local Voiceover surveys to give us our performance and satisfaction data on which Levels of Service can be considered.

In addition, the Council inspects footways for defects, with the frequency of inspections dependent on footway hierarchy. These 'Safety' inspections enable the recording of dangerous defects, which are then risk assessed and where appropriate, scheduled for repair. Further details on all of these survey regimes can be found in the Council's Highway Safety Inspection Manual, and in Appendix C of this document.

Current Condition

The current condition of all of the footways is measured by FNS surveys. This is a method adopted since 2011, Middlesbrough's 2014/15 figure is 3.0%, although this has reduced from 6.0% in the previous year, and seems more reflective of local sample area condition fluctuations.

We are unable to use the FNS data to compare the condition of Middlesbrough's footways with other unitary authorities. However, we have satisfaction of knowing that our NHT survey results compared with others indicate that we are in mid-range of performance and satisfaction.

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 A.

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 B.

The authority is committed to improving the condition of the Borough's footways, in line with the indicators produced by our NHT surveys. Our aim shall be to achieve and then remain in the upper 'green' rated sector for our footways. With regards to the FNS surveys, a steady state target averaging 3% to 4% is our objective.

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. This 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 C.

Maintenance, Renewal or Replacement and Upgrading

A typical flexible footway has a design life of 15 to 20 years. With appropriate and timely intervention, surfacing treatments, such as slurry sealing, and surface course renewal can extend the life to around 40 years. This however may be greatly reduced where trees overshadow the footways and desiccate the ground beneath.

Flagged footways can achieve a life expectancy of around 40 years. It should however be noted that flagged footways may have a significantly reduced life expectancy where vehicle trespass is excessive. Generally, concrete footways are less prone to damage caused by excessive vehicle trespass, as this may be a reason to choose this construction in commercial districts.

Due to the great number of influencing factors that determine the life cycle of any footway, various life cycle plan options have been included in Appendix C, from which a suitable plan can be chosen.

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, damaged or loose edgings and kerbs
- Planned: e.g. slurry sealing, patching and surface course renewal. 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, sometimes with alternative bituminous materials.

Descriptions of footway maintenance and renewal treatments appear in Appendix C, 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 through 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

Funding allocations

The funding formula for footways is the same as that described above for carriageways.

It has an element of the needs based allocation allotted for planned maintenance activities. It also is to be used for exceptional requirements when a Challenge Fund bid can be submitted for consideration of funding. As the Incentive Fund allocation is reliant upon our progress in developing our asset management regime, we are in overall control of the impact that this has on available resources to be put towards footway maintenance.

As with carriageway projects, the Council may supplement this capital allocation by using prudential borrowing. Whilst such borrowing may provide capital funds, it has associated debt charges that the Council has to be able to repay. Under normal circumstances, to take this option, it would require a sound ‘invest to save’ case to be established.

New strategic infrastructure may also be achieved through contributions from developers’ section 106 contributions, Local Growth Fund (LGF) and also Local Enterprise Partnership (LEP) funding contributions.

Performance Gaps

Our preferred method of defining performance gaps for the condition of footways is to use our NHT surveys and FNS surveys to target our Levels of Service to achieve and then remain in the upper 'green' rated sector for our footways, according to NHT. For FNS our aim shall be to achieve a steady state target averaging 3%. Given these caveats, a performance gap can be defined as below;

The performance gap in terms of condition is that between the current steady state where the Council is now, and the condition that enables us to remain in the upper 'green' rated sector for our footways. This gap is not readily quantifiable and the Council will initially have to rely upon informed opinion and experience, survey results and public feedback.

Condition data indicates that the greatest performance gap between current and desired condition lies within the category 3 & 4 footways. It is this that we aim to eradicate as a priority.

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

7.3.3 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.

Middlesbrough Council aim to create quality cycle infrastructure by constructing safe, convenient cycle routes that are attractive, comfortable and connected to the rest of the cycle network. In order to achieve this, cycleways are graded on a sliding scale ranging from 5 star to 1 star rating, in relation to the cycleways various attributes.

In their efforts to achieve the required standards, the Tees Valley authorities have combined together to produce their latest design guide, 'Tees Valley Cycle Design Standards; Creating Quality Cycle Infrastructure'.

Any cycle route infrastructure installed should aim to reach the highest possible standard for each of the criteria in order to address the aim. As a minimum, 2 star rating should be achieved in each of the criteria. Averaging the scores for infrastructure against the criteria will provide an overall grade, which will assist in highlighting where improvements are required.

The specific grading of attributes relating to the benefits derived from the infrastructure can be seen in the schedule below, and graded between 5 star (excellent) to 1 star (unacceptable):

- Surface condition
- Crossings, conflicts and pinch points
- Connectivity
- Accessibility
- Strategic Links
- Navigation and Signage
- Traffic levels
- Attractiveness of route
- Directness of route

The full table can be found in the 'Tees Valley Cycle Design Standards; Creating Quality Cycle Infrastructure' document:

- Surface width:- On carriageway; off carriageway; off carriageway shared
- Surface condition
- Crossings, conflicts and pinch points
- Connectivity
- Accessibility
- Strategic Links
- Navigation and Signage
- Traffic levels
- Attractiveness of route
- Directness of route

The full table can be found in the 'Tees Valley Cycle Design Standards; Creating Quality Cycle Infrastructure' document.

Inventory

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

Cycleways may be created through legal orders and are sometimes added to footway inventories, but the process has been inconsistent and often based upon permitted use. The inventory data for the Council's cycleways is however now virtually complete, and will allow for future improvement action plans to be developed.

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

Based upon an estimated length of 52.9km of remote cycleways (to be valued for WOA) within the Borough, these will have a Gross Replacement Cost of approximately £7.965 million (based on life plans 03/02/2014).

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

Condition

Assessing Condition

Cycleways within the carriageway or shared with the footway are inspected with the shared asset according to the carriageway or footway hierarchy. This is applicable to safety inspections and performance NHT surveys.

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 Safety Inspection Manual.

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

In addition to the physical and structural condition of the cycleway, there are other factors that are also to be considered. These relate to the quality of the cycle route facilities and how it achieves the strategic aims. These additional factors and any improvement in the grading achievable need to be considered in life cycle planning when maintenance intervention is planned.

Current Condition

For cycleway inspection regimes, the cycleway condition is taken to be that of the shared carriageway or footway surface it is using. The remote metalled cycleways have now been separately documented and added to our asset management data base, and accordingly have been given a GRC valuation as indicated above. Our cycleway DRC will be valued once we have accumulated sufficient condition data.

Desired Condition

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

Middlesbrough Council aspires towards the creation of cycle routes that meet the descriptions of 5 star rated criteria. However, retrofitting infrastructure with a limited budget whilst balancing the needs of an increasingly pressured highway network; and changing environment, does not always lend itself to these high standards. It is envisaged that as a minimum, the Council should seek to achieve and maintain a 2 star rating in every category.

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 Active Travel and Road Safety Group. 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 also entitled to use bridleways.

Under the Highways Act 1980, the highway authority can convert part or all of a footway to a cycle track. This has the effect of removing the footway under section 66(4) and then a cycle track is 'created' under section 65(1). A clear audit trail must be shown and a recorded decision made. Cyclists are also 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 unless it is associated with a PROW.)

- 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 when reported).

- 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, is subject to a funding resource being identified.)

A typical flexible cycleway has a design life of 15 to 20 years. With appropriate and timely intervention, surfacing treatments, such as slurry sealing, and surface course renewal can extend the life to around 40 years. However, as with footways, 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 through 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

Funding allocations

Previously, funding sources to provide new or upgrade the existing cycleway infrastructure has been made available through the Local Transport Plan (LTP), the Local Sustainable Transport Fund (LSTF) and through other local grant schemes and contributions.

Under the new highway funding formula, the majority of cycleway maintenance work would need to be funded through Highway Maintenance funding sources for carriageways and footways. The comments relating to budget optimisation for carriageways and footways are generally applicable to cycleways.

For further details on the life cycle of cycleways, please see Appendix C.

Performance Gaps

Generally, any performance gaps for cycleways will be those already identified on the associated carriageway or footway gap analysis.

Further details of the condition of all remote cycleways needs to be collated and relevant data is to be recorded in our asset management system. As mentioned previously, this is required urgently in order to evaluate the DRC for the remote cycle route network. It will also become the base information for future life cycle planning needs and prioritisation of maintenance action plans.

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

7.3.4 Structures

This refers to a construction that supports itself and carries load.

It may be any bridge or other structure that impinges in any way within the footprint of the highway or that materially affects the support of the highway or land immediately adjacent to it and that meets the dimensional criteria defined in the Code of Practice for 'Management of Structures' in 2005, last updated May 2013. This is further defined as a structure with a span of 1.5m or more spanning and providing passage over an obstacle, e.g. watercourse, railway, road, valley. This category also covers subways, footbridges and underpasses.

Inventory

Middlesbrough Council is responsible for approximately 186 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 1980's and is checked / updated at each opportunity when carrying out Principal and General inspections, and for drains ad culverts by procuring CCTV surveys. The extent and reliability of the inventory data varies, but generally is good.

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

Hierarchy

To enable us to attach an Inspection and Maintenance regime, commensurate with the importance of the structure, we have developed the following hierarchy for Bridges and other Structures. These are as follows:

Hierarchy	Description
Historic:	Having 'Listed Structure' status.
Cat 1:	Carrying or crossing Principal or Classified Roads, recorded abnormal load route, impacting upon Network Rail property or watercourses.
Cat 2:	Carrying or crossing Unclassified Roads, or structures within public realm
Cat 3:	Minor bridges and structures off highway
Cat 4:	Other none loadbearing culverts, pits, pipes or structures.

Condition

Assessing condition

Structures are recommended to be inspected in the following ways:

- General Inspections –All Historic, Cat 1 and Cat 2 Bridges and Structures are visited once every four 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 8 years on a set of significant structures including Historic and Cat 1Bridges and Structures, where a more detailed inspection is undertaken, which could also include material testing being carried out.
- Special 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. These can also 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.
- Safety Inspections – It is anticipated that the Council's Highway Inspectors or maintenance Engineers will undertake the Safety inspections on Historic, Cat 1, Cat 2 and Cat 3 Bridges and Structures. This will generally take place as part of another routine highway inspection or other activity.

With each type of inspection, data is collated using the County Surveyors Society Inspection Forms, or an abridged version commensurate with the significance of the structure concerned. This data is then loaded into our Asset Management system, and is analysed in-house to produce our BCI. To achieve this, the Authority has carried out data analysis within our 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 are then 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 use in determination of our annual Whole of Government Accounts report.

For further details of structures condition assessment, see Appendix A

Current Condition

The Average Condition Index for Bridges is under review with a programme of major structures undergoing Principal Inspections. As soon as the results are known we will produce our average condition rating and use this as our baseline for planning future levels of service and improvement action plans.

Condition	Percentage
Very Good	%
Good	%
Fair	%
Poor	%
Very Poor	%
Severe	%

B.C.I currently under development

A further local performance indicator records the percentage of bridges that are **not** substandard. This is currently recorded as 99%. This is also supported by the local indicator identifying the number of bridges with weight restrictions placed upon them carrying classified or unclassified roads. This presently stands at zero, not counting the Historic Transporter bridge.

Desired Condition

We are aiming for a target of 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 early attempt at setting targets and will need to be reviewed over several 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 C.

Option Appraisal

Creation/ Acquisition

Middlesbrough Council acquires responsibility for structures through the following processes:

- Adoption of new structures that are constructed as part of new highways schemes. A recent example being the A66 Middlehaven interchange. Middlesbrough Council had a major input into the design process, and the structure then becomes the responsibility of the authority after the expiry of a maintenance period.
- New structures on the recorded Public Rights of Way network become the responsibility of Middlesbrough Council to maintain.
- Structures are from time to time transferred from private ownership to that of Middlesbrough Council. Typical transfers are from the Environment Agency and Network Rail. Before Middlesbrough Council 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, drainage and the removal of vegetation
- Reactive: e.g. bridge impacts, vandalism, repairing flood damage, etc.
- Planned: e.g. replacement of joints and bearings, brick and concrete repairs, and parapet upgrades, pier protection, etc.

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

Upgrading consists of the major works that improve an asset beyond its existing design capacity or life expectancy. 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, and other works such as those associated with kerb and road realignment and improving parapets to modern standards.

Structure Asset Upgrading can include:

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 (15-20yr 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.

Whenever possible, cyclic, reactive, planned maintenance and upgrading are carried out simultaneously. This has financial and environment benefits, also reduces congestion and inconvenience.

Disposal or Decommissioning

Structures may be decommissioned because they are no longer required (e.g. those associated with disused railway lines). We have included on our inventory several redundant subways beneath carriageways that have been closed to the public, and in some cases sealed off.

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 if the removal of structure causes a highway to become unusable or impassable.

Budget Optimisation

Funding allocations

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, but in addition, requires the commitment to maintain a cyclic inspection regime in order to generate the forward maintenance programmes and determine the Bridge Condition Index (BCI).

In addition to calculating the BCI for our structures, we have a duty to keep structures safe for use. This requires the continuation of the regular cyclic

inspection regimes, relative to the hierarchy of the structure concerned.

In order to achieve this, there is an ongoing budget requirement of approximately £300,000 per annum, in order to facilitate the carrying out and procurement of professional consultant structural engineering services, traffic management, Network Rail possessions etc., to undertake Principal and Special inspections of Cat 1 structures.

The funding formula for maintenance of Structures is the same as that described previously for other elements of highways.

It has an element of the needs based allocation allotted for planned maintenance and cyclic inspection activities. It also is to be used for exceptional requirements, when a Challenge Fund bid can be submitted for consideration of funding.

As with carriageway projects, the Council may supplement this capital allocation by using prudential borrowing. Whilst such borrowing may provide capital funds, it has associated debt charges that the Council has to be able to repay. Under normal circumstances, to take this option, it would require a sound 'invest to save' case to be established.

New strategic infrastructure may also be achieved through contributions from developers' section 106 contributions, Local Growth Fund (LGF) and also Local Enterprise Partnership (LEP) funding contributions.

Revenue funding allocated to the maintenance of structures has not been based on condition measures or the demands placed on the network. The majority of the revenue budget is spent on remedial maintenance arising from bridge inspections, routine Highway inspections and incident/accident damage where it is not recoverable.

Performance Gaps

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

In the area of other highway supporting structures and retaining walls, inventory data regarding construction and condition is currently being assessed through the services of our consultant engineers, undertaking Principal Inspections of these elements. This current programme of Principal Inspections has specifically targeted our more significant Cat 1 and Cat 2 structures to enable confidence levels to be increased. The number of known retaining walls is 2.4km, but there could be a similar number of lesser known walls that are not recorded.

In the past, Bridges were dealt with in accordance with the policy set out in the LTP. This was traditionally been based on replacing all sub-standard bridges, strengthening structures for additional load bearing capacity, and pier protect works. This was to be delivered within a ten year program (ending in 2010).

Through our adoption of the guiding principles of asset management, we are at present addressing the backlog of Structure Inspections and resulting remedial maintenance work. Through our own classification of structures, this can now be

prioritised on a transparent risk approach to the network.

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

7.3.5 Drainage

This covers the entire infrastructure that plays a part in draining surface water from the highway. It also includes highway structures such as culverts carrying water courses that are crossed by highways.

Middlesbrough Council has been subjected to fluvial and pluvial flooding within the Tees Valley catchments area, This has impacted upon communities and on the Highway Network, as a result of an aging drainage network with exceeded capacity, climate change and the impact from new developments. The impact from further development is now mitigated through the additional powers to control discharges brought about through the introduction of the Flood and Water Management Act 2010.

Decisions on future programmes of flood alleviation and new drainage works are taken after extensive consultation with our partners, Environment Agency, Northumbrian Water Limited, Tees Valley Strategic Flood Risk Management Partnership and the NRFCC where applicable. This also takes into account consideration of Climate Change, and 'Middlesbrough Councils' One Planet Living Action Plan and the results are then formulated in our Local Flood Risk Management Plan (LFRMP).

Inventory

Middlesbrough Council, in its capacity as the Lead Local Flood Authority (LLFA), has maintained close working relations with Northumbrian Water Limited, The Environment Agency, and neighbouring LLFA's. As a result, the dependencies, shortfalls and forward plans to mitigate problems are well known to all.

Middlesbrough Council is responsible for a drainage asset with a gross replacement cost (GRC) estimated at approximately £16.3million. This includes approximately 26,000 gullies, channels and safety kerbs, kerbed drain carriers, culverts, piped drains, swales and ditches.

Inventory information (where available) has been collected over a number of years, and has a considerable amount of further surveys to be carried out before our data will be complete. Despite this shortfall, the degree of accuracy is still reasonable, although the situation with individual elements of drainage assets is not complete.

Our asset data base shows the number of gullies is listed per length of road. There is no surveyed data recorded to confirm the length or location of ditches, although these known by maintenance staff. The Highway Inspectors are generally aware of where these are located, and will report defects and maintenance requirements when problems are seen. The Council also has very little information to confirm the position, size, depth, gradient, and outfall details of some remote piped highway drainage systems, kerbed drainage, channels and safety kerbs.

A system for managing inventory data relating to manholes, catch-pits and soakaways is being developed in conjunction with the Council's Maintenance Manager. The Council has detailed information on the number of gullies per road, but further data needs to be collated regarding the type, size or exact location of the various assets. Further information is also being compiled in our mapping and other records, for previously unrecorded piped drainage, channel drainage, etc, and other items such as flap valves and outfalls.

The current inventory of Middlesbrough's drainage asset is given in Appendix A

Condition

Assessing Condition

Damaged gullies are recorded during safety inspections, routine cleansing activities, and other surveys, or from public reports. Blocked ditches or roadside grips are, however, not always noticed during safety inspections and problems are frequently discovered during the course of other works and/or through reports of flooding received from the public.

Piped systems, manholes, outfalls, attenuation systems, catch-pits, soakaways and SUDS (sustainable urban drainage systems) do not routinely have a regular inspection regime. Faults are sometimes discovered following detailed inspections of the highway, reported by the public or when the system is in need of clearance or repair. As a result of this, it is considered that certain drainage assets can be managed on a none cyclic, risk assessed basis. The risk assessments will consider the likely return frequency and severity of a recurring risk. This risk may be due to excessive leaf matter accumulations, through risk of blockages caused by persons and developments, or silts running from adjacent land.

There are currently four highway drainage pumping stations in Middlesbrough. Pumps are maintained on a regular basis and following recent attention they are generally in a good state of repair. Discussions are currently taking place with Northumbrian Water Limited regarding them possibly taking over responsibility for their upkeep in the future.

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 and currently subject to a programme of CCTV surveys that is helping us develop our highway and other drainage asset data base.

In recent years, in response to the impact caused by austerity measures, gully cleaning has been reduced from twice per year, to now being an annual cleanse of all gulley's. Over and above this, we will be reactive to needs when problems are reported, and attend known trouble spots, where more frequent cleansing will take place when required.

Desired Condition

The frequency of cleansing is intended to prevent water from accumulating on the highway, and carried out within the constraints of the Council's budget. The service could be improved by risk assessing and targeting sites of known flooding with a higher frequency of cleansing, but this would result in a reduction elsewhere.

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. This however can be managed by extra vigilance and a risk assessed approach.

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

Option Appraisal

Creation/Acquisition

The drainage asset is added to when new roads are constructed, a recent example being the A66 Middlehaven Interchange where drainage and a pumping station were added to our inventory. New developments that are adopted by the Council as highway maintainable at public expense include drainage infrastructure, all constructed to meet the requirements of latest legislation.

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 or channels may be provided to deal with specific drainage problems; however total discharges must be managed so that they do not place

additional pressures on existing systems, many of which are already at capacity.

Maintenance, Renewal or Replacement and Upgrading

The life of a gully, or kerb offlet (side entry discharge), or kerb drainage system will vary depending on the location, volume of HGV traffic, quality of system. Experience suggests that the life of the ironwork should be 40 years, although the chamber of the gully may well last longer, and mild steel kerb offlets a far shorter term.

A 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. Most roadside ditches will require checking for obstruction annually, and maintenance to clear out or reform the channel every 5 years.

Piped drainage and associated inspection chambers, silt traps etc. are expected to have an indefinite life span. This however can only be achieved by carrying out a regime of inspection, cleansing and repair, commensurate with its location and use.

The maintenance of highway drainage may be categorised as:

- Cyclic: e.g. gully emptying, root cutting and cleansing of ditches and grips
- Reactive: e.g. clearing blocked gullies and channels, connections and silt traps, and repairing damaged or missing 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 C.

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. If however the stopping up is in favour of future development, the Council may take a view that the infrastructure is still a valuable asset to be used in conjunction with a new development.

Budget Optimisation

Funding allocations

The funding formula for highway drainage is the same as that described previously for other highway assets. When capital budget is used to improve the drainage asset, this is normally undertaken as part of major highway maintenance schemes.

The funding formula has an element of the needs based allocation allotted for planned maintenance activities. It also is to be used for exceptional requirements when a Challenge Fund bid can be submitted for consideration of funding. This fund generally is for far larger schemes than could be envisaged in isolation for highway drainage needs.

Within the 'Needs' based funding element, we need to allow an annual budget allocation commitment towards carrying out regular cyclic specialist CCTV surveys of known 'at risk' parts of our drainage systems. This is especially required where tree roots encroach into drainage systems, and for best value we would need to root cut when the survey identifies a problem. The cost of this activity is currently around £85,000 per annum.

As with carriageway projects, the Council may supplement this capital allocation by using prudential borrowing. Whilst such borrowing may provide capital funds, it has associated debt charges that the Council has to be able to repay. Under normal circumstances, to take this option, it would require a sound 'invest to save' case to be established, which may prove difficult with works of this nature.

Schemes developed to specifically improve drainage will be assessed for priority against competing demands for capital funding, and such improvement schemes would represent a small proportion of the total capital allocation.

Performance Gaps

Reports of flooding have significantly reduced in recent years. This would suggest that most parts of the network are now in a reasonable condition due in part to the extensive CCTV surveys carried out and resulting repairs that followed. Without further inspections and surveys being carried out in piped systems, manholes, catchpits, soakaways and ditches, the condition of the drainage assets will not be complete, and the future needs not fully quantifiable.

Grips and ditches are only cleaned when necessary or as a result of Public reports. Footway drainage provision is not currently part of any cyclic maintenance activity and is solely reactive based.

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

Drainage incorporated within and serving many of our major highway structures have been found through inspection to be in need of extensive maintenance, repair or renewal. This has been seen to be the cause of serious structural concerns and as such is now considered to be a priority for inclusion into inspection and cyclic maintenance.

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

7.3.6 Street Lighting & Illuminated Signs

This in our plan covers all highway lighting associated with carriageways, footways and carparks, illuminated signs, bollards and zebra crossings. It also includes Street light advertising sites, and equipment required for remote management and dimming of lighting equipment.

Inventory

Middlesbrough Council's street lighting asset, which includes 22,833 No. lighting columns has a gross replacement cost (GRC) estimated at just over £32 million. In addition to this there are 1,147 No. illuminated signs and bollards with a GRC estimated at just over £1.4 million.

The street lighting inventory is held in a database within a bespoke application called Geoworks. Information from this system can be imported into our asset management system Symology "Insight", a computer system designed specifically to provide an integrated solution for the management of highways. This has not yet been carried out.

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 in Council ownership. As part of the cyclic maintenance activities, private cable networks are identified during the electrical testing programme, and recorded on a 6 year cycle.

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

Condition

Assessing Condition

The Symology '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 maintenance contractor.

With regards to the street lighting installations, each component of the installation is visually inspected and given a rating of one (good) to four (poor) based on its condition. From this an overall rating can be attached to the total asset. This would then result in an overall rating for each asset being produced, falling into the following three categories:

- High Priority for intervention
- Medium Priority for intervention
- Acceptable, not requiring intervention

Due to the present situation under the austerity measures imposed, Middlesbrough Council limits its decision making on required maintenance or replacement intervention, in relation to the individual elements of the installation. This enables the re-use of reclaimed materials from energy reducing schemes to be given extended life when an individual component fails.

Current Condition

The current condition, in terms of lighting columns over 25 years old, being high priority for replacement is shown in the table below. Also included are subway units over 10 years old and illuminated bollards over 15 years old:

Column Height	Number of Asset Type	Number Over 25 Years	% Over 25 Years
Columns up to 6.0m	16,053	8,915	56%
Columns up to 8.0m	2,607	1,013	39%
Columns up to 10.0m	2,555	1,696	66%
Columns up to 12.0m	249	52	21%
Subway Units	635	317	50%
Feeder Pillar Small	197	150	76%
Illuminated Bollards	381	269	71%

Desired Condition

The optimum situation would be for all equipment to have a minimum 5 years residual life expectancy. This would then be the Council's target for funding the 5 year forward maintenance plan. Although much of the inventory exceeds the manufacturer's life expectancy, testing regimes can be used to increase the confidence in the extended life of an asset.

Taking the initial assumption that all of the inventory in the table above that exceeds 25 years of age are at risk, and likely to be requiring replacement in the 5 year forward plan, this would result in a total cost of £18.106 million being committed by the Council.

Option Appraisal

Creation/ Acquisition

Middlesbrough's lighting asset is increased when new roads are built. For example, the A66 Middlehaven Interchange added 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 conventional 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 street lighting asset. Developments such as Grey Towers Farm and Nunthorpe Gardens have recently added more than 80 new street lighting units to our inventory.

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. This extends to our requirements for minimum energy use for specified levels of illumination, ease of maintenance, correct IP rating, and manufacturers guarantees. Any departure from our specified requirements will require the payment of an adequate commuted sum.

Maintenance, Renewal or Replacement and Upgrading

The maintenance of lighting may be categorised as:

- Cyclic: e.g. visual inspection, cleaning of lanterns, bulk lamp changes at agreed cycles and electrical tests of approx. 15% of stock annually.
- Reactive: e.g. repairing faulty lamps / lanterns and photocells and reacting to accident damage.
- Planned: e.g. obsolete column and lantern replacements, de-illumination of signs and illuminated sign post and luminaire replacements. This will also include energy reducing 'Invest to Save' schemes where LED lighting replaces obsolete installations.

With recent advancements in technology, maintenance specifications are being adjusted to meet the changing attributes of our lighting installations. This is generally leading towards reduced frequencies in cyclic maintenance attendances.

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

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, for example where we have introduced an alternative high mast lighting scheme.

Budget Optimisation

Funding Allocations

Formally funded from Revenue resources for maintenance and LTP for Capital replacement and upgrading, it is now subject to change.

Revenue resources are still used to support our service delivery partnership, which also covers the ongoing annual cyclic charges within that service agreement. It also remains the source of funding our highways and lighting energy charges.

The Capital resources are now subject to the new highways funding formula. This is intended to fund street lighting and illuminated signs needs, in the same way as that described previously for carriageways and other highway asset types.

The Funding formula has an element of the needs based allocation allotted for planned maintenance activities. It also is to be used for exceptional requirements when a Challenge Fund bid can be submitted for consideration of funding. As the Incentive Fund allocation is reliant upon our progress in developing our asset management regime, we are in overall control of the impact that this has on available resources to be put towards footway maintenance.

As with carriageway projects, the Council may supplement this capital allocation by using prudential borrowing. Whilst such borrowing may provide capital funds, it has associated debt charges that the Council has to be able to repay. Under normal circumstances, to take this option, it would require a sound 'invest to save' case to be established. This in many cases can be more readily achieved in streel lighting through reduced energy and carbon usage by replacing luminaires with LED lighting.

Performance Gaps

There are gaps in the inventory data held for this asset. This mainly relates to the installation dates (and hence age) of lighting and sign installations in the Insight database and also 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 thought or known to exceed or be within 5 years of its life expectancy are to be prioritised for planned replacement, and monitored through an inspection or testing regime.

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

7.3.7 Traffic Signals & 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. More recently, introduction of Variable Message Signs (VMS) have been an addition to our telematics inventory.

Inventory

Middlesbrough Council's telematics asset, which includes some 56 junctions and 81 pedestrian crossing sites, 10 Variable Message sites and 41 Speed Activated Sign sites, has a gross replacement cost (GRC) estimated at approx. £9.71million.

The signal element includes a total of 1,446 No. traffic signal head units and associated control equipment. Although the data is proposed to be managed within the Symology Insight management system in the near future, it is at present maintained on a protected Access data base at local level. The data is considered to be accurate and confidence levels are high at 90%.

Further detailed information on the sites, including histories of amendments and improvements are contained on paper files. Current confidence levels on this asset data is lower and thought to be about 75%.

Full details on Middlesbrough's Traffic Signals and telematics equipment are given in Appendix A.

Condition

Assessing Condition

Many of the signalised junctions and controlled crossings are connected to 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 or changes in traffic flows.

In addition, the Traffic Signal engineers and technicians carry out periodic inspections of all sites. Lamp changes to signals take place when seen during inspection or when reported. During annual inspections, checks cover all items not automatically reported back.

Electrical testing takes place following maintenance activities or following damage resulting from a RTC.

It is Traffic Signal engineers and Technicians who will carry out audits to verify equipment and condition at each site. These reports will comprise a condition questionnaire and a printout of the settings for the installation.

Current Condition

Signalised junctions and the like are generally considered to have a design life of 15 to 20 years. Manufacturers are required to keep replacement parts for each design type for 10 years after manufacture ceases. This may be extended due to the growing use of LED arrays. This however has not always been the case and in some circumstances replacement has been made necessary to avoid delays in repairs.

There is a significant percentage of transport telematics over the designed 10 year life span, 48%, and 11% over 15 years. Maintenance strategies and funding needs to be developed to produce the best value life cycle plans.

Desired Condition

Although the best practice and industry standard is a maximum age of 15 years, 20 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, however, due to current austerity measures, this is something that may not at this time be achievable.

- An immediate cash injection of £120,000 would bring the age of the oldest equipment down from over 15 years to 10 to 15 years old.

- A follow on budget of £610,000 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 installed when new road junctions or interchanges 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, often installed by the Highway Authority under section 278 agreements.

Maintenance, Renewal or Replacement and Upgrading

The maintenance of telematics may be categorised as:

- Cyclic: e.g. Inspection and testing annually, signals lamp changes when on cyclic arrangements.
- Reactive: e.g. replacing expired or blown lamps and replacing equipment damaged in accidents.
- Planned: e.g. upgrading equipment on the basis of age and through energy reduction schemes, and through highway junction modifications etc.

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

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

Funding allocations

Revenue funding resources day to day upkeep of the signals and telematics. This does not extend beyond lamp replacements, electrical fault diagnosis etc.

The Capital resources are now subject to the new highways funding formula. This is intended to fund Traffic Signal and Telematics needs, in the same way as that described previously for carriageways and other highway asset types.

The Funding formula has an element of the needs based allocation allotted for planned maintenance activities. It also is to be used for exceptional requirements when a Challenge Fund bid can be submitted for consideration of funding. As the Incentive Fund allocation is reliant upon our progress in developing our asset management regime, we are in overall control of the impact that this has on available resources to be put towards footway maintenance.

As with carriageway projects, the Council may supplement this capital allocation by using prudential borrowing. Whilst such borrowing may provide capital funds, it has associated debt charges that the Council has to be able to repay. Under normal circumstances, to take this option, it would require a sound 'invest to save' case to be established. This in many cases can be more readily achieved in streel lighting through reduced energy and carbon usage by replacing luminaires with LED lighting.

Performance Gaps

There is a significant percentage of around 48% of transport telematics over the 10 year life span, with about 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.

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.

All of the above contributes towards the existing funding gap. The current routine maintenance budget is insufficient to cover any replacements or renewals. The current known shortfall relating to priority replacement / renewal projects is currently estimated to be £500,000.

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

7.3.8 Public Rights of Way (PROWs)

These cover all categories of PROWs included on the Definitive Map, and also those routes which are unrecorded. This includes footpaths, bridleways, and Byways Open to All Traffic (BOATs).

Inventory

Middlesbrough Council is responsible for 41km of recorded and a further 80km of unrecorded public rights of way with a combined gross replacement cost (GRC) estimated at just under £8.76million. The network covers both urban and rural areas.

The path network is recorded on Middlesbrough Council's Definitive Map and statement (often referred to as simply the "Definitive Map"), and managed by the Countryside Access Management System (CAMS). It manages by referencing sections of paths, referred to as 'links', rather than by whole paths. The Definitive Map is paper based which was last updated in 2011, at which time the map was also digitised. This enables the Council to fulfil its duty to keep the Definitive map and Statement under continuous review.

The inventory data was collected in 2012 and is updated annually from surveys undertaken across Middlesbrough.

Condition

Assessing Condition

The Condition of the currently recorded network (links) is assessed using the former BVPI method, and is based on an 80% random sample of the links currently

recorded in CAMS. This is surveyed annually, (40% in May, 40% in November). Each link is surveyed completely against a pass/ fail criteria. Condition scores are determined, based on criteria that rate it as 'Satisfactory' (good), or 'Unsatisfactory' (missing, where replacement or attention is required).

Furniture which is attached to the link is inspected at the same time and includes Bridges/Culverts of less than 10m spans.

Bridge Structures are subject to a 'Safety' and 'General' inspection regime, as detailed in the Structure section 7.3.4. Inspection data for minor structures is recorded on an adapted bridge structure inspection report form, picking up the readily seen essential elements of the structure. Information gathered from these inspections is then forwarded to the asset management team within the Highway Management & Maintenance Group, where any intervention requirements are further considered and actioned if necessary.

Reactive and ad-hoc PROW Surveys – Middlesbrough Council responds to reports on the state of the path network from a number of sources. These reports traditionally have been through letters, e-mails or by telephone. This information is then required to be entered into CAMS.

However, with the recent development of CAMS and the introduction of CAMS Web and CAMS Mobile, reports relating to either paths or furniture are now able to be reported directly into the CAMS system. This now both speeds up the process as the information is reported directly into CAMS, but also produces automatic updates to the reporter by e-mail.

The Volunteer PROW Rangers are also allocated tasks through CAMS Web which allows them to report back information directly through to the system.

Current Condition

The current condition of PRoW is considered to be good. This has been established through consultation feedback during the RoW Improvement Plan consultations with the parish councils, user groups and general public.

The Council intend to continue to use the former BVPI 178 criteria in order to monitor and benchmark our RoW network with others. This will also ensure that we are aware of any network deficiencies, and assist us in targeting improvements.

Desired Condition

There are currently no standards nationally for RoW in respect to asset condition; however the Council does have a number of responsibilities to consider. These include keeping public rights of way clear of undergrowth and free from obstructions, assisting landowners with the maintenance of stiles and gates, signposting PROW where they leave the surfaced road and maintaining most bridges and culverts.

To achieve these the Council has identified the following objectives:-

Objective 1 - To ensure that 100% of the network is available and easy to use.

Objective 2 - To ensure as far as is practicable that the network is free from obstructions.

Objective 3 - To ensure that all Rights of Way required to be shown on the Definitive map and statement are correctly recorded and that the line and legal status is correct.

Objective 4 - To Improve on the time that it takes for the Council to respond to query's or reports of obstructed paths and damaged furniture.

Objective 5 - To ensure that all PRoW which leave a surfaced road are signed and that all routes are adequately waymarked.

Objective 6 - Where possible, the Council should ensure access for all is available. Where this is not possible the least restrictive item of furniture should be used.

Maintenance, Renewal or Replacement and Upgrading

The maintenance of rights of way may be categorised as:

- Cyclic: e.g. surface clearance by the Council
- Reactive: e.g. repairs to damaged signs, bridges and other types of furniture, this is undertaken by the Council. Repair to ploughed ways is undertaken by the land owner.
- Planned: e.g. replacement of small bridges, waymarks, path improvements and furniture replacement. This is undertaken by the Council.

Full descriptions of all maintenance activities, together with proposed

improvements to the current regime are given in Appendix E & F.

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

Funding Allocations

Planned works such as the replacement of small bridges, path improvements and furniture replacement is funded through the Highway Funding Process.

Cyclic and reactive works such vegetation management and signage is funded through an annual revenue budget.

Performance Gaps

Feedback from defect reports and consultations demonstrates some gaps 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 concerning recorded links, surface condition, roadside signposting, gates and stiles provision is currently considered to be in a reasonable condition for users. For the rest of the unrecorded network, standards are in need of improvement. The main area of concern is the suitability for users with disabilities.
- Inventory - Although most of the RoW asset data is sample based there is no clear indication of significant gaps in our knowledge of the asset condition. A gap can be identified in that the Definitive Map is still incomplete, and there is a need for the information to be gathered, digitised, and recorded in our updated Definitive Map and Statement.

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

7.3.9 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. A full inventory of assets under maintenance by 'Area Care' has been made. The quantity of highway assets is as follows; trees (30,000), hedges (51km) with an estimated replacement cost estimated at approximately £5.9 million.

Verge, tree and hedge records exist on a variety of GIS, and paper records and Treewise, maintained and managed by Area Care Services.

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

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

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.

There is a requirement to inspect all highway trees and also those in private ownership within falling distance of a public highway. This is covered by the Highway Inspectors Safety Inspection regime, operating with guidance from the Arborist.

Current Condition

Trees;

The general condition of the tree stock is recorded in our 'Treewise' asset data base.

Verges;

Damaged verges are recorded on an Access data base by Highways and Transportation Service, under their management of the Council's policy and control of 'Verge and Pavement Parking'.

Most verges are planned to be cut thirteen times annually, between mid-March and end of October. Additional cutting will be undertaken if necessary, on safety grounds. Due to the nature of past development in parts of Middlesbrough, along with an unaccounted growth in car ownership, there is a problem with overrunning and parking on grass verges. This is unsightly and can lead to third party claims from members of the public. A further concern on rural roads is the creeping of road width due to carriageway edge patching, and the impacts upon drainage of rural

un-kerbed carriageways.

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. This is sometimes jointly managed, with any root containment, planting structures etc., maintained by the Highways and Transportation Service, and the planting elements by Area Care for Streetscene Services.

Desired Condition

All council owned highway trees are to be maintained in a sound and safe condition, so far as is reasonably practicable.

All council owned hedges are to be cut back so that there is no obstruction to the highway or footway. Cutting back is to be programmed to take place outside the bird-nesting season, unless it constitutes an immediate hazard.

Rural verges are to be cut a minimum of once a year, and visibility splays more often if they become a hazard.

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

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. Not all developers follow this process. As SuD's requirements generally impede upon open space in new developments, often blue / green corridors are retained in the control of an independent management company. The development control procedure enables the Council to be sure that new trees, verges and landscaped areas have been planted to the requisite specification, taking account also of control of species. 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 hedges and shrubs are to be pruned as required dependant on growth.

  For urban verges, the highway verge width receives approximately 13 cuts per year, unless specified as 'low maintenance'.

  All rural verges receive a minimum of one cut 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 Area Care Manager.

  The Council carries out cyclic maintenance on planted areas.

- Reactive:

  Maintenance on highway trees is often a reactive service, pruning as necessary for safety reasons.

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

  Hedges may also be cut back if they are considered 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). It shall be the policy of the Council to recover its costs incurred in carrying out remedial works on privately owned trees and hedges.

- Planned:

  The Council generally maintains planted areas in urban areas and housing estates in a planned and programmed way.

  Very little planned maintenance (renewals or replacements etc.) is undertaken on trees throughout Middlesbrough. Where a rural highway verge is over 1.2m wide, then the Council will plan to cut back self-established scrub and vegetation to the highway boundary.

Where evidence exists of persistent damage to highway verges, consideration will be given to hard landscape. The Council's Verge and Footpath Protection Policy sets out procedures to assess the need and priority for intervention. It can be based upon very narrow or isolated grass verges being unsustainable. It may also be for safety reasons or environmental reasons when no provisions for car parking was ever considered or provided.

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

Disposal or Decommissioning

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. Verge hardening under Council approved procedures does not alter the adopted highway status. 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

Funding Allocations

There is usually a small annual allocation of capital funding for these assets. This has been provided over a period of time to address the public requests for removal of environmental eyesores and hazards created by continuous verge parking, especially in east Middlesbrough where car ownership provisions were not catered for. There is also capital provision that comes about when planting or other maintenance is required as a part of a capital regeneration project.

The revenue budget supports Area Care in their routine maintenance of the soft landscape assets. This is based on inventory for verges, landscaped areas and historical precedence for trees and hedges.

A summary of current capital and revenue expenditure for 2014/15 is shown in the table below:

Performance Gaps

A full inventory and condition survey for this asset group has been undertaken by Streetscene Services.

The condition of highway trees has been recorded and is currently in the process of being updated, including those within falling distance of a public highway. It is known that some of these are not in a desirable condition, and reaching a point of decline where future planned intervention will need to be considered.

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, crown lifting and thinning of trees, and also hedge cutting.

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

7.3.10 Unlit Signs & Street Furniture

This covers all of the Council owned non-illuminated signs and street furniture assets that are intended to guide, inform or control the travelling public. The list of assets covered by this description covers Regulatory and Warning signs, direction and information signs, street nameplates, seats, fencing, knee rails bollards etc.

Inventory

The Unlit Signs and street furniture asset group within the Council's highway network, totals 5684 recorded assets in number. It is a relatively low value asset, but never less an important asset group with a gross replacement cost (GRC) estimated at approximately £0.85 million.

- Other assets included within this group also include:
- Public Right of Way signing
- Bus stop poles
- Bus shelters (non-advertising)
- Salt/grit bins
- Bollards and knee rails and fences
- Street furniture (seats, sculptures, clock towers, planting containers
- Street nameplates
- Alley gates

The above assets are included in Whole of Government accounts returns and currently have a gross replacement cost (GRC) estimated at approximately £8.64 million.

The existing data is held on the Symology Insight system or in hardcopy format. There are video survey lists of signs on A & B roads, but unfortunately the size and type of sign is not recorded. More work is to be carried out to raise confidence levels in this data but is not currently a high priority.

Traffic Regulation Orders (TRO's) are all recorded and are also held in hardcopy

format.

Some boundary fences are recorded on purchase agreements for land needed for road improvements.

There are proposals to trial further hand held data capture devices for use by Highway Inspectors. It is hoped that these devices when fully introduced into working practices, can assist in the detailed capture of missing inventory for various asset types including unlit signs and street furniture.

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

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 specific detailed condition inspections undertaken on unlit signs anywhere on the network, or on reflective markers, bollards, or other street furniture.

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

Current Condition

In most cases, the condition of advance directional signs, regulatory and warning signs on classified roads will be checked, and deficiencies reported back to the Council. In some areas this may also true for unclassified roads. However, the majority of signs on unclassified roads, reflective markers, nameplates and bollards are not currently recorded for inspection, and defects are responded to on a reactive basis. It is proposed that the condition of these assets can be determined and captured over time as the new hand held devices become introduced.

Desired Condition

All signs, chevrons etc., are unobstructed and are visible and legible at distances which allow them to be read by highway users as they pass by at speeds appropriate to the type of road, during day or night. All missing or defective signs are to be repaired promptly. Priority is to be given where necessary, to rectifying defects with regulatory and warning signs, such as speed limit signs and give way signs.

Existing signage should be reviewed for condition and need before completing an improvement scheme on any given site. An inventory needs to be created, and new assets added with a record of the type of asset and preferably supported by a photograph. There should also be an ongoing review of all materials being used.

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

Option Appraisal

Creation/ Acquisition

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

Middlesbrough's Unlit Signs asset can be increased when new roads are built. For instance, the A66 Middlehaven Interchange added approximately 20 new unlit signs to the highway inventory. Similarly, de-illumination where permitted may also increase the inventory of unlit signs.

New developments that are adopted as highway maintainable at public expense usually add to the unlit signs and street furniture assets.

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, Reflective Markers and Bollards are assessed for cleaning and repair upon receipt of reports, although many signs are neither inspected nor cleaned.

  Missing or illegible signs are prioritised for replacement, subject to available resources, 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. However, existing signing is referred to the appropriate officers to review ahead of planned maintenance taking place. In some cases signs and bollards may be replaced/upgraded as part of traffic management or safety schemes, and also as part of a de-illumination scheme.

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

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, or regulations require the reduction in number or relocation of signing.

Budget Optimisation

Funding Allocations

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 budgets

The revenue budget supports reactive maintenance of the asset and is based on historic levels of expenditure.

Performance Gaps

A full inventory and condition survey for all unlit signs, reflective markers, bollards and other street furniture across all road classes has not been completed and needs to be addressed. It is proposed that further trials of hand held data capture devices will be carried out by Highway Inspectors. It is hoped that this will enhance the levels of information held against this inventory.

As the current condition of all unlit signs and other street furniture across the network is not fully known, it is recognised that a proportion of this asset will not be in a desirable condition.

The provision of speed restrictions across the Borough and in particular the extension of the 20mph zones, along with other traffic management and safety schemes, funded from the capital budget, have had no corresponding increase in the revenue budget to maintain them. This inevitably will result in a declining asset condition that will require a risk assessment to prioritise the limited reactive maintenance that can take place.

Non recoverable accident damage, vandalism and theft have all increased substantially in recent years. This means that many signs and other street furniture have to be replaced well before the end of their serviceable life. In many cases, there is insufficient revenue budget available to fund their replacement, and therefore many sign plates etc., have to be risk assessed to determine if they can be left missing for extended periods of time.

Due to the limitation of resources, we have to accept that lower priority unlit signs that are not inspected regularly, may not be replaced quickly, and may remain missing or unknown, unless noted by staff or reported by the public.

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

Due to austerity measures, there is a lack of funding for renewals of unlit signs, markers, bollards and other street furniture when they become damaged or are missing. This can lead to a poor impression of the maintenance of this asset in some locations, and is something that we shall monitor through consultation and public surveys to see if it compromises customer expectations.

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

7.3.11 Vehicle Restraint Systems and Pedestrian Guardrails

Vehicle Restraint Systems (VRS) and Pedestrian Guardrails are provided to separate and protect various categories of highway user from each other, e.g. guardrails near traffic lights separate pedestrians from vehicles; Vehicle Restraint Systems on central reservations of dual carriageways separate opposing flows of traffic. Appropriate systems may be provided to protect the highway user from specific hazards, e.g. bridge parapets, embankments, trees etc.

Inventory

Although the Vehicle Restraint Systems (VRS) and Pedestrian Guardrails component of the Council’s highway network, (approximately 15.1km of VRS and 20.1km of Guardrail) is small in overall value, it is never the less an important asset group with a gross replacement cost (GRC) estimated at approximately £7.24 million.

photo to replace with more standard barrier

Inventory records are good in relation to Vehicle Restraint Systems, but are limited for Pedestrian Guardrails. Consequently, the condition data for these assets is also limited. There is at present no formalised system for managing or updating this inventory data, but is hoped to be incorporated into the inspection regime as new hand held data capture devices are introduced to Highway Inspectors.

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

Condition

Assessing Condition

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

Since pedestrian guardrails are not routinely inspected it is recognised that a proportion of this asset will not in a desirable condition.

Current Condition

Vehicle Restraint Systems have 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, however much of the VRS throughout Middlesbrough is known to be in need of replacement and at the end of its expected life cycle. Wooden posts are now sub-standard and, where identified, they need to be changed to the current specification.

There are a number of types of pedestrian guardrails used for differing circumstances. All intended to protect the public from vehicles at junctions or other areas of potential conflict, they are vulnerable to vehicle impact and need to be repaired if found to be in a dangerous condition. Timber barriers and fences are not to be used for separation of pedestrians and vehicles.

Desired Condition

Vehicle Restraint Systems and Pedestrian Guardrails should be in a serviceable condition and fit for their purpose. All substandard installations should be replaced as a matter of priority, where required.

Critical sections of highway, such as the A66 through central Middlesbrough, suffer exceptional levels of damage and subsequent disruption to the travelling public. This is due mainly to the number of interchanges and high event sections along this corridor, carrying up to 85,000 vehicles per average weekday.

For this reason, Middlesbrough Council have decided that it should change the present VRS from steel box section rails and posts, to a continuation of the extruded concrete barrier, introduced several years ago close to the A19 interchange. As this will give a significant life cycle saving to the authority, this is to be carried out at the earliest opportunity.

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

Option Appraisal

Creation/Acquisition

Amendments to the existing highway network, or changes in legislation, may generate the installation of new Vehicle Restraint Systems and pedestrian Guardrails.

Middlesbrough's Vehicle Restraint Systems and pedestrian Guardrails assets is increased when new roads are built. For instance, the A66 Middlehaven Interchange added approximately 300m of new Vehicle Restraint Systems, 200m of new pedestrian Guardrails, and 50m of vehicle restraint bridge parapets to the highway inventory.

New developments that are adopted as highway maintainable at public expense often add to this group of assets.

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 Vehicle Restraint Systems (VRS)

- Reactive:

  For VRS and pedestrian guardrails, dangerous sections will be made safe within 24 hours and permanent repairs are targeted for completion within 2 weeks. (For the A66 we have had to make an exception with emergency repairs to make safe the carriageway being carried out as an emergency response, and necessary replacement being planned for off peak or the next cyclic maintenance closure.

- Planned:

  Very little planned maintenance (renewals or replacements etc) is undertaken on VRS and pedestrian guardrails. As mentioned above, the A66 is an exception, due to the disruption caused by unplanned and unannounced maintenance activity on this busy carriageway.

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

Disposal or Decommissioning

Vehicle Restraint Systems and Pedestrian Guardrails may be removed when parts of the highway are Stopped Up. They can also be decommissioned when changes to the highway network require their omission or relocation.

Budget Optimisation

Funding Allocations

The funding formula for Vehicle Restraint Systems and Pedestrian Guardrails is the same as that described previously for other highway assets. When capital budget is used to improve these assets, this is normally undertaken as part of major highway improvement scheme.

The funding formula has an element of the needs based allocation allotted for planned maintenance activities. It also is to be used for exceptional requirements when a Challenge Fund bid can be submitted for consideration of funding. This fund generally is for far larger schemes than could be envisaged in isolation for highway maintenance needs, and has been used (unsuccessfully) to bid for the replacement of the A66 VRS with an extruded concrete barrier system.

Within the 'Needs' based funding element, we need to allow an annual budget allocation commitment towards carrying out regular cyclic inspections of the Vehicle Restraint Systems as previously described. These inspections are carried out by accredited inspectors, and would need to be procured if not carried out by Highway Inspectors. The cost of this activity is currently estimated to cost around £15,000 per annum.

As with other highway projects, the Council may supplement this capital allocation by using prudential borrowing. Whilst such borrowing may provide capital funds, it has associated debt charges that the Council has to be able to repay. Under normal circumstances, to take this option, it would require a sound 'invest to save' case to be established, this has been found to be possible with the A66 VRS proposals, due to it being maintenance free for a greatly extended life cycle.

Performance Gaps

The inventory data for Vehicle Restraint Systems is considered to be quite accurate, however, condition data is unreliable and in need of full review. The pedestrian guardrails are less well documented both in terms of inventory totals and condition. The current condition of all VRS and pedestrian guardrails needs to be established as soon as possible, but it is reasonable to assume that a fairly large proportion of these assets are not in a desirable condition.

One such example, seen by thousands of motorists daily, is the A66 corridor through Middlesbrough. This highway with its many event sections has suffered the rigours of many RTC's, causing considerable damage to lengths of VRS and significant delays to users of this highway. A risk assessment undertaken to look at this problem has resulted in it becoming a high priority for intervention, while presenting an excellent invest to save opportunity by changing the VRS to an extruded concrete barrier system.

Generally, due to the considerable gap in the data available and the purpose of the assets concerned, we need to develop a comprehensive register of the high risk areas in order to assess the need for additional resources to replace these Vehicle Restraint Systems and Pedestrian Guardrails.

As it is often not possible to complete reactive repairs to safety fences and pedestrian barriers within the standard 2-week timeframe, this is a particular service operation that needs reviewing.

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

7.3.12 Road Markings & Studs

Road markings cover all forms of white and yellow lines or symbols and may be thermoplastic screed or paint. Road studs can include the reflective “cats eye” or adhesive reflective equivalents, used to indicate the centre or edge of a carriageway. This asset group also includes the stainless steel crossing markers, occasionally used to define lane movements through complicated multi-lane junctions.

Inventory

Although the road markings and studs installed on the Council’s carriageways have been surveyed over our classified road network, the unclassified road network is largely unrecorded. The asset group inventory is in need of verification but is thought to consist of some 147km of line and 2567 studs. This may be relatively small in overall value, however, they are an integral highway asset, estimated to have a gross replacement cost (GRC) of approximately £0.11million.

There is no formalised system for collecting, maintaining or updating inventory data relating to road markings and studs. There is, however information in respect of regulatory markings, and these are inspected regularly for upkeep and enforcement purposes.

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

Condition

Assessing Condition

Our Highway Network Management Plan suggests that all road markings and studs on the highway network, including all regulatory markings on the road network, should have an annual service inspection carried out.

It is recommended in national guidance that inspections should assess the following:

- Road markings and reflecting studs should undergo an annual night time 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)

Due to the very small percentage of highway network that is not illuminated, combined with the impact of austerity measures, there is currently no rigid inspection regime for this part of the asset in place.

Current Condition

Due to the situation described above, the condition of road markings and studs on the highway network is not documented. Regulatory markings are in a better condition than non-mandatory road markings, this has been made necessary in order to effectively enforce traffic regulation orders. The classified road network is being inspected and maintained by the Highways and Transportation Service, and is under risk assessment based upon use to develop Life Cycle Plans for the Lining and studs future maintenance. There is little known about the unclassified road network lining and studs inventory or condition. This part of the network is only being maintained on a reactive basis by Streetscene Services, being prioritised against available resources and other service pressures.

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.

When resources permit, an inventory of all road marking and studs needs to be collected, and then included within the annual inspection regime to determine condition and needs.

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

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 has added new lining and studs assets to the highway inventory.

New developments that are adopted as highway maintainable at public expense usually add to the road markings assets and occasionally to the stud's asset.

Maintenance, Renewal or Replacement and Upgrading

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

- Cyclic:

  The repair / renewal of essential road markings and studs on the highway network, undertaken following highway safety inspections.

- Reactive:

  Reinstatement of essential road markings and studs, following reports from the public, council staff or police that are not previously identified, or cannot wait for planned maintenance programme.

- Planned:

  Planned maintenance (renewals or replacements) is undertaken on the classified road markings and studs. This is derived from risk assessed life cycle plans, and frequencies are based upon traffic flow data. In most other cases, this work is only undertaken on parts of the network when re-surfacing or surface dressing has been completed.

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

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 take place as a result of legislation; mandatory requirements or road safety schemes are introduced.

Budget Optimisation

Funding Allocations

The funding formula for Road markings and studs is the same as that described previously for other highway assets. When capital budget is used to improve these assets through planned maintenance, or undertaken as part of major highway improvement scheme, the funding formula element of the needs based allocation has to be allotted for these maintenance activities.

Cyclic and Reactive maintenance works undertaken on Road markings and studs are generally funded through Revenue sources.

Performance Gaps

A full inventory and condition survey of all road markings and studs has not been completed and should be carried out at the earliest opportunity. Inventory data has been collated for much of the classified road network, this will enable us to introduce risk based life cycle planning of maintenance on this part of the network. There are also complete records on the location and type of Traffic Regulation Order (TRO) markings. This ensures enforcement can take place.

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 unclassified 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 E & F.

8.0 INVESTMENT STRATEGIES

8.1 SERVICE PRIORITIES

8.1.1 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 before 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.

8.1.2 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.

8.1.3 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.

8.1.4 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 C) 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.

8.1.5 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; 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.

8.1.6 Carriageway Profiles

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.

BV 224b - Condition of Unclassified Carriageways

Graph 1 removed

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

8.1.7 Footway Profiles

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.

Graph 2 removed

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.

8.1.8 Traffic Signals & Telematics Profiles

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

- No allowance has been made for any works associated with the Traffic Management Act.
- The figures are based on existing asset levels and known expansion. No allowance has been made for future growth in the asset base.
- The profiles are based on actual asset age.

Graph 3 removed

8.1.9 Lighting Profiles

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.

8.1.10 Drainage Profiles

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.

Graph 4 removed

8.1.11 Structures Profiles

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

Graph 5 removed

8.1.12 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.

8.2 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 G.

9.0 PERFORMANCE MONITORING

Performance Monitoring involves monitoring the performance of the TAMP and feeding the results back through the asset management process. Its main aim is to identify potential improvement points and how they should be managed.

9.1 EXISTING PERFORMANCE MEASURES

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.

9.2 PROPOSALS FOR FUTURE PERFORMANCE MONITORING

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 F.

10.0 WORK PROGRAMMING

Work programming involves identifying the work required to fulfil the specified performance levels into programmes of maintenance works.

10.1 FORWARD WORKS PROGRAMMING

10.1.1 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.

10.1.2 Works Programming 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 C) 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:

Diagram 1 removed

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.

Graph 6 removed

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).

Graph 7 removed

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.

10.1.3 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.

11.0 OVERALL RISK IMPLICATIONS OF THE PLAN

11.1 INTRODUCTION

The management of risk is central to the successful delivery of public services. It is also the foundation to an effective Asset Management approach towards highway maintenance.

It is critical that the Council can clearly demonstrate to local residents and other key stakeholders that all risks are fully considered in the delivery of services. The Council is committed to an effective, systematic and proportionate approach that will minimise risk and so enable the Council to optimise its contribution to the achievement of the vision for Middlesbrough and improved outcomes for local communities.

Building on previous documents and progress to date, the Council strategy aims to promote continuous improvement in the effectiveness of risk management across the Council. It sets out the Council's aims and objectives for risk management and outlines the corporate framework established to identify and assess risks, decide on appropriate responses and track progress.

Risk management is a critical element of corporate governance and is a statutory requirement for public sector organisations. The Council is required to provide for the health and safety of its elected members, employees and those that it serves. It has a duty to ensure effective planning for civil emergencies. It is required to protect its assets and to take steps to minimise losses and liabilities.

Furthermore, 'Risks' must be reduced to an acceptable level, or if possible eliminated. Robust risk management will enable the Council to effectively discharge its responsibilities and deliver its various functions. The Council is committed to maintaining a systematic and cost-effective approach to the identification and management of risk that is consistent with best practice and complies with statutory and audit requirements.

The Council's Risk Management Strategy is reviewed regularly to ensure that it reflects best practice and promotes continuous improvement in the management of risk. It provides a comprehensive framework to support elected members and officers in their work to address risk and so enable the Council to discharge fully its responsibilities in this area.

The strategy identifies the objectives and benefits of managing risk, outlines responsibilities for risk management, and provides an overview of the process used to manage risk successfully. This strategy has been translated in this document to specifically target the risks associated with the Management and Maintenance of highway assets.

The role of risk management in the context of highway 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

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The strategy identifies the objectives and benefits of managing risk, outlines responsibilities for risk management, and provides an overview of the process used to manage risk successfully. This strategy has been translated in this document to specifically target the risks associated with the Management and Maintenance of highway assets.

11.2 THE RISK MANAGEMENT PROCESS

Risk Analysis framework currently used throughout 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.7 September 2012). The strategy identifies the objectives and benefits of managing risk, outlines responsibilities for risk management, and provides an overview of the process used to manage risk successfully.

It is not the intention of the Transport Asset Management Plan to either repeat or replace the Council's strategic processes detailed and contained within the above document, hereby referred to as the "MC Risk Management Strategy". The objective is to supplement and add detail where necessary, that will enable risk based decision making to provide the best value, 'Optimum' or 'Achievable' levels of service of our highway assets.

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

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, this covers '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.

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11.3 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 or achievable) 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 typical examples of risks to be considered are:

i) Carriageways - Condition worsening, leading to need for major structural strengthening or reconstruction.

ii) Drainage - Gullies becoming blocked, leading to flooding of the highway and possibly property.

11.4 ASSESSING RISKS

Once risks have been identified, an assessment of their likelihood and impact needs to be carried out. This is done in a consistent manner to give a balanced view of the risk levels associated with the different service options that are considered achievable.

The following table of LIKELIHOOD and IMPACT has been 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 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
	High Risk
	Medium Risk
	Low Risk

NB for an explanation of the risk categories refer to "Middlesbrough Council Risk Management Strategy"

11.5 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 taken from the "MC Risk Management Strategy". This shows the direction of travel required to achieve the preferred condition.

11.6 AN EXAMPLE OF A 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	

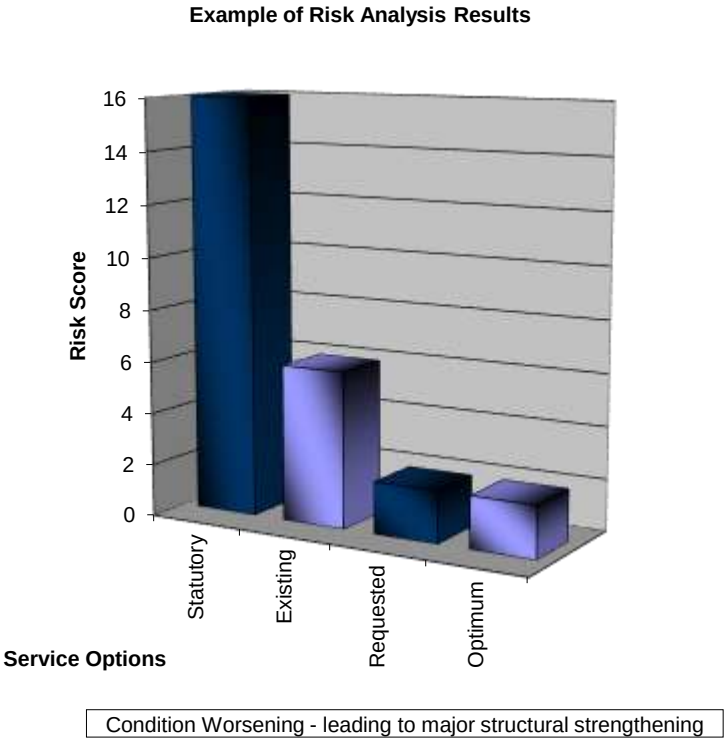
Carriageways - Plot of each service option for risk of Condition Worsening:

		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:



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

11.7 THE RISKS ASSOCIATED WITH ASSETS

Below are lists of the key tactical risks associated with each of the highway asset types. When reviewed against the different Service Options these risks can be scored and the results are displayed graphically below (a full analysis is contained within Appendix E). Also shown are recent results from our consultation processes indicating existing levels of public satisfaction.

11.7.1 The Key Tactical Risks Associated with Carriageways are:

- Level of maintenance of the network leading to very poor performance as measured nationally by the former BVPI processes. This could result in intervention by central government by way of financial penalties through the Incentive fund element not being fully allocated.
- 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 and efficiency, leading to a lower Incentive fund element being awarded.
- An increase in the carriageway maintenance backlog, combined with the resulting decrease in the value of the asset.
- Low levels of public satisfaction with the condition of carriageways, and subsequent decline in our CQC results.

11.7.2 The Key Tactical Risks Associated with Footways are:

- Level of maintenance of the network leading to very poor performance as measured nationally by the former BVPI processes, possibly resulting in intervention by central government by way of financial penalties through the Incentive fund element not being fully allocated.
- An increase in the number of successful third party claims associated with trips, falls and the like.
- Failure to demonstrate improvement in performance and efficiency, leading to a lower NHT assessment results.
- An increase in the footway maintenance backlog, with the resulting decrease in the value of the asset.
- Low levels of public satisfaction with the condition of footways.

11.7.3 The Key Tactical Risks Associated with Cycleways are:

- An increase in the number of successful third party claims associated with surface defects and caused by the resulting falls and damage to cycles.
- An increase in the cycleway maintenance backlog, with the resulting decrease in the value of the asset. (This is only relevant to remote cycle routes, not those sharing footways or carriageways).
- Low levels of public satisfaction with the condition of cycleways.

11.7.4 The Key Tactical Risks Associated with Structures are:

- Structure fails owing to inadequate maintenance. (Depending upon the structure hierarchy, this could be catastrophic for traffic movements and commerce).
- 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 structure, leading to increased costs through the need for more frequent monitoring inspections and possible traffic loading restrictions.
- Injury sustained by Highway user as a result of a defect.

11.7.5 The Key Tactical Risks Associated with Drainage are:

- Blocked gullies, piped systems, SuD's, 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 carriageways or structures.
- Third Party claim from Highway user due to flooding resulting from blocked drainage network.

11.7.6 The Key Tactical Risks Associated with Street Lighting are:

- Low level of maintenance and replacement resulting in poor performance as measured by former BVPI processes.
- Reduced opportunity for significant energy savings through use of energy efficient luminaires.
- Reduced road safety due to poorly maintained lighting, leading to increased accidents and increased numbers of people killed or seriously injured.
- Increase in tripping accidents suffered by pedestrians in poorly lit areas.
- Increased risk of 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, and subsequent increase in reactive maintenance costs combined with a resulting decrease in the value of the asset.
- Increased crime and disorder associated with poor street lighting and a rise in the fear of crime.

11.7.7 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 increased congestion and adverse impact on local commerce.
- An increase in the maintenance backlog combined with additional reactive maintenance costs, and a resulting 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.

11.7.8 The Key Tactical Risks Associated with Public Rights of Way (PROW's) are:

- Low level of maintenance and replacement resulting in poor performance as measured by the former BVPI processes.
- Bridge damage or failure leading to possible personal injury or closure of the highway.
- Bridge asset deterioration due to inadequate maintenance, leading to possible requirement to replace structures.
- 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 cyclic maintenance, leading to increased cost for reactive maintenance intervention.

11.7.9 The Key Tactical Risks Associated with Trees, Hedges, Verges & 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.
- Tree roots causing damage / accident claims from trips, subsidence and heave.
- Obstruction to highway visibility can increase risk of accidents.
- Damaged verges causing claims / eyesores and public dissatisfaction.
- Debris build-up at edge of carriageway leading to accidents due to reduced carriageway width and loss of surface texture.
- Public dissatisfaction due to loss of amenity where verges are converted for car parking provisions.
- Landscape areas and verges become overgrown and unkempt leading to low levels of public satisfaction.

11.7.10 The Key Tactical Risks Associated with Unlit Signs & Street Furniture are:

- Missing or illegible signs that will reduce safety or cause delay and disruption to the Highway user.
- Risk of claims from damaged street furniture.
- Damage to verges, paved areas and property by inappropriate vehicle trespass.
- Asset deterioration due to inadequate routine maintenance, leading to increased reactive maintenance costs.

11.7.11 The Key Tactical Risks Associated with Vehicle Restraint Systems and Pedestrian Guardrails are:

- Poorly maintained vehicle restraint systems and pedestrian guardrails, allowing vehicles to conflict with people and other hazards.
- Pedestrians and motorists alike, not being fully protected when using the highway.
- Asset deterioration due to inadequate maintenance with the resulting decrease in the value of the asset, along with additional costs for reactive maintenance intervention or full replacement.

11.7.12 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.
- Increased dissatisfaction where lining is inadequate to properly guide road users safely.
- Risk of claims where markings are not legible.
- Asset deterioration due to inadequate maintenance, leading to unplanned reactive intervention costs.

12.0 IMPLEMENTATION PLAN

12.1 Determining Needs

Before we can start to determine what our various objectives are with regards to improving or simply maintaining the condition of the previously mentioned highway asset groups and elements, we need to know the present condition of the assets in order to compare with recommendations or Council policy.

We therefore need to compare our current practices and levels of service against the desired levels of service. In doing so it is right that we should be taking into consideration, recognised good practice from other authorities.

This process is known as the Gap Analysis, and the 'gap' needs to be understood and made known for each of the asset types. Understanding the scale of this exercise, limitations of resources and the greater financial implications associated with more major asset types, we will prioritise our assessments and gradually address the gap analysis of the whole of the highway assets over an extended period of time. This continues the 'risk' based approach and can be related to our previously determined hierarchies.

12.2 Gap Analysis

The gap analysis will provide us with the information we require to move from the present levels of service and achieve our required (optimum or achievable) levels of service.

In carrying out this analysis, we shall consider the following:

- **Gap** – What are the differences between current and desired practice?
- **Cost** – What are the costs of closing the gaps?
- **Timescales** – How much time is needed to make progress in closing the identified gaps?
- **Benefit** – How will the proposed changes benefit the overall approach to asset management and the desired outcomes? This should also consider the financial benefits.
- **Priorities** – Which items are most crucial to meet the requirements and will achieve the maximum benefit for the minimum cost?
- **Resources** – Can resources be made available to action the desired changes?

It is the outcome from the gap analysis processes that we shall use to set out our proposals for our Implementation Plan.

The Implementation Plan will summarise the findings from the gap analysis and describe:

- **Actions** – The required actions and those responsible for their completion.
- **Communication** – A communication strategy to inform affected staff.
- **Programme** – A proposed programme, possibly including a staged delivery (subject to approval).
- **Funding** – The funding requirements.
- **Review** – The review process proposals.

12.3 The Implementation Plan

Our Implementation Plan will be reported to the 'key decision makers' annually in order to inform them of the varying funding requirements, dependent upon the levels of service that are agreed to be delivered.

In making the case, ‘key decision makers’ will need to be informed and engaged. We will seek their buy-in early on in our planning process. This we hope will result by providing evidence of good practice and potential benefits. The Audit Commission Report ‘Going the Distance’ provides a number of recommendations for councillors and senior managers that support the case for asset management as currently being proposed.

Arrangements are to be put in place to monitor progress against the Implementation Plan, and where appropriate, take corrective action. We propose to approach the monitoring of our performance through the use of benchmarking processes, using established and consistent measures.

We appreciate that we need to be able to ensure that key decision makers are kept fully informed of the benefits derived from this approach to managing the highway assets. For this reason, we shall ensure that each of our staged processes are fully documented and recorded within the Asset Register.

Our processes and business cases will be subject to regular review, and any changes found necessary will be documented, implemented and reported annually. Reports shall also outline developing risks brought about through the need for additional skills training and other resource issues identified as this asset management approach matures.

13.0 ASSET MANAGEMENT ROLES & RESPONSIBILITIES, LEGISLATION, GUIDANCE DOCUMENTS, GLOSSARY OF TERMS, AND BIBLIOGRAPHY

13.1 Asset Management Roles and Responsibility

Person/ People	Role/ Responsibility
▪ Elected Members & Senior Decision Makers	▪ Leadership, culture and direction for asset management across the authority
▪ Senior Management	▪ Demonstration of senior management commitment
▪ Director with Responsibility for Highways	▪ Leadership, culture and direction ▪ Embedment of behaviours related to a whole life view ▪ Delivery of asset management benefits ▪ Asset Management Champion
▪ Highways Asset Manager	▪ Develop highways asset management strategy ▪ Review asset management activities and develop improvements where necessary ▪ Develop documentation to support asset management ▪ Develop the Highways Infrastructure Asset Management Plan and resource requirements ▪ Liaise with Stakeholders ▪ Ensure work programmes are consistent with levels of service ▪ Work with business and information systems to ensure they meet asset management needs
▪ Roads and Footways Management	▪ Paved areas ▪ Drainage ▪ Geotechnical assets ▪ Fences, walls, screens and environmental barriers ▪ Road restraint systems ▪ Road markings and road studs ▪ Road traffic signs ▪ Landscaped areas & verges ▪ Signs and bollards
▪ Structures Management	▪ Bridges ▪ Large culverts ▪ Small span structures

	▪ Retaining walls ▪ Tunnels ▪ Sign gantries
▪ Lighting Management	▪ Street Lighting ▪ Illuminated signs and bollards ▪ Energy
▪ Information Technology Management	▪ Traffic signals ▪ Variable message signs ▪ Information systems
▪ Data Collection and Management	▪ Inventory ▪ Condition ▪ Traffic ▪ Construction and maintenance records
▪ Programme Management	▪ Portfolio of projects in the works programme ▪ Integrate and optimise projects to minimise: ▪ Impact on the network ▪ Procurement associated with projects
▪ Maintenance Management	▪ Maintenance works ▪ Integrated and optimise planned works ▪ Procurement associated with maintenance ▪ Minimise impact on the network
▪ Inspection and Condition Measurement	▪ Safety and serviceability inspections ▪ Condition surveys

13.2 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 effects of operations, and

Health and Safety. To assist in guiding practitioners, the bibliography at 13.5 below has been produced.

13.3 Guidance Documents

UKRLG – UK Road Liaison Group Codes of Practice;

Well Maintained Highways for Highway Maintenance Management 2005 (last updated 18/09/2013 and now under review)

Well Lit Highways 2004 (last updated 13/08/2013 currently under review)

Management of Highway Structures 2005 (last updated 13/08/2013 currently under review)

HMEP – Highways Maintenance Efficiency Programme;

The Highway Infrastructure Asset Management Guidance 2013

The Potholes Review Report 'Prevention and a Better Cure' 2012

DfT – Department for Transport;

The Transport Resilience Review 2014

Inclusive Mobility 2005 – A guide to best practice on access to pedestrian and transport infrastructure.

CIPFA – The Charted Institute of Public Finance and Accountancy;

The CIPFA Code for Transport Infrastructure Assets 2013

DfCLG – Department for Communities & Local Government;

The Audit Commission Report 'Going the Distance' 2011 (now held in the National Archives)

Middlesbrough Council Documents

The Transport Asset Management Plan 2007 (TAMP) (under review)

Local Transport Plan 2011-2016 (LTP)

The Highway Network Management Plan 2006 (under review)

The Highway Maintenance Plan 2006 (under review)

The Highway Maintenance Specification (under review)

The Highway Safety Inspection Manual 2007 (reviewed 2009)

The Street Lighting Maintenance Management Plan (including Telematics)

The Structures Maintenance Management Plan

'Middlesbrough 2020 Our Vision' 'the place to live work and visit'

13.4 Glossary of Terms

Additionality	Is the extent to which something happens as a result of an intervention that would not have occurred in the absence of the intervention
Asset	An item to which a value can be assigned.
Asset Management	Economic benefits provided by highway maintenance and improving highway performance, value for money through longer term investment, meeting stakeholder expectations and public satisfaction.
Asset Management Policy	A short and concise document that describes the principles adopted in applying asset management to achieve an authority's strategic objectives.
Asset Management Strategy	A clear and concise high-level document setting out how the highway infrastructure asset management will be delivered in order for an authority to meet its long term corporate goals and objectives.
Audit Commission	The Audit Commission was an independent public corporation that existed between April 1983 and 31st March 2015. Following its closure, it has been replaced by a new local audit framework from 1st April 2015.
Barriers and fences	Structures to guide highway users within a safe place / area.
Business Case Context	Consideration of a problem and the possible impact on local economy, access to services, use of the highway network, value of the highway network, existing service arrangements. Being addressed through asset management and identifying gaps from recognised good practice.
Business Case Review	Annual review, achieving the benefits, meeting the levels of service.
CIPFA	The Charted Institute of Public Finance & Accountancy.
Code of Practice	A set of rules according to which people in a particular profession are expected to behave.
Communication Strategy	How the TAMP will be communicated to stakeholders; primarily the public including the wider community and road users.

Cycleways	Routes specifically designed for use by pedal cycles
Data Management Strategy	The means of the requirements for data and how the requirements may be met over the short term, medium term, and long term. Forms part of the asset management planning process.
Economic Drivers	Available or required funding that determines the direction and processes of change.
Executive Summary	Brief summary of key issues.
Financial Plan	The financial plan covers investment requirements for the short, medium and longer term. It ensures support for future budgetary requirements and that funding is appropriately targeted and effectively spent.
Gap	What are the differences between current and preferred practice.
Highway Maintenance Plan	A document that sets out the Council's operational requirements to maintain the network and identifies the resource requirements to deliver the maintenance service.
HMEP	Highway Maintenance Efficiency Programme (UK Roads Liaison Group) A guidance aimed at local authorities providing advice on asset management principles used to support more efficient highway asset maintenance.
Implementation Plan	The actions that are required to be undertaken over a time period.
Improvement Plan	The outcome of a performance review. It sets out the actions, resources and timescales required to achieve the expected outcomes of the improvement plan and the ultimate benefit it may provide to the authority and stakeholders.
Infrastructure (highway)	Large-scale facilities within the borough that are necessary for economic activity and town functionality: the road network is infrastructure as an example.
Investment Strategy	Details of funding required to deliver the lifecycle plans, and short, medium and long term annual works programmes.

Levels of Service	Levels of service describe the quality of services provided by the asset for the benefit of the customers. To determine levels of service we consider quality, quantity, reliability, responsiveness, environmental acceptability and cost.
Life Cycle Planning	A way of maintaining an asset from a new condition through to the end of its life, taking into account the necessary care of the asset including its maintenance needs and performance requirements – the result gives a cost per year for maintaining the asset.
LTP	Local Transport Plan
Maintenance Strategy	An approach to maintain the asset over the short, medium and long term. This strategy supports the development of the Lifecycle Plan.
Milestones	Key activity completion dates
Objectives	Aims and goals. Key objectives meaning the main aims and goals
Operating Model	A system or way of operation to achieve specified outcomes
Optimal	Most desirable of favourable
Options – business case	Cost benefit analysis, including 'do nothing', reasoned recommended option, if change is recommended, impact of not changing
Pedestrian Guardrails	Structures that separate pedestrians and vehicles where additional safety is required
Performance Monitoring	It is how the TAMP is monitored and results are fed back into the asset management process. Identifies potential improvements/ deficiencies.
Priorities	Which items are the most crucial to meet the requirements
Prudential Code (The)	A professional code of practice to support Local Authorities in taking Capital Investment Decisions and enables them to ensure that capital programmes are affordable, prudent and sustainable.
Resources	Funding available to provide services; can also be time, competencies & skills available

Risks	Statistical chance or danger of something happening, particularly a failure – affecting reputation, finance, and delivery.
Risk Action Plan	A key input into lifecycle planning and works programming. Addressing the risk register, evaluation, and mitigation required to be undertaken, along with timeframes and responsibilities for managing risk associated with the Assets being considered.
Road markings	Marks on the ground on roads and footpaths that helps users travelling across them, e.g. the line down the centre of the road.
Shortfall	When the funding available falls short of what is required – the shortfall is the difference between the two: required and available budgets.
Social Drivers	Social patterns (gender, ethnicity, religion, location), institutions, agencies, social norms and values – that determine the direction and processes of change.
Stakeholders Key	People or groups with direct interests, involvement, or investment in the highway assets e.g. residents, businesses, visitors to the town, services & organisations, charities, government departments, politicians
Statutory Service	A service which must be provided according to an Act of Law
Strategy	A carefully devised plan of action to achieve a goal or the art of developing or carrying out such a plan
Structures	Objects which are built within the environment like bridges, embankments, and retaining walls
TAMP	Transport Asset Management Plan. Part 1 An Introduction to Asset Management. Part 2 Detailed Plan.
Telematics	Transmission of computerised data e.g. computers controlling traffic signals
Timescales	How much time is needed to achieve an outcome
Transport Modes	Different means of transport e.g. bus, rail, car
Vehicle Restraint System (VRS)	Structures that retain vehicles within the roadway where additional safety is required

Verges	Strips of land at the side of the road or footway and can be open green spaces or hard landscaping
WGA	Whole Government Accounting – data reporting to central government on the Council's highway assets that determines the gross value of the whole of the towns assets.
Whole Life Costing	A cost-benefit analysis that compares maintenance options with the objective of selecting the one with best outcomes at lowest cost.

13.5 Bibliography

Acts of Parliament

The Highways Act 1980
The New Roads and Street Works Act 1991
The Traffic Signs Regulations & General Directions 2002
The Road Safety Act, 2006
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

Sex Discrimination Act 1975

Race Relations (Amendment) Act 2000

Equality Act 2006

Age Discrimination (pending)

Although not legislative, there are several more documents provided to give guidance to practitioners and decision makers alike. These are recommended nationally to be considered for adoption by Local Authorities and service providers when determining and providing their levels of service. These in turn have assisted Middlesbrough Council in producing its own internal policy documents shown above in 13.3.