

Highways Maintenance Plan

Contents

1. Highway Maintenance Plan.

- 1.1. Summary.
- 1.2. Introduction to Well Managed Highways.
- 1.3. Strategic Context.
- 1.4. Document Owner.
- 1.5. Highway Maintenance Manual.
- 1.6. Scope.
- 1.7. Summary of Recommendations.
- 1.8. Implementation of the Code of Practice.

2. Highway Maintenance Procedures.

- 2.1. Introduction.
- 2.2. Legal Framework.
- 2.3. Asset Management Information.
- 2.4. Asset condition and investigatory information.
- 2.5. Inspection, assessment and recording.
- 2.6. Programme and Priority.
- 2.7. Winter Service.
- 2.8. Inspection, assessment and recording.
- 2.9. Competence.
- 2.10. Skidding resistance.
- 2.11. Safety Defect Inspections.
 - a. Carriageway, footways, cycle routes.
 - b. Gullies and Drainage systems.
- 2.12. Vehicle restraint systems, guardrails, pedestrian barriers.
- 2.13. Non-illuminated signs and bollards.
- 2.14. Road markings and road studs.
- 2.15. Landscaped areas.
- 2.16. Structural condition surveys.
 - a. Carriageways.

- b. Footways.
- 2.17. Lifecycle Planning.
- 2.18. Investment planning scenarios.
- 2.19. Long term works plan.
- 2.20. Utility inspections.
- 2.21. Information.
 - a. Reliability.
 - b. Recording.
- 2.22. Monitoring, review, feedback, lessons learnt.

3. Structures Maintenance Procedures.

- 3.1. Introduction.
- 3.2. Legal framework.
- 3.3. Asset management information.
- 3.4. Performance measures.
- 3.5. Bridges.
 - a. Highway.
 - b. Railway.
 - c. Canal.
 - d. Private.
- 3.6. Retaining Walls.
 - a. Highway retaining walls.
 - b. Property retaining walls.
- 3.7. Culverts.
- 3.8. Cellars and vaults.
- 3.9. Earthworks.
 - a. Embankments.
 - b. Cuttings.
 - c. Engineered earth structures.
- 3.10. Inspection Regime.
- 3.11. General inspection.
- 3.12. Principal inspection.
- 3.13. Prioritisation Criteria.
- 3.14. Competence and training.
- 3.15. Abnormal loads.
- 3.16. Lifecycle planning.
- 3.17. Investment planning scenarios.
- 3.18. Long Term works plan.
- 3.19. Weight restrictions.
- 3.20. Strengthening prioritisation programme.
- 3.21. Monitoring, review, feedback, lessons learnt.

4. Street Lighting, Illuminated Signs and Illuminated Bollards Maintenance Procedures.

- 4.1. Introduction.
- 4.2. Legal framework.
- 4.3. Asset management Information.
- 4.4. Performance measures.
- 4.5. Inspections regime.
- 4.6. Competence and training.
- 4.7. Lifecycle Planning.
- 4.8. Investment planning scenarios.
- 4.9. Long term works plan.
- 4.10. Monitoring, review, feedback, lessons learnt.

1.1 Summary

This Highway Maintenance Plan details the implementation of the procedures for day to day management and delivery of the highway maintenance service. It should be read in conjunction with the Asset management Strategy and the Highway Safety Defect Inspection Policy.

In recent years the performance and resilience of transport, and in particular highways, infrastructure has come under increasing scrutiny. The Department for Transport has reviewed the provision of funds to local highway authorities as well as the way they expect highway authorities to carry out maintenance in the light of increased public expectations and diminished budgets.

At the direction of central government, the DfT commissioned and worked with the UK Roads Liaison Group (UKRLG) and the highway sector to review three national codes of practice: 'Well-maintained Highways', 'Management of Highway Structures' and 'Well-lit Highways'.

The purpose was to combine these three codes into a single code, this was published in October 2016 as 'Well Managed Highways Infrastructure, A code of Practice'. It assists local highway authorities to move away from the restrictions of

prescriptive guidance and implement a risk based approach to highway maintenance, which considers the risks associated with maintenance as well as the structural condition.

The new Code is not statutory; it provides highway authorities with guidance on highways management. Adoption and implementation of the 36 recommendations is a matter for individual authorities. The previous Codes of Practice will remain valid until October 2018.

1.2 An Introduction to the new Code of Practice, 'Well-managed Highway Infrastructure'

A new [Code of Practice](#) was drafted by the UK Roads Liaison Group in October 2016, they advise that it's thirty-six recommendations are adopted by highway authorities. This plan documents the Council's implementation of these recommendations.

The new Code of Practice (CoP) advocates a risk based approach to asset management in favour of a reliance on specific formulaic guidance. This places a greater onus on individual highway authorities. The Code is designed to promote the adoption of an integrated asset management approach to highway infrastructure based on the establishment of local levels of service through risk-based assessment. Delivery of a safe and well maintained highway network relies on good evidence and sound engineering judgement. The intention of this Code is that Authorities will develop their own levels of service and the Code therefore provides guidance for authorities to consider when developing their approach in accordance with local needs, priorities and affordability.

Adoption of the new Code is expected to be tested in the Courts when ~~where~~ local highway authorities seek to defend third party liability claims. Implementation of the code is also likely to be of interest to the local media, residents and key stakeholders in understanding the Council's response and risk management to significant events such as flooding and other causes of traffic disruption on the authorities' network. Legal guidance suggests that Solicitors will be viewing local authorities' processes to determine their ability to defend third party claims. The authority will also be required to demonstrate to the DfT that it has fully implemented the codes into their working practices. It is widely anticipated that the implementation of the codes will form part of the highway self-assessment process for attaining capital funding.

The Code is a single document comprising four parts. Part A details overarching matters and deals with general duties and powers of the Code, Part B covers issues and themes regarding highways and associated asset types, Part C contains information on duties and powers specifically related to Highway Structures and Part D covers specific issues and themes regarding street lighting and related assets.

This document sets out the technical procedures for the day to day delivery of the highway maintenance service and provides vital supporting evidence to demonstrate the implementation of the recommendations.

1.3 Strategic Context

This plan supports and complements the Council's [six priorities](#) expressed in the [Corporate Plan](#):

1. Creating more **jobs** and supporting business growth
2. Improving **housing** quality and building more houses
3. Improving **health and well-being**;
4. Improving outcomes for our **young people** – education and skills
5. Safeguarding the most **vulnerable people**
6. **Making your money go further** – supporting households in difficult financial times through efficient and effective use of council tax.

It should be read in conjunction with the [asset management policy](#) and the [asset management strategy](#).

The Council's [Local Transport Plan 2011-2021](#) establishes how transport policy will be delivered at a local level whilst this Highway Asset Management Strategy sets out how the authority plans highway maintenance activities to achieve the best outcomes within the resources available.

This document sets out how out operational maintenance of the authorities' highway infrastructure asset is carried out. The plan incorporates a degree of flexibility to accommodate changes in resources or priorities.

1.4 Document owner

The Highway Asset Manager has overall responsibility for the content and for the biennial review of this document. All updates and changes will be reported via an executive member briefing paper.

For each of the three areas of highways, structures and lighting have specific owners who will maintain that section of the whole document.

In addition to reviewing the content of the document a lessons learnt exercise will be undertaken and its findings reported to the executive member and incorporated into the plan.

1.5 A Highway Maintenance Manual for Blackburn with Darwen

The procedures contained within this plan are developed in line with the recommendations documented in the code of practice.

The introduction to each maintenance procedure will highlight the relevant Code of Practice recommendations and an overview of the requirements.

1.6 Scope of the Highway Maintenance Plan

This plan covers highway infrastructure assets in that Blackburn with Darwen maintain under its duties as local highway authority expressed in the Highways Act, 1980.

The infrastructure assets are:

1. Carriageways,
2. Footways.
3. Drainage.
4. Cycle paths.
5. Public rights of way (PROW).
6. Bridges and related structures.
7. Street Lighting.
8. Traffic signals.

1.7 A Summary of the Recommendations of the Codes of Practice Recommendations

RECOMMENDATION 1 – USE OF THE CODE

This Code, in conjunction with the UKRLG Highway Infrastructure Asset Management Guidance, should be used as the starting point against which to develop, review and formally approve highway infrastructure maintenance policy and to identify and formally approve the nature and extent of any variations.

RECOMMENDATION 2 – ASSET MANAGEMENT FRAMEWORK

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

RECOMMENDATION 3 – ASSET MANAGEMENT POLICY AND STRATEGY

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

RECOMMENDATION 4 – ENGAGING AND COMMUNICATING WITH STAKEHOLDERS

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

RECOMMENDATION 5 – CONSISTENCY WITH OTHER AUTHORITIES

To ensure that users' reasonable expectations for consistency are taken into account, the approach of other local and strategic highway and transport authorities, especially those with integrated or adjoining networks, should be considered when developing highway infrastructure maintenance policies.

RECOMMENDATION 6– AN INTEGRATED NETWORK

The highway network should be considered as an integrated set of assets when developing highway infrastructure maintenance policies

RECOMMENDATION 7 – RISK BASED APPROACH

A risk based approach should be adopted for all aspects of highway infrastructure maintenance, including setting levels of service, inspections, responses, resilience, priorities and programmes.

RECOMMENDATION 8 – INFORMATION MANAGEMENT

Information to support a risk based approach to highway maintenance should be collected, managed and made available in ways that are sustainable, secure, meet any statutory obligations, and, where appropriate, facilitate transparency for network users.

RECOMMENDATION 9 – NETWORK INVENTORY

A detailed inventory or register of highway assets, together with information on their scale, nature and use, should be maintained. The nature and extent of inventory collected should be fit for purpose and meet business needs. Where data or information held is considered sensitive, this should be managed in a security-minded way.

RECOMMENDATION 10 – ASSET DATA MANAGEMENT

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

RECOMMENDATION 11 – ASSET MANAGEMENT SYSTEMS

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

RECOMMENDATION 12 – NETWORK HIERARCHY

A network hierarchy, or a series of related hierarchies, should be defined which include all elements of the highway network, including carriageways, footways, cycle routes, structures, lighting and rights of way. The hierarchy should take into account current and expected use, resilience, and local economic and social factors such as industry, schools, hospitals and similar, as well as the desirability of continuity and of a consistent approach for walking and cycling.

RECOMMENDATION 13 – WHOLE LIFE / DESIGNING FOR MAINTENANCE

Authorities should take whole life costs into consideration when assessing options for maintenance, new and improved highway schemes. The future maintenance costs of such new infrastructure are therefore a prime consideration.

RECOMMENDATION 14 – RISK MANAGEMENT

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

RECOMMENDATION 15 – COMPETENCIES AND TRAINING

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

RECOMMENDATION 16 – INSPECTIONS

A risk-based inspection regime, including regular safety inspections, should be developed and implemented for all highway assets.

RECOMMENDATION 17 – CONDITION SURVEYS

An asset condition survey regime, based on asset management needs and any statutory reporting requirements, should be developed and implemented.

RECOMMENDATION 18 – MANAGEMENT SYSTEMS AND CLAIMS

Records should be kept of all activities, particularly safety and other inspections, including the time and nature of any response, and procedures established to ensure efficient management of claims whilst protecting the authority from unjustified or fraudulent claims.

RECOMMENDATION 19 – DEFECT REPAIR

A risk-based defect repair regime should be developed and implemented for all highway assets.

RECOMMENDATION 20 – RESILIENT NETWORK

Within the highway network hierarchy a 'Resilient Network' should be identified to which priority is given through maintenance and other measures to maintain economic activity and access to key services during extreme weather.

RECOMMENDATION 21 – CLIMATE CHANGE ADAPTATION

The effects of extreme weather events on highway infrastructure assets should be risk assessed and ways to mitigate the impacts of the highest risks identified.

RECOMMENDATION 22 – DRAINAGE MAINTENANCE

Drainage assets should be maintained in good working order to reduce the threat and scale of flooding. Particular attention should be paid to locations known to be prone to problems, so that drainage systems operate close to their designed efficiency.

RECOMMENDATION 23 – CIVIL EMERGENCIES AND SEVERE WEATHER EMERGENCIES PLANS

The role and responsibilities of the Highway Authority in responding to civil emergencies should be defined in the authority's Civil Emergency Plan. A Severe Weather Emergencies Plan should also be established in consultation with others, including emergency services, relevant authorities and agencies. It should include operational, resource and contingency plans and procedures to enable timely and effective action by the Highway Authority to mitigate the effects of severe weather on the network and provide the best practicable service in the circumstances.

RECOMMENDATION 24 – COMMUNICATIONS

Severe Weather and Civil Emergencies Plans should incorporate a communications plan to ensure that information including weather and flood forecasts are received through agreed channels and that information is disseminated to highway users through a range of media.

RECOMMENDATION 25 – LEARNING FROM EVENTS

Severe Weather and Civil Emergencies Plans should be regularly rehearsed and refined as necessary. The effectiveness of the Plans should be reviewed after actual events and the learning used to develop them as necessary.

RECOMMENDATION 26 – PERFORMANCE MANAGEMENT FRAMEWORK

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

RECOMMENDATION 27 – PERFORMANCE MONITORING

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

RECOMMENDATION 28 – FINANCIAL PLANS

Financial plans should be prepared for all highway maintenance activities covering short, medium and long term time horizons.

RECOMMENDATION 29 – LIFECYCLE PLANS

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

RECOMMENDATION 30 – CROSS ASSET PRIORITIES

In developing priorities and programmes, consideration should be given to prioritising across asset groups as well as within them.

RECOMMENDATION 31 – WORKS PROGRAMMING

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

RECOMMENDATION 32 – CARBON

The impact of highway infrastructure maintenance activities in terms of whole life carbon costs should be taken into account when determining appropriate interventions, materials and treatments.

RECOMMENDATION 33 – CONSISTENCY WITH CHARACTER

Determination of materials, products and treatments for the highway network should take into account the character of the area as well as factoring in whole life costing and sustainability. The materials, products and treatments used for highway maintenance should meet requirements for effectiveness and durability.

RECOMMENDATION 34 – HERITAGE ASSETS

Authorities should identify a schedule of listed structures, ancient monuments and other relevant assets and work with relevant organisations to ensure that maintenance reflects planning requirements.

RECOMMENDATION 35 – ENVIRONMENTAL IMPACT, NATURE CONSERVATION AND BIODIVERSITY

Materials, products and treatments for highway infrastructure maintenance should be appraised for environmental impact and for wider issues of sustainability. Highway verges, trees and landscaped areas should be managed with regard to their nature conservation value and biodiversity principles as well as whole-life costing, highway safety and serviceability.

RECOMMENDATION 36 – MINIMISING CLUTTER

Opportunities to simplify signs and other street furniture and to remove redundant items should be taken into account when planning highway infrastructure maintenance activities.

1.8 Implementation of the Code of Practice (36 Recommendations)

The table below illustrates how and where each of the 36 recommendations have been implemented. The information sign posts the reader to the relevant document.

Recommendation 1 - USE OF THE CODE

Recommendation 2 - ASSET MANAGEMENT FRAMEWORK

Recommendation 3 - ASSET MANAGEMENT POLICY AND STRATEGY

The Council endorsed the principles behind UKRLG Well Managed Highway Infrastructure Code of Practice in January 2017 and published a [briefing paper](#) to this effect.

The authority has developed an asset management [policy](#) and an accompanying [strategy](#), both of these have been approved and endorsed by the Executive Member for Regeneration and are periodically revised to ensure that they remain current and appropriate. Although the Code of Practice is not a statutory document the Council has embraced the guidance it contains.

Recommendation 4 - ENGAGING AND COMMUNICATING WITH STAKEHOLDERS

A communication strategy has been drafted and approved by the Council's executive member and is incorporated into the asset management strategy. This defines how the authority intends to communicate target requirements and performance with stakeholders such as utility companies, transport companies, elected members and members of the public.

Recommendation 5 - CONSISTENCY WITH OTHER AUTHORITIES

This authority actively works with adjacent and nearby local highway authorities to share knowledge and experience. This allows all parties to benefit, where practical, from shared services, particularly procurement of external contractors. This also permits common service levels to be established across authority boundaries. Regular meetings are held with utility companies to facilitate coordination of works on the highway.

Recommendation 6 - AN INTEGRATED NETWORK

The structure of the asset management strategy encourages an integrated approach to the maintenance of the various facets of the overall asset, particularly in the urban and town centre areas. The strategy facilitates increased consideration of the needs

of vulnerable users and sectors of society and offers the opportunity to add value to the asset.

Recommendation 7 - RISK BASED APPROACH

Risk is considered as part of the maintenance process, particularly as part of safety defect inspection policy, inspection of structures and consideration of the resilient network.

These documents have been approved by the executive member and are published on the Council's website.

Recommendation 8 - INFORMATION MANAGEMENT

The management of highways data is described in detail within the asset management strategy. Data is held securely on the Council's own servers which are administered by the Council's IT department. A variety of information is made available to the public via the [Council's website](#). Additional information can be requested through an appropriate [freedom of information request](#).

Recommendation 9 - NETWORK INVENTORY

Recommendation 10 - ASSET DATA MANAGEMENT

Recommendation 11 - ASSET MANAGEMENT SYSTEMS

The data management strategy contained within asset management strategy identifies the data to be kept and the frequency with which it should be updated. This describes the nature of individual facets of the whole asset. The asset management systems employed support planning and programming decisions and are available to appropriate staff across the authority and its partner organisations.

Recommendation 12 - NETWORK HIERARCHY

Carriageway and footway hierarchies have been developed from those described in the Code of Practice and have been endorsed by the Executive Member and included within the asset management strategy.

Recommendation 13 - WHOLE LIFE / DESIGNING FOR MAINTENANCE

Lifecycle costs are examined as part of the design process and form a major part of the decision making process in determining appropriate treatment regimes. This is recorded in the asset management strategy.

Recommendation 14 - RISK MANAGEMENT

The authorities' approach to risk is recorded in the asset management strategy.

Recommendation 15 - COMPETENCIES AND TRAINING

A competencies framework has been developed to identify the required skills and attributes needed for individual roles within the highway maintenance staff structure. These are described within Appendix 5 of the asset management strategy.

Recommendation 16 - INSPECTIONS

Recommendation 17 - CONDITION SURVEYS

The type, nature and frequency of surveys and inspections are described within the data management strategy which is incorporated within the asset management strategy.

Recommendation 18 - MANAGEMENT SYSTEMS AND CLAIMS

The details of all safety defect inspections, including the inspection date are recorded and kept to provide the basis of a legal defence in the event of any claim for accident or injury in accordance with the safety deflection inspection procedure, which has been approved the executive member.

Recommendation 19 - DEFECT REPAIR

A risk-based defect repair regime has been developed for the authorities' highway infrastructure assets. This has been approved by the executive member for regeneration and covers all types of highway asset, highways, structures and street lighting.

Recommendation 20 - RESILIENT NETWORK

A resilient network has been developed to ensure minimal disruption in the event of severe weather, major incident or industrial action. This has been agreed with neighbouring, adjacent authorities and has been approved by the executive member and published on the [authorities' website](#).

Recommendation 21 - CLIMATE CHANGE ADAPTATION

Although the Borough is fairly hilly and does not suffer from severe flooding the risk associated with severe, prolonged rainfall have been carefully considered and incorporated into the asset management strategy. Reference should also be made to the Council's [climate change adaption plan](#).

Recommendation 22 - DRAINAGE MAINTENANCE

A drainage management strategy has been prepared and discussed in detail with the executive member for regeneration. Cyclic gully cleaning and emptying has been scheduled on a risk basis.

Recommendation 23 – CIVIL EMERGENCIES AND SEVERE WEATHER

Highways Resilience Strategy

The Council's Civil Emergency Plan has been approved by the executive board and is published on the Council's website. It is augmented by a number of additional plans and procedures, specifically, relating to highways, these include:

- Cold Weather Plan.
- Heatwave Plan.
- Critical Structures diversion routes.

- Asset Management Strategy.

These plans and strategies have been discussed with and approved by the appropriate executive member.

Recommendation 24 - COMMUNICATIONS

The highways communications strategy is incorporated into the asset management strategy; it describes how communications are maintained during periods of severe weather and civil emergency.

Recommendation 25 - LEARNING FROM EVENTS

The highways and traffic manager regularly takes part in training exercises to examine the effectiveness and responsiveness of the authority's emergency plans. These exercises include officers from the emergency services as well as Lancashire County Council and the Environment Agency.

Plans and strategies are revised after significant events to ensure that they remain effective and incorporate any and all lessons that may have been learnt during any actual events. A lessons learnt register is maintained, it can be accessed and updated by all highways staff.

Recommendation 26 - PERFORMANCE MANAGEMENT FRAMEWORK

A performance management framework is incorporated into the asset management strategy which has been discussed and is approved by the executive member and is published on the authority's website.

Recommendation 27 - PERFORMANCE MONITORING

Key performance indicators are monitored and reported via executive member briefing reports and meeting with the appropriate director and the executive and lead members for regeneration. The performance of the highways asset and the highways service is periodically examined by scrutiny committee as they feel necessary, their findings are published on the Council's website.

Recommendation 28 - FINANCIAL PLANS

Recommendation 29 - LIFECYCLE PLANS

The Councils medium term financial strategy incorporates all aspects of the highways service; it is discussed with the appropriate executive member, is approved by the executive board and is published on the authority's website.

This strategy is supported by financial plans for individual service areas of the highways asset which have been developed and are updated and contained within the asset management strategy.

These financial plans are supported by lifecycle plans for major asset groups, these are updated annually as required by the asset management strategy, they are discussed with and approved by the executive member and are published on the Council's website.

Recommendation 30 - CROSS ASSET PRIORITIES

Works programmes are evolved to anticipate the future needs of all asset groups in any given area, this reduces overall costs and minimises delay and disruption to highway users.

The authority consults regularly with adjacent local highway authorities and utility companies.

Recommendation 31 - WORKS PROGRAMMING

The authority maintains and updates a capital maintenance works programme for major asset groups for up-to two years in advance. An indicative programme of work for a further three years is also maintained.

These programmes are reviewed to take into consideration accelerating deterioration, updated/revised condition data, stakeholder expectations and requirements and available budgets.

These programmes are discussed with and approved by the appropriate executive member and are published on the Council's website.

Recommendation 32 - CARBON

The Highways asset management strategy is committed to reducing the carbon footprint of the whole Borough by effectively managing its highway works.

Recommendation 33 - CONSISTENCY WITH CHARACTER

Recommendation 34 - HERITAGE ASSETS

The Borough has a number of conservation and heritage areas and sites which are mapped on the corporate GIS platform. The choice of treatment and materials within these areas takes their character into account whilst also considering the robustness of proposed materials and the whole life cost of potential options.

Recommendation 35 - ENVIRONMENTAL IMPACT, NATURE CONSERVATION AND BIODIVERSITY

The authority's asset management strategy recognises the benefits of choosing appropriate materials and techniques to cause least impact to the environment, to be

able to cater for increasingly adverse weather conditions as well as minimising whole life costs and improving safety and serviceability.

Recommendation 36 - MINIMISING CLUTTER

The authority takes advantage of routine, planned maintenance to reduce any redundant road signs or road-markings to reduce the amount of clutter on the highway.

Highway Maintenance Procedures

2.1 Introduction

Part 2 of this document covers specific issues and themes regarding highways themselves and includes the following asset types:

- carriageways
- footways
- public rights of way
- cycle routes
- highway drainage systems
- embankments and cuttings
- landscaped areas and trees
- fences and barriers
- traffic signs and bollards
- road markings and studs

2.2 Legal framework

This section contains information on duties and powers specifically related to highways.

The Highways Act 1980 sets out the main duties of Highway Authorities in England and Wales. In particular, Section 41 imposes a duty to maintain highways maintainable at public expense, and almost all claims against authorities relating to highway functions arise from an alleged breach of this section.

Section 58 of the Highways Act provides highway authorities a defence against action in respect of damage resulting from a failure to maintain the highway providing that they can prove that they had ‘taken such care as in all the circumstances was reasonably required to secure that the part of the highway to which the action relates was not dangerous for traffic.’

Winter Service

The statutory basis for Winter Service in England and Wales is addressed through Section 41 (1A) of the Highways Act on the 31st October 2003 and by Section 111 of the Railways and Safety Transport Act 2003. The first part of Section 41 reads:

(1) The authority who are for the time being the Highway Authority for a highway maintainable at the public expense are under a duty, subject to subsections (2) and (4) below, to maintain the highway.

(1A) In particular, a Highway Authority are under a duty to ensure, so far as is reasonably practicable, that safe passage along a highway is not endangered by snow or ice.

Section 150 of the Highways Act 1980 also imposes a duty upon authorities to remove any obstruction of the highway resulting from 'accumulation of snow or from the falling down of banks on the side of the highway, or from any other cause'.

In addition, the Traffic Management Act 2004 placed a network management duty on all local traffic authorities in England. It requires authorities to do all that is reasonably practicable to manage the network effectively to keep traffic moving. In meeting the duty, authorities should establish contingency plans for dealing promptly and effectively with unplanned events, such as unforeseen weather conditions, as far as is reasonably practicable.

Given the scale of financial and other resources involved in delivering the Winter Service, it is not considered reasonable either to:

- provide the service on all parts of the Network; and
- ensure carriageways, footways and cycle routes are kept free of ice or snow at all times, even on the treated parts of the network.

2.3 Asset management information

The Highway asset management strategy contains information relating to the Council's asset management system, condition surveys and their frequency and financial monitoring. This is published on the authority's website xxxxx.

2.4 Asset condition and investigatory levels

All information relating to asset condition and investigatory levels are included within the Highway Asset Management Strategy. These documents can be accessed by visiting the Council's website xxxxx.

The condition of the highway asset is reported to the executive member via briefing papers which are published on the authority's website.

The investigatory levels are documented within individual procedures for managing a highway asset and can be found in the appendices of this document.

2.5 Inspection, assessment and recording

All information relating to how inspections and assessments are carried out and how data is recorded is documented in the Data Management Strategy contained within the Highway Asset Management Strategy. This document can be accessed by visiting the Council's website xxxxxx.

2.6 Programming and priorities

The Highway Asset Management Strategy sets out how future programmes and priorities for the authorities' highway assets are determined. These programmes are reported to the executive member and published on the Council's website.

These documents are available to view on the Council's website.

2.6 Winter Service

Winter service plans are internal documents and endorsed by senior decision makers. The plans are reviewed annually and consultation carried out with appropriate stakeholders. The gritting routes are available to view on the Council's website.

2.7 Inspection, assessment and recording

Highway Safety Inspections are completed on the adopted highway network.

Highway records are held and stored in accordance with the Data Management Strategy.

The highway authorities within Tyne and Wear came together to work collaboratively, known here after as the group, to develop and implement a consistent approach to highway safety inspections Code of Practice (CoP).

A consultation exercise has been carried out with stakeholders and subsequently has been signed off by respective senior executive and [lead] member[s]/Cabinet

The group commenced work in August 2017 and completed the work in April 2018 therefore enabling individual authorities the opportunity to complete additional work if required. The implementation for the CoP is October 2018.

This document is available/internal document.

A how to guide for carrying out highway safety inspections has been developed collaboratively by the group and used to ensure a consistent approach to carrying out safety inspections on the highway. Include claims investigators procedures within the guide.

2.7 Safety inspections of highway trees

The highway trees inspection plan is an internal document and endorsed by senior decision makers. The plans are reviewed annually and consultation carried out with appropriate stakeholders. Include overgrown hedges trees etc. leaflets which are circulated. Include in the leaflet reference to S154 and dead/diseased trees. Include inspections will only be completed so far as can be seen without trespassing.

Refer to arborculturst role and any information held on respective websites.

B.2.8 Competence

The competency framework document has been developed to align with the principles of ISO55000. The key roles associated with this competency framework are responsible for the delivery of the codes of practice, Well-managed Highway Infrastructure, completion of the Incentive Fund highway assessment questionnaire and managing highway assets. The document is available to view at appendix 6.

2.9 Skidding resistance policy and surveys

The skid resistance policy/practice is available to view at appendix 7 – or where you locate this document.

The required surveys are carried out annually and are documented within the Data Management Strategy or appropriate document.

2.10 Service [safety] inspections – general

General service inspections are defined as a combination of safety and condition inspections. Individual asset service inspections will be determined by applying a risk based approach to identify if a service or a supplementary safety inspection is required.

On occasions there may be a requirement to carry out a bespoke service / condition inspection; however these will be determined on an ad hoc basis.

2.11 Service [safety] inspections – general

General service inspections are defined as a combination of safety and condition inspections. Individual asset service inspections will be determined by applying a risk based approach to identify if a service or a supplementary safety inspection is required.

On occasions there may be a requirement to carry out a bespoke service / condition inspection, however these will be determined on an ad hoc basis.

2.12 Service [safety] inspections for carriageways, footways and cycle routes

The HSI CoP has been developed collaboratively by the group and can be found at appendix 2.

The CoP is supported by an Inspection Manual which can be found at appendix 3

2.13 Service [safety] inspections of highway drainage systems

The inspections and maintenance of highway drainage is documented in the Highway Drainage Strategy/CoP. This document can be found at appendix 4.

2.14 Service [safety] inspection of embankments and cuttings

These inspections are documented in the Highway Safety Inspection Guidance document. The document can be found at appendix 5.

2.15 Service [safety] inspection of landscapes areas and embankments

These inspections are documented in the Highway Safety Inspection Guidance document. The document can be found at appendix 5.

2.16 Service [safety] inspection of fences and barriers

These inspections are documented in the Highway Safety Inspection Guidance document. The document can be found at appendix 5.

2.17 Service [safety] inspection of traffic signs and bollards

These inspections are documented in the Highway Safety Inspection Guidance document. The document can be found at appendix 5.

2.18 Service [safety] inspection of road markings and studs

These inspections are documented in the Highway Safety Inspection Guidance document. The document can be found at appendix 5.

2.19 Service inspections for network integrity

The maintenance of the network infrastructure is the responsibility of the highway asset management team whereas network efficiency and the management of activities on the highway is managed by the Network/Traffic Manager. The procedures maintaining the network infrastructure as contained within this maintenance plan. The procedures for managing the network efficiency are documented in the Network Management Plan.

The maintenance manual and network management plan are available to view on the Council's website.

2.20 Condition surveys – general

Condition surveys are necessary to determine future programmes of work. These surveys are documented in the data management strategy which is located in the HAMP/HAMF.

2.21 Inspections for regulatory purposes

A significant element of highway maintenance comprises regulation and enforcement of activities on or affecting the highway. The most significant of these for the authority involves responsibilities under the New Roads and Street Works Act 1991 (NRSWA). These matters are incorporated within the authorities' statutory duty for network management imposed by the Traffic Management Act 2004 and are the responsibility of the Network/Traffic Manager. These responsibilities are outlined in the Network Management Plan.

There are other general regulatory and enforceable activities under the Highways Act 1980. There are extensive powers within the Highway Act to regulate various activities which occur on the highway. These will be dealt with on an ad hoc basis.

2.22 Reliability of data

This is documented in the Data Management Strategy located within the Asset Management Strategy.

2.23 Recording of information

This is documented in the Data Management Strategy located within the Asset Management Strategy.

2.24 Developments in survey technology

When reviewing the suite of documents consideration will be given to the latest developments in technology and will be considered if appropriate.

2.25 Programming and Priorities – Highways

Introduction

The process to develop a works programme for asset maintenance comprises the identification, prioritisation, optimisation, programming and delivery of individual schemes. It should meet the annual budgets that have been developed by the authority, ideally with the support of lifecycle planning process described in the HAMF.

The process for identifying candidate schemes and developing a programme of works is described in the following paragraphs and summarised in the diagram below.

2.26 Balancing priorities by type

The broad priorities for the respective types of highway maintenance will largely be determined by the outcome of safety and service inspections and condition surveys,

assessed against local risks and policies specified by the authority in the light of this Code. In general it will be important to establish priorities and programmes for each of the following:

- emergency / reactive maintenance – attending to defects and other safety matters that require urgent action arising from inspections or user information;
- planned maintenance – attending to defects and other less urgent matters that may benefit from further planning leading to permanent repairs;
- programmed maintenance – providing lifecycle / road condition based work streams;
- routine maintenance – providing locally defined levels of service;
- regulatory functions – regulating occupation, interference or obstruction of the network;
- Winter Service – providing locally defined levels of service of salting and clearance of ice and snow.

The determination of priorities and programmes for items within the categories of regulatory functions and Winter Service will tend not to require any special consideration and will largely arise out of the design of the services.

2.26 Priorities for emergency / reactive maintenance

These are documented in the Highway Safety Inspection Policy.

2.26 Priorities for planned maintenance

These are documented in the Highway Asset Management Strategy.

2.27 Priorities for routine maintenance

When determining priorities for routine maintenance decisions are informed by the level of services developed against the backdrop of the code of practice (CoP), Well-managed Highway Infrastructure guidance. This should enable the needs of customers and stakeholders to be met and statutory requirements to be delivered.

2.27 Regulatory functions

See inspections for regulatory purposes section above.

2.28 Value management

The first stage of the value management process is the determination of the parameters set in the asset management software systems. This information is detailed within the life cycle planning section of the HAMP.

The above will generate an initial programme list for consideration. This will be further refinement by applying the principles of asset management, value engineering, consultation with stakeholders and network management considerations.

The final programme of schemes for all asset groups will be determined holistically and by applying the objectives of the Highway Asset Management Plan.

2.29 Materials, products and treatments

Techniques, materials and methods are trialled. The authority maintains contact with industry leading companies who offer advice on an ad-hoc basis.

2.30 Winter service

The authority has developed a winter service plan, which has been discussed with and approved by the executive member.

3.0 Structures Maintenance Procedures

3.1 Introduction:

Bridges and highway structures are an important asset to the Borough enabling movement across or past various obstacles which would otherwise prevent or delay transit. The function provided by many of the Borough's bridge and highway structure assets is vital to ensure community and economic connectivity.

This maintenance plan covers bridges (both vehicular and pedestrian), culverts, subways and retaining walls. Bridges are of various types and spans but their construction is mainly concrete, metal or masonry/brick. The asset group includes Public Right of Way (PROW) structures. Highway structures that the Council is responsible for maintaining are specifically:

- Highway bridges, culverts, chambers or subways under or over the highway with a composite span of 0.9 metres or more.
- Highway retaining walls where the height of retained fill measured between lower and upper ground level is 1.37 metres or more.
- Reinforced earth embankments 1.37 metres or more in height and where the angle of the slope is greater than the natural angle of repose of the embankment material.
- High mast lighting columns 20 metres or more in height.
- Structural aspects of sign or signal gantries as defined in DfT Standard BD63.
- Structural aspects of traffic signal mast arm assemblies as described in DfT Standard BD88.

A number of bridges span the Borough boundary responsibility for maintenance with the neighbouring authority has been established in all cases.

Amenity bridges are bridges owned by the Council which are generally found away from the highway network in parks and open spaces.

Private structures are those adjacent to, over or under highways that are vested in and maintained by third parties.

3.2 Legal Framework:

Where a highway passes over a bridge, Section 328(2) of the Highways Act 1980 vests the bridge as part of the highway and the normal duty to maintain under Section 41 of the Act applies. However, this does not preclude bridges under highways being in private ownership and rightly the responsibility of the private owner.

3.3 Asset Management Information:

Currently all highway structures asset management information is held electronically on servers with regular back up. Each structure has been given a unique identifier and file with locations in Ordinance Survey co-ordinates. The locations of each structure are shown on Google Earth with each unique structure file linked for ease of access.

Private structures, including bridges owned by Network Rail and Canal & River Trust are also included.

The highway structure asset data is currently being transferred across to a new cloud based asset management system. The system will provide greater development of bridge management techniques and can also include up to date tablet based data entry linked at a site level during inspections. This provides consistent element inventories where works management and prioritisation can be supported by deterioration modelling and life cycle planning.

The asset management system will provide the information required for data entry into the Structures Asset Management Planning toolkit (SAMPt). The toolkit developed by the UK Bridges Board is used to produce the figures required for the Whole of Government Accounts for asset valuation reporting purposes.

The toolkit is also used to support the life cycle planning process which is covered later.

3.4 Performance Measures: to follow

3.5 Bridges

a) Highway

The majority of highway bridges are maintainable at public expense unless they were built under an Act of Parliament for the construction of the canal and railway networks or built by private owners under authority of a Royal Charter or an Act of Parliament in consideration for being allowed to charge tolls. Where a bridge carries a road, which is not maintained by the Council there are agreements in place with the owner (e.g. Network Rail) in relation to the demarcation of maintenance responsibilities.

b) Rail

Within the Borough there are number of bridges owned by Network Rail. There are also a number of disused railway bridges which are the responsibility of the residual body of the Rail Property Board. A superficial inspection is carried out for highway safety purposes.

There are three main types of rail bridge in the Borough:

1. Bridges owned and maintained by Network Rail which normally carry the railway over the highway or watercourse but not always the case.
2. Bridges owned by the Council but maintained by Network Rail at the Council's expense.
3. Bridges owned and maintained by the Council which normally carry the highway over the railway.

Bridges in 1) and 2) are subject to a superficial inspection for highway safety purposes.

Maintenance responsibility for Network Rail bridges does not extend to the highway surface which remains with the Council by virtue of Section 116 of the Transport Act 1968. The maintenance does not include bridge expansion joints and waterproofing.

c) Canal

The Leeds Liverpool Canal passes through the Borough which has several bridge crossings. The canal has remained classified as a navigable waterway which is managed by the Canal and River Trust. The Transport Act 1968 (Part VIII Bridges and Level Crossings etc) sought to clarify responsibilities of the then British Waterways Board, now the Canal & River Trust.

There are three main types of canal bridge in the Borough:

1. Bridges owned and maintained by C & RT which carry the highway over the canal.
2. Bridges where part is owned by the Council and part is owned by C & RT. Each is responsible for the structural maintenance but the Council's maintains the highway surface.
3. Bridges owned and maintained by the Council which normally carry the highway over the canal.

Private:

Under Section 41 of the Highway Act 1980, the Council is responsible for ensuring the safety of the general public crossing the highway. The following scenarios relate to the Council's approach to private bridge owners:

1. If the bridge is owned, and maintained by a responsible owner the Council following the superficial inspection shall inform the owner of any defects that may require attention. The works cost to correct the defects are borne by the owner.
2. If the bridge is owned by a resident association, charity etc then an agreement will be made to ensure the bridge condition is adequate to ensure the safety of the public. Alternatively, consideration will be given to adoption of the structure by the Council under Section 93 of the Highways Act.
3. If there are defects that directly affect the highway and public safety. The Council will act in the form of an inspection before informing and liaising with the owner. If after a reasonable timescale, the defects have still not been rectified the Council will take the necessary steps to carry out the repairs. The associated costs shall be sought from the owner and may ultimately become a land charge on the landowner.

3.6 Retaining Walls:

a) Highway retaining walls

Most retaining walls, which directly support the highway or support land carrying the highway and are within the highway boundary are maintainable at public expense. In some circumstances retaining walls were built to level sites e.g. for a mill and are owned and should be maintained by the landowner. There is an issue that some walls were not covered by an agreement but the highway does have a right of support under Common Law and can be used by the Council in case of defects or collapse.

b) Property retaining walls

Property retaining walls which support property adjacent to the highway are more problematic to the Council. These walls may have been built as part of the highway or as accommodation works for the adjoining landowner with an agreement for maintenance by the landowner. Some may be built to create more space and are maintainable by the landowner. If such walls become a danger to the public than the Council will serve notice under Section 167 of the Highways Act. If no action is taken by the landowner the Council will act in default.

3.7 Culverts

A culvert is a drainage structure which passes through a highway embankment that has a proportion of the embankment, rather than a bridge deck, between its uppermost point and the road running surface. A culvert is primarily constructed to carry or divert a watercourse due to development.

There are a significant number of culverts within the Borough which carry the main watercourses the Rivers Blakewater and Darwen and a number of minor watercourses.

3.8 Cellars and Vaults:

The majority of cellars and vaults associated with the highway are privately owned and their maintenance and management is largely outside the remit of the Council. In the event of a private cellar or vault collapse it is usually the responsibility of the Council's Bridge Manager to oversee investigation and subsequent repairs.

Sections 179 and 180 of the Highways Act 1980 give procedures the control of the construction of new cellars and vaults under the highway, particularly the provision of openings in the highway, pavement lights and ventilators.

3.9 Engineered Earth Structures

Statutory Consultation:

A small number of the Council's bridges are listed structures. Before undertaking maintenance, we consult with and seek approval from the Council's Conservation Officer.

Many of the bridges and culverts span watercourses which are part of the flood defence network managed by the Environment Agency. Where this is the case we will consult with and seek approval for the works in the form of an Environmental Permit before proceeding with the proposed works.

A number of bridges cross the Leeds Liverpool Canal, a navigable waterway, which passes through the Borough. Where the maintenance works affect the operation of the canal we consult with and seek approval from the Canal and River Trust.

All bridges carry statutory undertakers plant and apparatus across the obstacle. Depending upon the nature of the maintenance works it may be necessary to temporarily divert the services to facilitate the works.

3.10 Inspections Regime:

All Council owned highway structures are regularly inspected to monitor their condition, and ensure so far as reasonably practicable that they are safe and fit for lawful use by the public. The information from the inspection is also used to identify

maintenance needs and to develop a prioritised maintenance programme in the short and long term.

Within the Borough there are also a significant number of structures carrying highways and other transport systems that are owned by other statutory bodies such as Highways England, Network Rail, Canal and River Trust and utility companies. Superficial inspections are carried out on these structures for highway safety purposes.

Inspections are undertaken in accordance with 'Well Managed Highway Infrastructure - Code of Practice' (2016).

3.11 General Inspection

General inspections are undertaken every two years which involves a visual inspection to all parts of the structure accessible without the need for special access or traffic management.

Amenity and third party bridges will only have a superficial inspection for safety purposes.

Retaining walls over a retained height of 1.5 metres are subject to a General inspection every two years. Retaining walls below this height threshold will be inspected following identification of possible defects stemming from Highway Safety Inspections or enquiries from members of the public.

3.12 Principal Inspection

Principal inspections are usually carried out every six years and involve a close examination within touching distance to determine the condition of all parts of the structure. Special access is sometimes required particularly if parts are underwater, there are confined spaces or where parts are obscured. The Principal inspection interval can be increased if assessed to be appropriate by the Principal Bridge

Engineer. The decision to increase the interval will be recorded and based on the risks and consequences of failure.

3.13 Maintenance Prioritisation:

Maintenance to address defects is prioritised using the risk based approach outlined above. Category 2 defects are held in the structures forward programme and are prioritised based on Asset Management principals which includes the following factors:

- The hierarchy of the highway and/or route that the structure supports.
- The most efficient and effective use of funds.
- Intervention timing and whether certain maintenance activities can be carried out together for maximum cost benefits.
- Meeting the objectives of the Local Transport Plan.
- Public pressure or opposition.

The strategy is based on managing assets which recognises that whilst everything cannot be done all at once, there is a need to prioritise based on the relative importance that each group contributes toward the goal of delivering an effective transport system.

Abnormal Load Management:

An abnormal load is considered to be a vehicle that is outside the classification of normal permitted traffic by virtue of its gross weight, length, width or axle configuration according to current road vehicle regulations.

The Council has an appointed officer who of the Bridges team responsible for checking abnormal loads gross weights on routes passing through the Borough. Notifications are received by e-mail, telephone and held for a maximum three months following the passage of the abnormal load.

Assessment and Structural Reviews:

Between 1989 and 1999, as the result of a European Directive all Highway Authorities were requested by Central Government with assessing the strength of their adopted bridge stock. Following the bridge stock assessment, a strengthening programme was developed in order to ensure that the nations bridges were adequate for the 40 tonne European Standard which was being introduced into the UK on 1st January 1999.

Assessments are carried out in accordance with the 'Design Manual for Roads and Bridges' (DMRB). The primary assessment standard is BD21 'The Assessment of Highway Bridges and Structures' other standards as used dependent upon the type of bridge construction. Prior to an assessment being performed it is necessary to carry out an Inspection for Assessment to accurately determine the condition of the structure for the condition factors required by BD21.

A structure that does not meet the requirements of the assessed load carrying capacity standards is now termed a 'Substandard Structure' and will be managed in accordance with BD79 The Management of Substandard Structures. The structure will be placed on the forward programme of maintenance works and be prioritised against other categorised substandard structures.

Schemes may be implemented as short term measures which may involve measures to prevent overloading the structures critical elements. There are a small number of bridges where due to the high cost to benefit ratio have remained substandard but have had the critical areas protected. In these cases, a detailed risk assessment has been carried out to determine the risk to public safety before any mitigation measures were implemented.

Structural reviews ascertain the adequacy of structures to carry the specified loads when there are significant changes to usage, loading, condition or the assessment standards. Initially any structures identified on a priority basis which has deteriorated to an extent likely to affect their design as assessed capacity. The Structural Review considers a number of criteria in the form of a Risk Assessment in accordance with *BD101 Structural Review and Assessment System*.

Competence and Training:

The management of the Council's highway structures is carried out by suitably qualified and experienced civil and structural engineers. The Principal Bridge

Engineer is a chartered civil engineer with some 25 years experience of managing local authority bridges. The engineer is assisted by an experienced bridge inspector who is applying to become an accredited Bridge Inspector under the recently introduced Bridge Inspector Certification Scheme (BCIS).

BICS has been introduced to provide accurate and reasonably consistent bridge inspections. It will also provide a reduction in risk for bridge owners due to evidence of competence and best practice being followed. Highways England have issued IAN 192/16 which acknowledges the benefits of BICS and requires the mandatory use of certified inspections on their highway structures within the next twelve months.

The majority of ADEPT members nationally have indicated that they will be supporting the scheme.

Also, the bridges team has a chartered senior structural engineer (part time availability) and a graduate bridge engineer with some 3 years bridge maintenance related experience.

CoP Recommendation 15 – Competencies and Training. Recommendation 5 Consistency with other Authorities.

Risk Management Approach:

Inspections:

The data provided by structure inspections is fundamental to Highways Structures Life Cycle Planning.

General and Principal Inspections provide the majority of the available condition data for structures. This data is the primary source of information that feeds the Life Cycle Planning through the Highway Asset Management Strategy and the SAMPt.

a) General Inspections:

General inspections are undertaken on structures every two years unless the risk management process has reduced the frequency based on whether the structure is

a critical asset or it has a low BCI (critical) score. Currently there are no reductions in frequency of the General Inspection two year frequency.

b) Principal Inspections:

Accessibility of all parts of a structure will be considered. For structures where all parts can be inspected closely during a General Inspection, no Principal Inspection will be required unless the structures BCI (critical) is below 40 or BCI (average) is lower than 65. A review as above will be carried out to determine if there is a likelihood of a significant defect not being detected during a General Inspection. If this is the case a regular Principal Inspection will be carried out. (*See Well Managed Highways Infrastructure C5.2.26*)

Once the bridges have had an initial Principal Inspection, the frequency of future inspections will be reviewed taking into account the condition recorded in the Principal Inspection.

c) Confined Space and Underwater Inspections:

The structures which require confined space inspection are predominantly culverts. These are carried on the same time as General Inspections. Underwater inspections are carried out as part of the Principal Inspection and on high risk scour areas following extreme flooding events.

Lifecycle Planning:

Lifecycle planning is an important aspect of asset management and involves drawing up long-term plans for managing an asset grouping with the aim of providing the required levels of service at the lowest whole life cost.

Lifecycle plans capture all information relating to the inventory, its condition and performance. They also identify both the short-term routine maintenance needs and

long-term capital costs and enable annual spend profiles per asset to be produced. They also enable long-term predictions about the deterioration of various assets and their maintenance needs to be forecast.

Lifecycle plans also provide secondary benefits in enabling the 'institutional knowledge' i.e. the knowledge and judgement of key personnel, to be captured and documented, thereby enabling it to be shared and further developed. They also enable the Council to gather information on the costs for each treatment option and the effect that this expenditure has on performance improvement year on year. Once these are known benchmarking can then take place with other authorities / treatments etc.

'Well Managed Highways Infrastructure' Code of Practice Recommendation 29 Life Cycle Plans states:

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

The Inspection regime records the condition of bridges at element level for all components of a bridge e.g. main beams; bearings; piers; parapets etc. Currently each element is scored on severity and extent of any defect recorded in accordance with national standards.

The Code of Practice on Transport Infrastructure Assets (CIPFA 2010) recognises that the structure breakdown for bridges life cycle planning should be at component level. This is because the individual elements of a bridge will have considerably different life cycles e.g. a paint system may only have a life span of 25 years, waterproofing may be expected to last 40 years and masonry elements could continue to function with little maintenance for several hundred years.

In many instances the existing age of bridge elements is unknown. The Structures Asset Management Planning toolkit which provides technical and engineering detail for structures life cycle planning, deals with this issue by using complex deterioration profiles to predict the life span of each element. This is also influenced by the environment of the individual element with mild, moderate or severe environments being used in the model. The inspected element condition score is then used to predict the useable life remaining in every element of the bridge. This information is then used to populate the toolkit to provide long term scenario planning for predicting preventative maintenance requirements over a 30 year period. The results of this

analysis will clarify the need for appropriate and substantive long term investment as recommended in the Well Managed Highways Infrastructure Code of Practice.

The Councils new asset management database stores the condition data of each structure at element level and is used to update the SAMPt. The SAMPt is capable of reporting in accordance with the four proposed maintenance strategies outlined below. This provides a risk based strategy which considers maintenance on structures at different defined intervention levels for the different category of carriageway that the structure supports.

Maintenance Strategies: -

The following strategies are used to plan structure maintenance within the SAMPt:

1. Planned Targeted Strategy

Interventions aimed towards delivering a required target condition for the structure. All elements are considered for treatment when they reach a condition of 3C. This should be linked to Resilient Route Network Assets.

2. Planned Preventative Strategy

To be used for regular and frequent minor intervention that slow down the rate of deterioration. All critical elements are considered for treatment when they reach a condition of 3C. This should be linked to all gritting routes and all listed structure.

3. Planned Do Minimum Strategy

To be used for infrequent, but major interventions. The Structures Asset Management Planning toolkit suggests intervention at an element condition score of 4D. This should be linked to all roads that are not on the gritting route network.

4. Unplanned Reactive Strategy

All elements are considered for treatment when they reach condition 5B (i.e. failure). The Structures Asset Management Planning toolkit states that this would be very unlikely in practise and this is not normally the practice by the Council. However, if financial constraints dictate this maintenance strategy may be used where it is known the existing bridge is to be replaced in the medium term e.g. there is a proposed development at the site. This strategy will provide the most cost effective solution to manage the deterioration in the medium term.

Two scenarios detailed below, using standard CIPFA accredited use of data from the WGA return will be used to plan long term maintenance strategies.

1. 30 year Life Cycle Planning keeping the structures stock condition static over the 30 year period.

2. 30 year Life Cycle Planning using the Council's current budget figures over the 30 year period.

Both scenarios will allow detailed Life Cycle Planning and will provide the most appropriate time to carry out treatment works in terms of Life Cycle Planning.

The scenarios also highlight the amount of funds required for each of the 30 years so that long term financial plans can be developed.