Northamptonshire County Council

Northamptonshire Highway Asset Management Policy and Strategy

October 2015

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Foreword

It is with pleasure I present Northamptonshire County Council's Highway Asset Management Policy and Strategy. This document brings together key policies and strategies to manage the significant number of assets we have on the Northamptonshire Highway Network and it supersedes historical Northamptonshire Asset Management Plans.

The Northamptonshire highway network continues to grow year-on-year and we constantly look to refine and improve how we manage the highway assets to develop maintenance strategies which balance the demand on the network, available maintenance funding and public expectation.

The importance of establishing and practicing a sound approach to asset management is recognised by the Department for Transport. The Highway Maintenance Efficiency Programme was established to assist Local Authorities with managing assets and more recently future highways funding allocations will reflect how well a Local Authority practices asset management.

The Highway Asset Management Policy and Strategy document is supplemented by other key documents including the Highway Network Management Plan and the Northamptonshire Transport Plan. Furthermore the Highway Infrastructure Asset management Plan supports the Northamptonshire County Councils corporate objectives including contributing to and increasing the well-being of our citizens and making Northamptonshire a great place to live and work through creating and maintaining safe, inclusive and functional highways.

Councillor Michael Clarke
Cabinet Member for Transport, Highways and Environment

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Chapter 1: Highway Asset Management Policy

Northamptonshire County Council is responsible for maintaining a highway network that not only serves the residents of Northamptonshire but also supports the growth of the County's economy and promotes recreational activities. Effective and efficient management of highway assets is a key factor in the ability of the Council to deliver its services and enable the economy of the County to thrive.

1. Increasing the wellbeing of your community

Our priority is to keep the Northamptonshire Highway network safe and through our asset management strategies we will prioritise and target work to the areas where maximum benefit will be derived from the investment. Our asset management strategies allow the competing needs and demands placed on highway services to be balanced resulting in a consistent and fair allocation of resources.

We recognise the importance of a well-managed highway infrastructure and our extensive public rights of way network for healthy lifestyle activities, like cycling and walking, as well as contributing to physical and mental well-being.

2. Helping you take charge of your life

The Northamptonshire highway network allows travel to places of work, to schools, and travel for social reasons. Our maintenance decision making will be based on consideration of all highway assets and their competing needs. Through considering the interaction of assets on the network with a holistic approach we can promote travel choices to assist people moving around the County.

Our effective asset management strategies will support the development of a valuable transport system that helps facilitate a high quality of life by meeting the needs of the individual whilst remaining responsive to the changing needs of businesses and the local economy.

3. Innovative Public Sectors

We will continue to develop our knowledge of Northamptonshire's highway assets and how they behave. Through improving our understanding of asset condition and behaviours, we will ensure

the decisions we make now look to the future by maximising the life of the asset. We will use this data as a benchmark to evaluate new maintenance materials and methods assessing their suitability for Northamptonshire. Our knowledge of the use and purpose of assets on the network will ensure public money is not used to maintain assets that serve little or no purpose.

4. Enterprising Public Sector

Adopting an asset management approach that promotes preventative maintenance will ensure that highway infrastructure assets support the delivery of services in the local economy, taking into account the long term performance of the asset. A well-managed highway network plays an essential role in supporting growth and attracting increased investment in the County. We recognise that increasing traffic volumes will place a higher demand on the network and we will incorporate these changing demands into our decision making.

5. Democratic and Engaging

An effectively managed local road network will ensure that those people in most need of access to local services have the best ease of movement, whilst also facilitating the support to vulnerable people within their own communities. The needs of the community form part of our maintenance decision making.

Where expenditure on the highway does not allow for all desired works to be undertaken we will use our asset management approach to identify and manage any risks on the network.

6. Trusted Brand

Our maintenance strategies mandate making right first time repairs and developing maintenance programmes that target the maximising the asset condition over its lifecycle. Through our Communications Strategy we will inform users of our approach to maintaining the highway network.

Through making asset management the core of our approach to highway maintenance we can enable other Council services to flourish and ensure we make a significant contribution towards achieving the County Council's strategic aims.

Chapter 2: Asset Management Strategy

Objective

The objective of Northamptonshire County Council's Asset Management Strategy is to deliver the maximum impact from targeted investment in highway assets.

Achievement

Delivering the maximum impact of investment in highway assets will be achieved through four core activities:

- Focused data gathering to further understand asset condition and behaviours
- Life-cycle planning to analyse data to forecast future condition and the impact of investment on asset condition
- Prioritisation of maintenance work based on long term asset benefits, lifecycle plans and budget availability
- Informed selection of treatments, minimising temporary repairs and efficient delivery

Data will be gathered and maintained that adds value to managing an asset.

Data will be used to create and evaluate asset lifecycles to assess the impact maintenance will have on the long term condition of the asset. Future condition data will be used to evaluate the success of decisions made now.

The balancing of demands on the asset and prioritising of maintenance work against budget constraints will be used to develop future work loads

We will focus on developing asset group strategies starting with the highest value assets. The primary focus will be on carriageways followed by footways, structures and drainage and then other asset groups.

Asset groups will not be considered in isolation. The effect of maintenance decisions on one asset group will be considered against all relevant asset groups.

Maximising the impact of investment on other asset groups will continue to be developed over time.

Carriageway, footway, structures and drainage have well developed maintenance strategies that outline how the asset group is maintained.

When partial funding is available through non-maintenance streams for highway maintenance activities, priority will be given to match funding from maintenance budgets to enable these activities to happen where a positive contribution to the current works programme is identified.

Applicability

This strategy will apply to the management of all highway asset groups Northamptonshire County Council is responsible for maintaining.

Chapter 3: General

Asset Grouping

As Highway Authority, Northamptonshire County Council is responsible for the maintenance of the adopted highway throughout Northamptonshire. This is one of the biggest asset groups the County Council is responsible for. Due to the size and nature of the assets encompassed within the highway Northamptonshire County Council has adopted an asset grouping based on the *Code of Practice on Transport Infrastructure Assets*. This grouping has then subsequently been broken-down and adapted for local use in Northamptonshire taking into account the scope of the assets, what is known about the assets, and the importance placed on the asset by users.

Northamptonshire County Council has tailored the recommendations in the *Code of Practice on Transport Infrastructure Assets* as some asset groups are very complex and have maintenance requirements that require the asset group to be treated individually. The Code of Practice also includes other asset groups with numerous smaller components. At the present time Northamptonshire County Council does not have sufficient detail on the componentisation to produce detailed maintenance plans for this document.

Data Management

Through numerous maintenance operations data is gathered that assists with making decisions on the future maintenance of an asset. The management of this data is incorporated in many of Northamptonshire County Councils business processes. These processes include updating, retrieving, and administering data.

A data maintenance register contains details of all asset data that is held and how each data set is maintained.

For some asset groups Northamptonshire County Council holds robust data sets that include asset locations, condition, maintenance, valuations, and costs. For a small number of assets less information is held and decisions are based on reasonable assumptions.

Resilient Network

Northamptonshire's resilient network is a combination of the traffic sensitive network and the primary road network. The maintenance hierarchy of all sections of the resilient network are defined as Strategic & Main Routes which supports higher maintenance standards for this network. The resilient network is a consideration included in all maintenance decisions. A map of the resilient network is included as Appendix 1.

Highway Safety Inspections

Policy

Northamptonshire County Council undertakes a programme of highway safety inspections to ensure the highway network remains in a safe condition for all users of the network.

Scope

All adopted carriageways, footways and cycle tracks will be subject to programmed highway safety inspections during the year. The frequency of these inspections is based on where the asset, carriageway, footway or cycle track, sits in the highway maintenance hierarchy. These inspections may be either walked or driven. The frequency of inspection applied in Northamptonshire is given in Tables 1 and 2 below.

Footway Type	**Category**	**Inspection Frequency**	
		NCC	**Code of Practice for Highway Maintenance Management**
Primary Walked	1	Monthly	Monthly
Secondary Walking Zone	2	3 monthly	3 monthly
Link Footway	3	6 monthly	6 monthly
Local Access	4	Annually	Annually

Table 1: Northamptonshire Footway Inspection Frequencies

Carriageway Type	Category	Inspection Frequency	
		NCC	**Code of Practice for Highway Maintenance Management**
Strategic and Main	2 & 3a	Monthly	Monthly
Secondary Distributor	3b	Monthly	Monthly
Link Roads	4a	3 monthly	3 monthly
Local Access Road	4b	Annually	Annually

Table 2: Northamptonshire Carriageway Inspection Frequencies

Assets listed on the structures register are subject to a different inspection regime. Details of the structures inspection programme are covered in the *Highway Structures* of this document.

Safety Inspection Guidance

Northamptonshire County Council has developed a Highway Safety Inspection Manual to give clear guidance to staff undertaking an inspection or identifying defects on the network. The Highway Safety Inspection Manual gives clear guidance on what a dangerous defect is and how defects should be categorised for repair.

The Highway Safety Inspection Manual is updated as necessary, often through the issue of a memo outlining necessary changes and when they will be implemented from.

The Highway Inspection Programme

The highway safety inspection programme is a mix of walked and driven inspections as appropriate to needs. Walked inspections are typically carried out by a lone working inspector whilst driven inspections and undertaken in a slow moving vehicle with a dedicated driver and the inspector in the passenger seat.
Highway safety inspections are carried out to a fixed programme which sets out which inspections need to be completed each month.
All defects that meet Northamptonshire's criteria for a safety defect as defined in the current Highway Safety Inspection Manual are recorded during the safety inspection and then loaded into Northamptonshire County Councils asset management database which triggers the repair process.

Chapter 4: Carriageway

Policy

It is the policy of Northamptonshire County Council to manage the carriageway network and associated assets in an effective and affordable manner whilst maintaining the assets value, availability, and safety to users of the network. The carriageway and associated assets will be maintained to a standard appropriate to their location and use, including treatments and maintenance techniques.

Scope

The extent of the carriageway asset by road classification is given in Table 3 below.

Road Type	Urban (km)	Rural (km)	Total (km)
A Roads	202.09	354.64	556.73
B Roads	58.77	93.05	151.82
C Roads	309.68	812.75	1,122.43
Unclassified Roads	1,716.78	670.71	2,387.49
TOTAL:	2,287.32	1,931.15	4,218.47

Table 3: Northamptonshire Carriageway Inventory at April 2014

A full breakdown of the carriageway network is included in Appendix 2.

Condition

The condition of the carriageway is assessed annually through three primary surveys or assessments.

- SCANNER: (Surface Condition Assessment for the National Network for Roads) is a vehicle mounted automated condition survey that assesses the visual defects on the surface of the road and relates these to an overall road condition.
- SCRIM: (Sideways Force Coefficient Routine Investigation Machine) used to measure the wet skidding resistance of a road surface.
- CVI (Coarse Visual Inspection) a visual survey of the network undertaken from a slow moving vehicle with basic defects being measured and recorded from within the vehicle.

The length of carriageway assessed using the above methods varies annually and is determined by the information that is required to make sound decisions when prioritising for future works. The current survey frequencies in Northamptonshire are given in Table 4:

Survey	Road Classification	% Network Surveyed pa	Length Surveyed pa
SCANNER	A, B & C	50% A Roads 100% B Roads 50% C Roads	984.3km
SCRIM	A Roads	100% A Roads	553.6km
CVI	Unclassified	Variable. Currently 100% bi-annually	2,274.1km (bi-annually)

Table 4: Carriageway Condition Survey Frequencies

Current survey data is given in Table 5. This data represents the percentage of the road category surveyed that should be considered for maintenance. This data is used for two purposes; the first is to feed into the identification of sites for future treatment and the second is to give a consistent measure of the condition of the network. These results indicate that the condition of the A and B networks remain steady, whilst there has been deterioration of the C and unclassified networks.

Year	A Roads		B Roads	C Roads	U Roads
	SCRIM	SCANNER	SCANNER	SCANNER	CVI
2011/12	21.69%	3.7%	5.3%	8.5%	32%
2012/13	35.41%	2.9%	4.5%	7.5%	32%
2013/14	31.86%	3.4%	4.7%	7.2%	No survey
2014/15	32.68%	2.9%	5.0%	7.2%	22%

Table 5: Carriageway Condition Survey Outcomes

Maintenance Strategy

Northamptonshire County Council's carriageway maintenance strategy starts with an assessment of the skid resistance of the "A" road network using the results of the latest SCRIM survey, Northamptonshire County Council uses investigatory levels based on the recommendations in HD 28/04 modified for use in Northamptonshire. A more detailed investigation of sites with a characteristic SCRIM coefficient below the investigatory level will be investigated in more detail. Collision statistics will then be included in the investigation. This iterative assessment prioritises sections of the network where treatments, signing, or speed reduction is required to reduce the risk of skidding on the carriageway.

The second stage of the strategy is to review the structural condition of the carriageway network. Northamptonshire County Council has adopted the colour based bandings to represent the structural condition of the carriageway.

- Red: Poor structural condition
- Amber: Minor structural deterioration with surface defects
- Green: Satisfactory condition with some isolated defects

Northamptonshire County Council's current approach to carriageway maintenance is to undertake targeted preventative maintenance to sections of the carriageway network that are assessed to be in an amber (approaching red) condition. This approach has been taken after the cost of undertaking suitable repairs to carriageways in different structural conditions was evaluated. This evaluation showed that the cost of preventative maintenance on carriageways with minor structural damage is approximately 1/6th of that requiring structural maintenance.

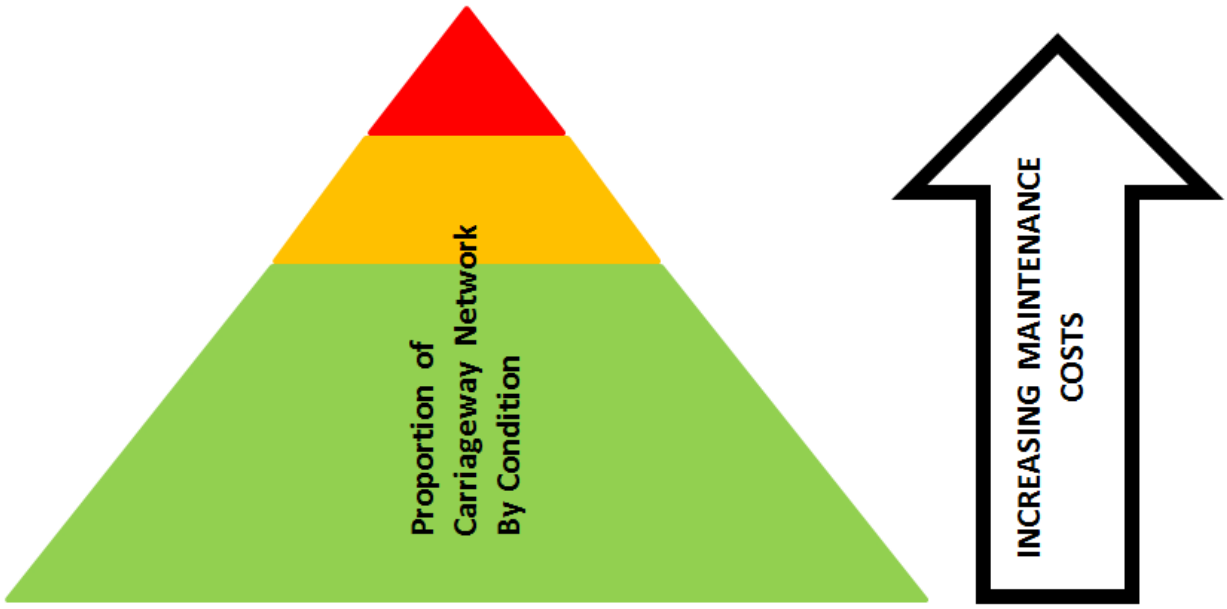

Figure 1: Carriageway Maintenance Costs Compared to Condition

This approach allows greater sections of carriageway to be maintained annually and to reduce the future burden on maintenance budgets. Figure 2 below shows the effect of this approach on the condition of the carriageway over its lifecycle.

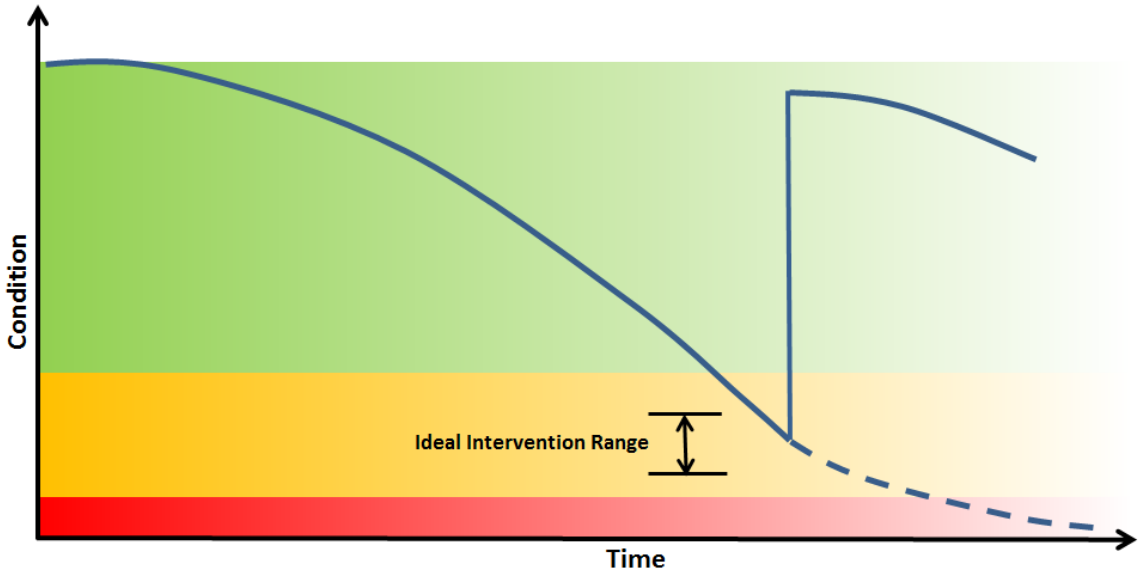

Figure 2: Carriageway Condition and Treatment over Time

Northamptonshire County Council utilises two core budget streams for carriageway maintenance: routine (revenue funded) and planned (capital funded). Routine maintenance allows for the undertaking of day-to-day maintenance activities, such as pothole repairs. Details of how potholes are categorised and what repair methods are used by Northamptonshire County Council are included on Northamptonshire County Council's website.

Planned maintenance sites are initially assessed through reviewing the combined outputs of condition surveys, defect data, accident data, and public enquires. An electronic database is used to assess these variables and produce two prioritised lists of sites: One list identifying proposed preventative maintenance sites and the second list is proposed structural maintenance sites. This forms the forward business plan for Northamptonshire's carriageway maintenance.

The lists of proposed maintenance sites are then reviewed against carriageway deterioration models before a list is sent to local area maintenance teams to review to ensure local demands

and pressures are considered in the decision making. A final proposed list of works is agreed before pre-work onsite assessments are undertaken.

The proposed sites are visited by an engineer who will assess them for a suitable treatment type, the extent of the works, and estimate the cost of the works. The details from the visits are used to review the list of sites against available investment. Should the works list extend beyond a single year the sites will be prioritised based on potential risks to highway users and the likelihood of further deterioration causing future maintenance costs to be substantially higher. Typical carriageway treatment types used in Northamptonshire are listed below in Table 6 below.

Treatment Type	Description
Major Patching	A large number of patch repairs or a number of very large patches in a discrete area
Surface Dressing	Application of a bituminous emulsion to the carriageway upon which one or more layers of stones and chippings are applied
Thin Surfacing	Addition of new thin surfacing materials on top of existing construction
Haunching	Major repairs to the edge of the carriageway
Resurfacing Overlay	Addition of new surfacing materials on top of existing construction
Resurfacing (Inlay)	Removal of existing surfacing materials, surface and binder courses and replacement with new
Recycling	Insitu carriageway construction is rejuvenated and reused to reconstruct carriageway.
Reconstruction	Removal of existing carriageway construction, full or partial depth, and replacement with new
High Friction (Anti-skid)	Application of high friction surfacing to improve skid resistance

Table 6: Carriageway Treatment Types

To ensure a complete picture of the condition of a carriageway is taken into account when decisions are made, other indicators covering condition and usage are used to develop solutions. These other indicators include:

- Reactive and routine maintenance defects
- Insurance claim records
- Accident location statistics
- Utility works

- Locations of future major works
- Political queries
- Public enquiries

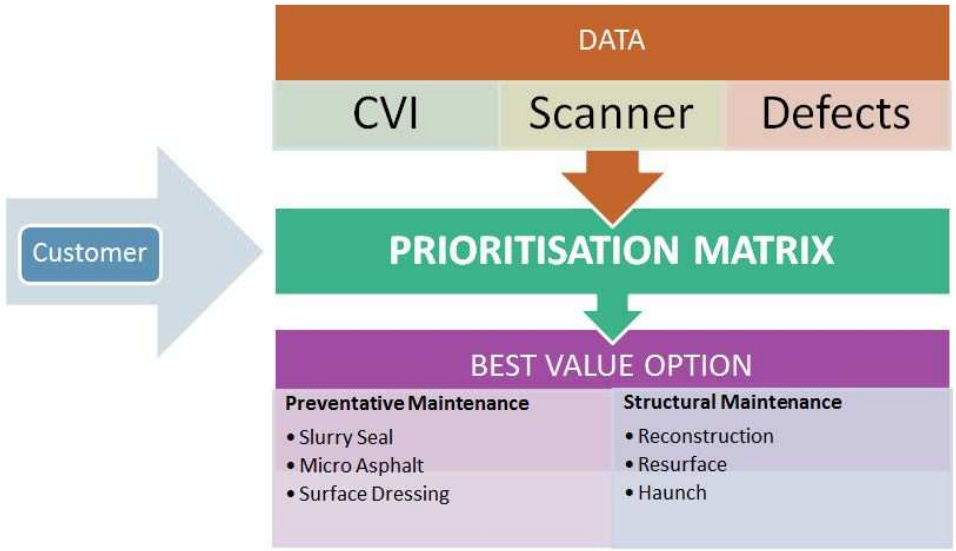

Figure 3: Carriageway Prioritisation

The response times for reactive category 1 and category 2 carriageway repairs have been set to balance the period of time a defect might be present on the network and undertaking a permanent repair on the first visit. Northamptonshire County Council's strategy for reactive repairs is based on the philosophy that a small delay in the time taken to repair a defect to ensure the repair is permanent is better than reacting faster to the defect and undertaking a temporary repair only to have the defect reappear in the future. The future reappearance of the defect increases the risk users of the network are exposed to. Current response times are included in the Highway Safety Inspection Manual.

Levels of Service

Northamptonshire County Council is introducing condition led levels of service which are based on assessing the carriageway against both the capability of the carriageway and the condition of the carriageway. Northamptonshire is adopting thresholds for the maximum lengths of carriageway that can be in red and minimum levels that can be in green (refer *Maintenance Strategy*). The thresholds vary depending on the road classification and will be reviewed regularly as the prescribed condition can only be achieved with sufficient investment.

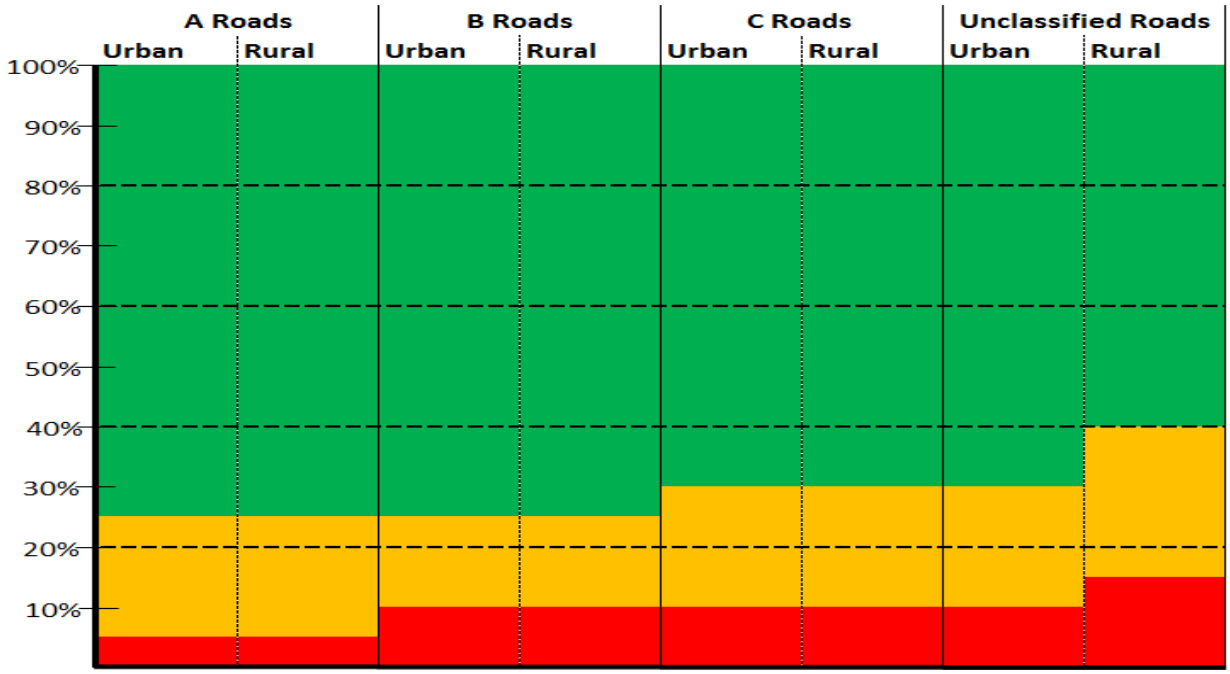

Figure 4: Carriageway Condition Service Levels

The performance of the asset is measured through two activities, condition surveys and defect numbers. The condition surveys, including outputs, are covered in the *"Carriageway (Pavements) Asset Condition"* section above. The number of category one (excluding emergency response) and category two defects are also an indicative measure of how the carriageway pavement is performing, with increasing numbers of defects indicating a worsening condition, or a worsening performance of the pavement layer.

Year	Category 1 Defects (number)	Category 2 Defects (number)
2011/12	4,900	30,490
2012/13	7,575	36,610
2013/14	9,897	35,153
2014/15	8,001	28,310

Table 7: Carriageway Category 1 and 2 Defect Numbers

It is expected that decreasing numbers of potholes would correlate to an improved carriageway condition and an increase in satisfaction with the highway service.

Valuation

Northamptonshire County Council has supplied a valuation of the carriageway to the Chartered Institute of Public Finance and Accountancy (CIPFA) to contribute towards the whole of government accounts. The valuation calculations and any estimation made are based on the guidance given by CIPFA and the Highways Asset Management Finance Information Group (HAMFIG). In 2014/15 the carriageway gross replacement cost (GRC) was calculated as £4.526 billion. The DRC was calculated as £04.300 billion.

Chapter 5: Footway + Cycle Routes

Footway Policy

It is the policy of Northamptonshire County Council to manage the footway network and associated assets in an effective and affordable manner whilst maintaining the assets value, availability, and safety to users of the network. The footway network and associated assets will be maintained to a standard appropriate to their location and use including treatments and maintenance techniques.

Footway Scope

The extent of the footway asset by footway classification is given in Table 8 below.

Footway Category	Description	Length (km)
Category 1a	Very busy areas of towns and cities with high public space and street scene contribution	0.0km
Category 1	Busy urban shopping and business areas and main pedestrian routes	26.0km
Category 2	Medium usage routes through local areas feeding into primary routes, local shopping centres etc.	368.0km
Category 3	Linking local access footways through urban areas and busy rural footways	3,405.6km
Category 4	Footways associated with low usage, short estate roads to the main routes and cul-de-sacs.	354.5km
TOTAL		4,154.1km

Table 8: Northamptonshire Footway Inventory

The length measurements for the footway have been taken in one direction only. Historically the category 1, 2 and 3 figures have been doubled to get an approximate overall figure of the urban footways. A full breakdown of the footway network is contained in Appendix 3.

Footway Condition

A detailed visual investigation (DVI) survey covering 50% of the category 1 and 2 footway network per annum was carried out until 2007/08. From this survey Best Value Performance Indicator (BVPI) 187 was calculated. BVPI 187 recorded the percentage of categories 1a, 1 and 2 footways where maintenance should be considered. In addition, some surveys of category 3 and 4 footways were also undertaken. This data has been used to measure the condition of the footway and present the data in a consistent manner. DVI data is in Table 9.

Banding	Description	% of Network
Red	Major defects – requires structural treatments	8.5%
Amber	Minor defects – requires surfacing treatments	17.8%
Yellow	Aesthetically impaired – minor localised treatments required	29.5%
Green	No defects	44.2%

Table 9: Northamptonshire Derivation of DVI Survey Results

Through the maturing of Northamptonshire County Council's use of asset management to aid the maintenance of the highway asset, the focus is shifting from a concentration on carriageways to improving knowledge of the footway asset. Northamptonshire County Council is currently undertaking a programme of footway network surveys (FNS) across the county. These surveys provide valuable information on footway types and footway condition. The surveys started in early 2014 concentrating on the areas of high pedestrian footfall. The information gained will be used to influence planned footway maintenance from 2015/16.

Footway Maintenance Strategy

Historically footways have been maintained on a keep safe basis first and when additional funding has become available sites have been assessed on limited available information. Footway sites for substantial investment have been short listed using the following factors before sites visits are carried out:

- Safety defects (emergency, category 1 and category 2)
- Local knowledge

- Political queries
- Public enquiries
- Accidents
- Condition of adjacent kerb

With the introduction a FNS condition survey a more comprehensive assessment will be carried out and investment in the footways can be optimised to the areas that will give greatest benefit to the future condition of the footway network. The sites selected can be effectively prioritised as well using the same approach as that used for carriageways.

When the site visit is carried out by an engineer the most suitable treatment types are assessed, the extent of works decided on and a cost estimate made, which are added to the final list of works for review and approval. The most common footway treatment types used by Northamptonshire County Council are included in Table 10. Currently, outside public realm areas, it is preferred to replace concrete slabs with a bituminous surface to reduce future maintenance costs. In addition, schemes will include measures to minimise damage caused by cars parking on footways.

Treatment Type		**Description**
Bituminous	Slurry seal/Micro-asphalt	Addition of new thin surfacing materials on top of existing construction
Bituminous	Surface dressing	Application of a bituminous emulsion to the footway upon which one or more layers of stones and chippings are applied
Bituminous	Resurface (Overlay or chase in edges)	Addition of new surface materials on top of existing construction, with or without edges matching previous levels
Bituminous	Re-tread	Scarify existing bituminous footway materials, reshape with emulsion and overlay with new surface course.
Bituminous	Reconstruct / Recycle bituminous layers	Removal of existing footway construction, full or partial depth, and replacement with new or recycled materials
Concrete Slab	Lift & relay	Existing concrete slabs are lifted, sub-base and bedding re-graded and pavers replaced
Concrete Slab	Replace with new slabs	Damaged pavers replaced with new (Sub-base strengthened if damaged by overriding)
Concrete Slab	Replace with bituminous	Concrete slabs are removed, bedding and sub-soil excavated. Reconstructed with sub-base, binder/surface course (bituminous layers)

Table 10: Footway Treatment Types

The response times for reactive category one and category two carriageway repairs have been set to balance the period of time a defect might be present on the network with undertaking a permanent repair on the first visit. Northamptonshire County Council's strategy for reactive repairs is based on the philosophy that having a small delay in the time taken to repair a defect to ensure the repair is permanent is better than reacting faster to the defect and undertaking a temporary repair only to have the defect reappear in the future. The future reappearance of the defect increases the risk users of the network are exposed to. Current response times are included in the Highway Safety Inspection Manual.

Footway Levels of Service

Northamptonshire County Council will develop condition based levels of service similar to those used on the carriageway following the completion of the FNS in mid-2015.

The performance of the footway asset is measured through two activities: condition surveys and defect numbers. The condition surveys, including outputs, are included in the *"Footway Asset Condition"* section above. The number of category one and category two defects also give a measure of how the footway is performing, with increasing numbers of defects indicating worsening condition, or a decrease of the performance of the pavement layer. Recent footway defect numbers are shown in Table 11.

Year	Category 1 Defects (number)	Category 2 Defects (number)
2011/2012	805	18,953
2012/2013	512	16,035
2013/2014	1,172	13,064
2014/2015	1,633	14,047

Table 11: Footway Defect Repair Numbers

Footway Valuation

Northamptonshire County Council has supplied a valuation of the footway asset to CIPFA to contribute towards the whole of government accounts. The valuation calculations and estimations are based on the guidance given by CIPFA and HAMFIG. In 2014/15 the footway GRC was calculated as £0.573 billion. The DRC was calculated as £0.512 billion.

Cycle Routes Policy

Northamptonshire County Council will manage cycle routes and associated assets in an effective and affordable manner keeping the asset safe and available for the community. Cycle routes and associated assets will be maintained to a standard appropriate to their use including treatments and maintenance techniques.

For the purpose of maintaining cycle routes across Northamptonshire cycle routes include the following:

- Cycle lanes (forming part of the carriageway)
- Cycle tracks (cycle routes not contiguous with a public footway or carriageway)
- Cycle trails (leisure routes through open spaces)

Northamptonshire County Council does not currently hold a complete inventory of all cycle routes in the county. The collation of this inventory is included on a list of asset inventories requiring collection and it is expected to be collected by 2018.

The cycle route network is included with the programme of highway safety inspections. The frequency of inspections is included in Table 12.

Category	**Footway Description**	**Inspection Frequency**	
		NCC	**Code of Practice for Highway Maintenance Management**
A	Part of carriageway	As for road	As for road
B	Part of footway	As for footway	N/A
V	Remote from carriageway	6 monthly	6 monthly
C	Cycle trails	Annually	Annually

Table 12: Northamptonshire Cycleway and Cycle track Inspection Frequencies

Cycle route maintenance is carried out in Northamptonshire based on the outputs of highway safety inspections or reports from the public. The response time for defects repairs depends on the magnitude and the location of a defect.

Chapter 6: Drainage

Introduction

The drainage asset is a substantial asset group within the Northamptonshire highway network. Due to the importance and nature of the drainage asset Northamptonshire County Council has broken down the drainage asset into the components as each component requires different maintenance regimes to meet the demand placed on it. These components are:

- Highway gullies (including footway gullies)
- Kerb offlets
- Culverts
- Grips
- Other drainage assets

The condition of the drainage asset is proven to have a direct influence on the condition of other highway assets, in particular on the carriageway. Northamptonshire County Council has adopted a maintenance programme that seeks to achieve the policy objective and also minimise wider damage to other highway assets.

Highway drainage assets have not been valued as an individual asset group. Drainage assets have been valued within the carriageway valuation.

The importance of understanding the drainage asset has been enhanced with the introduction of the Flood and Water Management Act 2010 which promotes finding suitable solutions to surface water problems through organisations working together as necessary.

Policy

Northamptonshire County Council's policy on highway drainage is to manage the drainage asset in an effective and affordable manner that keeps the assets free from obstructions to provide the greatest opportunity to remove water efficiently from the surface of the highway.

Scope

Northamptonshire County Council does not yet hold a complete inventory of all drainage asset components. The inventory collection is on-going and asset knowledge is growing as the inventories grow. Table 13 includes the inventory that has been collected and is also being regularly updated. Table 14 covers the components where a complete inventory is not held and how the data will most likely be collected.

Description	Quantity
Highway Gullies	161,500
Culverts (dia < 900mm)	359
Kerb Offlets	Inventory included in "Highway Gullies"
Highway Grips	49,598
Balancing Ponds	12

Table 13: Known Drainage Asset Inventory

Item	Extent	Collection Method
Filter Drains	Full inventory - Start/end - Condition	Identification of asset location through routine inspections followed by on site electronic inventory collection.
Catch Pits	Full inventory - Location - Position	On site electronic inventory collection
Soakaways	Full inventory - Location - Condition	On site electronic inventory collection
Carrier Drains & Manholes	Gaps in inventory - Location - Start/end - Condition	Identify gaps in flood defence inventory data. Collect inventory data not already held.
Hydra breaks	Full inventory - Location	On site electronic inventory collection
Backdrains & Ditches	Full inventory - Start/end - Ownership - Condition	On site electronic inventory collection
Outfalls	Full inventory - Location	On site electronic inventory collection

Linear drains (Kerb channel and footway channel drains)	Full inventory - Start/end - Location - Ownership	On site electronic inventory collection
Gully & kerb offlet connections	Gaps in inventory - Start/end - Ownership	On site electronic inventory collection

Table 14: Outstanding Drainage Asset Inventory

Northamptonshire County Council also holds a large volume of third party drainage asset data that has been collated as part of Northamptonshire County Councils responsibilities under the Flood and Water Management Act 2010.

Maintenance Strategy

Northamptonshire County Council has developed a risk based strategy to prioritise drainage maintenance sites. Within this strategy two core budget streams are utilised for drainage maintenance: routine (revenue funded) and planned (capital funded). Routine maintenance allows for the undertaking of day-to-day maintenance activities, such as repairing gully pits.

Sites where planned drainage maintenance is required are identified through a number of sources including highway inspections, public reporting and flooding records. The identified sites are prioritised against a number of factors that take into account key considerations including:

- Usage of the affected asset
- Impact of the flooding
- Consequential damage to other assets
- Risk to the public

An overview of the prioritisation in shown in Figure 5 below. The output of this process is a ranked list of sites requiring maintenance. This list will form the basis of the drainage maintenance budget in the annual business plan. The full list runs to between three and five years of work. In year one of the list each scheme will be fully scoped and priced, schemes in following years are allocated estimated costs.

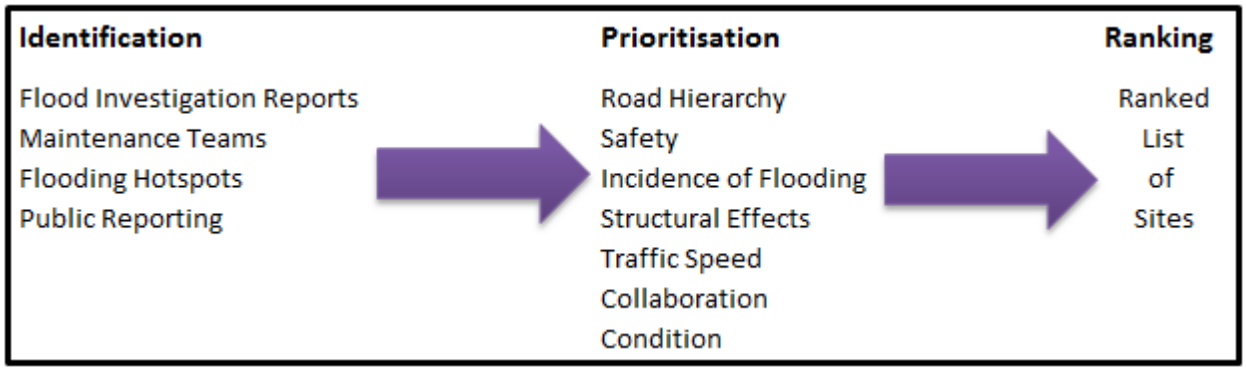

Figure 5: Drainage Scheme Prioritisation

Highway Gullies

Highway gullies sit largely below the surface of the carriageway or footway leaving the undertaking of regular condition inspections expensive and inefficient.

Highway Gully Scope

The highway gully inventory is included in Appendix 4.

Highway Gully Condition

The characteristics of highway gullies make condition inspections impractical. Subsequently the key measures used to review the overall condition of highway gullies effectiveness are:

- Silt levels collected through cyclical maintenance
- Defects requiring maintenance action identified through:
    - Highway safety inspections
    - Cyclical cleansing
- Public enquiries received

Highway Gully Maintenance Strategy

Northamptonshire County Council's approach to cyclical maintenance of highway gullies is to undertake an optimised programme of cyclical cleansing across the County with cleansing frequencies based on historical levels of silt recorded during past cyclical cleaning cycles. This

needs based approach minimises the unnecessary cleansing of gullies and ensures gullies requiring higher cleaning frequencies are attended to.

An electronic record of each gully visited during cyclical cleaning will be taken and recorded against the individual gully asset to build a history of its maintenance. This record will include the following details for each record:

- A unique gully asset reference
- Gully type
- Location coordinates (via GPS)
- Percentage of silt found in the gully at the time of cleaning
- Defects (if any present)
- Reason if gully obstructed from cleaning (parked car, stuck lid etc.)

From the silt level data a suitable cleaning frequency for each gully is identified, which is then compared with other gullies along the same sections and an appropriate cleansing frequency for the section of network is determined. The cleaning frequencies currently used are:

- Six monthly
- Annually
- Bi-annually

In addition the frequency of cleaning is increased where there are known drainage issues and minimum annual cleaning frequency is adopted for all “A” roads. The net effect of this is to ensure gullies are cleaned at a frequency appropriate to the levels of demand.

Highway Gully Levels of Service

Northamptonshire County Council currently use performance based levels of service to monitor the performance of asset maintenance. For drainage services this levels of service is a measure of the gully cleaning programme performance. Condition based levels of service are intrinsically linked to predictable investment and the current environment does not allow consistent and predictable investment, subsequently levels of service, although linked to long term forecasting when developed will be updated annually in line with budgeting.

Implicit with our policy of efficiently removing water from the carriageway we are identifying low

spots on the network. Low spots will remove higher volumes of water from the carriageway then elsewhere as they are the final point water can flow to on the carriageway. These locations are the points on the network most likely to flood if drains are not working efficiently. At the identified low spots we will ensure drainage facilities are both adequate and cleared at an appropriate frequency.

Footway Gullies

Footway gullies are defined as gullies that sit within the footway which generally have the purpose of removing water from low points in the footway. Northamptonshire County Council has been developing a definitive record of footway gullies since 2013. Footway gullies are cleaned, where possible, at the same frequency as the corresponding carriageway gullies in the same section of road.

Following the collection and analysis of two years' silt data the cleaning frequency of footway gullies will be reviewed to identify gullies that require a higher frequency of cleaning.

Kerb Offlets

The kerb offlet inventory was collected as part of the 2013/14 and 2014/15 cyclical gully cleaning programme. The future cleaning of kerb offlets will be the same as the corresponding carriageway gullies on the same section of road.

Grips

Grips across the county are maintained on a cyclical programme across the county. All grips are inspected and cleared as necessary once annually with the programme starting mid-autumn to ensure the majority of grips across the county are cleared before the on-set of wet weather during the winter months.

Chapter 7: Structures

Introduction

There are in excess of 2,000 structures on the Northamptonshire highway network ranging from vehicular bridges to culverts to public rights of way pedestrian bridges. Efficient maintenance and long term management of highway structures is key in maintaining an open and safe highway network.

Maintenance of highway structures is linked to the upgrading the structures to meet the increasing demands placed on highway structures. Many structures were originally designed to accommodate lower loadings than they are now subjected to.

Highway Structures

Policy

Northamptonshire County Council's policy for highway structures is to ensure their structures are maintained to a condition where the safety of the highway user is not compromised. Where new structures are to be installed, Northamptonshire County Council will ensure these structures are designed and constructed to current standards.

Scope

The Northamptonshire structures inventory consists of the items in Table 15.

	Bridge (>1.5m)	**Culvert (>0.9m)**	**Footbridge**	**Subway**

Principal	124	116	18	59
Non Principal	165	436	10	19
Unclassified	115	392	32	32
Bridleway open to all traffic	11	29	1	0
Public rights of way	0	0	399	0
TOTAL	**415**	**973**	**460**	**110**
	Retaining Wall (>1.5m)	**Culverts (<0.9m)**	**Private**	**Other Owners**
Principal	46	36	8	111
Non Principal	46	159	28	135
Unclassified	63	139	48	114
Bridleway open to all traffic	0	25	5	4
Public rights of way	0	385	58	57
TOTAL	**115**	**44**	**147**	**421**

Table 15: Northamptonshire Structures Inventory

Details of each structure are held in the bridge management system (BMS). Details that are included for each structure include:

- Unique structure number
- Structure name
- Structure owner
- Structure type
- Inspection details
- Maintenance responsibilities
- Other relevant details such as dimensions or weight limits

Northamptonshire County Council has a reasonable level of confidence in the records held, although some inaccuracies and gaps are known to exist in the inventory information. Details of retaining walls are known to include gaps and although retaining walls have been resurveyed recently, it is possible some walls remain unidentified.

New structures are added to the database either when identified or when adopted.

There are a number of structures on the Northamptonshire highway network that are owned and maintained by others. A summary of these structures is included in Appendix 5.

Condition

Structures that are the responsibility of Northamptonshire County Council to maintain are subject to a programme of inspections that are carried out in accordance with the requirements and recommendations of the Approved Code of Practice for Highway Structures the frequency of these inspections are included in Table 16.

Inspection Type	Frequency	Asset Type
General Inspections (A visual examination of all parts of a structure without using access equipment)	Every 2 years	All highway structures. (Unless subject to a Principal Inspection during that year)
Principal Inspections (A close examination within touching distance to all parts using access equipment)	Every 6 years	A and B network structures and "at risk" structures
Special Inspections (The type depends on the aim of the inspection)	As required	For a particular reason (e.g. deteriorating structure)
Routine Surveillance (A general surveillance by Highway Inspectors as part of normal inspections)	Part of the highway inspection programme	Inspectors to report any safety or serious defects to the Structures Team
Monitoring Inspections	As required	For specific requirements
Diving Inspections	Every 6 years and after periods of prolonged heavy rainfall	A scour assessment on vulnerable bridges

Table 16: Northamptonshire Structure Inspection Frequency

Bridge Condition

The outcomes of bridge inspections are recorded in accordance with the CSS Bridge Condition Index procedures. As each inspection is completed the BMS is updated and the overall condition of the asset is recalculated.

When as assessment carried out by Northamptonshire County Council shows a bridge to be sub-standard or provisionally sub-standard the risk management procedures contained in the Highways Agency Departmental Standard BD79 are followed. This will result with interim measures such as weight restrictions, traffic management restrictions or a regime of monitoring being imposed on the structure. These procedures would be put in place to minimise the risk of the asset failing.

The scour potential for all structures over main rivers is being developed following the 2010 Cumbria bridge failures.

Structures Maintenance Strategy

Reactive and Emergency Repairs

Following structure inspections recommendations will be made as necessary to rectify defects that require a response faster than routine repairs. Emergency temporary road closures will be implemented where necessary, for example after vehicle collision damage.

Renewal/Replacement (Steady state Maintenance)

Appendix 6 gives details of the planned maintenance renewal and replacement activities undertaken on structures assets in Northamptonshire and includes the expected programme intervals.

Major Maintenance, Strengthening and Replacement

As a structure approaches the end of its design or service life it will often become uneconomical to repair and the structure will require replacement. Each structure will be considered on its individual merits as to whether further maintenance is required or if the asset should be replaced.

If the highway loadings are increased structures will need to be reassessed. If a structure is found to be substandard a decision will be made whether to strengthen it, replace it, or use alternative traffic management measures to ensure it is safe.

Levels of Service

The Bridge Condition Index (BCI) forms the core element of assessing highway structures and assigning works into the future. The BCI represents the outcome of all assessments of the structure.

Structural geometry and condition assessments are carried out on structures to ensure they can carry their designated loading. When necessary strengthening projects will be carried out or weight limits imposed.

Structure Valuation

Northamptonshire County Council has supplied a valuation of the structure asset group to CIPFA towards the whole of government accounts. The valuation calculations and any estimations made are based on the guidance given by CIPFA and HAMFIG. In 2014/15 the gross replacement cost (GRC) of the structures asset was calculated as £0.464 billion. The depreciated replacement cost was calculated as £0.430 billion.

Chapter 8: Other Asset Groups

Introduction

Whilst the carriageway, footway, drainage and structure asset groups make up the four highest value asset groups maintained on the highway there are a number of other asset groups that are also maintained on the highway. These other asset groups are typically smaller in size and value than the four main groups, however each group has a unique maintenance strategy and levels of service.

Life cycle plans for the following asset groups are being developed. Further development of these lifecycle plans may be awaiting any of the following.

- Confirmation of asset quantities
- Fully understanding asset behaviour
- Assessment of asset condition

Traffic Management

Traffic Signals and Urban Traffic Control (UTC)

Northamptonshire County Council will operate efficient economical systems to manage traffic flows effectively, reduce congestion and allow automatic fault reporting. The systems employed will be maintained to a usable standard to ensure traffic conflicts are avoided and to maintain safe passage for all highway users.

The extent of the traffic signal and UTC asset inventory is included in Table 17 below.

Asset Type	Description	Number of Sites
Traffic Signalled Junctions	Number of approaches	422
Traffic Signal Central System		3
CCTV Cameras	On street	30
CCTV Cameras	Central system	1

Table 17: Northamptonshire Signal and UTC Inventory

Pedestrian Signals and Zebra Crossings

Northamptonshire County Council will ensure pedestrian signals and zebra crossings are managed in an effective and affordable manner keeping the asset fit for use and safe for use by the community. Pedestrian signals and zebra crossings will be maintained to a standard appropriate to their use.

The extent of the pedestrian signal and zebra crossing asset inventory is given in table 18 below

Asset Type	Description	Number of Sites
Puffin Crossings	Controlled crossing with pedestrian lights on near side	90
Pelican Crossings	Controlled crossing with pedestrian lights on opposite side	98
Toucan Crossings	Controlled crossing for pedestrians and cyclists	87
Pegasus Crossings	Controlled crossing for pedestrians and horses	1
Zebra Crossings	Uncontrolled crossing	277

Table 18: Northamptonshire Pedestrian Signal & Zebra Crossing Inventory

Variable Message Signs/Vehicle Activated Signs/Real Time Passenger Information

Northamptonshire County Council will ensure variable message signs (VMS), vehicle activated signs (VAS), Real Time Passenger Information signs (RTPI) and other message signs are managed in an effective and affordable manner keeping the asset fit for use. VMS, VAS and other message signs will be maintained to a standard appropriate to their use.

The inventory of VMS, VAS and RTPI is included in Table 19 below.

Asset Type	Description	Number of Sites
RTPI Equipment	On bus	180
RTPI Equipment	Shelter	155
RTPI Central System		1
VMS Central System		1
VMS	50-100mm x-height	13
VMS	101-175mm x-height	4

VMS	176-225mm x-height	0
VAS		280
VMS “over height vehicle”		9
Wig Wag Signs		1

Table 19: Northamptonshire VAS/VMS/RTPI Inventory

Line Marking and Studs

Northamptonshire County Council will maintain road markings and studs to ensure the asset remains fit for the purpose of conveying information to the highway user.

Northamptonshire County Council does not hold a current inventory that includes the length or number of units of road marking types, colours or locations. A video survey of the Northamptonshire highway network includes road markings and allows the details of road markings at specific locations to be identified. Table 20 gives the estimated inventory taken from historical data.

Item Description	Quantity
Hatched Markings	100,000m
Longitudinal Markings	2,986,064m
Transverse / Special	21,589 No.
Road Studs	492,429m

Table 20: Northamptonshire Line Marking Inventory

An annual night time survey of line markings is undertaken towards the end of each calendar year in the hours of darkness on A, B and C classified roads. Line markings on unclassified roads will be assessed during planned highway safety inspections. The condition of line markings along any section of the network are evaluated against the criteria in Table 21 below. Based on this assessment road markings are prioritised and allocated to a works programme for the following financial year.

Assessment Value	Description
0	Line markings non-existent
1	Line markings barely visible
2	Visible, but has bare spots and low night time conspicuity

3	Some visible wear and/or fair night time conspicuity characteristics
4	Good time conspicuity and very little wear
5	Good night time conspicuity and no wear.

Table 21: Line Marking Condition Assessment

In addition to the condition surveys, ineffective line markings will be identified for renewal through routine safety inspections in accordance with the requirements for road markings assessment in the Highway Safety Inspection Manual.

Northamptonshire County Council currently use the condition assessment and level of spend on road marking maintenance to monitor road markings. The level of spend gives an indication of the volume of markings that have been replaced on a year whilst the condition survey gives an indication of the quality of the road markings users are exposed to.

Street Lighting

Street Lighting (and illuminated signs and bollards) in Northamptonshire are included within the scope of a dedicated street lighting private finance initiative (PFI). The PFI involves replacing or upgrading all of Northamptonshire's 65,766 street lights over a five year period with completion set for the end of September 2016. The current street lighting inventory is included in Table 22.

Item Description	**Quantity**
Street lighting columns	57,344
Illuminated Signs	6,796
Illuminated Bollards	2,856
Beacon	642
CMS Base Station	11

Table 22: Street Lighting Inventory at April 2015

Maintenance of the street lighting stock will be undertaken through programmes of electrical testing, structural inspections, bulk lamp replacements and lens cleaning.

In addition to the routine programmes for street lighting maintenance night time patrols are undertaken to identify street lighting performance in the hours of darkness and faults reported by the public will also be responded to.

Emergency faults shall be attended to within two hours of the Service Provider being made aware of such fault.

Non-emergency faults shall be rectified within five business days. Faults involving the Distribution Network Operator (DNO) or Independent Distribution Network Operator (IDNO) shall be rectified within 30 Business days.

Upgraded street lights will be dimmed between the hours of 22:00 and 06:00.

Verges

Northamptonshire County Council will maintain highway verges (including wild flower verges) in an affordable manner whilst ensuring the condition of the asset does not compromise the safety of the highway user or the integrity of the asset.

The area of verges maintainable by Northamptonshire County Council is included in Table 23 below.

District / Borough	Area (km^2)
Corby	1.04
Daventry	4.03
East Northamptonshire	2.47
Kettering	1.60
Northampton	1.78
South Northamptonshire	3.56
Wellingborough	1.09

Table 23: Northamptonshire Verges

Verges are maintained through a combination of cyclical maintenance and routine maintenance. Grass cutting and weed spraying are both carried out as cyclical activities with a fixed number of cycles carried out for each activity. The frequency of grass cutting and weed spraying will be

evaluated annually and will vary from year to year. The exceptions to this are the cutting of visibility splays which are undertaken as required to maintain visibility and the spraying of noxious weeds which is undertaken when Northamptonshire County Council is made aware of a location where a noxious weed is present.

In some instances Northamptonshire County Council will enter into agreements with Borough, District or Parish Councils to undertake verge maintenance operations, such as grass mowing or weed spraying, on behalf of Northamptonshire County Council.

Damage to verges, such as rutting, is identified through the highway inspections process, via ad-hoc inspections from public enquiries or through inspection undertaken by Regulations Officers. Repair timeframes will be based on the severity of the defect.

Street Furniture

Signs and Bollards (Non-Illuminated)

Northamptonshire County Council uses street signage to warn or give information or directions to highway users. Signs and bollards will be managed and maintained to allow this usage to be met. Where signs or bollards have been installed or are no longer required they will be removed.

The extent of non-illuminated signs and bollards in Northamptonshire by road classification is in Table 24 and is taken from a survey undertaken in 2008/09.

	Directional Sign	Information Sign	Regulatory Sign	Misc. Sign	Warning Sign	Bollards
A Road	3,424	1,640	2,661	58	2,271	1,075
B Road	564	370	651	11	764	269
C Road	2,656	1,392	4,246	57	3,520	1,252
U Road	1,308	2,642	5,683	71	2,559	580
TOTAL	7,952	6,044	13,241	197	9,564	3,136

Table 24: Non-Illuminated Sign and Bollards Inventory

There is no condition data held against the inventory of non-illuminated signs and bollards.

Maintenance of non-illuminated signs and bollards in Northamptonshire is reactive. Defects are identified through highway safety inspections with repairs prioritised and programmed in accordance with the requirements of the Highway safety Inspection Manual.

To maintain visibility of signs and bollards a regime of cutting back vegetation impeding sight lines will be considered each year. This will be considered against the rate of vegetation growth predicted each year. Where signs are obscured by vegetation maintainable by others this will be

undertaken through enforcement procedures. Northamptonshire County Council enforcement procedures are included in the Network Management Plan.

Northamptonshire County Council is seeking to continually reduce sign clutter on the highway network. As part of this a requirement that, where possible, for every sign that is erected two redundant signs should be removed.

There are no levels of service or performance indicators used in Northamptonshire that are directly related to the maintenance of non-illuminated signs and bollards. The maintenance of mandatory signs is given a higher priority than warning signs due to the adverse impact that could occur when a sign is not in use.

It is estimated that the gross replacement cost for all the non-illuminated signs in Northamptonshire is £13.7million and non-illuminated bollards is £0.2million.

Fences and Barriers

Northamptonshire County Council will ensure all highway fences and barriers are managed in an effective and affordable manner whilst maintaining the assets value and integrity. Highway fences and barriers will be maintained to a standard appropriate to their including inspections and maintenance techniques.

Northamptonshire County Council holds an inventory for vehicle restraint systems (VRS) that was obtained in 2008/09. This is included in Table 25. Inventory details for other barrier types, such as pedestrian guardrail, are planned to be collected over the next three years.

	Tensioned	**Untensioned**	**Wire Rope**
A Roads	41.5km	27.3km	5.4km
B Roads	1.9km	1.1km	0.0km
C Roads	3.3km	8.3km	0.4km
Unclassified Roads	3.8km	6.3km	0.0km

Table 25: Northamptonshire VRS Inventory

Condition information is collected for tensioned vehicle restraint barriers through the bi-annual re-tensioning programme. The VRS re-tensioning programme is undertaken on a borough/district basis with all tensioned VRS within a district or borough inspected in the same year.

Condition information is collected for Untensioned and wire rope VRS through a four year inspections programme. The Untensioned VRS programme is also undertaken on a district/borough basis.

For other barrier and fence types there is limited condition information held.

Maintenance of barriers and fences is largely reactive. Repair work is generated from the re-tensioning programme, highway safety inspections or through ad-hoc inspections from public enquires. Public enquiries include reports of damage resultant from accidents on the highway.

The gross replacement cost for all vehicle restraint systems in Northamptonshire is estimated at £6.26million.

Bus Signs and Shelters

Northamptonshire County Council will manage bus signs and shelters that are the responsibility of the local authority to maintain. Bus signs and shelters will be maintained to a level appropriate to their use.

A comprehensive asset inventory collection exercise of bus stop signs and shelters was carried out between 2012 and 2013. A breakdown of the bus sign and shelter inventory is in Table 26.

Item Description	Maintained by NCC	Maintained by Others
Bus Stop Shelters	53	829
Integrated timetable cases	1,781	0
Posts with bus flag	412	0
Bus stop flags on columns	170	208
Other timetable types	62	465
Stops with raised kerbs	1,806	0
Real time displays	155	0
Yellow bus cage markings	1,529	0

Table 26: Northamptonshire Bus Sign and Shelter Inventory

The maintenance of bus signs and shelters maintained by Northamptonshire County Council is reactive. Defects are reported through highway safety inspections, public enquiries or from bus service providers. As repair details are received the work is prioritised with defects posing the highest risk highway users to be first attended to.

The gross replacement cost of bus signs and shelters has not been calculated to date. With the comprehensive data collections completed this figure will be included in the next Whole of Government Accounts for Northamptonshire.

Trees and Hedges

Northamptonshire County Council will manage and maintain trees and hedges within the highway boundary to avoid any highway trees or hedges becoming a hazard or obstruction.

In some instances Northamptonshire County Council may enter into agreements with Borough or District Councils to undertake tree and hedge maintenance operations on their behalf.

A comprehensive survey of trees on the Northamptonshire Highway Network, including trees near the network that could affect highway safety, is currently under way. This survey is following the capital asset value for amenity trees (CAVAT) format which will allow an accurate value of Northamptonshire's tree stock to be calculated.

The maintenance of trees and hedges in Northamptonshire is managed through reactive maintenance. Work carried out to maintain the trees and hedges on Northamptonshire is in response to defects identified through highway safety inspections or public enquiries. In both instances a trained inspector will visit the site and establish what work is required to preserve safe use of the highway and minimise any adverse impact on the health of the tree.

Where the defect lies within a tree or hedge that is not the responsibility of Northamptonshire County Council the enforcement guidelines set by the authority will be followed.

Public Rights of Way

Northamptonshire County Council will maintain the public rights of way network in accordance with current legislation and to keep the rights of way network safe for its users.

The Northamptonshire public rights of way network measures 3,065km in length and is made up for the following path types:

- 2,145km footways
- 813km bridleways
- 107km byways

The public rights of way network includes numerous asset types made up of the following inventory numbers. These are estimated figures and a detailed asset inventory collection is being undertaken and is expected to be completed in 2016.

Inventory Description	Number	Inventory Description	Number
Standard Kissing Gate	897	Bridle Gates	546
Disabled Kissing Gate	67	Field Gates	706
Metal Kissing Gate	93	Single Stile	1,760
Footbridge span 4m	160	Double Stiles	626
Footbridge span 5.5m	220	Footbridge / Bridle Bridge 8 to 14m	231
Footbridge span 7.5m	123	Footbridge / Bridle Bridge 15 to 25m	23
Bridle Bridge span 4m	57	Footbridge / Bridle Bridge 25m & over	13
Bridle Bridge span 5.5m	47	Culverts 300mm diameter	190
Bridle Bridge span 7.5m	14	Culverts 450mm diameter	80
Sleeper Bridge span 2.6m	307	Culverts 600mm diameter	77
Sleeper Bridge span 3.6m	200	Culverts 900mm diameter	63
Fingerposts	3,183	Culverts 1000mm diameter & over	2
Waymark Posts	2,300	Mowing	863 km²

Table 27: Public Rights of Way Inventory

All bridges on the public rights of way network with a span of 7.5m or more are subject to periodic inspections to assess the condition of the structure, the structures suitability for purpose and the level of safety. Where maintenance work is required it is prioritised against other work required

on the rights of way network. If necessary bridges will be closed until work is carried out to ensure users are not placed in any danger.

Maintenance of the public rights of way network is a mix of planned cyclical work and reactive maintenance. Grass cutting is instructed to be carried out at set times during the year and major path reconstruction is undertaken during the summer months to avoid wet ground conditions. Other maintenance is carried out as-and-when it is identified.

Seasonal closures of byways are used by Northamptonshire County Council to protect the byway surfaces from damage caused by motorised vehicles during the winter period.

Best value performance indicator (BVPI) 178 has been retained in Northamptonshire as a measure of the ease of use of the local public rights of way network. Although no longer reported to Central Government, Local Authorities are encouraged to continue using the BVPI. Annual results are given in Table 28.

Year	BVPI 178
2013	75%
2014	77%

Table 28: Northamptonshire BVPI 178 Results

The gross replacement cost of the Northamptonshire public rights of way network is £44,123,862.

Chapter 9: Risk Register

Introduction

Northamptonshire County Council maintains a details risk register used to assess the potential risks encountered when managing a county highway network. The risk register records what the risk is, evaluates the impact, identifies how the risk can be mitigated, what steps need to be taken to control the risk and who is lead contact for each risk.

The detailed risk register is owned by the Asset Management Team and is reviewed on a two-monthly basis. The reviews re-evaluate the status of existing risks and identify new risks. The review is undertaken by a panel of staff from across the highways team. Table 29 is a summary of the risk register at the time this document was prepared.

Risk	Impact	Mitigation	Rating
Reductions in funding	Inability to plan and forecast Reduction in maintenance standards Fewer maintenance schemes Deterioration of asset condition	Maintenance operations prioritised using asset management processes Safety first ethos	High
Increased traffic on the highway network	Increased deterioration rates Reduced asset life Increased pressure on maintenance budgets Increased likelihood of claims	Maintenance undertaken in accordance with asset management strategies. Traffic volumes considered as part of maintenance prioritisation.	High
Use of differing surfacing materials (carriageway)	Increased maintenance requirements Increased maintenance costs placing higher strain on budgets	Avoid using or specifying expensive materials with short life spans. Clear guidance on material selection	Medium
Variation in street furniture specifications	Inability to maintain reasonable stocks Increased costs through small purchases of different furniture types	Introduce palate of street furniture	Medium
Adverse weather	Increased asset deterioration Pressure on budgets through maintenance spend	Use asset management knowledge to assess impact of events on network and prioritise works to minimise event impacts	Medium
Network growth	Demand on maintenance resources	Continue to manage assets in accordance with asset management strategies to balance competing demands	Medium
Asset clutter	Unnecessary maintenance costs Redundant assets remaining on the network	Utilise asset rationalisation to remove unnecessary assets from the network	Low

Adverse culture of accident compensation	Budget and time diverted to defend claims Deviation from asset managed maintenance to fear of claim maintenance	Engage legal teams in changes to maintenance standards Learn from failed defences	High
Utility works	Asset deterioration Impact on works programme	Effective programming with utilities to minimise damage to new surfaces Maintenance teams liaise with NRSWA teams	High
Not holding complete asset inventories	Estimates used to manage maintenance of assets	Prioritised collection of future inventories and processes to maintain existing inventories	Medium
Inventory changes not recorded	Asset inventories become redundant Expensive updating of inventories Decisions made using incorrect data	Establish, communicate and reinforce processes to convey changes to the asset management team to update inventories	Medium
Staff turnover	Loss of local knowledge	Records of local knowledge to be incorporated into asset management database.	High
Data loss	Inability to make informed maintenance decisions	Data not saved to local drives Server strategies to ensure all data is backed up	Low
Increasing data volumes	Data not shared Information saved on	Include managing increasing asset data volumes in IT strategies	Low
Changing maintenance standards	Impact on budgets to achieve new standards	Collaborate with other authorities and share benchmarking and strategies	Low
Political priority influencing maintenance decisions	Deviation from publicised asset managed maintenance strategies	Ensure staff at all levels are informed and signed up to asset management strategies and polices	Medium
Levels of service not defined for all assets	Maintenance decisions not supported and directed by levels of service	Continue to develop levels of service as asset intelligence grows	Medium

Staff training and knowledge	Decisions made that do not support asset management strategies or policies	Develop training matrix that supports appropriate training of staff at all levels in asset management.	High

Table 29: Northamptonshire Asset Management Risk Register Summary at July 2015

Appendix 1: Northamptonshire Resilient Network

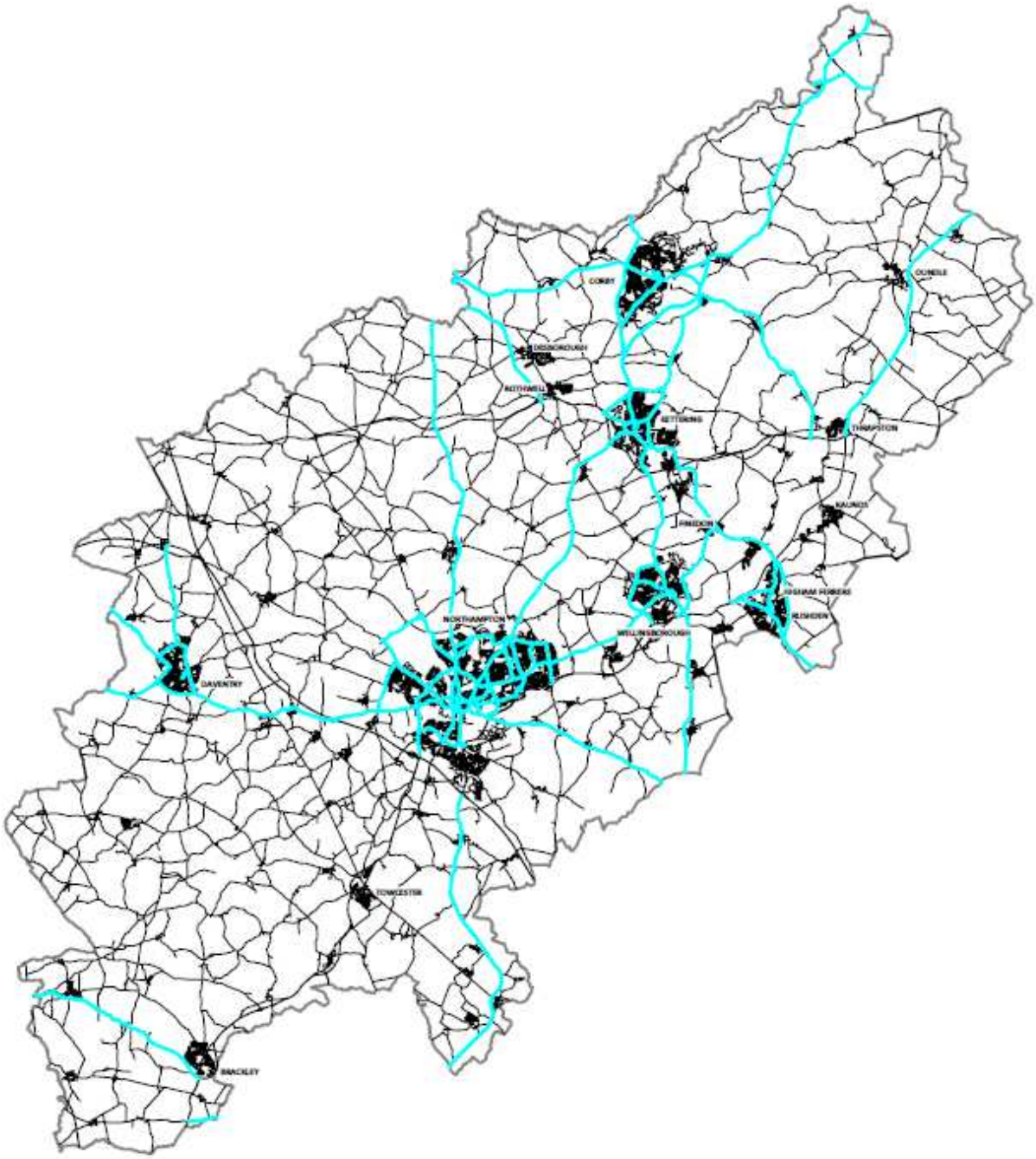

Figure 5: Northamptonshire Resilient Network

Appendix 2: NCC Carriageway Network

Table 31: Northamptonshire Carriageway Network (Distances in km)

Network Hierarchy Road Lengths (April 2014)												
	Northampton			**Wellingborough**			**East Northants**			**South Northants**		
Road Class	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
A	66.91	23.89	90.80	18.93	35.53	54.46	26.18	64.23	90.41	8.75	63.92	72.67
B	3.15	0.00	3.15	15.79	13.69	29.48	14.25	17.02	31.27	6.53	32.08	38.61
C	45.63	3.07	48.70	20.10	47.75	67.85	52.87	183.10	235.97	71.07	216.80	287.87
U	506.37	3.63	510.00	178.57	27.10	205.67	206.26	100.17	306.43	233.04	244.05	477.09
Total	**662.06**	**30.59**	**652.65**	**233.39**	**124.07**	**357.46**	**299.56**	**364.52**	**664.08**	**319.39**	**555.85**	**876.24**

	Corby			**Daventry**			**Kettering**		
Road Class	Urban	Rural	Total	Urban	Rural	Total	Urban	Rural	Total
A	2644	28.09	54.43	30.08	89.64	119.72	24.80	49.34	74.14
B	2.23	3.12	5.35	8.72	13.46	22.18	8.10	13.68	21.78
C	13.25	17.50	30.75	75.26	245.60	320.86	31.50	98.93	130.43
U	177.05	11.50	188.55	197.02	239.53	436.55	218.47	44.73	263.20
Total	218.97	60.21	279.18	311.08	588.23	899.31	282.87	206.68	489.55

Appendix 3: NCC Footway Network

	Category 1a	Category 1	Category 2	Category 3	Category 4	TOTAL
Corby	0.0	2.8	32.4	332.6	19.0	386.8
Daventry	0.0	2.4	40.8	463.2	69.8	576.2
Kettering	0.0	6.0	38.6	449.6	36.9	531.1
N'hampton	0.0	8.4	131.4	936.6	57.9	1,143.3
W'borough	0.0	3.0	39.2	367.4	40.0	449.6
East Northants	0.0	2.0	45.6	426.0	52.8	526.4
South Northants	0.0	1.4	40.0	430.2	78.1	549.7

Table 32: Northamptonshire Footway Network (Distances in km)

Appendix 4: Highway Drainage Inventory

	Highway Gullies	Culverts (<900mm)	Grips
Corby	15,552	12	632
East Northamptonshire	19,060	52	12,318
Wellingborough	12,876	16	2,600
Daventry	19,658	81	12,271
Kettering	20,882	33	3,947
South Northamptonshire	19,525	118	14,810
Northampton	38,580	16	34

Table 33: Northamptonshire Drainage Inventory

Appendix 5: Highway Structure Ownership

Owner	Bridge (>1.5m)	Culvert (>0.9m)	Footbridge (>7.5m)	Subway
NCC	421	661	61	110
NCC PROW (<7.5m)	-	-	-	-
Network Rail	71	1	1	1
Historical Railways Estate	46	-	-	-
Canal & River Trust	34	3	-	-
Environment Agency	2	-	-	-
Utility Company	-	7	-	-
District Councils	2	-	-	-
Other Authorities	197	7	8	4
Owner	**Retaining Wall (>1.5m)**	**Drains (<0.9m)**	**PROW Bridges**	**Other Structures**
NCC	157	315	267	45
NCC PROW (<7.5m)	-	-	123	-
Network Rail	-	-	5	-
Historical Railways Estate	2	-	-	-
Canal & River Trust	-	-	2	-
Environment Agency	-	-	21	-
Utility Company	-	-	-	-
District Councils	-	-	-	-
Other Authorities	49	11	78	8

Table 34: Northamptonshire Structures by Owner

Appendix 6: Highway Structure Maintenance Activities

Description of Maintenance Activity or Treatment Type	Expected Life or Treatment Frequency	Works History	Lifecycle Impacts
Major repainting Protection of steelwork to prevent corrosion	15 years	All works records are kept on file as hard documents, which have been scanned.	Work is required to prevent steel work from corroding
Patch repainting to be implemented	As required	All works records are kept on file as hard documents, which have been scanned.	Work is required as temporary measures before major repainting
Waterproofing Replacement of waterproofing to bridge decks	20 years	All works records are kept on file as hard documents, which have been scanned.	Work required to keep out water and chloride which can cause corrosion of reinforcement
Expansion joints Replacement of expansion joints in bridge decks (span length <20m)	20 years	All works records are kept on file as hard documents, which have been scanned.	Work required to ensure there is no restriction to movements in the bridge deck
Span length >20m	15 years	All works records are kept on file as hard documents, which have been scanned	Work required to ensure there is no restriction to movements in the bridge deck
Sealing of joints	As required		Required to keep out water and chloride which can cause erosion of reinforcement
Bearings replacement Replacement of bridge bearings	As required	All works records are kept on file as hard documents, which have been scanned.	Work required to ensure no inbuilt stress within the bridge deck occurs
Bearings Clean sliding and	As required	All works records are kept on file as hard	Work required to ensure no inbuilt

roller bearings if accessible and re-grease		documents, which have been scanned.	stress within the bridge deck occurs
Impregnation Concrete impregnation to prevent chloride entry (BD43)	15-20 years	All works records are kept on file as hard documents, which have been scanned.	Required to ensure that salt laden water does not penetrate into the concrete and corrode the steel bars
Replace aluminium parapets	40 years	All works records are kept on file as hard documents, which have been scanned.	Ensure that parapets can withstand any modern impacts safely
Major repainting of steel parapets	As required	All works records are kept on file as hard documents, which have been scanned.	To ensure steelwork does not corrode
Replace steel parapets	50 years	All works records are kept on file as hard documents, which have been scanned.	Ensures that parapets are capable of withstanding modern impact loads
Concrete repairs	As required but not more than 40 years	All works records are kept on file as hard documents, which have been scanned.	Prevents any spalls falling onto passers-by and to prevent further corrosion of the steel bars
Major brickwork/masonry pointing and repairs	As required but no more than 30 years	All works records are kept on file as hard documents, which have been scanned.	Ensure the full life of the structure is maintained
Other work Other maintenance not shown above	Varies	All works records are kept on file as hard documents, which have been scanned.	Ensure the full life of the structure is maintained

Table 35: Northamptonshire Structures Planned Maintenance Renewal and Replacement Activities

Appendix 7: Revenue Maintenance Standards

Item	Service Standard
Carriageway	To repair category one and category two carriageway defects within prescribed timeframes as described in the Highway Safety Inspection Manual.
Footway	To repair category one and category two footway defects within prescribed timeframes as described in the Highway Safety Inspection Manual
Signs and Bollards	To repair category one and category two sign and bollard defects within prescribed timeframes as described in the Highway Safety Inspection Manual
Traffic Signals	To undertake essential maintenance to traffic signals, CCTV, messaging signs and real time passenger information signs.
Road Marking & Studs	To remark road markings within in prescribed timeframes to the standards described in the Highway Safety Inspection Manual.
Drainage - cyclical	Cyclical cleaning of highway gullies to optimised programme. Cyclical inspection and cleaning of highway grips.
Drainage - routine	To repair category one and category two footway defects within prescribed timeframes as described in the Highway Safety Inspection Manual
Verges	To repair verge defects as described in the Highway Safety Inspection Manual.
Grass cutting	In areas where NCC is responsible for undertaking cyclical grass cutting there will be three cyclical cuts to grass in urban areas per annum and two cuts in rural areas. Safety splays will be cut as required to maintain visibility.
Weed treatment	In areas of identified weed growth there will be three cyclical sprays per annum. Injurious weeds will be attended to when sites are identified.
Trees	To undertake all urgent and emergency tree maintenance. No allowance to undertake routine or cyclical tree maintenance
Hedges	To undertake maintenance of hedges NCC is responsible for maintaining as described in the Highway Safety Inspection Manual. Enforcement processes to be followed for third party hedges as described in the Network Management Plan.
Fences and Barriers	To repair category one and category two highway fence and barrier defects within prescribed timeframes as described in the Highway Safety Inspection Manual

	To undertake bi-annual retensioning programme.
Accident & Vandalism	To undertake repairs resultant from damage caused by acts of vandalism or accidents. Wherever possible costs will be recharged.
Public Rights of Way	Essential maintenance of the rights of way network including paths and structures.
Emergency Service	Provision of the emergency response service and out-of-hours response.
Highway Inspections	Programmed highway safety inspections will be undertaken as prescribed in the current highway safety inspection manual. Annual night time inspection of road markings on A, B and C hierarchy roads.
Netcom	Essential management and operation of the Netcom centre
Structures	Management and undertaking of structures inspections including general and principal inspections.
Wildflower Verges	One annual maintenance grass cut at identified wildflower verge sites with removal of arisings.
Bus stops	To undertake repairs to defects to NCC maintained bus stop assets that are a danger to users.

Table 36: 2015/16 Revenue Maintenance Standards

Northamptonshire Highways: Approach to Highway Infrastructure Asset Management 2015

For more information please contact
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