Stockport Council
Transport Asset Management Strategy

Stockport's vision and strategy for maintenance of transport infrastructure 2015-2034

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PART 1 CORE ASSET MANAGEMENT STRATEGY

1.1 INTRODUCTION

This document is Stockport Council's Transport Asset Management Strategy (TAMS) which is a 20 year strategy covering the management of our roads, pavements and associated infrastructure. These include (amongst others):

944km of roads

1,502km of pavements and 437km of footpaths, bridleways and byways

72,214 gullies (with associated connections) and 49km of culverts

92 bridges and 117 retaining walls

33,141 street lights

18,475 signs and 13,330 bollards

Collectively these assets have a gross value of £1.69bn and as such comprise the most valuable publicly owned assets in Stockport.

The Audit Commission report "Going the Distance, Achieving Better Value for Money in Road Maintenance" recommends that local highway authorities in England should adopt the principles of asset management when making investment decisions in order to optimise the use of available resources.

The TAMS provides the guiding principles, objectives, processes, actions and investments that are needed to ensure that the performance of Stockport's transport infrastructure can support our corporate aspirations whilst maintaining long term financial sustainability over the period from 2015 to 2034. It clarifies the links between our approach to management of transport assets and specific objectives for economic growth, environmental sustainability and the promotion of greater independence of people in Stockport to enable them to get out and about.

The TAMS also starts from the firm principle that strategy options can only be deemed to be affordable if this is true for current and future generations over and beyond the next 20 year period. By providing a long term view this edition of the TAMS has brought us closer to achieving this by identifying investments that will bring down long term costs. However, it also identifies affordability gaps that need to be addressed for the next and future editions.

In the face of increasing uncertainty from global macro-economic conditions and climate change a key focus of the TAMS is on the need to increase the resilience of our infrastructure and our ability to manage risks over the next 20 year period. Alongside this, on the basis of demographic trends and projections for Stockport it is clear that there will be a substantial increase in pressure on other Council services and budgets over the same period. In this context the TAMS is clear that the only way to meet our infrastructure objectives is through, improved efficiency and effectiveness and continual innovation supported by a robust risk management approach. Reliable, relevant and timely data and robust analyses will be at the heart of this approach.

In April 2011 the Greater Manchester Combined Authority (GMCA) was established. A key point in the setting up of the GMCA was to place a statutory duty on the 10 Greater

Manchester Highway Authorities (Bolton, Bury, Manchester, Oldham, Rochdale, Salford, Stockport, Tameside, Trafford and Wigan) to work together in the delivery of transportation projects and the management and maintenance of the highway network. The strategies and policies of Transport for Greater Manchester (TfGM) are set by GMCA and its TfGM Committee. TfGM is the primary public body responsible for co-ordinating public transport services throughout Greater Manchester; and for investments in improving transport services and facilities and supporting the largest regional economy outside London.

1.2 OUTLINE OF THE TRANSPORT ASSET MANAGEMENT STRATEGY

1.2.1 Overview

The Transport Asset Management Strategy is laid out in three parts.

PART 1 CORE ASSET MANAGEMENT STRATEGY: The Core Asset Management Strategy outlines the high level principles, policy, objectives and strategy common to all our transport infrastructure. The purpose of the Core Strategy is to translate Corporate and wider policy and strategy into clear objectives for the TAMS.

PART 2 ASSET INVESTMENT STRATEGIES: Asset Investment Strategies are developed for individual asset types to provide more detail on the asset specific context and demands and the long term investment requirements. The full financial model associated with these investment strategies is given in **ANNEX 4.** In the current edition, Asset Investment Strategies have been completed for Roads, Pavements and Surfaced Footpaths and Highway Bridges and Structures. Action plans are included to develop strategies for Drainage, Street lighting, Public Rights of Way, Green Infrastructure and Street Furniture. It should be noted that the boroughs Traffic Signals are managed and maintained by TfGM who have their own management plan.

PART 3 PERFORMANCE PLAN: This covers the processes that are needed to enable the delivery of key asset management requirements. The first of these is the Prioritisation Framework which sets out the process flow and criteria for decision making for the 5 year capital programme for maintenance. Secondly it briefly outlines the requirements for financial reporting through the Whole of Government Accounts programme. Finally, it briefly outlines the requirement for Asset Information Management, in part to enable compliance with standards for asset data systems that will come into force in 2016 for all Government construction projects.

1.2.2 Outline of the Core Asset Management Strategy

The remainder of **PART 1** is arranged as follows:

SECTION 1.3 TRANSPORT ASSET MANAGEMENT FRAMEWORK: This describes the key documents and processes used in standards for Asset Management contained in PAS 55-1:2008 and ISO 55000:2014 and locates the TAMS within this framework

SECTION 1.4 TRANSPORT ASSET MANAGEMENT POLICY: This provides a high level policy statement and a set of 10 principles that will guide the development of the strategy.

SECTION 1.5 STRATEGY CONTEXT: This section describes the context of risks, future demands and opportunities that are underlying drivers behind our long term approach in the TAMS. It then details the links to other national, regional and Stockport strategies.

SECTION 1.6 CORE ASSET MANAGEMENT OBJECTIVES: This section effectively translates wider policy and strategy objectives into high level objectives for the TAMS taking into account the context of risks, trends in demand and future opportunities.

SECTION 1.7 CORE ASSET MANAGEMENT STRATEGY: This section contains the high level actions required to deliver the Core Asset Management Objectives

SECTION 1.8 STRATEGIC RISKS: This section contains a strategic risk register describing key risks to the delivery of the strategy, identified as either medium or high priority, and mitigation actions.

1.2.3 Note on the layout of the document

For ease of cross-referencing and navigation some colour coding is used to direct readers to key pieces of information. Where appropriate summary and conclusions are contained in blue shaded boxes at the end of the sections and strategy actions are contained in green shaded boxes. Where additional technical information is provided to explain the derivation of indicators or model forecasts these have been put in buff shaded boxes.

1.3 TRANSPORT ASSET MANAGEMENT FRAMEWORK

Transport asset management is a multi-disciplinary function and affects a wide range of stakeholders. For this reason the TAMS sits within an overall transport asset management framework which consists of a number of different documents that are required for planning in different specialist areas and at different levels and timescales.

Figure 2 overleaf summarises Stockport's Transport Asset Management Framework highlighting how the asset management system links with wider corporate strategy. The Framework shown in Figure 2 is based on the PAS 55:2008[1] standards and is consistent with the new ISO 55001:2014[2] with some adjustment as appropriate for management of Local Authority highway assets.

The framework also indicates the frequency of review of elements within the TAMS and the individual plans that come under the umbrella of the TAMS. The timing of review of specific items and corresponding approval mechanisms are detailed in the **Review** sections of the strategy.

The TAMS should remain the key document outlining Stockport's 20 year strategy for investment and should be reviewed on at most a 5 yearly basis. As this provides a key link to Stockport Council's corporate strategy, reviews should take place in line with reviews of the Community Strategy.

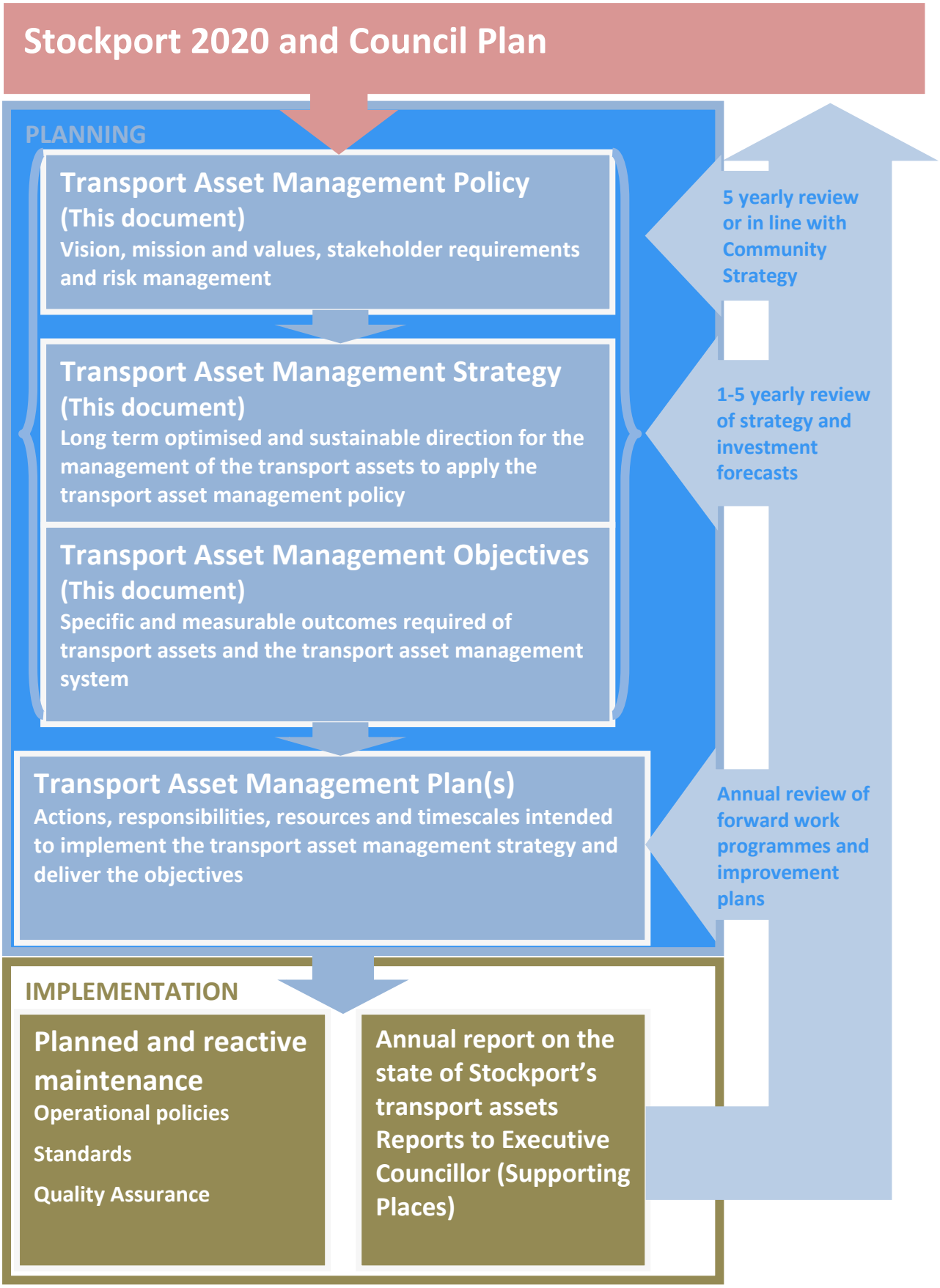
This document effectively contains the top 3 elements in the asset management planning framework, namely:

- **Transport Asset Management Policy**
- **Transport Asset Management Strategy**
- **Transport Asset Management Objectives**

The fourth element of the asset management planning framework is the Transport Asset Management Plan (TAMP). This will not exist as a single document. Instead it will be a range of documents referred to in the **Performance Plan** (**Part 3 Paragraph 3.4)** including a detailed prioritisation framework and 5 year forward works plans. The timings or frequencies of review of these elements are contained within the **Performance Plan**.

[1] Publicly Available Specification (PAS) 55-1:2008 Asset Management
[2] ISO 55001:2014 Asset Management

Figure 2 Stockport Transport Asset Management Framework



1.4 TRANSPORT ASSET MANAGEMENT POLICY

1.4.1 Scope

This policy covers the management of highway infrastructure assets for which Stockport is the relevant Highway Authority, including:

- Roads (excluding motorways), pavements and footpaths and associated drainage
- Bridges and other highway structures
- Street lighting
- Public Rights of Way
- Signs, bollards and other street furniture

The focus of the Transport Asset Management Policy is on the high level principles guiding the overall management of these asset types. This is distinct from existing and proposed operational policies for individual asset types (that are referenced in the strategy below).

1.4.2 Policy statement

Stockport Council considers effective transport asset management to be an essential part of delivering its priorities and those of the Stockport Partnership as set out in the Sustainable Community Strategy, the Council Plan and the 'Investing in Stockport' model. In particular our approach will support the following outcomes in the Council Plan:

- Stockport benefits from a thriving economy Re-shape our own services to ensure a more co-ordinated and proactive approach to growth is pursued;
- Stockport is a place people want to live Develop a shared service that maintains local accountability for highways services and improves resilience in highway services across the conurbation; Improve overall service provision through greater collaborative working.
- Communities in Stockport are safe and resilient Involve more local people in discussions about local needs and priorities, and how we can work together to address them;
- People are able to make informed choices and look after themselves: Most people rely on their own skills and knowledge, and on friends, families and their local community, to deal with most of what life throws at them. It's vital that people continue to acquire and use these skills confidently in order to live independent and fulfilling lives. As part of this the council is investing in 'digital by design' to increase that ability of the public to interact with the council online.

We are committed to continually improving our asset management approach so that we can learn from past and present performance to guide decisions about future investments in the context of growing financial challenges and demands across all of our services. In so doing, we will also ensure compliance with relevant legislation (see **ANNEX 2**) and other requirements relating to the management of our infrastructure as detailed in relevant

Codes of Practice (also listed in **ANNEX 2**). We will also ensure compliance with requirements for financial reporting as part of the Whole of Government Accounts process.

1.4.3 Principles

Below are the principles that will guide the development of our strategy for highways asset management.

1. Our first priority in all contexts is to ensure the safety of residents and people travelling or working in Stockport and in other areas that might be directly or indirectly affected by the condition of our infrastructure or our operations. We will continually review our operational maintenance policies to ensure that they minimise safety risks.
2. In keeping with our obligations under the Traffic Management Act 2004 we will prioritise operations that minimise disruption over the whole life of a highway asset. In particular we will prioritise maintenance options that improve the overall resilience and reliability of the network in the context of increasing occurrence of extreme weather events.
3. We will apply risk based approaches to prioritisation of our short, medium and long term plans using analysis of local, regional and national data. We will prepare and review 3-5 year rolling programmes of work on an annual basis using a risk assessment framework to prioritise across all asset types.
4. We will identify the most cost effective long term maintenance options through lifecycle cost optimisation and through contractor engagement and unit cost targets.
5. Our asset management strategy will be supported by long term forecasts of investment needs based on the optimum allocation of resources and informed by models of asset performance and risks. Investment options will be considered where they are very likely to achieve high value for money or where there is evidence of significant social benefits including those which are gained through the promotion of economic growth and vitality.
6. In view of the challenges that Stockport Council will face in meeting growing demands on budgets across all portfolios over the next 20 years, innovation will be a fundamental part of our future strategy to reduce whole life costs without compromising safety or network reliability. We will continue to develop relations with partners and contractors to elicit their proactive engagement in identifying new solutions. As innovation brings new risks this approach will be accompanied by robust data management and risk analysis.
7. We will establish and periodically review appropriate targets in support of the Council Plan priority to achieve the lowest possible levels of waste, raw material consumption and carbon emissions incurred by our highway infrastructure maintenance operations.
8. We will ensure that levels of satisfaction and expectations from residents and road users, and in particular the views of vulnerable and disabled people, are taken into account when establishing levels of service and condition standards.
9. We will support the Council Plan priority to promote greater transparency and encourage active involvement in decision making by stakeholders by making all data on

the performance and maintenance of our assets available online for viewing, downloading and analysing (subject to legal and commercial considerations).

10. We will establish all necessary processes and protocols at a high level to ensure our asset data systems are fit for the purposes of supporting all of the above principles and have regard to current and emerging standards for asset information management.

1.5. STRATEGY CONTEXT

1.5.1 Risks

This section briefly outlines some of the high level challenges that will influence our 20 year strategy for transport asset management. In summary, these are:

- The legacy of ageing infrastructure
- Climate change
- Commodity price inflation

1.5.1.1 The legacy of ageing infrastructure

Manchester was the world's first industrial city. As such it has an extensive legacy of infrastructure dating back to the 19th century and earlier that is now required to support a 21st century economy.

This infrastructure legacy includes a large number of highway bridges and retaining walls constructed from brick or stone but it also exists as a complex and evolved system of layers hidden under modern road surfaces. For example a large proportion of our strategic and local roads are built on 19th century cobbles (or sets). Whilst much of this infrastructure has potential to continue to support our modern transport requirements indefinitely this is entirely dependent on ensuring that we can make timely interventions to preserve its structural integrity.

We also have a significant proportion of infrastructure built during the post-war era from the late 1950s through to the early 1980s. Much of this infrastructure can be characterised by concrete components such as street lighting columns or prestressed concrete slabs on bridge decks that have finite lives and eventually require whole replacement. These service lives may vary between 40 to 120 years dependent on its function, specification and material quality. As above, service lives are also dependent on intervening maintenance operations such as waterproofing of concrete bridge decks. Whilst these assets have continued to perform over the last few decades with comparatively infrequent interventions the implications of these finite lives are clear and a significant proportion of this post-war infrastructure will require renewal or major maintenance within the next 20 years. In the medium term (5-10 years) we also need to increase investment in preventative maintenance in order to slow the rate at which renewals will be required.

Conclusion from 1.5.1.1
Investments must be made on the basis of forecasts of asset performance taking into account the inherent uncertainty and variability of our older assets. These forecasts should enable an understanding of the implications for financial sustainability and economic performance and as such should inform Stockport's Investing in Growth Strategy. Our strategy must start from the premise that we can no longer view historical budgets for maintenance as indicative of future need.

1.5.1.2 Climate change

Whilst there is considerable uncertainty over forecasts of the nature, extent and severity of weather patterns as a result of global warming there is a broad-based scientific consensus that extreme weather events of some form will become more frequent and intense. Projections for Greater Manchester (Cavan, 2010) in the 2050s indicate that under a high emission scenario we may anticipate a 14% increase in winter precipitation from a 1961-1990 average baseline. Similarly, we may expect an average of 3 days per annum with temperatures over 30°C by the 2050s over a baseline of < 1 over the period 1961-1990.

Recent experiences of consecutive extreme weather events in Stockport demonstrate the fragility of our highway infrastructure. Since 2010 Stockport Council has made £3.7M of additional expenditure over and above basic Government capital maintenance funding to address the impacts of extreme weather on road surfaces and undertake associated drainage repairs.

Conclusion from 1.5.1.2
There is a need to plan for greater uncertainty. In order to do this we need to build up our intelligence base using data on changes in asset condition and associated maintenance costs as result of extreme weather events. Preventative treatments will be crucial to increasing our resilience to climate change, particularly where they relate to prevention of water penetration or accommodating movements due to expansion and contraction in extreme temperatures.

1.5.1.3 Commodity price inflation

The macro-economic context of infrastructure management has changed significantly in the last two decades and with rapid growth in China and South Asia in particular leading to a shift in the core of demand for raw construction materials and energy. Alongside this our dependence on bitumen bound materials for road surfacing means that highway maintenance services are comparatively more vulnerable to oil price volatility than other branches of the construction industry.

Whilst medium term forecasts indicate that Consumer Price inflation should remain within the 1.5-2.5% range (BoE, 2014), construction prices are expected to grow at a much faster rate over the next 4 years with estimates of annual tender price inflation in 2017 ranging between 4% and 7.3% across the UK and between 3.5% and 4.4% in the North-West (Gardiner & Theobold, Q2 2014, Sweett Group, Q1 2014). Given that the global construction market is forecast to grow by over 70% by 2025 (Global Construction Perspectives and Oxford Economics, 2013) it is likely that this inflation trend will continue.

Conclusion for 1.5.1.3
We need to engage with partners and contractors to identify ways of reducing dependence on primary raw materials and increase our resilience to volatile macro-economic conditions. The difference between Consumer Price and Construction Price inflation represents a substantial comparative risk that needs to be explicitly quantified in investment forecasts for highways.

1.5.2 Demand

1.5.2.1 Demographic trends

The number of people nationally who are aged over 65 is expected to increase as a percentage of the total population from 16% in 2011 to 19% by 2021. In Stockport these figures are slightly higher at 17% in 2011 rising to 20% in 2021 although this is in stronger contrast with the situation across Greater Manchester as a whole where there is expected to be a far smaller increase from 15% to 16%[3].

These demographic trends are likely to lead to a change in perceptions of safety on the highway network and the ease with which people are able to physically access services.

Equally, it is important to recognise the context of growing demand for older people's services that will place greater and competing pressure on Council budgets. These pressures will inevitably place limits on our expectations for higher standards of condition and performance of the Borough's highway network and will drive the need to find further efficiencies in the delivery of highway services in the medium term.

Conclusion for 1.5.2.1
In the context of competing demands on budgets it also important to recognise the fundamental contribution that highway maintenance services provides in enabling people, in particular people with restricted mobility, to live independent lives. With the expected rate of growth in the population of older people in the Borough in the next 20 years it is necessary to establish a long term strategy for meeting the travel needs of people with mobility and sensory impairments in particular. The role of Stockport's residential roads should be emphasised here as they form the start and end of the majority of journeys, in particular to bus and rail stations. We will seek to secure the necessary investments in Stockport's residential roads as part of this strategy.

1.5.3 Opportunities

1.5.3.1 Opportunities for borrowing

There are a number of alternative opportunities for borrowing to fund infrastructure improvements including utilising the local authorities own opportunities, accessing funding from the Public Works Loan Board (PWLB) or investigating the opportunities presented by theLocal Capital Finance Company created by the LGA in associaton with a number of authorities in 2014 .

Conclusion for 1.5.3.1
The TAMS Asset Investment Strategies (**PART 2**) provide very strong cases for investment that would be suitable for prudential borrowing arrangements and indeed the Council has already approved in February 2014 a first phase of borrowing for the Highway Investment Programme (HIP).

[3] ONS (2014)

1.5.4 National policy and strategy

In September 2014, the Department for Transport undertook a policy review of local highway maintenance funding with a view to incentivising greater efficiency in the delivery of highway services. Whilst overall funding for local highway maintenance from 2015/16-2020/21, as set out in the June 2013 statement, represents a 19% increase over the average annual allocation over the period 2012-15, the Department has established the principle that Local Authorities' relative share of this funding will be subject to new criteria reflecting the extent to which they have planned or implemented measures to increase short and long term efficiency.

In terms of the scale of efficiency measures envisaged, the Department for Transport has endorsed targets established by the Highways Maintenance Efficiency Programme (HMEP), which is an industry partnership with public and private sector organisations (including Local Authorities). In December 2013 HMEP published its annual plan with targets to achieve 15% efficiency gains by 2015 and 30% by 2020 across the industry. The incentive mechanisms being proposed through the review of capital funding will be designed to support the achievement of these targets.

More relevant to the construction industry as a whole, in July 2013 the Government published its Industrial Strategy for Construction, titled Construction 2025 which outlines shared priorities between the Government and the construction industry. The strategy vision includes an efficiency target to reduce overall lifecycle costs of assets by 33% over a 2009/10 baseline, which broadly aligns with the HMEP target. A further target is introduced to reduce greenhouse gas emissions from the built environment by 50% over 1990 levels. The strategy includes a new review of procurement to promote greater efficiency and address persisting problems of a highly fragmented client base and poor economies of scale. It also seeks to promote the UK's research and innovation capability, in particular in the development of low carbon construction materials and methods.

Conclusions for 1.5.4
The TAMS will present strong evidence of our commitment to contribute to national efficiency targets for both the highways sector and the construction industry as a whole through the adoption of investment strategies that minimise long term costs. At the same time it is important to recognise opportunities arising from the economies of scale that these investment strategies produce to establish appropriate targets for reducing unit costs and lifecycle carbon emissions. This should also ensure that we are able to secure our share of central government capital grant over the period 2015/16-2020/21.

1.5.5 Greater Manchester Strategy and Growth and Reform Plan

The Greater Manchester Strategy 2013 sets out aspirations to create a new model for low carbon growth and to become a city region that can compete for international investment

and skills. The quality of public realm as well as the connections to the surrounding natural environment will be crucial assets in achieving this.

The strategy recognises the need for a more sustainable approach to the management of existing highway infrastructure and contains proposals for a review of delivery of highway services across the city region to identify where economies of scale can be achieved whilst ensuring that local priorities can still be addressed.

As part of the Growth and Reform Plan submitted to Government in March 2014 the GMCA, AGMA and GMLEP have secured an agreement through a City Growth Deal with Government to increase the flexibility of funding structures so that they can be aligned to local needs.

Conclusions for 1.5.5
The review of governance and delivery of highway services will substantially influence the efficiency outcomes discussed in the previous section. However, as the timescales of this governance review do not align with the TAMS it is recommended that separate or interim efficiency targets are established for the specific investment programmes detailed in **PART 2**. Given this context it is inappropriate for the TAMS to include recommendations that pre-suppose a particular governance structure for delivery of highway services. Nonetheless, Stockport Council will ensure that objectives and targets established through the TAMS form the basis for output specifications. The level of ambition in the TAMS objectives will also reflect the opportunities that will arise from long term partnership approaches and bulk purchasing arrangements to explore fresh solutions to some of the key sustainability challenges that Stockport Council faces. Given the level of ambition required to tackle these challenges it is recommended that a Competitive Dialogue Procedure process is considered as part of the procurement of a new delivery framework. Following the announcement of the Growth Deal for Greater Manchester in July 2014, the introduction of greater flexibility of funding arrangements in Greater Manchester may present important opportunities for bidding to the Greater Manchester Local Enterprise Partnership (GMLEP) and Local Transport Board (GMLTB) to secure the shortfalls in funding identified below in **PART 2** and **ANNEX 4**.

1.5.6 Greater Manchester Local Transport Plan (GMLTP)

The current third Greater Manchester Local Transport Plan (GMLTP3) sets out key priorities for the city region transport network. In the light of growing concern about the resilience of the transport network to the effects of climate change and the implications for economic growth the GMLTP3 places emphasis on the role of asset management in supporting the wider aspirations for meeting and managing travel demand in the conurbation. Particular priorities that the TAMS support are:

- Maintain high standards of safety and reliability on the network to support economic growth

- Improve the resilience of the highway network to the effects of climate change by undertaking timely preventative maintenance and incorporating risk assessment of critical infrastructure.
- Improve the reliability of the highway network by ensuring the traffic impacts of alternative lifecycle options are considered in the identification of investment strategies
- Use best practice procurement to minimise the carbon impact of infrastructure maintenance investments and in particular their dependence on primary oil supplies.
- Reduce the incidence and severity of casualties on the network through risk based maintenance of roads, pavements, lighting and structures
- Increase walking and cycling in priority neighbourhoods by improving the quality of public realm
- Ensuring that the public realm meets the needs of all users including those with mobility and sensory impairments.
- Minimising traffic noise by improving and maintaining ride quality in sensitive areas
- Maximise value for money through the implementation of asset management and network management approaches.

Conclusions for 1.5.6
The TAMS will support GMLTP objectives through the development of relevant service levels, long term investment strategies and decision making criteria and weightings for the prioritisation of medium term (3-5 year) maintenance programmes. Some of these objectives are more relevant to specific asset types and so links to these objectives will be clarified in **PART 2**.

Transport for Greater Manchester has started consultation on the Greater Manchester Transport Strategy 2040. This identifies maintenance and renewal as vital to the safety and efficiency of the network. This is an initial step in the replacement of the Local Transport Plan 3 when the full Greater Manchester Transport Strategy and delivery plan is publicised in 2016.

1.5.7 Stockport 2020 and the Council Plan 2015-16

Stockport 2020 is Stockport's overarching Community Strategy setting out the shared priorities of Stockport Council and its public, private and voluntary sector partners.

Brief explanations are provided below to demonstrate the strength of the relationship between the TAMS and the priority outcomes in Stockport 2020 and the Council Plan:

Stockport benefits from a thriving economy: Stockport plays a key role in the economy of Greater Manchester, and many residents both benefit from and help create a thriving local economy. The Borough though still has pockets of above-average deprivation, where better skills and training are needed to reverse long-term unemployment and the impact this can have on wider social issues. Achieving this outcome also means making the right investments across the Borough, but particularly to help our Town Centre fulfil its potential to be the best in the southern part of Greater Manchester.

Although independent evidence of the direct effects of road and pavement condition on economic vitality is limited, in a recent survey of small to medium enterprises across the UK[4] the condition of local roads emerged as a key factor in selecting new business locations ahead of proximity to major rail hubs or airports. The Stockport Highway Design Guide supports the need for efficient and appropriate maintenance of the borough will still providing quality which supports economic vitality.

Conclusion for 1.5.7
Prioritisation of public realm maintenance in the Town Centre and other district and local centres in the 3-5 year rolling programmes will play a significant role in attracting inward investment and enabling regeneration and will complement new and enhanced infrastructure proposals (e.g. Town Centre Access Package) in delivering these outcomes.

People are able to make informed choices and look after themselves: Most people rely on their own skills and knowledge, and on friends, families and their local community, to deal with most of what life throws at them. It's vital that people continue to acquire and use these skills confidently in order to live independent and fulfilling lives.

Evidence from regular meetings with disabled groups[5] has highlighted that poor condition of pavements can be a critical factor affecting the ability of people with mobility and sensory impairments to access services. Annual attitudinal surveys of Stockport residents[6] also show that people with long term disabilities are significantly less satisfied with the condition of footways (34%) than has been the case for the sample as a whole (46%).

Conclusion for 1.5.7
It is important to continue to work with local groups for people with mobility and sensory

[4] YouGov – AIA survey into the impact of local road condition on SMEs (2012)
[5] Stockport Disability Transport and Access Forum
[6] National Highways and Transportation Survey (IPSOS Mori)

impairments to ensure that the TAMS will deliver real improvements to people's lives. We will also continue to monitor the specific levels of satisfaction amongst respondents with long term disabilities through annual attitudinal surveys.

Stockport is a place people want to live: Increasing prosperity in some parts of the Borough will lead to other challenges which will need to be managed; in other places this outcome will only be achieved if there is investment to build more sustainable communities.

In a Borough with substantial rural areas that penetrate into the urban areas along river valleys it is clear that dependencies between our transport infrastructure and the natural environment work both ways. The stability of slopes supporting our highways and control of surface water is dependent on adequate levels of vegetation and tree cover. Equally, maintenance of complex drainage infrastructure is necessary to prevent major pollution incidents during heavy rainfall events. Our vulnerability due to dependence on global natural resources has been discussed in **section 1.5.1.3** in relation to risks from price instability and again in **section 1.5.6** in relation to the GMLTP objective to reduce dependence on oil reserves.

Conclusion for 1.5.7
There is considerable scope to achieve multiple objectives at the local level through preventative maintenance and enhancement approaches, such as vegetating slopes. Equally the TAMS recognises that there will be opportunities to reduce raw material consumption through recycling methods or lowering energy requirements that will enable us to meet both cost efficiency and environmental objectives.

1.5.8 Town Centre regeneration proposals and the Town Centre Access Plan

The Town Centre Prospectus outlines Stockport Council's key regeneration proposals for the Town Centre including proposals for Redrock, Stockport Exchange, Gorsy Bank and the Covent Garden housing plan. It is recognised that these proposals need to be underpinned by a transformational improvement in the connectivity with and within the Town Centre to ensure that the Town Centre can attract the inward investment required. The Town Centre Access Plan has been developed specifically to tackle under-capacity at key links between the A6 and the M60 and accessibility improvements for walking and cycling into and across the Town Centre. It is included within the Growth Deal package and Phase 1 has been approved by the Greater Manchester Combined Authority. Phase 1 implementation has begun on site in spring 2015. Phase 2 is being developed and subject to the same approval process will commence delivery in spring 2017.

The town centre proposals will be informed by the Green Infrastructure Plan for the Town Centre and the Highways and Street Furniture Design Guide.

Stockport Town Centre contains a number of critical structures that support major retail areas (Merseyway), routes through the Town Centre (Wellington Road Viaduct) and routes linking to the M60 (Greek St Bridge). A number of these structures have been identified in the **Bridge Asset Investment Strategy** as being at risk or requiring interventions in the short to medium term. The nature of these structures is such that our approach to addressing these issues should be integral to the proposals for the Town Centre. These are discussed further in a section of the **Bridge Asset Investment Strategy**.

Conclusion for 1.5.8
Town Centre proposals will need to be considered in tandem with key works required to critical structures in the Town Centre. Whilst some of these interventions are preventative (such as waterproofing) the overall reduction in lifecycle costs achieved by the interventions should be carefully considered against the potential for additional disruption to businesses and the regeneration proposals around Redrock and Merseyway.

1.6 CORE ASSET MANAGEMENT OBJECTIVES

Our objectives for asset management are derived from understanding of the contextual issues described above and recognition of the potential contribution of the TAMS to national, regional and local policy and strategy. Some of these objectives have yet to be defined as fully measurable targets and actions to address this are described in the Core Transport Asset Management Strategy in **Section 1.7** below. Other objectives are linked to service level targets described in the individual Asset Investment Strategies.

CO1 To ensure that risks to the safety and well-being of current and future users of Stockport's transport network are minimised.

CO2 To ensure that service level options do not result in higher and unaffordable future costs to rate payers, businesses and road users during and beyond the 20 year strategy period

CO3 To ensure that the condition of our transport network is maintained to a level that minimises risk of disruption to traffic particularly as a result of extreme weather events

CO4 To minimise the cost of third party claims for damage or injury

CO5 To build financial resilience to the effects of rising raw material prices

CO6 To ensure that the condition of the public realm encourages walking and cycling and enables accessibility for all.

CO7 To ensure that the condition of our public realm in designated retail and employment centres is maintained to a level that can support and enhance economic activity

CO8 To ensure that the condition and appearance of the public realm is maintained such that it supports regeneration and community cohesion

CO9 To protect and enhance the local natural environment in areas where our infrastructure both impacts on and depends on sensitive habitats

CO10 To minimise the contribution of transport infrastructure to adverse environmental impacts

CO11 To reduce lifecycle carbon emissions from our transport infrastructure throughout the supply chain

CO12 To ensure appropriate communication with all stakeholders on issues impacting on our transport infrastructure

1.7 CORE ASSET MANAGEMENT STRATEGY

The Core Transport Asset Management Strategy provides the high level actions required to deliver the above objectives.

Central to the strategy is the identification of a **£134M** capital investment in maintenance of highways and structures over the next 8 years (from 2015/16-2022/23) and continued annual investments from 2023 onwards to maintain the network in a steady state. The full proposed 20 year financial profile is contained in **ANNEX 4**. The investment is needed to improve the current condition and performance of the network, minimise potential for disruption to traffic and importantly address a growing backlog of preventative maintenance to reduce deterioration rates that are currently growing to unsustainable levels.

£100M of capital funds have been identified as part of the 8 year programme subject to a mid-term review in 2018, which includes **£88M** of unsupported borrowing for the Highway Investment Programme and Footway Invest to Save. However, there is a need to identify funding sources for a potential additional **£22M** for highway structures, drainage and street lighting for 2015/16-2022/23.

The proposed financial profile in **ANNEX 4** crucially identifies the shortfall in funding to maintain the network in a steady state from 2023 onwards. On the basis of lowest cost lifecycle models and current unit costs the requirement for capital maintenance expenditure is **£10M per annum** The strategy is therefore focused towards driving efficiency and effectiveness in the delivery process and engaging with partner Research &Development organisations to identify solutions that provide lower unit costs over the whole life cycle and engaging more widely with DfT and Greater Manchester bodies to identify funding sources.

It is important to note that the financial profilel in **ANNEX 4** includes expected inflation for those particular maintenance types. In most cases the inflation rates are higher than Bank of England projections for Consumer Price Inflation and this reflects the actual trend over the last 25 years.

Table 1.7 Core Transport Asset Management Strategy

Ref	Description	Objectives
CS1	We will pursue the 8 year investment strategies contained in **PART 2** and summarised in **ANNEX 4** **including £134M of investment from 2015/16 to 2022/23** in order to improve overall condition, address a backlog of preventative maintenance and reduce deterioration rates. We will engage both internally and externally with LGA, DfT and GM LEP on options for meeting the shortfall in available funds over the next 8 years.	**CO1/ CO2** **CO3 / CO4** **CO6 / CO7** **CO8 / CO9** **CO10**

Ref	Description	Objectives
CS2	We will implement the **Prioritisation Framework** in **PART 3** to optimise the achievement of objectives **CO6, CO7, CO8, CO9** and **CO10** through our forward works programmes.	**CO1/ CO2** **CO3 / CO4** **CO6 / CO7** **CO8 / CO9** **CO10** **CO11**
CS2	We will consider implementing a Competitive Dialogue process for the next delivery framework (jointly with collaborating authorities as appropriate) to establish targets to drive down unit lifecycle costs for maintenance to improve the affordability of annual steady state funding requirements from 2023 onwards.	**CO1 / CO2** **CO3**
CS3	We will invest in robust data, intelligence and analysis on performance of smaller scale treatments to identify potential alternative lifecycle plans that will further reduce whole of life costs	**CO1 / CO2** **CO3 / CO5**
CS4	We will consider implementing a Competitive Dialogue process for the next delivery framework (jointly with collaborating authorities as appropriate) to establish ambitious targets for reducing greenhouse gas emissions and dependency on primary raw materials through maintenance operations over the whole lifecycle of each infrastructure asset. These targets should reflect the ambition in the Construction 2025 Industrial Strategy and should work in tandem with **CS2**.	**CO5** **CO11**
CS5	We continually review best practice and monitor updates to relevant infrastructure Codes of Practice to ensure Council policies and procedures for risk management are robust. We will also continue to share information with other GM and neighbouring authorities to tackle fraudulent claims. We will also ensure that management of data on inspections, emergency responses to make safe and permanent repairs are robust enough to demonstrate that we have complied with our policies (such as the Highway Inspection and Repairs Policy). In particular all data on safety defects will be spatially accurate and complete details of works against each can be readily retrieved and analysed. All alleged defects referred to in injury and damage claim reports will be identified with accurate georeferences.	**CO1 / CO4**

Ref	Description	Objectives
CS6	We will continue close co-ordination across all the relevant infrastructure management teams, Network Management and liaison with utility companies (through NWHAUC) to minimise traffic disruption and optimise the movement of plant and materials. We will also continue to support the effective delivery of the GM Road Activity Permit System.	**CO3**
CS7	We will prioritise works where preventative measures would have significant benefits for the natural environment (for e.g. designated sites) or vice versa enhancements to the natural environment would have benefits to the resilience of infrastructure	**CO9**
CS8	We will establish an appropriate target date to make all appropriate spatial data on asset condition, planned and completed maintenance schemes and associated expenditure available on www.mystockport.org.uk. We will publish annual reports on the state of the network and a communication plan for major investments detailed in **Part 2**.	**CO12**

1.8 STRATEGIC RISKS

It is recognised that there are many uncertainties currently within the Core Transport Asset Management Strategy and key actions are subject to significant risks, notably our ability to meet funding requirements for identified investment needs. These risks are contained within the Strategic Risk Register in **Table 1.8** below.

The Strategic Risk Register is structured in line with Stockport Council's **Risk Management Framework and Strategy** and will be reported annually to the **Executive Member (Supporting Places)**. Only medium and high risk items are included here.

Table 1.8 Risk register for the Core Transport Asset Management Strategy

Ref	Description	Objectives affected	Impact score	Likelihood score	Overall risk	Mitigation
CR1	Failure to secure funding for outstanding investment requirements between 2015 and 2023 as detailed in ANNEX 2. This would affect investments in highway bridges and structures in particular with the result that important preventative measures cannot be undertaken and risk levels on a number of bridges will reach critical levels within 10 years (requiring restrictions or full closure).	**CO1/ CO2** **CO3 / CO4** **CO6 / CO7** **CO8 / CO9** **CO10**	4	3	High	Explore options for borrowing Engage with DfT directly or via Local Authority networks to enable representations on the potential funding options available (such as supported borrowing).
CR2	Failure to secure funding to cover the shortfall in annual budget requirements from 2023 onwards.	**CO1/ CO2** **CO3**	4	3	High	Engage with Local Authority Networks and DfT on the potential funding options for annual budget requirements from 2023 onwards. Put all necessary resources to pursuit of strategy **CS2** through any future delivery mechanism for Highway Services
CR3	Implementation of the investment strategies in TAMS (including the Highway Investment Programme) results in unacceptable increase in traffic delays	**CO3**	3	3	High	Undertake a mid-term review to include analysis of lifecycle costs of smaller scale treatments (e.g. patch repairs) that may reduce overall traffic impacts. If this is not

						possible then consider revision of the service level outcomes. Work closely with Network Management on the delivery of the Highway Investment Programme.
CR4	A short to medium term surge in extreme climatic events causes more rapid deterioration of infrastructure than accounted for in the investment model	**CO1/ CO2** **CO3 / CO4** **CO6 / CO7** **CO8 / CO9** **CO10**	3	2	Med	Ensuring delivery of required levels of preventative maintenance will minimise the impact of climatic events. Continue to build the intelligence base to enable us to do a quantified risk assessment of the effects of climate change on our infrastructure.
CR5	Commodity price inflation results in failure to meet targets in the Asset Investment Strategies and associated reductions in revenue budget pressures.	**CO1/ CO2** **CO3**	2	3	Med	A quantified risk assessment has been carried out for the Highway Investment Programme and the preferred option ensures high value for money even beyond the 99th percentile inflation outcome. The effects of inflation should be mitigated by pursuing strategy **CS5.**

PART 2 ASSET INVESTMENT STRATEGIES

2.1 INTRODUCTION

This section details the links between the issues, challenges and high level strategy objectives described in **Section 4.2** and the specific performance requirements for particular asset types. This translates into detailed objectives and investment strategies.

A summary of Stockport's transport assets is given in **ANNEX 1**. This also provides a summary of the financial indicators reported in the closing accounts for 2013/14 as part of the Whole of Government Accounts return.

A tabular summary of the preferred 20 year investment projection for all asset types is presented in **ANNEX 2,** detailing projected funding sources and shortfalls. The approaches to addressing the funding shortfalls are described in the relevant sections.

Asset investment strategies are described for the following asset types:

SECTION 2.2 ROADS

SECTION 2.3 PAVEMENTS, FOOTPATHS AND CYCLEWAYS

SECTION 2.4 HIGHWAY BRIDGES AND STRUCTURES

In each section the following aspects are covered:

1. **Classification and inventory**
2. **Trends in investment and performance**
3. **Future demands and risks**
4. **Forecasts of condition and performance**
5. **Objectives**
6. **Strategy**
7. **Risk management**
8. **Monitoring**
9. **Review**

Further work is required to address important gaps in condition and risk data for Street Lighting, Drainage and Public Rights of Way before a clear strategic direction can be defined for these assets. However, available information on performance is presented in:

SECTION 2.5 HIGHWAY DRAINAGE

SECTION 2.6 PUBLIC RIGHTS OF WAY

SECTION 2.7 STREET LIGHTING

SECTION 2.8 STREET FURNITURE

SECTION 2.9 HIGHWAY GREEN INFRASTRUCTURE

2.2 ROADS

2.2.1 Classification and inventory

A summary of Stockport's road network inventory is given in terms of length and surface area in **ANNEX 3**. The summary also presents a full valuation of Stockport's road assets which include the gross value (referred to as Gross Replacement Cost – see the **GLOSSARY AND ACRONYMS** in **ANNEX 1**) of the road surface, underlying structure and associated lining and iron work, which stands at **£1.106bn**.

2.2.1.1 Road hierarchy classification

For the purposes of risk prioritisation and network management Stockport Council uses a local road hierarchy in accordance with the Code of Practice for Highways Maintenance Management. These do not align exactly with the national road classifications presented in **ANNEX 3**. These are defined in **Table 2.2.1** overleaf.

Additionally, within each of these road classes it is important to consider a Cycle Network Hierarchy to reflect the level of risk to cyclists on our roads and the actual levels of cycling on those routes. Currently our Cycle Network Hierarchy only considers the actual provision of on-road cycle lanes (see **ANNEX 3**). However, prioritising maintenance on this basis will be ineffective in targeting resources to achieve the most benefit for cyclists' safety. It is therefore important that this hierarchy is refined in future reviews.

Summary

The road hierarchy is an important element of TAMS and will be used as a means of prioritising forward works programmes. It also determines inspection frequencies as detailed in the Highway Inspection and Repairs Policy and Plan (http://www.stockport.gov.uk/2013/3006/53395/highwaysafetyinspectionandrepairsplan)

Table 2.2.1 Stockport Road Hierarchy Classification

Class	Definition	Examples	Traffic flows (veh/day)	HGV flows (veh/day)	Bus frequency (buses/ hr)	Length (km)	Surface area (m^2)
2 – Strategic roads	Routes carrying large proportions of traffic from outside of the conurbation or to the Regional Centre. Bus routes to town and regional centres.	A34 Kingsway, A6	>20,000	>1,000	>6	34.6	366,262
3A – Main distributor	Routes providing links between town and district centres	A5145 Didsbury Road, B6167 Reddish Road	>10,000	>500	>6	80.4	708,573
3B – Secondary distributor	Routes providing links between district and local centres and main distributor and primary route network.	B6104 Compstall Road, C462 Dialstone Lane	>5,000	>50	0-4	57.4	471,611
4A – Local link roads	Primarily residential areas or rural link roads that are used as through routes or access for school drop off.	Seal Road, Bramhall and Dale Road, Marple	<5,000	<50	0-4	185.3	1,280,132
4B – Local access roads	Residential or rural access roads. Implement measures to promote use of roads as links to wider walking and cycling networks.				0	586.7	3,619,372
Total						**944.4**	**6,445,951**

2.2.2 Trends in roads investment and performance

This section summarises historical trends in capital investment in road maintenance and the resulting performance of the road network.

2.2.2.1 Investment and maintenance output

Table 2.2.2a shows the trend in capital spend on road maintenance since 2007/08. A particular pattern since 2010/11 has been an increase in the use of supplementary funds to address sudden deterioration across the network due to extreme weather, notably in 2010/11 with the £2.238M winter repairs fund of which Stockport Council directly contributed £2.000M of capital funding. However over the period basic allocations through the capital maintenance block have declined steadily.

Figure 2.2.2a shows the trend in total maintenance output since 2004/05. This shows that, with the exception of the 2010/11 programme with elevated funding, output has been steadily declining. This is in part due to the decline in capital funding but has also been compounded by price inflation for maintenance work which has risen far above the Consumer Price Index over the period. For example unit costs for carriageway resurfacing rose by over 45% between 2004/05 and 2013/14.

Figure 2.2.2b demonstrates that this decline has been at the expense of preventative treatments which comprised only 24% of the maintenance output in 2013/14 compared to 67% in 2004/05. The decline in preventative maintenance has been as a result of pressure to prioritise limited funding towards addressing roads in poorest condition.

2.2.2.2 Performance

Table 2.2.2b provides a summary of condition and performance indicators for roads since 2009. An explanation of the indicators is provided in **Boxes 2.2.2a, b and c**.

There is a lack of consistent historical data on road condition as previous surveys undertaken to produce the National Indicators for road condition were too unreliable for asset management purposes. Reliable condition trends are critical for asset management planning and the 2013 figures should now provide a firm baseline for future monitoring. In particular the 2013 condition survey highlights significant proportions of roads that are in mid to late stages in the lifecycle where more rapid deterioration will be expected. This would indicate the potential for more rapid decline in the condition of the network in the next 5-10 years. Modelling work has been undertaken that draws out underlying evidence from the 2013 condition data and historical maintenance records to provide forecasts of changes in condition. This is work is described further in **Section 2.2.4.**

Consistent data on safety defects is only available from 2011 (see **Box 2.2.2a** for an explanation). With only 3 points of data it is not possible to provide a clear picture of trends since then and it is crucial that consistent monitoring is undertaken to inform future reviews of the TAMS.

Table 2.2.2a Capital expenditure on highway maintenance since 2007/08

	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
			£m	£m	£m	£m	£m
Capital							
Carriageways Planned Maintenance	1.899	2.264	1.448	1.181	1.389	1.110	0.878
Residential Road Repairs			0	0	0.000	0.996	0.000
Winter Repairs			0	2.238	0.505	0.000	0.000
Total capital	**1.899**	**2.264**	**1.448**	**3.419**	**1.894**	**2.106**	**0.878**

Figure 2.2.2a Trend in total maintenance output (surface area)

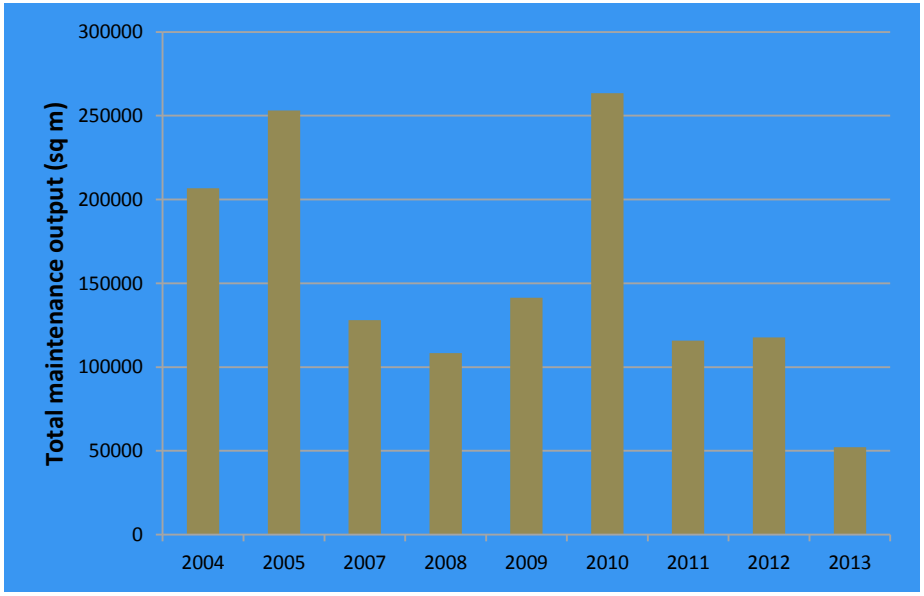


Figure 2.2.2b Trend in preventative maintenance as a proportion of total maintenance output

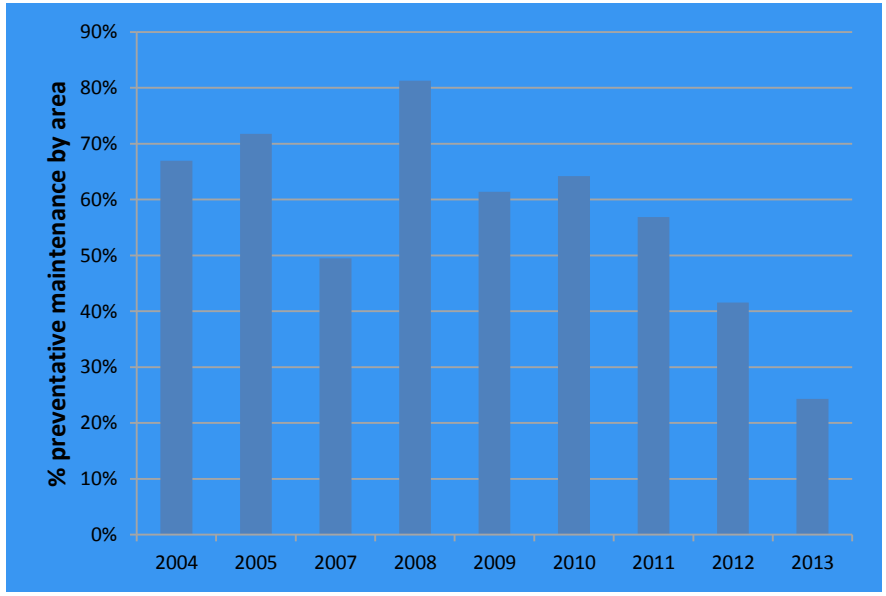


Table 2.2.2b Road condition and satisfaction indicators

Indicator	2009	2010	2011	2012	2013
% of Strategic Roads in poor condition					2.5%
% of Main Distributor Roads in poor condition					7.4%
% of Secondary Distributor Roads in poor condition					12.1%
% of Local Link and Local Access Roads in poor condition					22.1%
% of whole network in poor condition					18.6%
No. of carriageway safety defects reported			3638	5328	4129
% of Principal (A) Roads requiring investigation of skid resistance				31%	
% of Non-principal (B&C) Roads requiring investigation of skid resistance					38%
% satisfaction with the condition of road surfaces	43.7%	39.7%	30.0%	31.2%	25.6%
Average morning peak (07.00-10.00) speeds on A and B roads in Stockport (MPH)	18	17	18	NA[7]	
% satisfaction with efforts to reduce delays to traffic	45.9%	52.6%	50.4%	48.4%	49.2%

The clearest trend since 2009 has been in public satisfaction with the condition of roads in Stockport. This has declined from 43.7% in 2009 to 25.6% in 2013. In part, heightened media interest in the declining condition of roads nationally will have contributed to this trend. However, the consistency of decline in satisfaction over the period suggests that this is also in part indicative of the local trend in road condition.

Conclusions for 2.2.2

Three related areas of concern emerge from the trends presented in **Section 2.2.2**. These are:

- Decline in capital maintenance funding allocations compounded with rapid inflation of maintenance costs
- A sharp decline in preventative maintenance undertaken on the network
- A continuous fall in public satisfaction with road condition since surveys began in 2009

It is concluded that the current condition of the road network falls short of public expectation and that on current levels of expenditure the network will begin to deteriorate at a much faster rate in future thereby placing greater pressure on existing budgets.

[7] Indicators are produced by Transport for Greater Manchester 2 years in arrears

Box 2.2.2a Explanation of road condition indicators

Road condition indicators for 2009-2012 have been excluded as they are not comparable with 2013/14 condition indicators. Following extensive on-site auditing of condition data using standard SCANNER[8] and CVI[9] surveys and analysis of trends for trial sites it was found that these surveys were too inaccurate to support asset management and for this reason Stockport Council discontinued their use after 2012.

These surveys have been replaced by a single visual survey referred to as the Carriageway Treatment Survey (Gaist Solutions Ltd). This a walked visual survey that provides 5 condition categories where grades 4 and 5 indicate significant failure of the surface course and in the case of grade 5 failure of lower layers as well. The road condition indicator states the percentage of the network that is in condition grade 4 or 5.

The survey reports actual surface areas in each condition which enables the data to be used to identify the quantity of maintenance requirement.

The second indicator in **Table 2.2.2b** shows the number of safety defects reported by Highway Safety Inspectors on pavements. These refer to all safety defects that meet criteria for intervention as detailed in the Highway Inspection and Repair Policy and Plan. Consistent data on reported safety defects is only available since 2011 with the introduction of improved tracking of actionable defects using mobile data capture to provide accurate locations and unique identifiers for each defect. Prior to this period safety defects were reported using paper forms and this meant that lower priority defects that were not treated in the time interval between successive Safety Inspections would be reported again as a duplicate record as Inspectors would not have access to information from the previous inspection cycle. The introduction of mobile data capture also facilitated improved programming of repairs such that all actionable defects would be repaired on a street-by-street basis.

Box 2.2.2b Explanation of skid resistance indicators

The % of roads requiring investigation of surface friction is derived from a machine survey of skid resistance called SCRIM (Sideways-Force Co-efficient Routine Investigation Machine). SCRIM data is used to provide an indication that further engineering assessment is required to determine if surface treatments are necessary to improve surface friction dependent on site specific safety issues. As such the SCRIM measures do not tell us how much of the road network actually has insufficient surface friction. However, the indicator provided is a useful proxy measure and we would wish to reduce this proportion over time to improve the safety of the network.

Box 2.2.2c Explanation of public satisfaction indicators

Public satisfaction indicators are obtained through the **National Highways and Transportation** survey of Stockport residents (IPSOS Mori). Percentage satisfaction is

[8] SCANNER is a machine survey previously used for Stockport's classified road network

[9] CVI (Coarse Visual Inspection) is an assessment of road condition from a slow moving vehicle previously used for Stockport's unclassified network.

Box 2.2.2c Explanation of public satisfaction indicators
measured by respondents providing a 1-5 rating where 1 is taken to be 0%, 2 is taken to be 25% satisfied etc. Figures on percentage satisfaction are highlighted in green or red to indicate respectively where a significant[10] improvement or decline in satisfaction has occurred as compared to the preceding 3 year average. Stockport has participated in the survey since 2009/10.

[10] Statistical significance is taken to be any result that differs by greater than 2 standard errors from the preceding 3 year average

2.2.3 Future demands, risks and opportunities for the Road Asset Investment Strategy

2.2.3.1 Climate change

Section 1.5.1.2 provides a discussion of the forecasts for climate change and extreme weather. The likely increases in average rainfall and intensity of individual rainfall events are of particular concern as this will inevitably increase deterioration rates. These occur through a number of processes:

1. Hydraulic pressure as water is compressed under tyres as the vehicle passes over the road surface. Preventative treatments are crucial to ensuring that water does not penetrate into the surface causing erosion and widening of cracks.
2. Rising water tables (as experienced in the winter of 2013/14) breaching the lower layers of the road weaken the road structure as vehicles pass over the road surface.
3. Increased likelihood of breaching surface water or mains sewer capacity and leakages causing leaching of material, creating voids and localised failures. This process leads to more sudden failures and should be minimised through a robust risk management approach supported by comprehensive data and knowledge on assets below ground, ground conditions and associated risks as well as integrated works programmes between drainage and highway maintenance.

Heat wave events also present risks through softening of bitumen binders in the surface of the road at high temperatures. This can lead to deformation of the surface and 'fatting up' of bitumen on the surface causing skidding hazards. Specification of 'stiffer' bitumen grades may reduce this future risk although these typically require higher temperatures prior to laying which result in higher energy costs and carbon emissions. It is therefore important to continue to engage with contractors to find solutions that enable stiffer bitumen grades to be laid at lower temperatures.

During the winter of 2010/11 freeze-thaw processes led to a 90% increase in potholes over the average for a winter period. Importantly, most of these were associated with roads that were already in poor condition or had some degree of surface deterioration. This highlights the potential to improve our resilience to climate change through implementing improvements to the overall condition of the network.

2.2.3.2 Global demand for raw construction materials

The macroeconomic context leading to rising demand for raw construction materials has been discussed in **Section 1.5.1.3**. In relation to road maintenance operations price inflation is to expected to be between 3.5% and 4.8% for preventative treatments (e.g. surface dressing) and between 4.2% and 5.7% for structural maintenance (e.g. plane and resurface

operations)[11]. By 2033 this will result in a 42% increase in maintenance costs relative to the Consumer Price Index (assuming a target CPI rate of 2.5%) although this excludes further super-inflationary effects on bitumen prices as oil reserves become scarcer.

2.2.3.3 Population growth

The population of Stockport is projected to grow by approximately 6% by 2033 over 2015 levels[12]. The National Trip End Model (NTEM) projects growth in car trips in Stockport ranging from 7% in the central area to 13% in High Lane over the same period.

NTEM projections are the subject of continued discussions about the realism of car ownership and trip making models, particularly in the context of very slow growth or decline in traffic levels over last decade. In particular, in Stockport there has been a 6% reduction in car traffic on A and B roads since 2005 in part as a result of demand management and public transport measures delivered through the GMLTP.

In spite of the mixed picture over the last decade, with continued population growth in Stockport and Greater Manchester as a whole it can only be concluded that demand for high quality road space will grow.

The GMLTP sets out a strategy to manage this demand for road space through measures to improve and promote the use of alternative modes of travel (including public transport and active modes). However, the GMLTP is also clear that improvements should be made to the functioning of the network itself to accommodate growth in traffic. The TAMS therefore has a role to play in ensuring that investment options are selected that minimise traffic delays over the full lifecycle of the road.

2.2.3.4 Housing growth and distribution policies

Reviews of housing distribution policies across Greater Manchester, Cheshire East and High Peak will impact on the concentrations of traffic growth, in particular on strategic roads in Stockport. Stockport is working with High Peak and Cheshire East to assess the impacts of their respective Local Plans on the A6 and A34 corridors. With a clearer view on the likely traffic impacts and scale of capacity improvements required on these corridors it will be possible to consider more optimum timings of major maintenance interventions on the A34 in particular in the medium (5 year) term.

2.2.3.5 Freight trends

Growth in online retail will lead to mixed impacts on traffic. Whilst this should have a negative effect on the rate of growth in car traffic there will be likely to be an increase in freight movements and distance travelled[13]. However, it is important to place this in the

[11] Calculated on the basis of historical commodity, plant and labour price indices since 1990 and apportioned to typical weightings for preventative and structural treatments. The ranges represent 90% most credible values.
[12] Oxford Economics (2013) Greater Manchester Forecast Model
[13] OECD international Transport Forum (2013) Long Run Trends in Car Use. Roundtable Report

context of recent trends in Stockport. Since 2005 there has been a 22% decrease in Heavy Goods Vehicle (HGV) traffic in Stockport coupled with a 7% increase in Light Goods Vehicle (LGV) traffic. This is likely to be a result of an increased consolidation of freight in centralised distribution centres.

The impact of HGVs on the rate of deterioration of the road structure is disproportionately greater by weight than the impacts of LGVs and other vehicles and so even if there is a continued increase in LGV journeys and tonnage carried on Stockport's local roads this is unlikely to have a significant impact on rates of structural deterioration.

2.2.3.6 New road schemes: A6 Manchester Airport Relief Road and Poynton Bypass

TheA6 to Manchester Airport Relief Road Planning Applications have been approved and works started on site in 2015. The cost implications for long term maintenance of the route within Stockport's boundaries have been considered within the Major Scheme Business Case and will be integrated within the core of the TAMS in the next review. Notwithstanding the whole life cost implications of the new infrastructure there are additional important considerations for changes in freight movements and volumes on the existing network and in particular on the A555, A34 and A6. Work has been undertaken to quantify the impacts of the A6 MARR on structural maintenance requirements on these roads. This was undertaken using traffic model outputs for the forecast years 2017 and 2032 and combined with measurements of the strength of the existing road structure (using a machine survey referred to as Deflectograph). The results indicated that even under increased loading from HGV traffic over 97% of the length of the A555 and A34 would continue to perform for at least a further 20 years without major reconstruction of the underlying road structure. However, isolated areas would need addressing and early preventative interventions are required along the routes to ensure that this life can be achieved.

The Poynton Bypass proposal will also have significant impacts on traffic on A555 and A34. Cheshire East Council are currently preparing their Major Scheme Business Case and further work should be undertaken to understand if additional HGV traffic flows will require a review of the current conclusion above.

Conclusion for 2.2.3
The historical evidence of declining road condition and associated risks indicates that our network is not sufficiently resilient to growing occurrences of extreme weather with growing impacts on the wider economy in Stockport and Greater Manchester as a whole. This establishes a clear case for investing to improve the overall condition of the road network. The combined effects of the above trends are difficult to quantify at this stage. It is clear that dependency of road maintenance operations on primary raw materials has long term sustainability implications and a target will be established to increase the use of recycled materials, in particular bitumen binder, in road surfacing. Broadly speaking, an increase in

Conclusion for 2.2.3
the use of surface dressing and slurry seal treatments where appropriate will contribute to reducing overall volume requirements for primary materials as well as mitigating the impacts of traffic growth by preventing the onset of surface deterioration and minimising the average length of traffic disruption due to maintenance operations over the lifecycle of the road. The change in rates of structural deterioration will be likely to be modest as result of changes in freight movement patterns across the Borough owing to an apparent trend in the reduction of the share of HGV traffic. Where HGV traffic is anticipated to grow as a result of network proposals (A6 MARR and Poynton Bypass) the additional impacts are not anticipated to be significant within the 20 year strategy period. However this will require further review within the next 5 years.

2.2.4 Investment options and value for money assessment

Forecasts of condition show how the percentage of the road network in poor condition is likely to change over time under a number of scenarios. These enable assessment of the benefits of different investment options in reducing lifecycle and reactive maintenance costs and third party liabilities as well as the achievement of social and economic benefits per se through the improvement in road condition. The Highways Investment Programme has been approved.

2.2.4 Conclusion
The forecasts show that if we continue with levels of investment in road maintenance since 2009/10, including the recent trend in short term investments of supplementary maintenance grants, the percentage of the network in poor condition is likely to more than double in the next 20 years from 2013 levels. The resulting pressures on revenue budgets from reactive maintenance and third party pay outs will be unsustainable particularly in view of growing pressures from other Council services. The value for money assessment shows that an intermediate option to reduce the extent of the road network in poor condition to approximately half the current level will be preferable to a more expensive option to minimise the extent in poor condition and yields significantly higher benefit to cost ratios. **ANNEX 4** provides the detail of the 20 year investment projection.

2.2.5 Road Asset Investment Strategy Objectives

Our long term objectives for road asset management are detailed below.

Objective RO1 To reduce the extent of our roads in poor condition to 10% in 2022/23. Highways Investment Plan is part of the way in which this target is to be achieved. Specific targets are also established for individual road classes as in Table 4.3.2.5.

Table 4.3.2.5 Condition targets for Individual Road Classes

Road class	Baseline	2022/23 target	Upper (95%) tolerance
Percentage of Strategic Roads in poor condition	2.5%	2.5%	4.3%
Percentage of Main Distributor Roads in poor condition	7.4%	5.1%	6.8%
Percentage of Secondary Distributor Roads in poor condition	12.1%	6.6%	7.7%
Percentage of Local Link and Access Roads in poor condition	22.1%	10.5%	12%

The targets will contribute to the GM Local Transport Plan to enhance network safety, reliability and resilience to the effects of climate change. More specifically, by improving the condition of local residential roads we will support Council Plan objectives to promote independent living and sustainable neighbourhoods.

Objective RO2 To reduce the number of roads requiring investigation for skid resistance. Definitions of high risk road sections are provided in **PART 3 (3.1 PRIORITISATION FRAMEWORK)**. Appropriate targets will be needed to be established following a review of Stockport's Skid Resistance Policy (see **Box 2.2.5** for an explanation).

Box 2.2.5 Explanation of objective for skid resistance
Currently Stockport's standards and thresholds for investigation of skid resistance loss are based on the Design Manual for Roads and Bridges (HD28/04). These standards were developed for trunk roads and reflect a much higher level of risk from skidding accidents. As such these are inappropriate for the majority of Stockport's local roads where traffic speeds are much lower and therefore present a much lower risk of skidding. Therefore thresholds for investigation of skid resistance loss should be reviewed to reflect this and ensure that we can focus resources on the specific stretches of road where skid resistance loss may present high risks to traffic. Once these thresholds have been reviewed it will be possible to establish appropriate targets under this objective.

Objective RO3 To improve overall satisfaction with road condition by 2022/23 (NHT Survey). This must take account of the effects of media coverage and other social and cultural factors over this time.

Objective RO4 To effectively manage residual safety risks associated with the road network and risks associated with snow and ice cover.

Objective RO5 To minimise traffic delays as a result of road maintenance operations. Appropriate targets for duration of traffic management, average speeds on A and B roads and public satisfaction with efforts to reduce traffic delays will be established in 2017/18[14] after the third year of monitoring and receipt of the results of the 2015 and 2016 NHT surveys.

2.2.6 Road Asset Investment Strategy

The strategy below describes how the above objectives will be achieved. Links to the objectives are shown adjacent to each action.

Ref	Description	Relevant objectives
RS1	The **Highway Investment Programme** has been approved in order to reduce the extent of the road network in poor condition to 10%**.**	**RO1/ RO2** **RO3**
RS2	Identify options for funding the shortfall in annual average spend requirements post-investment (see **ANNEX 4**). This will include engagement with TfGM and DfT. Average annual spend post-investment needs to be maintained at £3.96m in 2013 prices (average £6.31m per annum including inflation in the period 2024-2033). This figure will be revised on establishment of the efficiency targets in **RO6.**	**RO1/ RO2** **RO3**
RS3	Allocate an average of 26% of the Highway Investment Programme budget to preventative maintenance to deliver 54% of total treatment coverage during the period 2014/15 to 2022/23. Thereafter maintain allocations to preventative maintenance at an average of 31% of total spend or 60% of total treatment coverage for the remainder of the strategy period.	**RO1/ RO2** **RO4/ RO5** **CO2/ CO3** **CO5/ CO11**
RS4	Undertake a review of Council Skid Resistance Policy including an overhaul of intervention thresholds on the classified road network.	**RO2**
RS6	We will continue close co-ordination between Network Assets, Network Management and partners through the Highway Investment	**RO5**

[14] The two year delay is required to ensure that average speed data for A and B roads can be obtained for the first year of the strategy.

	Programme to optimise the movement and storage of plant and material as well as minimising traffic disruption. We will also continue to support the effective delivery of the GM Road Activity Permit System.	

2.2.7 Risk assessment for Road Asset Investment Strategy

Table 2.2.7 overleaf provides a strategic risk register that will be maintained and updated on an annual basis. This details the residual risks that objectives in **Section 2.2.5** are not achieved through the strategy in **Section 2.2.6**. The risk register is structured in line with Stockport Council's **Risk Management Framework and Strategy** and will be reported annually.

Table 2.2.7 Risk register for Road Asset Investment Strategy

Risk reference	Description	Objectives affected	Impact score	Likelihood score	Overall risk	Mitigation
RR1	Failure to secure funding to cover the shortfall in annual budget requirements post-completion of the 8 year Highways Investment Programme.	**RO1 / RO2** **RO3**	4	3	High	Engage with Local Authority Networks and DfT on the potential funding options for annual budget requirements from 2023 onwards. Put all necessary resources to pursuit of strategy **RS5** through any future delivery mechanism for Highway Services
RR2	Implementation of Highway Investment Programme results in unacceptable increase in traffic delays	**RO7**	4	3	High	Undertake a mid-term review to include analysis of lifecycle costs of smaller scale treatments (eg patch repairs) that may reduce overall traffic impacts. If this is not possible then consider revision of the service level outcome. Continue to work closely with network management on forward works programmes.
RR3	A short to medium term surge in extreme climatic events restricts our ability to deliver required levels of preventative treatments (due to	**RO5 / RO6**	3	3	High	Use the opportunity arising from long term cash flow security through the Highway Investment Programme to build stronger relationships with surface dressing

	inappropriate weather conditions)					contractors to ensure flexibility and capability for rapid deployment of plant and materials to site. This will also enable the use of a wider weather window to include March and April and later into September and October.
RR4	Sufficient resources are not available for the delivery of the Highway Investment Programme	**RO1 / RO2** **RO3**	3	3	High	Ensure that additional staff resources can be drawn from Stockport Council's existing consultancy framework
RR5	A short to medium term surge in extreme climatic events causes more rapid deterioration of road surfaces than accounted for in the investment model	**RO1 / RO2** **RO3**	3	2	Med	Ensuring delivery of required levels of preventative maintenance will minimise the impact of climatic events.
RR6	Commodity price inflation exceeds 95th percentile threshold resulting in failure to meet objectives in RO1 and associated reductions in revenue budget pressures.	**RO1 / RO2** **RO3**	2	3	Med	Selection of Option 2 ensures high value for money even under exceptional construction price inflation scenarios (beyond 99th percentile outcomes). The effects of inflation should be mitigated by pursuing strategy **RS5.**

2.2.8 Monitoring of the Road Asset Investment Strategy

Table 2.2.8 below outlines the schedule of monitoring indicators and methods for acquiring data. **These indicators will be reported annually.**

Table 2.2.8 Monitoring indicator data acquisition method and schedule

Indicator	Method
% of Strategic Roads in poor condition	Condition survey strategy being developed
% of Main Distributor Roads in poor condition	Condition survey strategy being developed
% of Secondary Distributor Roads in poor condition	Condition survey strategy being developed
% of Local Link and Local Access Roads in poor condition	Condition survey strategy being developed
% of whole network in poor condition	Condition survey strategy being developed
No. of carriageway safety defects reported	Annual reporting of Safety Inspection data
Total cost of reactive repairs on carriageways	Annual financial reporting, excluding overheads
Total cost of injury and damage claims on carriageways	Annual financial reporting to include self-insurance and premiums
% of Principal (A) Roads requiring investigation of skid resistance	Biannual SCRIM survey
% of Non-principal (B&C) Roads requiring investigation of skid resistance	Biannual SCRIM survey
% satisfaction with the condition of road surfaces	Annual National Highways and Transportation survey (IPSOS Mori)
Average morning peak (07.00-10.00) speeds on A and B roads in Stockport (MPH)	TrafficMaster data provided by Highway Forecasting and Analytical Services (TfGM)
% satisfaction with efforts to reduce delays to traffic	Annual National Highways and Transportation survey (IPSOS Mori)

2.2.9 Review of the Road Asset Investment Strategy

Table 2.2.9 below provides a schedule for review of elements of the Roads Asset Investment Strategy. Reviews of these elements should be approved by the Executive Portfolio Holder.

Table 2.2.9 Schedule for review

Section	Description	Time
2.2.1 Road hierarchy	Review the on-road Cycle Network Hierarchy to reflect levels of cycle usage	
2.2.4 Investment Options	Undertake a mid-term review of the long term investment model in support of the Highway Investment Programme	September 2017
2.2.5 Objectives	Review Objective RO2 in line with revised Skid Resistance Policy	September 2015
2.2.5 Objectives	Establish targets under Objective RO7 for average speeds on A and B Roads and % satisfaction with efforts to minimise congestion	April 2017
2.2.5 Objectives	Establish appropriate targets for reducing treatment unit costs, lifecycle carbon emissions and increasing the use of recycled materials	To align with timetable for new delivery framework (2016/17)

2.3 PAVEMENTS AND SURFACED FOOTPATHS

2.3.1 Pavement classification and inventory

2.3.1.1 Definitions

In this document we use the term pavements and surfaced footpaths in a more familiar sense to refer to pedestrian routes both on-road and providing off-road links that have a formal surface that is either bound (with bitumen binder or concrete) or modular (such as with flags or block paving). See the Glossary for more clarification of terms. For the purposes of brevity in the remainder of the section we will use the term pavements to mean all of the above unless making specific reference to off-road footpaths.

These are defined separately from Public Rights of Way, which are often unsurfaced or have loose bound surfacing materials and are typically less heavily used for everyday purposes. Although it is difficult to generalise in terms of their physical entities and usage, they have different legal contexts and consequently different approaches to management and risk.

Through the future development of the Rights of Way Asset Investment Strategy, Stockport Council will harmonise management approaches such that common principles can be applied on the basis of the physical characteristics of the infrastructure and usage. In particular this will cover risk management, long term financial planning and physical works prioritisation.

A summary of Stockport's pavement inventory is given in terms of length and surface area in **ANNEX 3**. The summary also presents a full valuation of pavement and surfaced footpath assets with a Gross Value of **£0.241bn**.

2.3.1.2 Pavement Hierarchy

Stockport Council uses a local hierarchy for pavements in accordance with the Code of Practice for Highways Maintenance Management for the purposes of risk prioritisation and network management. These determine inspection frequencies as outlined in the Highway Inspection and Repair Policy and Plan.

The Pavement Hierarchy is defined in **Table 2.3.1a**. In addition Stockport Council uses a Cycle Network Hierarchy which is shown in **Table 2.3.1b**. Although the Cycle Network Hierarchy is also used for the purposes of risk prioritisation it is important to note that it reflects the physical nature of the asset and the level of risk that it presents to users rather than the actual levels of usage as this may vary considerably. Therefore only category 2 (segregated Cycleways) applies to this section.

2.3.1 Conclusion
The Pavement Hierarchy and Cycle Network Hierarchy will be used as a means of prioritising investments in maintenance forward works programmes.

Table 2.3.1a Stockport Pavement Hierarchy Classification

Classification	Definition	Examples	Length (km)	Surface area (m2)
1a – Prestige walking zones	Very busy areas of towns and cities with high public space and streetscene contribution	Princes Street/ St Peter's Sq	10.14	28,730
1 Other town and district centre footways	Busy urban shopping and business areas and main pedestrian routes	Stockport Road, Marple	28.79	81,377
2 (High usage urban) footways	Medium usage routes through local areas feeding into primary routes, local shopping centres etc. In particular these include routes to Secondary Schools and leading to district and local centres.	Dialstone Lane, Offerton	196.70	529,067
3 – Important links to local facilities	Linking local access footways through urban areas and busy rural footways	Warwick Road, Heaton Moor	300.08	666,216
4 – Other residential footways and footpaths	Footways associated with low usage, short estate roads to the main routes and cul-de-sacs		965.89	2,097,624
Total			**1,501.59**	**3,403,015**

Table 2.3.1b Stockport Cycle Hierarchy Classification

Classification	Definition	Length (km)
2 – On road segregated cycle paths (in this section)	Shared cycle/pedestrian paths, either segregated by a white line or other physical segregation, or un-segregated.	6.3

2.3.2 Trends in investment and performance of pavements

2.3.2.1 Historical trends in expenditure and maintenance output

Table 2.3.2a shows the trend in capital spend on pavement maintenance since 2007/08.

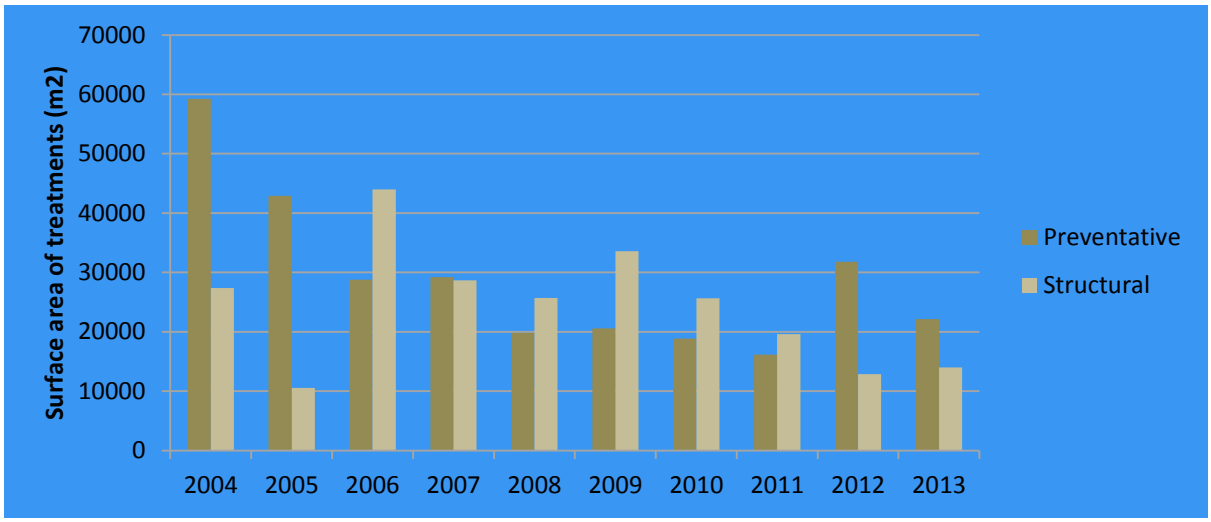
Table 2.3.2a Capital expenditure on highway maintenance since 2007/08

	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14
	£m	£m	£m	£m	£m	£m	£m
Capital							
Invest to Save	2.000	2.000	2.500	1.500	2.000	1.964	2.036

Since 2005 Stockport Council has used unsupported borrowing to finance a £32M Invest to Save Programme to improve the condition of pavements in Stockport and tackle growing pressures from insurance claims and reactive repair costs. The Invest to Save Programme was originally scheduled to include an initial £2M in 2005/06 followed by £3M per annum until 2015/16. This was subsequently altered to an annual programme of £2M over 16 years and hence at the time of the current version of TAMS there are a further 7 years of investment remaining. This programme has now been incorporated into the Highways Investment Programme.

Figure 2.3.2 shows the total surface area of maintenance carried out on pavements in Stockport in each year since 2004.

Figure 4.3.2.2 Pavement maintenance output (note 2012 data is not currently available)



Overall output has been decreasing over the last decade with a more marked decrease in the coverage of preventative treatments. The Invest to Save programme saw a relative increase in structural maintenance particularly in areas where there was a concentration of claims and reactive maintenance costs. However, this level also continued to decline over the period of the programme. Price inflation is the primary cause of this decline in output with an overall increase of more than 50% in material and plant prices since 2005.

2.3.2.2 Condition and satisfaction

Table 2.3.2b provides a summary of condition and performance indicators for pavements and surfaced footpaths. An explanation of the derivation of the indicators is provided in

Boxes 2.3.2. As with roads we lack consistent condition data for pavements prior to 2013 and previous data has been excluded to avoid presentation of misleading trends. The 2013 condition survey should now provide a reliable baseline for future monitoring of condition.

Table 2.3.2b Pavement condition and satisfaction indicators

Indicator	2009	2010	2011	2012	2013
% of pavements in poor condition					20.2%
No. of pavement safety defects reported			7343	8818	9391
% satisfaction with the condition of pavements	47.2%	50.1%	47.4%	44.7%	46.3%
% satisfaction with the condition of pavements: Respondents with long term disabilities		39.2%	34.9%	35.2%	34.4%
% satisfaction with provision of drop kerb crossing points		54.9%	60.3%	59.8%	58.9%

A key trend is apparent in the growing numbers of safety defects reported year on year since 2011 and this would suggest that current budgets provided through the Invest to Save programme are insufficient to arrest deterioration. The Highways Investment Programme is part of the councils work to break the downward trend in highway condition.

Public satisfaction with pavement condition has remained relatively stable over this period when compared with satisfaction with road condition. This may be a result of the lower level of media coverage of pavement condition as compared with road condition. Nonetheless, the level of satisfaction with pavement condition amongst people with long term disabilities is consistently much lower. This presents evidence of the differential impact of the poor condition of Stockport's pavements on disabled people.

Table 2.3.2c provides additional information on satisfaction with the condition of cycle routes. These refer to all cycle routes including off road routes that will be covered in the Public Rights of Way Asset Investment Strategy. However, the evidence points to low levels of satisfaction with the condition of cycle routes amongst cyclists themselves, albeit relatively stable over the period. There are implications here that further deterioration of cycle infrastructure may compromise the benefits of investments in new infrastructure in promoting greater use of cycling particularly for commuting purposes.

Table 2.3.2c Cycle infrastructure satisfaction indicators

Indicator	2009	2010	2011	2012	2013
% satisfaction with the condition of cycle routes	46.2%	49.8%	53.0%	51.4%	51.7%
% satisfaction with the condition of cycle routes: Respondents that use a bicycle		35.4%	41.2%	37.7%	36.8%

Conclusion for 2.3.2

Conclusion for 2.3.2
Evidence from the numbers of safety defects emerging year on year suggests that the condition and resilience or our pavement network is declining in spite of the Invest to Save programme. The reason for this is evident from the declining maintenance output year on year which in turn is a result of price inflation over the period of the Invest to Save programme. The low level of satisfaction amongst disabled people with the condition of pavements highlights a continued imperative to both arrest deterioration and improve the overall condition of the pavement network. Prioritisation of physical works should also take account of the condition of segregated and non-segregated cycleways.

Box 2.3.2 Explanation of pavement condition indicators
Prior to 2013 pavement condition indicators had only been available for category 1a, 1 and 2 routes and there was no reliable condition data for the majority of the network. Data from 2009-2012 have been excluded as they are not comparable with 2013/14 condition indicators. Stockport Council has discontinued the use of standard UKPMS surveys as they were too inaccurate to support asset management. These surveys have been replaced by a single visual survey referred to as the Footway Treatment Survey (Gaist Solutions Ltd). This a walked visual survey that provides 5 condition categories where grades 4 and 5 indicate significant failure of the surface course and in the case of grade 5 failure of lower layers as well. The condition indicator states the percentage of the network that is in condition grade 4 or 5. The second indicator shows the number of safety defects reported by Highway Safety Inspectors on pavements. These refer to all safety defects that meet criteria for intervention as detailed in the Highway Inspection and Repair Policy and Plan.

2.3.3 Future demands, risks and opportunities for the Pavement Asset Investment Strategy

2.3.3.1 Climate change

Section 1.5.1.2 provides a discussion of the forecasts for climate change and extreme weather events. In relation to pavements one of the principal risks arises from increased rainfall causing leaching of bedding material in flagged pavements. This will exacerbate problems in areas where vehicles frequently override flagged pavements. Also, as experienced in the recent winters of 2010 and 2011, freeze-thaw processes also cause damage to bituminous pavements in particular. The wider use of preventative treatments such as slurry seal will be required to improve the resilience of pavements to both increased rainfall and potential damage by frost, snow and ice.

2.3.3.2 Global demand for raw materials

The macroeconomic context leading to rising demand for raw construction materials has been discussed in **Section 1.5.1.3**. In relation to pavements inflation has already eroded the annual incremental benefits of the Invest to Save Programme. Future budgeting for pavement maintenance must therefore take account of price inflation risk. However, it is clear that at the same time we must focus on a transition towards the minimisation of dependence on primary raw materials through in situ recycling (e.g. retread) or use of other recycled materials. There is currently no other sustainable option for meeting future demands for materials.

2.3.3.3 Increased population of older people

Section 1.5.1.4 highlighted the effect of changing age profile of Stockport's profile on likely demands for standards of maintenance on roads and pavements. If we continue with the current standard of condition of our pavements the overall level of exposure to risk of injury and resultant loss of independent mobility would grow as the proportion of older people grows. It is clear therefore that improving the condition of Stockport's pavements must form part of the strategy to promote independent living for older people.

Conclusions for 2.3.3
In the light of current and future changes in perceptions and expectations of pavement performance it has previously been concluded that the current scope of the Invest to Save Programme for Footways was insufficient to meet demand and address future risks. The Highway Investment Programme was developed to address this issue. A discussion of further options and forecasts is given in **Section 2.3.4** below.

2.3.4 Investment options and value for money assessment for the Pavement Asset Investment Strategy

Forecasts of condition show how the percentage of pavements in poor condition is likely to change over time under a number of scenarios. These enable assessment of the benefits of different investment options in reducing lifecycle and reactive maintenance costs and third party liabilities as well as the achievement of social and economic benefits per se through the improvement in pavement condition.

2.3.4 Conclusion

A key conclusion from the modelling work has been that the current allocation of £2m per annum from the Invest to Save Programme has only enabled maintenance of a steady state and due to inflation effects will not be sufficient to arrest deterioration on the pavement network from 2019 onwards.

It was clear that without an additional investment programme Stockport's pavements would decline in condition to an unacceptable level and one that could not support our long term Community Strategy objectives to support independent living and GMLTP objectives to promote walking and cycling. Since then a Highways Investment Programme has also been developed however further work still needs to be done.

With 37% of the pavement network in poor condition it is likely that this will impact on the lives of a significant proportion of the people with mobility difficulties who need to access local facilities or public transport services.

Our current assumption is that the costs of reactive maintenance and third party payouts on injury and damage claims on pavements will rise roughly in proportion to the increased extent of pavements in poor condition. Hence, without an investment programme we would expect these costs to increase by 67% (excluding inflation) by 2033.

Box 2.3.4 Explanation of condition forecasts and value for money assessment

The condition forecast is produced using a computer model that calculates rates of deterioration for different types of pavement including flagged and bituminous pavements and accounting for the effects of override and different types of maintenance. The mathematical models were developed using statistical analyses of local historic data which provides us with confidence in the outputs.

2.3.5 Objectives for the Pavement Asset Investment Strategy

Our long term objectives for pavement asset management are detailed below.

Objective PO1 To reduce the extent of our pavements in poor condition to 10% in 2022/23. The target will contribute to the GM Local Transport Plan objective to encourage walking and cycling through enhancements to the public realm (page 13) and Council Plan and Community Strategy objectives to promote independent living and sustainable neighbourhoods (page 14).

Objective PO2 To improve overall satisfaction with pavement condition by 2022/23.

Objective PO3 To improve satisfaction amongst people with limited mobility with the condition of pavements by 2022/23.

Objective PO4 To improve satisfaction with the condition of cycle routes by 2022/23.

2.3.6 Pavement Asset Investment Strategy

The strategy below describes how the above objectives will be achieved. Links to the objectives are shown adjacent to each action.

Strategy reference	Description	Relevant objectives
PS1	Invest in improving as part of the **Highway Investment Programme** in order to reduce the extent of the pavement network in poor condition to 10%**.**	**PO1 / PO2** **PO3**
PS2	Identify options for funding the shortfall in annual average spend requirements post-investment (see **ANNEX 4**). Average annual spend post-investment needs to be maintained (average £3.25m per annum including inflation in the period 2024-2033). This figure will be revised on establishment of the efficiency targets in **PO7.**	**PO1 / PO2** **PO3**
PS3	Allocate an average of 40% of expenditure on pavement maintenance to preventative treatments over the strategy period.	**PO1 / PO2** **PO4 / PO5** **PO6 / PO7**
PS6	Continue to implement the Council's Policy and Plan for Highways Inspection and Repair and ensure that Council policies and procedures for risk management are either in accordance with the Code of Practice for Well-Maintained Highways or establish local standards with reference to the Code. Ensure that all data on safety defects are spatially accurate and complete details of works against each can be readily retrieved and analysed. Ensure the spatial accuracy of all alleged defects referred to in injury and damage claim reports. Continue to work with other GM and neighbouring authorities and share information via the Council's Insurance Team in CSS to tackle fraudulent claims.	**PO8**

2.3.7 Strategic risk assessment for the Pavement Asset Investment Strategy

Table 2.3.7 overleaf provides a strategic risk register that will be maintained and updated on an annual basis. This details the residual risks that objectives in **Section 2.3.5** are not achieved through the strategy in **Section 2.3.6**. The risk register is designed to comply with Stockport Council's **Risk Management Framework and Strategy** and will be reported annually.

Table 2.3.7 Risk register for the Pavement Asset Investment Strategy

Risk ref	Description	Objectives affected	Impact score	Likelihood score	Overall risk	Mitigation
PR1	Failure to secure funding to cover the shortfall in annual budget requirements post-completion of the 8 year Highways Investment Programme.	**PO1 / PO2** **PO3/ PO4**	4	3	High	Engage with Local Authority Networks and DfT on the potential funding options for annual budget requirements from 2023 onwards. Put all necessary resources to pursuit of strategy **PS4** through establishment of future delivery mechanism for Highway Services
PR4	A short to medium term surge in extreme climatic events causes more rapid deterioration of pavement surfaces than accounted for in the investment model	**PO1 / PO2** **PO3**	4	3	High	Ensuring delivery of required levels of preventative maintenance will minimise the impact of climatic events. Undertake further work to quantify extreme weather risks through the mid-term review of the investment model
PR3	Interest rates on borrowing exceed the average of 4.7% assumed for the financial model. Given current indications from the Bank of England this is unlikely over the period of the first phase of the Highway Investment Programme. However, the	**PO1**	3	2	Med	Investigate opportunities for cheaper Undertake more detailed risk analysis as part of a mid-term review in 2018 of the effects of interest rates on the viability of

	risk remains significant and should be quantified further.					further investment in phase 2 of the Highway Investment Programme.
PR5	Legislative, commercial or social trends result in an increase in injury and damage claims or average claim values compromising the Council's ability to make repayments on borrowing. Recent legislative changes to the structuring of success fee payments make this very unlikely.	**PO1/PO2** **PO3/PO4**	3	1	Low	Ensure robust data management under strategy **PS6**

2.3.8 Monitoring of the Pavement Asset Investment Strategy

Table 2.3.8 below outlines the schedule and methods for acquiring data to support these monitoring indicators. These will be reported annually to the Transport Board.

Table 2.3.8 Monitoring indicator data acquisition method and schedule

Indicator	Method
% of pavements in poor condition	Condition survey strategy to be developed
No. of pavement safety defects reported	Annual reporting of Safety Inspection data
Total cost of reactive repairs on pavements	Annual financial reporting, excluding overheads
Total cost of injury and damage claims on pavements	Annual financial reporting to include self-insurance and premiums
% satisfaction with the condition of pavements	Annual National Highways and Transportation survey (IPSOS Mori)
% satisfaction with the condition of pavements: Respondents with long term disabilities	Annual National Highways and Transportation survey (IPSOS Mori)
% satisfaction with provision of drop kerb crossing points	Annual National Highways and Transportation survey (IPSOS Mori)
% satisfaction with the condition of cycle routes: Respondents that use a bicycle	Annual National Highways and Transportation survey (IPSOS Mori)

2.3.9 Review of the Pavement Asset Investment Strategy

Table 2.3.9 below provides a schedule for review of elements of the Pavement Asset Investment Strategy. Reviews of these elements should be approved by the Executive Portfolio Holder.

Table 2.3.9 Schedule for review of the Pavement Asset Investment Strategy

Section	Description	By when?	Approval
4.3.3.1	Review the Pavement Hierarchy to ensure that Category 3 Pavements reflect higher usage routes to local community facilities	September 2017	Executive portfolio holder
4.3.3.3 Investment Options	Undertake a mid-term review of the long term investment model in support of the Highway Investment Programme	2017-2018	Executive
4.3.3.5 Objectives	Establish appropriate targets for reducing treatment unit costs, lifecycle carbon emissions and increasing the use of recycled materials	To align with timetable for new delivery framework (2016/17)	Executive portfolio holder

2.4 HIGHWAY BRIDGES AND STRUCTURES

2.4.1 Classification and inventory of Highway Bridges and Structures

There are currently 859 bridges and structures in Stockport Council's ownership. Of these, the current version of the TAMS provides detailed modelling of only those structures that are defined within the scope of the Code of Practice for Management of Highway Structures, as defined in **Table 2.4.1a** below:

Table 2.4.1a Classification of Stockport's Highway Bridges and Structures

Structure type	No.
Bridges >=1.5m span supporting adopted roads	78
Footbridges >=1.5m span supporting adopted footpaths	14
Retaining Walls >=1.5m height supporting or adjacent to adopted highways	117
Culverts >=1.5m diameter for watercourses beneath adopted highways	35
Sign gantries	5
Subways	17
Tunnels	1
All highway structures	**267**

The gross value of these structures is £273.8M.

Stockport Council also monitors slopes providing structural support to highways across the Borough. As geotechnical investigations are carried out on these slopes are included within the structures database. The TAMS financial projection includes works required to be carried out on these slopes.

The Borough also has a large number of Steps which are being monitored and maintained as structures. These steps are being upgraded to meet modern guidance as necessary.

There are also a large number of structures supporting public rights of way and routes in parks and open space as detailed in **Table 2.4.1b** below:

Table 2.4.1b Other structures managed by Stockport Council

Structure type	Public Rights of Way	Parks and Open Space
Bridges >=1.5m span	0	7
Footbridges >=1.5m span	49	64
Retaining Walls >=1.5m height	1	84

Culverts >=1.5m	13	19
All highway structures	**63**	**174**

Long term investment strategies have not been developed for these structures and further work is required to include these within the scope of the TAMS financial model.

In addition to responsibilities for structures under Stockport Council's ownership, Stockport Council has a duty of care to undertake routine safety inspections on structures owned by other organisations that affect adopted highways, although this does not infer any duty to maintain those structures. However, Stockport Council has further responsibilities in relation to road and footbridges over railways and canals that are not under Stockport Council's ownership and these responsibilities can infer liabilities for some or all of the costs of strengthening works. These are discussed further in Section 2.4.3.2

2.4.2 Trends in investment and performance of Highway Bridges and Structures

Table 2.4.2a provides a summary of levels of investment in highway structures since 2007/08. This investment covers works delivered by Stockport Council although this includes the reconstruction of Belmont Bridge in 2007/08 which was undertaken on behalf of Network Rail as owners of the bridge and funded through a Central Government grant for Primary Route Network bridges.

The overall trend shows a period of elevated investment through until 2011/12, primarily from supplementary and major scheme funds from Central Government followed by a drop in funding to the basic levels provided through the block capital allocations. The elevated investments supported major works to stabilise the slope at Dan Bank in Marple and construct a piled wall to support the A626. Shortly afterwards £9M of major scheme funding was secured for major maintenance and reconstruction of over 50 highway retaining walls.

Figure 2.4.2a also presents total expenditure on physical works (excluding design and preliminaries) by the type of activity. Note that these works relate directly to reports from Principal Inspections of existing structures under Stockport Council's ownership and as such do not include the works on Belmont Bridge in 2007/08 construction of the piled wall at Dan Bank.

This chart shows that elevated investment has been primarily focused towards major remedial works to address deterioration and safety issues with some reconstruction (recognising the omission of Belmont Bridge and Dan Bank from the chart).

However, there are two areas of concern.

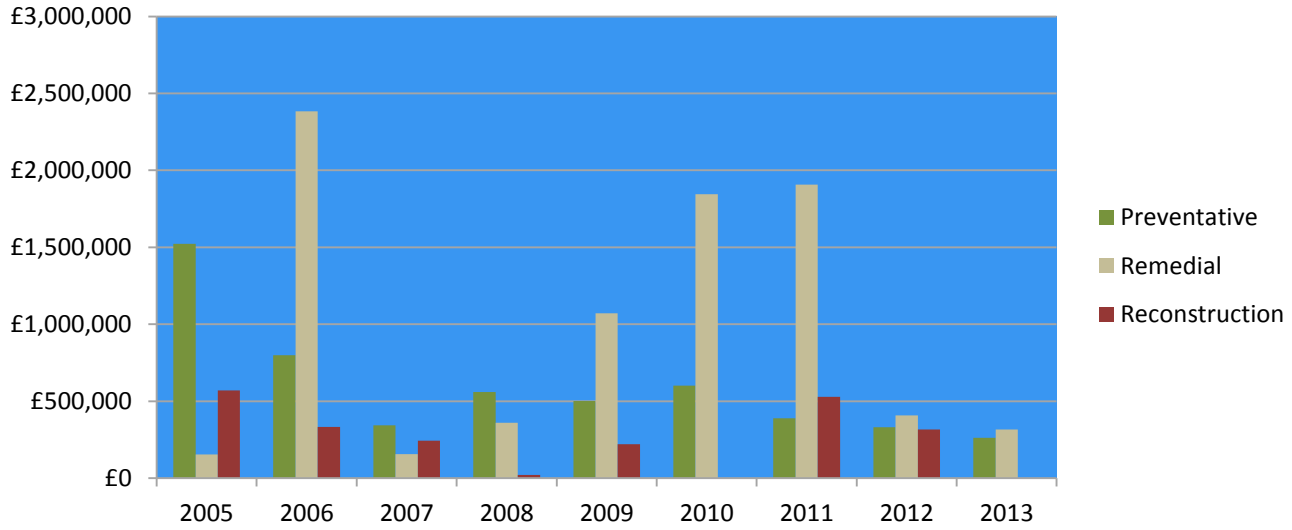
- The chart shows a general decline in the levels of preventative maintenance such as waterproofing, protective coatings and joint sealant replacement. With projected

Central Government allocations for structures unlikely to increase above £1.000M for the next spending review period, this general trend will inevitably continue without additional investment.

Table 2.4.2a Trend in capital spend for Highway Structures since 2007/08

	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15
	£m	£m	£m	£m	£m	£m	£m	£m
Highway Structures Programme	6.262	1.713	0.854	0.945	0.934	1.316	1.388	2.190
Dan Bank Slope Stabilisation		0.502	0.850	1.871				
Retaining Walls Major Scheme			2.839	3.858	2.185			
Total	**6.262**	**2.215**	**4.543**	**6.674**	**3.119**	**1.316**	**1.388**	**2.190**

Figure 2.4.2a Trend in physical works expenditure (excluding feasibility and design) by works type



- Since 2005 unit prices for major maintenance on highway structures have risen by more than 30%. This means that the trend in outturn expenditure shown in **Figure 2.4.2** conceals the true extent of decline in actual maintenance output.

Trends in the condition of bridges and structures are reported in **Table 2.4.2b** below. The condition indicators are produced according to a standard method (see reference (8)) using data on the condition of individual elements of a structure obtained from Principal Inspections (PI).

Table 2.4.2b Trends in condition indices for highway structures[15]

Indicator	2009	2010	2011	2012	2013
% of road bridges in poor condition (by surface area of bridge deck)	15.0%	10.5%	8.2%	3.8%	7.6%
% of footbridges in poor condition (by surface area of bridge deck)	15.1%	12.5%	14.7%	6.5%	10.6%
% of retaining walls in poor condition	18.9%	18.0%	14.2%	15.7%	13.5%
% of large culverts in poor condition	13.7%	12.7%	6.9%	13.7%	8.2%

These inspections take place on a 6 yearly cycle and only began to be recorded in the current system from 2005 so it is difficult to draw immediate conclusions from changes in figures from one year to the next. However, the indications are that there has been an improvement in the condition of all structure types since 2009 as a result of investments described above, and the indicators will provide a more reliable tool for monitoring structure condition as future PI cycles are completed.

However, these indicators only relate to the late stages of the structure lifecycle and do not demonstrate requirements for preventative interventions that ensure the longevity of the structures that was envisaged when they were originally designed.

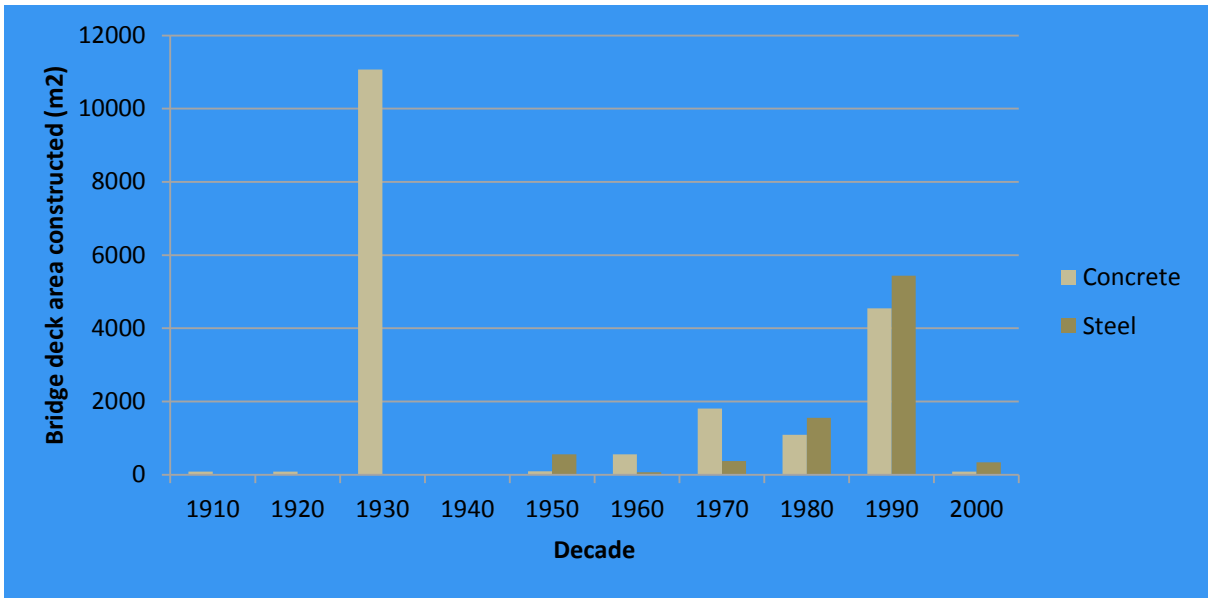
Figure 4.3.5 demonstrates the importance of this issue. The Figure shows the age profile of concrete and steel bridges in Stockport by the surface area of the bridge decks. The apparent peak in the 1930s is almost entirely due to the construction of Merseyway between 1935 and 1937. The other peak in the 1990s is linked to the construction of the A555, A34 and Crookilley Way. However there are a large number of smaller structures constructed in the 1960s, 70s and 80s.

Whilst concrete structures are designed to achieve a 120 year service life this is dependent on undertaking key lifecycle maintenance activities. A key intervention is the replacement of the waterproof seal across the concrete slab which should take place typically on a 40 year

[15] Structural condition is taken to be the condition of elements that are critical to the load bearing capacity of the structure

cycle. By implication we would expect to replace waterproofing on all concrete structures constructed in the 1930s, 1970s and 1980s over the next 20 years. If these waterproof seals are not replaced then there is a significant risk that many of these structures will reach critical condition by the end of the 20 year strategy, requiring far higher levels of investment than seen in recent years through supplementary and major scheme funding.

Figure 2.4.2b Age profile of concrete and steel bridges in Stockport



Conclusion for 2.4.2
Whilst there has been significant investment in renewal of structures between 2005 and 2012 this has concealed an underlying decline in key lifecycle maintenance activities that are required to ensure the longevity of structures due to pressures on funding for critical repairs. The result is that we currently have a growing backlog of preventative maintenance that needs to be addressed in order to avoid unaffordable costs towards the end of the 20 year period.

2.4.3 Future demands, risks and opportunities for Highway Structures Asset Investment Strategy

2.4.3.1 Climate change

As already mentioned, forecasts for Greater Manchester in the 2050s indicate that rainfall events leading to surface water flooding and high river flow will become more frequent. Heatwaves are also likely to become more frequent by the 2050s with most years experiencing at least 1-3 days with temperatures over 30°C. Less certain is the likely frequency of extreme cold weather, although recent experience of record breaking winter weather between 2010 and 2012 in the UK would suggest that we must be prepared for this risk over the next 20 years.

Given the strategic nature of many structures the risks posed by climate change are detailed in the strategic risk register in **Section 2.4.7.**

Engineering solutions to many of these problems are a matter of ensuring timely preventative interventions. However, it is clear from the previous section that current budgets do not enable this to happen. As a result our structures assets will become increasingly vulnerable to these growing risks.

In the case of bridges over rivers and a number of critical slopes in the east of Stockport there is a need for additional protection measures to prevent scour and erosion during periods of high river flow. Additionally, relatively low cost interventions to stabilise slopes by planting trees and shrubs will have benefits in terms of soil conservation and habitat enhancement.

2.4.3.2 Network rail and Canal and River Trust bridges

Road bridges and footbridges over railways and canals are owned and maintained respectively by Network Rail and the Canal and River Trust and as such do not fall within the scope of Stockport Council's highway infrastructure assets. However, in maintaining those bridges, Network Rail and the Canal and River Trust are only legally required to ensure that the bridges are designed to bear 24 tonne loading from traffic[16] which is far short of the requirements for modern traffic load bearing on highways[17]. The responsibility for meeting the remainder of the load bearing capacity for these bridges falls with Stockport Council for local highways in Stockport.

If, following an assessment, it is determined on the basis of design and current condition that the structure is insufficient to meet modern traffic loading requirements an arrangement for cost sharing is usually made on the basis of the relative extents to which the bridge fails to meet the respective requirements of each party.

[16] Contained within the Technical Memorandum (Bridges) No. BE4 The Assessment of Highway Bridges for Construction and Use Vehicles (1967) as amended up to 11th November 1970, Ministry of Transport

[17] BD21 The Assessment of Highway Bridges and Structures (DMRB 3.4.3) requires structures to meet 40 tonne load bearing capacity

Under existing arrangements Stockport Council is ~~unable~~ constrained it its ability to actively plan for long term investments in these structures and any future costs must be treated as a financial risk to the Council.

Whilst Stockport Council is aware of assessments to Network Rail bridges last undertaken in 2000, Stockport council does not currently have Network Rails condition results from its inspections most recently undertaken on these bridges. Of particular concern is the status of Greek St Bridge which traverses the West Coast Mainline to the south of Stockport Rail Station which had a number of issues raised about its load bearing capacity in its 2000 assessment. Network Rail currently hopes to address issues with this structure in 2017 however, until then it remains a risk to the success of the Town Centre Access Package. Stockport Council will seek to liaise with Network Rail on the current condition of the bridges and risks to the structure within the next 5-10 year time frame.

2.4.3.3 Town Centre Structures

The context of the Town Centre regeneration proposals and Town Centre Access Plan has been discussed in Section 1.5.8. There are a number of key structures that are central to future proposals for the Town Centre. Two structures in particular require major interventions to ensure continued performance beyond the 20 year strategy period.

Merseyway, is formed from a substantial system of reinforced portal frames with reinforced concrete slabs spanning across the River Mersey and supporting the central retail area with a total deck area of 9000m2. The structure currently requires continuous annual budgets in order to complete concrete repairs to the frames and slabs. Whilst these repairs should ensure continued structural performance of the structure for a further 40 years this is dependent on replacement of the transverse and longitudinal movement joints and application of a continuous waterproof system over the deck for the full extent of Merseyway.

Wellington Road Viaduct, which is a 140m long series of masonry arches supporting the A6 through the town centre. The waterproof system along the width and length of the viaduct requires replacement in order to avoid structural damage to the arches and damage to the infrastructure (electric sub-station) below.
Clearly any works to these structures and to Greek St Bridges mentioned above, will have significant impacts on accessibility to the Town Centre and so the timing is crucial. It is also important to consider the whole lifecycle options and future risks for these structures in detail to ensure that interventions provide optimum outcomes in terms of costs and benefits to the Town Centre economy

Other Structures

Queens Road Bridge, which was constructed in 1959 is a single span reinforced concrete bridge supported on mass concrete abutments which carries Queens Road over Micker Brook in the Cheadle Hulme area. The bridge was assessed in 1995 and it was concluded that the

bridge was only capable of carrying 17 tonne Assessment Live Loading (ALL) and a 7.5 tonne weight restriction was imposed on the bridge. In order to increase the capacity of the bridge to carry the full 40/44T ALL and 45 units of HB loading the bridge superstructure requires full replacement.

2.4.4 Forecasts of condition and performance of Highway Bridges and Structures

Preliminary forecasts have been undertaken to understand the likely budget requirements for lifecycle maintenance of our structures stock over the next 20 years (see Box 2.4.4) for an explanation of the forecasting method and outputs). This is described as Option 1 in Table 2.4.4 below and annual budget requirements are detailed in ANNEX 4. This was compared with a scenario in which we only follow a minimum intervention strategy to address structures with critical defects, described as the Business as Usual scenario below.

Table 2.4.4 Scenario forecasts for Highway Structures

Option	Description	% of structures in poor condition in 2034	Present value of costs to businesses and road users	BCR (internal costs only)	Full BCR
Option 1	Invest £25.12m over the period 2015/16 to 2022/23 to address a backlog of preventative and timely major maintenance interventions followed by an average annual spend of £2.56m (£1.63m in 2013 prices). 63% of capital spend is on preventative treatments to ensure that maximum design lives are achieved.	4%	£2m	5.5	13.1
Business as Usual	Continue with current approach and levels of planned investment at £1.2m per annum and 30% of spend on preventative maintenance. Within 10 years (by 2024) it will be necessary to find emergency funding for major concrete repairs and reconstruction of under-strength bridges.	9%	£34m		

The model outputs indicate that following a minimum intervention strategy (Business as Usual) will result in substantially higher maintenance costs over the 20 year period as we will need to undertake more expensive repairs to concrete and masonry structures. At the same time, owing to the fact that the minimum intervention strategy will inevitably be reactive this will result in the need for prolonged traffic restrictions to avoid significant safety risks. The present value of costs of traffic disruption to businesses, commuters and other road users is estimated at £34m over the 20 year period.

The model used for this edition of the TAMS is only able to provide us with an indication of scope and is not reliable enough to provide details on numbers of structures affected. Further work needs to be undertaken to develop a more robust model for these purposes.

Future programmes are being developed which will ensure that the existing backlog is addressed at a sufficient rate to enable us to anticipate deterioration on other structures in the medium term. The programme will includes a number of preventative measures such as scour protection, slope toe protection and deck waterproofing.

Conclusions for 2.4.4
Further work is required to validate and improve the model on which the 20 year forecasts are based. However, this provides scope and quantified evidence to direct the need for elevated investment in lifecycle maintenance activities and demonstrates that following a minimum intervention strategy will result in higher costs for the Council and tax payer.

Box 2.4.4. Explanation of highway structures forecasts and options

Structures deterioration model

The forecasts have been undertaken by adapting outputs from the Structures Asset Management Planning Toolkit produced by the UK Bridges Board using detailed data on Stockport's bridges and structures. This data includes information on structure elements and their current condition as well as other risk factors affecting deterioration and impacts of works and restrictions on traffic disruption.

The model forecasts deterioration taking account of uncertainty in deterioration rates and random events. It uses data on Stockport's forward works programme (up to 5 years in advance) after which the model uses predetermined decision rules to identify appropriate maintenance treatments according to a chosen strategy.

The deterioration models require further validation with historical and current data. Models should be reviewed on a regular basis as new data becomes available to ensure that risk forecasting is as reliable as possible.

Traffic delay costs

The model also uses information on the design features of structures to determine the type of traffic management required for different types of work and the typical levels of delay to road users. Total delays and congestion from closures and diversions have been estimated using a basic traffic model for a sample of 80 structures across Stockport. The costs of delays to businesses and road users have been calculated using standard parameters in the DfT's Transport Analysis Guidance (WebTAG).

How the scenarios are defined

In this assessment an investment strategy with 63% of capital spend on early life preventative interventions (for example waterproofing) was compared against a largely reactive approach which focuses annual programmes on structures in critical condition and only allows for 30% spend on preventative treatments. This reflects the situation that Stockport Council currently faces as we are unable to allocate sufficient funding to preventative treatments.

Assessment and modelling of investment options for structures requires a different approach to those for roads and footways. Structures can be assessed to be unsafe if load bearing elements deteriorate to an unacceptable condition. At this point engineering risk assessment is used to determine if traffic restrictions are required or even full closure of the road. Therefore the economic costs of a reactive approach to management of structures can be prohibitive to the extent that the Local Authority must seek emergency funds to address the problem.

In assessing the Business as Usual scenario we have not used current budgets as constraints

Box 2.4.4. Explanation of highway structures forecasts and options
but rather set the approach to prioritising works such that it reflects current practice. In this way it is demonstrated that continuation of current practice will lead to both unacceptably high costs to road users and also will directly affect the Council's own financial sustainability.
Value for money assessment
We have compared the present value of costs of Investment Option 1 with the Business as Usual approach to present Benefit Cost Ratios (BCR) to provide a measure of value for money. These are presented both in terms of the internal benefits and costs for the Council (or public accounts) and also as a full economic BCR to include a comparison of the wider costs to road users and businesses as a result of traffic delays.

2.4.5 Objectives for the Highway Structures Asset Investment Strategy

BO1 Achieve maximum design lives from our bridges and structures by undertaking necessary preventative and routine measures, subject to the need to limit disruption to traffic.

BO2 Ensure that interventions to address deterioration are early enough to avoid any need for prolonged restrictions or closures on any roads supported by bridges and retaining walls under Stockport Council's ownership. This is with the exception of restrictions for network management purposes and those in place for the duration of maintenance schemes.

BO3 Manage the condition of structures at the network level to ensure that there is sufficient in-built redundancy and network resilience in the event of an emergency or failure due to storm damage.

BO4 Ensure that necessary protection systems are installed to bridges, retaining walls and slopes to enable contingency for anticipated frequencies and intensities of storm events and fluvial flooding under current climate change projections.

BO5 Protect and enhance sensitive habitats that affect or are affected by our structures or slopes supporting roads.

BO6 Continue to meet recommended and best practice in the Code of Practice for Highway Bridges and Structures and other documents referenced therein.

BO7 Fulfil our Flood and Water Management Act obligations in relation to large culverts.

BO8 Reduce the level of lifecycle carbon emissions in structures maintenance operations and maximise the use of recycled materials where appropriate.

2.4.6 Highway Structures Asset Investment Strategy

Ref	Description	Relevant objectives
BS1	Pursue an elevated investment over the period 2015/16 to 2022/23 to address a backlog of preventative and timely major maintenance interventions. Secure funding to enable additional investment in structures in 2016/17. Use the indicative scope of £21m for 2017/18-2022/23 as shown in **ANNEX 4** to identify appropriate funding options through discussion with GMLTB and DfT. Review the forecast model to obtain a more accurate prediction of investment requirements over the period 2017/18-2022/23 and beyond.	**BO1 / BO2** **BO3 / BO4** **BO5**
BS2	Identify options to address the shortfall in average annual spend requirements from 2023 onwards. This is currently estimated at £2.56m (£1.63m in 2013 prices).	**BO1 / BO2** **BO3**
BS3	Allocate an average of 60% of expenditure on preventative and routine maintenance over the strategy period to ensure design lives are achieved	**BO1 / BO2** **BO3 / BO4** **BO5**
BS4	Undertake a network level study to review Stockport's register of critical structures. Ensure that it reflects risks, impacts and the need for built-in redundancy.	**BO3 / BO4** **BO7**
BS5	Establish appropriate targets within future delivery mechanisms for reducing lifecycle carbon emissions for structures maintenance schemes	**BO8**

2.4.7 Risk Register for Highway Structures Asset Investment Strategy

Ref	Description	Objectives affected	Impact score	Likelihood score	Overall risk	Mitigation
BR1	Failure to secure funding for the shortfall in structures investment requirements results in requirement for restrictions on a number of structures within the next 20 years	**BO1 / BO2** **BO3 / BO4** **CO3**	**4**	**3**	**High**	Consider alternative funding options. Engage with Local Authority Networks and DfT on the potential funding options for annual budget requirements Develop more refined risk models for critical structures and implement prioritisation framework to ensure that risks to those structures are addressed
BR2	Increased frequency and intensity of rain storms causes scour and undermines foundations on critical bridges over rivers and landslides on critical slopes	**BO1**	**4**	**2**	**High**	Implement programme of scour protection on river bridges
BR3	Network Rail bridge assessments identify liabilities for Stockport Council to fund works to meet load bearing requirements.	**BO1**	**2**	**3**	**Med**	In view of the criticality of some of the Network Rail structures to the Town Centre Access Package it is important to approach Network Rail to undertake closer collaboration with them on the results of their investigations.
BR3	Increase in average temperature and moisture leads to more rapid deterioration	**BO1**	**2**	**3**	**Med**	Undertake a review of the underlying deterioration models in 2015/16 to ensure

Ref	Description	Objectives affected	Impact score	Likelihood score	Overall risk	Mitigation
	of concrete structures (due to increased rate of carbonation etc.) beyond those accounted for in the financial forecast					that this is accounted for.

2.4.8 Monitoring of Highway Structures Asset Investment Strategy

Table 2.4.8 below provides a schedule for performance monitoring to be reported annually to the Transport Board.

Table 2.4.8 Schedule of performance monitoring for the Highway Structures Asset Investment Strategy

Indicator	Method
% of road bridges in poor condition (by surface area of bridge deck)	Annual reporting on basis of Principal Inspections. Use critical indicator scores weighted by deck area
% of footbridges in poor condition (by surface area of bridge deck)	Annual reporting on basis of Principal Inspections. Use critical indicator scores weighted by deck area
% of retaining walls in poor condition	Annual reporting on basis of Principal Inspections. Use critical indicator scores weighted by wall area
% of large culverts in poor condition	Annual reporting on basis of Principal Inspections. Use critical indicator scores weighted by supported area
No. of critical structures in poor condition	Annual reporting on basis of Principal Inspections. Use critical element condition indicator.
No. of days of traffic restrictions associated with under-strength structures	Annual reporting
Backlog of preventative maintenance (in £)	Annual reporting following Principal Inspections.

2.4.9 Review of the Highway Structures Asset Investment Strategy

Table 2.4.9 below provides the schedule for review of elements of the Highway Bridges and Structures Asset Investment Strategy. Owing to the dependency of the strategy on robust models for deterioration it is recommended that the full Asset Investment Strategy is reviewed in the light of the revision of the deterioration model for Executive approval.

Table 2.4.9 Schedule for Review of the Highway Structures Asset Investment Strategy

Section	Description	Time	Approval
2.4.4 **ANNEX 4**	Undertake a full review of the structures deterioration model to provide improved predictions for budget requirements for 2017/18 to 2022/23 and beyond.	March 2016	Executive
2.4.5 Objectives	Establish appropriate targets for reducing lifecycle carbon emissions	To align with timetable for new delivery framework (2016/17)	Executive portfolio holder
2.4.6 Strategy	Undertake a network level study to review Stockport's register of critical structures. Ensure that it reflects risks, impacts and the need for built-in redundancy.	March 2016	Executive

2.5 DRAINAGE ASSET INVESTMENT STRATEGY

2.5.1 Classification and Inventory

A summary of Stockport's drainage assets is provided in **Table 2.5.1** below. Whilst we are confident of the total number of road gullies continued investigations into complex drainage issues are revealing previously unaccounted for culverts and so we expect the numbers and lengths of culverts to increase rapidly in the next 2-3 years. and the introduction of Global Positioning System based computer tracking for gully emptying vehicles (Exactrak) has enabled the introduction of a fault response team for problem gullies addressing the hotspots identified by Exactrak data as well as investigations following Member/customer enquiries. Most drainage assets are hidden underground, with many of the historic plans and drawings no longer available and this is a common problem throughout the UK due to the age of some of the assets. We have made great strides over the last few years to locate and survey the extent of our drainage assets and our records have improved significantly. These surveys confirm that the highway drains are generally clogged-up with silt or are in need of repair which means they perform poorly especially during heavy rainfall which results in surface water not draining away properly both above and below the surface which can lead to flooding and also structural damage to the road, particularly through the winter months.

Table 2.5.1 Inventory and classification of drainage assets in Stockport

Asset type	No.	Length (km)
Carriageway gullies	72,214	
Culverts owned or part owned by Stockport Council	218	22.4
Culverts for which Stockport Council have Flood Management duties	368	26.4

2.5.2 Strategy

An investment strategy has not yet been prepared for Drainage assets. On the basis of the annual rate at which defects and capacity issues are emerging it is anticipated that an annual requirement of approximately £0.35m will be required for complex highway drainage works and investigations. However, further work is being undertaken to enable more detailed modelling of asset deterioration and risk using historical flood data and the surface water flood risk modelling undertaken for the purposes of the Greater Manchester Surface Water Management Plan.

There are still however, many miles of pipework and culverts yet to survey and these types of survey are relatively expensive to carry out. A planned programme of cleansing and repair is underway and our plan is to continue to survey / inspect our highway drains each year and record them using a GIS based system. Once we have a clearer picture of the size and condition of this asset we will be able to improve our long term plans to maintain and improve the drainage assets.

This is scheduled for development of the Drainage Asset Investment Strategy is given in **Table 2.5.2** below:

Table 2.5.2 Schedule for development of Drainage Asset Investment Strategy

Section to be reviewed	Description	Time	Approval
2.5 **ANNEX 4**	Develop Drainage Asset Investment Strategy	March 2016	Executive

2.6 STREET LIGHTING ASSET INVESTMENT STRATEGY

2.6.1 Classification and inventory of Street Lighting

Asset type	No. of columns
Rigid steel lighting columns	10,623
Stainless steel lighting columns	5,795
Concrete lighting columns	13,500
Decorative lighting columns	708
Cast iron lighting columns	376
Other lighting columns	2,139
Total	**33,141**

2.6.2 Trends in performance of Street Lighting

Table 2.6.2a Trend in condition and performance indicators for street lighting (confirm data)

Indicator	2009	2010	2011	2012	2013
% satisfaction with provision of street lighting					68.7%
% satisfaction with speed of repair to street lighting	60.1%	58.3%	58.6%	57.1%	60.4%

Indicator	2006	2007	2008	2009	2010	2011	2012	2013	2014
% of steel columns in poor condition	1.2%	2.4%	5.4%	2.5%	3.6%	N/A	N/A	1.9%	3.3%

2.6.3 Strategy

An asset investment strategy has not yet been prepared for Street Lighting assets. This is scheduled for development in the timetable below in **Table 2.6.3** below:

Table 2.6.3 Schedule for Review of the Street Lighting Asset Investment Strategy

Section	Description	Time	Approval
2.6.2	Undertake a comprehensive survey of asset condition and demand requirements	2015/16	N/A
2.6.3 ANNEX 4	Develop forecasting model to predict future budget requirements and investments	March 2016	Executive

2.7 PUBLIC RIGHTS OF WAY ASSET INVESTMENT STRATEGY

2.7.1 Classification and inventory of Public Rights of Way assets

A summary of Stockport's Public Rights of Way assets is given in **Table 2.7.1** below.

Table 2.7.1 Classification and inventory of Stockport's Public Rights of Way Assets

Asset type	Length (km)
Footpaths	249
Bridleways	163
Byways	25

2.7.2 Trends in performance of Public Rights of Way assets

Table 2.7.2 Rights of Way satisfaction indicators

Indicator	2009	2010	2011	2012	2013
% satisfaction with the condition of Rights of Way	54.1%	54.3%	56.8%	54%	52.9%
% satisfaction with the condition of Rights of Way: Respondents with long term disabilities		52.0%	51.7%	54.7%	47.6%
% satisfaction with the ease of use of Rights of Way for disable people: Respondents with long term disabilities		38.4%	40.4%	43.1%	41.8%

2.7.3 Strategy

A strategy has not yet been prepared for Public Rights of Way assets. This is scheduled for development in the timetable below in **Table 2.7.3** below:

Table 2.7.3 Schedule for review Public Rights of Way Asset Investment Strategy

Section	Description	Time	Approval
2.7.2	Undertake a comprehensive condition survey of assets including surfacing, drainage, stiles and signage	2015/16-2016/17	
ANNEX 4	Develop forecasting model to predict future budget requirements	March 2018	Executive

2.8 STREET FURNITURE ASSET INVESTMENT STRATEGY

2.8.1 Classification and inventory of street furniture assets

A summary of Stockport's street furniture assets is provided in **Table 2.8.1** below.

Table 2.8.1 Classification and inventory of Stockport's street furniture assets.

Asset type	No.
Illuminated traffic signs	3,310
Illuminated bollards	3,052
Non-illuminated signs	15,165
Non-illuminated bollards	10,278
Benches	270
Pedestrian dropped crossing points (with tactile paving)	1980

2.8.2 Trends in performance of street furniture assets

Table 2.8.2 Trend in condition and performance indicators for street furniture (Confirm Data)

Indicator	2009	2010	2011	2012	2013
% of signs in poor condition					2.3%
% of bollards in poor condition					2.9%
% satisfaction with condition and cleanliness of signs	62.4%	60.2%	61.3%	57.9%	59.9%

2.8.3 Strategy

An Asset Investment Strategy has not yet been prepared for Street Furniture assets. This is scheduled for development in the timetable below in **Table 2.8.3** below:

Table 2.8.3 Schedule for review Street Furniture Asset Investment Strategy

Section	Description	Time	Approval
2.8 ANNEX 4	Develop Street Furniture Asset Investment Strategy	March 2018	Executive

2.9 HIGHWAYS GREEN INFRASTRUCTURE ASSETS STRATEGY

2.9.1 Classification and inventory of highways green infrastructure assets

A summary of Stockport's highways green infrastructure assets is provided in Table 2.9.1 below.

Table 2.9.1 Classification and inventory of Stockport's highways green infrastructure assets.

Asset type	No.	Surface Area (m^2)
Highway Verge		968793
Highway Trees	15255	

2.9.2 Trends in performance of highways green infrastructure assets

Currently no trend in condition and performance indicators for highways green infrastructure

2.9.3 Strategy

An Asset Investment Strategy has not yet been prepared for Highway Green Infrastructure assets. This is scheduled for development in the timetable below in **Table 2.9.3** below:

Table 2.9.3 Schedule for review Highway Green Infrastructure Asset Investment Strategy

Section	Description	Time	Approval
2.9	Develop Highway Green Infrastructure Asset Investment Strategy	March 2018	Executive

PART 3 PERFORMANCE PLAN

3.1 OUTLINE

This section provides an outline of the corporate processes required to support asset management. The section is laid out as follows:

SECTION 3.2 PRIORITISATION FRAMEWORK

Provides the decision making criteria for prioritising physical works including our approach to managing critical risks. This will be applied in the development of rolling 5 year forward works programmes.

SECTION 3.3 FINANCIAL REPORTING

This section summarises financial reporting requirements through the Whole of Government Accounts process, associated actions and an estimate of capacity and resources required.

SECTION 3.4 ASSET INFORMATION MANAGEMENT

This section summarises requirements in relevant standards within BS1192 for Asset Information Management with an estimate of resources required and timescales.

3.2 PRIORITISATION FRAMEWORK

3.2.1 Guiding principles

3.2.1.1 Delivering the optimum service

There will never be sufficient resources to undertake every maintenance operation that is identified through inspections and condition assessments in the desired time frame. The investment options identified in the Asset Investment Strategies take this into account by working towards optimum levels of service rather than simply quantifying everything that needs doing. However, the forecasting models used for TAMS are primarily reliability or risk-based and as such cannot take into account all the localised factors associated with a potential scheme that are relevant to the strategy objectives in the TAMS.

With the optimum levels of investment identified through the forecast models, the prioritisation framework is then required to enable decisions on which physical works should be included in medium term plans and which should be deferred or even not undertaken at all. This should ensure that the optimum outcome is achieved taking into account the TAMS strategy objectives.

This framework does not prescribe in detail the tools that should be used and weightings to be applied to criteria. The aim of this document is to enable a practicable, consistent and systematic approach to assessing critical risks and applying value engineering criteria across all asset types. However, where multiple options are identified for a large number of schemes it may be necessary to employ the use of optimisation programs to avoid the need for excessive staff resources in preparation.

3.2.1.2 Application to capital maintenance works

The framework applies to capital works that have a function in:

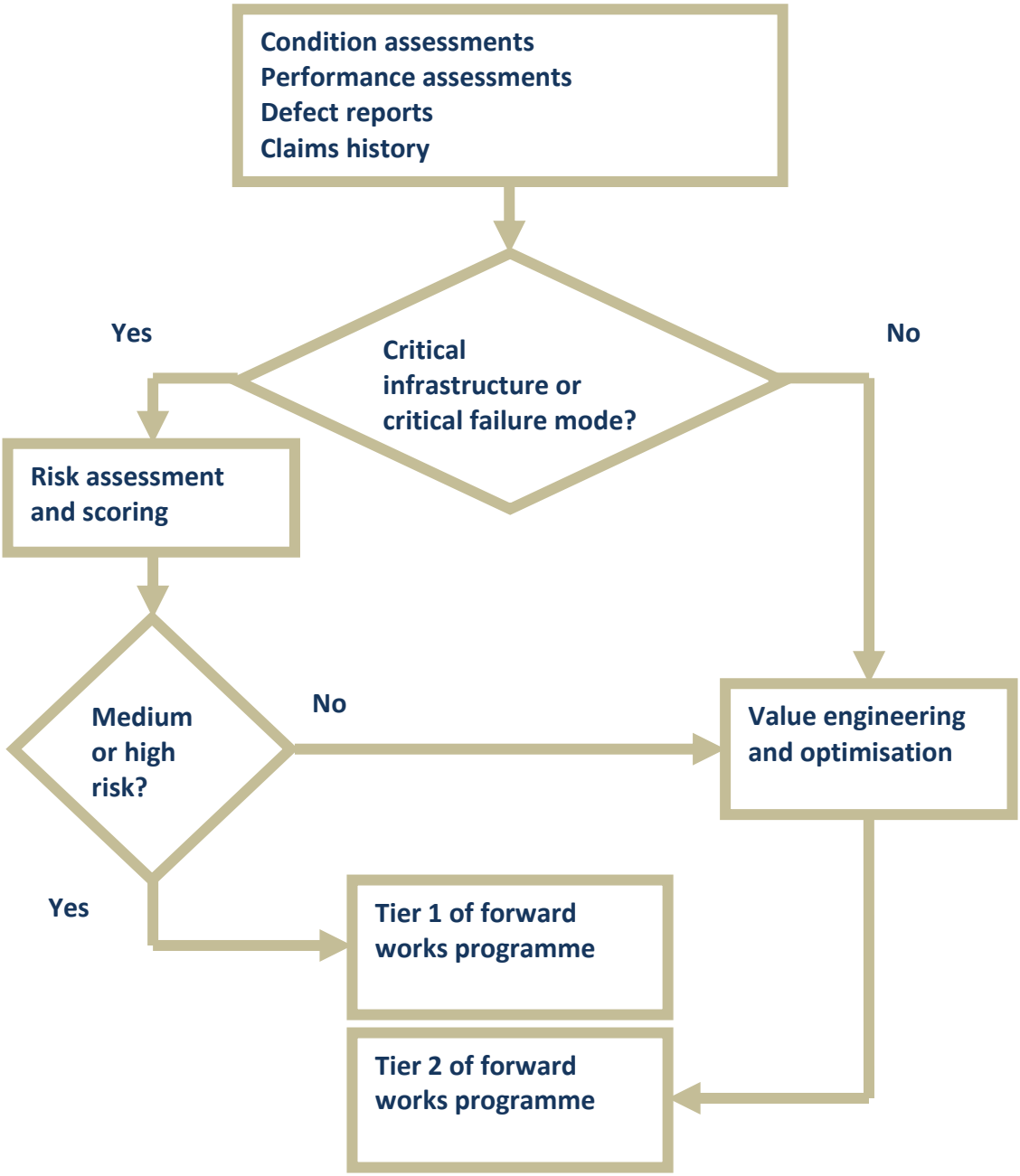
- Enhancing performance for example by reducing failure risks, providing better ride quality or more reliable journey times or
- Extending its life by reducing deterioration rates and improving the long term economic performance of the asset

This is distinct from reactive works that deal directly with the consequences of failures and seek to minimise harm caused by them. Although the definitions are not always clear cut, reactive works are not expected to reduce the risk of failure happening again over the planning period and do not improve the economic performance of the asset. Prioritisation methods for reactive works are detailed in relevant operational policies, such as the Highway Inspection and Repair Policy and Codes of Practice and do not form part of this framework.

3.2.2 Two-tier process

The framework uses a two-tier process. The first tier contains scheme proposals that are associated with specific critical infrastructure or potential critical failure modes where the risks associated with not undertaking the scheme are scored as high or medium. The second tier contains the remaining scheme proposals that have been selected through a value engineering process. This process is summarised in **Figure 3.1.2** below.

Figure 3.2.2 Two-tier programme development process



3.2.3 Tier 1 Prioritisation

Table 3.2.3 provides criteria for use of standard condition inspections and assessments to select scheme options for detailed risk assessment and scoring.

Table 3.2.3 Criteria for selection of options for risk assessment in Tier 1

Asset type	Potential failure mode	Critical locations
Roads	Skid resistance below investigatory level (to be reviewed in Skid Resistance Policy)	1. 50m approaches to pedestrian crossings and SCP points on all major roads 2. 50m approaches to signalised junctions on major roads 3. Major road roundabouts 4. Single 30mph major roads with bend radius of <250m or gradient of >10% 5. Single 40mph major roads with bend radius <500m or gradient of >10%
Roads	Sections of road of any class where there is recent evidence from police reports of road accidents where skidding is identified as a factor and where inadequate skid resistance is verified through on-site assessment (pendulum test or other)	Any
Roads	Sections of road with Grade 4 or 5 where there have been accidents in which road condition has been identified as a potential factor	Any
Pavements	Sections of pavement in Grade 4 or 5 where condition, width and crossfall are such that people with mobility difficulties may attempt to divert onto the road	Any pavements with no alternative on the other side of the road Category 1a, 1 or 2 pavements Pavements adjacent to strategic, main distributor, secondary distributor or local link roads
Highway Bridges and Structures	Scour protection not in place	All bridges over main rivers supporting strategic, main distributor and secondary distributor roads

Table 3.2.3 Criteria for selection of options for risk assessment in Tier 1

Asset type	Potential failure mode	Critical locations
Highway Bridges and Structures	Slopes identified as vulnerable to heave	1. Slopes supporting or adjacent to main distributor roads 2. Slopes supporting or adjacent to Secondary distributor roads 3. Slopes supporting or adjacent to routes for which there is no alternative diversion
Highway Bridges and Structures	Load bearing element (including foundations) with condition score of 5	1. Structures supporting or adjacent to Strategic roads 2. Structures supporting or adjacent to Main distributor roads 3. Structures supporting or adjacent to Secondary distributor roads 4. Structures supporting or adjacent to routes for which there is no alternative diversion 5. Structures directly affecting residential or business and retail premises
Drainage	All investigations	Any
Street lighting	All columns identified through ultrasound testing (for steel) or visual assessment as requiring return assessment within 1 or 3 years	1. Elevated sites exposed in the W or SW direction 2. Category 1a, 1 or 2 pavements
Street lighting	Concrete columns with steel sleeves where corrosion or spalling is evident at the join	1. Elevated sites exposed in the W or SW direction 2. Category 1a, 1 or 2 pavements
Street furniture	All double pole signs with pole condition identified as poor or where corrosion is evident	1. Elevated sites with sign face exposed in the W or SW direction 2. Category 1a, 1 or 2 pavements

Items identified through the criteria in **Table 3.2.3** are assessed using the standard scoring matrix as outlined in Stockport Council's **Risk Management Framework**.

Criteria for impact scoring are as follows:

Table 3.2.3.2 Impact scores

Impact	1	2	3	4
Safety		Potential for slight injury		Potential for serious injury or loss of life
Third party damage	Damage to vehicles	Damage to unbuilt land	Damage to up to 20 properties or to utilities in built up area	Damage to more than 20 properties
Economy		Temporary disruption to business and retail	Relocation or closure of 1-5 retail units	Closure of retail area for longer than 6 months
Accessibility		Closure of rural local access route with no alternative diversion route	Prolonged severe delays (>5000veh hrs additional journey time per day) for longer than 6 months	Severe delays (>10000veh hrs additional journey time per day) for longer than 6 months
Environment		Visual impact or temporary environmental nuisance	Disruption to designated site	Loss of habitat in designated site or major pollution incident

In order to provide a meaningful likelihood score it is necessary to recognise changing levels of risk over time due to deterioration. Table 3.1.3.3 provides a matrix for determining the appropriate likelihood score given different time horizons. This will enable a more reasoned judgement by engineers as well as the ability to use reliability models estimated from local data.

Risks are then scored using the standard Impact × Likelihood matrix as in **Table 3.2.3.4**.

Any risks assessed as high or medium are included in Tier 1 of the Forward Works Programme. The schemes are allocated in the earliest possible year subject to network management constraints and co-ordination with other works. Other schemes assessed as low criticality are then passed to the main value engineering process as described in the next section.

Table 3.2.3.3 Likelihood scoring matrix

	1	2	3	4
Likelihood within next 5 years	Negligible chance (<1% chance)	Low likelihood (≥1% chance)	Could happen (≥5% chance)	Highly likely (≥50% chance)
Likelihood within next 10 years	Low likelihood (≥1% chance)	Could happen (≥5% chance)	Highly likely (≥50% chance)	
Likelihood within next 20 years	Could happen (≥5% chance)	Highly likely (≥50% chance)		

Table 3.2.3.4 Impact × Likelihood Matrix

Impact	Likelihood			
	1	2	3	4
4	4=Low	8=Medium	12=High	16=High
3	3=Low	6=Medium	9=Medium	12=High
2	2=Low	4=Low	6=Medium	8=Medium
1	1=Low	2=Low	3=Low	4=Low

3.2.4 Tier 2 Value Engineering

The value engineering process is designed to enable effective prioritisation of a large number of schemes in a transparent manner. The purpose of the exercise is to obtain the best result from the programme in terms of the TAMS objectives.

As this involves balancing of a number of objectives and criteria inevitably this will require the application of weightings to obtain a comparable score for each proposal. It is not appropriate to provide the detail here on the weightings to be applied or the manner in which scores are calculated. In keeping with the aim of ensuring transparency these should be regularly reviewed and described in the annual capital programme reports.

Table 3.1.4 outlines the key criteria to be measured for scheme proposals.

Conclusion for 3.2
The two-tier approach described in 3.1.3 and 3.1.4 will be adopted for the prioritisation and scheduling of schemes in the development of rolling 5 year programmes.

Table 3.2.4 Value engineering criteria

Objective	Roads	Pavements and surfaced footpaths	Highway bridges and structures
CO1 To ensure that risks to the safety and well-being of current and future users of Stockport's transport network are minimised	Skid resistance below investigatory level in high risk site % coverage of condition Grade 4 or 5 within scheme length No of reported safety defects related to deterioration of road surface (including around iron work etc) in preceding year No of damage claims in preceding year No of injury claims in preceding year	% coverage of condition Grade 4 or 5 within scheme length No of reported safety defects related to deterioration of pavement surface in preceding year No of damage claims in preceding year No of injury claims in preceding year	Maximum Element Condition Score for load bearing elements Structure Condition Indicator (weighted for all elements) Parapet condition score for bridges and retaining walls with approach bend radius <250m (30mph) and <500m (40+mph)
CO2 To ensure that service level options do not result in higher and unaffordable future costs to rate payers, businesses and road users during and beyond the 20 year strategy period	Treatment service life (Mean Time to Failure or incremental failure risk) Estimated cost of deferred maintenance option Estimated timing of deferred maintenance option (to produce Present Value estimate)	Treatment service life (Mean Time to Failure or incremental failure risk) Estimated cost of deferred maintenance option Estimated timing of deferred maintenance option (to produce Present Value estimate)	Treatment service life (Mean Time to Failure or incremental failure risk) Estimated cost of deferred maintenance option Estimated timing of deferred maintenance option (to produce Present Value estimate)
CO3 To ensure that the condition of our transport network is maintained to a level that minimises risk of disruption to traffic particularly as a result of extreme weather events	Road class (as defined in **Table 2.2.1**) No alternative routes available or alternative route also in poor condition No of TM days for current proposal No of TM days for deferred proposal Potential to share TM with nearby proposal Conflict with another scheme (alternative route)	Pavement class (as defined in **Table 2.2.1a**) No pavement on other side of road No dropped crossings on other side of road	Road class of supported or crossed route (as defined in **Table 2.2.1**) Structure affects adjacent residential or business premises Structure affects flood risk to nearby highway or properties Proposal addresses vulnerability to scour, erosion or heave No alternative routes available or alternative route also in poor condition
CO4 To minimise the diversion of budgets away from maintenance to third party payouts for damage or injury	No of damage claims in preceding year No of injury claims in preceding year	No of damage claims in preceding year No of injury claims in preceding year	
CO5 To build financial resilience to the effects of rising raw material prices through our lifecycle management plans for transport infrastructure	Potential use of recycled materials	Potential use of recycled materials	Potential use of recycled materials

Objective	Roads	Pavements and surfaced footpaths	Highway bridges and structures
CO6 To ensure that the condition and appearance of our public realm encourages walking and cycling and enables people with mobility and sensory impairments to get out and about independently		Cycle path Aesthetic walking route	
CO7 To ensure that the condition of our public realm in retail and employment centres is maintained to a level that can contribute to retaining and attracting inward investment and new businesses	Retail centre Employment centre Potential to use CIL/s106	Retail centre Employment centre Potential to use CIL/s106	Retail centre Employment centre Potential to use CIL/s106
CO8 To ensure that the condition and appearance of the public realm in Priority 1 and 2 areas is maintained such that it supports regeneration and community development	Priority 1 Regeneration Area Priority 2 Regeneration Area	Priority 1 Regeneration Area Priority 2 Regeneration Area	Priority 1 Regeneration Area Priority 2 Regeneration Area
CO9 To protect and enhance the local natural environment in areas where our infrastructure both impacts on and depends on sensitive habitats	Proposal reduces traffic noise in sensitive area		Proposal enhances local natural environment through vegetating slopes Proposal prevents habitat loss through preventing erosion and heave
CO10 To minimise the contribution of poor road condition to traffic noise in sensitive areas	Priority 1 location for noise action plan Priority 2 location for noise action plan		
CO11 To reduce lifecycle carbon emissions from maintenance operations and in the production and transport of materials in the supply chain to reflect the ambition held within GMLTP3 and Construction 2025	Carbon emissions from treatment Potential to trial innovative new materials or methods	Carbon emissions from treatment Potential to trial innovative new materials or methods	Carbon emissions from treatment Potential to trial innovative new materials or methods

3.3 FINANCIAL REPORTING

The Code of Practice on Transport Infrastructure Assets (CIPFA, 2013) requires Local Authorities to adopt an asset management approach to financial reporting from 2017 onwards. This involves a fully audited statement of the depreciated value of our transport assets ensuring that Local Authorities comply with the requirements of Government policy on Whole of Government Accounts, International Financial Reporting Standards (IFRS) and International Accounting Standard 16 (IAS16), which have been adopted in the UK as of 2010/11.

The Code is therefore one of the driving forces behind ongoing changes to our asset management systems including the need to improve the accuracy and reliability of data on physical condition, maintenance costs and risks to enable an accurate representation of the current value of our assets and associated financial liabilities (see **Section 3.4** next).

There are specific requirements within the Code that require significantly different approaches to accounting from the current practice:

1. Valuation of assets needs to reflect the condition or level of performance of the asset. This is a requirement of HMT policy.
2. Consequently, in year changes in value must also reflect any improvements or deterioration in asset performance. This requires the same deterioration models as used in the forecasts for the Asset Investment Strategies. In line with IAS16, in year changes may be calculated through the subtraction of annual depreciation and addition of capital investment, or through periodic full revaluations.
3. As a requirement of IAS16, all assets must be identified as individual physical components in a database, and their value and in-year depreciation accounted for individually as per IFRS requirements. This requirement holds insofar as the attributes, performance and environment of the asset are unique and thus assets that are effectively identical should be identified as a single group.

Local Authorities are required to produce three indicators for the valuation:

1. Gross Replacement Cost (**GRC**)
2. Depreciated Replacement Cost (**DRC**)
3. Annualised Depreciation (**AD**)

Definitions of these terms are given in the glossary in **ANNEX 1**. The calculation of AD is the most crucial aspect of this exercise. If capital expenditure does not at least equal the value of AD then the annual return will show a reduction in the value of the asset.

Conclusion for 3.3
The WGA returns will be subject to independent audit as part of the overall audit of the Council's **closing book accounts for 2016/17** onwards (June 2017). By implication this requires all systems for reporting to be in place for the calculation of 2015/16 closing book accounts (**June 2016**) as these must be restated for the following year. **Additional resources (to be estimated) will be required to enable these systems to be implemented.**

3.4 ASSET INFORMATION MANAGEMENT

3.4.1 The purpose of Asset Information Management

The delivery and review of the TAMS and associated performance management processes will require reliable and accurate spatial data on asset performance, risks and event histories. In particular, asset data should be captured and held in formats that enable the management of the long term performance of transport assets.

3.4.2 Requirements for Asset Information Management

Most of the information that is required for strategic asset management planning should also be relevant for effective operational management. However, strategic asset management planning requires that data from numerous operational processes are readily available through a central data hub and can be queried at a network level or for different asset types.

The 2014 publication of the Publicly Available Standard (PAS) 1192-3:2014 provides a framework for development of an Asset Information Model to support the delivery of the TAMS. This ensures that all asset information is held in formats that enable transfer, storage and querying. The standard requires that business information requirements are clearly identified and translated into asset information requirements. The asset information requirements should then direct the development of an **Asset Information Model**.

Importantly, the development of an Asset Information Model will enable Stockport Council and its partners to meet requirements for **Building Information Modelling (BIM)** which will be mandated for all public sector construction projects from 2016. These requirements relate to the transfer of data on new infrastructure by contractors or partners. However, by implication it also requires that Stockport Council as client has an established Asset Information Model that will direct the specification of the information to be provided on new infrastructure.

With growing pressures on Council staff resources the Asset Information Model must enable effective communication of information without dependence on individual system super-users and prevent limited time and resources being wasted in locating critical asset information. Through the Local Information System project, Stockport Council has already developed a firm basis of ICT infrastructure to enable work to progress towards these ends. However, an Asset Information Management Plan will be required to direct the development of an Asset Information Model to support the business needs of the TAMS.

The highway network is of significant interest to the public and the media particularly during challenging weather conditions and resulting damage to the highway network which often provide the focus for significant national and local media coverage. Due to the trend towards transparency in the public sector we are developing a GIS based Local Information System and focusing on providing clarity and transparency in how we make decisions in the identification, assessment, programming and delivery of asset management activities, including maintenance works, and how the public are/will be involved in making decisions for the service provided by the network.

Conclusion for 3.4
An Asset Information Management Plan will be developed that provides detail on the

Information Requirements for business processes associated with the delivery of the TAMS.

ANNEX 1 GLOSSARY OF TERMS AND ACRONYMS

Acronym/ Term	Explanation
A6 MARR	A6 Manchester Airport Relief Road. This is due for completion of construction in 2017.
ALARM Survey	Annual Local Authority Road Maintenance Survey. This is carried out by the Asphalt Industry Alliance. The 2014 survey can be found at this link http://www.asphaltindustryalliance.com/images/library/files/ALARM_Survey_2014.pdf
Annualised Depreciation	This is a measure of in-year change in value due to deterioration of the infrastructure. This is taken as the average annual spend required to maintain the asset in a serviceable condition. At its most basic level this is calculated by taking the According to Section 7.4 of the Code of Practice on Transport Infrastructure Assets where it is possible to quantify risks due to extreme events (such as prolonged snow cover) these costs need also to be incorporated in the depreciation cost, although the repairs must be permanent and restore the service potential of the asset. In basic terms it is calculated as the total cost interventions in the **lifecycle plan** divided by the number of years in the lifecycle.
Backlog	A maintenance backlog is defined here as the total value of accumulated remedial works to assets that are determined to be in an unacceptable condition and beyond the tolerance levels identified in individual asset lifecycle models.
CIL	Community Infrastructure Levy. The CIL has been introduced nationally to provide a transparent mechanism for the use of developer contributions to key infrastructure schemes.
CVI	Coarse Visual Inspection. This is a road condition survey undertaken from a moving vehicle. This was previously required for the production of national road condition indicators for local unclassified roads.
DMRB	Design Manual for Roads and Bridges. This suite of documents contains EU and UK standards for design, construction, assessment and maintenance of trunk roads. Many of the standards are equally applicable to local highway authority infrastructure. http://www.standardsforhighways.co.uk/dmrb/
Depreciated Replacement Cost (DRC)	The depreciated replacement cost is simply taken as difference between the Gross Replacement Cost and total value of works that would be required to bring the infrastructure in its current state back

	to 'as new' condition. The DRC method is accepted internationally as the most appropriate for the purposes of valuation of public infrastructure assets that have no equivalent or comparable market value.
Footway	This is the formal term to describe pedestrian routes at the side of roads. In this document we use the familiar term 'pavement' although this is used in engineering terminology to describe the physical structure of the road or footway (including lower layers).
GMLTP3	Third Greater Manchester Local Transport Plan
Gross Replacement Cost (GRC)	The Gross Replacement Cost represents a total value of the asset in a theoretical 'as new' condition. As most transport assets do not have specific market value through acquisition and disposal, it is assumed that their value is embodied in the cost of replacing the full asset (such as reconstruction of a stretch of road), hence the term 'Replacement Cost' is used.
IAS 16	International Accounting Standard 16. IAS16 sets out specific requirements for accounting of physical assets including accounting for individually identifiable assets including depreciation and revaluation.
IFRS	International Financial Reporting Standards. These standards were formally adopted by the UK in 2010/11. These confer a requirement to adopt IAS 16 (as above).
Lifecycle plan	A forecast of the maintenance requirements of an asset throughout its entire lifecycle. For some assets the total period of the lifecycle may be the time that elapses before an asset is to be replaced. For many assets such as road pavements this is defined as the time that elapses between major maintenance interventions (such as resurfacing or reconstruction). The lifecycle plan then details the maintenance requirements including the nature, timing and cost of interventions within that time period. These interventions must not include temporary emergency repairs, but must maintain the service potential or extend the life of the asset (such as through preventative maintenance).
LGV	Light Goods Vehicle
NHT	National Highways and Transport Public Satisfaction Survey. This is a survey of public satisfaction within individual participating authorities to assist in measuring performance and prioritisation of highways and transportation services and enable benchmarking across highway authorities. In 2010 a total of 95 authorities took part. The TAMS draws evidence from this survey in relation to highway infrastructure management aspects.
Pavement	In this document we use the term pavements in a familiar sense to refer to road side pedestrian routes with a formal surface

	that is either bound (with bitumen binder or concrete) or modular (such as with flags or block paving). In other planning documents the term 'footway' is used instead of 'pavement', and in fact the term 'pavement' is used in engineering terms to represent the physical structure of the highway surface and underlying layers on both footways and carriageways
Preventative maintenance	Maintenance operations undertaken before the onset of significant deterioration in the condition of an asset to extend the useful life before more expensive structural maintenance is required. As such it is a critical part of a sustainable investment strategy for highways in particular.
PRN	Primary Route Network. This is a network of roads carrying high proportions of regional, national and international traffic. There are specific requirements for freight loading capacity on structures on these routes.
SCANNER	Surface Condition Assessment for the National Network of Roads. SCANNER surveys use automated road condition measurements machines to measure a range of road condition parameters including ride quality, rut depth, intensity of cracking, texture depth and edge condition. These were previously required for use in the production of the National Indicators for road condition.
Structural maintenance	This refers to major maintenance of a road or footway involving renewal of one or more layers of the road pavement structure.
UKPMS	UK Pavement Management System. This is an accreditation system for road and footway condition surveys including Scanner machine surveys and Course and Detailed Visual Inspections and associated software to process the data. A key function previously was to produce national road and footway condition indicators although it is no longer a requirement to use UKPMS for this purpose.
Whole Life Cost	This is the total cost associated with an asset over the entire period of the lifecycle plan including quantifiable risks associated with the asset and subsequent reactive maintenance requirements.

ANNEX 2 REFERENCES

Standards

(1). Institute of Asset Management IAM (2008) Publicly Available Specification (PAS) 55-1:2008 Specification for the optimized management of physical assets
(2). BSI (2014) BS ISO55000:2014 Asset Management
(3). BSI (2013) PAS 1192-2:2013 Specification for information management for the capital/delivery phase of construction projects using building information modelling
(4). BSI (2014) PAS 1192-3:2014 Specification for information management for the operational phase of assets using building information modelling

Codes of Practice

(5). **Well-Maintained Highways (2005, updated 2013)**: A Code of Practice for Highways Maintenance Management (updated 2013)
(6). **Management of Highway Structures (2005, updated 2013**: A Code of Practice for Highway Bridges and Structures (updated 2013)
(7). **Well-lit Highways (2004, updated 2013)** A Code of Practice for Highways Lighting Management
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(22). Global Construction Perspectives and Oxford Economics (2013) Global Construction 2025

ANNEX 3 SUMMARY OF STOCKPORT'S TRANSPORT ASSETS

Asset type	Gross Value (£M)	Depreciation Rate (£M per Annum)	Net Value (£M)	Asset sub-category	No.	Length (km)	Surface area (m^2)
Roads	£1,106.0	£3.9	£1,023.1	Principal (A) Roads		102.45	952,167
				B Roads		37.18	327,489
				Other classified (C) Roads		38.86	312,641
				Unclassified		765.90	4,853,653
				Total		**944.39**	**6,445,951**
Pavements and footpaths	£241.0	£1.4	£214.6	1a (Prestige) footways		10.14	28,730
				1 (Other town and district centre) footways		28.79	81,377
				2 (High usage urban) footways		196.70	529,067
				3 – Important links to local facilities		300.08	666,216
				4 – Other residential footways and footpaths		965.89	2,097,624
				Total		**1,501.59**	**3,403,015**
Public Rights of Way				Footpaths		249	
				Bridleways		163	
				Byways		25	

Asset type	Gross Value (£M)	Depreciation Rate (£M per Annum)	Net Value (£M)	Asset sub-category	No.	Length (km)	Surface area (m^2)
Cycle facilities[18]				Cycle lanes		13.7	
				On road segregated cycle paths		6.3	
				Off road cycle paths		47.1	
				Advanced Stop Lines	582		
Structures	£273.8	£3.3	£203.9	Bridges	78		
				Footbridges	14		
				Retaining Walls	117		
				Culverts (>1.5m span)	35		
				Sign gantries	5		
				Subways	17		
				Tunnels	1		
Street lighting	£61.0	£1.5	£20.7	Rigid steel lighting columns	10,623		
				Stainless steel lighting columns	5,795		
				Concrete lighting columns	13,500		
				Decorative lighting columns	708		
				Cast iron lighting columns	376		

[18] Cycle network lengths are included within the road and pavement/ footpath lengths as appropriate

Asset type	Gross Value (£M)	Depreciation Rate (£M per Annum)	Net Value (£M)	Asset sub-category	No.	Length (km)	Surface area (m^2)
				Other lighting columns	2,139		
				Total	**33,141**		
Drainage				Carriageway gullies	72,214		
				Culverts owned or part owned by Stockport Council	218	22.4	
				Culverts for which Stockport Council have Flood Management duties	368	26.4	
Street furniture	£4.9	£0.25	£2.9	Illuminated traffic signs	3,310		
				Illuminated bollards	3,052		
				Non-illuminated signs	15,165		
				Non-illuminated bollards	10,278		
				Benches	270		
				Pedestrian dropped crossing points (with tactile paving)	1980		
Verges and trees				Verges			968,793
				Trees	15,255		
TOTALS	**£1,686.7**	**£10.4**	**£1,465.2**				

ANNEX 4 INVESTMENT PROJECTIONS, AVAILABLE FUNDS AND SHORTFALL (INCLUDING INFLATION)

Asset Investment Strategy	15/16	16/17	17/18	18/19	19/20	20/21	21/22	22/23	TOTAL	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33	33/34
	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m	£m
	Approved HIP								TOTAL	Expenditure required to keep the highways at a steady state of repair:										
Highways Investment Programme (HIP)																				
Roads	7.44	7.22	7.24	7.21	7.16	6.97	6.62	3.47	**53.33**	5.10	5.23	5.34	5.51	5.76	6.02	6.35	6.63	6.95	7.33	7.63
Pavements	4.54	4.70	4.87	5.05	5.21	5.37	5.54	2.24	**37.52**	2.50	2.62	2.75	2.88	3.02	3.16	3.29	3.41	3.53	3.66	3.80
Programme Management	0.39	0.40	0.42	0.43	0.44	0.46	0.47	0.36	**3.37**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL HIP	**12.37**	**12.32**	**12.53**	**12.69**	**12.81**	**12.80**	**12.63**	**6.07**	**94.22**	**7.60**	**7.85**	**8.09**	**8.39**	**8.78**	**9.18**	**9.64**	**10.04**	**10.48**	**10.99**	**11.43**
note: total spending on HIP is £100m including 2014/15 expenditure																				
	Expenditure required to deal with the issues in Structure, Street Lighting & Drainage (does not equate to actual budget available)																			
Structures	1.04	3.11	2.85	3.28	3.98	3.68	3.60	3.72	**25.26**	2.15	2.22	2.29	2.36	2.43	2.51	2.59	2.67	2.75	2.84	2.93
Street lighting	1.24	1.28	1.32	1.36	1.40	1.45	1.50	1.54	**11.09**	1.59	1.64	1.70	1.75	1.81	1.87	1.92	1.99	2.05	2.12	2.18
Drainage	0.36	0.37	0.38	0.40	0.41	0.42	0.43	0.45	**3.22**	0.46	0.48	0.49	0.51	0.52	0.54	0.56	0.57	0.59	0.61	0.63
TOTAL Structures, Lighting, Drainage	**2.64**	**4.76**	**4.55**	**5.04**	**5.79**	**5.55**	**5.53**	**5.71**	**39.57**	**4.20**	**4.34**	**4.48**	**4.62**	**4.76**	**4.92**	**5.07**	**5.23**	**5.39**	**5.57**	**5.74**
Total Investment Required	**15.01**	**17.08**	**17.08**	**17.73**	**18.60**	**18.35**	**18.16**	**11.78**	**133.79**	**11.80**	**12.19**	**12.57**	**13.01**	**13.54**	**14.10**	**14.71**	**15.27**	**15.87**	**16.56**	**17.17**
Available Funding - HIP																				
Borrowing	11.54	11.49	11.70	11.86	11.98	11.97	11.80	5.24	**87.56**	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grant	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	**6.66**	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Total HIP Funding	**12.37**	**12.32**	**12.53**	**12.69**	**12.81**	**12.80**	**12.63**	**6.07**	**94.22**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**	**0.83**
Shortfall HIP	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**6.77**	**7.02**	**7.26**	**7.56**	**7.95**	**8.35**	**8.81**	**9.21**	**9.65**	**10.16**	**10.60**
Available Funding - Structures, Lighting, Drainage																				
Grant (estimated)	2.35	2.08	1.99	1.73	1.73	1.73	2.72	2.81	**17.12**	2.90	3.00	3.09	3.19	3.29	3.39	3.50	3.61	3.72	3.83	3.95
Shortfall Structures, Lighting, Drainage	**0.29**	**2.68**	**2.56**	**3.32**	**4.07**	**3.83**	**2.81**	**2.90**	**22.45**	**1.30**	**1.34**	**1.39**	**1.43**	**1.47**	**1.53**	**1.57**	**1.62**	**1.67**	**1.74**	**1.79**
Total Shortfall	**0.29**	**2.68**	**2.55**	**3.31**	**4.06**	**3.82**	**2.81**	**2.90**	**22.45**	**8.07**	**8.36**	**8.65**	**8.99**	**9.42**	**9.88**	**10.38**	**10.83**	**11.32**	**11.90**	**12.39**