Highway Asset Management Policy & Strategy

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Bolton's Highway Asset Management Policy and Strategy

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Foreword

Highway infrastructure is the most valuable asset owned by the public sector in the UK. The significant levels of funding for the management of this asset are under continuous scrutiny, with increasing pressure from government and the public for transparency, accountability and more efficient use of the limited resources available.

Infrastructure Asset Management is best practise for demonstrating good stewardship of infrastructure such as highways. It can offer significant cost savings in the efficient management of large networks, which is particularly important when resources are limited and finite.

Highways make up the majority of an effective transport network, which is an essential catalyst to realise the potential of economic prosperity as it connects people to places in a sustainable manner – places where they can work, study, shop, relax, and access public services.

Meeting this challenge is more critical than ever, with lower levels of public funding available.

This points to the need for greater clarity than ever on priorities for spending; alongside initiatives aimed at the efficient use of all transport networks to ensure that we move to a lower-carbon economy whilst maximising every opportunity for economic growth.

Councillor Nick Peel – Executive Cabinet Member for Environmental Services

1. Asset Management and Highway Maintenance

1.1 Objective of Highway Asset Management Plans

Growth of the transport network and travel demand is continuing to occur, along with an expectation by network users of a high-quality reliable road network. The highway network is an ageing asset, but funding for maintenance of the network is constrained and finite.

The Bolton highway network comprises:

1001 km	of carriageway.
1559 km	of footways and cycleway.
362	bridges and structures.
35,200	street light columns.
61,000	road gullies.

The highway network is by far the most valuable asset in the control of the local authority. In Bolton, the replacement cost all of highway assets in 2015/16 is estimated to be £ 1.68 Billion (*excluding land values*).

This estimate is made up of the following values (in 2015/16):

Carriageways	£1,149 million
Footways and cycleways	£ 252 million
Street Lighting	£ 42 million
Bridges and Structures	£ 236 million
Traffic Signals and Pedestrian Crossings	£ 267,000
Street Furniture	£ 7.5 million

Each year the value of Bolton's highway network depreciates by approximately £16 Million, the amount of physical investment in its upkeep is around £ 13 Million. This year-on-year shortfall has over time resulted in a current maintenance backlog on highway infrastructure of £ 54 Million; nearly two-thirds of the backlog is attributable to depreciation on residential roads and footways.

The objective of preparing a Highway Asset Management Strategy, is to lay out in a transparent manner, how the highway authority manages its highway assets to keep them safe, sustainable, fit for purpose and how work on the network is undertaken in a targeted and strategic way.

The term "highway" refers to all publicly maintained rights of way and includes, but is not restricted to, roads, streets, footways, footpaths and cycle routes. The term "highway assets" or "highway

infrastructure" refers to the physical components that make up the network of highways, including the bridges, structures, street lighting and other assets that are directly associated with the highway, such as the green estate (trees and planted areas), road signs and road markings.

The Strategy is not a static document; it will need to be revised as necessary to reflect the current political, economic and environmental demands of the time. A key role of a Strategy is to make the connections between the regional and local high-level strategies, governing highway authorities' work and day-to-day decisions each authority makes when maintaining its network.

1.2 What is Asset Management

The Asset Management process can be complex and requires the support of a large amount of data. However, a simplified Asset Management Process will require the following to be undertaken:

- Compile an asset inventory - ***What do we maintain and where is it?***
- Carry out a condition survey of the assets and assign condition grades – ***What is the physical state of the asset?***
- Compile a list of service grades or levels of services based on guidance and customer expectations – ***What is and what is not an acceptable condition?***
- Assign performance grades to each asset based on the levels of service – ***How does the asset perform its function?***
- Assign asset lives – ***Where is the asset in its life cycle?***
- Assign replacement costs to the assets – ***How much will it cost to remediate?***
- Assess how critical is the asset – ***How vital is the asset within the network?***

Outputs from the above process lead to:

- Calculation of the remaining asset life of each asset
- A valuation of the highway assets
- A prioritised list of schemes for the investment programme

This information is analysed and used to inform and shape the long term strategy, and leads to improved long term planning, and optimised allocation of resources.

The Asset Management process chiefly deals with the management of existing assets and its primary aim is to move to a planned maintenance regime rather than a largely reactive maintenance regime. It focuses on business and engineering practices for resource allocation and utilization, with the objective of better decision making based upon quality information and well defined objectives.

There are several definitions of Asset Management but they all contain a key theme, that of ***customer focus***. An effective Asset Management system must focus on the service an asset provides compared with customer expectations, rather than a solely objective technical assessment. The technical condition of an asset can be measured in a structured manner to produce an objective score, but this may not reflect the opinion of the public about an asset, or how they use or avoid using an asset. Part of the process of creating an Asset Management Plan includes consulting customers on their priorities and requirements, which in turn leads to setting levels of service for assets.

2. The Asset Management Framework

The diagram below illustrates the Asset Management Framework derived by national bodies and how these activities we undertake interrelate.

AM Context	National Transport Policy DfT guidance	GMCA Transport Policy	Bolton Vision 2030
	Stakeholder Expectations NHT Surveys	Legal Constraints	Financial Constraints Cipfa Guidance

Communication ↕

AM Planning	Asset Management Policy and Strategy
	Bolton's Asset Management Policy - Principles , Political Commitment Bolton's Asset Management Strategy - Long Term Approach, Outcomes & Objectives
	Performance
	Demand – Assessing Need Levels of Service – Setting acceptable local performance levels Measures – How we measure progress Targets – Setting performance targets
	Data
	Requirements, collection, reporting, management
	Lifecycle Planning
	Performance Gaps, Investment Strategy
	Works Programme
	Scheme Identification, forward programme, Annual programme

Communication ↕

AM Enablers	Leadership and Organisation
	Culture, Commitment, Investment, Training,
	Risk Management
	Identifying, Evaluating and Managing Risks
	Asset Management Systems
	Functionality, Management, Cost, Procurement
	Performance Monitoring
	Benchmarking, Performance Reviews, Continuous Improvement
	Getting Started
	Gap Analysis, Implementation Plan

Communication ↕

AM Delivery	Operations and Service Delivery
	Routine, cyclic, and reactive maintenance
	Safety Inspections
	Delivery of capital programme
	Procurement

3. Our Highway Asset Management Policy

Bolton Council Policy for Highway Asset Management

1. The Council recognises the vital role played by the local highway network in supporting the authority's vision and its strategic priorities.

2. The Council accepts that Infrastructure Asset Management is best practice for demonstrating good stewardship of infrastructure, and delivers the best long term outcomes for the local community.

3. An Asset Management Strategy will set out how Highway Infrastructure Asset Management will be delivered in Bolton. The strategy will take into account current and projected financial resources and will explain how they shall be utilised to maximise their benefit.

4. The Greater Manchester 2040 Transport Strategy further supports our vision and duties, the Council has developed with Transport for Greater Manchester a series of local and regional transport objectives.

To help meet these local and regional objectives, the Council's Highways Asset Management Strategy will seek to:

Support a Prosperous Bolton: A good transport network is essential for a successful economy and society. An effective transport system helps the local community connect to the benefits that new skills, growth and modern employment bring; it facilitates a high quality of life, by meeting the needs of the individual, whilst supporting the needs of businesses and the local economy.

Support a Connected Bolton: It provides the local and regional connections for the community to access opportunities, jobs, education, health care and public services, and allows us to make the most of our free time.

Support an Active Bolton: Poor health damages the quality of life, hindering access to jobs and services; active communities are healthier communities. We will work to improve opportunities for access to sustainable and active transport options to education and the workplace, and taking part in regular physical activity.

Support a Safe Bolton: We will support the delivery of road safety initiatives, to help to reduce road traffic accidents, by making our roads safer, we will save lives. All partners from schools, police, health services and above all, parents and young people will play a key role in reducing deaths and injuries.

Support a Cleaner and Greener Bolton: The Asset Management Strategy will set out a framework that maximises cost over time, value to the community and environmental contribution, whilst keeping people healthy and supporting lower carbon transport choices. We shall maximise our environmental contribution by using physical resources more efficiently, reducing waste and maximise the recycling of waste.

Meet the Challenges of Climate Change: By ensuring the transport network is resilient we can ensure that we meet the challenges of climate change and the effects of extreme weather events. The Highway Maintenance Programme will incorporate sustainable solutions and treatments, which minimise carbon production and waste disposal.

4. Alignment with Local Strategies and Plans

4.1 Bolton's Community Strategy

The Highway Network is Bolton's most valuable community asset which to remain effective must be adequately maintained and improved. An effective, accessible and efficient highway network has a unique contribution to make towards achieving both our Economic Strategy and our Strategic Vision as outlined in the Council's key strategy: *Bolton Vision 2030.*

The three main principles of the *Bolton Vision* are :

- To be economically **Prosperous**.
- To be a physically and socially **Active** community.
- To be linked and **Connected** to people, places and opportunities.

There are three themes for the Directorate of Place:

- Prosperous Bolton
- Clean and Green Bolton
- Strong and Distinctive Bolton

Underpinning the principles and themes are the drivers of change, which are:

- Digital Delivery
- Delivering Efficiently
- Rebalancing Finances
- Behaviour Change
- Maximising our Assets
- Engaging and Empowering

Therefore a good and efficient highway transportation network is vital if the authority is to serve the community and achieve its aims and priorities. Poorly maintained highways impede easy transport and so negate any effective contribution the network can make towards Bolton's strategic objectives.

The highway network:

- Enables the population, regardless of mode of travel, to move safely around the Borough and connect with other areas, to access opportunities so building the prosperity of the local community.

- Enhances the image of the town by improving the environment, thus increases the population's sense of well-being and creates a pride in the area besides significantly impacting on the quality of life for all the people of Bolton.

- Is vital to achieving our Economic Strategy, as it supports the local economy by enabling and encouraging commercial activities to prosper and generate further investment in the area, so assisting in the prosperity of the town.

- Encourages the use of such environmentally sustainable and active forms of transport as cycling, public transport and walking so enhancing mobility for all sections of the community, improving health and the quality of life and reducing the effects of pollution.

4.2 The Greater Manchester 2040 Transport Strategy



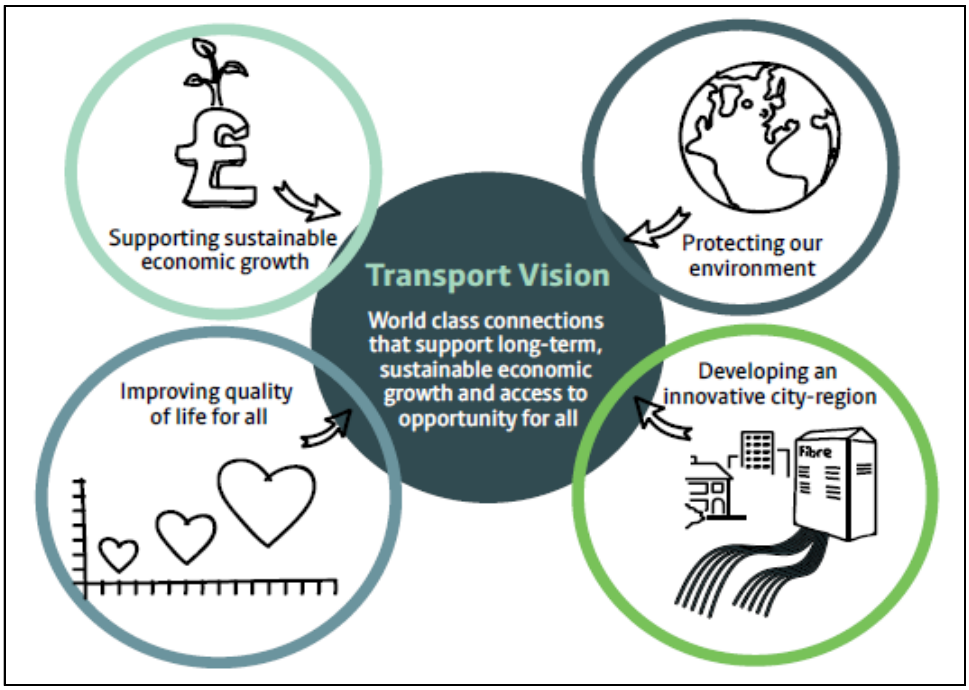
Bolton's Highway and Engineering Division undertakes not only the maintenance of the highway network but is also involved in plans, improvements and enhancements to facilitate the aims and aspirations the Greater Manchester Regions Transport Plans.

"Our 2040 Vision" document sets out a vision for transport in Greater Manchester in 2040 and is produced by Transport for Greater Manchester (TfGM). This sets out how the Greater Manchester Combined Authority is to direct, manage, plan and deliver Transport within the Greater Manchester Region between now and 2040.

Vision 2040 covers all modes of travel, including buses, heavy rail, Metrolink (light rail), walking, cycling, cars and freight, as well as the other issues which affect people's travel choices - fares, ticketing, passenger information, accessibility and safety.

From the Vision document a detailed Strategy will be drawn up highlighting the Transport interventions required to achieve the long term needs and aspirations of the GM region. Delivery Plans for each five year period will follow on from the Strategy.

Thus the aims and aspirations of the 2040 Vision are not Bolton specific but apply to the whole of the Greater Manchester Districts. The four key elements of that vision, namely sustainable economic growth, quality of life, environment and developing an innovative city-region, will provide a focus for transport investment up to 2040 and beyond.



The 2040 Transport Strategy is customer focused to residents, businesses and visitors alike, as well as considering the different needs of passengers and freight.

The Strategy has developed seven core principles, each of which will be applied across the transport network:

Integrated – allow customers to move seamlessly between modes and services
Inclusive – provide accessible and affordable transport
Secure – make public transport, walking and cycling desirable options
Healthy – promote walking and cycling for local trips
Environmentally responsible – deliver lower emissions, better quality environment
Reliable and resilient – able to withstand unexpected events and weather conditions
Safe – reduce road accidents and deaths

5. Our Highway Assets and Their Condition

A corner stone of asset management is knowing what you have, where it is and what condition it is in. This information is kept in Asset Registers which are maintained for each of the asset types below. The current size of the highway network in Bolton is:

Table 5.1 – Asset Size

ASSET TYPE	ASSET GROUP		TOTALS
Carriageways, Footways & Cycleways	A roads	km	128
	Class "B" Roads	km	47
	Class "C" Roads	km	38
	Unclassified Roads	km	690
	Back Streets	km	98
	Off road cycle-ways	km	29
	Footways	km	1,530
Bridges and Structures	Bridges	No	104
	Footbridges	No	79
	Culverts	No	36
	Retaining walls	No	138
	Sign Gantries	No	5
Drainage	Road Gullies	No	61,000
	Highway Drainage Pipes	km	25
	Manholes	No	770
Verges, Hedges, Trees and Landscape Areas	Areas of Grass Verge or landscaping	m2	801,000
	Highway Trees	No	450
Street Lighting And Traffic Management Assets	Street Lighting Installations	No	35,250
	Illuminated Traffic Signs, Bollards, refuge poles etc	No	2,860
	Vehicle Activated Signs	No	38
	Zebra Crossings	No	56
	School crossing warning signs	No	24
	CCTV installations	No	52
Street Furniture Bollards and Pedestrian Railings	Road Signs	No	12,900
	Bollards	No	500
	Pedestrian Guard Rail	m	12,580
	Street Name Plates	No	9,450
	Boundary Fencing	m	11,700
	Safety Fencing	m	18,180
Public Rights of Way	Footpaths	km	300
	Bridleways	km	3.5
	Restricted byways	km	48
	Signs	No	500
	Stile and Gates	No	300
Other assets	Depots	No	1
	Grit Bins	No	553
	Weather Stations	No	2
	Gritters	No	8

NB: Traffic lights and pedestrian crossing installations are controlled and managed by Transport for Greater Manchester.

The above information is collated from asset registers for each asset type. These asset registers vary between asset types from simple to complex, and also vary in quality of data. For most registers we have a high degree of confidence in their content and quality, but in a few areas the asset data could be improved. For example, in common with other authorities, the data on road signs and road markings is of low confidence.

Management of the different asset types is guided by specific guidance, and regulations to that discipline. The UK Roads Liaison Group has published separate Codes of Practice relating to the Management of Highway Structures, Street Lighting, Electronic Traffic Equipment, Highway Maintenance, and Highway Risk and Liability. There is additional guidance published by the Highways Maintenance Efficiency Programme (HMEP).

Assets are regularly monitored through condition surveys so that problems are identified early and the rate of deterioration is closely monitored. Each asset type requires its own type of surveys, which are done at different levels of detail and at different frequencies.

Using the asset registers along with the analysis of regular condition surveys can lead to sound evidence on which to base investment decisions on maintenance.

Table 5.2: The condition of key highway assets.

Asset	Type of Survey	Frequency	Current Asset Condition (% where maintenance should be considered)
A Road Carriageway	Scanner Survey (specialist automated vehicle survey)	100% each year	2
B and C Road Carriageway	Scanner Survey (specialist automated vehicle survey)	100% each year	3
Unclassified Roads	Visual Inspection	100% each year	11
Footways	Visual Inspection	25% each year	15
Street Lighting	Age database review	annually	10

Asset	Type of Survey	Frequency	Current Asset Condition (Average SSCI)
Bridges and Structures	General Inspection	Each structure every 6 years	72.2

6. Value of the Assets

The highway network is by far the most valuable asset in the control of local authorities. From 2018/19 the value of the highway infrastructure will be reported in the balance sheet of the accounts of the authority.

Using guidelines provided by the Chartered Institute of Public Finance and Accountancy (CIPFA) the value of these assets is reported to Government each year as part of Whole of Government Accounts (WGA). Public sector organisations are required to produce WGA each year, these are independently audited.

A fundamental component of long term planning is to ensure infrastructure is preserved and replenished in a sustainable way without imposing an undue financial burden on future generations. The extent to which this is being achieved can be measured and monitored over time using a robust asset valuation procedure that provides a true and fair value of assets. If the value of an asset is increasing year after year this indicates an improvement in condition, a year on year decrease in value indicates declining condition and the storing up of cost for future generations.

This valuation requires three values to be calculated; Gross Replacement Cost (GRC), Depreciated Replacement Cost (DRC) and Accumulated Depreciation.

Where: **Depreciated Replacement Cost = Gross Replacement Cost – Accumulated Depreciation**

The GRC calculation determines what it would cost to replace all the highway assets with equivalent new ones**.** The current monetary value is evaluated as the DRC. Accumulated Depreciation is the amount of value that has been lost due to deterioration over time.

For the financial year 2015/16 the calculation of **GRC for highway assets** in Bolton was **£1,688 Million** (this excludes land values).

The calculation of DRC requires up to date condition data to estimate how much assets have deteriorate. Many resources are used each year through visual and machine inspections to establish condition data, and to establish current market maintenance rates.

For the financial year account in 2015/16 the calculation of **DRC for highway assets** in Bolton was **£1,430 Million** (this excludes land values).

For the financial year account in 2015/16 the calculation of **Accumulated Depreciation** for highway assets in Bolton was **£258 Million**.

Table 6.1 Valuation of Highway Assets 2015/16

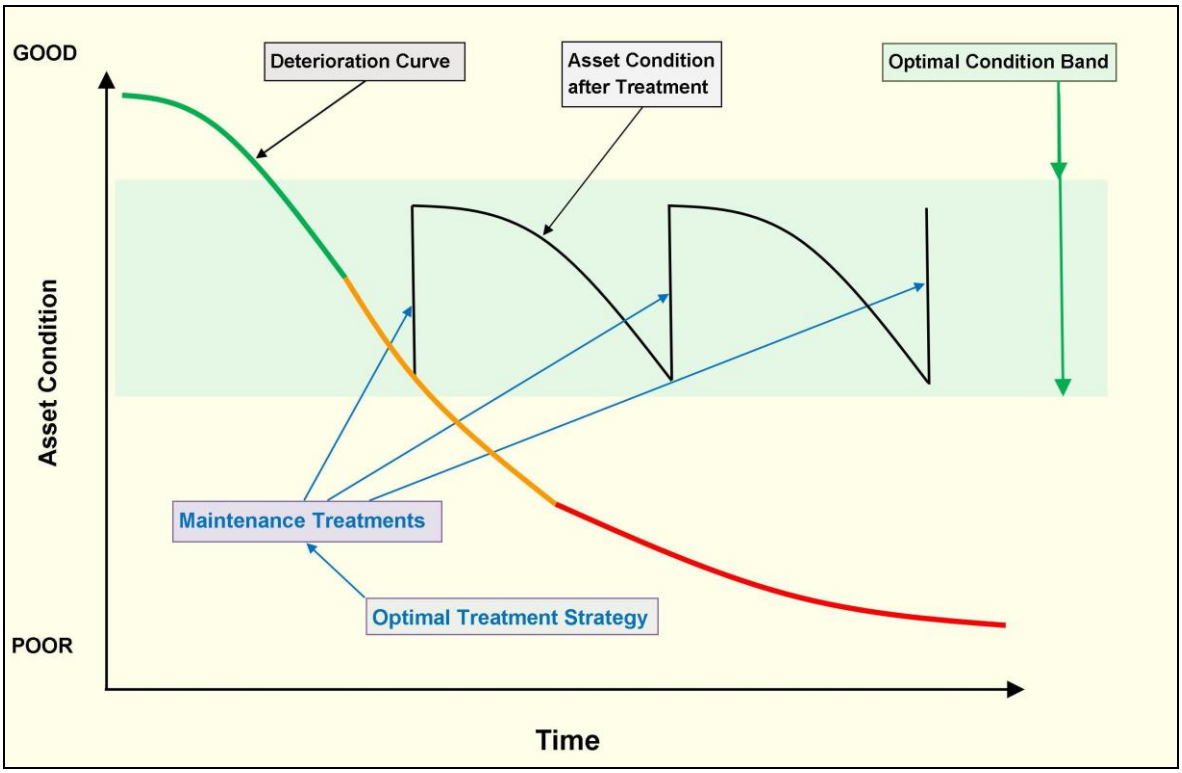
Asset Type	GRC, £	Accumulated Depreciation, £	DRC, £
Carriageway	1,149,403,000	62,619,000	1,086,784,000
Footway and Cycleways	252,741,000	24,731,000	228,009,600
Bridges and Structure	236,280,000	136,622,000	99,658,000
Street Lighting	42,162,000	30,456,990	11,705,030
Traffic Management	266,500	123,000	142,800
Street Furniture	7,469,000	3,613,930	3,855,090
Totals	1,688,321,500	258,165,920	1,430,154,520

7. Life Cycle Planning

Life Cycle Planning is a process which underpins asset management, it is a technique which for each type of asset considers:

- rate of deterioration,
- desired level of service
- available maintenance options
- cost and life time of each maintenance option

Using this information, a lifecycle plan and optimal treatment strategy can be developed that shows an assets life from cradle to grave and the likely maintenance cycles undertaken. This is illustrated in the diagram below.



Life cycle planning tools have been produced to predict outcomes from investment strategies. These are used to develop strategies that deliver an agreed level of performance. They can also predict the level of service that can be delivered for particular funding scenario.

Using current condition data, and lifecycle planning tools we can develop work programmes which make best use of the available funding in meeting long-term objectives, whilst mitigating the risk of failure by allocating funds to where they will be most beneficial. This can then inform future maintenance needs for each asset and indicate future funding requirements.

8. Risk Management

The identification of risk and its management is an important component of highway asset management.

The Highway Authority are required to manage a variety of risks at strategic, tactical and operational levels. The likelihood and consequences of these risks can be used to inform and support their approach to asset management and inform key decisions regarding performance, investment and implementation of works programmes.

The most commonly understood risks affecting the highway service relate to safety. However, there are a wide range of other risks and their identification and evaluation is a crucial part of the asset management process. Risks may include:

- Safety;
- Asset loss or damage;
- Operational;
- Financial; and
- Reputation;
- Service reduction or failure;
- Environmental;
- Contractual.

Risk Registers

Risks for each service area are identified on a risk register, and are assessed according to their likelihood of occurring and the consequence of an event. Risks that have been classified as high require control measures to reduce them to an acceptable level, these actions are recorded and monitored.

9. Network Resilience

Following recent weather events that impacted the transport networks the government has recognised the importance of taking actions to maintain a highway network that is well prepared to minimise the impact of extreme weather.

Over the past 10 years there have been repeated flooding events that cause traffic disruption, in particular the flooding during the winter of 2015/16, the winters of 2008/09, 2009/10 and early part of 2010/11 saw significant snow and freezing conditions, producing much transport disruption. High winds cause trees and debris to block roads.

It is therefore important that we plan for this and ensure that our transport network is as prepared as it can be to minimise the impact of extreme weather event. This is of growing importance as there is a widening consensus and understanding that climate change will increase the frequency of extreme weather events in future years. This will also be ever more important in future as travel and freight transport demands on our transport system continues to grow.

The 2014 Transport Resilience Review gave local highway authorities several recommendations on managing a resilient network, key recommendations include:

- Identifying a 'Resilient Network' to which they will give priority, in order to maintain economic activity and access to key services during extreme weather.
- Ensure that drainage assets are maintained in good working order, to reduce the threat and scale of any flooding.
- Learn from previous events and ensure we are prepared for, and able to respond to, similar extreme weather events in the future.

We will work locally and with other local authorities to ensure that a Resilient Network throughout Greater Manchester is maintained so that the impact on the transport network of an extreme event is minimised. This will be done through a coordinated assessment of key locations followed by targeted maintenance of the Key Route Network to ensure assets are operational.

10. Asset Strategies

Bolton's highway network is the mainstay of the local economy and is essential in allowing people and goods to move to and from and through the borough. Targeting maintenance or network improvements takes into account factors such as condition, importance of the route, and traffic volumes.

The approaches to maintenance of each asset group are set out in the asset strategies below.

There are six main assets groups comprising:

1. Carriageways (Roads)
2. Footways and Cycleways
3. Bridges and Structures
4. Drainage Assets
5. Street Lighting
6. Street Furniture

NB: Traffic Signals and pedestrian crossings in the area are the assets of Transport for Greater Manchester.

For each of these key assets, investment and delivery plans will be drawn up in accordance with asset management principles identifying where maintenance will be proposed over several years.

10.1 Carriageways

Carriageways are the largest and most valuable highway asset, the roads range from busy dual carriageway roads to minor rural lanes. The underlying structure of some of these roads has evolved over time rather than been designed in accordance with modern engineering practice, consequently their construction is not always consistent or robust.

Current Status:

Bolton Council carries out routine collection of data to understand the condition of the network and support the development of maintenance programmes. The classified road network is surveyed every year using SCANNER (measures road condition) and SCRIM (measures skid resistance) vehicles which collect data on road surface deterioration whilst on the move, that can be later analysed to establish problem areas. Other carriageways are surveyed by visual surveys undertaken by trained inspectors.

When monitoring condition we generally split the carriageway into three categories; A roads, B and C Class roads, and the roads that are not classified (unclassified roads) which are usually residential minor roads.

The current asset condition for each of these three road categories in Bolton are comparable with other Greater Manchester authorities.

Minor roads are most at risk of rapid deterioration due to their construction, ingress of water into the fabric of the road and overloading by vehicles. Investment in the minor road network needs to be balanced against investment in the more strategically important routes, whilst recognising the needs of local communities.

Current Condition

Asset Condition 2015/16 Road Category	% where maintenance should be considered	% where road is showing signs of deterioration
A Road Carriageway	2	14
B and C Road Carriageway	3	15
Unclassified Roads	11	17

Target Condition:

Road Category	Target Condition (% where maintenance should be considered)
A Road Carriageway	2 to 5
B and C Road Carriageway	2 to 5
Unclassified Roads	7 to 12

Proposed Asset Strategy:

Lifecycle Planning has been undertaken to establish a baseline funding requirement for the network. Having undertaken analysis of carriageway condition across the network, predicted levels of deterioration and the required investment to meet targets have been identified.

As a result, investment shall be targeted where the money will return greatest whole life cost benefit, (e.g. maximising residual life for minimal investment)

Where appropriate, a preventative approach to maintenance has been adopted, investing a greater

proportion of the available budget to treat carriageway in the early stages of deterioration. The surface treatment of carriageways that are not currently in need of full structural renewal results in an extension of their life by arresting or delaying deterioration.

Investment Programmes have been derived spanning a two year period, along with a tentative longer term programme. These are annually reviewed taking into account the current financial constraints or additional funding available at the time.

10.2 Footways and Cycleways

Most carriageways have a footway on each side of the road which are usually termed "the pavement"; they are the second most valuable highway asset. Footways are a vital part of any town centre or housing estate. We spend a significant amount of our highway maintenance budgets on footways in order that all pedestrians, including those with mobility difficulties, can travel on the footway in comfort.

Current Status:

Monitoring of footway condition is undertaken using a nationally agreed methodology that categorises the footway condition as red, amber, yellow or green. Generally, a red condition is where the footway requires reconstruction and amber is where a surface treatment, is advised. We aim to survey the whole network on a 2 year cycle.

Footways are most at risk in urban areas where vehicle overrun and works by Statutory Undertakers are the most common causes of failure in footways.

Surveys undertaken in 2015/16 indicate the current condition of the footways as follows:

Current Condition

Asset	Asset Condition % requiring structural treatment	Asset Condition % requiring resurfacing
Footways	3	15

Target Condition:

Asset	Target Condition % requiring structural treatment	Target Condition % requiring resurfacing
Footways	2 to 5	<10

Proposed Asset Strategy:

Condition surveys undertaken in the following years will continue to gather improve asset data on type and condition which will inform future maintenance plans.

We have established a baseline funding requirement for the network using life cycle planning techniques, and establish an improved prioritisation process for footway maintenance utilising the latest condition data.

Where appropriate a preventative approach to maintenance has been adopted, investing a greater proportion of the available budget to treat footways in the early stages of deterioration. The surface treatment of footways that are not currently in need of full structural renewal results in an extension of their life by arresting/delaying deterioration. A common surface treatment on tarmac footways is overlaying with a bitumen slurry that seals the surface; treatments like these can extend the life of the footway for over 7 years.

10.3 Structures and Bridges

Bridges and Structures are essential components of the highway network.

Current Status:

Detailed asset data exists for all types of highway structures. In accordance with the Code of Practice "Management of Highway Structures", General and Principal Inspection regimes are regularly undertaken for bridges and structure.

There are many aged structures; this leads to an increasing risk that a structure will pose in future years such an increased level of deterioration that closure or weight restrictions could be imposed.

The latest inspections indicate the following average condition scores.

Structure Asset	Structure Stock Condition indicator
Bridges	75
Footbridges	75
Culverts	76
Retaining walls	70
Sign Gantries	84

Target Condition

Our aim is to maintain the highway bridges and structures stock condition score in a steady state of repair by adopting a preventative strategy with the appropriate interventions which will deliver value for money against a backdrop of reducing capital and revenue budgets.

Proposed Asset Strategy:

We will continue to adopt the well-established principles set out in the "Management of Highway Structures: A Code of Practice" to prioritise our inspections, on-going monitoring of substandard and weak structures and direct our works programmes.

The existing maintenance work schedules and strengthening programmes are prioritised based on risk of failure, cost and other strategically weighted factors such as road hierarchy, obstacle crossed, heritage status and length of structure. This toolkit will continue to be used to demonstrate the desired outcomes are being delivered in the most cost-effective manner with the funding available.

We will develop lifecycle planning and prioritisation methods; to assist with asset valuations and financial planning; and identify the appropriate level of funding required for future maintenance and strengthening.

10.4 Highway Drainage

The highway authority has extensive drainage assets that drain rainfall from the highway; it is also responsible for maintaining watercourses passing in pipework under the highway. Having drainage assets that are operational and adequate, are key to making sure the public can safely use the highway, reducing the risk of flooding to properties, and ensuring the network is resilient to extreme rainfall events. Bolton Council, as the Lead Local Flood Authority, has the responsibility for locally managing surface water flood risk, and has delivered projects to reduce flood risk on highways.

Current Status / Challenges:

The risk of surface water flooding coupled with the predicted changes in climate present challenges we need to prepare for. Flooding can result in high economic losses, disruption to business's and can have a detrimental impact on communities; highways often play a role in conveying flood water.

The Government in 2014 published the "Transport Resilience Review" this was a review of the resilience of the transport network to extreme weather events, and gave recommendations on the approach we should take to counter extreme weather and its impact on the transport network, the management of drainage assets is key.

HMEP have published "Guidance on the Management of Highways Drainage Assets", this gave recommendations on how this asset is best managed, particularly through the adoption of mobile technology and improved back office functions.

Current challenges include:

- Discharges from land on to the highway - *This causes flooding to the highway and poses a risk to road users which is increased during icy weather.*
- Reduced budgets which have led to a decrease in maintenance activities.
- Gathering quality data information on assets and their operational condition.

Target Status:

1. As a minimum, compliance with recommendations in the HMEP Guidance on the Management of Highways Drainage Assets.
2. Identification and mapping of all highway drainage assets.
3. Introduce an improved operational asset management system.
4. Introduction of a risk based routine maintenance regime.

Proposed Asset Strategy:

Gather adequate data on the location, operation and condition of assets. Utilise this data along with known and predicted flood risk areas, traffic volume and network hierarchy to inform and prioritise maintenance activities. This will result in a more risk based and targeted routine maintenance regime.

Introduce a programme of works to:

- Resolve non-operational drainage assets.
- Resolve problems with water run off on to the highway.
- Make improvements to flood risk areas.
- Ensure the road network is resilient to flooding.

10.5 Street Lighting, Illuminated Signs, and Electrical Traffic Equipment

In the early 2010' s, Street lighting used around 25% of the electricity consumption the council used at around £1.8M per year. In the next ten years, prices are predicted to significantly increase due to energy costs and carbon reduction commitments. Faced with decreasing budgets and the increasing costs, the service would soon be unsustainable.

Recent advances in street lighting technology include; low-energy and long-life LED lamps, and Central Management Control Systems (CMS). A CMS allows the flexibility to dynamically manage and control light levels at either an individual lamp, street or area level. The CMS coupled with LED lamps can result in efficiency savings of up to 60%.

Deploying this technology gives control over street lighting levels and helps mitigate the rising costs of electricity. These interventions will future proof the Street Lighting asset by allowing us the flexibility to respond to changing conditions whilst also significantly reducing carbon production.

Bolton Council is investing £10M between 2010 and 2018 to fit LED and CMS technology. As part of this investment, the CMS system will also act as a development platform that we will use to explore and trial the introduction of smart city solutions and applications, such as smart cameras and sensors embedded in the road surface,.

Current Status / Challenges:

Street lighting columns have a varied design life depending on their construction; this is on average a 40 year life span. There are 35,250 columns in Bolton and currently around 4,800 of these have exceeded their design life. Whilst there is a column replacement programme which replaces approximately 500 columns per year, the number of columns over their design life increases by around the same amount each year.

Steel street lights installed during investment and housing booms in the mid 1980's and mid 1990's will become over their design life in the next ten years adding an additional wave of over life assets. Lifecycle Planning coupled with inventory data has been analysed to establish a baseline funding requirement for the network in respect of column replacement.

Target Status:

1. Install LED lighting, where applicable, to all street lights by 2020; with their control to be managed by a Central Management Control System.

2. Establish an up to date GIS record of street lighting, ducting, cabling and feeder pillars.
3. Reduced number of columns over their design life.

Proposed Asset Strategy:

1. Continue to roll out the installation of LED lamps programme across the borough.
2. Actively manage the street lighting network to respond to changes in energy costs and carbon reduction tax policies.
3. Plan a prioritised programme of column renewal taking into account risk, road hierarchy and age of column.
4. Gather asset location and type for all street lighting assets and record on a GIS database.
5. Explore and trial smart city solutions applications using the CMS as the host platform.

10.6 Street Furniture

The Street Furniture asset includes a wide variety of assets including; statutory road signs, directional signs, fencing , barriers, bollards, street name plates, grit bins etc. They are numerous and collectively are a significant asset in terms of value.

Current Status / Challenges:

For many street furniture assets there is little detailed asset information, so managing and monitoring the asset presents difficulties.

Target Status:

Improve asset information on location, type, and condition of street furniture.

Proposed Asset Strategy:

Gather and record a GIS inventory of relevant street furniture including asset condition and type.

11 Communications Strategy

The Highway Authority needs to ensure it is consistently and actively engaging with key residents, businesses and partner agencies at the local level. We provide a range of approaches, based upon the range of opportunities for interaction at the local level.

Our aim is to work closely with the Members, Partner Agencies and the community; to keep all fully informed regards the highway authority's services and delivery, in order to ensure our services effectively meet the needs of Bolton Council and the wider community.

We provide all the usual channels for reporting issues on the highway, and our website can be used for making fault reports on-line such as; faulty street lights, potholes, blocked gullies.

Information is also made available on-line such as current and planned road works, temporary road closures and restrictions.

Other highways information is made available on the website's mapping area which shows the status of streets, rights of way information, the location of proposed traffic schemes and new road construction.

Our "Code of Practice on Highway Inspections" is available which states how we undertake the cyclic and reactive inspection of streets, what constitutes a defect, and how the response time to fix a defect such as a pothole is arrived at.

Highway Maintenance work is also highlighted in our quarterly residents' magazine SCENE which goes out to every household across the borough; again to raise awareness and encourage the reporting of problems.

An annual independent customer survey is undertaken on the highway service called the National Highways and Transport (NHT) survey. This assesses how we are delivering six themes relating to the highway service. The themes are:

- Accessibility
- Public Transport
- Walking and Cycling
- Tackling Congestion
- Road Safety
- Highways Maintenance and Enforcement

In 2016, our Overall Satisfaction score was found to be 52 out of 100. This compares with a national average of 55 and a national high score of 61. Detailed results can be found at: http://www.nhtnetwork.org

12 Knowledge Sharing, Good Practice and Collaborative Working

Bolton Council is committed to developing and implementing best working practices and will make best use of the following forums:

- Greater Manchester Combined Authority
- Transport for Greater Manchester (TfGM)
- Greater Manchester Transport and Growth Group
- Greater Manchester Highways Group
- Highway Maintenance Efficiency Programme (HMEP)
- The Chartered Institute of Public Finance and Accountancy (CIPFA)
- Highways Asset Management Financial Information Group (HAMFIG)
- UK Roads Board
- ADEPT Asset Management Working Group
- National and Regional Conferences
- Professional Institution Engagement
- Competency Training

Our highways service work collaboratively with our framework contractors, supply chain partners and neighbouring authorities where applicable, to identify and share good practice and improvements.

We have put in place formalized collaborative working agreements with other local authorities and key suppliers, and are looking for further collaborative working opportunities where they are found to be appropriate.

13 Performance Monitoring

As a key element of this strategy, we are developing a performance management framework that defines key performance areas of the highways asset, prescribes targets and measures actual performance against the agreed targets on a regular basis.

Monitoring the performance will involve regular review and checking that identified improvements are being implemented effectively, and ultimately that these improvements are contributing to the achievement of asset management objectives. Reporting of progress against these performance areas will also allow assessments to be made on progress and demonstrate continuous improvement.

This performance management framework will form a key element of our asset management framework implementation. The Key Roads Network Highway Strategy for Greater Manchester will have specific measures and monitoring of this network and will be undertaken by Transport for Greater Manchester.

14 Strategy Review

This Strategy will be reviewed regularly to allow informed decisions to be made in order to accommodate any changes in funding and priorities within the longer term forecasts.

This basis of this Strategy is irrelevant of funding levels, and therefore, significant changes to the Strategy will not need to be made if major changes in available budget occur.