Annex A

Bracknell Forest Council

Highways Infrastructure Asset Management Plan

October 2015

Bracknell Forest Council

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Executive Summary

Asset management has been widely accepted by central and local government as a means to deliver a more efficient and effective approach to management of highway infrastructure assets through longer term planning, ensuring that standards are defined and achievable for available budgets. It also supports making the case for funding and better communication with stakeholders, facilitating a greater understanding of the contribution highway infrastructure assets make to economic growth and the needs of local communities.

The demand for a more efficient approach to the management of highway infrastructure assets has come to prominence in the light of the fiscal challenges faced by both by central and local government as well as the devolved administrations. Recent developments include:

1. The CIPFA Code for Transport Infrastructure Assets, provides advice on how asset management should be implemented for local highway authorities to meet Whole of Government Accounts requirements.

2. The Audit Commission report Going the Distance recommends that local highway authorities in England adopt the principles of asset management when making investment decisions in order to optimise the use of available resources.

These developments provide a greater focus on asset management. Although the principles of asset management have been generally accepted, highway authorities throughout the UK have adopted a wide ranging approach to its implementation. Where asset management has been successfully adopted, demonstration of leadership and commitment from senior decision makers in supporting an asset management approach has been fundamental.

This Council accepts the principles promoted in respect of the need for ensuring good asset management. This Plan sets out Bracknell Forest's approach towards ensuring the most cost effective use of available resources.

Cllr C Turrell
Executive Member for Planning and Transport

Bracknell Forest Council

Executive Overview

Bracknell Forest Council

Policy for Asset Management

Bracknell Forest Council is committed to adopting an asset management approach for the highway network in order to support the Council's vision for:

"a place where all people can thrive; living, learning and working in a clean, safe and healthy environment."

The Council recognises that transport systems play a huge part in facilitating a high quality of life by meeting the needs of the individual whilst remaining responsive to the changing needs of business. In LTP3, the Council's transport vision has been defined as "to develop a sustainable transport system that supports local economy, provides choice and improves quality of life in a safe and healthy environment". To support this vision, a series of local transport objectives have been developed. In order to meet these objectives, the Council's Asset Management Policy will seek to:

Reduce delays associated with traffic congestion and improve reliability of journey times. The Council seeks to manage congestion by encouraging the location of development to reduce travel need and journey length and provide additional capacity through improvement schemes.

Adopting an asset management approach will allow optimised planned maintenance activities over the lifecycle of all highway infrastructure assets and coordinate works to reduce road closures allowing for maximum network availability.

Maintain and improve, where feasible, the local transport network. The Council will continue to develop and maintain an effective transport network that is resilient to the increase in demand and the effects of climate change and adverse weather conditions.
Our adoption of an asset management approach will take a long term view in making maintenance and investment decisions, making the most of the funding available.

Secure necessary transport infrastructure and services to support development. The Council will ensure that appropriate and necessary transport mitigation measures and more sustainable modes are planned for in new development from an early stage through engagement with developers and use of appropriate tools.
The Council's approach to asset management will ensure that highway infrastructure assets will be maintained to support delivery of services, taking into consideration the long term performance of the asset

Enhance the street environment. The Council will promote and create a street environment more attractive for all users, through measures such as high quality street furniture, landscaping and tree planting, for both the existing network and upcoming development.
Asset management will allow the performance of different materials to be assessed over their lifecycle, allowing for long term maintenance needs to be established and considered when making investment decisions.

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Asset Management Strategy

Priorities, Vision and Objectives

Bracknell Council recognises the importance of transport in delivering the Council's strategic priorities for thriving population, desirable place and cohesive communities. The Council's transport vision is:

> *"to develop a sustainable transport system that supports the local economy, provides choice and improves quality of life in a safe and healthy environment"*

This vision is described in the Council's Local Transport Plan 3, which also describes a set of objectives that underpin this vision.

The Council has an ambitious plan that involves the regeneration of Bracknell Town Centre, creates employment space and delivers new housing. The Council recognises the importance of transport services and transport infrastructure in order to meet these targets and deliver sustainable communities. At a time of increasing social, environmental and economic challenges, the Council remains committed to making better use of the available resources to manage transport infrastructure, through the implementation of an asset management approach.

An Asset Management Policy has been developed that defines how the implementation of asset management will support Bracknell Council in delivering its transport vision. This Asset Management Strategy describes how this Policy is to be delivered and sits within the wider asset management framework, and is one of the key strategic documents related to the delivery of the Council's highway services.

The Highway Asset

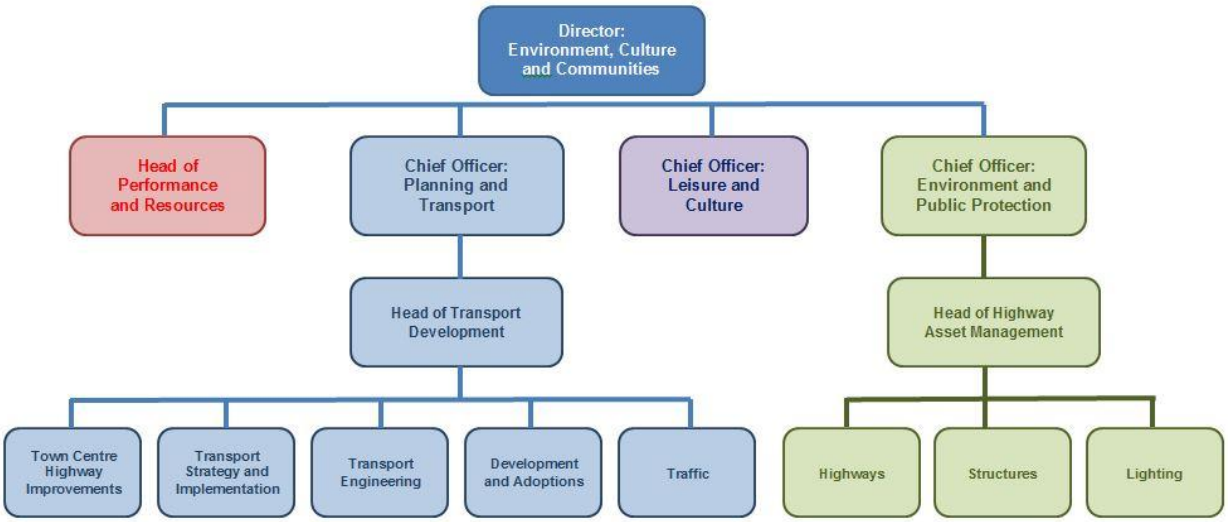
Bracknell's highway network comprises just over 460 km of carriageway, approximately two thirds of which is in an urban environment. The unclassifed network accounts for arount 60% of the asset. The footway and cycleway network is about 650 km. The asset also includes over 11,000 traffic signs and approximately 14,000 lighting columns. In terms of structures, the Council is responsible for 34 road bridges, 41 footbridges and numerous underpasses, subways, culverts, and retaining walls. The highway asset also includes safety fences, drainage, street furniture, road markings, traffic signals, intelligent transportation systems and soft estate.

The Council has calculated the asset value in accordance with the requirements for Whole of Government Accounts. In July 2014 this value was estimated to be £690 million, excluding the value of the land.

Bracknell experienced significant growth as a 'New Town' from the 1950s and much of the highway asset dates from that period of development. The recognised consequence – termed 'New Town Inheritance' - is that significant elements of the infrastructure reach the point of refurbishment at around the same time, which poses potential problems in terms of financial and lifecycle planning.

Managing the Highway Asset

Responsibility for managing the highway asset rests with the Council, which has set up an organisational structure to reflect the responsibilities for policy development and delivery of maintenance activities. This structure is summarised in the following diagram.



Organisational Structure

From this figure it can be seen that the planning and maintenance functions are separated, with different divisions of the Environment, Culture & Communities Department of the Council having responsibility for these functions. It is recognised that a strong link must exist between planning and delivery of maintenance, in order to ensure that resources are alocated to activities that safeguard the highway infrastructure and support the delivery of the overall transport objectives of Bracknell Forest Council. This Asset Management Strategy provides this link by describing the initiatives and processes that enable the implementation of asset management to support the delivery of these objectives. It also makes reference to the enablers, both tools and information, necessary for delivering the highway service effectively and efficiently. Effective joint working and delivery is ensured through regular operational and joint liaison meetings.

Funding for highway maintenance activities is currently allocated largely on a historic basis. Budgets are determined for the various asset groups and works are prioritised based on need in line with the national picture and reflective of the current economic climate. Over recent years there has been a reduction in the budgets available for both capital and revenue activites. The asset managenment appoach that is being developed will allow the Council to consider the implications of budget availability on the current and future performance of the highway asset.

Asset Management

Asset management is defined as a strategic approach to the optimal allocation of resources for the management, operation and preservation of transportation infrastructure.

This definition puts emphasis on the strategic role that asset management plays within an organisation and highlights the need for optimal use of resources and long term planning. Key aspects of asset management are therefore:

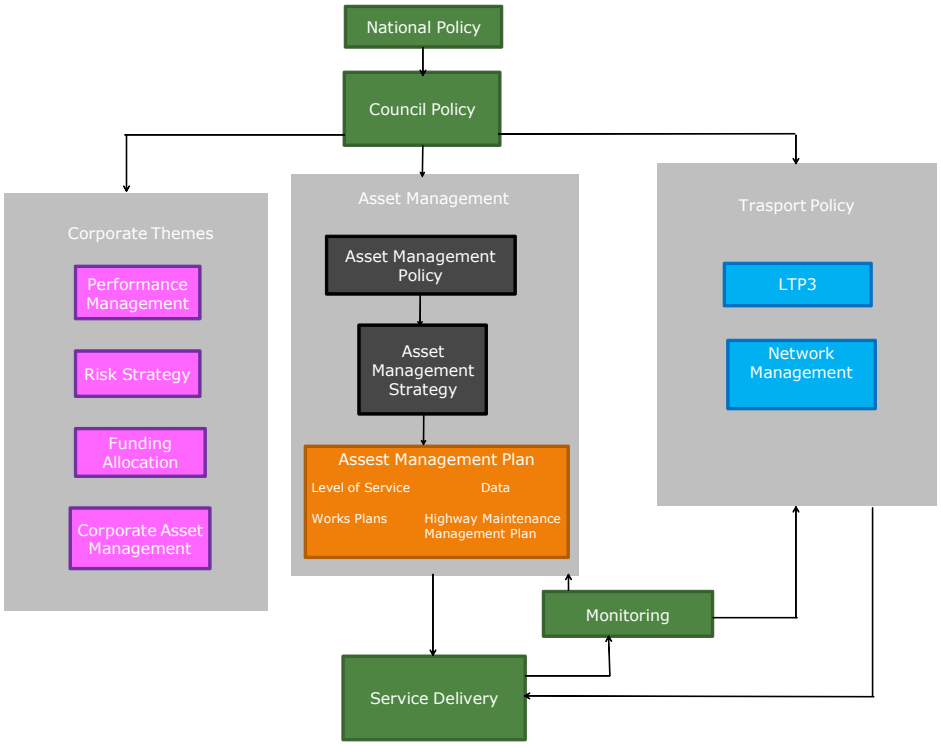
- Strategic approach
- Systematic procedures
- Optimal allocation of resources
- Managing expenditure over the lifecycle
- Achieving the long term strategic plan
- Meeting customers' needs

The adoption of asset management principles provides a means for Bracknell Forest Council to face the challenges of managing the highway asset, through the development of a systematic approach that aims to deliver the most efficient and effective regime over the lifecycle of the asset, ensuring that the performance of that asset reflects the requirements of the Council and funding constraints.

It also provides a valuable tool to enable the Council to establish appropriate budget allocations through the demonstration of the effects of under-investment in the network and the implications of not meeting safety and serviceability requirements on the customers using the network.

Asset Management Framework

This Asset Management Strategy is based on the framework shown schematically below, and outlined in the following sections. The elements of this Strategy will support continual improvement in the management of the highway asset.



Asset Management Framework

Bracknell Forest Council

This Strategy explains how individual asset groups and components fit in the framework, describes how the asset management planning process is implemented and refers to tools currently employed, as well as links to other key documents. Finally, the Strategy describes how the Department will embed a continuous improvement approach to highway asset management, including how national developments and good practice are taken into consideration, as well as how the work carried out in Bracknell Forest can influence the national asset management agenda.

The development of the asset management framework described in Figure 2 follows national guidance and recognised good practice. It is also based on the Council's approach to delivering services and alligns with the corporate policies on performance management and risk management.

The framework refers to a number of key policies and documents. The Highway Asset Management Plan (HAMP) supports the implementation of this Strategy. The Highway Maintenance Management Plan (HMMP) describes the operational activities and procedures related to highway maintenance.

Implementation of Asset Management

In accordance with good practice, priority has been placed on certain elements of the asset management framework, in order to facilitate full implementation of asset management in due course.

Gap Analysis

It is recognised that the resources available for the implementation of asset management for highway infrastructure assets are limited. In order to make efficient use of these limited resources, a gap analysis has been carried out against recognised good practice. This analysis resulted in the development of an implementation plan that takes into account not only the actions that need to be taken, but links these to timescales and resource requirements. This implementation plan is included in the Highways Asset Management Plan.

Data Collection

Effective management of the highway asset can only be achieved through reliable, current and robust data.

Asset inventory and available condition data have been reviewed in the development of the HAMP. There is a significant shortfall in the inventory with regards to the requirements for effective asset management and the need to improve this data is one of the principal actions for consideration in the implementation action plan. Condition data for carriageways, footways and structures is adequate but other assets are lacking information; this is captured in the implementaion action plan.

Levels of Service

A key function of the asset management process is to understand the spending needs of each asset group against performance, aims and objectives. This means understanding how funding needs to meet:

- LTP objectives;

- Delivery Planning
- Performance Targets.

Bracknell's Levels of Service are largely based on established perfomance measures, eg National Indicators (NI), where available. The Levels of Service are presented in the HAMP, having been reviewed in the development of that document.

Lifecycle Planning

Inherent to the asset management process is a need to understand the influence of budget decisions on customer satisfaction and delivery of the corporate priorities. Furthermore, the impact that investing in one asset component may have on the overall performance of other asset components, as well as the whole asset, is examined. To this end, a lifecycle planning approach has been developed and is being used.

In line with national guidance and good practice Bracknell Council is developing a lifecycle approach to managing its highway maintenance activities. Understanding how long specific maintenance treatments last, the relative cost of these treatments and the Levels of Service (LoS) provided are essential pre-requisites to good asset management. Successful implementation of the lifecycle approach relies on good understanding of the asset, its current performance, expenditure and customer feedback, as well as an understanding of the various service levels that may be achieved for the different funding options.

Bracknell has developed an asset model that combines established treatment strategies and local knowledge of asset performance with current condition and inventory information to assess the impact of varying maintenace scenarios on the whole life performance and funding requirements of the highway asset. Initial work with the model has demonstrated its value in supporting the medium to long term planning of the asset management approach.

Financial Planning

One of the key benefits of asset management is that it provides the platform for robust and transparent financial planning. When lifecycle plans for all asset groups are developed, these will be used to determine funding needs and supoort the case for funding of the maintenance of the highway asset.

Gross Replacement Cost and Depreciated Replacement Cost

Whole of Government Accounts (WGA) have set new requirements for the way the value of the highway asset is reported to the HM Treasury in the Authority's audited accounts. The new approach needs to be fully implemented by 2012/13, at which time authorities are required to report the Depreciated Replacement Cost (DRC) of the highway asset. For this to be achieved, there is clear need for accurate and detailed inventory information and performance data. This requirement will support asset management by providing an improved understanding of network deterioration and combining that with the levels of service to be achieved.

Bracknell Council adopted this approach and has calculated the value of highway assets in accordance with WGA requirements. However, a number of assumptions had to be made to fill gaps in information and processes. Altough this is acceptable at this stage, the Council is working towards filling these gaps. Further developement and implementation of the asset management approach will allow the calculation of asset value to be refined and hence support the process of financial planning.

Data Management and Information Systems

Bracknell has operated a highway maintenance and management software system ('Confirm') for over 14 years and this holds a comprehensive maintenance history of the highway assets.

Good Practice

Bracknell Forest Council is committed to the development of good practice and benefits from lessons learnt at National, Regional and Local levels. Officers from Bracknell Forest have played a leading role in the developement of the national agenda on highway asset management, carrying the responsibility of representing the interests of smaller highway authorities. This is done through attendance at

- The UK Roads Board;
- The Technical Advisers' Group;
- The UKRLG Asset Management Working Group;
- The Project Board for the Highway Efficiency Maintenance Programme (HMEP);
- The Highways Asset Management Financial Information Group (HAMFIG); and
- Steering Groups for various national projects on asset management.

Furthermore, Bracknell Forest Council is a member of the CIPFA Highways Asset Management Planning Network and the National Highways & Transportation Customer Satisfaction Survey.

Review Process

The Asset Management Plan is a 'live' document and will be subject to regular review as the highway network evolves over time.

References

Well Maintained Highways – Code of Practice for Highway Maintenance Management. UKRLG
Well-Lit Highways – Code of Practice for Road Lighting Management. UKRLG
Management of Highway Structures – A Code of Practice. UKRLG
Management of Electronic Traffic Equipment – A Code of Practice. UKRLG
CIPFA Transport Infrastructure Assets Code
Maintaining a Vital Asset
UKRB Quick Start Guidance
HMEP Highway Infrastructure Asset Management Guidance Document
Publicly Available Specifications PAS 55-1 & PAS 55-2:2008 Asset Management
Bracknell Forest Council, Local Transport Plan 3 – Core Strategy and Implementation Plan
Bracknell Forest Council – Highway Maintenance Management Plan

HIGHWAYS INFRASTRUCTURE ASSET MANAGEMENT PLAN

1. INTRODUCTION

1.1. It is not possible to implement a fully developed asset management approach overnight; time is required, not only to collect relevant asset data, analyse it and consult but also to modify business practices to accommodate the asset management needs.

1.2. The knowledge and understanding of the highway assets gained through development of a HIAMP will be of assistance in the maintenance and management of the network by providing robust data regarding the size, condition and performance of the asset. This will aid decision making and, by taking a long term, risk based approach, should make it possible to optimise asset replacement/refurbishment programmes to deliver an agreed Level of Service (LoS).

1.3. The HIAMP can provide evidence to the Department for Transport (DfT) and Members, when assessing the Council's performance, to demonstrate the assets are being competently managed.

1.4. To comply with current accounting practices and the need for the provision of asset valuation, it is important that the Council's highway assets are organised in a systematic and methodical manner, which can be facilitated by the framework of a HIAMP.

1.5. However, the most significant benefit of developing the HIAMP is that a formal review of existing practices is undertaken and an opportunity is provided to adopt best practice and embrace real changes in the way the highway asset is maintained and developed.

1.6. BFC's highway network comprises just over 430 km of carriageway, approximately two thirds of which is in an urban environment. The unclassified network accounts for around 60% of the asset. The footway and cycleway network is about 700 km. The asset also includes over 11,000 traffic signs, and approximately 14,000 lighting columns. In terms of structures, the Council is responsible for 34 road bridges, 41 footbridges and numerous underpasses, subways, culverts and retaining walls. The highway asset also includes safety fences, drainage, street furniture, road markings, traffic signals, intelligence transportation systems and soft estate. The extent of the highway network is illustrated in Figure 1 below.

1.7. There are pressures on the resources available to continue to deliver an acceptable LoS across the network. These arise principally from:

- An increasing population with high proportions of both car ownership and commuting by car.
- BFC Forest's prime location at the heart of the Thames Valley, in close proximity to London, Heathrow and the motorway network.
- The fact that BFC experienced significant growth as a 'New Town' from the 1950s and much of the highway asset dates from that period of development. The recognised consequence – termed 'New Town Inheritance' – is that significant elements of the infrastructure reach the point of refurbishment at around the same time, which poses potential problems in terms of financial and lifecycle planning.
- Being a location of choice within the Thames Valley for a number of national / international headquarters for signigicant businesses, e.g. Waitrose and Honda.
- Providing a significant transportation corridor link between the M3 and M4 via the A329 and A322.

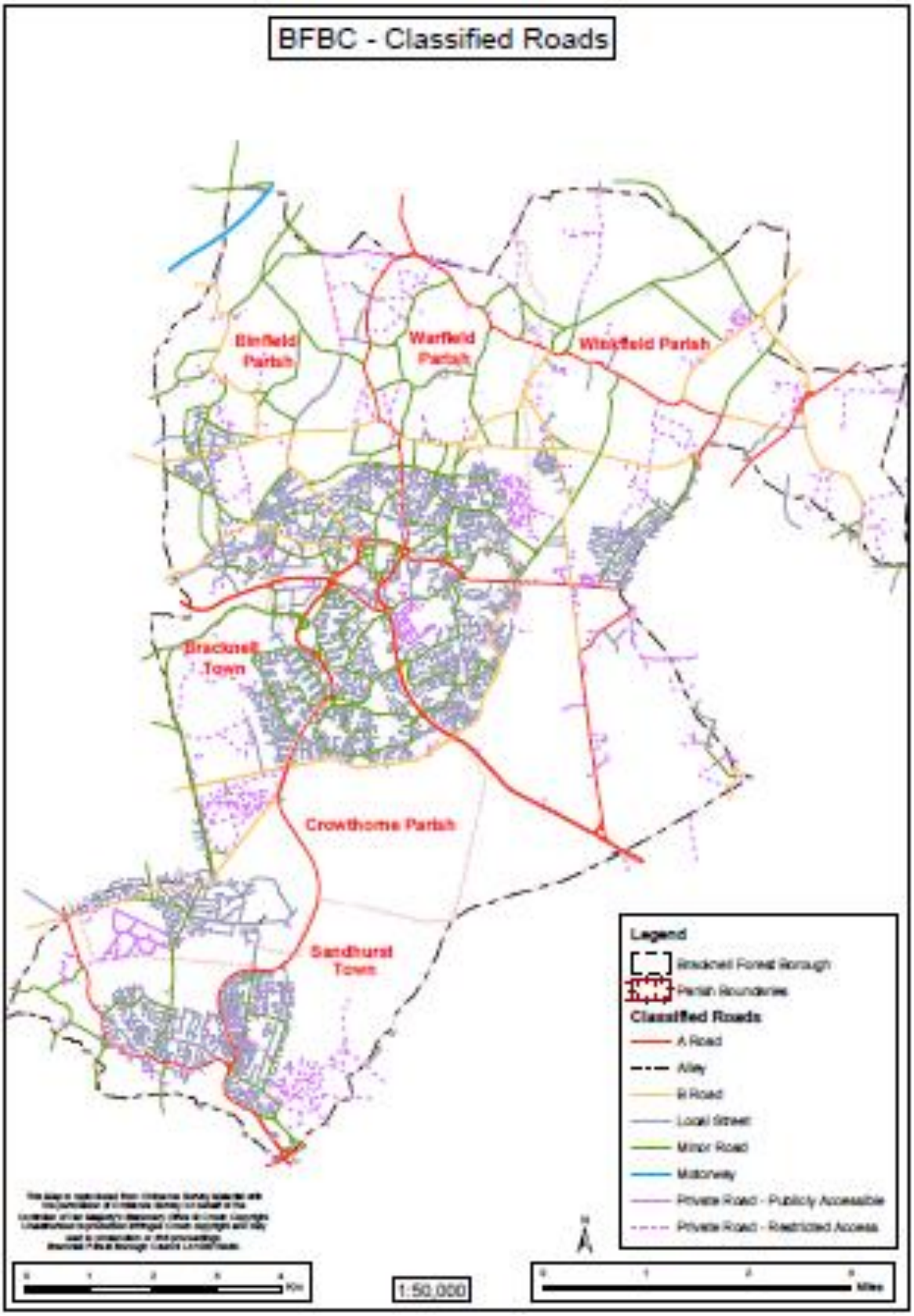


Figure 1 – BFC's Highway Network

Bracknell Forest Council

2. HIAMP FRAMEWORK

2.1 This HIAMP considers three levels within the approach to management of the network:

- Strategic
- Tactical
- Operational

2.2 Figure 2 shows an idealised hierarchy of the management process.

Figure 2 – Idealised Management Hierarchy

2.3 Asset Management is a rational process that links stakeholder expectations, Government transport policy and the Council's Corporate Plans. It also considers operational and tactical management through organisational and business processes and systems which manage the flow of information. Additionally it links highway network needs with Value Management and Risk.

2.4 This HIAMP has been developed in accordance with the Framework for Highway Asset Management and the later Highway Infrastructure Asset Management guidance document. The key elements of this framework are shown diagrammatically in Figure 3 below, which illustrates the basic relationships between each element. In simple terms the framework requires authorities to address the basic issues raised in the diagram in relation to the management of the Council's highway assets**.**

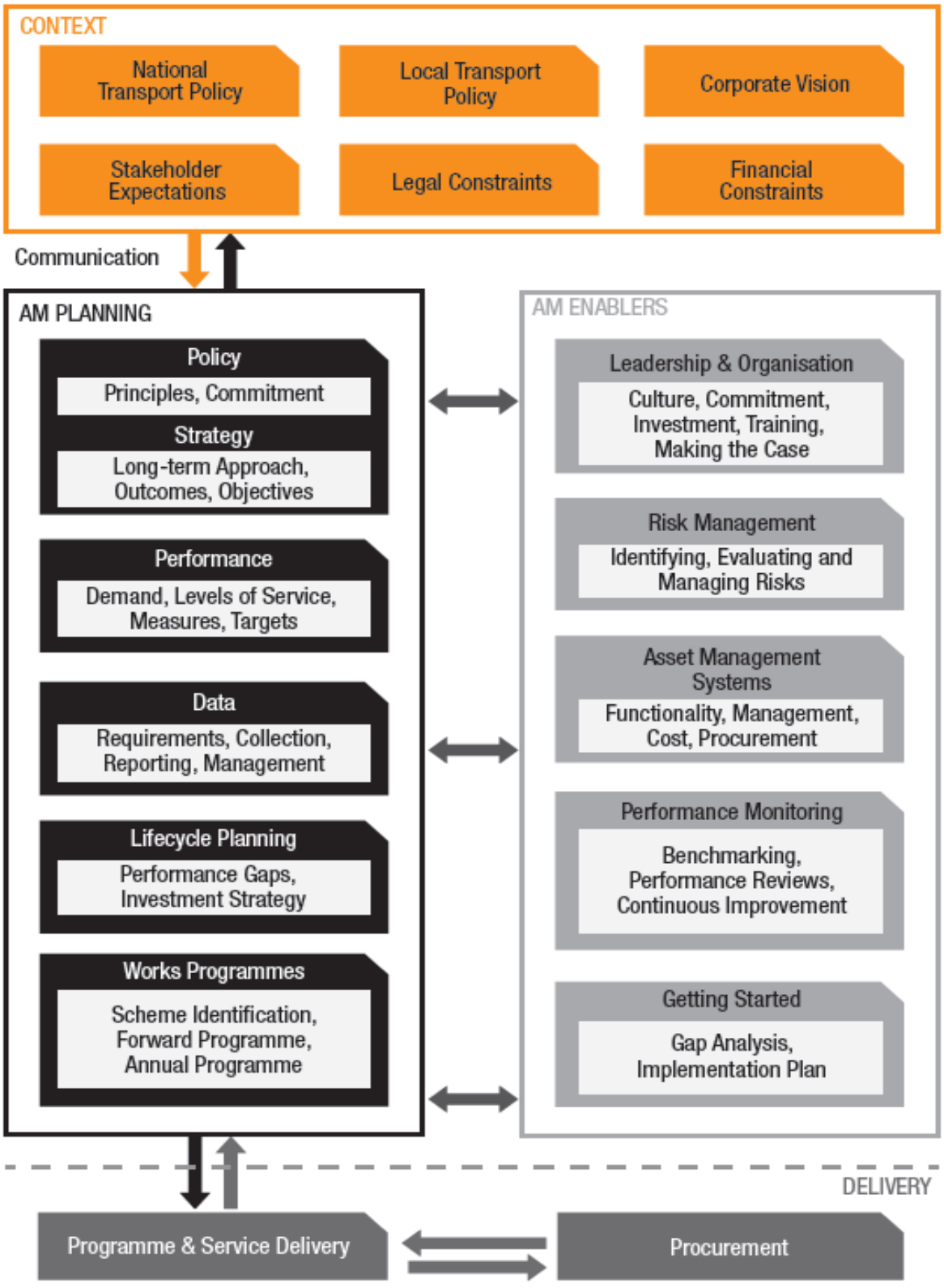


Figure 3 – Asset Management Framework

Bracknell Forest Council

2.5 It is important to remember that asset management does not replace existing good practice; instead it provides the framework within which this practice may be more effectively implemented, managed and complemented by other processes.

2.6 Figure 4 shows the asset management process as a circular or iterative process with the results of the decisions that are taken and their effects upon the condition and remaining lives of the assets. This is fed back into the process as an aid to future decision-making and continuous improvement.

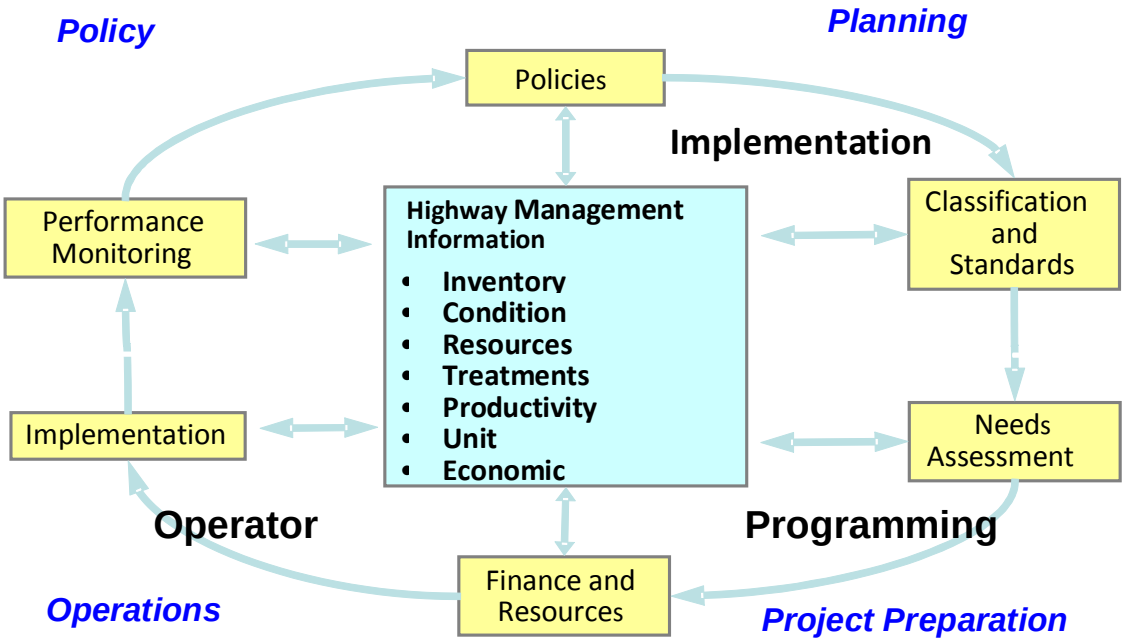


Figure 4 – Asset Management Circular Process

The Benefits of Asset Management

2.7 The adoption of asset management practices will make more efficient use of available resources, delivering value for money and providing a service that is aligned to its customers. This is demonstrated by:

- Alignment of the Council's objectives with delivery of the service;
- A comprehensive understanding of the size and condition of the asset and the associated liability;
- A programme of inspections and surveys to record current asset condition;
- A understanding of the performance of the assets in the BFC highway network;
- Defined Levels of Service (LoS);
- Adoption of a lifecycle approach to the management of the asset;
- Explicit identification and management of risks;
- Decision making that is based on the relationship between the asset performance and the Council's Priorities and Objectives through LoS;
- Demonstrating the consequences of funding decisions;
- Considering the current condition and priorities required to maintain the asset and the network.

Drivers for Asset Management

Improving Value for Money and Effectiveness in Managing the Highway Network

2.8 Knowledge of the various elements of the highway infrastructure, their lifecycles and the comparative risks to the Council as the local highway authority to adopting particular budget strategies for each of the assets allows the effects of increases or decreases of resource to be assessed objectively. Hence best use can be made of available resources.

Codes of Practice for Highway Maintenance Management

2.9 The following documents, published by the UK Roads Liaison Group (UKRLG), inform the contents of this HIAMP:

- Well Maintained Highways – Code of Practice for Highway Maintenance Management.
- Well-Lit Highways – Code of Practice for Road Lighting Management
- Management of Highway Structures – A Code of Practice.
- Management of Electronic Traffic Equipment – A Code of Practice.

2.10 These documents, along with the UK Roads Liaison Group's Highway Infrastructure Asset Management guidance document, provide an integrated family of best practice guidance for highway infrastructure management. Consideration has also been given to the guidance produced by the British Standards Institute, i.e:

- PAS 55-1: Asset Management and
- PAS 55-2: Guidelines for the application of PAS 55-1.

2.11 Highway maintenance is also required to meet the challenge of sustainability**.** This requires that the wider economic, social and environmental implications of both the service and its individual schemes are first of all understood, and then modified as far as practicable to ensure best value outcomes for the community.

The Prudential Code

2.12 Any borrowing under this Code has to be supported by sound asset management information.

2.13 Some local highway authorities have already utilised prudential borrowing to help with the maintenance of the network of carriageways and footways, others may consider use of this facility in the future. Justification of such borrowing will be required and the asset management approach, in particular whole life costing, will be a key component of any such justification.

Whole of Government Accounts and Asset Valuation

2.14 The introduction of the Whole Government Accounts places an obligation upon local authorities to value their transportation assets. Asset management will help produce the key inputs to enable the valuations to be completed.

2.15 Robust asset management processes and a HIAMP are required to support the asset valuation process described in the Guidance Document for Highway Infrastructure Asset Valuation, published by UKRLG.

Traffic Management Act 2004 (TMA)

2.16 This Act places a network management duty on local authorities to keep traffic flowing; the HIAMP will support this by promoting an integrated approach to network management.

Local Transport Plan

2.17 Local authorities have been required to demonstrate that they are making the best use of their property and other assets. The DfT now recommends the development of HIAMPs in support of Local Transport Plans (LTP). These are strongly linked to the DfT's 'Value for Money' principle. This document represents the latest phase of work for the Council's HIAMP.

Value for Money

2.18 Asset management plays a key role in demonstrating that Authorities are providing value for money and supporting performance management.

Corporate Manslaughter

2.19 The Corporate Manslaughter and Corporate Homicide Act 2007 is on Statute; this makes provision for the offence of corporate manslaughter.

2.20 The HIAMP will provide evidence of a rational approach to the management of the network which may be considered in any proceedings by demonstrating the Authority is making funding decisions based upon asset management principles.

3. GOALS, OBJECTIVES AND VISION

Framework

3.1 Figure 5, below, illustrates where the HIAMP is positioned in the context of the policies, plans and guidance that inform and support the Council's management of its transportation infrastructure.

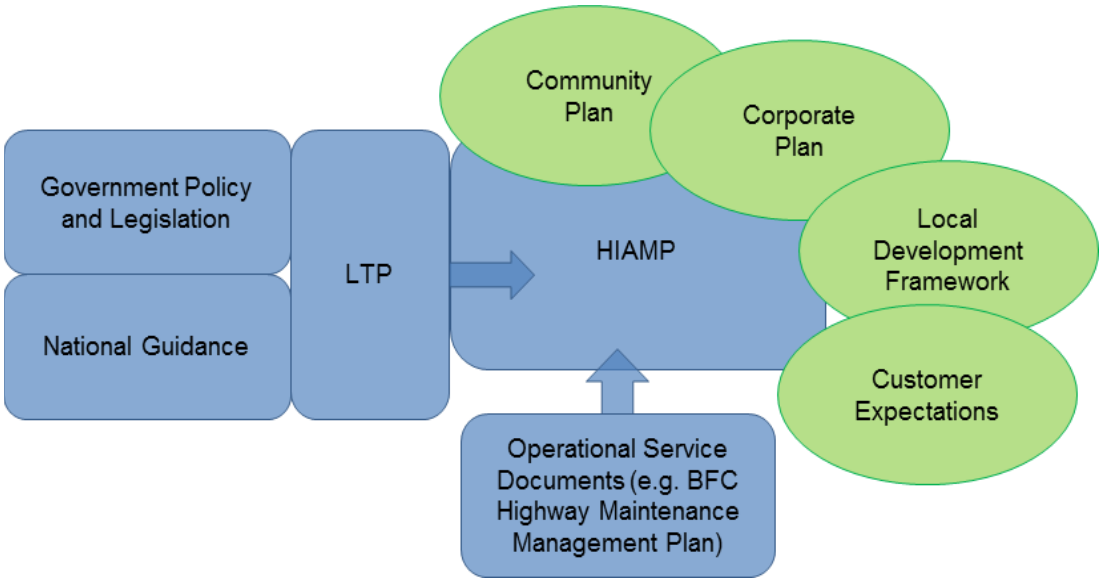


Figure 5 – Relationship between HIAMP and the Council's Key Documentation

3.2 It is important that the approach is consistent across this family of key documents; periodic review/re-drafting should be considered a necessary activity for all of these.

The Council's Vision

3.3 The Local Transport Plan (LTP) vision for the Borough has been identified as:
"To develop a sustainable transport system that supports the local economy, provides choice and improves quality of life in a safe and healthy environment"

3.4 There are five National Goals set by the Government as the strategic backbone for the UK's future transport policy and infrastructure. These goals are:

- Goal 1: To support national economic competitiveness and growth, by delivering reliable and efficient transport networks
- Goal 2: To reduce transport's emissions of carbon dioxide and other greenhouse gases, with the desired outcome of tackling climate change
- Goal 3: To contribute to better safety, security and health and longer life expectancy by reducing the risk of death, injury or illness arising from transport, and by promoting travel modes that are beneficial to health
- Goal 4: To promote greater equality of opportunity for all citizens, with the desired outcome of achieving a fairer society
- Goal 5: To improve quality of life for transport users and non-transport users, and to promote a healthy natural environment.

3.5 The DfT's Business Plan 2011-2015 reinforces the government's vision for a transport system that is greener, safer and an engine for economic growth that improves quality of life. The plan outlines key Structural Reform Priorities that LTP3 will need to support.

3.6 Flowing from the LTP vision are objectives which the Council and it partners will work to achieve over the life of the plan.

3.7 The Council has prepared transport policies which set out the measures on which it will focus until 2026. These policies will be regularly reviewed to adapt to new or more advanced technologies, changing Government policies and economic conditions.

3.8 Each policy is supported by one or more delivery Strategy. Each policy has been informed and influenced by the national goals for transport, local objectives, officer expertise and stakeholder engagement.

3.9 Therefore, the Council has a clear vision supported by developed policies and strategies. Specifically, these include:

- making railway services more sustainable,
- encouraging sustainable local travel by making public transport, cycling and walking more attractive and effective,
- promoting low carbon transport, and
- tackling road congestion.

4. PERFORMANCE AND LEVELS OF SERVICE

Why Levels of Service (LoS)?

4.1 The creation of LoS should reflect and support user aspirations which are a key element in the adoption of an asset management plan. This section describes the basis on which LoS (service standards and performance targets) have been established. These standards need to take into account statutory duties of the Council as a highway authority, the Council's strategic transport goals (as detailed in the Local Transport Plan 3) and the expectations of customers.

4.2 The target LoS contained in this plan have been determined by applying service options to all asset groups. These have been applied in detail to individual asset groups based upon priority.

4.3 Once a suite of 'LoS' and 'performance measures' have been established , it will then be possible to obtain some understanding of the relationship between the individual costs and the level of performance against each LoS.

4.4 This information can then ultimately be used to inform decisions on the allocation of resources between competing demands.

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

What are Levels of Service?

4.6 LoS 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 HIAMP, LoS 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.

4.7 LoS may relate to quality, quantity, reliability, responsiveness, environmental acceptability and cost.

Use of Levels of Service

4.8 LoS 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.

4.9 The LoS defined in this section will be used:

- To inform customers of the proposed type and level of service to be offered and to provide more detailed information to customers about the level of service they can expect. In some instances this will outline what they cannot reasonably expect unless they are prepared to pay more, e.g. localised variations of frequencies in street cleaning.
- As a focus for the strategies developed to deliver the required LoS 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 current methods. Key service targets will be identified and monitored to ensure the effectiveness of the plan.
- To identify the costs and benefits of the services offered. This will be used to assess the costs of delivering differing LoS 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 LoS elsewhere e.g. less gully cleaning if more grass cutting is carried out.

4.10 Any such decision would be determined through consultation in order to understand the implications of various choices. It should be noted that LoS cannot drop below the minimum statutory requirements.

Key Considerations

4.11 In developing appropriate LoS the Council has a number of factors to be taken into consideration.

Customer expectations

4.12 Actions taken by the highway authority are in the interests of its customers. Their views should, therefore, be considered when developing LoS. 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 LoS provided.

4.13 The Council is committed to consulting with residents and other key stakeholders in the delivery of services. A strategic approach has been built by establishing cross-organisational structures to plan, co-ordinate and integrate consultation activities 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 resident of BFC, 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.

Legislative requirements

4.14 The role of the local highway authority is governed by legislation and precedents developed through our Common Law legal system. The respective legislation assigns the authority particular duties and powers in relation to highway maintenance and associated duties.

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

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

4.16 Highway authorities also have a general duty of care to users and the community to maintain the highway in a condition fit for its purpose.

4.17 These considerations directly affect the LoS that the Council provides by establishing the statutory (or minimum) LoS that must be provided.

Codes of Practice for Highway Maintenance Management

4.18 There are a number of published Codes of Practice that directly influence the LoS provided (see Chapter 2). Whilst these codes of practice do not constitute statutory duties they do represent a statement 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.

4.19 These documents have been taken into consideration, along with the particular practices, requirements and constraints that apply to the Council, in the development of LoS presented in Appendix 3.

Organisational objectives

4.20 The Council has a series of organisational goals and objectives that influence the way in which the highway network is managed – see Chapter 3.

4.21 The linkages between the HIAMP and the Council's strategic goals and objectives are taken into consideration, in the development of appropriate LoS for the transportation infrastructure.

Affordability

4.22 Affordability is one of the primary reasons for developing and presenting options for LoS. This approach gives decision makers the facility to decide upon the relative merit of competing funding needs based upon improved data on both existing and predicted future performance, risk and cost.

4.23 The Service options developed for the HIAMP identify, amongst other options, an economically optimum level of service which is the most economically efficient way of delivering an acceptable level of service over the long term. Due to other pressures on Council funding and other pressures on the network it may not be possible to deliver the funding required to deliver the optimum solution.

Availability of resources, skills and appropriate delivery mechanisms

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

4.25 Rapid significant changes in any maintenance programme can be difficult to deliver and this has to be considered when establishing LoS, in particular, delivery of any services that are significantly different to the current LoS. For example, damage as a result of severe winters or prolific flooding and water damage may result in notable diversion of resources and funds from the proposed maintenance programme.

Current Levels of Service

4.26 The schedule in Appendix 3 gives details of the Council's current Level of Service framework. This schedule identifies current methods for recording performance against service areas. It also identifies areas where little or no performance data or measurement systems exist. The improvement action plan identifies how and when it is planned to plug these information gaps.

4.27 The service is currently managed around the performance indicators (PI) within the service groupings most notably National Indicators (NI) and those from the LTP.

Scope of Service Groupings

4.28 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.

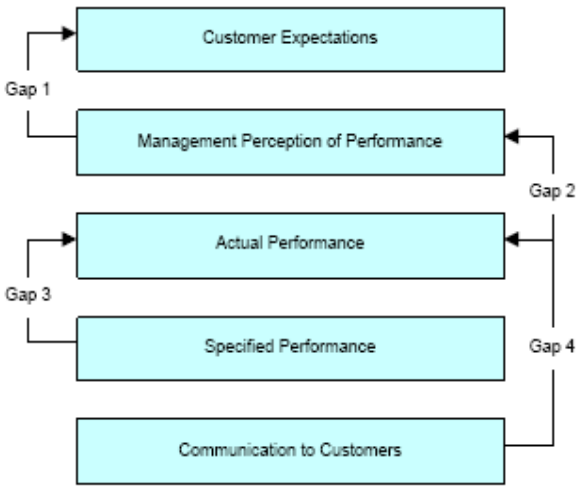
Levels of Service	Scope
Safety	Accident Reduction Education, Training & Publicity Safety Related Defects
Condition	Footways/Cycleways Lighting, Signs and Signals Roads Structures
Availability / Accessibility of the Asset	Congestion Levels Disabled Facilities Modal Shift Network Restrictions
Environmental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

Table 1 – Service Groups

Performance Management

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

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



Performance Gaps Model

Figure 6 – 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.

4.31 All of these possibilities should be considered in establishing what performance gaps exist.

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

4.33 An annual review is undertaken of all National Indicators (NI), Local Performance Indicators (LPI) and LTP indicators. This includes targets, related indicators and factors affecting progress together with improvement actions.

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

4.35 As part of this process life cycle plans for each asset should be re-appraised and the budget and programme for each service area established. The process of optimisation and the development of a forward works programme are tools that will help manage the competing demands.

Service Options

4.36 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.

4.37 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

4.38 The following are the service option categories selected for inclusion in the HIAMP:

- 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.

Service Option Evaluation

4.39 The service options for each of the asset groups can be identified and evaluated against an agreed common set of criteria. These criteria include the following:

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

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

4.41 Understanding cost is however an incomplete picture. Many authorities have in the past adopted a precedence of budget evaluation that is based largely upon historical spending, not on the needs of the asset or the optimal investment required.

Determination of Final (Attainable) Service Option

4.42 It is anticipated that following evaluation of the selected service options and their subsequent review and approval by senior officers and Executive, a “Final” or Attainable Service Option will be determined for each asset group.

4.43 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.

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

Measuring Asset Performance

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

4.46 Proposed new local KPIs for each asset group can be developed under the following Level of Service groupings proposed for inclusion in the HIAMP.

- Safety
- Availability
- Accessibility

- Condition
- Environmental
- Customer
- Financial

4.47 A list of proposed new local indicators (alongside the existing ones) can be found in Appendix 3 (these are identified as “to be developed” at the foot of each asset group).

4.48 The Association of Directors of Environment, Economy, Planning & Transport (ADEPT) Guidance on Asset Management Plans states that setting LoS (LoS) is the key decision in asset management planning. It suggests that authorities provide a broad set of LoS categorised, for example, as:

- Minimum – Core services (safety/statutory)
- Fair – Safe and serviceable
- Good – Safe and serviceable improving towards a sustainable level
- Excellent – Safe, serviceable and sustainable

4.49 The Highways Asset Management Team has proposed outline service definitions for each of the asset groups comprising the highway network and the management of highway data. These consist of basic descriptions of LoS and appropriate performance measures / targets compatible with service provision at these levels. The definitions adopted are stated in simple terms for ease of understanding.

4.50 The indicative performance measures for each level of service have been derived from data across a range of sources including guidance and performance data from; TRL, APSE, DfT, Technical Advisors Group (TAG), and benchmarking data.

4.51 In order to gauge how existing service levels compare with these service standards the highway service is broken down into a series of “Asset Groups”. These comprise;

- Carriageways
- Footways
- Cycle Tracks
- Structures
- Street Lighting (including illuminated apparatus)
- Highway Drainage
- Signs & Bollards
- Road Markings
- Fences & Barriers
- Street furniture & amenities
- Trees & Soft Estate

4.52 For each of the Asset Groups, an outline of the current level of service is presented in Appendix 3 together with an overall rating for current service within that Asset Group. The following additional services have also been included in this assessment:

- Highway Data and Data management

4.53 From the completed matrix a number of perceived gaps in service provision can start to be identified. TRL guidance lists those factors influencing the LoS to be adopted by authorities as:

- National and local objectives
- Customer expectation
- Customer requirement to meet real needs
- Legislative requirements and Code of Practice recommendations
- Availability of resources – particularly financial
- Organisational delivery requirements
- Future trends

4.54 The challenge is to establish the appropriate compromise between the aspirations and expectations of stakeholders and what is deliverable in practice.

5. ASSET DATA AND INFORMATION

Introduction

5.1 Effective asset management planning requires knowledge of an asset, its condition and its use. This entails the collection and maintenance of asset data that can assist managers to asses, analyse and report on performance and progress.

5.2 Data management is fundamental to the overall asset management process. A significant factor when assessing and identifying the appropriate data requirements is the interrelation of data to other processes that incorporate data use.

5.3 As part of the asset management approach there is a need to examine:

- Data requirements;
- Coverage and currency of data;
- Procedures – processes for information capture, verification, transfer, retrieval, updating, backup and the staff responsible for each;
- Storage – location and media;
- Data usage – existing and proposed data usage.

Types of Data

5.4 The following asset data types are required:

- Inventory: comprising details of the number, size, type, age and component make up of each asset.
- Condition: comprising measurement and observational rating of the condition of elements of the asset derived from either physical testing or visual inspection.
- Use: comprising details of the use of assets in the form of data such as traffic counts, heavy vehicle routes, etc
- Past maintenance history from which the performance and expected lives can be determined for differing specifications and actual use within Bracknell.

5.5 Good asset data is the foundation on which asset management processes are built. The availability of appropriate asset data allows all staff involved in the process to obtain an overall view and to apply a consistent management approach.

Asset Management Data Requirements

5.6 Accurate and current asset data is required to enable the following processes to be undertaken:

- Effective monitoring of and reporting on the performance of the highway network;
- Assessment of the expected lives of individual assets or asset components;
- The assessment of current and development of future LoS;
- The assessment of current and development of future performance indicators;
- The development of future maintenance options;
- The identification of future investment strategies;
- The development of short, medium and long-term forward works programmes;
- The development of budget requirements form the work programmes;
- Valuation assessments for each of the assets and the calculation of how they have depreciated in value since they were created.

5.7 Once completed, these processes will allow properly informed and cost effective management decisions to be made.

Asset Groupings

5.8 The highway network comprises a number of assets and the principles of asset management should be applied to all of these. The principal asset groupings to which this Plan applies are shown in Table 2.

Asset Group	Asset Element
Carriageways	Carriageway, anti-skid surfacing, central reserve, kerbs, edgings and channels
Footways	Footways, hard verges, footway gullies, kerbs, channels, footway crossings
Cycle Tracks	May be dedicated or shared with footways.
Structures	Bridges, subways, retaining walls
Street Lighting	Columns, lamps, cabling, feeder pillars, illuminated signs, subway lights, illuminated bollards. Pedestrian Crossings.
Traffic Signals	Traffic Signals, Pedestrian Crossings
Intelligent Transport Systems	Counters, detectors, VMS, CCTV
Highway Drainage	Gullies, catch pits, manholes, pumping stations, ditches, filter drains, culverts
Signs & Bollards	Advanced direction signs, warning signs, information signs, sign posts, street name plates, non-illuminated bollards
Road Markings	Longitudinal markings, transverse markings, hatched markings, road studs
Fences & Barriers	Highway fences, pedestrian barriers, safety barriers, boundary fences
Street Furniture & Amenities	Seats, bus shelters, and other items of street furniture.
Trees & Soft Estate	Grass verges, trees, hedges, flowers and shrub beds, planters located on the highway.

Table 2 – Asset Groups

Current and Proposed Status

5.9 From assessment of the Council's data, there is greatest confidence in the inventory for carriageway, footway, structures, street lighting, drainage and some elements of soft estate (trees). It is evident that other assets, safety fencing in particular, would benefit from improvement in coverage of inventory data.

5.10 Whilst the condition information for carriageways, footways and structures is fit for purpose there is limited condition information available for other assets. These issues are reflected in the gap analysis and discussed further in the section on Lifecycle Planning (Section 6).

5.11 It is clear that additional inventory and condition data is required to support asset management principles and the cCouncil's decision making. The ongoing collection of this data is a matter of priority.

Asset Inventory

5.12 The desired and current position regarding asset inventory information is shown in Table 3 below. Priorities have been assessed by considering the importance to safety, network integrity, the long term programme, the lifecycle model, fault reporting and performance indicators. The impact of good quality data on these has been measured from 0 to 3 with 3 being the most important.

Asset Group	Asset Sub-Group	Asset Attribute	Safety	Network Integrity	Programme	Modelling	Fault Reporting	Performance Indicators	Priority	Available	Coverage %
Carriageways	Carriageway	Length	3	3	3	3	2	3	17	Y	100
Carriageways	Carriageway	Surface	3	3	3	3	2	3	17	Y	20
Street Lighting	Lighting Point	Column type	3	3	3	3	3	2	17	Y	100
Footways	Footways	Length	3	3	3	3	2	3	17	Y	100
Cycle Tracks	Cycle Tracks	Surface	3	3	3	3	2	3	17	Y	80
Footways	Footways	Surface	3	3	3	3	2	3	17	N	50
Structures	Bridges	Type	2	3	3	3	2	3	16	Y	100
Street Lighting	Lighting Point	Height	3	2	3	3	3	2	16	Y	100
Street Lighting	Road Traffic Signs	Illuminated	3	3	3	2	3	2	16	Y	100
Traffic Signals	Traffic Signals	Type	3	3	3	3	3	3	17	Y	-
Carriageways	Carriageway	Width	3	3	3	3	2	0	14	N	90
Carriageways	Anti-Skid Surfacing	Length	3	3	3	3	2	0	14	N	-
Cycle Tracks	Cycle Tracks	Length	3	3	3	3	2	0	14	Y	100
Cycle Tracks	Cycle Tracks	Width	3	3	3	3	2	0	14	N	50
Footways	Footways	Width	3	3	3	3	2	0	14	N	50
Carriageways	Carriageway	Construction	2	3	3	3	2	0	13	N	-
Carriageways	Lay By	Length/Width	3	2	3	3	2	0	13	N	-
Street Lighting	Pedestrian Crossing	Type	3	2	3	3	2	0	13		100
Highway Drainage	Gully	Type	3	2	3	3	2	0	13	Y	100
Road Markings	Longitudinal Markings	Length	3	2	3	3	2	0	13	N	-
Road Markings	Longitudinal Markings	Diag No	3	2	3	3	2	0	13	N	-
Carriageways	Central Island	Width	2	2	3	3	2	0	12	N	-
Carriageways	Central Reserve	Width	2	2	3	3	2	0	12	N	-
Fences & Barriers	Pedestrian Guard Rail	Length/Type	3	2	2	3	2	0	12	N	50
Fences & Barriers	Safety Fence	Length/ Type	3	2	2	3	2	0	12	N	50
Carriageways	Channel	Length	3	3	2	2	2	0	12	N	-
Carriageways	Kerb	Length	3	3	2	2	2	0	12	N	-
Road Markings	Transverse & Special Markings	Length	3	1	3	3	2	0	12	N	-

Asset Group	Asset Sub-Group	Asset Attribute	Safety	Network Integrity	Programme	Modelling	Fault Reporting	Performance Indicators	Priority	Available	Coverage %
Road Markings	Transverse & Special	Diag No	3	1	3	3	2	0	12	N	-
Carriageways	Traffic Calming	Type	2	1	3	3	2	0	11	N	100
Carriageway	Traffic Calming	Surface	2	1	3	3	2	0	11	N	-
Highway Drainage	Catchpit	Type	2	2	3	3	1	0	11	N	100
Trees & Soft Estate	Outer Verges	Width	2	1	3	3	2	0	11	N	-
Road Markings	Hatched Markings	Area	2	1	3	3	2	0	11	N	-
Street Furniture & Amenities	Street Furniture	Type/Owner	1	2	3	2	3	0	11	N	-
Signs & Bollards	Road Traffic Signs	Type/Size	3	3	2	1	2	0	11	Y	100
Signs & Bollards	Safety Bollards	Type	3	2	2	1	3	0	11	Y	100
Carriageways	Central Reserve	Surface	1	2	2	3	2	0	10	N	-
Highway Drainage	Manhole	Type	3	2	1	3	1	0	10	N	100
Structures	Retaining Wall	Type/Height	2	3	1	3	1	0	10	Y	100
Trees & Soft Estate	Inner Verges	Width	1	1	3	3	2	0	10	N	-
Carriageways	Channel	Type	2	2	2	2	2	0	10	N	-
Carriageways	Kerb	Type	2	2	2	2	2	0	10	N	-
Street Furniture & amenities	Street Furniture	Type	1	2	2	2	3	0	10	N	-
Trees & Soft Estate	Trees	-	3	2	2	1	2	0	10	Y	75
Carriageways	Central Island	Surface	1	2	2	2	2	0	9	N	-
Highway Drainage	Culverts >900mm	Length	2	2	2	2	1	0	9	Y	100
Highway Drainage	Culverts <900mm	Length	2	2	2	2	1	0	9	N	100
Highway Drainage	Culverts >900mm	Diameter	2	2	2	2	1	0	9	Y	100
Highway Drainage	Culverts <900mm	Diameter	2	2	2	2	1	0	9	N	100
Road Markings	Hatched Road Markings	Diag No	3	1	2	1	2	0	9	N	-
Carriageways	Central Island	Width	1	2	2	2	1	0	8	N	-
Highway Drainage	Ditch	Length	1	2	2	2	1	0	8	N	-
Highway Drainage	Ditch	Width	1	2	2	2	1	0	8	N	-
Signs & Bollards	Road Traffic Signs	Diag No	3	2	1	1	1	0	8	N	-
Road Markings	Road Studs	Type/Spacing	2	1	1	2	1	0	7	N	-
Carriageways	Anti-Skid Surfacing	Colour	1	2	2	1	1	0	7	N	-
Street Lighting	Lighting Point	Coating	1	2	2	1	1	0	7	Y	75
Road Markings	Longitudinal Markings	Colour	1	1	2	1	2	0	7	N	-
Signs & Bollards	Safety Bollards	Diag No.	2	2	1	1	1	0	7	N	-
Trees & Soft Estate	Hedges	Length	2	1	1	1	1	0	6	N	-
Street Lighting	Pedestrian Crossing	Material	1	2	1	1	1	0	6	N	100

Table 3 – Desired and Current Road Asset Inventory Information (Prioritised)

5.13 In order to support the development of the HIAMP and implementation of the associated asset management approach the Council is developing programmes for the collection and periodic updating of inventory data. The above priority ratings assist in the development of achievable programmes against existing resources.

5.14 Additional inventory information is required in order to develop fully an asset management approach. There are methods of achieving this goal, each having different cost and time implications.

Inventory Collected as part of Normal Works Activities

5.15 Inventory information is being collected as part of the routine works and operations associated with maintaining the highway network.

5.16 This approach has the disadvantage that it will take time to collect the whole inventory data and requires training and changes to work procedures that may be difficult to implement with the work crews.

Inspections and Surveys

5.17 Inspections and surveys visits to site can be extended to include inventory collection; they are effective if targeted at specific high priority assets across the complete network.

5.18 This approach has the disadvantage that it takes time to collect data and requires changes in business process.

Video Inventory Survey

5.19 This technique utilises high-resolution video cameras to record a comprehensive survey of the network. The system incorporates a highly accurate GPS and/or chainage based system to give sub-1 metre accuracy. Video collection survey speeds can be variable (up to 100km/hr) using an array of between 3 and 7 forward, angled or downward facing cameras. No traffic management or disruption of the network is required.

Inventory Data for Lifecycle Model

5.20 It is clear from Table 3 above that the current inventory is not entirely complete. A sample video inventory survey was undertaken in 2012. An 11km sample was identified to reflect the overall network in terms of class/hierarchy/road type.

5.21 The inventory items were digitised from the video survey, along with a condition attribute (good, average, poor). The data was scaled up from the 11 km on a pro rata basis to give a representation of the entire network, and this was used to supplement existing inventory data.

5.22 The key assets in the Council's network used in the lifecycle plan are summarised in Table 4 below:

Key Asset	Quantity				Comment
	A Class	B Class	C Class	Unclassified	
Roads – total length Km	48.7	42.7	44.5	323.9	BFC data
Roads –Urban length Km	18.3	31.4	39.0	291.9	BFC data
Roads – Rural length Km	30.4	11.3	5.5	32.0	BFC data
Roads urban – Area m^2	209,457	212,663	385,821	1,277,889	BFC data
Roads rural – Area m^2	337,459	96,485	70,917	135,216	BFC data sample
Central res. – Length Km	14.839	0.598	0.229	0.038	BFC data
Central res. – Area m^2	37,097.5	1,495.0	572.5	95.0	BFC data. 2.5m average width estimated
Footways & Cycle tracks km	33.618	57.542	48.123	395.648	Pro rata from sample
Footways & Cycle tracks m^2	60,774	118,234	112,186	755,454	Pro rata from sample
Kerbs – length Km	121.078	80.655	82.224	476.800	Pro rata from sample
Gullies - No.	2,808	3,023	2,808	12,959	BFC data
Lines hatched – length m^2	13,522	22,594	13,204	40,918	Pro rata from sample
Longitudinal lines - Km	83.432	54.652	40.758	138.725	Pro rata from sample
Road Markings - No.	2,314	2,097	871	4,998	Pro rata from sample
Veh. Safety Fence - Km	2.461	0	2.876	0	Pro rata from sample
Ped. Guard Rail - Km	5.954	0.851	0.998	6.004	Pro rata from sample
Signs (non illum) – No.	1,361	859	1,474	4,998	Pro rata from sample
Signs (illuminated) – No.	1135	514	242	533	BFC data
Bollards – No.	389	632	358	448	Pro rata from sample
Lighting columns	1761	1727	450	10200	BFC data
Traffic Signals (heads)	603	101	0	112	Pro rata from sample
Structures – Road Bridges	34				BFC data
Structures- Subways/upass	74				BFC data
Structures - Footbridges	41				BFC data
Structures – Culverts – No.	13				BFC data
Structures – Retaining wall	19				BFC data
Structures – Gantry/CCTV	12				BFC data

Table 4 – Assets considered in this HIAMP

Asset Condition

Roads Condition Data

5.23 The nature and extent of the highway condition data collected should ensure it is fit for purpose, meet business case criteria and consider risk. There can be no business case for collecting data where the cost is disproportionately high, the benefits low, and the

risks of non-availability low. Conversely, where the cost of collection is relatively low, the benefits high and the risks of non-availability high, the business case is strong.

5.24 To assist with planning future maintenance, it is essential to use maintenance history data in conjunction with the condition data. The majority of maintenance work is managed and recorded through a works ordering system. This can be interrogated to find dates of past maintenance history, including treatments, dates and costs.

5.25 The estimated service lives, maintenance need and planned maintenance dates have been developed as part of the Lifecycle Model in the Asset Management Planning Process (see Section 6).

5.26 Recognising that additional condition information should be collected the requirement has been prioritised by assessing the impact on the HIAMP and the effect on management of the asset. The priority has been assessed by considering the importance to safety, network integrity, the long term programme, the lifecycle model, fault reporting and performance indicators. The impact of condition information on these has been assessed on a scale from 0 to 3 with 3 being the most important. The current condition information, together with its priority is shown in Table 5.

5.27 Based on best practice and the recommendations of "Well Maintained Highways", the list in Table 5 has been identified as the desired state of condition information that should be collected to allow the efficient management of the highway asset.

5.28 Using the prioritised information, a program of data collections has been developed which targets gap closure. In addition to the indicated priorities this programme should consider:

- Estimated cost of closing the gaps;
- Benefit of closing the gap;
- Prioritised list of actions for closing the information gap.

5.29 It is clear from Table 5 that the current condition data is also not entirely comprehensive. In order to address the missing condition data and thereby develop the HIAMP an assessment of the condition of some assets was taken from the 11Km sample video survey. The results of this condition assessment are shown in Appendix 4.

Asset Group	Asset Sub-Group	Asset Attribute	Safety	Network Integrity	Programme	Modelling	Fault Reporting	Performance Indicators	Priority	Available
Footways & Cycle tracks	Condition Surveys	CVI/DVI	3	3	3	3	3	3	18	Y
Street Lighting	Lighting Points	Condition	3	3	3	3	3	3	18	Y
Carriageway	Condition Surveys	SCANNER	3	3	3	3	3	3	18	Y
Carriageway	Condition Surveys	CVI/DVI	3	3	3	3	3	3	18	Y
Structures	Bridge over	Condition	3	3	3	3	1	3	16	Y
Structures	Bridge under	Condition	3	3	3	3	1	3	16	Y
Structures	Retaining Wall	Condition	3	3	3	3	1	2	15	Y
Fences & Barriers	Safety Fence	Condition	3	3	3	3	2	0	14	N
Fences & Barriers	Pedestrian Guard Rails	Condition	3	2	3	3	3	0	14	N
Road Traffic Signals	Traffic Signals	Condition	3	2	3	3	3	0	14	Y
Street Lighting	Illuminated Signs	Condition	3	1	2	3	2	3	14	Y
Structures	Subway	Condition	3	2	2	2	2	2	13	Y
Road Traffic Signs	Un-lit signs	Condition	3	1	2	3	2	0	11	Y
Kerbs, Edgings & Channels	Kerb	Condition	2	2	3	2	2	0	11	N
Road Traffic Signs	Safety Bollards	Condition	3	1	2	2	3	0	11	N
Drainage	Gullies/Catchpits/Manholes	Condition	2	2	2	2	2	0	10	Y
Street Furniture	Bus shelters & bus stops	Condition	2	1	2	2	3	0	10	N
Hedges & Trees	Trees	Condition	3	2	1	2	2	0	10	Y
Road Studs & Markings	Longitudinal Road Markings	Condition	3	1	2	1	2	0	9	N
Drainage	Culverts	Condition	1	2	2	2	1	0	8	Y
Kerbs, Edgings & Channels	Channel	Condition	1	1	3	2	1	0	8	N
Road Studs & Markings	Transverse/Special Markings	Condition	3	1	2	1	1	0	8	N
Road Studs & Markings	Hatched Road Markings	Condition	2	1	2	1	1	0	7	N
Drainage	Ditches	Condition	1	2	1	1	1	0	6	Y
Grassed Areas	Outer Verges	Condition	1	1	1	1	2	0	6	Y
Grassed Areas	Inner Verges	Condition	1	1	1	1	2	0	6	Y
Road Studs & Markings	Road Studs	Condition	1	1	2	1	1	0	6	Y
Hedges & Trees	Hedges	Condition	1	1	1	1	1	0	5	Y

Table 5 – Current Road Condition Information (Prioritised)

Inspections

5.30 The frequency of data collection surveys is recommended by the Codes of Practice and should be taken into account when developing survey programmes; the frequency is be based on carriageway and footway hierarchy or on asset priority.

5.31 Inspections and surveys are routinely undertaken to provide information on the condition of the network. Typically these are:

- Safety Inspections;
- Service Inspections;
- Condition Surveys.

Condition Surveys

5.32 Authorities need to demonstrate value for money from investment in maintenance and ideally need to have information on the nature and severity of deterioration in order to determine the most appropriate maintenance treatment. There are a number of types of survey, providing information from differing perspectives, which in combination can provide a comprehensive picture of the condition of the asset.

5.33 BFC routinely carries out asset condition assessments including:

- Regular principal and general inspections on structures
- Annual SCANNER (Surface Condition Assessment of the National Network of Roads) surveys on A, B and C roads
- Annual Skidding resistance surveys on A & B roads
- Coarse Visual Inspections (CVI) on 1/2 of the unclassified road network each year
- Footway network Surveys (FNS) on 1/2 of the whole network each year.

5.34 There is a risk-based testing programme for steel lighting columns (columns beyond expected life and its tall columns), and an assessment of tree condition.

5.35 Programmes for routine assessment of safety fences are in development.

5.36 Routine and/or network level surveys are used to assist in the identification of potential schemes for the forthcoming programme. Scheme specific surveys may then be undertaken to develop and refine the appropriate treatment solution.

Future Collection of Condition Data

5.37 The coverage and currency of the Councils condition data is variable. Good data exists for some assets, e.g. carriageways, while for others data is lacking, e.g. safety fences. In order to support the development and implementation of the HIAMP principles, and to identify potential risk or liability from poor performance or condition, the Council is developing programmes for the collection and periodic updating of inventory data.

Maintenance History

The Council holds, within its asset information system, a comprehensive fifteen-year history of information on the installation and maintenance of all assets.

5.38 Other maintenance information to support asset management is shown in Table 6:

Other Information	Available
Technical approval records	Y
Contract Details	Y
Operations Manual	Y

Table 6 – Availability of Maintenance Information

Data Use

5.39 Data is required to support the following activities:

- Maintaining an inventory: So that the extent of the highway assets is known; essential in delivering asset management procedures;
- Routine Maintenance Management: To demonstrate inspections and repairs are undertaken in accordance with policies;
- Customer Queries and Service requests: To track customer queries and be able to demonstrate that there has been an efficient and appropriate response;
- Performance Reporting: Performance is reported to a range of stakeholders (this includes the collation and dissemination of NIs, KPIs and Local Performance Indicators);
- Asset Valuation: To enable a high confidence replacement/depreciation cost to be established for all assets;
- Awareness: To enable the network to be managed and information used in insurance/legal claims.

6. LIFECYCLE PLANNING

6.1 This section describes the procedure that has been adopted to develop lifecycle plans. This aligns with industry best practice.

Future demand

6.2 The Future Usage and Demand on the network must be assessed so as to develop plans to meet future needs together with initiation of seeking funding to facilitate these.

6.3 A number of demands that could become influential are:

- Traffic growth;
- National Forecasts;
- Road Traffic Reduction Act;
- Changes in technology;
- Climate change;
- Population growth in the area;
- Legislation.

Phases of an Asset's Lifecycle

6.4 Highway assets have lifecycles that include the following phases; creation/acquisition; maintenance; renewal or replacement; upgrading and disposal or decommissioning.

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

6.6 Lifecycle plans aim to identify the lowest long-term cost for the scope of work required in order to close the performance gap between the current and the target performance level of the asset and to sustain the performance at the desired Level of Service.

6.7 The plans start to optimise the cycle of activities that the assets will experience throughout their lives including (where necessary) planning, design, construction, operation, maintenance, rehabilitation/reconstruction and disposal. They can be used as general guidance to identify specific maintenance needs through the various stages of the asset life and provide a link to the short-term planning process.

6.8 A lifecycle plan should address all stages of an asset's life, as shown in Figure 7.

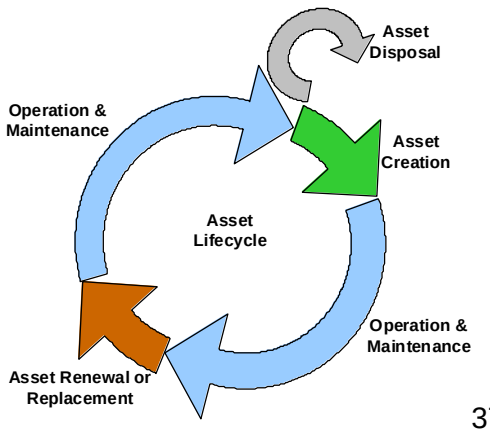


Figure 7 – Lifecycle Phases of an Asset

Lifecycle Management Planning

6.9 Lifecycle plans are a core component of the Asset Management Framework and Asset Management Planning process. A lifecycle plan is a long-term Strategy for managing an asset or a group of similar assets, with the aim of providing the required LoS while minimising whole life costs. The LoS cover safety, environment, sustainability etc. and are described in Section 4 of this HIAMP.

6.10 The lifecycle plans for each asset group/sub-group take account of the expected deterioration mechanisms and rates of deterioration for the material type concerned, component service lives, the required LoS, maintenance techniques, influence of maintenance on future deterioration rates, maintenance unit costs and risks to safety and service loss. This requires a sound understanding of asset behaviour and prediction models for the following: following phases:

- Maintenance and renewal activities commonly employed for different asset types and their effect on asset performance and deterioration
- Whole life costs of asset ownership.

6.11 A number of alternative maintenance strategies are being developed for each asset group/sub-group and compared in terms of whole life costs to identify the optimal Strategy.

Developing a Lifecycle Plan

6.12 The following are the core principles of lifecycle plan development:

- Audit trail - document all assumptions, data sources, analytical techniques and engineering judgements in order to provide a clear audit trail.
- Knowledge transfer – the Council's engineers have a wealth of expert and practitioner knowledge that needs to be retained and passed on to other and future staff. The full documentation of lifecycle plans provides an important knowledge capture and transfer mechanism.

6.13 The lifecycle plans developed as part of this HIAMP are not at the operational level in the management structure; they are set in the strategic level for use as a tool to improve performance and value for money (see Figure 2 in this HIAMP).

6.14 The steps in producing a lifecycle plan are shown in Figure 8 below.

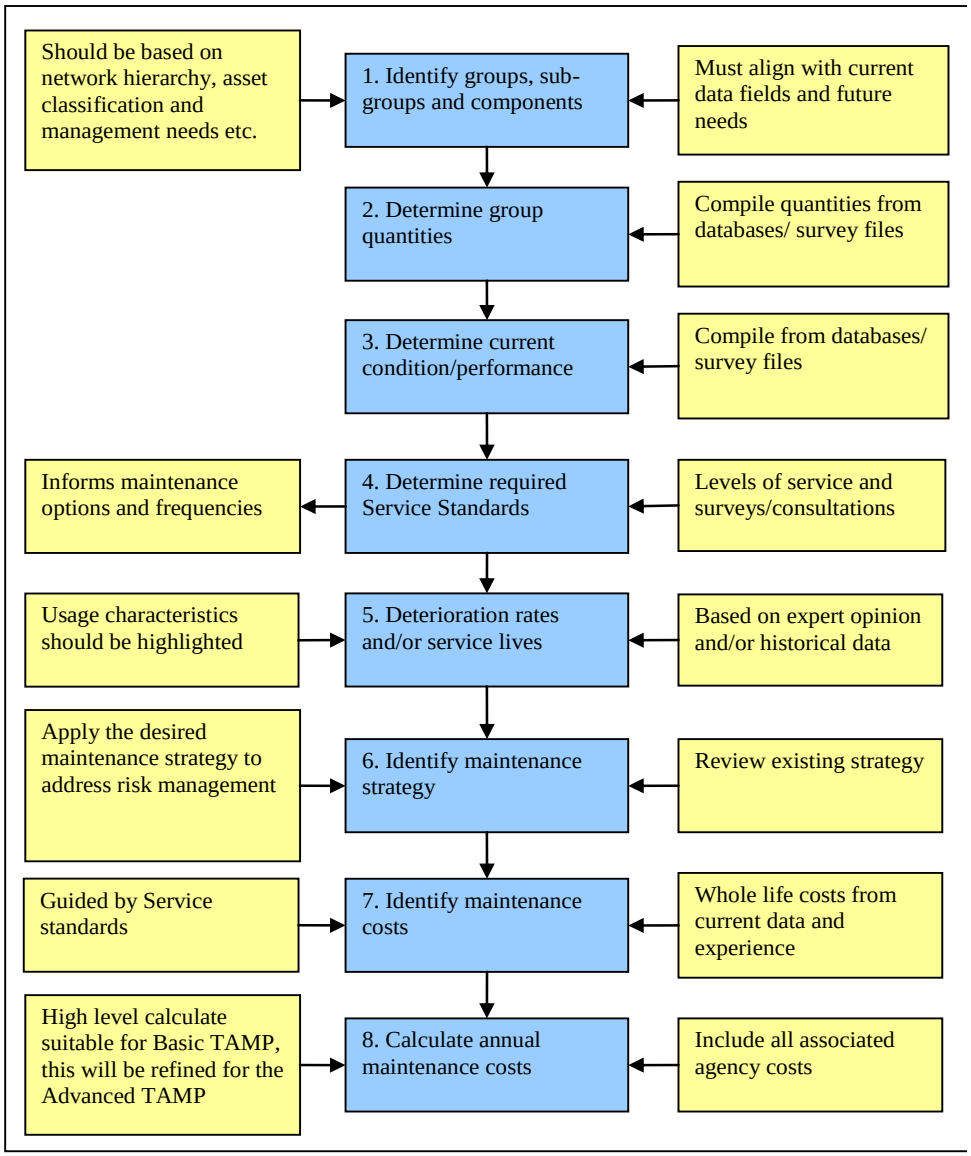


Figure 8 – Lifecycle Plan Development

6.15 The following sub-sections describe the activities involved in each step of the development process.

Step 1: Identify Groups

6.16 Determine the assets that are homogeneous in nature. Homogeneous assets are those assets that are of uniform structure or composition throughout. As an example, consider the entire network of carriageway asset, the homogeneous asset groups can be defined using road class and pavement type such as; Class A – Flexible, Class A – Flexible Composite, Class A – Rigid. In the lifecycle planning process the total quantity of the homogeneous asset is grouped together. Different asset types deteriorate at different rates, likewise different asset types have their own unit costs and to capture these conditions, it is essential to group the assets by homogeneity.

Step 2: Determine Group Quantities

6.17 This is the inventory information discussed in Section 5 of this HIAMP. Much of the inventory used in the lifecycle plan was modelled from the sample surveys. A complete and accurate inventory will produce a higher level of accuracy in the lifecycle outputs.

Step 3: Determine Current Condition and Performance

6.18 Current condition can be determined by inspection regimes and survey routines. Developing forward works programmes on a best value approach seeks to deliver works on an optimised needs basis, with consideration of cost and achieving the goals and objectives established through LoS.

6.19 The current performance of the homogeneous asset group and quantity has been categorised into various performance ranges based on performance state, i.e. Poor, Fair, Good and Excellent. Condition data is not available for all of the highway assets and in these instances condition has been assessed from sample video survey

Step 4: Determine Required Asset Performance

6.20 An essential element in developing the lifecycle plan is to understand the performance required from the asset. Section 4 of the HIAMP describes how corporate goals are related, via strategic transport objectives and LoS, to asset specific performance measures and targets. Full consideration also must be given to the impact upon the levels of funding. Performance targets are used to define the asset group requirements, including:

- condition, e.g. required carriageway and footway condition;
- capacity, e.g. bridge load carrying capacity
- availability, e.g. road must not be closed during the day
- standard, e.g. minimum lighting levels.

6.21 Additional asset group specific requirements are identified based on the performance measures and targets. These performance requirements are used to identify the intervention thresholds and, where appropriate, inspection/maintenance frequencies for the asset.

Step 5: Deterioration Mechanisms, Unit Rates and Service Lives

6.22 Knowledge of the deterioration rates and service lives enables the timing and type of maintenance intervention to be assessed.

6.23 The typical deterioration rates of the homogeneous assets are identified in order to determine the rate of deterioration in the asset over time. Deterioration rates are produced by reviewing the historical changes in performance of the asset group over time, using the performance measures established for the LoS.

6.24 Service lives and deterioration rates for assets/treatments may be estimated from general industry records, published technical guidance and knowledge of performance. Maintaining authorities tailor these estimates based on local network history and experience, in consideration of factors such as the established performance of products and treatments typically used, traffic levels, maintenance policy, resource constraints, LoS etc.

6.25 The tailored estimates of service life used in the lifecycle analysis for the Council's network, are presented in Table 7. These service lives represent the anticipated length of time for an asset/treatment to deteriorate, in terms of level of service, from the point of maintenance or refurbishment.

6.26 In balancing resource demand and stakeholder requirements the lifecycle analyses are based on delivering a 'fair' level of service.

Inventory Assets	Service Life (Years) Level of Service		
	Good	Fair	Poor
Anti-Skid	<3	5	>10
Bollard	<20	25	>30
Carriageway Surface Course A	<12	15	>20
Carriageway Surface Course B	<12	15	>20
Carriageway Surface Course C	<12	15	>20
Carriageway Surface Course U	<12	15	>20
Central Reserve	<20	40	>50
Channel Block	<20	50	>50
Crossover	<20	25	30
Cycle Track	<20	25	30
Footway	<20	25	30
Gully	<30	40	50
Hatched Road Markings	<8	10	15
Hump	<10	12	15
Kerb	<20	50	>50
Lay-by	<17	20	23
Lighting Point	<20	30	>30
Longitudinal Road Markings	<4	5	>7
Pedestrian Crossing	<4	5	>7
Pedestrian Refuge	<20	25	>30
Pedestrian Guard Rail	<20	30	>40
Safety Fence	<25	30	>40
Fences and Barriers	<22	28	>30
Signs	<15	25	>30
Street Name Plate	<15	25	>30
Street Furniture	<10	15	>20
Traffic/Central Island	<20	40	>50
Transverse and Special Road Markings	<3	4	>7
Earthworks and embankments	<40	40	>40
Traffic Signals	<13	15	>20

Table 7 – Defining Service Life

Step 6: Identify Maintenance Strategy

6.27 A maintenance Strategy is the plan of action required to accomplish the specific performance target for the homogeneous asset. Intervention thresholds are used to identify the performance level, at or below which maintenance action is to be considered.

6.28 Intervention levels are used in lifecycle plans as triggers for maintenance action. When the performance of the homogeneous asset group is identified as being below the

threshold then it is addressed in the lifecycle plan. For example, the bandings Poor, Fair and Good can be replaced with categories that are ranked in relation to the intervention threshold (for carriageways and footways the Poor, Average and Good UKPMS thresholds have been used). Any of the homogenous assets found to be ranked in the category below the threshold are addressed in the lifecycle plan.

6.29 Intervention levels may be determined by statutory obligations, e.g. to meet minimum safety requirements, and to consider the customer's expectation of the highway service.

6.30 The maintenance needs for all carriageways, footways and cycletracks has been identified and unit rates associated with each work option have been compiled. These are shown in Appendix 4.

Step 7: Maintenance Costs

6.31 Deterioration mechanisms and unit rates influence the work options considered for an asset, and the work in turn influences the deterioration rate. Therefore Steps 5 and 6 are interrelated and are carried out in parallel.

6.32 The identified deterioration mechanisms will inform the selection/determination of deterioration rates and service lives. Knowledge of the deterioration rates and service lives provides the basis for determining when (in time) a maintenance intervention is required, and frequently what type of maintenance intervention is required. It may also be feasible to use combinations of options, e.g. preventative combined with essential treatments. This is shown schematically in Figure 9, along with an intervention threshold.

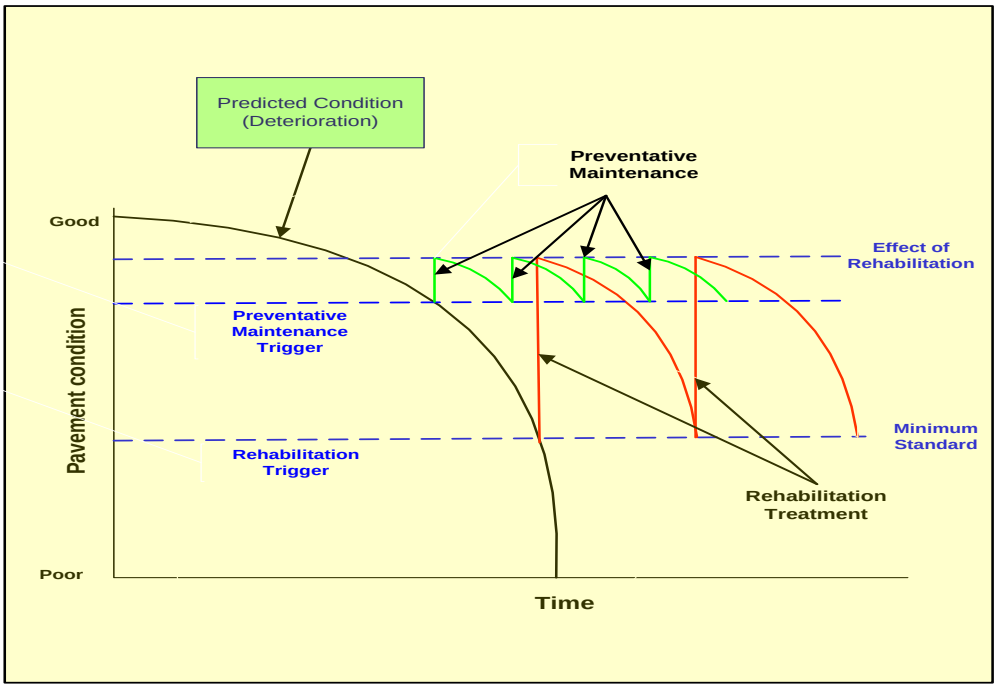


Figure 9 – Maintenance Interventions

6.33 The outputs from Steps 4, 5 and 6 are combined to support the identification of the optimal solution for each asset group/sub-group. The optimal solution is identified by comparing, where appropriate, a series of feasible management options, for example:

- Option A - 'Do minimum' Strategy with minimum maintenance to meet performance requirements.
- Option B - Reactive Strategy with major maintenance/renewal when required with 'do minimum' approach in the intervening periods.
- Option C - Programmed maintenance with minor maintenance carried out at regular intervals.
- Option D - A major enhancement at the present time followed by programmed maintenance at regular intervals.

6.34 The option appraisal is based on the comparison of Whole Life Costs, where WLC are assessed over a minimum 30 year period for the delivery of the required Level of service and discounted to Net Present Value. All costs associated with the asset through the whole lifecycle are considered, from construction to end of life. Such costs will include those associated with building or acquiring new assets, routine maintenance, replacement, renewal or enhancement and disposal.

6.35 The process will help to assess the cost of various maintenance treatments in the light of their effects upon the condition of assets and the risks associated with the varying LoS.

6.36 A schematic a typical output from an option appraisal is shown in

6.37 Figure 10, which shows what the options above may look like.

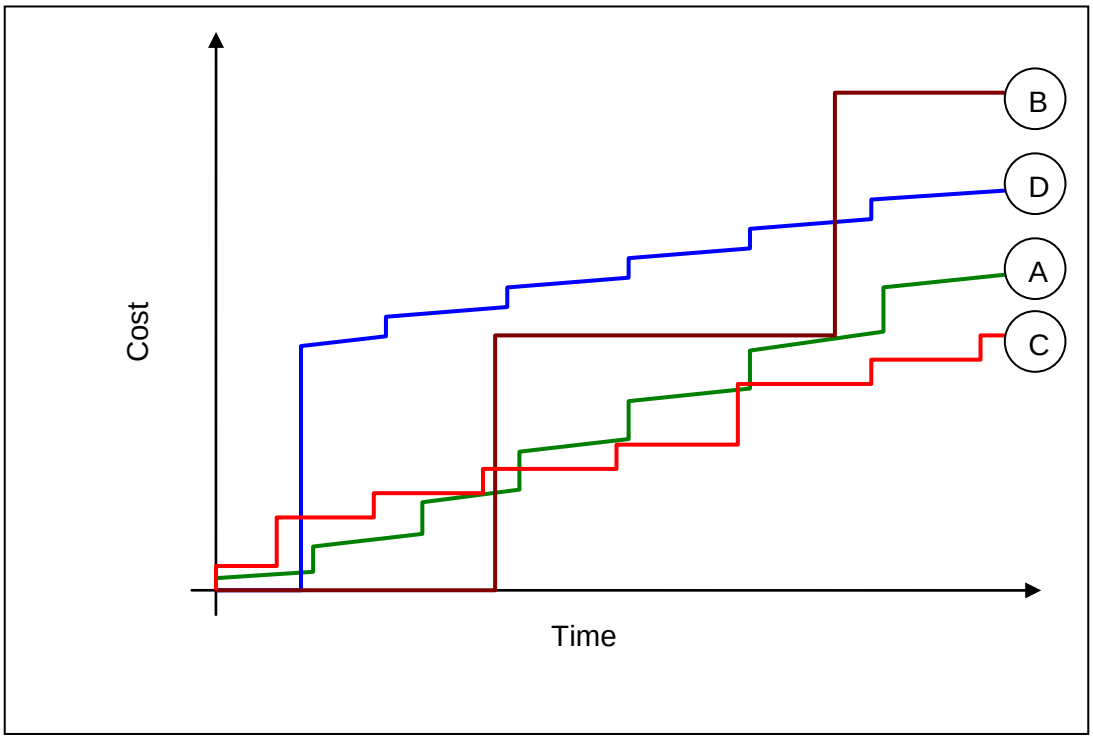


Figure 10 – Option Appraisal Using Whole Life Costs

6.38 In identifying the optimum Strategy that minimises whole life costs the following costs are considered:

- direct costs of maintenance and renewal, i.e. plant, material and labour
- access costs and traffic management costs
- risk of service loss, e.g. indicative costs related to road user delays, diversions and loss of access to facilities
- risk to safety, e.g. indicative costs related to risk of loss of life, injury, litigation and adverse public opinion.

6.39 The option appraisal approach can be extended to give more explicit and robust consideration to appearance, risk, sustainability and environment measures, as well as Whole Life Costs.

Step 8: Calculate Annual Maintenance Costs

6.40 Typical outputs from the lifecycle plans include:

- Identification of the long-term maintenance need;
- Cost per year, i.e. the spend profile;
- Cost per treatment per year;
- Performance per year, i.e. condition progression (see Figure 11 for an example). This illustrates the proportion of the network in good/average/poor condition over a 30 year analysis period as generated by the initial condition and applied service life/treatment regime, with associated implicit funding requirement.

6.41 Tables and Charts provide a summary of indicative costs for each asset over the 30 year period for good, for the Level of Service required and the WLC options chosen. These outputs from the lifecycle plan are shown in Section 9 – Financial Management.

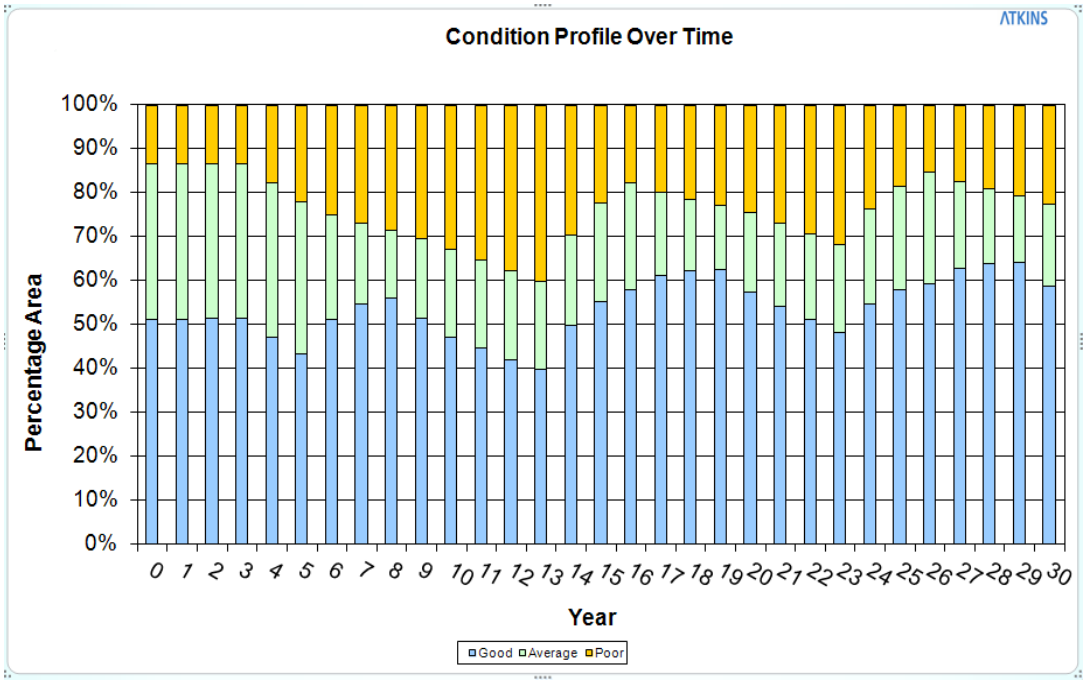


Figure 11 – Typical Chart of Change in Condition over Time

6.42 Lifecycle plans should be regularly updated throughout the maintenance planning process to improve the long-term predictions for maintenance need. Assumptions made about the deterioration models, changes in measured condition and unforeseen changes to unit rates can then be easily accommodated. Improvements to the quality and completeness of inventory and condition data used in the lifecycle plan will improve the quality of the outputs.

Lifecycle Model

6.43 The lifecycle plans have been developed using the HMEP toolkits. These are supplemented by advanced software enabling future investment scenarios to be analysed and advance long-term works programmes develped.

6.44 The Council will update the Lifecycle Plan on a regular basis as new inventory, condition data and unit rates become available. Over time the deterioration of each asset can be refined which will further improve the accuracy of the outputs.

6.45 The HMEP toolkits are Excel based programmes designed to input deterioration data as either Time based deterioration curves or Transition Matrices. Time based curves have been used.

6.46 Time based curves are the more simplistic form where condition deterioration is matched to time and is based on one scenario. Transition Matrices are slightly more complicated in that there are a given proportion of assets in a given condition and then the system deteriorates each condition to the next but each is always dependant on the previous.

6.47 Outputs from the Lifecycle model for a selection of homogeneous assets are shown in Appendix 4. Tabulated costs for the maintenance of each asset are shown in Section 9 - Financial Management and Valuation.

7 RISK MANAGEMENT

Importance of Risk Management

7.1 Managing risk is an integral part of the management of the highways assets. All activities from identification and prioritisation of repair of defects to the establishment for budgets have risks associated with them. The purpose of this section is to emphasize the need for processes to manage these risks in a holistic manner.

7.2 "Risk is the threat that an event or action will adversely affect an organisation's ability to achieve its objectives and to successfully execute its strategies". Audit Commission - Worth the Risk: Improving Risk Management in Local Government.

7.3 A growing interest in risk management is being fuelled by a backdrop of an increasingly litigious society, the significant sums of money paid out by some authorities for public liability claims and the threat of corporate manslaughter charges that some authorities are currently potentially facing. All of these lead to the need to improve risk management procedures.

7.4 Risks should be identified at each level of management hierarchy (strategic, tactical and operational: see Figure 2) using tools and procedures and identify critical risks together with action plans to mitigate the threat the risk poses.

Need for Risk Management

7.5 Risk management is an integral part of good asset management practice with benefits which include:

- Fewer surprises, a reduction, control or transfer of risk;
- Provision of a better quality of services;
- Improved planning, performance and effectiveness;
- Increased ability to manage change;
- Contingency planning;
- Exploitation of opportunities and innovation;
- Improved information for decision making;
- Improved accountability, assurance and governance;
- Improved economy and efficiency;
- Awareness of limitations;
- Improved stakeholder relationships;
- Enhanced reputation;
- Director/Senior Manager protection;
- Opportunity to identify and mitigate risk at an early stage.

The Application of Risk Management

7.6 The objective of applying risk management within the asset management plan is to identify the specific risks associated with the management and operation of the network and by doing so ensure that these are managed in a structured, appropriate and auditable manner. It is conceivable that previously perceived risks may not now be apparent, e.g. safety barriers where changes in standards over (say) the last 20 years may mean that they would no longer be required.

7.7 The assessment of comparative risk is a key asset management tool. It can be used to assist with option appraisal and selection by assisting with the assessment of:

- The comparative risks of providing differing LoS, e.g. is it acceptable to fund only a minimum (Fair) level of service for a certain asset group i.e. a repair when broken approach;
- The comparative risk of funding works on different assets, e.g. is it better to fund works on streetlights as opposed to footways?
- The comparative risk of funding improvements to the network as opposed to maintenance works, e.g. is it better to provide additional speed control facilities or to improve response time to certain defects?

Categorisation of Risks

7.8 A three-tier model can be used to categorise risk based on strategic, tactical and operational risks. The rationale behind this is that it is likely that different groups of people within the Council will manage risks at these different levels.

- Strategic risks being managed at a corporate senior manager level;
- Tactical risk being managed at an asset management/network management level;
- Operation being managed at a service delivery/operations level.

7.9 The main focus of the HIAMP is the tactical risk; each level of risk has been described for reasons of clarity and to foster a universal definition of each type of risk.

The Risk Management Process

7.10 The four main steps of a risk management process can be broken down into:

- Risk Identification – identify key risk exposures.
- Risk Profile (Assessment/Evaluation) – probability and severity level.
- Risk Control and Management – manage and control risk exposure.
- Risk Reporting and Review – monitor, review and report on progress.

7.11 The process for completing risk management is show below in Figure 12; this is a circulatory process that necessitates periodic review:

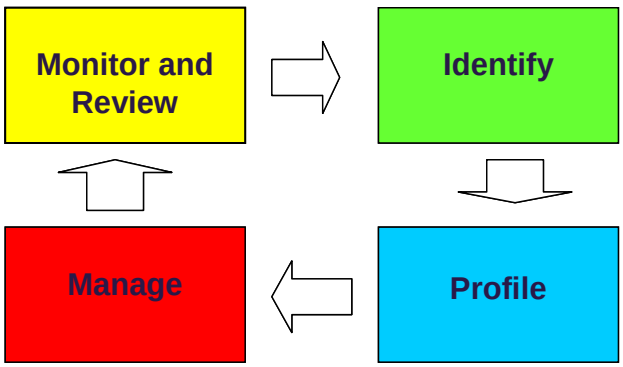


Figure 12 – Risk Management Process

7.12 Additional information relating to risk management process is contained in Appendix 6.

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8. FORWARD WORK PROGRAMME

8.1. The lifecycle plan produced as part of this HIAMP is at a strategic level analysis based on overall network condition and 'global' deterioration rates and treatment regimes. It is not derived from analysis of individual streets or schemes; its principal function in programme development is, therefore, to give an indication of the required resource profile to achieve the corresponding condition profile.

8.2. In order to deliver the required level of service, the Council develops and executes appropriate programmes of work within the usual budgetary constaints.

8.3 Currently the Council's Executive annually approves 3+ year rolling works programmes. Longer term programmes, covering 5 - 10 years are being produced utilising a hosted highway condition analysis software system. (Horizons).

8.4 A longer term programme provides an opportunity to develop and Integrated Forward Works Programme (IWP), which will include all assets and services and input from other organisations that may have an interest in or an effect upon the management of the highway network.

8.5 An IWP provides the possibility to integrate works from all funding streams and initiatives and by bring the planning of all works on the network into one location enable easier co-ordination to take place. It will be able to assist with short-term road space/traffic management issues and longer term planning. An important part of the integration will be to liaise closely with the Statutory Undertakers.

8.6 With good quality condition data available for analysis, it will be possible to predict the likely future maintenance schemes and their locations. The timing of other works can then be reviewed to ensure situations don't arise where new works are damaged by subsequent tasks. This long-term programme will be built on projections using currently held data and knowledge; as such there will be significant limitations on the reliability of the projections. The reliability of projections regarding the precise nature and location of the works for the later years of the programme will be relatively low; however an aggregation of the anticipated needs is a valid method of developing the programme. An example of the process for developing a works programme is shown in Figure 13.

8.7 In developing an IWP, there will be a need to consider other factors, including the requirements of :

- The Traffic Manager
- Other internal Council teams;
- Police and other emergency services;
- Schools and other education interests;
- Health bodies;
- Public transport companies;
- Statutory undertakers;
- Developers;
- Changes in technology.

8.8 The IWP will need to be, as a minimum, updated annually. Developing an IWP will need time and effort from all parties, internal and external. For carriageway and footway assets it is possible to use a computerised ranking programme to develop a draft IWP based upon numeric data e.g. UKPMS condition, traffic flow, accident data etc.

8.9 The draft IWP can be further prioritised using Value Management.

Value Management used for Prioritisation

8.10 A value management (VM) framework can be used to produce a final priority score for all identified maintenance work.

8.11 Value management is a process that can be used to prioritise the competing needs of highway maintenance activities. Prioritisation is based on financial (actual costs), economical (benefits from works) and non-monetised (social-economic, environment, political) criteria. The VM process provides a formal, structured and consistent approach for comparing the benefits of different maintenance activities against each other.

8.12 The outcome of the VM process is to produce a priority score for each unique maintenance activity. The score is based on how well the activity will satisfy the Council's strategic goals and objectives, should it be completed. The priority score is used in the coordination process as a sort key. This sort key is used to group high priority maintenance activities that are concentrated in a specific location into maintenance schemes for completion.

Value Management and the HIAMP

8.13 Figure 13 on the next page shows the position of VM within the context of HIAMP . The process becomes especially useful once a significant Workbank has been developed.

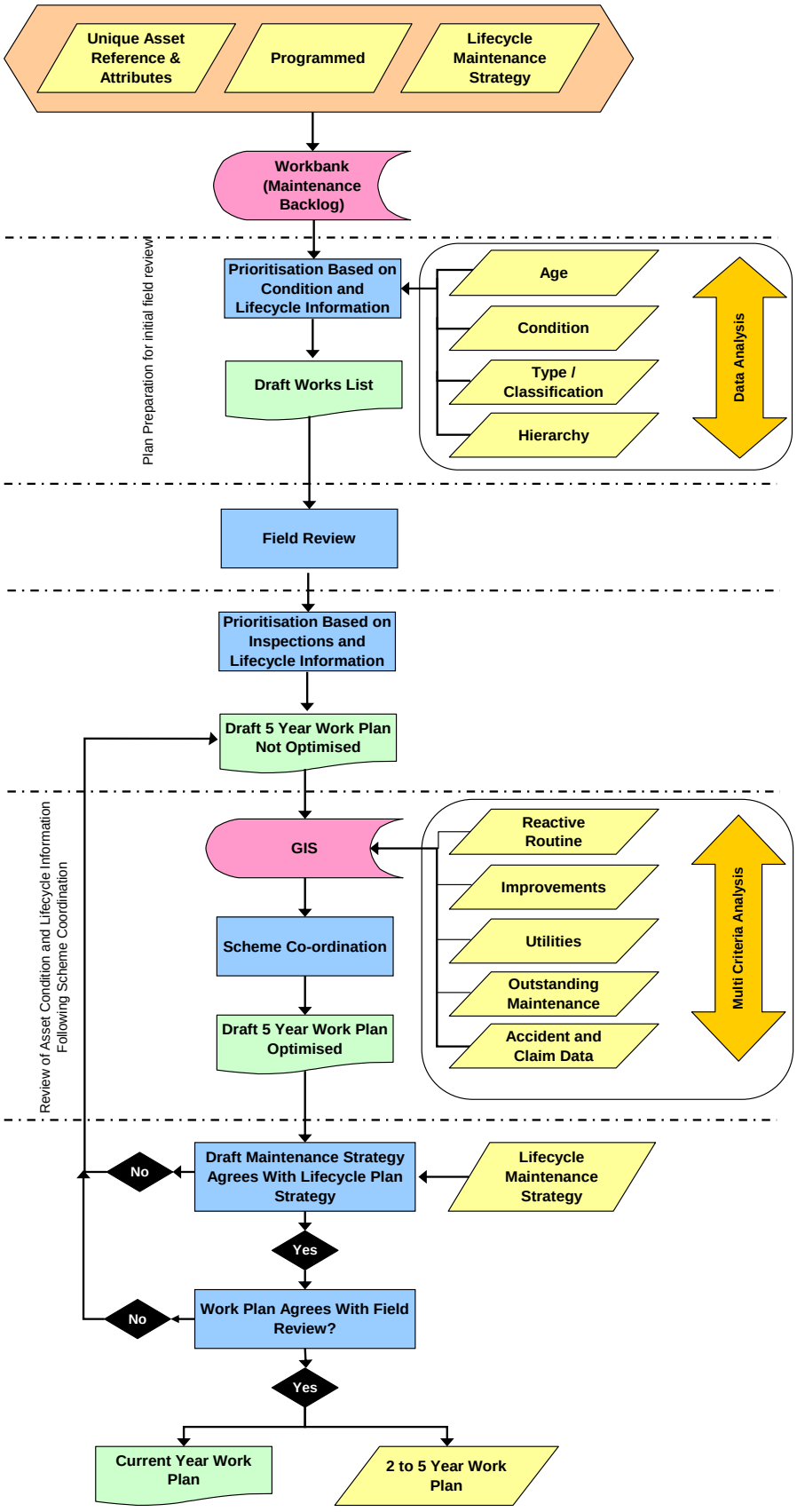


Figure 13 – Process for Developing Operational Works Programme

Bracknell Forest Council

9. FINANCIAL MANAGEMENT AND VALUATION

Current Sources of Funding

9.1 Funding for highway asset maintenance, upgrade and renewal can be split into capital and revenue expenditure.

Capital

9.2 Capital funding can be defined as "investment that will increase the value of the asset". Capital funding may often be externally sourced primarily from central government via DfT through the Local Transport Plan (LTP) process, rate support grants, prudential borrowing and developer contributions (Section 106 and 278). Capital expenditure for maintenance is generally associated with upgrading and renewal and is used to improve the life of assets by strengthening or replacing them, (e.g. overlaying a carriageway surface).

9.3 The Capital expenditure for 2015/16 is shown below.

Total Highway Maintenance Capital Expenditure	£1,618,400
Total Bridges Capital Expenditure	£538,800
Total Street Lighting Capital Expenditure	£747,000

Revenue

9.4 Revenue funding can be defined as "investment that will maintain or reduce the rate of depreciation of the value of the asset". Revenue funding comes from internal sources from the Council's regular income (e.g. Council tax) and from central government as part of its revenue support for local government services. Revenue expenditure is used for cyclic and reactive maintenance activities which make the network safe for day to day use.

9.5 The Revenue expenditure for 2015/16 is shown below.

Total Highway Maintenance Revenue Expenditure	£2,570,000
Total Bridges Revenue Expenditure	£124,580
Total Street Lighting Revenue Expenditure	£1,102,600

Future Funding

9.6 It is important to understand the funding levels required for the delivery and improvement of the highway network.

9.7 The ability to demonstrate the effects of changes in funding upon network condition (through the use of lifecycle plans) and LoS, changes to the risk profile and whole life cost arguments will serve to support this.

Valuation

9.8. Central government has moved towards a more commercial style of accounting with the introduction of Whole of Government Accounts (WGA). This will lead to the production of accounts on an accruals basis and using Generally Accepted Accounting Principles (GAAP). This form of accounting is known as Resource Accounting and Budgeting (RAB. Under these requirements, local authorities are required to value their highway asset, as a private business is required to value its assets.

9.9 There are three aspects of Asset Valuation:

- Gross Replacement Cost (GRC); the cost of replacing the asset with a Modern Equivalent Asset, using standardised Unit Rates;
- The current monetary value which is defined as the Depreciated Replacement Cost (DRC), which is the gross replacement cost (GRC) less the accumulated consumption (AC);
- Accumulated consumption which is the depreciation in value due to ageing, usage, deterioration, damage, reduced service levels and obsolescence.

9.10 The key drivers for asset valuation are:

- Emphasising the need to preserve the highway infrastructure by placing a monetary value on it;
- Demonstrating good stewardship by monitoring the asset over time;
- Supporting WGA and promoting greater accountability, transparency and improved stewardship of public finances;
- Supporting highway asset management.

9.11 The Gross Replacement Cost of the whole highway asset, submitted to HM Treasury in 2014 as part of the Whole of Government Accounts, was estimated to be worth £808 million, excluding the value of the land. The Depreciated Replacement Cost was estimated to be £690 million.

9.12 This valuation is useful to demonstrate the comparative size of the highway asset against other Council owned assets and to benchmark maintenance spending. Currently, approximately, 1% of the highway asset value is spent annually on operation and maintenance.

10. MONITORING

Overview

10.1 The HIAMP is a 'live' document which will require periodic review to update and appraise work programmes and financial plan against latest data and conditions, financial provisions, costs of works and expectations.

Monitor and Review

10.2 Continuous improvement is an essential element of asset management enabling better decisions to be made with better information.

10.3 It is essential to monitor and review the performance of the assets and the asset management regime. The monitoring process will enable the timely identification of instances where expected performance is not being achieved so that corrective action can be taken, thereby ensuring targets are met. Learning from mistakes, amending processes and feeding this information back into the asset management process will ensure continual improvement in the asset management approach.

Future Actions

10.4 Improvement actions necessary to embed the asset management approach should have impacts on current business processes and/or the organisation's culture. Some measures may take a considerable time to implement before reaping the benefits.

10.5 A gap analysis has been undertaken and this identified a series of improvement actions. These are detailed in Appendix 7.

10.6 The gap analysis should be updated on a regular basis to monitor progress towards delivering the improvement actions.

Monitoring, Review and Feedback in the Asset Management Process

10.7

10.8

10.9 Figure 14 – highlights where monitoring, review and feedback of the HIAMP and the asset management planning process is completed. Essentially each element in the asset management planning process is to be monitored and reviewed for achievement of performance targets by comparing the expected against actual targets. The outcomes are then to be feedback into the asset management process to ensure that the experience learnt is then taken into account in future developments of the HIAMP.

10.10 In an asset management approach, performance measures are used:

- To provide inputs for managerial decisions;
- As a diagnostic tool to identify critical actions required to prevent undesirable outcomes;
- To support the efficient distribution and control of public resource;

- As a tracking tool to monitor activities associated with the management of the highway asset.

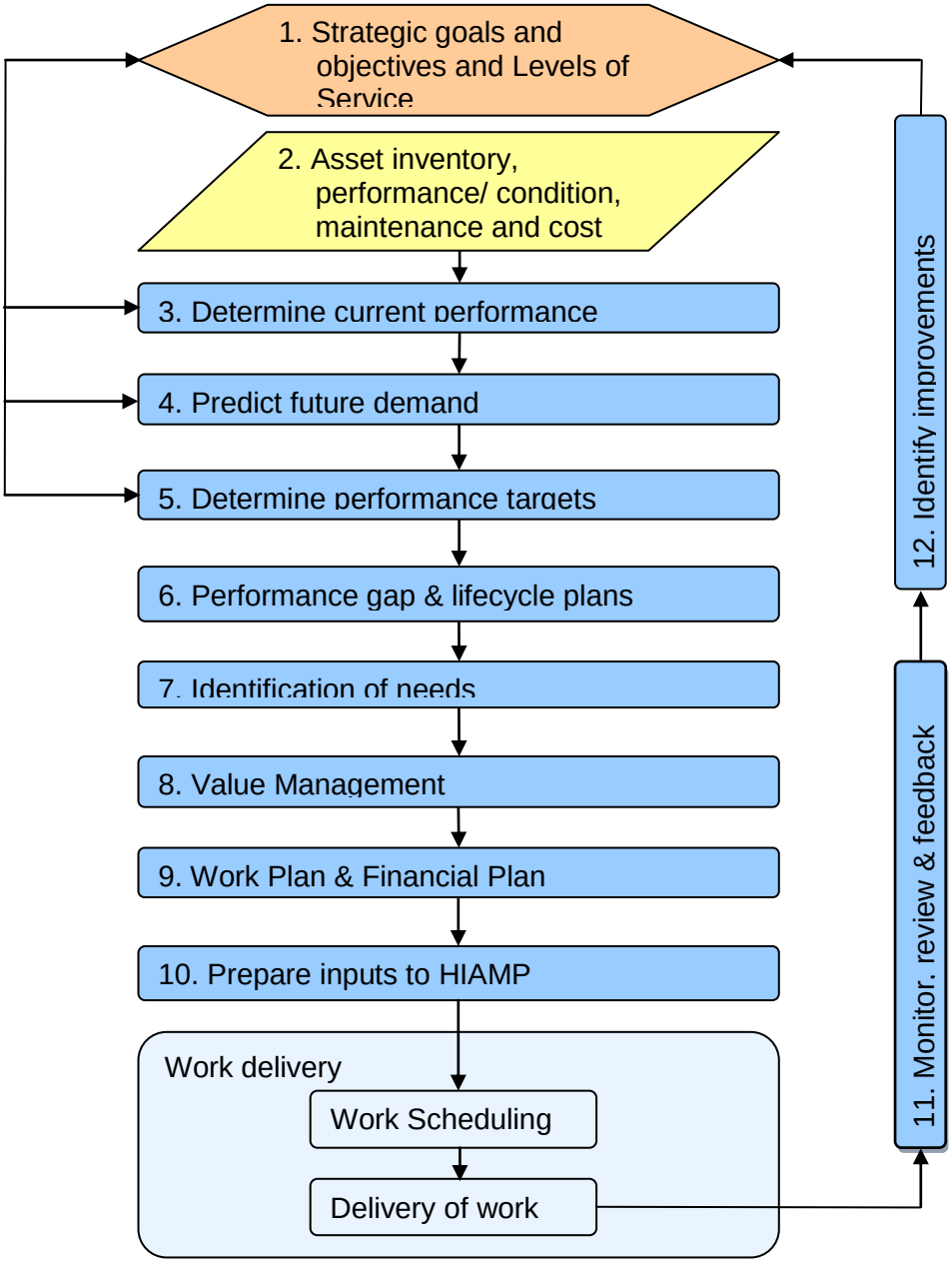


Figure 14 – Monitoring, Review and Feedback an Asset Management Planning

11. GAP ANALYSIS ACTION PLAN

Analysis of Asset Management Practice

11.1 A gap analysis provides a structured approach to the comparison of current asset management practice with desired practice and has been completed.

11.2 The following steps were carried out

- Identify current practice;
- Establish desired practice;
- Complete gap analysis by comparing 1 and 2 above;
- Produce an Action Plan to close existing gaps;

11.3 The Figure below demonstrates the analysis process.

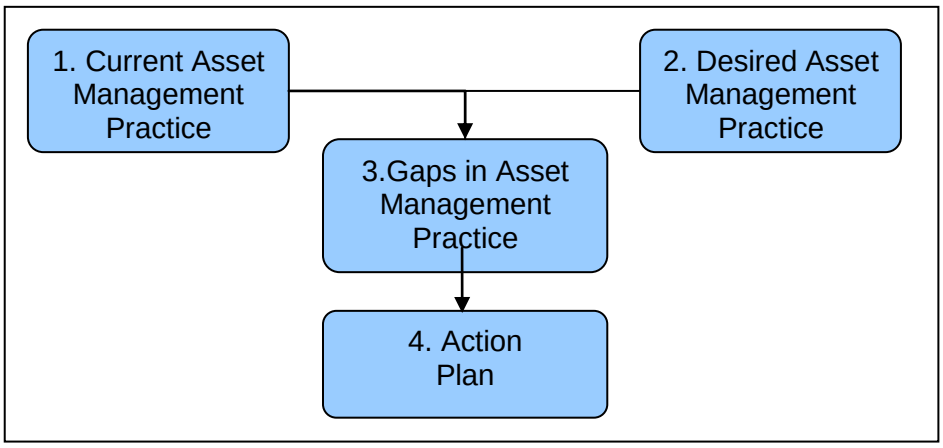


Figure 15 – Asset Management 'Gap' Analysis

Actions for Consideration

11.4 A series of improvement actions have been identified from the Gap Analysis the most significant of which include:

- Complete full inventory survey for key assets and update regularly;
- Complete collection of condition data for all assets and update regularly;
- Develop LoS;
- Review budget requirements and link to LoS;
- Develop risk assessments as a management tool;
- Review current business processes in light of asset management practice to see where improvements can be made;

11.5 An Action Plan based upon the gap analysis with recommendations and outcomes is included in Appendix 6.

APPENDIX 1: GLOSSARY AND DEFINITIONS

Terminology	Definition
AC	Accumulated Consumption
Asset Management	A strategic approach that identifies the optimal allocation of resources for the management, operation, preservation and enhancement of the highway infrastructure to meet the needs of current and future customers.
Asset Management Regime	Comprises the organisational structure and business processes, asset management planning and work planning and information management and systems that enable asset management to be effectively planned and delivered.
Asset Valuation	The procedure used to calculate the asset value.
Authority	A collective term used to refer to the asset owner.
Backlog	The monetary value of work required to close the gap between the current performance provided by an asset and the required performance. Where the required performance is defined nationally and may be lower than some locally set performance targets.
BCI	Bridge Condition Indices
BVPI	Best Value Performance Indicator
Control	An action to minimise the negative risk
CSS	County Surveyors' Society (now ADEPT)
CVI	Coarse Visual Inspection
Data	Numbers, words, symbols, pictures, etc. without context or meaning, i.e. data in a raw format.
DCD	Data Capture Device
DfT	Department for Transport
DRC	Depreciated Replacement Cost
DVI	Detailed Visual Inspection
Excel	Software Spreadsheet
Frequency	A measure of the number of occurrences based on time
GAAP	Generally Accepted Accounting Practice
GIS	Geographical Information System
GPS	Global Positioning System
GRC	Gross Replacement Cost
HIAMP	Highway Infrastructure Asset Management Plan
Hazard	A source of potential harm
HMEP	Highway Maintenance Efficiency Programme
Highway Network	Collective term for publicly maintained facilities laid out for all types of user, and for the purpose of this guidance includes, but is not restricted to, roads, streets, footways, footpaths and cycle routes.
Information	A collection of numbers, words, symbols, pictures, etc that has meaning, i.e. information is data with context.

Terminology	Definition
Inventory	Information that is used to describe each individual asset, including but not restricted to location, asset type, dimensions, construction information and records of use.
KPI	Key Performance Indicator
LA	Local Authority
Level of Service	A statement of the performance of the asset in terms that the stakeholder can understand. They cover the condition of the asset and non-condition related demand aspirations, i.e. a representation of how the asset is performing in terms of both delivering the service to stakeholder and maintaining its physical integrity at an appropriate level. LoS typically cover condition, availability, accessibility, capacity, amenity, safety, environmental impact and social equity.
Lifecycle Plan	A considered Strategy for managing an asset, or group of similar assets, from conception construction (planning and design) to disposal. A lifecycle plan should give due consideration to minimising costs and providing the required performance.
LTP	Local Transport Plan
Maintenance	A collective term used to describe all the activities and operations undertaken to manage and maintain highway assets, e.g. inspection, assessment, renewal, upgrade etc.
Monitoring	Observation or measurement repeated periodically or continuously over time.
Need (or maintenance need)	Maintenance need required of an asset to improve its performance.
OSGR	Ordnance Survey Grid Reference
Owner	A collective term used to refer to any owner of a highway asset, i.e. highway authorities and other owners. Also see authority.
PAS 55-1 (and 2)	Publicly Available Specification 55-1 (and 2)
Performance	A term used to describe the service delivered as measured by a series of LoS. It comprises of both condition and non-condition measures (i.e. safety, accessibility, etc).
Performance Measure	A generic term used to describe a measure or indicator that reflects the performance and/or condition of an asset, e.g. Best Value Performance Indicators.
Risk	Chance of something happening that will impact on objectives
Risk Assessment	The process of risk identification, risk analysis and risk evaluation
Risk Identification	The process of determining what, where, when, how and why something could happen
Risk Management	The chance of something happening which will have an impact on corporate, departmental, tactical, operational or project objectives
Risk reduction	Action taken to lessen the likelihood, negative consequence or both
RMMS	Road Management Maintenance System
SCANNER	High speed surface condition survey of the pavement

Terminology	Definition
SCRIM	Sideway-force Coefficient Routine Investigation Machine
BFC or Council	Bracknell Forest Council
Stakeholder	An individual, group, body or organisation with a vested interest in the management of the transport network, e.g. Authority/owner, public, users, community, customers, shareholders and businesses.
TAG	Local Authority Technical Advisers Group
TAMP	Transport Asset Management Plan - A plan for managing the transport asset base over a period of time in order to deliver agreed target LoS, in the most cost effective manner.
TMA	Traffic Management Act 2004
Treatment Option	A possible treatment type that can be used for the maintenance of an asset.
UKPMS	United Kingdom Pavement Management System
Value Engineering	Development of optimal solutions for prioritised maintenance needs using option appraisal, whole life costing, scheme development, and synergies with other highway schemes.
Value Management	Assessment and prioritisation of identified maintenance needs.
WGA	Whole Government Accounts
WLC	Whole Life Cost - Total cost of the asset over the term of its life including planning, design, construction, acquisition, operation, maintenance, rehabilitation and disposal.
Workbank	Database of all outstanding maintenance work that currently exists on the network.

APPENDIX 2: PERFORMANCE AND LEVELS OF SERVICE

CARRIAGEWAYS

		SERVICE LEVELS				CURRENT LEVELS		
Asset Group	**Aspirations & Performance Measures**	**Minimum**	**Fair**	**Good**	**Excellent**	**Current Service Level**	**Asset**	**Customer Satisfaction**
Carriageway		Predominantly reactive maintenance (other than Capital allocations) - safety inspection regime and responding to reports of hazardous defects within 24 hours. Minimal intervention to prevent asset deterioration. Safety inspection and maintenance regime to deal with all potentially hazardous defects within 24 hours. Little or no repairs for non hazardous defects. No annual programme.	Routine maintenance and some planned works reducing dependence on reactive maintenance. Condition stabilised at a serviceable level. Safety inspection and maintenance regime to deal with all potentially hazardous defects within 24 hours. Resources insufficient to repair all required non hazardous defects. Annual programming.	Investment in structural maintenance leading to improvements in condition, reduction in backlog and further reducing dependence on reactive maintenance. Majority of arisings taken for recycling. Safety inspection and maintenance regime to deal with all hazardous defects within 1hour of Officer observation and all other repairs added to the programme to be dealt with in accordance with the timescales set out in the HMMP. 3-5 year forward programme.	Backlog in maintenance eliminated, operating at a sustainable level, using sustainable methods with minimal reactive maintenance. All arisings taken for recycling. Safety inspection and maintenance regime to deal with all hazardous defects within 1 hour of Officer observation and all other repairs added to the programme to be dealt with in accordance with the timescales set out in the HMMP. 5 - 10 year forward programme.	Standard routine maintenance and planned works reducing dependence on reactive maintenance. Condition currently adequate, at a serviceable level, but likely to fall without further investment. Safety inspection and maintenance regime sufficient to deal with all potentially hazardous defects within 24 hours and within 4 hours if a customer report. Annual programme of capital works.	Fair to Good	Survey results to be interrogated
	NI168	to be developed	to be developed	to be developed	to be developed			
	NI 169	to be developed	to be developed	to be developed	to be developed			
	BV225b	to be developed	to be developed	to be developed	to be developed			
	SCRIM	to be developed	to be developed	to be developed	to be developed			
	% customers satisfied with the service	< 50%	50 - 65%	65 - 85%	> 85%			

FOOTWAYS

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Footways		Predominantly reactive maintenance (other than Capital allocations) Minimal intervention to prevent asset deterioration. Safety inspection and maintenance regime to deal with all potentially hazardous defects within 24 hours. No annual programme	Routine maintenance and some planned works reducing dependence on reactive maintenance. Condition stabilised at a serviceable level. Safety inspection and maintenance regime to deal with all potentially hazardous defects within 24 hours. Resources insufficient to repair all required non hazardous defects. Annual programming.	Investment in structural maintenance leading to improvements in condition, reduction in backlog and further reducing dependence on reactive maintenance. Majority of arisings taken for recycling. Safety inspection and maintenance regime to deal with all hazardous defects within 1 hour of Officer observation and all other repairs added to the programme to be dealt with in accordance with the timescales set out in the HMMP. 3-5 year forward programme.	Backlog in maintenance eliminated, operating at a sustainable level, using sustainable methods with minimal reactive maintenance. All arisings taken for recycling. Safety inspection and maintenance regime to deal with all hazardous defects within 1 hour of Officer observation and all other repairs added to the programme to be dealt with in accordance with the timescales set out in the HMMP. 5 - 10 year forward programme.	Standard routine maintenance and planned works reducing dependence on reactive maintenance. Condition currently adequate, at a serviceable level, but likely to fall without further investment. Safety inspection and maintenance regime sufficient to deal with all potentially hazardous defects within 24 hours and within 4 hours if a customer report. Annual programme of capital works.	Fair to Good	Survey results to be interrogated
	Safety Ins Ratings					??		
	% length structurally impaired (CVI - 100m)	> 40%	25 - 40%	15 - 25%	< 15%	??		
	LPI's	to be developed	to be developed	to be developed	to be developed	to be developed		
	% customers satisfied with the service	< 50%	50 - 65%	65 - 85%	> 85%	??		

CYCLE TRACKS

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Cycle Tracks		Predominantly reactive maintenance (other than Capital allocations) Minimal intervention to prevent asset deterioration. Safety inspection and maintenance regime to deal with all potentially hazardous defects within 24 hours. No annual programme	Routine maintenance and some planned works reducing dependence on reactive maintenance. Condition stabilised at a serviceable level. Safety inspection and maintenance regime to deal with all potentially hazardous defects within 24 hours. Resources insufficient to repair all required non hazardous defects. Annual programming.	Investment in structural maintenance leading to improvements in condition, reduction in backlog and further reducing dependence on reactive maintenance. Majority of arisings taken for recycling. Safety inspection and maintenance regime to deal with all hazardous defects within 1 hour of Officer observation and all other repairs added to the programme to be dealt with in accordance with the timescales set out in the HMMP. 3-5 year forward programme.	Backlog in maintenance eliminated, operating at a sustainable level, using sustainable methods with minimal reactive maintenance. All arisings taken for recycling. Safety inspection and maintenance regime to deal with all hazardous defects within 1 hour of Officer observation and all other repairs added to the programme to be dealt with in accordance with the timescales set out in the HMMP. 5 - 10 year forward programme.	Standard routine maintenance and planned works reducing dependence on reactive maintenance. Condition currently adequate, at a serviceable level, but likely to fall without further investment. Safety inspection and maintenance regime sufficient to deal with all potentially hazardous defects within 24 hours and within 4 hours if a customer report.	Fair to Good	Survey results to be interrogated
	Safety Ins Ratings % length structurally impaired (CVI - 100m) LPI's % customers satisfied with the service	 > 40% to be developed < 50%	 25 - 40% to be developed 50 - 65%	 15 - 25% to be developed 65 - 85%	 < 15% to be developed > 85%	?? ?? to be developed ??		

STRUCTURES

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Structures		Predominantly reactive maintenance with minimal intervention to prevent asset deterioration. Little or no repairs for non safety defects. Inspections carried out to identify potential safety issues only. No annual programme	Programme of inspections and determination of bridge condition. Short term programme of planned works and routine maintenance reducing dependence on reactive maintenance. Condition stabilised at a serviceable level. Resources insufficient to repair all required non safety defects.	Programme of inspections and determination of bridge condition. Short to medium term programme of planned works and routine maintenance with minimal reactive maintenance. Investment in structural maintenance leading to improvements in condition, reduction in backlog and further reducing dependence on reactive maintenance.	Programme of inspections and determination of bridge condition. Long term programme of planned works and routine maintenance with minimal reactive maintenance. Investment in structural maintenance leading to elimination of maintenance backlog and maintaining the stock at a steady state with minimal reactive maintenance. All bridges capable of carrying 40T vehicles or an appropriate capacity to suit the local highway network.	Programme of inspections (Principal and general) and determination of bridge condition. Routine maintenance and short term programme of planned works. Condition currently stabilised at a serviceable level but condition is likely to deteriorate without increased investment.	Good	Survey results to be interrogated
	BCI	0 - 65	65 - 85	85 - 95	95+	??		

STREET LIGHTING

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Street Lighting (incl. Illuminated apparatus)	All installations refurbished within last 25 years. All apparatus < 40yrs old. Detailed underground Inventory. Apparatus comprises low energy/sustainable components capable of being dimmed/trimmed/switched remotely (full HQ control). Implement in-house remote monitoring (Central Management System) capability. Bulk lamp changes extended to 6 yrs to match electrical/structural testing.	No cyclic maintenance. Lamps allowed to burn to extinction resulting in high number of faults. Growing backlog of obsolete columns. Replacements restricted to potential hazards. Incomplete inventory.	No cyclic maintenance. Lamps allowed to burn to extinction resulting in high number of faults. Customer reported failures completed in 5 days, others within 20 days. Column replacement at a level where condition of stock is generally stable. Inventory substantially complete	Cyclic maintenance undertaken with faults minimised and condition of stock improving. 90% of customer reported failures completed within 5 working days. Replacement of columns at a level where obsolete units and potential hazards reducing. Comprehensive inventory.	Cyclic maintenance taking place All customer reported failures repaired within 5 working days (other than DNO faults) street scene enhanced by appearance of equipment. Backlog of columns in need of replacement eliminated. Increasing use of high quality equipment including electronic control gear, energy efficient lamps and remote monitoring equipment.	Approx 15% of columns fitted with remote monitoring equipment. Ongoing programme of concrete column replacement. LED “invest to save bid “ in progress	Good	Survey results to be interrogated
	BVPI215a % street lights working as planned % of columns older than original design life % faults identified via authority patrol. BVPI 215b % customers satisfied with the service safety insp structural	10 days <97% 97 - 98% 98 - 99% >99% 99.10% > 30% to be developed > 20 days < 50%	7 days > 20% to be developed 12 - 20 days 50 - 65%	5 days 10 - 20% to be developed 7 - 12 days 65 - 85%	3 days < 10% to be developed < 7 days > 85%	5 days 98 - 99 ?? to be developed 12 - 20 ??		

HIGHWAY DRAINAGE

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Highway Drainage (inc. subway pumping stations)	Pumping Stations Separate - Annual Service	Service reactive in nature. All gullies and channelized drainage cleansed annually. Backlog of drainage faults increasing and includes cases of internal flooding of property.	Inspection undertaken in response to flooding events. Cleansing frequency less than need and prioritised on traffic use. Backlog of minor improvements relatively stable but some schemes dependant on one-off capital bids.	Routine inspection of known flooding hotspots. Cleansing frequency based on need. Backlog of improvements to alleviate flooding of property cleared.	Routine inspection of all drainage assets where flooding occurs due to malfunction. Cleansing frequency meets need. Sustainable system for disposal of arisings. Backlog of improvements to alleviate highway flooding cleared. Progressive mapping of underground systems and condition underway.	Cleansing frequencies appropriate to network needs. Improvements undertaken on a priority basis. Number of required improvements relatively stable. Larger improvements will be reliant on Capital funding.	Fair	Survey results to be interrogated
	% road gullies running free following cyclic cleansing Number of reports of blocked gullies per 1000 gullies sily??	< 97% > 40	97 - 98% 20 - 40	98 - 99% May-20	> 99% < 5	?? ??		

PUBLIC RIGHTS OF WAY

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Public Rights of Way		Reactive inspection and maintenance only. Little or no action to increase disabled access. Maintenance backlog growing.	Limited inspection programme. Rectification of signage & furniture faults resource limited. Cutting back of vegetation reactive. Backlog of surface improvements stabilised. Disabled provision and action on obstruction cases considered on a priority basis.	Routine inspection programme. Rectification of signage & furniture faults by next inspection. Cutting back of vegetation annually on priority network. Backlog of surface improvements reducing. Disabled provision and action on obstruction cases considered on a priority basis.	Routine inspection of all PROW. Rectification of signage, furniture and surface faults within 3 months. Cutting back of vegetation annually on majority of network. Backlog of surface improvements eliminated. Annual programme to improve disabled access. All obstruction cases actively addressed.	E.G. Routine inspection of all ROW. Fault rectification by next inspection. Cutting back annually on priority network and reactive elsewhere. Backlog of surface improvements reducing. Annual programme of works to improve disabled access. Obstruction cases considered on a priority basis.	Fair	Survey results to be interrogated
	% length accessible to disabled users & network obstructed Ave. time taken to respond to request for action	< 55% to be developed to be developed to be developed	55 - 70% to be developed to be developed to be developed	70 - 90% to be developed to be developed to be developed	> 90% to be developed to be developed to be developed	?? to be developed to be developed to be developed		

SIGNS & BOLLARDS

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Signs & Bollards	Inventory details complete. Annual clean of all sign faces	Signs / bollards maintenance reactive. Signage reviewed as part of improvements.	Signs / bollards maintenance reactive. Annual clean of sign faces on priority routes. Bollards cleaned on reactive basis on priority routes. Signage reviewed as part of improvements.	Annual clean of sign faces and reactive cleaning of all bollards. Basic inventory details held in computerised system. Signs / bollards maintenance reactive.	Annual inspection for signs & bollards maintenance. Annual clean of all sign faces &bollards All signs on priority routes reviewed every 5 years. Inventory details complete.	Annual inspection for signs & bollards maintenance. Annual clean of all sign faces & bollards Maintenance reactive. Signage reviewed as part of improvements. Inadequate inventory under improvement – data collected by Contractor	Fair	Survey results to be interrogated
	to be developed	to be developed	to be developed	to be developed	to be developed			

ROAD MARKINGS & CATS EYES

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Road Markings	Inventory details complete, Condition of all road markings above 100mcd/m2/lux Reflectivity Green? (>80 to 100< mcd/m2/lux amber, <80 mcd/m2/lux Red) and 95% of cat eyes operational.	Road marking refurbishment undertaken on a reactive basis following enquiries from third parties to junctions and regulatory locations, Cats eyes replaced when missing	Annual visual inspection as part of the highway inspection programme. Identifying and prioritising areas for remedial action	Ad hoc reflectivity surveys, Basic inventory details held in a computerised system. Reactive works programme	Bi annual reflectivity survey of road markings and Cats eyes? (comply with HMMP) Inventory data complete. Future Refurbishment programme developed	Annual visibility inspections undertaken. Ad hoc road marking surveys commissioned. Achieving bi annual cats eye survey cycle. No road marking data. Cats eye data 95 -100% complete. Works instructed on a yearly reactive programme	Fair to Good	Survey results to be interrogated
	Safety Inspections	to be developed	to be developed	to be developed	to be developed			
	Reflectivity Testing	to be developed	to be developed	to be developed	to be developed			

FENCES & BARRIERS

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Fences & Barriers	Full Inventory & Condition Data for Vehicle Restraint Systems (VRS) All fences, barriers and street furniture fit for purpose. Annual inspection and repair programme with non-urgent works included in FWP. Condition & Tensioning Survey programme Annual programme of environmental works such as painting. Implementation of programmed VRS post strength testing	Reactive maintenance only. Growing backlog of maintenance and improvements	Reactive and ad-hoc maintenance and refurbishment. Identification of issues requiring attention Backlog of necessary maintenance and improvement stable.	Routine inspections. General repairs undertaken prior to next scheduled inspection. Backlog in maintenance / refurbishment reducing. Ad-hoc programmed environmental works such as painting.	All fences, barriers and street furniture fit for purpose. Annual inspection and repair programme with non-urgent works included in FWP. Condition & Tensioning Survey programme Annual programme of environmental works such as painting.	Inadequate inventory or condition assessment data. inspection programme in progress Backlog of potential necessary maintenance unquantified. Reactive and ad-hoc maintenance and refurbishment.	Minimum to Fair	Survey results to be interrogated
	Average Response times	none	to be developed	to be developed	to be developed	to be developed		
	Strength Testing (VRS)	to be developed	to be developed	to be developed	to be developed	to be developed		
	Condition Surveys (VRS)	to be developed	to be developed	to be developed	to be developed	to be developed		

STREET FURNITURE & AMENITIES

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Street Furniture & Amenities		Reactive maintenance only. Growing backlog of maintenance and improvements	Reactive and ad-hoc maintenance and refurbishment. Backlog of necessary maintenance and improvement stable.	Routine inspections. General repairs undertaken prior to next scheduled inspection. Backlog in maintenance / refurbishment reducing. Annual programme of environmental works such as painting.	Street furniture fit for purpose. Annual inspection and repair programme with works undertaken within 3 months of inspection. Condition of on-street equipment makes a positive contribution to the street scene.	Reactive and ad-hoc maintenance and refurbishment. Backlog of necessary maintenance and improvement stable.	Minimum to Fair	Survey results to be interrogated
	Average Response times	to be developed	to be developed	to be developed	to be developed	to be developed		

TREES & SOFT ESTATE

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Trees & Soft Estate	Full scheduled tree survey of all trees within an influencing distance of all publicly maintained highways & parks & open spaces Annual Tree Planting & Maintenance Programme budget A fully integrated Arboricultural GIS & Management System	Principal Highway Routes - Annual Rapid Tree Survey Reactive maintenance to trees in a hazardous state/legal nuisance and in response to customer reports. All priority action maintenance identified carried out (regardless of budget)	Principal & Classified Highway Routes - Annual Rapid Tree Survey Reactive maintenance to trees in a hazardous state/legal nuisance and in response to customer reports. All priority action maintenance identified carried out (regardless of budget)	Principal & Classified Highway Routes - Annual Rapid Tree Survey Cyclical programme of detailed inspections and management of Principal Routes Reactive maintenance to trees in a hazardous state/legal nuisance and in response to customer reports. All priority action & planned maintenance identified carried out	Principal & Classified Highway Routes - Annual Rapid Tree Survey Cyclical programme of detailed inspections and management of Principal & Classified Routes Reactive maintenance to trees in a hazardous state/legal nuisance and in response to customer reports. All priority action, planned maintenance & routine maintenance identified carried out	Principal Highway Routes - Tree service condition Surveys documented Reactive maintenance to trees in a hazardous state/legal nuisance and in response to customer reports. All priority action maintenance identified carried out (regardless of budget)	Minimum	Survey results to be interrogated
	frequency of inspection of trees	> 10 years	5 - 10 years	5 years	3 years			
	No. ad-hoc inspections of highway trees	to be developed	to be developed	to be developed	to be developed	to be developed		

TREES & SOFT ESTATE (2)

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Trees & Soft Estate (2)	Inventory collection & Collation currently at 95+ % coverage (GIS based) Retain landscape & street cleansing contract in-house Upgrading and implementation of planting projects Re-enter BiB competition (Gold award in 2010) Implementation of Masternaut vehicle tracking to aid programming and response efficiencies PDA (Confirm Mobile) technology implementation	Routine cyclic maintenance of urban verges at quarterly intervals. Rural verges cut to provide clear sight lines (reactive) Litter clearance separate to verge maintenance. Annual weed clearance to shrub and rose borders. Little annual planting. Amenity areas grass cutting & litter clearing less than quarterly Minimal maintenance to ensure establishment of young trees	Routine cyclic maintenance of urban verges 6-8 times a year. No co-ordinated litter clearance. Rural verges cut one swathe width (1x per year) and to provide clear sight lines including traffic islands. Litter clearance separate to verge maintenance. Annual weed clearance/ pruning to shrub and rose borders. Annual planting limited to amenity sites. Reactive maintenance to young trees in a hazardous state/legal nuisance and in response to customer reports. Amenity areas grass cutting & litter clearing 6 x year Targeted Annual summer & winter bedding plants & provision of hanging basket (Bracknell Town Centre) incl watering provision	Routine inspection and cyclic maintenance of verges and young trees. Urban grass cut minimum 8x per year. Rural Verges: Grass cut 2x per year with additional visibility cuts where required including traffic islands. Shrub and Rose Borders have Weed cover <10% and pruned in accordance to species. Litter and Debris removed as part of treatment schedule. Amenity areas grass cutting & litter clearing 12 x year Targeted Annual summer & winter bedding plants & provision of hanging basket (Bracknell, Sandhurst & Crowthorne)	Adopted policy for management of "soft estate". Urban grass cut minimum fortnightly, including traffic islands (sponsored RABs every 7 days) Rural Verges: Grass cut 3x per year with additional visibility cuts where required. Routine inspection and integrated cyclic maintenance of verges and young trees Shrub and Rose Borders have Weed cover <5% Litter and Debris removed as part of treatment schedule. Pruned in accordance to species. Amenity areas grass cutting & litter clearing fortnightly Annual summer & winter bedding plants & provision of hanging basket throughout the borough	Adopted policy for management of "soft estate". Urban grass cut minimum fortnightly including traffic islands (sponsored RABs every 7 days) Rural Verges: Grass cut 2x (+ 1/3rd) per year with additional visibility cuts where required. Routine inspection and integrated cyclic maintenance of verges and young trees Shrub and Rose Borders have Weed cover <5% Litter and Debris removed as part of treatment schedule. Pruned in accordance to species. Amenity areas grass cutting & litter clearing fortnightly Annual summer & winter bedding plants & provision of hanging basket throughout the borough	Excellent	Survey results to be interrogated
	to be developed	to be developed	to be developed	to be developed	to be developed	to be developed		

DATA

Asset Group	Aspirations & Performance Measures	SERVICE LEVELS Minimum	Fair	Good	Excellent	CURRENT LEVELS Current Service Level	Asset	Customer Satisfaction
Highway Data & Data Management	Gaps in data identified and being actively addressed for main assets. Sufficient data held for accurate valuation and effective management of the main assets. Majority of asset groups' data held in single format with consistent referencing. Mechanism exists for routine updating of data held for main assets. Asset systems training / knowledge gaps identified and addressed	Data held on asset groups sufficient for minimum service delivery / valuation. Data held in different formats. Significant gaps in data held. No routine maintenance of data or clear responsibility for accuracy.	Basic inventory data held. Significant gaps in condition data. Ad-hoc arrangements for updating data. Data held in various electronic formats with no target for integration. No documented procedures for data management.	Gaps in data identified and being actively addressed. Sufficient data held for accurate valuation of the main assets. Majority of asset groups' data held in single format with consistent referencing. Mechanism exists for routine updating of data held for main assets	QA systems. Inventory and condition data held for whole highways asset (excl. pipework) to a common reference with electronic mapping. Consistency of network hierarchy across asset groups and highway applications. Clear ownership of data and regular routine updating of information. Works records extending back a number of years.	Inventory and condition data held on main asset groups (on value). Gaps in data identified and being addressed Actively working towards consistent referencing.	Fair to Good	NA
	Confidence Level for Data Completeness	None	Low	Medium	High	Medium		
	Confidence Level for Data Correctness	None	Low	Medium	High	High		

Data Confidence
In assessing the confidence level for data held on the Highway Asset a matrix approach can be adopted.

Coverage	Definition?	Reliability	Definition
None	No data storage	Very Poor	Hardly ever correct
Initial	< 10% held electronically or on paper records	Poor	Sometimes correct
Partial	10 – 30% held electronically	Good	Normally correct 50% of the
Typical	30 – 70% held electronically	Very Good	Correct most of the time
General	70 – 95% held electronically	Excellent	Seldom incorrect
Complete	> 95% held electronically	?	?

Confidence Matrix

Confidence Level		Coverage					
		None	Initial	Partial	Typical	General	Complete
Reliability	V Poor	None	Low	Low	Low	Medium	Medium
	Poor	None	Low	Low	Low	Medium	Medium
	Good	None	Low	Low	Medium	Medium	High
	V Good	None	Low	Low	Medium	High	High
	Excellent	None	Low	Low	Medium	High	Very High

APPENDIX 3 : ASSET DATA AND INFORMATION

Condition Data

The current condition data held by the Council is not entirely comprehensive. In order to produce the lifecycle plan an assessment of the condition of some assets was taken from the 11Km sample video survey. Three asset condition bands were used in the mode, Poor, Average and Good and the percentages of each asset in each band is shown in the table below.

Key Asset/Condition	Condition - Percentage				Comment
	A Class	B Class	C Class	Unclassified	
Roads – Poor	6%	9%	7%	27%	BFC data
Roads – Average	20%	26%	31%	30%	BFC data
Roads – Good	74%	65%	62%	43%	BFC data
Central res. – Poor	0	0	0	0	Pro rata from sample
Central res. – Average	0	0	0	0	Pro rata from sample
Central res. - Good	100%	100%	100%	100%	Pro rata from sample
Footways - Poor	10%	0	4%	13%	BFC data
Footways - Average	82%	54%	82%	75%	BFC data
Footways - Good	8%	46%	14%	12%	BFC data
Kerbs – Poor	0	1%	0	1%	Pro rata from sample
Kerbs- Average	80%	54%	88%	87%	Pro rata from sample
Kerbs - Good	20%	45%	12%	12%	Pro rata from sample
Gullies - Poor	2%	0	0	2%	Pro rata from sample
Gullies - Average	84%	78%	45%	91%	Pro rata from sample
Gullies - Good	14%	22%	55%	7%	Pro rata from sample
Lines hatched – Poor	9%	4%	0	0	Pro rata from sample
Lines hatched – Average	31%	69%	51%	91%	Pro rata from sample
Lines hatched – Good	60%	26%	49%	9%	Pro rata from sample
Longitudinal lines - Poor	13%	23%	8%	0	Pro rata from sample
Longitudinal lines - Average	75%	61%	84%	49%	Pro rata from sample
Longitudinal lines - Good	12%	16%	8%	51%	Pro rata from sample
Road Markings - Poor	8%	14%	0	2%	Pro rata from sample
Road Markings - Average	80%	70%	59%	52%	Pro rata from sample
Road Markings - Good	12%	16%	41%	46%	Pro rata from sample
Veh. Safety Fence - Poor	0	-	0	-	Pro rata from sample
Veh. Safety Fence - Average	70%	-	100%	-	Pro rata from sample
Veh. Safety Fence - Good	30%	-	0	-	Pro rata from sample
Ped. Guard Rail - Poor	0	0	0	0	Pro rata from sample
Ped. Guard Rail – Average	100%	15%	100%	0	Pro rata from sample

Ped. Guard Rail - Good	0	85%	0	100%	Pro rata from sample
Signs (non illum) – Poor	1%	6%	0	1%	Pro rata from sample
Signs (non illum) – Average	71%	82%	94%	94%	Pro rata from sample
Signs (non illum) – Good	27%	12%	6%	4%	Pro rata from sample
Signs (illuminated) – Poor	5%	0	0	0	Pro rata from sample
Signs (illuminated) –Average	63%	60%	100%	86%	Pro rata from sample
Signs (illuminated) –Good	33%	40%	0	14%	Pro rata from sample
Bollards – Poor	5%	10%	10%	15%	Pro rata from sample
Bollards – Average	85%	50%	71%	80%	Pro rata from sample
Bollards – Good	10%	40%	19%	5%	Pro rata from sample
Lighting columns - Poor	0	0	3%	0	Pro rata from sample
Lighting columns - Average	96%	97%	97%	79%	Pro rata from sample
Lighting columns - Good	4%	3%	0	21%	Pro rata from sample
Traffic Signals - Poor	0	0	-	0	Pro rata from sample
Traffic Signals - Average	100%	50%	-	100%	Pro rata from sample
Traffic Signals - Good	0	50%	-	0	Pro rata from sample

Asset Condition used in the lifecycle plan

APPENDIX 4: INDICATIVE LIFECYCLE PLANS

1.0 A Roads

1.1 Maintenance Strategy (Urban)

Current Condition	1ST Intervention			2nd Intervention			3rd Intervention		
	Treatment	Years	Restore to	Treatment	Years	Restore to	Treatment	Years	Restore to
Very Poor	100% STR	1 - 3	Good	100% INT	15 -18	Good	100% INT	30 -33	Good
Poor	100% STR	3 - 5	Good	100% INT	18 - 20	Good			
Average	100% STR	5 -7	Good	100% INT	20- 22	Good	-	-	-
Good	100% INT	11-14	Good	100% INT	26-29	Good			
Very Good	100% MS/SD	11 - 14	Good	100% RS	19 - 22	Good			

1.2 Maintenance Strategy (Rural)

Current Condition	1ST Intervention			2nd Intervention			3rd Intervention		
	Treatment	Years	Restore to	Treatment	Years	Restore to	Treatment	Years	Restore to
Very Poor	100% STR	1 - 3	Good	100% MS/SD	15 -18	Average	100% INT	23 -26	Green
Poor	100% STR	3 - 5	Good	100% MS/SD	18 - 20	Average	100% INT	26 - 28	Green
Average	100% STR	5 -7	Good	100% MS/SD	20- 22	Average	100% INT	28 -30	Green
Good	100% MS/SD	11-14	Average	100% INT	19-22	Good	-	-	-
Very Good	100% MS/SD	11-14	Good	100% RS	19 - 22	Good	-	-	-

1.3 Treatment Definition

Pavement Layers	Structural Treatment (STR)	Intermediate Treatment (INT)	Resurface (RS)	Microsurface/Surface Dress (MS/SD)	Treatment Depth
Surface Course	Replace 100%	Replace 100%	Replace 100%	-	0mm-40mm
Binder Course	Replace 40% of Binder course to 60mm	Replace 5% of Binder course to 60mm	-	-	60mm
Base Course					

2.0 B/C Roads

2.1 Maintenance Strategy (Urban)

Current Condition	1ST Intervention			2nd Intervention			3rd Intervention		
	Treatment	Years	Restore to	Treatment	Years	Restore to	Treatment	Years	Restore to
Very Poor	100% STR	1 - 4	Good	100% MS/SD	16-19	Average	100% INT	24-27	Good
Poor	75% STR	1 - 4	Good	100% MS/SD	16 - 19	Average	100% INT	24 - 27	Good
Average	100% STR	5 - 8	Good	100% MS/SD	20-23	Average	100% INT	28-31	Good
Good	100% MS/SD	13- 15	Average	100% INT	21-23	Good	-	-	-
Very Good	100% MS/SD	13- 15	Average	100% RS	21 - 23	Good	-	-	-

2.2 Maintenance Strategy (Rural)

Current Condition	1ST Intervention			2nd Intervention			3rd Intervention		
	Treatment	Years	Restore to	Treatment	Years	Restore to	Treatment	Years	Restore to
Very Poor	100% STR	1 - 4	Good	100% MS/SD	16-19	Average	100% INT	24-27	Green
Poor	75% STR	1 - 4	Good	100% MS/SD	16 - 19	Average	100% INT		Green
Average	100% STR	5 - 8	Good	100% MS/SD	20-23	Average	100% INT	28-31	Green
Good	100% MS/SD	13- 15	Average	100% INT	21-23	Good	-	-	-
Very Good	100% MS/SD	13- 15	Average	100% RS	21 - 23	Good	-	-	-

2.3 Treatment Definition

Pavement Layers	Structural Treatment (STR)	Intermediate Treatment (INT)	Resurface (RS)	Microsurface Surface Dress (MS/SD)	Treatment Depth
Surface Course	Replace 100%	Replace 100%	Replace 100%	-	0mm-40 mm
Binder Course	Replace 50% binder course to 60mm	Replace 10% binder course to 60mm	-	-	60mm
Base Course					

3.0 U Roads

3.1 Maintenance Strategy (Urban)

Current Condition	1ST Intervention			2nd Intervention			3rd Intervention		
	Treatment	Years	Restore to	Treatment	Years	Restore to	Treatment	Years	Restore to
Very Poor	100% STR	1 - 5	Good	100% MS/SD	16 - 20	Average	100% INT	24-28	Good
Poor	100% INT	1 - 5	Good	100% MS/SD	16 - 20	Average	100% INT	24-28	Good
Average	100% INT	6 - 10	Good	100% MS/SD	21-25	Average	100% INT	29-33	Good
Good	100% MS/SD	13 - 15	Average	100% INT	21-23	Good	-	-	-
Very Good	100% MS/SD	13 - 15	Good	100% RS	21-23	Good	-	-	-

3.2 Maintenance Strategy (Rural)

Current Condition	1ST Intervention			2nd Intervention			3rd Intervention		
	Treatment	Years	Restore to	Treatment	Years	Restore to	Treatment	Years	Restore to
Very Poor	100% STR	1 - 5	Good	100% MS/SD	16 - 20	Average	100% MS/SD	24-28	Good
Poor	100% INT	1 - 5	Good	100% MS/SD	16 - 20	Average	100% MS/SD	24 - 28	Good
Average	100% INT	6 - 10	Good	100% MS/SD	21-25	Average	100% MS/SD	29-33	Average
Good	100% MS/SD	13 - 15	Average	100% MS/SD	21-23	Average	100% INT	29-31	Good
Very Good	100% MS/SD	13 - 15	Good	100% MS/SD	21-23	Average	100% RS	29-31	Good

3.3 Treatment Definition

Pavement Layers	Structural Treatment (STR)	Intermediate Treatment (INT)	Resurface (RS)	Microsurface Surface Dress (MS/SD	Treatment Depth
Surface Course	Replace 100%	Replace 100%	Replace 100%	-	0mm-40 mm
Binder Course	Replace 50% binder course to 60mm	Replace 10% binder course to 60mm	-	-	60 mm
Base Course					

4.0 Footways and Cycletracks

4.1 Flags/ Modular Footways

Current Condition	1ST Intervention			2nd Intervention			3rd Intervention		
	Treatment	Years	Restore to	Treatment	Years	Restore to	Treatment	Years	Restore to
Very Poor	100%	1 - 4	Good	30%	13-16	Average	100%	26 - 30	Green
Poor	80%	1 - 4	Good	40%	13 - 16	Average	100%	26 - 30	Green
Average	100%	5 - 7	Good	30%	17-19	Average	100%	30-32	Green
Good	30%	11 - 14	Average	100%	23-26	Good	-	-	-
Very Good	15%	11 - 14	Average	70%	23 - 26	Good	-	-	-

Treatment Definition
Relay 50% and renew 50%
Treatment Rate £

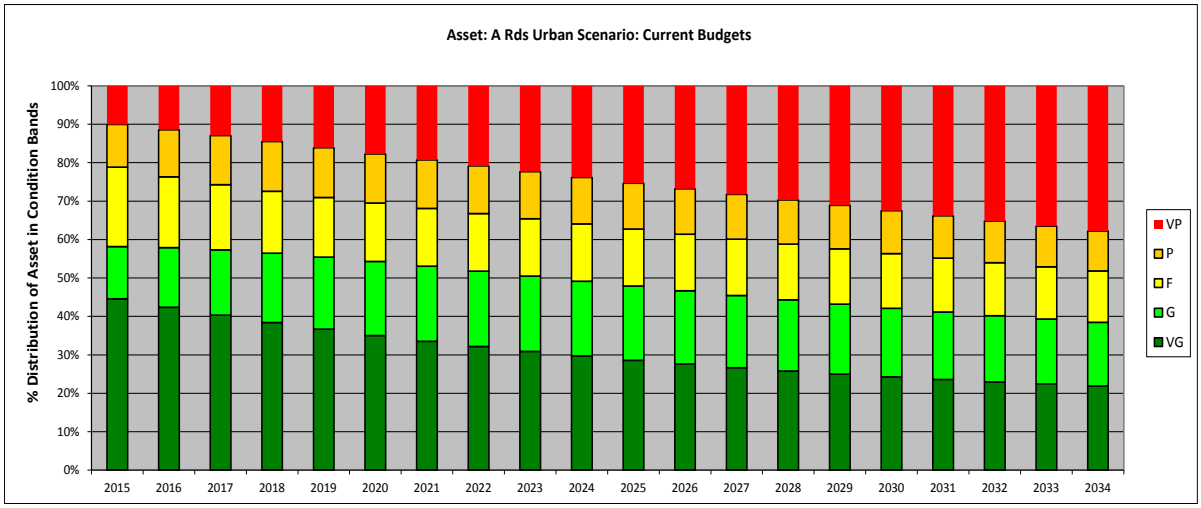
4.2 Bituminous Footways

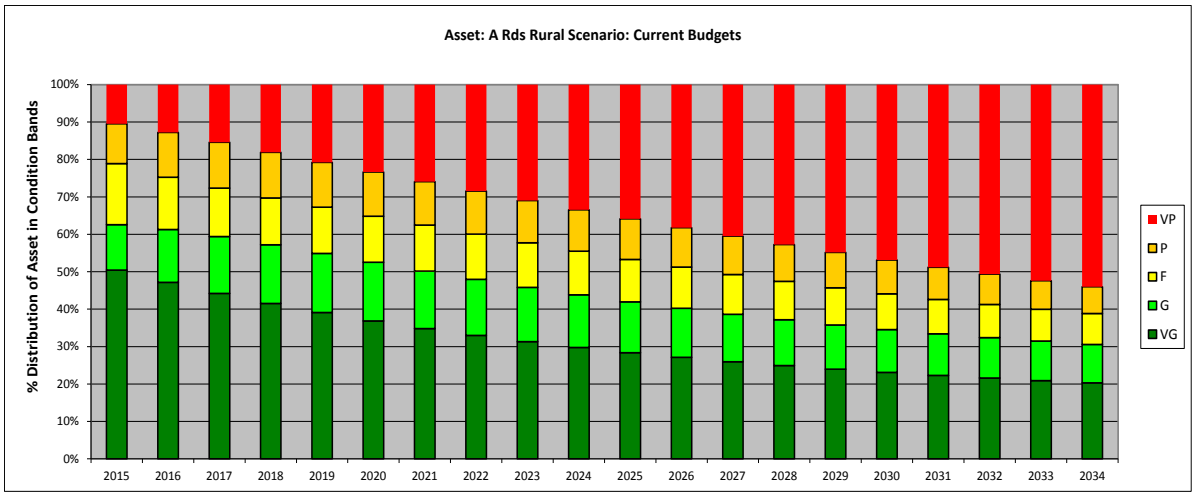
Current Condition	1ST Intervention			2nd Intervention			3rd Intervention		
	Treatment	Years	Restore to	Treatment	Years	Restore to	Treatment	Years	Restore to
Very Poor	STR	1 - 4	Good	SL	11-14	Average	SL	18-21	Average
Poor	RS	1 - 4	Good	SL	11 - 14	Average	SL	18 - 21	Average
Average	SL	5 - 7	Average	STR	12-14	Good	SL	22-24	Average
Good	SL	5 - 7	Average	SL	12-14	Average	STR	19-21	Good
Very Good	SL	7 - 10	Average	SL	14 - 17	Average	SL	21 - 28	Average

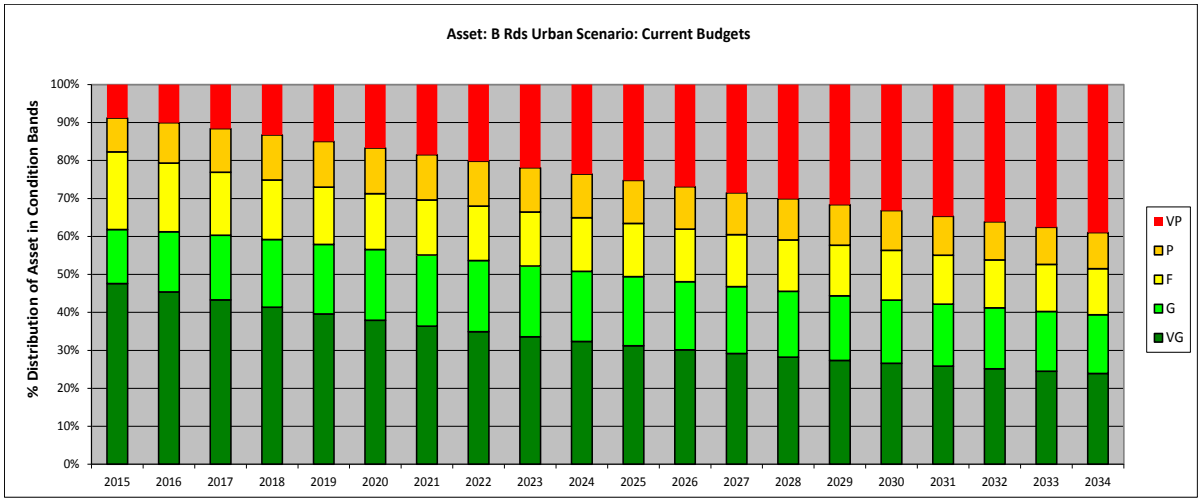
4.3 Treatment Definition

Pavement Layers	Structural Repair (STR)	Resurface (RS)	Slurry (SL)	Treatment Depth
Surface Course	Replace 100%	Replace 100%	100%	0mm-20 mm
Binder Course	Replace 100%	5% Reconstruction to 100mm	-	40mm

BFC Model Outputs







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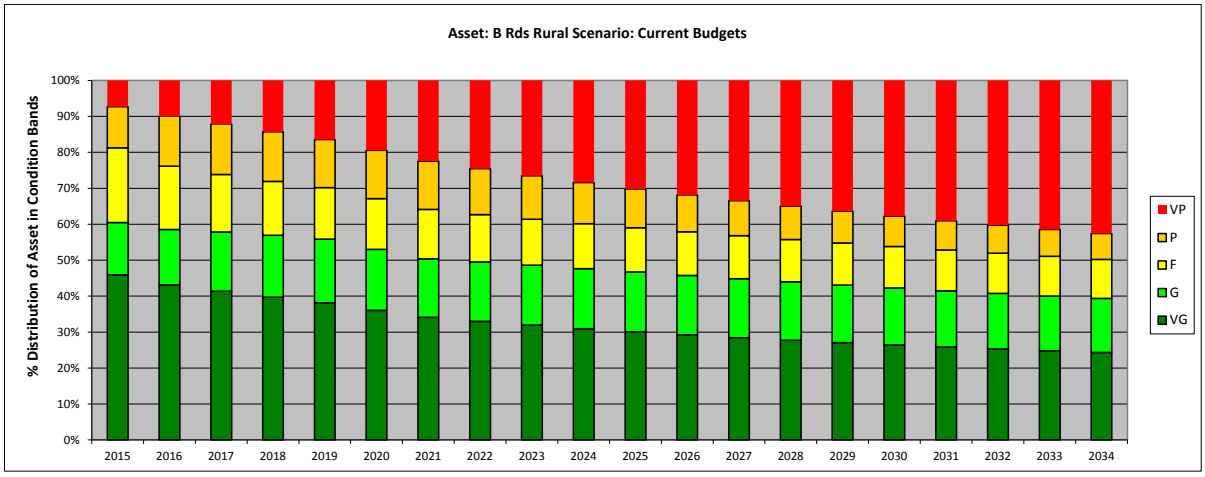

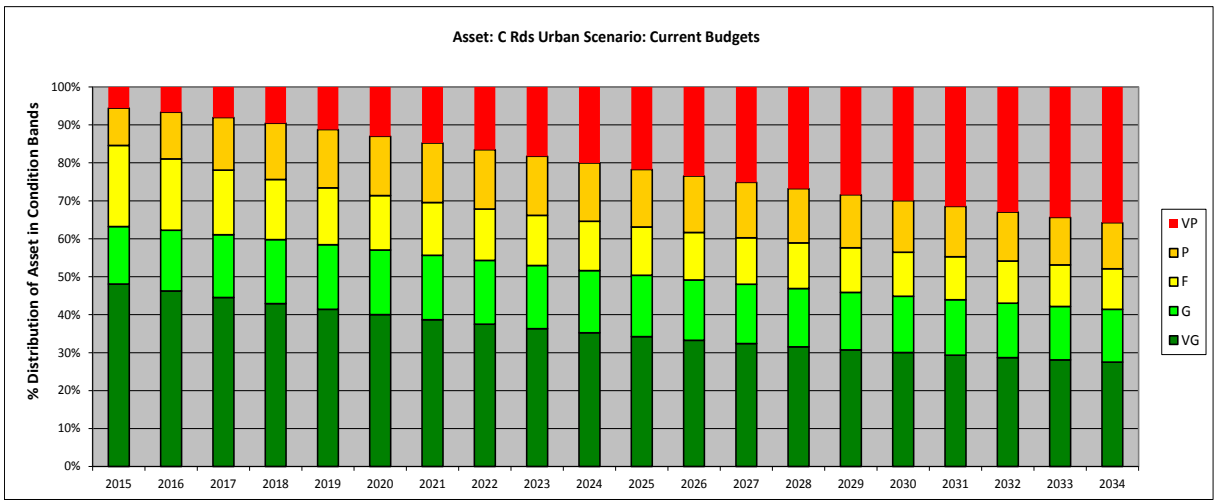

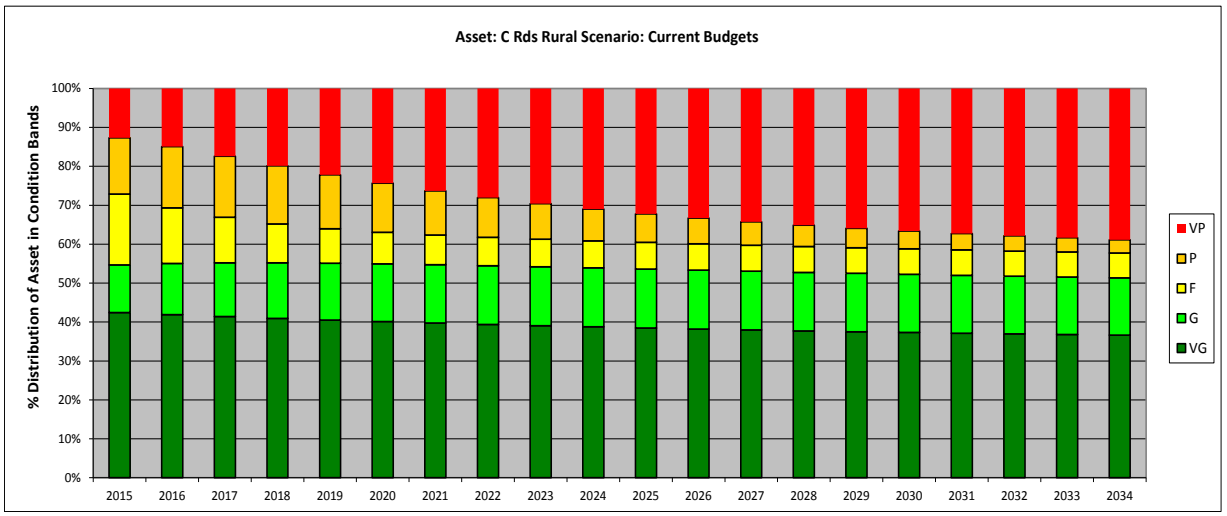

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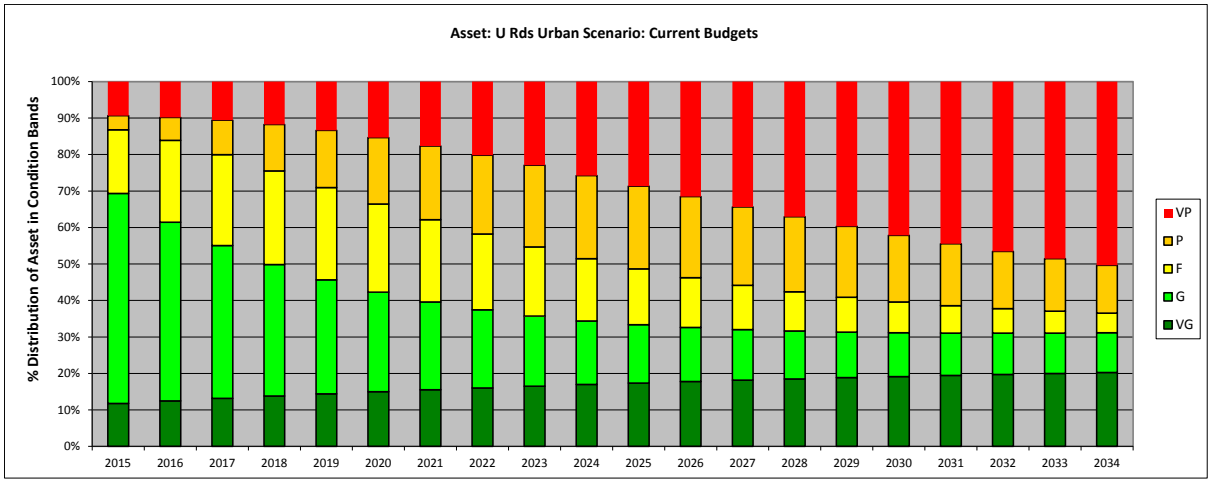

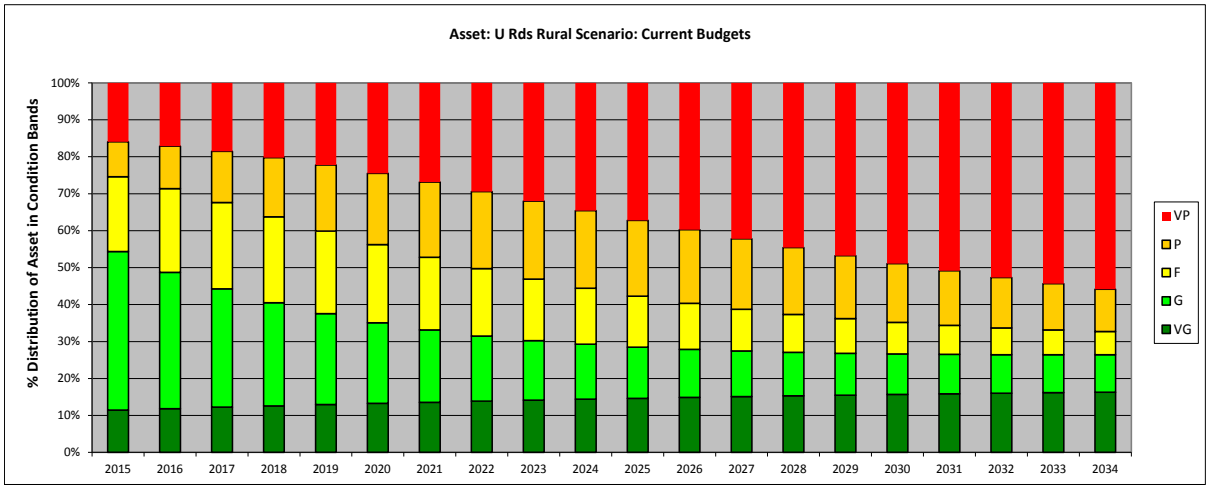

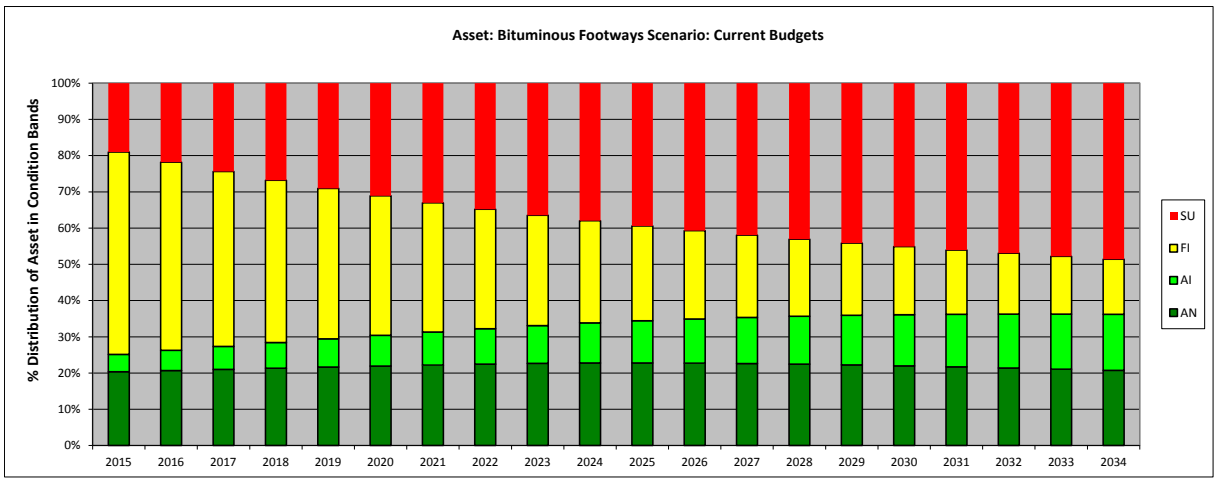

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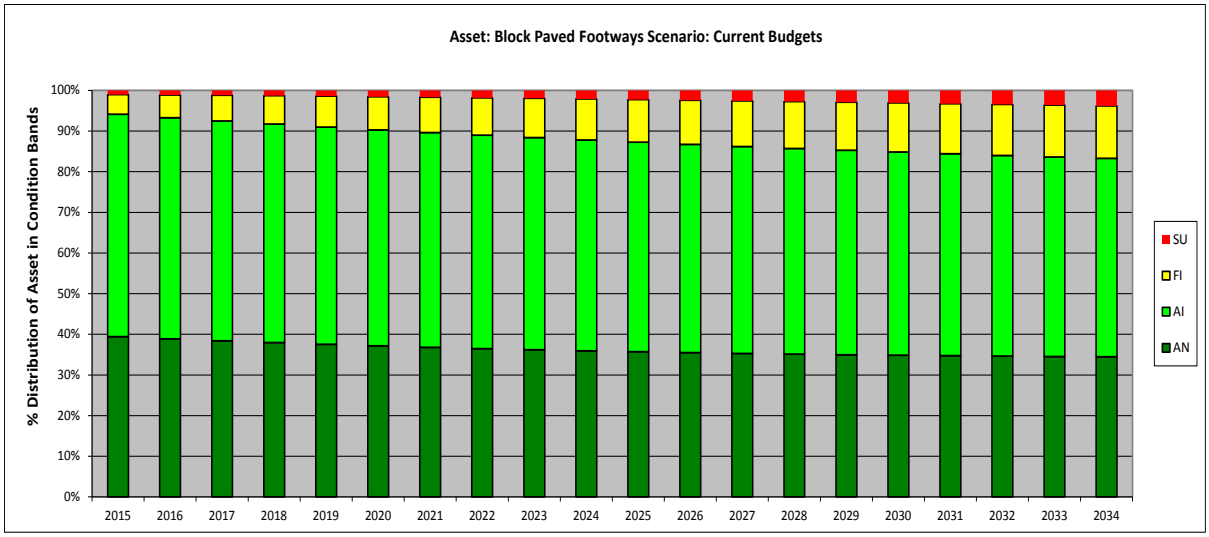

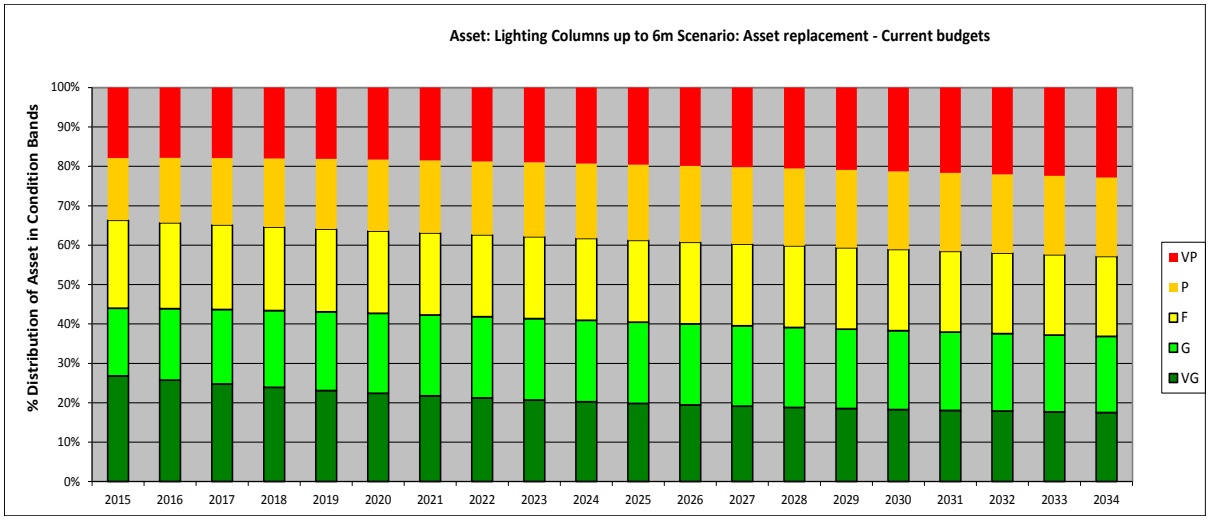

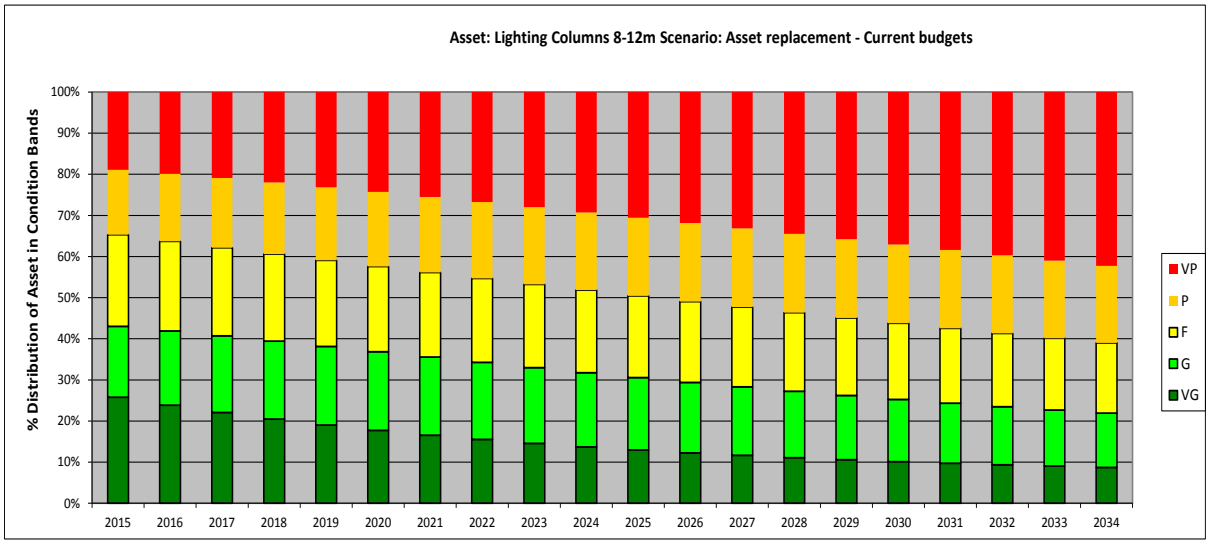

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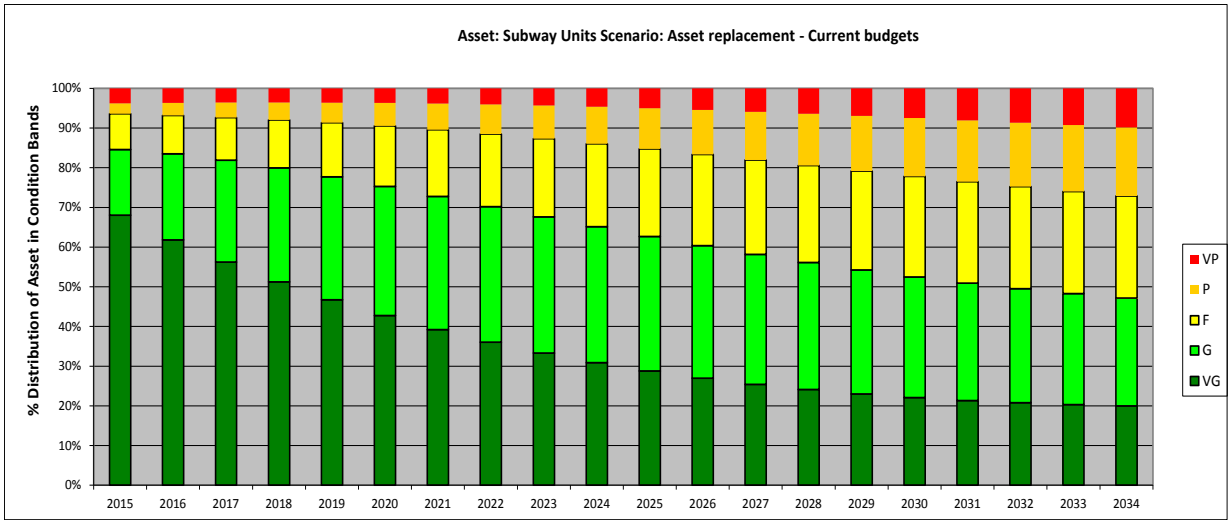

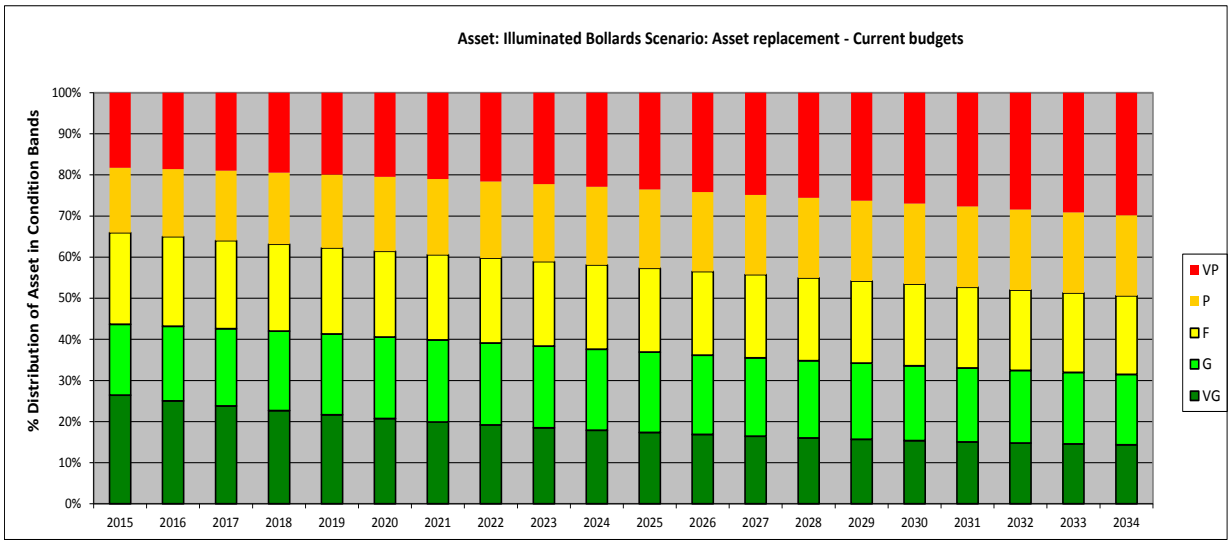

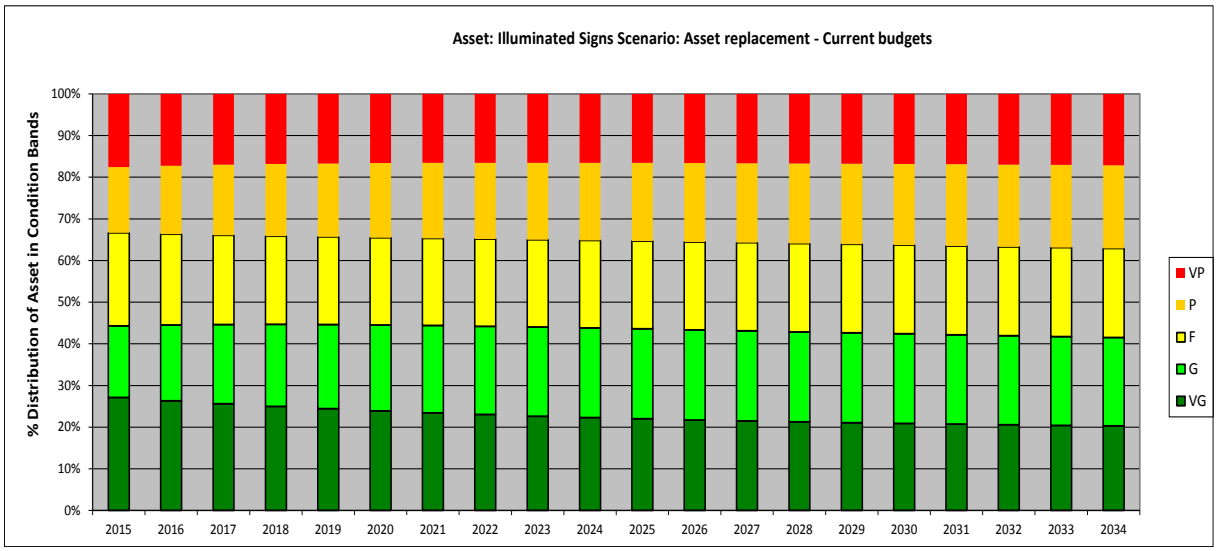

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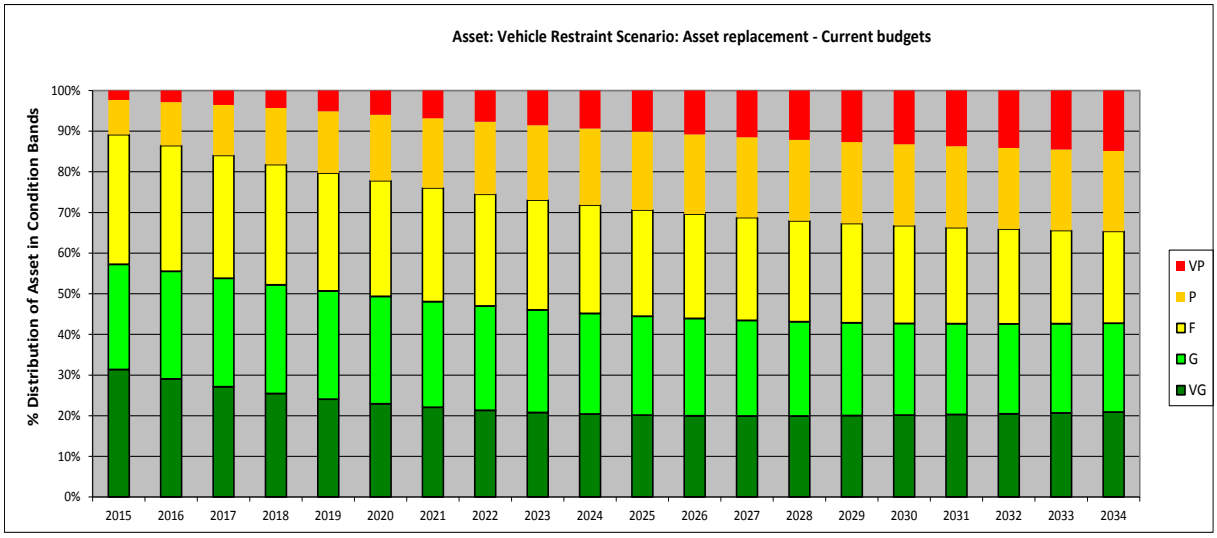

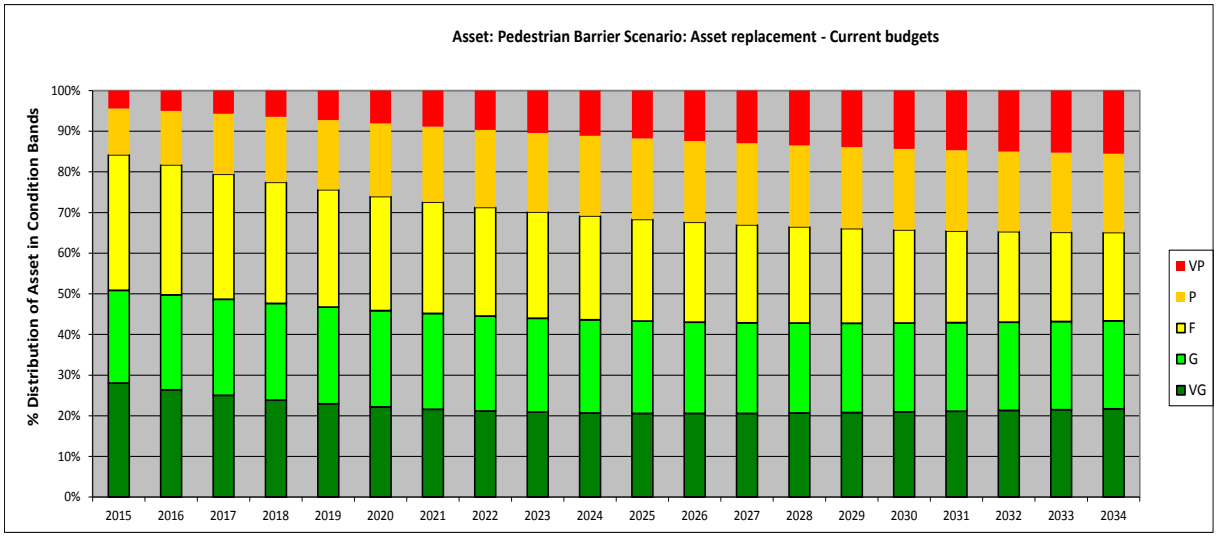

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APPENDIX 5: RISK MANAGEMENT

Everyone involved in maintenance and operation of the network or deliver of a project have a risk responsibility; the following table outlines those who may be responsible for risk management.

Who	Role
Elected Members	To oversee and ensure the effective management of risk by senior managers of the organisation through scrutiny processes and where appropriate direct involvement.
Management Team	To ensure that the organisation manages risk effectively through the development of a comprehensive corporate Strategy. Identify and steer the management of strategic risks through the organisation.
Head of Audit and Risk Management	To take responsibility for the promotion of effective management of risk across the organisation, its departments and services.
Directorate Management Teams	To ensure that risks are identified and effectively managed in each service area within the agreed corporate Strategy
Directorate Risk Management Lead	To take responsibility for effective risk management at Directorate level, to manage and monitor the work of the Directorate based Risk Champions.
Insurance & Risk Manager	To oversee directorates' delivery of risk management action plans and co-ordinate the provision of corporate risk maps.
Internal Audit	To provide independent review of risk management process as part of the wider corporate assurance role within the Council.
Insurance Section	To effectively manage claims made by and against the Council and ensure that risk management issues arising from these are reported to Management Team and departmental Risk Champions.
Corporate Governance Lead	To ensure that risk management is linked into the wider controls assurance work to provide the Council with a holistic controls assurance statement.
Service Managers	To manage risk effectively in their particular service areas and implement specific actions arising from the Directorate action plan.
All Employees	To effectively manage risk in their job.
All Asset Users	To take responsibility to use service with due care and diligence.

A risk register should be used to record identified risks; a simple risk register is shown below.

The risk probability, risk severity and risk score (priority) can be determined using a standard matrix approach.

Example Risk Register Fields

	Field	Definition
Risk Definition/ Description	Risk Number	Unique identifier for each risk
	Risk Categories	Identifier used to enable consistency in the recording of
	Risk Description	The "trigger" that will show that the risk has happened and "result" the severity of the risk happening.
Current Risk Score	Risk Probability 1-5	The likelihood of risk occurrence
	Risk Severity 1-20	The impact (or severity) as a result of the risk occurring
	Risk Score	The priority of action
	Risk Tolerance	Level at which risk is not acceptable
Risk Action Plan	New Control	Mitigation strategies that can be implemented to control the risk. (e.g. prevent, reduce, accept, transfer,
	Action Implementation	Date by which the risk action plan (control measure) is to be implemented
	Owner	The person who has overall responsibility for the risk
Target Score	Risk Probability 1-5	Revised probability score taking into account the mitigations introduced as part of the risk action plan
	Risk Severity 1-20	Revised impact score taking into account the mitigations introduced as part of the risk action plan
	Risk Score	Revised risk score taking into account the mitigations introduced as part of the risk action plan
Risk Status	Comments	General field for the inclusion of comments
	Date Reviewed	Date the risk was reviewed
	Projected Reviewed Date	Date that the risk is to be reviewed
	Status	Status of the risk, whether the risk is new or obsolete, or whether the risk rating as increased or decreased

APPENDIX 6 : GAP ANALYSIS AND ACTION PLAN

An Action Plan has been prepared following the Gap analysis, proposed actions are summarised below;

No	Developed Actions	Requirement	Timescale Year 1 = 2015/16	Responsibility
1.	Carry out annual update to HIAMP	HIAMP is a live document and requires annual updates	Year end formal review	Highways Asset Management teams
2.	Regularly update Asset Management Action Plan	Able to provide a direction for future development.	Year 1	Highways Asset Manager
3.	Establish Data Management regime and define practices for all technical data Define “owners” for each data set	There is a need to consider all aspects including access to data, format, data types and age, how it will be used and outputs required. Updating mechanisms following maintenance /damage/recorded activity will need to be considered.	In progress	Highways Asset Management teams
4.	Procure and implement a full asset inventory and register	Data held should be sufficient to aid decision making on the network. If full collection is not possible inventory should be collected on a priority basis.	In progress	Highways Asset Management teams
5.	Develop condition collection programmes for all ancillary highway assets	Data held should be sufficient to aid decision making on the network. If full collection is not possible inventory should be collected on a priority basis.	Year end formal review	Highways Asset Management teams
6.	Develop procedures to ensure inventory and condition data is kept up to date	Frequency of update should reflect priority of data	In progress	Highways Asset Management team
7.	Develop and keep updated Cost Data Information	Thorough usable data cost set which is created at the management level of the HIAMP.	Year end formal review	Highways Asset Management teams

No	Developed Actions	Requirement	Timescale Year 1 = 2015/16	Responsibility
8.	Review existing hierarchy	The hierarchy will be used to inform management and investment decisions, e.g. inspection regimes and allocation of resources.	Year 2	Highways Asset Management Teams
9.	Review hierarchy periodically	It is important to ensure that the hierarchy is kept up to date and reflects change in use or developments on the network.	Year 2 end	Highways Asset Management teams
10.	Review and update Levels of Service (LoS) and associated performance measures.	This may in future require a consultation process to determine attainable service. A usable set of indicators will be required.	Year end formal review	Highways Asset Manager
11.	Develop and implement a performance reporting framework.	Up to date indicators will be necessary to determine the LOS actually being achieved with the available budget.	Year 1-2	Highways Asset Management teams
12.	Consider the development of formal Whole Life Cost (WLC) process for all works including improvements	This is complementary to the Lifecycle plan for maintenance but is “stand alone” for improvements. It should consider the WLC of using alternative materials as well as differing technical solutions. Improvements should consider all future maintenance costs in the WLC.	Year 2	Highways Asset Manager
13.	Carry out annual update to Lifecycle plan	Lifecycle plan should be updated to reflect latest cost and condition data as well as knowledge gained over time on asset performance.	Year end formal review	Highways Asset Management teams

No	Developed Actions	Requirement	Timescale Year 1 = 2015/16	Responsibility
14.	Identify the quantity and extent of performance gaps and understand any backlog	Ascertain long-term outlook that is optimised to indicative medium term work programmes from which annual plan is developed.	Year 2-3	Highways Asset Management teams
15.	Formulate a 5-10 year forward works programme for the maintenance of Highway Assets	Review forward work programme following review of LoS Develop forward work programmes based upon LOS and budget requirements.	In progress - year end formal review ess -	Highways Asset Management teams
16.	Seek budget provision based on developed programmes	Long term budgetary implications known.	Year 2	Highways Asset Manager
17.	Consider the development of a post investment review process	This should examine outturn costs and a review to ensure that works envisaged at Value Management were actually undertaken.	Year 2-3	Highways Asset Manager
18.	Review skidding resistance policy	Review Skidding Resistance Policy and Scrim Sites	Year 2	Highways Asset Management teams
19.	Review practice relating to Vehicle Restraint Systems	This is a high risk area which should comply with the latest current practice including RRRAP	In progress	Highways Asset Management teams
20.	Monitoring and Feedback	Ensure effective monitoring and feedback in accordance with AM principles.	Ongoing	Highways Asset Management teams