Highways Asset Management Strategy

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Contents

1. Introduction

Thurrock Council recognises the importance of the highway infrastructure in the context of the well-being of all who use it. The Council as Highway Authority is committed to the good management of the highway asset not only for now but also, for future generations, and recognises that effective asset management is essential to deliver clarity around standards and levels of service, and to make best use of available resources.
The Asset Management Strategy underpins the Highway Asset Management Policy and is one of the key strategic documents related to the delivery of the Council's highway services.

This document reflects the guidance laid down in the suite of national Codes, in particular the Code of Practice '*Well-managed Highway Infrastructure* and the guidance issued by the Highway Maintenance Efficiency Programme (HMEP) on the use of asset management principles.

The purpose of this document is to:

- Formalise strategies for investment in key highway asset groups and their associated requirements
- Define affordable service standards (in accordance with the HAPMS – Highways Asset Performance Management Framework)
- Improve how the highway asset is managed
- Enable more effective and efficient Value for Money (VfM) highways services to be delivered.
- Align asset management practises to the corporate plan and vision for Thurrock Council
    - In particular: **Create** a great place for learning and opportunity, **Encourage** and promote job creation and economic prosperity, **Improve** health and wellbeing and **Promote** and protect our green environment

For a more brief overview of current highway asset condition see the Key Highway Asset Condition Dashboard (available on the Thurrock Council Website)

2. Policy, Legislative and Guidance Requirements

Developing a Highways Asset Management Strategy (HAMS), keeping it up to date and actually using it to feed into the decision making process is widely seen to be a valuable exercise. However, there are a number of other drivers at a local and national level. These include (but are not limited to):

- Government Guidance for the Local Transport Plan
- Whole Government Accounts (WGA) (detailed further in section 2.1)
- Guidance on the Requirements for the Production of Highways Asset Management Plans and a Simple Valuation Methodology – TRL (2006)
- Guidance Document for Highway Infrastructure Asset Valuation – County Surveyors Society/TAG Asset Management Working Group (2005)
- Highway Asset Management Worldwide Experience and Practice – County Surveyors Society (2004) Framework for Highway Asset Management
- Management of Highway Structures: A Code of Practice – Roads Liaison Group (2005)
- Thurrock Transport Strategy: 2013 to 2026
- DfT Transport Resilience Review (2014)
- Thurrock Council Resilience Review (2018) (detailed further in section 2.2)
- Thurrock Council Maintenance Policy (currently under review, expected completion mid 2018)

2.1. Whole Government Accounting (WGA) Requirements

Since 2006 all local authorities have been required to produce a valuation of their highway assets. Under these requirements from 2007/08, local highway authorities were expected to determine not only the value of their assets, but also monitor year on year whether or not they are depreciating following investment. There is therefore a close relationship between asset management and asset valuation.

Whole of Government Accounts (WGA) has set new requirements for the way the value of the highway asset is reported to the HM Treasury in the Authority's audited accounts. The new approach has now been fully implemented. Authorities are now required to report the Depreciated Replacement Cost (DRC) of the highway asset. For this to be achieved on a yearly basis there is clear need for accurate and detailed inventory information and performance data. This requirement is supporting asset management by providing an improved understanding of network deterioration and combining it with the levels of service to be achieved.

A new method of collating asset data has been developed. All asset valuation and inventory records are collectively added to the internal Asset Information Strategy and Register when updates are deemed necessary. The AISR has been specifically formatted to enable compliance with WGA processes to streamline WGA returns each year. Any changes in WGA reporting will also be reflected in the AISR. Figure 1 (page 7) shows a side-by-side comparison of part of Thurrock's AISR and a WGA return for carriageways.

CARRIAGEWAYS						LINEAR ITEMS	
Road Classification	Carriageway Length (km)	Carriageway Width (m)	Calculated Area (m²)	HAMFIG Default GRC Rate (£/m²)	GRC Value (£,000s)	HAMFIG Default GRC Rate (£/m)	GRC Value (£,000s)
M (all)			-	160.91	-	715.13	-
A Urban	22.00	8.57	188,540	136.04	25,648.98	604.60	13,301.20
A Rural	50.00	9.79	489,500	107.73	52,733.84	457.98	22,899.00
B Urban	15.00	8.35	125,250	126.86	15,889.22	554.47	8,317.05
B Rural	17.00	7.15	121,550	100.16	12,174.45	255.15	4,337.55
C Urban	28.00	7.71	215,880	104.70	22,602.64	482.58	13,512.24
C Rural	46.00	6.36	292,560	79.92	23,381.40	217.98	10,027.08
U/C Urban	365.00	6.43	2,346,950	96.69	226,926.60	352.39	128,622.35
U/C Rural	2.00	7.85	15,700	74.87	1,175.46	166.08	332.16
Total - Without Factor Applied			3,795,930.00		380,532.57		201,348.63
Total - With Factor Applied					376,727.24		199,335.14

Primary Asset Group	Asset	Length	Avg Width	Estimated Knowledge / Coverage	Replacelemt Rate	GRC (Gross Replacement Cost) (£000s)
CARRIAGEWAY	Total CW - Urban	431	6.69	100%	N/A (done via DfT Class/Urban-Rural)	N/A
	Total CW - Rural	114	8	100%	N/A (done via DfT Class/Urban-Rural)	N/A
	A Roads Urban	22	8.57	100%	From HAMFIG WGA Toolkit	38,950.18
	A Roads Rural	50	9.79	100%	From HAMFIG WGA Toolkit	75,632.84
	B Roads Urban	15	8.35	100%	From HAMFIG WGA Toolkit	24,206.27
	B Roads Rural	17	7.15	100%	From HAMFIG WGA Toolkit	16,512.00
	C Roads Urban	28	7.71	100%	From HAMFIG WGA Toolkit	36,114.88
	C Roads Rural	46	6.36	100%	From HAMFIG WGA Toolkit	33,408.48
	Unclassified Urban	365	6.43	100%	From HAMFIG WGA Toolkit	355,548.95
	Unclassified Rural	2	7.85	100%	From HAMFIG WGA Toolkit	1,507.62

Figure 1 – Selections of WGA return (top) and Thurrock's Asset Information Strategy and Register * (bottom)

*some fields omitted for this figure, original dataset too large for the level of detain necessary here

This strategy along with the asset register and all other asset management documents ensure both annual WGA reporting requirements are met and good asset management processes are applied. Data is much easier to manage when everything is in one place.

2.2. Resilience Review

As part of good asset management practice, Thurrock have established not only a resilient network but a comprehensive review and ongoing actions in increasing the resilience of the highway network during extreme events. This can be found on the council's website and covers events such as extreme heat, increased rainfall, and industrial action amongst others.

The resilient network has been provisionally identified and split into primary and secondary components. Reviews will be undertaken at least every two years; however an update/review will be undertaken after the first year to gauge the economic viability of the extent of the network and the efficiency of managing the resilient network.

3. Benefits of Asset Management Strategy

The benefits of implementing the asset management strategy are as follows:

- Encourages engagement with other stakeholders, including Elected Members, Senior Officers and the public;
- Readiness to respond to changes resulting from climate change, weather emergencies, contractors, resilience and finance,
- Close working and integration of efforts with other parts of the Council, including
- Corporate aims and objectives;
- Improved delivery within budget constraints – including procurement;
- Efficiencies – better ways of doing things, or improved service, enhancing performance in a challenging environment.
- Improved understanding of customer aspirations and expectations;
- To influence and focus on the better use of resources.
- Improve asset longevity using efficient asset management

4. Asset Management in Thurrock

4.1. Asset Management Roles

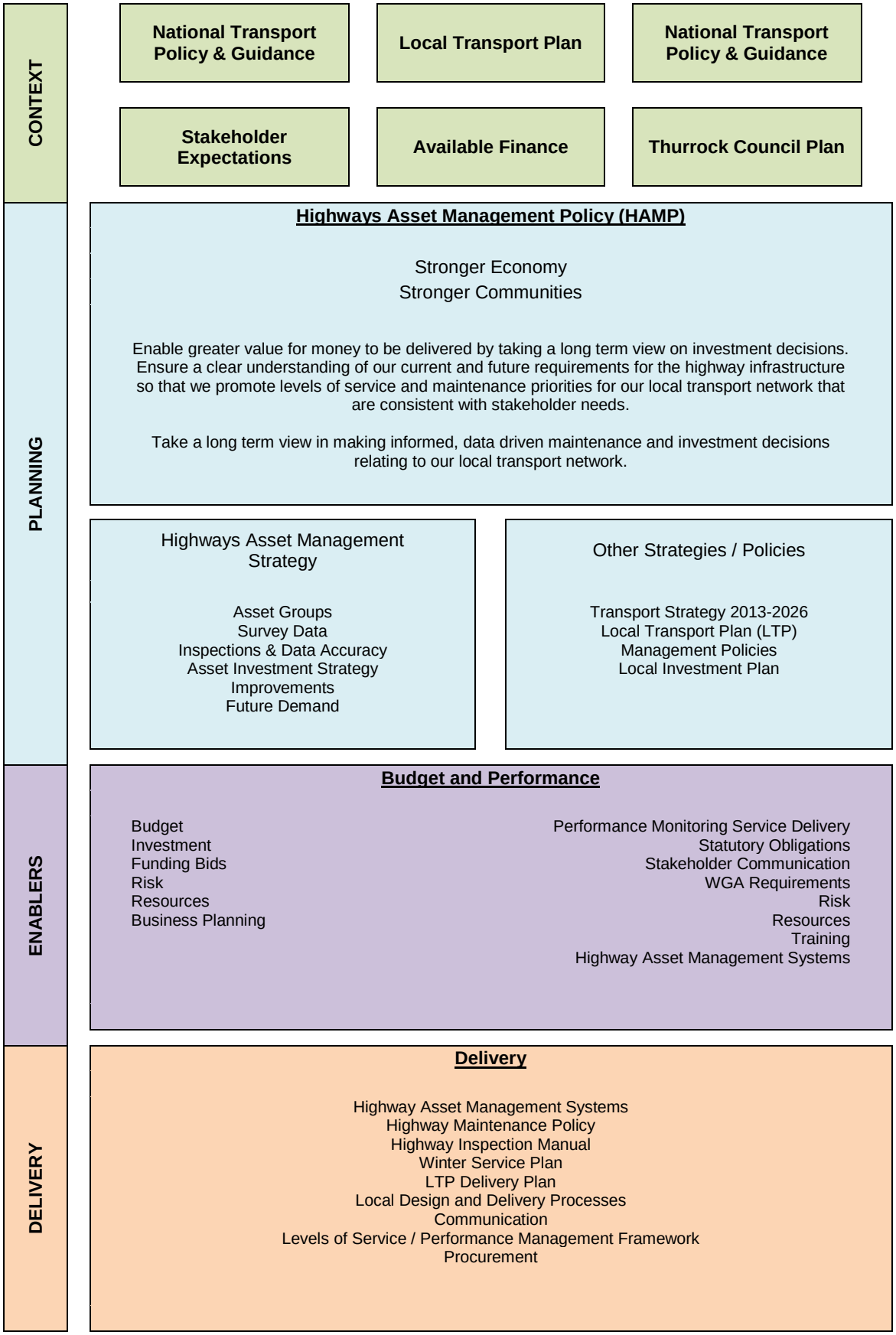
Senior Decision Maker Roles

Council / Cabinet Members	Leadership and directions
Chief Exec	Demonstration of Senior Management Commitment
Director	Leadership and directions
Finance team	Whole of Government Accounting reporting

Asset Management Roles

Highways Infrastructure Manager	Development of HAMP & assign resources required for its implementation
	Liaise with stakeholders
	Review HAM activities and develop improvements
	Work with business and information systems to ensure that they meet asset management needs
	Implement HAMP
Principal Highways Engineer	Roads & Footways Management
	Structures Management
	Lighting Management
	PROW Management
	Traffic Signal Management
	Highways ICT System management
	Maintenance Management
	Inspection and Condition Measurement
Senior Highways Asset Engineer	Development of HAMS
	Develop any other HAM supporting documents
	Ensure programmes are consistent with level of service
	Data Collection and Management
	Information Technology Management
	Creating funding bids
	Supporting Highways Infrastructure Manager and Principal Highways Engineer

4.2. Asset Management Framework



5. Risk Management & Data Sources

Thurrock Council has established risk management processes across all of its services including its highway infrastructure. These processes continually evolve and are subject to regular review to reflect customer requirements and the changing nature of the council's organisation.

5.1. Risk Management in an Asset Management Environment

Risk management within the asset management context involves an assessment of comparative risks to assist both options appraisal and options selection, by considering:

- The risks associated in providing different levels of service/performance measures
- The risks associated with variation of funding levels
- The comparative risk of distributing varying funding levels between different asset groups.

In setting performance measures in the Highways Asset Performance Management Framework risk has been taken into account and the 'risk management cycle followed'. Figure 2 (below) shows the risk management cycle.

Figure 2 – Risk Management Cycle

A risk based approach is used in prioritisation of planned maintenance schemes and reactive works. The reactive element of risk will be explored in more detail in the Maintenance Strategy (available separately on the Thurrock Council website). Section 9 of this document gives examples of the priority matrices used for planned maintenance on both carriageways and footways.

5.2. Data Driven Decisions

A variety of data sources are used to determine and alleviate risk as well as make informed decisions on maintenance. The combination of data sets can contribute to a much more efficient spend. For example: a section of carriageway that is deemed structurally 'sound' by annual condition surveys but has a high cost of reactive maintenance (e.g. potholing) may have a deeper underlying structural issue that cannot be picked up by visual surveys. Therefore a deeper treatment may be necessary to reduce reactive spend and lessen the cost of managing the asset over its lifecycle.

A list of data sources and a brief explanation of use are listed in table 3 (below).

Table 3 – Highway Asset Data Sources

Data Source	Description & Usage
Annual Condition Survey Data	Identify condition deficiencies for carriageway and footway, scoring for national reporting and performance levels and combined to derive historical deterioration rates for life cycle planning and investment scenarios. Performed by external accredited UKPMS surveyors and machines.
Safety Inspections	Routine safety inspections on the network performed by Thurrock Councils highway inspectors. Inspection frequency is based on a risk matrix derived via footfall, hierarchy and other factors (schools etc.). The network is covered at least on an annual basis with increasing frequency for higher risk areas. Each defect recorded is also assigned a risk based on defect type and location in accordance with the Highways Maintenance Policy (2018).
GIS Priority Layers	GIS layers have been obtained for priority areas (see section 9). These have been cross referenced to the maintained highway network to pinpoint areas of priority. Levels of detail vary by item varying from 50m subsections to entire carriageway lengths.

5.3. Risk management Compliance & Procedures

The following compliance and procedures are in in place

- Corporate Risk Management Strategy;
- Related policy statements and council procedures;
- Business continuity/contingency/emergency plans – including tests and reviews;
- Internal audit reporting;
- Risk management action plans and risk registers;
- Contract/programme/project proposal review and sign-off;
- Corporate risk register;
- Service risk register;
- Programme/project/risk registers;
- Partnership risk registers;
- Contractual/contract risk assessments/registers;
- Reports/minutes: council, cabinet, audit committee, performance boards/management team meetings;
- Risk management training arrangements;
- Strategic policies, plans, financial plans, performance management and project/programme management plans and reports;
- Governance arrangements and plans for significant partnerships including risk management;
- Procedure notes and manuals for business critical systems; and
- Business continuity plans including tests and reviews.

6. Future Demand & Events

6.1. Lower Thames Crossing

The Lower Thames crossing is a proposal brought forward by the DfT to construct a new Thames Crossing in order to relieve congestion at the current crossing.

Thurrock Council is unanimously opposed to any Lower Thames Crossing at the proposed locations for seventeen reasons. These can be found in full detail online. In terms of long term asset management the following have been selected to be included here for their impact:

- There is no evidence that the local road network can cope with traffic diverting from the Dartford Crossing to the Lower Thames Crossing. Highways England's preferred option may cause worse community and environmental

problems over the wide area, particularly on the key roads of the A13 and A2 when diverting traffic hits bottlenecks.

- Any gridlock will worsen pollution in the area in increased emissions from vehicles and the number of vehicles. The future modelled scenario has an increased traffic movement from 140,000 vehicles a day now with the existing crossing to nearly 240,000 a day in total by 2041
- At the existing crossing traffic volumes in 2025 are predicted to be around 14% lower than a scenario without a new crossing. By 2041 they are predicated to be just 7% lower. This suggests that location C options have very limited benefits in terms of the main objective ' to relieve the congested Dartford Crossing and approach roads'. In consequence, there is unlikely to be a significant long term difference to general traffic conditions at the existing crossing

Further information can be found at:

https://www.thurrock.gov.uk/thames-crossing/lower-thames-crossing-proposals

6.2. Climate Change

With evidence suggesting an increase in extreme weather events and a general trend towards wetter winters and drier summers an adverse impact on highway assets can be predicted. This is addressed both in the Winter Maintenance Plan, (in regards to snow etc.) and the Resilience Review. These documents focus on impacts and responses to extreme weather events.

6.3. Population Growth

The population of Thurrock is predicted to rise 5% from the 2016 census figure to the next census (2021). A growing population leads to increased strain on the highway network and an increased deteriorating, especially in regards to the carriageway asset.

7. Key Assets

Thurrock council are responsible for a large variety of different asset types. Inventory (where available) is held within appropriate systems and summarised in the asset register. This section will detail what has been deemed ‘key’ assets. This encompasses six groups with sub assets within these. Table 4 (page 15-16) lists all

key asset groups and assets within with levels of knowledge (location/composition as opposed to condition).

Table 4 – Key Asset Groups and associated components

Key Asset Group	Primary Component	Components	Extent**	Data Confidence	Value / Gross Replacement Cost (£000s)*
Networks	Selections/routes from the total 610km of adopted highway network	PMS (pavement management system) network	610km	High	N/A (As part of Carriageway and Footway)
		Inspection Network	610km	High	
		Gritting Routes (primary and secondary)	257km (primary), 28km (secondary)	High	
		Resilient Network (primary and secondary)	167km (primary), 26km (secondary)	High	
Carriageway	545km total carriageway	A Roads - Urban	22km	High	£581,881.22
		A Roads - Rural	50km	High	
		B Roads - Urban	15km	High	
		B Roads - Rural	17km	High	
		C Roads - Urban	28km	High	
		C Roads - Rural	46km	High	
		Unclassified Roads - Urban	365km	High	
		Unclassified Roads - Rural	2km	High	
Footway	Approx. 700, exact figures expected early 2018***	Hierarchy 1a - Urban	4km	High	£113,166.05
		Hierarchy 1 - Urban	84km	High	
		Hierarchy 1 - Rural	5km	High	
		Hierarchy 2 - Urban	41km	High	
		Hierarchy 2 - Rural	24km	High	
		Hierarchy 3 - Urban	98km	High	
		Hierarchy 3 - Rural	37km	High	
		Hierarchy 4 - Urban	405km	High	
		Hierarchy 4 - Rural	6km	High	
Structures	118 Total Structures	Bridge	65	High	£113,323.46
		Culvert (>=1.2m diameter)	22	High	
		High Mast Street Lighting	2	High	
		Retaining Wall	20	High	
		Sign/Signal Gantry	2	High	
		Subways	7	High	
Drainage	26,578 Gullies	Gully	26,578	High	£19,672.43
		Ditch	58km	High	
		Drainage Channel	7km	High	
		Soakaway	800	Low - Estimate	
		Manholes & catchpits	3837	Low - Estimate	
		Drainage pipes	80km	Medium - Estimate	
		Linear drainage	10km	Low - Estimate	
		Filter Drain	5km	Low - Estimate	
		Pump stations	2	High	
		Culverts (<1.2m diameter)	500m	Low - Estimate	
Street Lighting	17,177 lighting columns	Columns up to 10.0m	2767	High	£19,869.58
		Columns up to 12.0m	370	High	
		Columns up to 6.0m	12214	High	

		Columns up to 8.0m	1846	**High**	
		Feeder Pillar	351	**High**	
		Illuminated Bollards	1299	**High**	
		Other 3 (Tubular Steel galv/flange mount)	17	**High**	
		Other2 (7W Belisha Beacon)	147	**High**	
		Other3 (Wig Wags)	8	**High**	
		Other3 (VMS)	12	**High**	
		Illuminated Sign	2332	**High**	

*Explained further in section 2.1

**Where no unit is given this refers to number of assets

***As of December 2017 a FNS survey is being undertaken on 100% of the network, results expected early 2018

8. Performance Measures

The Highways Asset Management team is committed to deliver best performance outcomes which can be clearly measured. These performance measures are adapted from the Highways Asset Performance Management Framework (HAPMF). Table 5 (page 16-17) shows the performance measures, levels of service and currently available data. Performance measures/levels of service are derived using the following criteria:

- Is it useful? Will measuring the measure on an set basis contribute to the development of better asset management processes or greater understanding of the asset?
- Is it worth measuring? A performance measure may not be worth collecting/measuring on an set basis if the benefit of the resulting data is not worth the cost of collection.
- Is it realistic? A quick glance at the current performance could be used to set levels of service, however future issues must also be considered. Life cycle planning has been used (where applicable) to ensure all levels of service are realistic for at least the next 3 years.

Performance measures currently exist for the following categories:

- S – Safety and Resilience
- C – Condition
- E – Environment and Community

In addition to this a proposed category of F – Forward Planning is being considered, however this has currently been omitted as no performance measures exist for it (as of January 2018).

Due to the implementation of the Highways Asset Performance management framework previous performance measures have currently been archives and will be re-evaluated and fed into the Performance Management Framework where appropriate. The schedule for completion has been set for the next HAMS review (Q4 2018)

Table 5 (below) shows the current levels of service (LOS) for Thurrock and the latest available scores. Details of planned future additions are listed in the Highways Asset Performance Management Framework as well as measure calculations, reasoning for inclusion and future improvements.

Table 5 – Current Levels of Service for Thurrock Council Highway Assets (as per the Performance Management Framework)

ID	Category	Asset	Description	Value	LOS	Latest Figure	Figure Date	Performance*
C1	C	Footway	Footway network needing maintenance (All Hierarchies)	%	28	21	N/A	Good
C2	C	Footway	Footway network needing maintenance (Hierarchy 1, 1a & 2)	%	27	19	N/A	Good
C3	C	Footway	Footway network needing maintenance (Hierarchy 3 & 4)	%	28	21	N/A	Good
C4	C	Carriageway	Principal Roads requiring maintenance	%	10	2	2017/18	Good
C5	C	Carriageway	Non Principal Classified Roads requiring maintenance	%	12	3	2017/18	Good
C6	C	Carriageway	Unclassified Roads requiring maintenance	%	TBC	Pending	N/A	Poor - No LOS
C7	C	Carriageway	Principal Roads in 'Amber' band	%	30	18	2017/18	Good
C8	C	Carriageway	Non Principal Classified Roads in 'Amber' band	%	35	24	2017/18	Good
C9	C	Carriageway	Unclassified Roads in 'Amber' band	%	TBC	Pending	N/A	Poor - No LOS
E1	E	Street Lighting	Street Lighting Carbon Emission Percentage Change	%change	Reduction	-28.45	2016/17	Good
E2	E	Street Lighting	Street Lighting Energy Consumption Percentage Change	%change	Reduction	-20.49	2016/17	Good
E3	E	Other	Customer Satisfaction - Highway Assets Average Percentage Change	%change	Increase	1.01	2016/17	Good
E4	E	Other	Customer Satisfaction - 'Green Assets' (Trees, verges, etc.) Percentage Change	%change	Increase	26.34	2016/17	Good
E5	E	Networks	Customer Satisfaction - Network Availability Percentage Change	%change	Increase	8.8	2016/17	Good
E6	E	Footway	Customer Satisfaction - Cycle Tracks Percentage Change	%change	Increase	-14	2016/17	Poor
E7	E	Carriageway	Customer Satisfaction - Carriageway Percentage Change	%change	Increase	2.44	2016/17	Good
E8	E	Drainage	Customer Satisfaction - Drainage Percentage Change	%change	Increase	12.05	2016/17	Good
E9	E	Footway	Customer Satisfaction - Footway Percentage Change	%change	Increase	1.57	2016/17	Good
E10	E	Rights of Way	Customer Satisfaction - Public Rights of Way Percentage Change	%change	Increase	-6.31	2016/17	Poor
E11	E	Street Furniture	Customer Satisfaction - Road Signs Percentage Change	%change	Increase	0	2016/17	Fair
E12	E	Street Lighting	Customer Satisfaction - Street Lighting	%change	Increase	1.74	2016/17	Good
S1	S	Carriageway	A roads measured below investigatory level - SCRIM	%	25	19.28	2016/17	Good
S2	S	Carriageway	A roads measured 0.05 below investigatory level - SCRIM	%	13	8.96	2016/17	Good

*detailed description of performance criteria present in Appendix 2-4 of Highways Asset Performance Management Framework

9. Planning and Prioritisation

As part of Thurrock Councils ongoing commitment to asset management, life cycle plans are ongoing and continually improve for all key assets at varying levels of detail dependant on asset valuation, ‘importance’ and available data. As shown in table 4 (page 15-16), Carriageways have a much higher financial value and socio-economic importance; to reflect this much more detailed life cycle plans have been undertaken. Short-medium term life cycle planning on carriageways (up to 15 years) can be performed to a subsection (20m) level as opposed to a generalised whole asset level, showing where treatments will likely be necessary as opposed to amounts/costing on a network level.

Maintenance locations are derived using a ‘data driven method with a human touch’. Data modelling (where available) is used to determine all worked needed (by feeding an ‘unlimited’ budget into the software). This extensive list is then sense checked by multiple engineers and the priorities applied. This is important as multiple priorities are split across a single asset to ensure more efficient spends.

9.1. Carriageways - Planned Maintenance Prioritisation and Approach

Planned classified carriageway maintenance locations are determined using 3 factors with an equal weighting (each assigned ~33% of budget annually).

- Priority Areas: higher priority areas derived from the priority matrix shown in figure 3 (page 20)
- National Indicator Impact: it is essential to manage the national indicators as these give a guide on how Thurrock is performing in comparison to the national average and in meeting performance management targets. E.g. narrower roads where greater lengths can be treated across both lanes giving a smaller cost per linear metre. A Spearman-style ranking system has been developed and can be seen in Table 6 (page 21)
- Worst-first/local knowledge: a selection of the worst condition classified carriageways, section identified via local inspector and engineer knowledge: e.g. areas with higher reactive maintenance spends and areas with missing or invalid survey data

For unclassified carriageways a 50/50 split has been adopted. 50% of the budget assigned is assigned using the priority matrix and 50% is derived using the same worst-first/local knowledge methodology as used for classified carriageways.

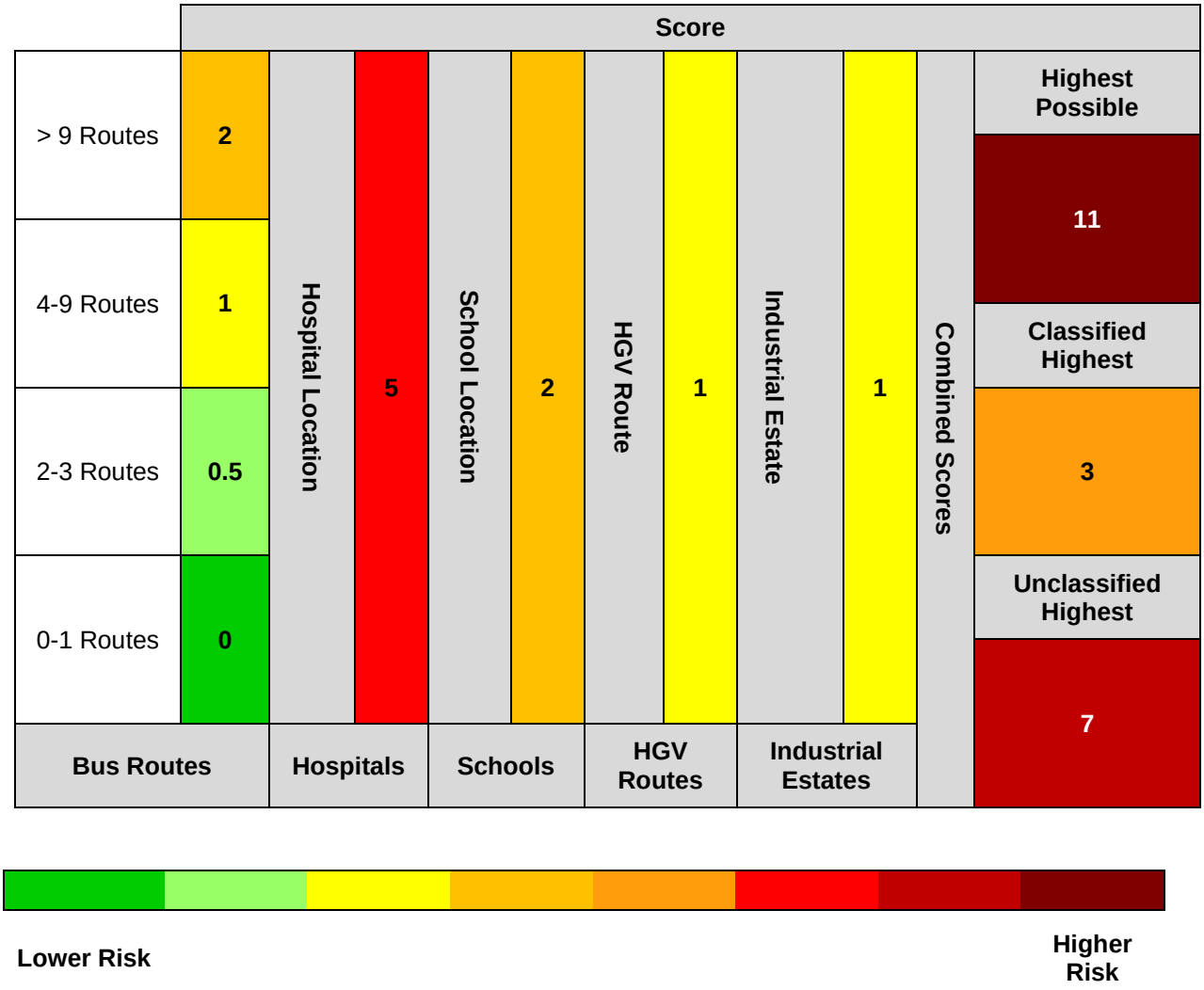


Figure 3 – Carriageway Planned Maintenance Priority Matrix

Table 6 – Spearman-style rank used to calculate priority of national indicator impacting schemes (Classified carriageway only)

Ranking Category	Description	Scores	Rank
Price / linear metre percentile	Which percentile of the range of price per linear metre the scheme falls under	1: Top 10% 2: Top 10-20% 3: Top 30-40% Etc.	Ranked using a 'competition rank method'. E.g if 5 items had equal 'top' rank all items ranked 2nd would be assigned a rank of 6 instead of 2
Scheme Efficiency (%)	Percentage of scheme generated that actually requires treatment (e.g if 100m was being treated and 10m subsection in the middle was fair enough quality to not require treatment, efficiency would be 90%	No score assigned, actual values ranked	Ranked using a 'competition rank'
Lane Ranking	Lanes treated	1: Two lanes treated 2: One lane treated	Ranked using a 'competition rank'. Generated as follows for year 2018/19: Two lanes treated: rank 1 One lane treated: rank 57 (56 schemes generated were over both lanes)

All ranks are combined and sorted lowest to highest to give a priority order in which schemes should be selected. As with other schemes these are first sense checked to take any factors arising from local knowledge into account.

9.2. Footways - Planned Maintenance Prioritisation and Approach

Similarly to carriageways a split has been derived for footways. This is approximately 50/50 based on 50% priority derived and 50% worst first derived. A priority matrix similar to the approach used for carriageways has also been adopted for footway prioritisation.

9.3. Other Key Assets – Planned Maintenance Prioritisation

This section will detail a brief overview of planned maintenance prioritisation on other key asset groups (structures, drainage and street lighting).

9.3.1. Structures

Structures planned maintenance is derived using information from inspections, assessed in line with the BCI (Bridge Condition Index) score. There is also a balance sought struck with the larger scale reactive works following road traffic collision damage, but the costs are sort via the recharge programme which feeds back into the budget.

9.3.2. Drainage

Drainage prioritisation is based on a street basis. A risk based approach has been developed to ensure detritus affected areas and flooding hotspots are maintained on a more regular basis than previously with some areas inspected on a lesser frequency (low risk areas with no previous flooding history). This enables a greater number of assets per day to be inspected and more attention paid to areas that need it.

9.3.3. Street Lighting

The Street Lighting programme is focused around column replacement following the annual surveys and where scope allows we look to renew and update outdated at risk feeder pillars. These feeder pillars generally are the ones on the strategic road network which are identified at high risk and subjected to regularly fault. Traditionally these have been left, but the replacing them it allows us to not only update them, but bring them up to standard as some of the circuits are old and antiquated. Full circuit records are also obtained and added to the asset register.

9.4. Individual Asset Strategy (Overview)

A key function of the asset management process is to understand the funding needs of each asset group and component against performance, aims and objectives. This means understanding funding requirements, which will meet the following:

- LTP objectives;
- Delivery Planning;
- Performance Targets.

Key to this process is a need to understand the impact of financial decisions on customer satisfaction and the delivery of the corporate priorities. The impact that investing in one asset component may have on the overall performance of other asset components as well as the whole asset, is considered during the assessment process.

For the delivery of the highway service, Thurrock Council undertakes all highway operations including all routine and operational functions along with planned maintenance and regeneration schemes.

The previous revision of the HAMS stated Thurrock Council's intent to develop a whole life cycle approach to managing maintenance. Life cycle plans have now been developed for all key assets to assess current condition, future impacts and budget requirements. These can be located in section 11.

10. Current Condition & Backlogs

This section of the document will outline the current condition of each key asset and the estimated realistic backlog. The realistic (also known as structural backlog) is the number of treatments required on the asset that could be realistically performed if funding was available. An example of carriageway realistic treatments can be seen in figure 4 (below). A more detailed methodology including treatment triggers is stored internally in the document Treatment Selection Methodology.

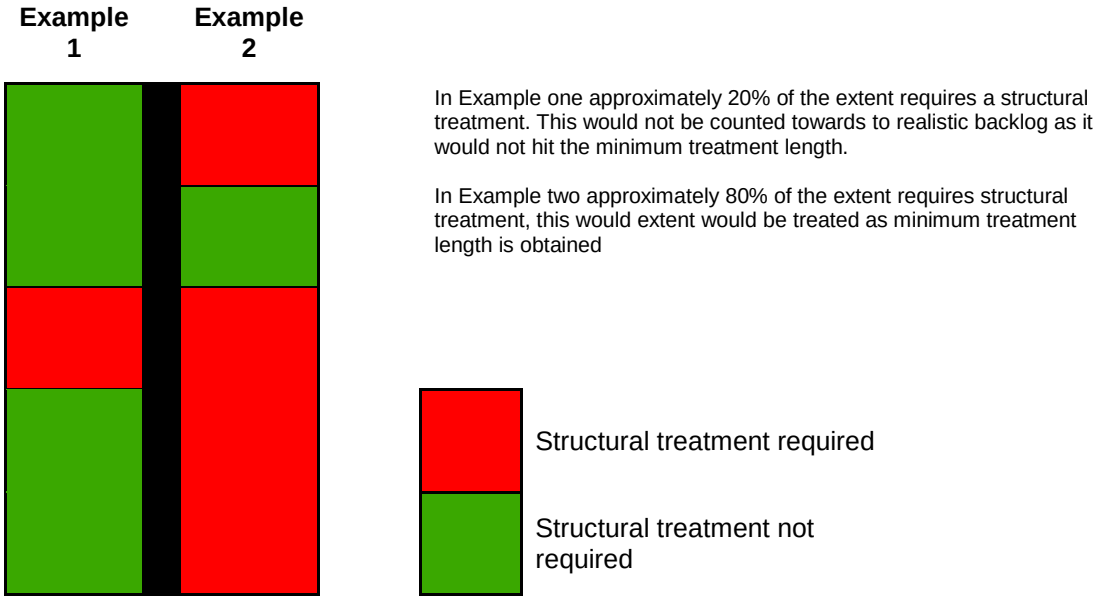


Figure 4 – Part of criteria used in calculating realistic carriageway backlogs

10.1. Carriageway – Current Condition & Backlogs

For national reporting carriageway is split into three categories:

- Principal (A) Roads (national indicator 130-01)
- Non-principal Classified (B&C) Roads (national indicator 130-02)
- Unclassified Roads (national indicator 224b)

Figures 5-7 (page 24) show the current condition of each category of carriageway based on the latest available data.

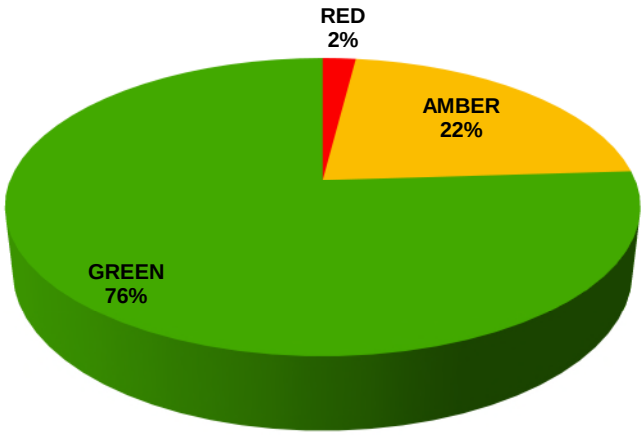


Figure 5 – Principal (A) Road Condition

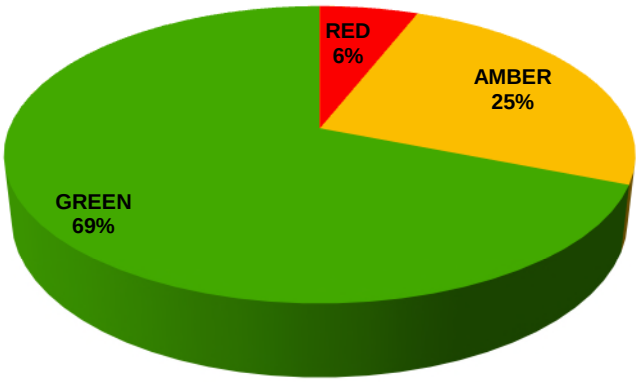


Figure 6 – Non-principal Classified (B&C) Road Condition

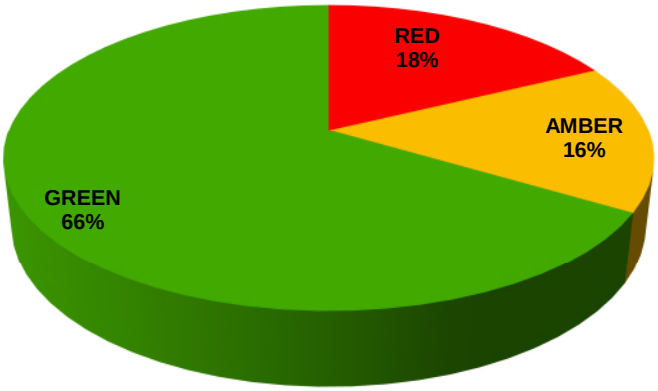


Figure 7 – Unclassified Road Condition

Realistic backlog calculations have been applied to each carriageway asset group separately and the following figures derived:

Table 7 – Realistic Carriageway Backlog

Asset Group	Asset Length (km)	Gross Replacement Cost (GRC)*	Realistic Backlog
A Roads	72	£114,583,020	£2,100,000
B Roads	32	£40,718,270	£1,200,000
C Roads	74	£69,523,360	£4,800,000
U Roads	367	£357,056,570	£16,250,000
Totals	**545**	**£581,881,220**	**£24,350,000**

*GRC is the value of all assets if they were in 'as new' condition, calculated via HAMFIG default rates using the WGA toolkit

10.2. Footway – Current Condition & Backlogs

For national reporting footway is only required on three of the six available hierarchies: 1a, 1 and 2; however Thurrock Council reports on both for internal use and to gain greater understanding and use of data. Hierarchies are combined for ease of reporting, Table 8 (below) lists UKPMS standard footway hierarchies.

Table 8 - Footway Hierarchies and national reporting requirements

Footway Hierarchy	Report / Notes
1a – Prestigious Walking Zone	National indicator 187
1 – Primary Walking Route	
2 – Secondary Walking Route	
3 – Link Footway	N/A – reported on by Thurrock and level of service set in Highways Asset Performance Management Framework
4 – Local Access Footway	
ND – Not Defined	Used by Thurrock for sections with no footway

The condition bands used in this report are based on UKPMS FNS surveys and are as follows:

- As New (Green)
- Aesthetically Impaired (Lower Green)
- Functionally Impaired (Amber)
- Structurally Unsound (Red)

Figures 8-9 (page 27) show the current condition of footways in Thurrock

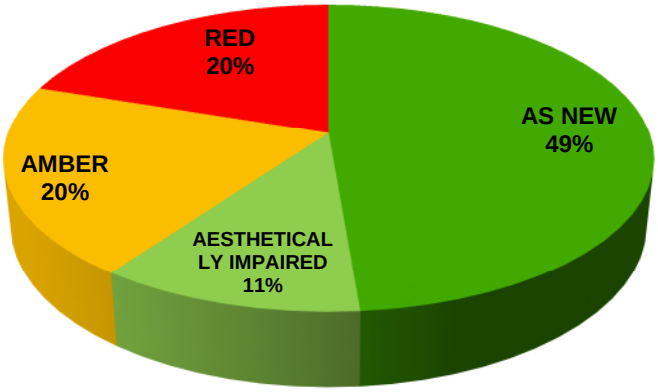


Figure 8 – Hierarchy 1a, 1 and 2 Footway Condition

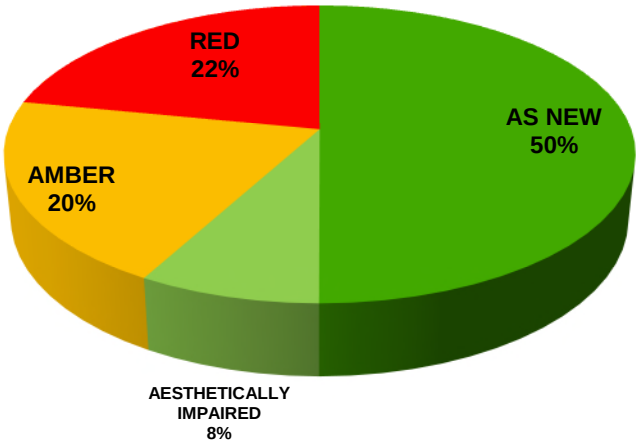


Figure 9 – Hierarchy 3 & 4 Footway Condition

Realistic backlog figures have been derived using an 80% sample of the network using data collected in the current financial year (2017/18). An average cost of £63.22/m² has been used across all surface types. All results multiplied by 1.25 to account for the 80% coverage.

Table 9 – Realistic Footway Backlog

FW Hierarchy	Asset Length (km)	Gross Replacement Cost (GRC)	Realistic Backlog
1a	3.3	£2,354,484	£7,116
1	83	£16,221,202	£535,761
2	56	£10,469,583	£517,231
1a, 1 & 2 Total	**142.3**	**£29,045,269**	**£1,070,108**
3	144	£20,068,954	£1,913,039
4	391	£51,565,884	£4,460,623
3 & 4 Total	**535**	**£71,634,838**	**£6,373,662**
Overall Total	**677.3**	**£100,680,107**	**£7,443,771**

10.3. Structures – Current Condition & Backlog

Two aspects of structure condition will be looked at:

- The condition band: very good/good/fair/poor/very poor – an overall score of all elements of a structure combined (based on the BCI – Bridge Condition Index score)
- The condition of 'critical' elements, these are the load bearing or otherwise critical elements of the structure (based on the $SSCI_{crit}$ - Structures Stock Critical Indicator score)

All results have been derived using the 'Structures Asset Management Planning Toolkit' developed by Atkins. Figures 10 and 11 (page 29) show the current overall condition band and the critical element score respectively.

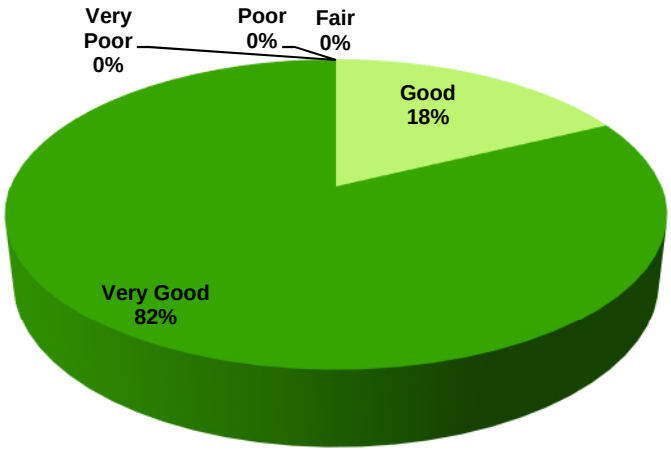


Figure 10 – Overall Condition of Structures (based on the BCI)

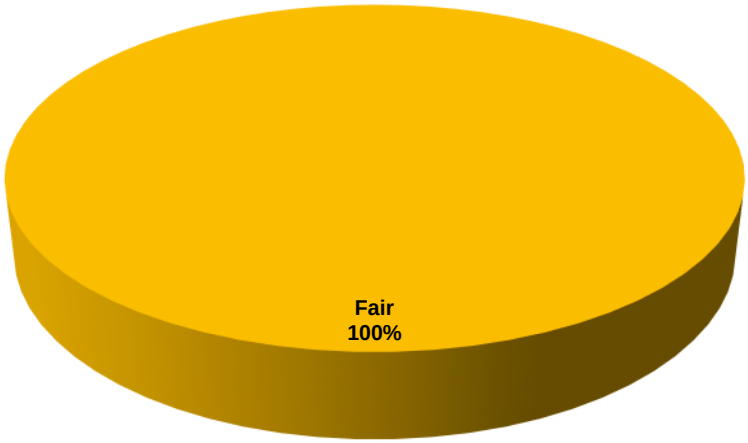


Figure 11 –Condition of Critical Structure Elements (based on the $SSCI_{crit}$)

Due to the nature of structures the overall condition/BCI should not be taken at face value. There is currently a backlog in regards to critical elements.

The structures backlog is averaged over three years as it widely varies, showing a general trend towards very large increases.

The figure agreed to set as the structures backlog is **£546,165**

The predicted backlog predicted over a five year period can be seen in figure 12 (page 30).

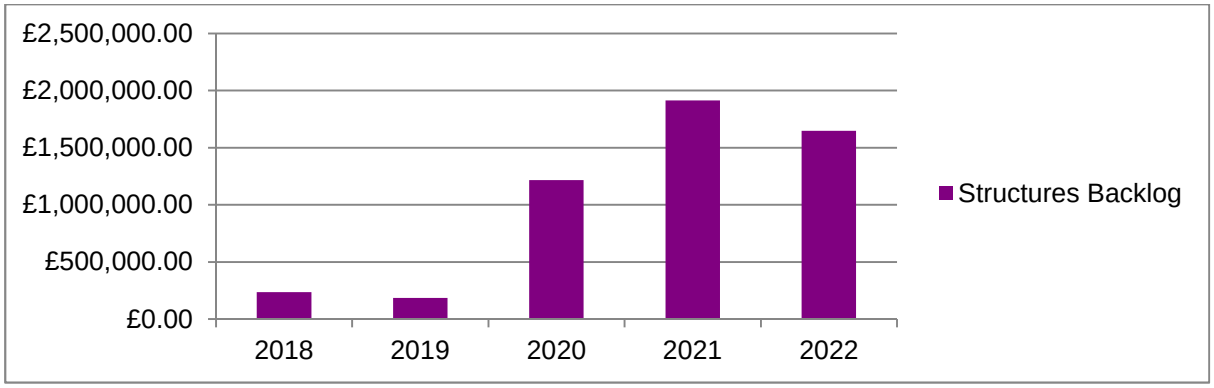


Figure 12 – Predicted Structures Backlog (2018-2022)

10.4. Drainage – Current Condition & Backlogs

Due to the variety of drainage assets condition has been simplified into two categories:

- Linear items (pipes, filter drains, ditches/grips and linear drainage)
- Numeric items (gullies, manholes/catchpits and soakaways)

Assumptions have been made on condition maintenance records, expenditure and local knowledge due to no official national condition surveys existing for drainage items.

Condition bands are sorted 1-5 (best to worst) as condition bands differ per asset type. A full detailed table of condition bands used for each drainage asset can be found in appendix A.

The conditions determined are displayed in figures 13 and 14 (page 29-30)

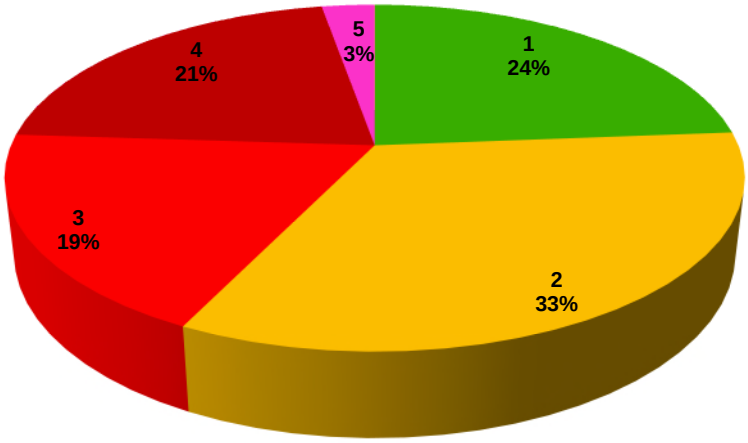


Figure 13 – Linear Drainage Items - Estimated Condition Profile

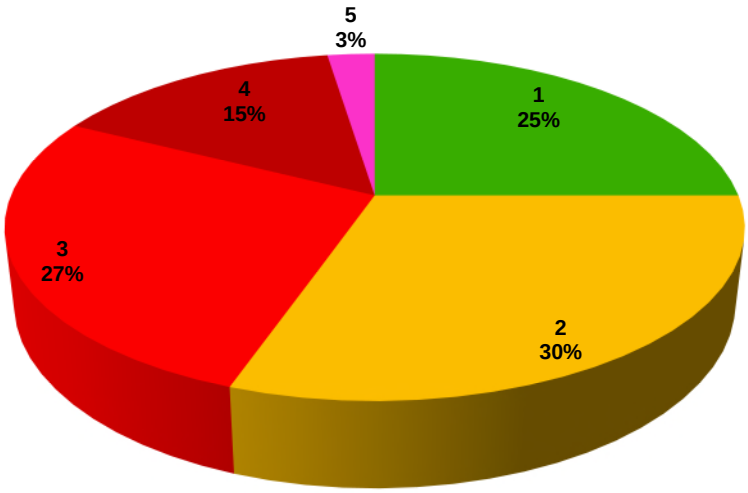


Figure 14 – Numeric Drainage Items - Estimated Condition Profile

Due to the condition bandings a realistic backlog approach will also be used for drainage. This is calculated as the cost of applying costs to replace condition 4 and 5 assets only.

The drainage backlog has been calculated using the above method and results can be seen in table 10 (page 32)

Table 10 – Realistic Drainage Backlog

Asset	Total (km/no.)	Realistic Backlog
Liner Drainage	161	£2,212,500
Numeric Drainage	31,215	£1,886,905
Overall Total	**N/A**	**£4,099,405**

10.4.1. Street Lighting – Current Condition & Backlog

Street lighting condition has been derived from a mixture of actual inventory, average age profiling and local knowledge. During to the recent LED replacement programme all columns with replacement lanterns were structurally tested and any 'poor' columns replaced. This has been taken into account, along with any deteriorating since then and columns not tested/replaced.

At present only lighting columns have been profiled/modelled, however as future data becomes available other elements can be profiled.

Figure 15 (below) shows the calculated street lighting condition. Condition bands have been developed with aide from an external street lighting consultant.

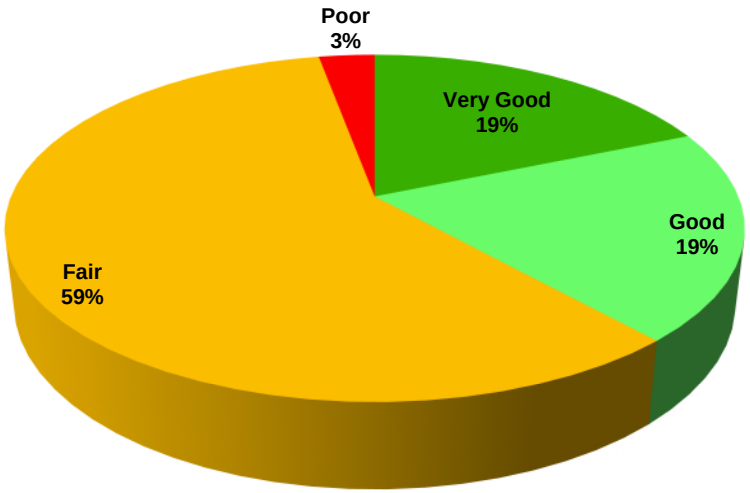


Figure 15 – Street Lighting (column) condition

It is worth noting that 'poor' in this scenario directly relates to columns in excess of the action age; columns which require monitoring but not necessary replacement. An increase in these 'poor' columns will lead to much higher monitoring costs. This is something for future consideration.

The backlog calculation for street lighting is as follows:

(Average cost of column replacement x No. of poor columns)

This figure currently stands at **£540,543**

Street lighting data is more likely to 'spike' with deterioration modelling. This will be explored further with the life cycle plans (section 11).

10.5. Backlog Summary

A collation of all backlogs determined is listed below in table 11 (below)

Table 11 – Key Asset Backlog Summary

Key Asset Group	Calculated Backlog
Carriageway	£24,350,000
Footway	£7,443,771
Structures	£546,165
Drainage	£4,099,405
Street Lighting*	£540,543
Total Backlog	**£36,979,884**

*lamp columns only

11. Asset Investment Strategies & Current Budget Life Cycle Plan Results

Setting performance levels can show areas of already satisfactory performance and areas in need of extra knowledge, funding and attention. The HAPMF contains a three year projection for all data driven measures based on knowledge gained from life cycle planning. For example; the LOS for 'Principal Roads requiring maintenance' has been set at 10% despite current performance being 2% as current-budget life cycle plans have shown this figure to be achievable within 3 years.

Using data modelling and life cycle planning, funding requirements to maintain the network in a current/steady/acceptable state can be derived. In this document these will be expressed as a percentage of latest budgets.

A detailed, technical methodology of life cycle planning is held in the internal document 'Life Cycle Planning – Methodology and Notes'; this includes a breakdown of treatments used, treatment costs and individual parameter deterioration for each key asset.

Only two scenarios will be used in this document at present, however a full suite of life cycle plans (including different scenarios) are also held and periodically updated in ‘Life Cycle Planning – Results’ document held internally.

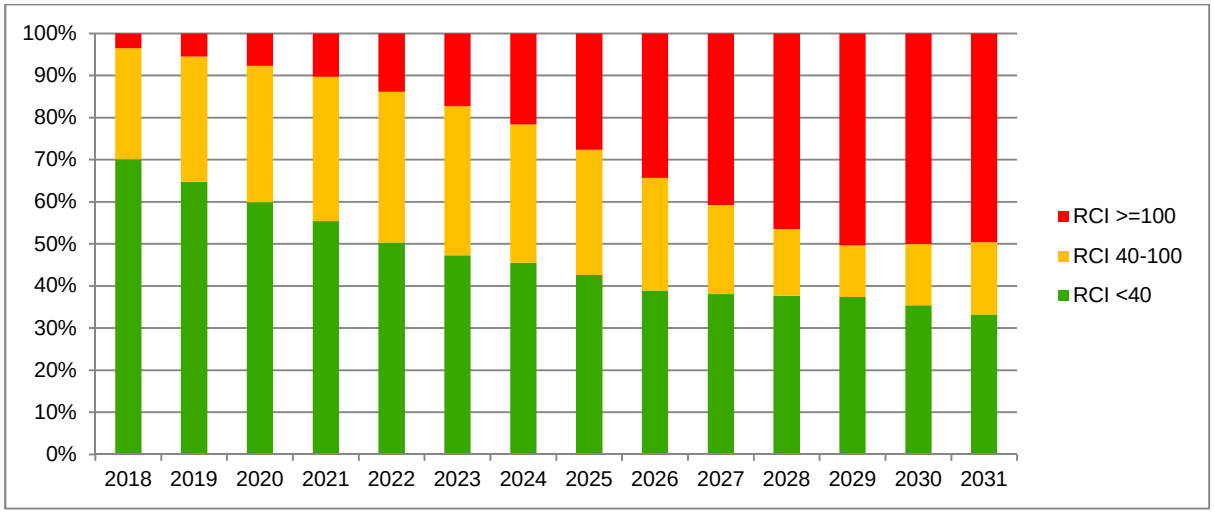
Where key assets are particularly currently underperforming, improvement life cycle plans will be produced and budgets gauged, this is planned for future revisions of the HAMS.

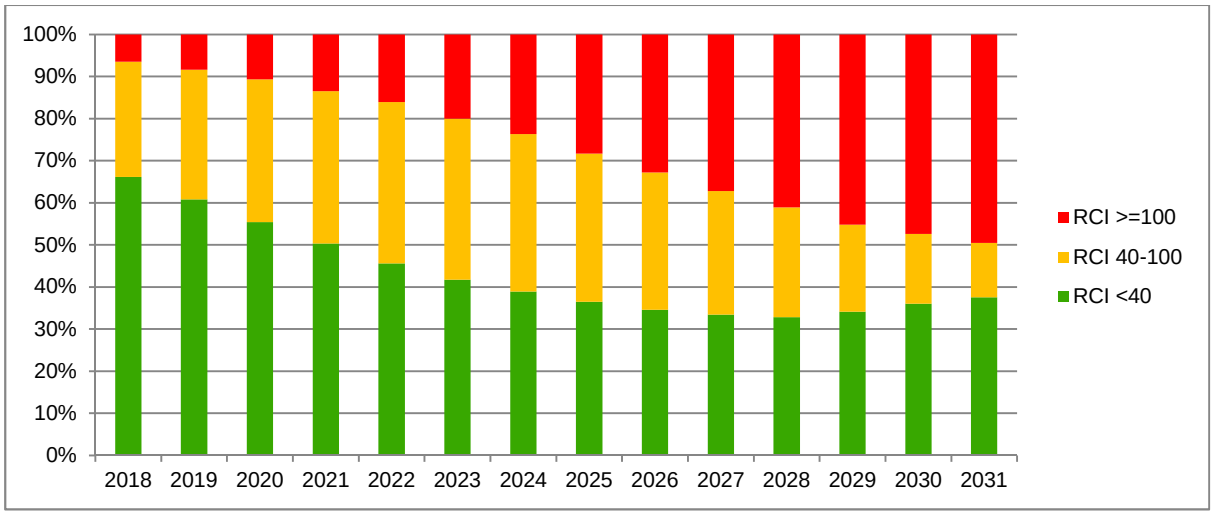
All figures are inclusive of current backlogs, as with improvement plans, scenarios are planned to be developed for steady state requirements with cleared backlogs.

11.1. Carriageway Life Cycle Plans & Steady State Requirements

All carriageway life cycle plans used for the purpose of asset investment strategies are run over a 15 year period using Yotta’s Horizons software. More long term (>15 year) life cycle plans and scenarios are performed using the HMEP life cycle toolkit. The advantage of this is a much higher level of detail; each subsection of surveyed data is deteriorated based upon historical deterioration rates of parameters as opposed to a network level probability based approach. However due to the processing power and time taken this becomes unfeasible above 15 years, thus the use of the HMEP toolkit for further future planning.

Figure 16 (page 35) shows the results of 15 year life cycle plans for each carriageway type. All have been run using 0% inflation on both budget and treatments and over a 15 year period.





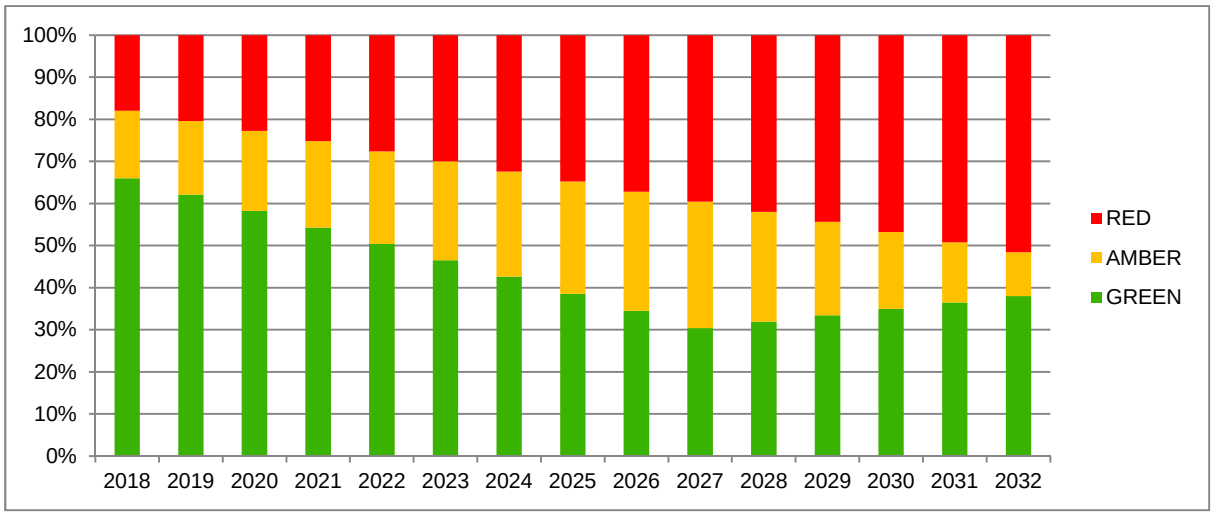


Figure 16 – Carriageway Life Cycle Plans (15 years, current budget, 0% inflation), A Roads (top), B&C Roads (middle), Unclassified Roads (bottom)

From the running of multiple deterioration models with various budget inputs it is believed a steady state figure has been obtained. As deterioration modelling does not account for the 'spread' of defectiveness, e.g. for a subsection requiring a more intensive treatment, the preceding and succeeding subsections of carriageway are more likely to deteriorate than a current 'green' section of carriageway elsewhere the figures have only been split into 'green' and 'amber/red'

These will be split amongst the different carriageway types. Firstly, Principal carriageways (A Roads) will be analysed.

Figure 17 (below) shows a life cycle plan for classified carriageways with approximately **243%** of current budget applied.

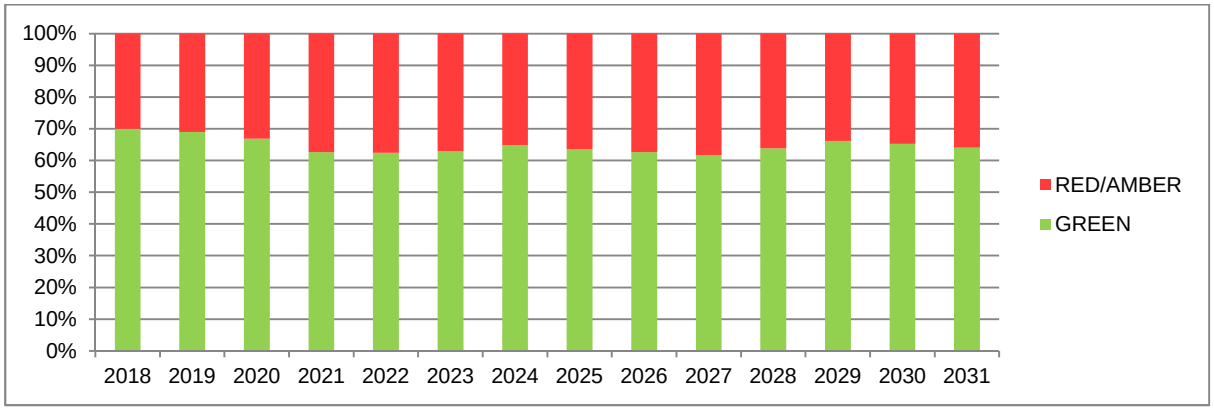


Figure 17 – Principal/A Roads Steady State Prediction (243% of current budget)

For non-principal classified carriageways approximately **200%** has been determined to reach a steady state. This is shown in figure 18 (below).

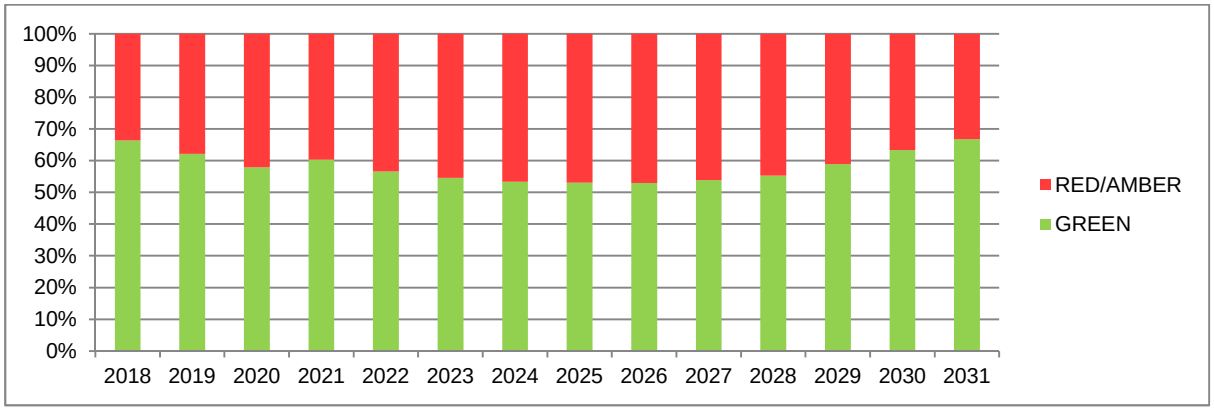


Figure 18 – Non-principal Classified/B&C Roads Steady State Prediction (200% of current budget)

For unclassified carriageways approximately **200%** has been determined to reach a steady state. This is shown in figure 19 (below).

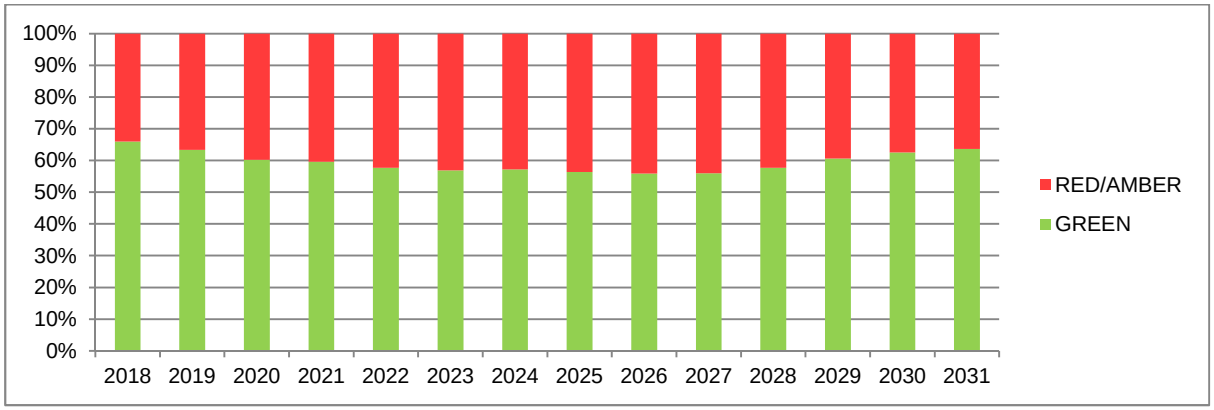


Figure 19 – Unclassified Roads Steady State Prediction (200% of current budget)

11.2. Footway Life Cycle Plans & Steady State Requirements

All footway life cycle plans will be performed using the HMEP life cycle toolkit. This is due to the nature of footway data collected. FNS (Footway Network Survey) data is collected comprising of four condition categories as opposed to individual defects. Therefore the probability based approach of HMEP is much more suitable. Currently a provisional life cycle plan has been performed using a sample of approximately 80% of the footway network as the 2017/18 FNS survey (covering 100% of the network) is currently in progress.

The FNS survey undertaken was the variant ‘enhanced 3’, surface types and lateral extents are collected rather than just levels of defectiveness. This impacts life cycle planning as the ‘true’ reflection of the condition of the footway network may not be realistic in the application of works.

For example; a subsection of footway that is 50% structurally unsound, would not be half treated, the whole extent would be. The enhanced method of survey collection benefits accuracy and robustness of data and asset prioritisation: generally* something 50% structurally unsound would take priority over something with only 25% defective.

*other prioritisation factors may be present such as locations of schools etc.

The FNS data could be interpreted in the following ways

- ‘Highest’ defect level first/worse case scenario. E.g. if a subsection is 25% structurally unsound then the whole subsection is classed as structurally unsound in terms of defect lengths across the network (worst case scenario).
- Best case scenario. For forward projections where 25% of a subsection is structurally unsound the other 75% is classed as ‘as new’
- Realistic condition adjustment/median case scenario. Any defects >=50% of footway extent are rounded up to 100%, data is both processed to best case and worst case scenario and ratio of defects averaged

The median-case scenario has been adopted in determining footway asset investment levels, however all scenarios do show similar trends so before individual plans are analysed a brief 5 year comparison of all scenarios is shown in figure 20 (below). All footway life cycle plans have the budget for 2018/19 applied and split equally between surface types (e.g. if 50% of the footways are bituminous, 50% of the budget will be applied.

Figure 20 – Best (top), median (middle) and worst (bottom) scenarios derived from FNS results (example surface: bituminous)

Similar to the approach used for carriageways, life cycle plans have been run over 15 years with 0% inflation for both treatments and budget. These are shown in figure 21 (page 40).

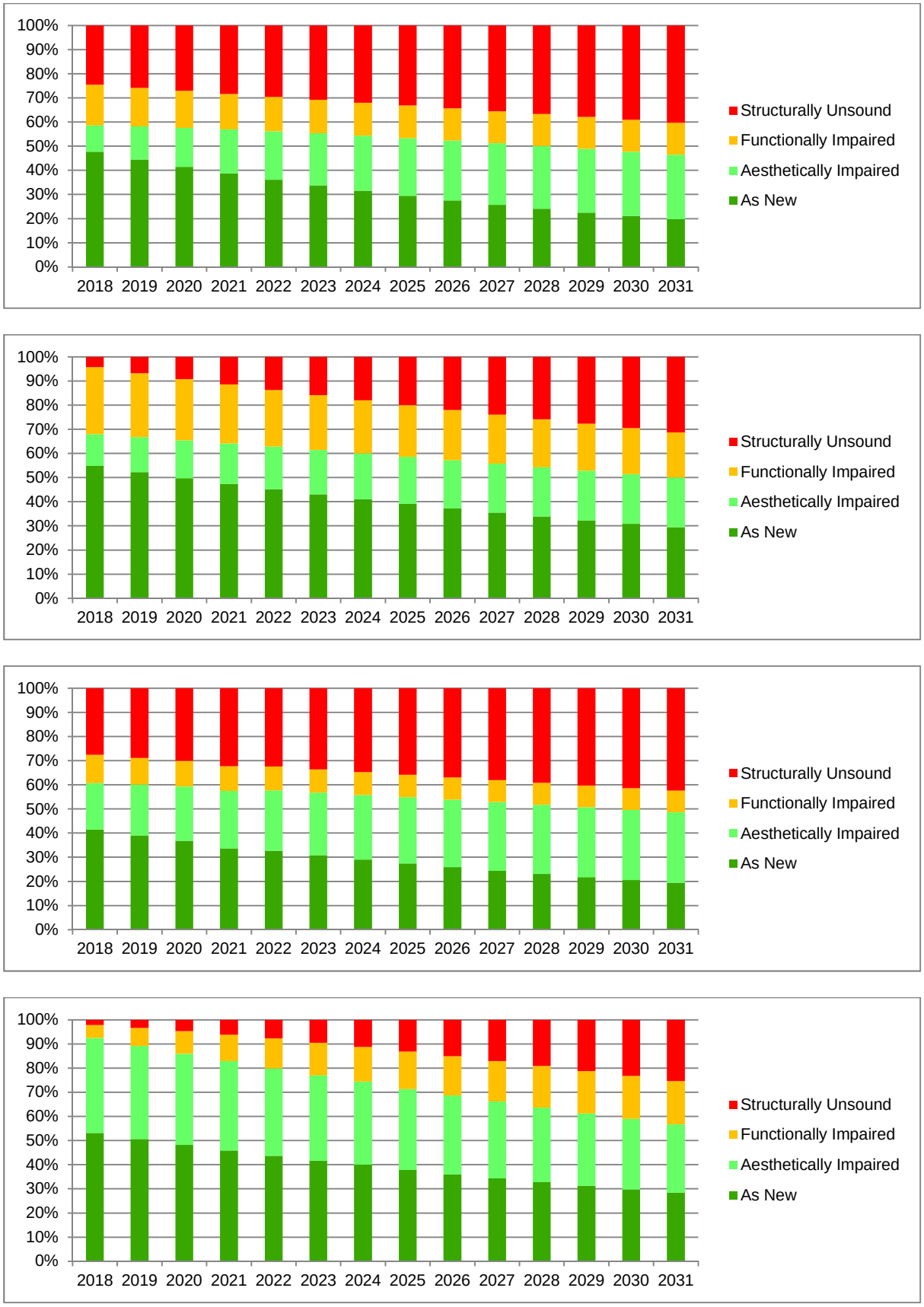


Figure 21 – Footway Life Cycle Plans (15 years, current budget, 0% inflation), Bituminous (top), Flag (second), Concrete (third), Block Paved (bottom)

Due to the footway breakdown (approx. 78% bituminous, 11% flag, 8% concrete and 3% block paved), these results can be amalgamated. This is shown in figure 22 (below)

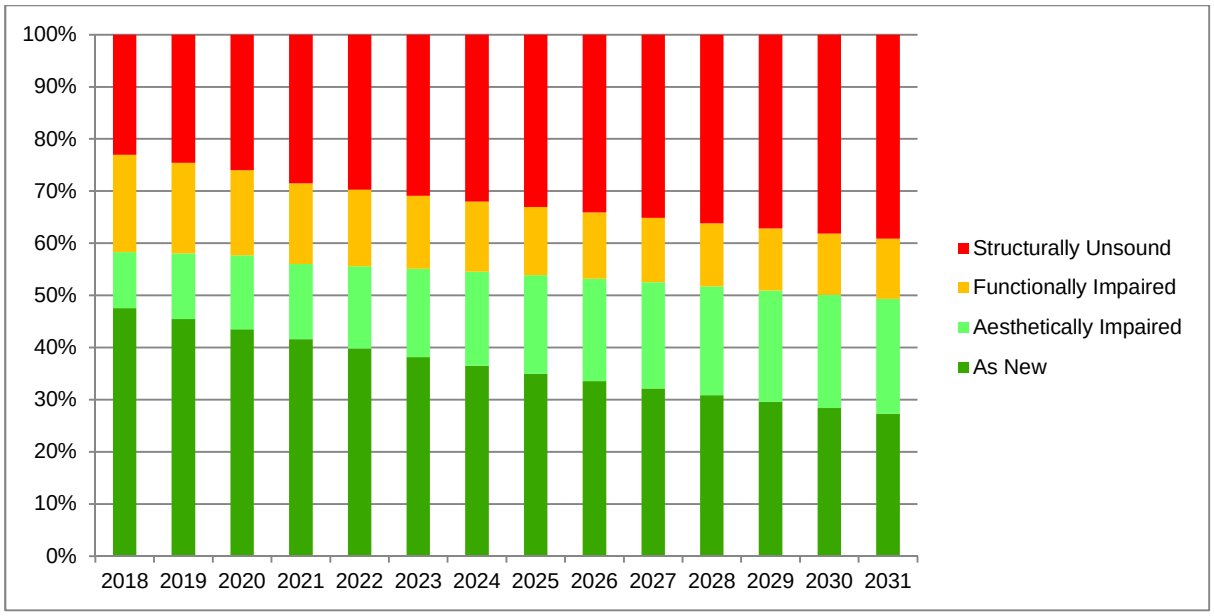


Figure 22 – Footway Life Cycle Plan (15 years, current budget, 0% inflation), all surface types amalgamated

As is the case with carriageway a deterioration of the footway network is presently predicted over the analysis period with current budgets. Therefore a deterioration limitation approach will be adopted in regards to planned maintenance.

An amalgamation of footway types will be used in determining the steady state. This is due to planned maintenance works being based on a priority and worst first basis with surface type not currently a factor.

Figure 22 shows a life cycle plan for all footways with approximately **417%** of current budget applied.

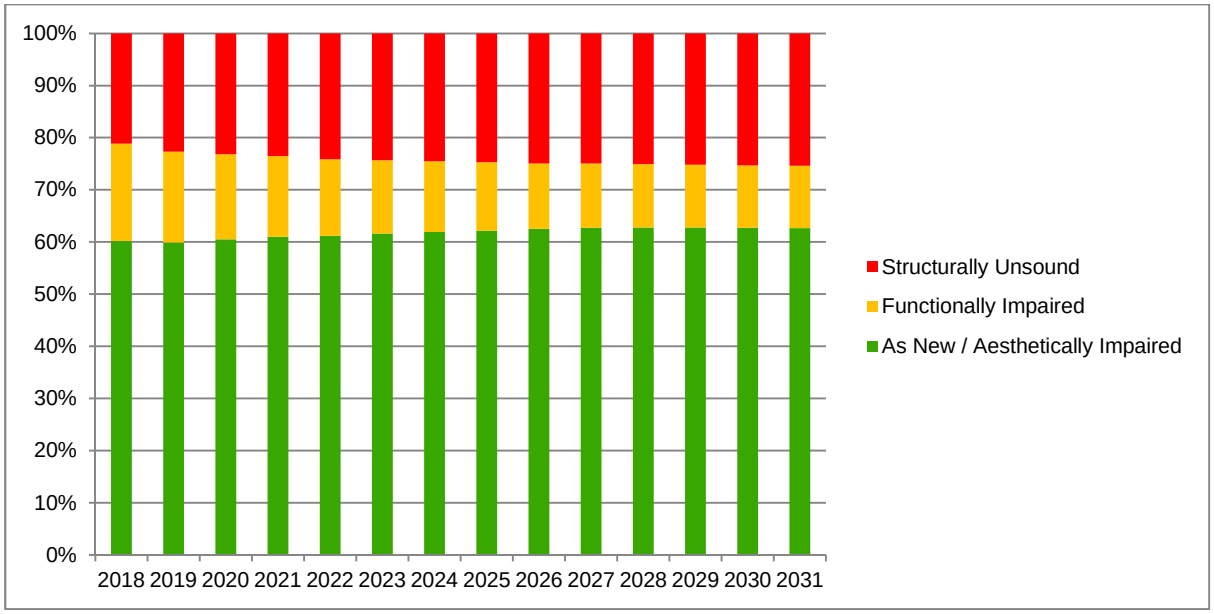


Figure 22 – All Footway Steady State Prediction (417% of current budget)

11.3. Structures Life Cycle Plan & Steady State Requirements

The Structures Asset Management Toolkit has been used to develop life cycle plans for structures. The structures life cycle toolkit has been developed by multiple structure engineers over many years from both the public and private sector.

Due to the nature of structures all components/assets are modelled together in one scenario. Figure 23 (below) shows the results of a current budget, 0% inflation model over 30 years including a projection of % of structures at risk.

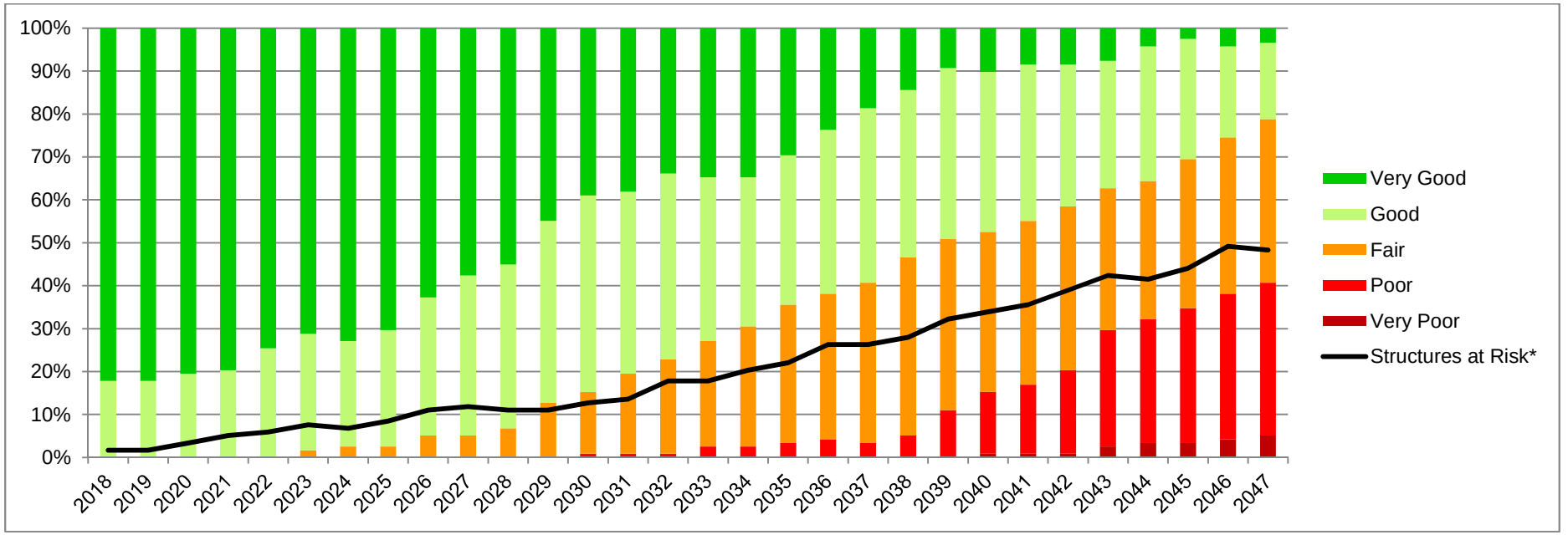


Figure 23 – Structures Life Cycle Plan

A budget shortfall can also be returned, this has been displayed as a % of total investment over the 30 year period. E.g. if £100,000 a year is invested annually, by year five this would be £500,000 and if year 5 shortfall was £1m the shortfall would be 200%. Figure 24 (below) shows budget shortfall.

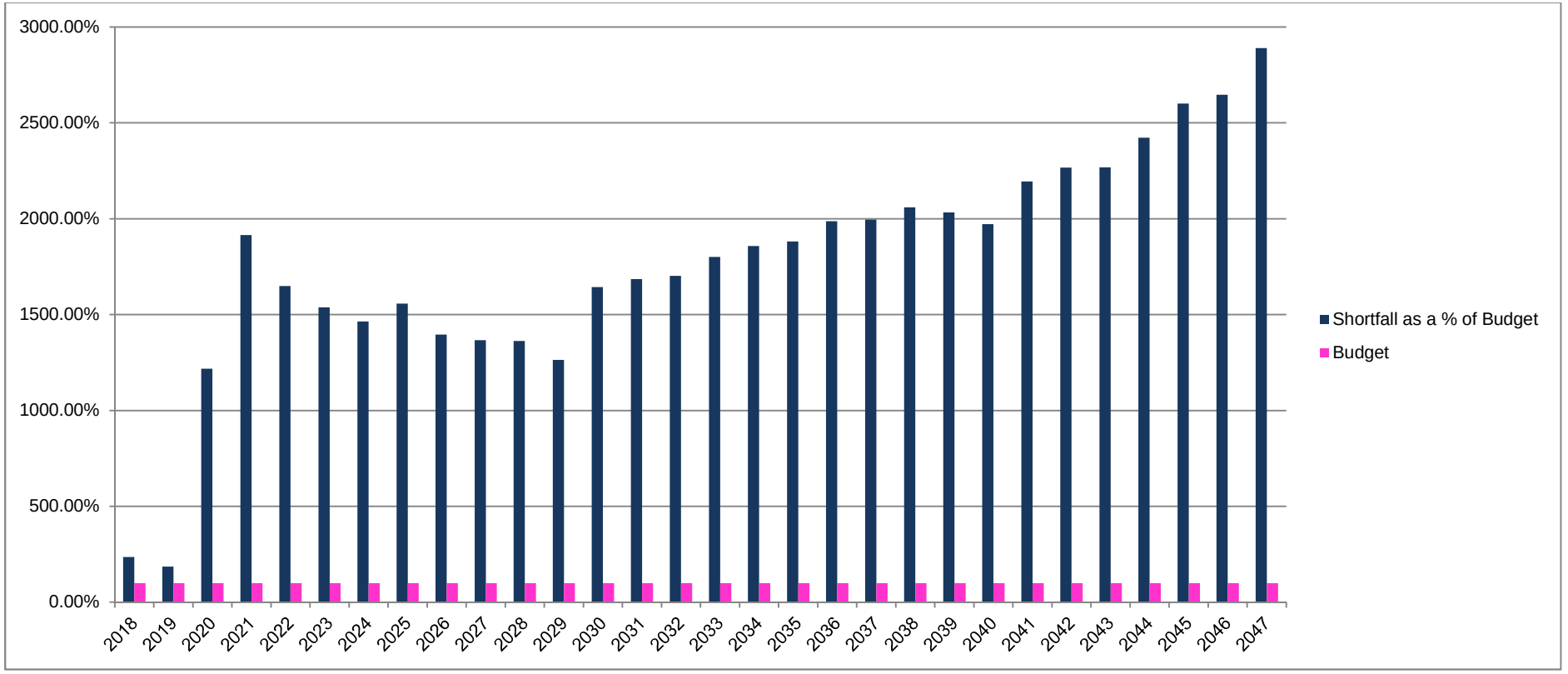


Figure 24 – Shortfall as a % of Budget (30 year projection)

It is important to highlight additional considerations regarding structures life cycle plans. Figure 23 (page 40) does reflect the overall condition as being ‘Good’ and ‘Very Good’ at present. However, this is an overall view of a structure whereas to see risks associated the $SSCI_{crit}$ scores must be considered. The $SSCI_{crit}$ is a nationally used score for structures that: “provides an indication of the criticality of the stock with regards to load carrying capacity”. This has previously been discussed in section 10.3.

Figure 25 shows the $SSCI_{crit}$ projection and associated condition band over the life cycle plan period (30 years).

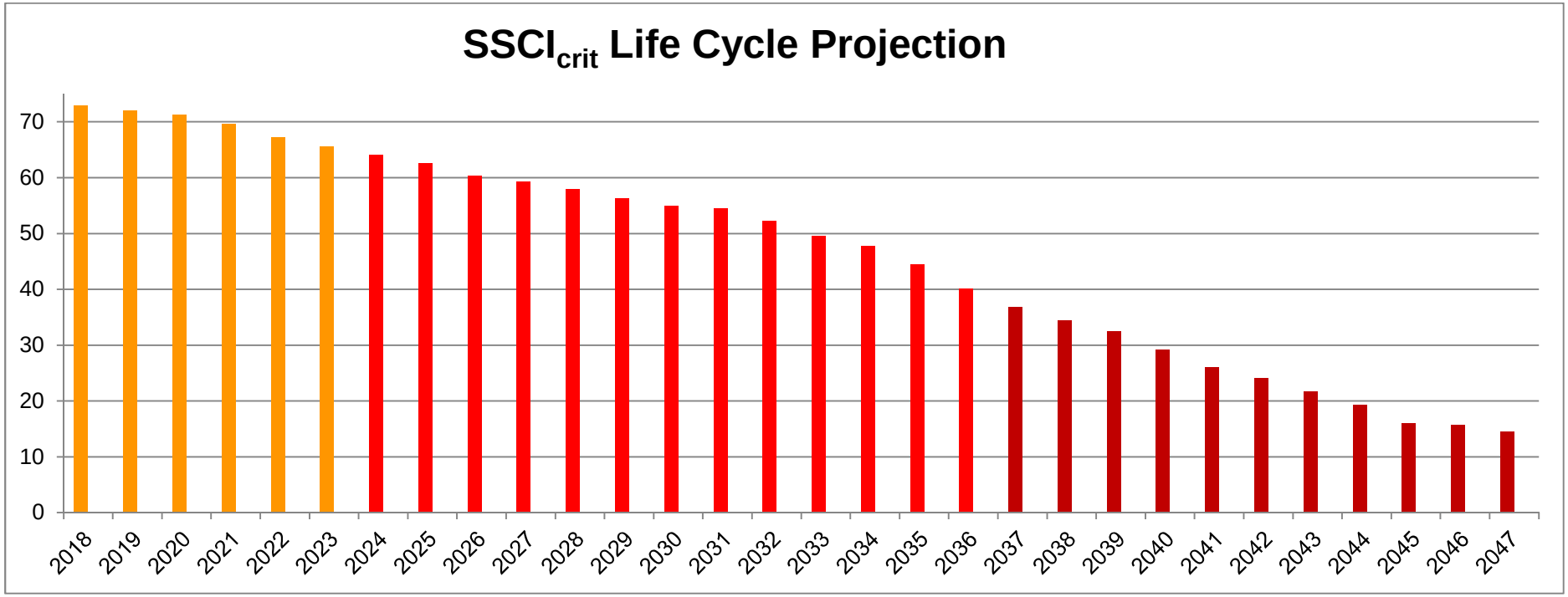


Figure 25 – $SSCI_{crit}$ Projection

Due to the varying levels of investment needed by structures the steady state percentage will be worked out as an average over a 15 year period (to normalise with other key asset life cycle plans). Figure 26 shows the average annual investment needed between 2018-2032 to retain Thurrock owned structures in a 'steady state'. This stands at approximately **1345%**

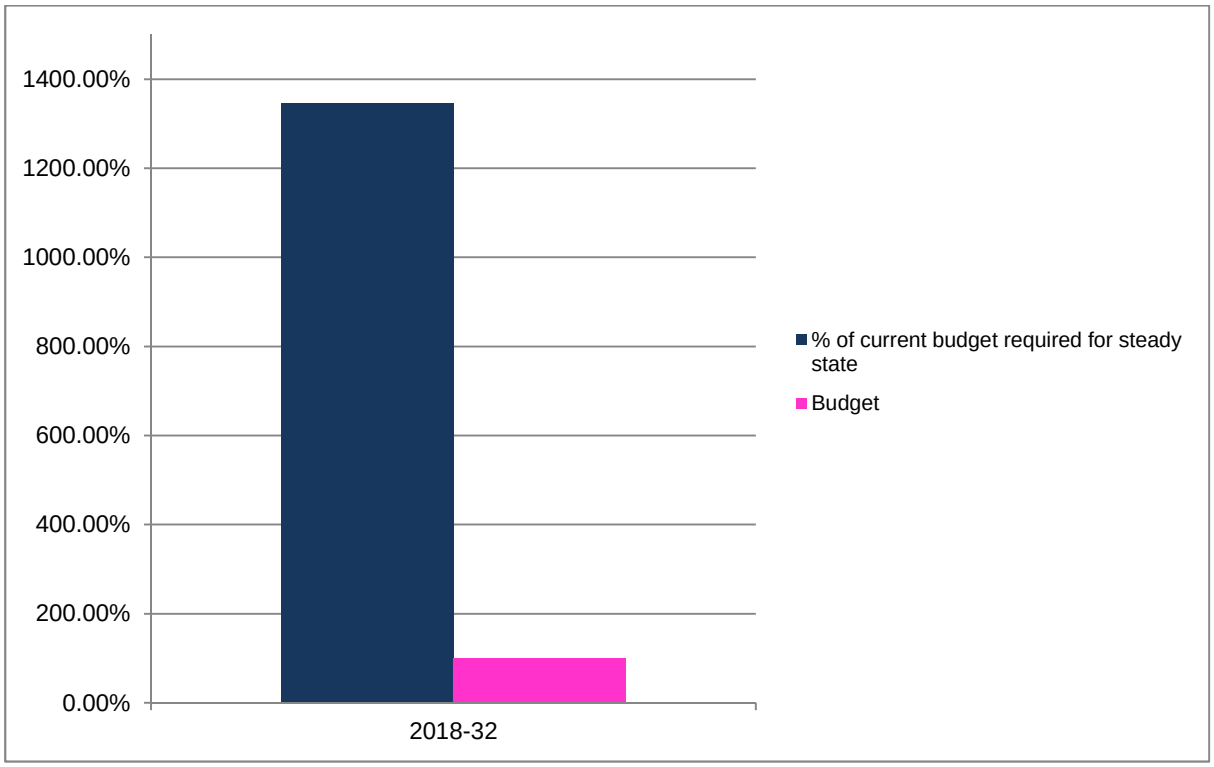


Figure 26 – Structures Steady State Requirement Prediction (requirements as a % of current budget)

11.4. Street Lighting Life Cycle Plan & Investment Scenarios

Street lighting life cycle plans were performed using a bespoke produced toolkit by an external street lighting consultant. As with the condition profile and backlog calculations this will also focus only on lighting columns.

The deterioration profile has been derived using the installation year of the column and a simple treatment applied: replacing as many columns as possible that are past the action age using available budgets.

Figure 27 (page 47) shows the results of the 15 year street lighting life cycle plan.

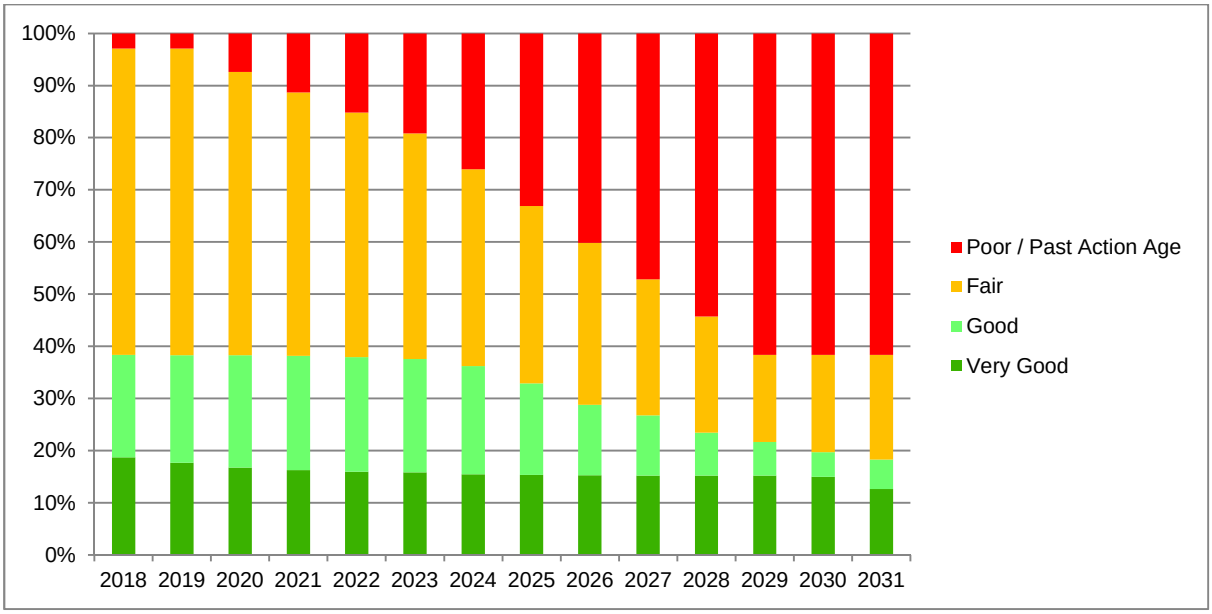


Figure 27 – 15 year street lighting life cycle plan

A static budget is not the most appropriate for street lighting as batches of columns tend to be installed/renewed in batches with action ages tending to spike.

In a realistic sense, not all columns passed the action age will require renewing immediately; many will be structurally sound past this age, only more frequent inspections will be needed. Due to this factor three investment scenario figures will be returned:

- Scenario 1: Investment required to replace 100% of columns past action age
- Scenario 2: Investment required to replace 50% of columns past action age
- Scenario 3: Investment required to replace 25% of columns past action age

All scenario figures will be presented as an average over the life cycle plan period (2018-2031) and returned as a % of current annual budget as opposed to a monetary figure.

- Scenario 1: approx. **1039%**
- Scenario 2: approx. **519%**
- Scenario 3: approx. **260%**

It is also worth noting that the large percentages generated by these scenarios are due to the nature of the column installation date: 33% of lighting columns in Thurrock were installed before 1990, over the 15 year projection period all of these will hit their action ages of 30, if not 40 years. Approximately 43% of columns are also un-dated, a proportion of these can also be assumed to be past action ages, this has been reflected in the model and confidence in the inventory data and assumptions made is relatively high.

From the data returned by all available scenarios it is clear that additional funding is required for managing the street lighting asset due to an ageing lighting network.

11.5. Drainage Life Cycle Plan & Investment Scenarios

A bespoke Markov model developed by an external drainage contractor was used in the development of preliminary drainage life cycle plans. Due to the current drainage inventory and knowledge being 'poor' as per the asset register scoring criteria a variety of estimates had to be made. These estimates are based on a variety of sources including: local knowledge, benchmarking and calculations vs. other assets.

The drainage items and assumptions/estimates made are as follows:

- Gullies (no.) – Actual inventory data collected 2014. Condition estimates derived via local knowledge and maintenance records
- Drainage Pipe – Lengths derived from gully inventory (assumed lengths of pipe per gully). Condition derived via local knowledge
- Manholes and Catchpits – Estimates based on ratios compared to Wokingham Borough Council due to similar gully amounts and network size. Condition estimates derived from local knowledge and maintenance records.
- Filter Drains – Inventory and condition estimates based on local knowledge
- Ditches and Grips - Actual inventory data collected 2014 and updated 2017. Condition estimates derived from local knowledge and maintenance records.
- Linear Drainage - Inventory and condition estimates based on local knowledge
- Soakaways – Originally estimated via Wokingham ratios, however local knowledge estimated a much larger amount due to the nature of Thurrock's network. Condition estimates derived from local knowledge.

As stated in section 10.4 drainage bandings vary per asset type. The same bandings have been used for the life cycle plan as in the condition analysis; bands 1-5 (best to worst), with band 5 generally being an entire replacement of the asset. More details and a breakdown per asset can be found in appendix A.

The model has been applied with current budgets and treatments needed when necessary. E.g. Bands 2, 3 & 4 for gullies have the same treatments. A cost benefit analysis has been performed prior to the model to be run to ensure treatments are not applied too early (e.g. only replacing frames and/or covers when condition is in band 4

As with the condition bandings linear drainage and numeric drainage have been analysed separately. Both results are shown in in figure 28 (page 49).

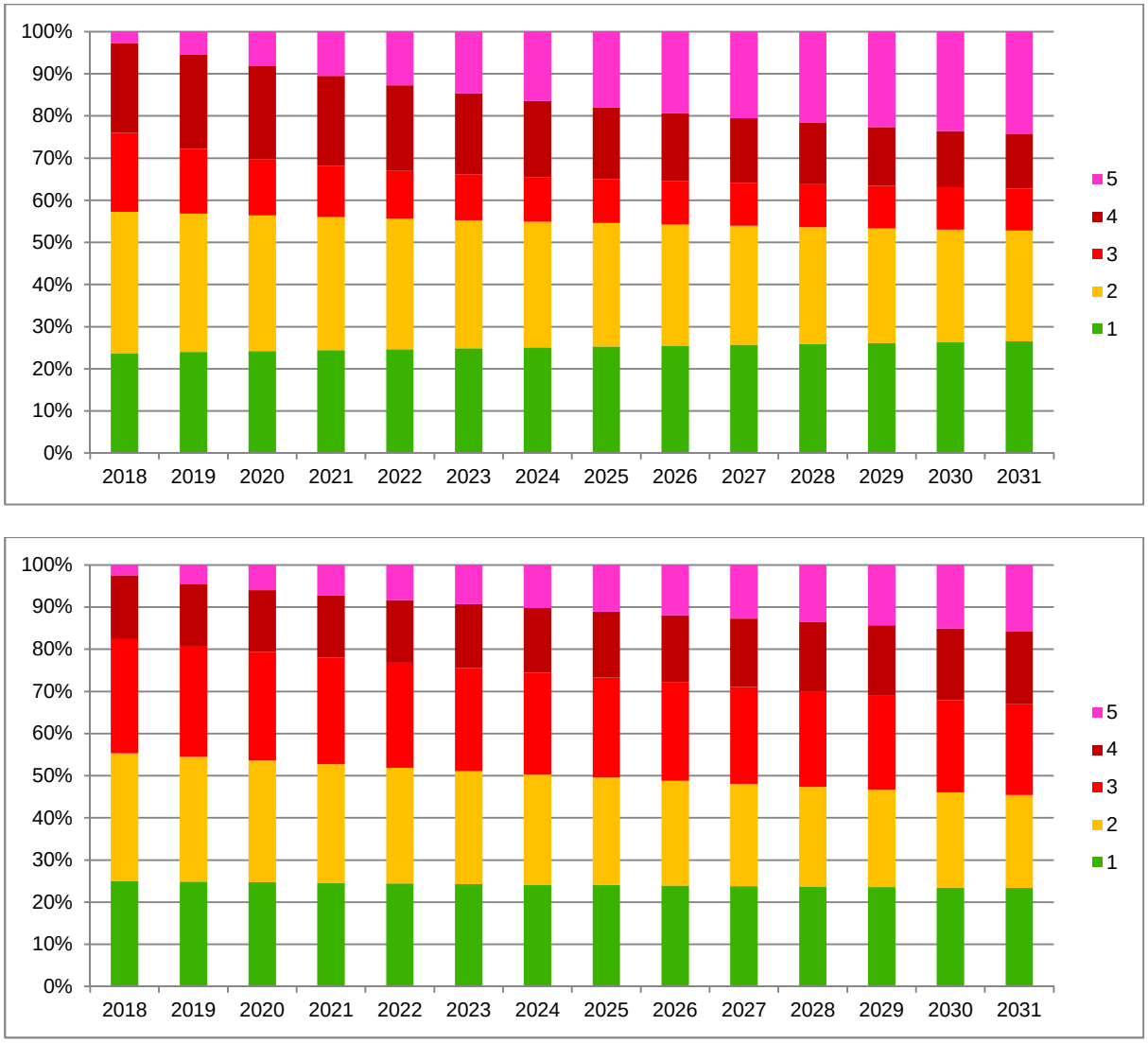


Figure 28 – Drainage Life Cycle Plans, current budget, 15 years, 0% inflation, linear drainage (top), numeric drainage (bottom).

Some ‘realistic’ adjustments can be made to the above graphs before investment strategies can be generated. For context the investment levels for steady state using the above two life cycle plans will first be returned:

- % of budget to achieve steady state (combined linear and numeric items): **336%**

‘Realistic’ adjustments that have been made to the data include affect pipe assets only at present:

- Deferral of pipe treatments as works can be combined with carriageway resurfacing: based on % of pipes in band 5 and lengths of carriageway treated annually (e.g. 10km carriageway approximately treated annually, an average of 0.15km of pipe per network kilometre, a potential of 1.5km of pipe treated per year combined with carriageway works, 30% of pipes in bands 4-5 resulting in average £80/m savings, resulting in a potential saving of around £35,000

Applying the pipe calculations a new figure can be calculated:

- % of budget to achieve steady state (combined linear and numeric items with realistic pipe adjustment): **289%**

More efficiencies are constantly being investigated and will be reflected in future updates of this document.

11.6. Asset Investment Strategies - Summary

Table 12 (below) shows a summary of all investment strategies scenarios analysed in this section of the report via the medium of life cycle planning.

Table 12 – Summary of Asset Investment Strategies

Asset Group	Asset	Scenario	% of current budget required to achieve scenario (annual)
Carriageway	A/Principal Roads	Steady State	243%
	B&C/Non-principal classified Roads	Steady State	200%
	Unclassified Roads	Steady State	200%
Footway	All Footways	Steady State	417%
Structures	All Structures	Steady State	1354%
Street Lighting	Lighting Columns	1: Replace 100% of columns past action age	1039%
		2: Replace 50% of columns past action age	519%
		3: Replace 25% of columns past action age	260%
Drainage	All Items	1: ‘As returned’ life cycle plan results	336%
		2: ‘Realistically adjusted’ life cycle plan results	289%
ALL – Combined Budgets		Minimum % scenario(s)	294%
		Maximum % scenario(s)	347%

All budget figures input into these models are based on the latest available of either 2017/18 or 2018/19.

To keep all key assets in a steady state approximately between 294-37% of current budget is required. Under current conditions a steady state is not achievable therefore a 'decay limitation' approach will be adopted across all key assets.

The slowing of asset decay can occur by adopting good asset management practices, embracing technology and developing innovations.

12. Improvement Plan

In the linked suite of asset management documents continual improvement is a key issue. For example; each performance measure and associated level of service has a continual improvement plan (see the Highways Asset Performance Management Framework for more details).

This section of the document will detail selected improvement plans for each asset to improve things such as data quality, VfM and asset condition. Selected improvements are listed in table 13 (below).

Table 13 – Brief Overview Of Key Asset Improvement Plans

Key Asset / Group	Improvement	Effect / Predicted Effect	Status
Carriageway	CVI survey commissioned for classified network sections with low SCANNER coverage	Much improved data coverage on some areas of the classified network (where data gaps are present due to SCANNER vehicles not being able to obtain at least 30mph). Data driven decisions will be able to be made on these sections of carriageway.	Survey commissioned, first set of results expected mid 2018
	Survey cycle on classified roads moved from four year cycle to three year cycle	Greater data coverage. Minimum national requirements for CVI surveys on unclassified roads are once every 4 years covering the entire network. If some sections are missed due to roadworks etc. they would be excluded from the reporting period	Survey commissioned, first set of results expected mid 2018
Carriageway / Footway	Combination of planned maintenance on adjacent footways / carriageways	More efficient works, a reduction traffic management costs (especially in regards to footway schemes where kerb works are undertaken)	Awaiting remaining 20% of FNS survey
Structures	Purchase of new structure asset management system (Bridge Station)	Much more efficient management of data via a cloud based system. WGA figures generated to reduce the time taken each year. Much more robust and usable data to make data driven decisions.	Awaiting implementation
Drainage	Risk-based cleansing regime developed	Possible reduction in flooding hotspots as these are cleansed on a more regular basis. Greater knowledge of possible 'deeper' faults as flooding of recently cleansed areas indicates other issues (pipes, leads etc.)	Awaiting approval
	Additional drainage cleansing vehicle	A greater number of drainage assets can be cleansed on a planned basis. Additional machine will be assigned to reactive works, freeing up current equipment	Approved, awaiting purchase and implementation
Street Lighting	LED replacement programme	Reduction in both carbon emissions and energy costs have been observed (see HAPMF)	Complete, results compiled regularly

12.1. Previous Actions

Improvements stated in the previous edition of the HAMS will be addressed in table 14 (below) (anything previously marked as complete has been omitted).

Table 14 – Progress of previous HAMS actions

Item/ Theme	Status (Oct 2016)	Action (Oct 2016)	Status (Dec 2017)	Notes
Strategy Investment Level	Strategies and options reports need to be developed as part of the budget setting process	Develop strategies and options reports – set investment level outcomes.	Ongoing	As part of implementation of good asset management practises prioritisation programmes have allowed use to produce forward works programmes on key asset groups. Investment levels are currently set by annual budgets. Currently looking into utilising improved asset data to drive bid submissions
	Need to review the cost coding structure to enable improved cost control and benchmarking	Review and implement revised cost coding structure if required.	Ongoing	Cost coding structure has been reviewed, current changes not needed at present. Will review for 2018/19
Asset Register	Asset Data is relatively poor. Some Asset Data is stored externally including Traffic Management and Structures. Internal data is patchy with no formal records for Drainage or Street Furniture.	Collect condition data for footways	In Progress	As of December 2017 surveyors are on site undertaking a FNS survey on 100% of the network.
		Develop strategy for drainage and Street Furniture asset data collection and collect higher priority items	Mostly Complete	Street furniture data (signs, bins, benches etc.) In Symology system. Data is available for gullies and ditches, however inventory for soakaways not present in accesible/usable format (paper records)
		Data is required regarding gully cleansing operations. The data will be used to devise a more cost effective and efficient gully cleansing regime, visiting higher need gullies more frequently and those that are routinely found to not need cleaning less frequently.	Complete	Gully cleaning regime referenced to both the highway network and each individualy gully. Risk-based cleansing regime developed ranging from thrice annual cleansing (flooding hot spots) to every two years (small cul-de-sacs)
Carriageway Life cycle Planning	There is accelerated deterioration of carriageways due to high level of HGVs on specific routes and areas at risk of structural damage due to periods of exceptional weather.	Carry out analysis to quantify and determine a response to this damage.	Complete	Numerous carriageway life cycle plans have been undertaken covering a variety of scenarios (see section 7)
Information systems	The Council has invested in an asset management system Symology, to support asset management.	Add required inventory data into Symology	Complete	Results of the 2014 walked asset inventory survey are now held in Symology (27 different asset types)
		Agree procedures for maintenance of data	Complete	Any changes to recorded and new inventory are added into symology and the internal asset register updated
		Continue updates of asset data.	Ongoing	Currently exploring methods to collect asset data with routine inspections/surveys to save time and money vs an individual asset survey. E.g. considering adding ironwork collection into the 2018/19 FNS survey onwards until coverage is 100%.

Whole Life Cost Planning	Prioritisation processes for key asset groups	Budget allocation process between key asset groups requires review and updating	Ongoing	Life cycle models performed on key assets (where applicable) to gauge predicted funding vs actual funding. Currently no areas were budget can be 'shifted' between key assets have been identified. Funding gaps identified for all key assets

12.2. Future/Continuous Improvement

Continuous improvement is key to good asset management. Thurrock Council is dedicated to continually improving asset management practices.

13. Good Practice

Thurrock Council is committed to the development of good practice and benefits from lessons learnt at National, Regional and Local levels. Officers from Thurrock Council regularly contribute to and attend:

- National and regional conferences;
- The CIPFA Highways Asset Management Planning Network;
- South East HAUC

Furthermore, Thurrock Council is committed to the sharing of knowledge and experiences in implementing asset management with other Highway Authorities across the Country. To this end, officers from Thurrock Council should aim to regularly present examples of good practice at national conferences and regularly attend meetings with the following groups:

- Highways Asset Management Financial Information Group (HAMFIG);
- The Chartered Institute of Public Finance and Accountancy CIPFA
- Highway Maintenance Efficiency Programme HMEP
- UK Roads Board
- National and regional conferences
- South East HAUC
- Eastern Highway Alliance

In addition to national level conferences and meetings Thurrock council has been regularly meeting with Medway council and benchmarking performance measures and asset management techniques.

14. Review Process

This strategy will be updated annually with minor amendments (where necessary) and reviewed on a three yearly basis by the Highway Asset Management Team.

Appendices

Appendix A – Detailed Drainage Asset Condition Bands

TableA1 – Drainage condition bands used for production of life cycle planning

	Band 1	Band 2	Band 3	Band 4	Band 5 / Replace
Gully	As New	Replace frame and/or cover	Replace frame and/or cover	Replace frame and/or cover	Replace entire gully
Pipe	As New	Replace	Replace	Replace	Replace pipe and deep excavation
Manhole/ Catchpit	As New	Reset	Replace cover	Replace cover	Replace entire manhole
Filter Drain	As New	Replace	Replace	Replace	Replace and deep excavation
Ditches/ Grips	As New	Excavate	Excavate	Excavate	Excavate
Linear Drainage	As New	Replace	Replace	Replace	Replace
Soakaways	As New	Clean	Clean	Clean	Replace