Nottinghamshire County Council

HIGHWAY INSPECTION & RISK MANUAL

July 2018

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Introduction

The Highway Inspection & Risk Manual (HIRM) sets out how Nottinghamshire County Council manages and risk assesses the day to day or routine maintenance of its highways to fulfil its statutory obligations and deliver a safe, serviceable and resilient highway network. This is a procedural document which is intended as a guide for all employees involved in the inspection of Nottinghamshire's highway network.

It covers highway safety and service inspections for a number of assets (a service inspection is an enhanced safety inspection), with additional information recorded on overall condition, and potential for asset to be considered for future planned maintenance. These inspections do not attempt to address overall structural condition, which forms part of the technical surveys covered in the Highway Infrastructure Asset Management Plan along with aspects associated with sustainability and resilience.

This document has been written in line with the recommendations and guidance in 'Well Managed Highway Infrastructure - A Code of Practice' published in October 2016. It should be considered as part of Nottinghamshire County Councils existing suite of highway documentation and the Highway Infrastructure Maintenance Plan.

- Highway Network Management Plan (HNMP)
- Highway Infrastructure Asset Management Plan (HIAMP).
- Highway Inspection & Risk Manual (HIRM)

Links to these documents is available through Appendix 05 of this document.

This document replaces the Highway Inspection Manual dated December 2014 and is operational from 1st October 2018

This guide is not intended to cover inspections associated with, public rights of way, planned street lighting apparatus inspections, or planned tree inspections.

Public rights of way (generally rural footpaths and bridleways) as shown on the definitive map record, are covered in the Rights of Way Improvement Plan, which will be replaced by the Rights of Way Management Plan in 2018.

1 The need for Highway Safety Inspections

Under Section 41 of the Highways Act 1980 Nottinghamshire County Council has a statutory duty to maintain a highway maintainable at public expense in a safe and serviceable manner for all types of road user. Neglecting this duty can lead to claims against the County Council for damages resulting from a failure to maintain the highway. Under **Section 58** of the **Highways Act 1980**, the highway authority can use a **"Special Defense"** in respect of action against it for damages for non-repair of the highway if it can prove that it has taken such care as was reasonable. Part of the defense rests upon:

"Whether the highway authority knew, or could reasonably have been expected to know, that the condition of the part of the highway to which the action relates was likely to cause danger to users of the highway".

This is where highway authorities must demonstrate that they carry out highway safety inspections in accordance with their policies and national guidance. Highway inspection reports are part of the evidence used to show that the highway authority has acted reasonably.

Section 58 of the Highways Act also says:

"The court shall in particular have regard to ……. the following matters:

- ***a)*** *The character of the highway and the traffic which was reasonably to be expected to use it;*
- ***b)*** *The standard of maintenance appropriate for a highway of that character and used by such traffic;*
- ***c)*** *The state of repair in which a reasonable person would have expected to find the highway."*

Case history demonstrates that the highway authority must also be recording all customer reports of highway defects, however not all defects which the authority becomes aware of by inspection or customer report need to be repaired. Highways Asset Management System (HAMS) records may also be used as evidence to show that the highway authority has acted reasonably.

Guidance on the discharge of the Section 41 duty has been available, for many years, in a national Code of Practice (ACOP) – Well maintained Highways (2005). In October 2016, a revised code of practice was published 'Well Managed Highway Infrastructure - A Code of Practice'. This HIRM specifically addresses the guidance and requirements contained in this revised code of practice relating to day to day maintenance, inspections and risk management. It sets the overall context for the application of a risk based methodology to the management of the highway.

Management of risk both in assessing the implications of investment decisions for asset management purposes and also in determining appropriate responses to highway deficiencies is core to understanding and managing risk. Critically, it must be noted that lack

of financial resources is not a defense under Section 58 of the 1980 Act. Those involved in highway maintenance, including Nottinghamshire County Council members, cabinet members and senior management must have a clear understanding of their powers and duties and the implications and the procedures used to manage and mitigate risk. There is also a need to understand the risks and impacts to the network in setting, or changing, the levels of service. Authorities have a general duty of care to users and the community to maintain the highway in a condition fit for its purpose. This principle should be applied to all decisions affecting highway maintenance works.

2 Information Management and Customer Care Policy

Details of Nottinghamshire's approach to Information Management forms part of the overall strategy to engage with stakeholders as detailed in Section 5: Communications of the Highway Infrastructure Asset Management Plan.

Link to: Appendix 05 - Nottinghamshire's Highway Infrastructure Asset Management Plan

All enquiries are logged into the Highways Asset Management System (HAMS) via the Customer Relationship Module (CRM). Further information regarding the HAMS is contained in Section 15 of the Highway Infrastructure Asset Management Plan. The system automatically forwards the details to the most appropriate officer for consideration / action and reply. These enquiries may trigger **Reactive Inspections**. Appendix 3 of this document, details items that will be dealt with as an enquiry in the Highway Asset Management System.

This system is held in a secure environment with controlled access for users. Set ICT policies and security measures are in place for the management and use of ICT hardware, infrastructure, data and access. Mobile devices are utilised to allow direct data capture and work functions to be performed. These devices allow highway network condition information to be monitored and future plans to be available to the user.

3 Aims and Purpose

The aim of inspecting the highway is to identify and take action to remove those hazards which present a potential risk to highway users. Additionally, the process will support the development of programmes, to maintain the asset and keep the highway in a serviceable condition. This is in line with our overall aim of network safety, serviceability, and sustainability.

Highway **Safety and Service Inspections** are undertaken to identify defects that are creating or likely to create a danger or serious inconvenience to users of the network or the wider community. Such defects should include those that will require urgent attention, as well as those where the reduced level of severity is such that longer periods of response would be acceptable, or may confirm that no response is needed.

4 Highway Inspection Regime

The Highway Inspection regime is managed through the Highway Asset Management System. It is configured so that inspection routes for the whole county are available to all, which provides flexibility for the Inspectorate, allowing Inspectors to work outside of their defined areas when the need arises. Inspections are carried out on a monthly, three-monthly, six-monthly or annual basis dependent upon the hierarchy of the network.

The inspection regime is made up of three key elements:

- Inspection Route: This refers to monthly and three-monthly inspections, generally on classified roads and unclassified distributer roads. These are designed as a single inspection route along a single numbered road.

- Inspection Area: This is reserved for all annual inspections and 6 monthly link footway inspections.

- Enquiry Area: These are specific geographical areas where enquiries such as those from the general public either via Customer Services or the website, are allocated to particular Inspectors or other relevant action officers through the Customer Relationship Module (CRM) in HAMS. In general, the Enquiry Areas broadly match the Inspection Areas but some sections of an Inspection route may be in different enquiry areas.

Inspections are fully managed through Confirm and defects and ordered works are maintained from creation to closure. Each inspection is recorded against the relevant Street Section in Highway Asset Management System, as well as any defects found.

As part of the planned inspection regime there is an in-built condition survey which allows the Highway Inspector to highlight sites that are displaying signs of deterioration into one of the three condition bands. These sites are then further reviewed as part of the inspection management process, added to the Candidate List and form part of the Annual Engineering Inspection (AEI) as detailed in the Highway Infrastructure Asset Management Plan.

When recording inspections, on the host (Confirm) or using a handheld device, HAMS will automatically time and date stamp the inspection. If no actionable defects are present this is recorded as part of the inspection. The inspection data should show the name of the person who carried out the inspection. (Inspections must not be carried out in another person's name).

All inspections shall be properly recorded into the Highway Asset Management System and retained by the Authority for future reference.

5 Types of Inspection

The Highway is routinely inspected as part of a planned inspection regime, with inspections being carried out at a set of frequencies (Monthly, 3 Monthly, 6 Monthly, Annually) that are based upon network hierarchy. This, combined with the Customer Relations process, results in all highway inspections being undertaken by the Highway Inspector. Observed defects which meet the investigatory 'trigger' level are considered for repair and a response time allocated dependent upon a risk assessment. Inspections can be classified into four types:

i. Safety inspections

These inspections are undertaken to meet the key objective of network safety. They are critical to the County Council's strategy for managing liabilities and risks. They are used to identify defects that are creating or likely to create a danger or serious inconvenience to users of the network or the wider community; including defects requiring urgent attention. These defects will either be repaired immediately or initiate reactive maintenance.

The safety inspection is carried out in a manner that ensures that the highway can be adequately assessed, and may include a combination of walked and driven inspections. The inspection methodology adopted will ensure risk to the inspector is minimised.

ii. Service inspections

The service inspection is an enhanced inspection to meet the key objective of network serviceability and provide conditional information which supports the management of the asset and programmes of work. Service inspections comprise of a more detailed inspection, to identify issues that may have an effect on the reliability, quality, comfort and ease of use of the network, as well as those associated with safety of the network. Defects will either be repaired immediately or initiate reactive maintenance. The service inspection should be carried out in a manner that ensures that the highway can be adequately assessed. In addition, the procedures adopted will ensure risk to the inspector is minimised.

iii. Specialist inspections

Specialist inspections comprise of more detailed specific inspections of particular highway assets, with regard to the key objectives of network serviceability and sustainability and will be used to identify programmed maintenance requirements.

It will often be necessary for inspectors to have specialist knowledge in a particular field and may require the use of specialist equipment.

Specialist inspections will be considered in the following areas:-

- Highway drainage systems
- Embankments and cuttings
- Landscaped areas and trees
- Vehicle Restraint Systems
- Large signage and gantries
- Road markings and studs reflectivity
- Traffic signals and pedestrian crossings
- Street lighting
- Bridges and structures

iv. Reactive inspections

Reactive inspections are carried out as a result of third party defect reports. Such reports may

be received through calls, in writing, via social media sites or via a web form submission.

Defects verified through this reactive inspection will be dealt with as if the defect was found as part of a planned inspection.

6 Health and Safety

All inspections must be carried out in a safe manner so as not to endanger staff or the public. Whenever a safety, service or specialist inspection is undertaken the basic principles of risk assessment are carried out, not only for the inspection process but also for the assessment of any observed defects and for any proposed remedies.

Safe working procedures are available for walked and driven inspections where potential common hazards have been identified, however inspectors are expected to ensure any unforeseen events are assessed to ensure safe working practices are maintained.

With regards to responses to individual hazardous defects a judgement can be made by evaluating them in terms of their significance, the likely impact should an incident occur and the probability of it actually happening.

All operations will have a current risk assessment which must be followed by staff.

7 Responsibility of the person undertaking Inspections

The person undertaking the inspection is responsible for the accuracy of that inspection and the recorded information. The inspector undertaking the inspection may also be required to provide information relating to third party liability claims against the Council or Via EM, this may include providing statements to support the defense of claims. On occasions, the Inspector may have to attend court as a witness in civil trials.

8 Network Hierarchy and Inventory

The network hierarchy and associated inventory are the foundation of the highway maintenance strategy. The hierarchy is also core to the inspection system as the attributes used to evaluate the position of roads, footways and cycle paths in the hierarchy are also the cornerstone of a 'risk-based approach' to the planned inspection regime.

The factors that influence the hierarchy of a particular road length, footway section etc are detailed in the HIAMP and the hierarchy table contained in Appendix 04 of this document**,** demonstrates the influence these will have and how the route will be managed. Each part of the network is assigned a hierarchy which relates to its importance to transportation and usage. This hierarchy is stored in the Highway Asset Management System and records are kept of hierarchy changes. Footway hierarchies may differ from carriageway hierarchies and hence, they can have potentially diverse inspection frequencies.

Nottinghamshire County Council has worked extensively with neighbouring authorities as part of both the Midlands Service Improvement Group (MSIG) and the Midlands Highways Alliance (MHA) to ensure consistency between hierarchies across local authority boundaries.

The Highway inventory and the many types of assets and their attributes are detailed in the HIAMP. Whilst the detailed technical specification for all assets are not inspected as part of the safety and service inspections, covered in this document, any asset which is considered to be a potential risk are identified and reported through the appropriate channels to ensure that the highway is kept safe.

Further information on network hierarchy can be found in Section 5.1.6 of Nottinghamshire's Highway Infrastructure Asset Management Plan.

Link to Appendix 05 - Nottinghamshire's Highway Infrastructure Asset Management Plan

9 Frequency of Highway Safety and Service Inspections

Nottinghamshire County Council has set its own standards for the frequency of its highway safety and service inspections. These have been approved by Elected Members and take into account national guidance for the definition of highway type, hierarchy and inspection frequencies, issued in *"Well Managed Highway Infrastructure - a Code of Practice*" (published in October 2016). It recognises the patterns of use of the network rather than classification.

Each part of the highway network is assigned a hierarchy which relates to its importance in terms of transportation and usage. This hierarchy is stored in the Highway Asset Management System and records are kept of hierarchy changes. Depending upon usage and hence hierarchy, it is possible for carriageways and footways which are part of the same street section to have different inspection frequencies.

The Authority will ensure that the routes include the existing highway network and newly adopted highways, where appropriate, are added to the inspection routes.

It may be necessary to inspect certain highways at a higher frequency than shown above when there are particular hazards, e.g. a highway is deteriorating quickly or a road being used as a diversion route for 1 month or more. Any agreed additional (ad-hoc) inspections will need recording in the Highway Asset Management System.

The defined inspection frequencies should be maintained in accordance with Table 1.

Table 1 – Frequency of Highway Inspections

CARRIAGEWAYS			
HIERARCHY CATEGORY	**TYPE**	**SAFETY INSPECTION FREQUENCY**	**ENHANCED INSPECTION FREQUENCY**
R	Resilient Network	Monthly	Annual
H1	Main Distributor	Monthly	Annual
H2	Secondary Distributor	Monthly	Annual
H3	Tertiary Distributor	Quarterly	Annual
H4	Local Access Road	Quarterly	Annual
H5	Local Road	Annual	Annual
H6	Minor Road	Annual	Annual
H7	Track	Annual	Annual
H8	Unsuitable for Motor Vehicles	Reactive Only	

FOOTWAYS			
HIERARCHY CATEGORY	**TYPE**	**SAFETY INSPECTION FREQUENCY**	**ENHANCED INSPECTION FREQUENCY**
F1	Primary Walking Route	Monthly	Annual
F2	Secondary Walking Route	Quarterly	Annual
F3	Tertiary Walking Route	6 Monthly	Annual
F4	Local Access Footway	Annual	Annual
F5	Right of Way	NCC Countryside Access Frequencies	

CYCLEWAYS			
HIERARCHY CATEGORY	**TYPE**	**SAFETY INSPECTION FREQUENCY**	**ENHANCED INSPECTION FREQUENCY**
C1	On Carriageway	As per CW	As per CW
C2	On Footway (shared)	As per FW	As per FW
C3	Remote from Carriageway / Cycle Trails (when highway maintainable at public expense)	6 Monthly	Annual

Note: Hierarchies and the attributes which define them are identified in Appendix 04

10 Safety and Service Inspections Tolerance

All safety and service inspections are based upon categories within the network hierarchy and they should be wherever possible, evenly spaced throughout the year. It is accepted however that some inspections will not be achievable due to unforeseen circumstances or extreme weather conditions. If this should occur, details of the event should be made against the appropriate inspection record.

INSPECTION TYPE	INSPECTION FREQUENCY	TOLERANCE	
Safety	Monthly	+/-	7 days
	Quarterly	+/-	14 days
	6 Monthly	+/-	14 days
	Annual	+/-	28 days
Service	Annual	+/-	28 days

The reference to days is calendar days not working days, inspection may be undertaken early (+) or late (-) as indicated.

The due date of an inspection in HAMS is fixed, therefore any inspection undertaken early/late, in line with the tolerance, does not change the due date of the next planned inspection.

Consideration of the potential rate of deterioration of surfaces and defects before the next planned inspection should also take into account the tolerances described above.

11 Method of Inspection

i. Driven

Carriageway Safety Inspections should always be undertaken by two people in a suitable liveried vehicle travelling at a suitable speed that will enable adequate recording of defects – (guidance speed is 20 mph), one driving and the other inspecting. The driver will not be expected to be actively involved in identifying and recording defects, but will concentrate on ensuring the safe passage of the vehicle. For high speed roads (above 40mph), a dynamic risk assessment should be undertaken by the inspectors to determine whether traffic management is to be provided to enable the inspection to take place safely.

For narrow roads, typically those less than 4m total width, the driven inspection may be carried out in one direction only.

ii. Walked

Carriageways can be inspected by one person on foot if the person is walking on a footway and can safely inspect the footway, carriageway and verge at the same time.

All footways surfaced in a flagged or modular paving are to be inspected in both directions to allow for the assessment of all vertical changes in level.

iii. Cycled

The cycle network (urban and rural) may be inspected by one person on a bicycle, or walked. Cycleways that are located on carriageways will be inspected as part of the carriageway inspection.

12 Information to be Recorded

For both safety and service inspections it is necessary to record details of the inspection, irrespective of whether there are any defects or not. The information to be recorded includes:

- The inspection route
- Street / section within the route
- Date of inspection
- Name of inspector

As each inspection is recorded against the relevant Street Section in HAMS, this information is automatically captured. In addition, any actionable defects found will also be recorded with a more specific location, type and nature of actionable defect and any action taken at the time. Where appropriate, an image of a specific actionable defect may also be recorded on HAMS.

An assessment of the overall condition of the carriageway and footway must be recorded as part of the annual service inspection. This information is further assessed to help identify potential preventative maintenance and renewal schemes.

When recording inspections, on the host or using a handheld device, HAMS will automatically time and date stamp the inspection. If no actionable defects are present this is recorded as part of the inspection. The inspection data should show the name of the person who carried out the inspection. (Inspections must not be carried out in another person's name).

All inspections shall be properly recorded into the Highway Asset Management System and retained by the Authority for future reference.

13 Inspection Coverage

A safety inspection should identify and record highway defects such as:

- Debris, spillage or contamination on footways, cycleways, carriageways or hard shoulders.

- Displaced road studs lying in the carriageway.
- Overhead wires in a dangerous condition.
- Vandalism, the results of which are likely to endanger the public.
- Abrupt level differences in footways, cycleways, carriageways or hard shoulders, the results of which meet the relevant investigatory trigger levels.
- Potholes, cracks and gaps in footways, cycleways, carriageways or hard shoulders, the results of which meet the relevant investigatory trigger levels.
- Damaged, broken or displaced kerbs which meet the relevant investigatory trigger levels.
- Edge deterioration of the carriageway.
- Visual evidence of potentially slippery surfaces / loss of texture.
- Missing or defective ironwork and other apparatus that is the responsibility of public utility companies should be directed to the relevant utility company for action as soon as possible, under Section 72 of the NRSWA 1991. This should be within a timescale decided by the Inspector to be reasonable and in line with relevant NRSWA Codes of Practice.
- Standing water, water discharging onto or overflowing across the highway if present at the time of inspection.
- Blocked drains and grips.
- Damaged, defective, displaced, missing traffic signs, signals or lighting columns.
- Badly worn road markings, missing road studs.
- Dirty or otherwise obscured traffic signals and signs.
- NRSWA Defects – contained in NRSWA 1991 Specification for the Reinstatement of Openings in Highways Second Edition 2002.
- Bollards and street furniture defects.
- Damaged safety fencing, parapet fencing, handrail and other barriers.
- Sight-lines obscured by trees, other vegetation, unauthorised signs and other features.
- Overhanging vegetation causing obstruction to pedestrian or vehicular traffic.
- Dead trees, or trees with obvious die-back, which could affect the highway to be referred to the Forestry Team for specialist advice.

The above list is not exhaustive; the important issue is to ensure the safety of, and to prevent serious inconvenience to road users and the wider community.

Safety and service inspections will generally only include the highway assets visible from the carriageway or footway.

14 Risk Management and Defect Risk Assessment

When undertaking inspections or responding to reported incidents a judgement has to be made with regards to categorizing any observed defects and the consequential responses required. Every decision could be critical to the safety of users and may potentially be subject to legal scrutiny in the event of an accident occurring at or near the site. Consequently, it is important that inspectors are competent, provided with appropriate training and guidance in undertaking safety inspections (see section 21), including guidance on items to be inspected and the application of risk management in determining the degree of deficiency and the nature of response in order to make safe and maintain the highway in a serviceable condition in relation to its use.

An example of a typical process is shown below and examples of parameters that may be taken into consideration include:

- The depth, surface area or other degree of deficiency of the defect or obstruction
- The localized volume, characteristic, speed of vehicles and use by pedestrians.
- The location of the defect relative to other highway features such as retaining walls, bridges, embankments, junctions and bends.
- The location of defect, if it could adversely affect non-highway features such as neighboring properties.
- The location of the defect relative to the positioning of users, proximity of community facilities, vulnerable users such as in traffic lanes or wheel tracks.
- The nature of interaction with other defects.
- Forecast weather conditions, especially potential for freezing of surface water.

All defects identified through the inspection process may be evaluated in terms of their significance, which means assessing the likely impact should an incident occur and the probability of it actually happening.

Risk factor

The risk factor for a particular hazard is the product of the “Risk of Impact” and the “Risk Probability”, which can be measured in the range of 1 to 25. This factor can be used to identify the overall significance of the risk and consequently the appropriate response required.

Risk impact - The impact of a risk occurring can be quantified on a scale 1 to 5.

1	No impact
2	Minimal impact
3	Moderate impact
4	High impact
5	Severe impact

Consideration can be given to the extent of damage or injury likely to be caused if an incident occurred. The impact is likely to change with different defects, the amount and type of traffic and increasing speeds.

Risk probability - The probability of a risk occurring can be quantified on a scale 1 to 5.

1	Remote
2	Unlikely
3	Possible
4	Likely
5	Probable

Consideration can be given to the likelihood of users passing by or encountering the hazard, including location, maintenance hierarchy, vehicular and pedestrian flows.

Risk Factor = Impact x Probability

Or

Risk Factor = Risk x Hazard

Where:

- **Hazard** is something with the potential to cause harm.
- **Risk** is the likelihood or chance of that harm occurring.

Risk Matrix table

Risk Matrix		Probability (Risk)				
		1 Remote	2 Unlikely	3 Possible	4 Likely	5 Probable
Impact (Hazard)	1 No impact	1	2	3	4	5
	2 Minimal	2	4	6	8	10
	3 Moderate	3	6	9	12	15
	4 High	4	8	12	16	20
	5 Severe	5	10	15	20	25

Defect risk management

Having identified a particular hazard, the defect category and response time can be allocated based on the assessment of risk in relation to the likely impact and probability of an incident occurring. Generally, a Risk Factor of 16 or greater, would be considered as a Category 1 defect.

All defects therefore need to be carefully assessed and appropriate actions applied in order to make safe and maintain the highway network in a serviceable condition in relation to its use.

The *Risk Impact*, *Risk Probability* and *Risk Matrix* tables are tools used by Inspectors to assist them in establishing the category of defect and hence, the appropriate response times. It is not expected that the numbers from these tables will be recorded.

15 Categories of Defect

There are 4 categories of defects, as below:

Defect Category	Risk Factor Range	Response Time*
Emergency	**25**	**2 hours**
Category 1	**16 to 20**	**1 working day**
Category 2	**9 to 15 #**	**28 calendar days**
Category 3	**6 to 10 #**	**90 calendar days**

* Response time relates to the time following inspection.

The risk factor range for category 2 and 3 defects overlaps. This is due to the variability in site conditions and the probability (risk) that a defect may have an impact or offer a hazard to users. Through dynamic risk assessment the inspector will determine the most appropriate timing.

a) Emergency defects (EMG)

These are the most serious defects that offer the greatest risk to road users, offering a severe outcome. The nature of the action taken to deal with such defects will be dependent on the type of defect. A response will be provided within 2 hours of inspection. These are defects that often require immediate action to be made safe and where possible this will be at the time of inspection. In this context, making safe may be displaying warning notices, installing temporary traffic control measures, coning off or fencing off to protect the public from the defects.

b) Category 1 defects (Cat 1)

These are defects that require an urgent response and to be made safe at the time of inspection, if reasonably practicable. In this context, making safe may constitute a permanent first-time repair using modern proprietary repair techniques, displaying warning notices, coning off or fencing off to protect the public from the defect. If it is not possible to correct or make safe the defect at the time of inspection, repairs or other action of a permanent or temporary nature should be carried out as soon as possible and in any case within 1 working day.

A temporary repair will be followed up with a permanent repair that will be issued as a separate instruction as per the appropriate defect category.

When temporary signing or guarding is employed to make safe, further remedial works should be undertaken to enable the removal of the signing and guarding within 28 days, unless there are exceptional circumstances.

c) Category 2 defects (Cat 2)

These defects are those that are assessed by the Inspector as highly likely to become a Cat 1 defect within 3 months if not attended to, allowing for the tolerances as detailed in Section 10 of this document.

Category 2 defects will be issued with a 28-day completion time.

Nottinghamshire's target is to repair 90% of Cat 2 defects within 28 days, and 100% within 90 days.

d) Category 3 defects (Cat 3)

These defects are those that are assessed by the Inspector as likely to become Cat 1 defect in 3 to 12 months' time, allowing for the tolerances as detailed in Section 10 of this document.

Category 3 defects will be issued with a 90-day completion time.

The categorisation of defects will be reviewed annually to consider the impact of budgetary constraints, the practicality of delivery and the volume of work being identified. This review has a greater implication for the lower categories of defect with the longer completion time.

Other sites may be recorded as suitable for preventative maintenance through the conditional information recorded as part of the service inspection. These are sites with minor deterioration and surface irregularities which are highly unlikely to become defects before the next inspection. Work will not be issued for these; however, their suitability is recorded to allow preventative maintenance treatment to be considered as part of the wider maintenance programme.

Where an inspector determines that a section of highway has numerous defects constituting a surface failure over the section length, they should issue the repairs for the street rather than identifying each individual defect, categorising all the repairs based on the local factors.

16 Defect Category Selection

This will depend upon the inspector's assessment at the time of the inspection which should be based on the following criteria:

- Overall probability and impact of damage or accident occurrence.
- Hierarchy and frequency of inspection from Table 1 above (Section 9).
- The depth, surface area – (extent of the defect and their parameters in relation to the investigatory levels see Appendix 02 of this document).
- The location of the defect relative to other highway features such as junctions and bends.
- The location of the defect and its likely effect on users. Consideration will be given to pedestrians and vulnerable road users and whether it affects walking routes outside sheltered accommodation, elderly people's homes, doctors' surgeries etc.
- Consideration is given to the location of the defect in terms of 'desire lines' (whether it sits within the areas of greatest use over the carriageway or footway cross-section)
    - In carriageways, this is likely to be in the wheel tracks.
    - In footways, it refers to the areas of greatest footfall, usually away from boundary features (hedges, fences, walls)
- The nature and extent of interaction with other defects.
- Forecast weather conditions and time of year, especially considering the potential for freezing of standing water.
- If the defect is categorised as a Cat.1, consideration will be given as to whether the next day is a working day (and not a weekend or bank holiday) and if the next day is not a working day, given the above parameters, whether an emergency response would be more appropriate.

Example: defects, classification, guidance and investigatory levels are contained in Appendix 01 and Appendix 02 of this document.

17 Claims by Third Parties

The authority receives claims for damages for alleged failure of statutory duty (Section 41 - Highways Act 1980: Duty to maintain a highway). The inspection records constitute an important defence document.

18 Types of Defect Repairs

The range of different types of repair and treatment available to the Highway Inspector form part of the works ordering process contained in the Highway Asset Management system. These processes and treatments are embedded in the system and are utilised through the use of tablet technology by the Inspectors and Operatives.

Operational works procedures are covered by systems accredited to the internationally recognised quality system ISO 9001 and the Health and Safety system OHSAS 18001.

Make safe arrangements, as referred to in Section 15 of this document, are also managed in the same way with a description of the work required/done forming part of the inspection/enquiry process.

19 Outcome of Inspections

The works ordered as a result of an inspection are determined based upon the category of the defect and its associated response time plus other information such as indicative forward works programmes and major utility works. Reactive repairs are carried out effectively, to potentially prolong asset life where possible.

'Highway Assistants' are used and they support and accompany Highway Inspectors on their daily duties. The role of the Assistant is to help with the repair or 'make safe' of Category 1 defects at the first visit, as far as is practicable. This reduces the need for multiple visits and allows operational staff to better plan their maintenance activities around lower category defects.

Routine or Reactive maintenance is undertaken in response to inspections, complaints or emergencies. The action taken may vary depending upon the nature of the defect.

- All assets - sign and making safe for safety purpose
- All assets - provide initial temporary repair for safety purposes
- All assets - provide permanent repair for safety and asset maintenance purposes

As part of the wider asset management strategy it is recognized that each element of the highway asset will have a variety of lifecycle options taking the asset through from creation to disposal. Furthermore, within the lifecycle of the asset there are also a variety of treatment options which will provide for short, medium and long-term maintenance of the asset. These treatment options will form an integral part of the process for identifying and prioritizing treatments as part of the asset management process. The treatment options chosen will have an impact on both achieving the core service levels of safety, serviceability and sustainability and maintaining or improving the asset value.

20 Audit Inspections

The standard of highway inspections is reviewed regularly through the implementation of audit inspections, to check that the planned inspection regime meets the necessary standard. These reviews are recorded, along with the associated outcome and monitored as a guide to the level of compliance. Any element of an inspection that may be found to be below the required standard is amended and raised with the inspector accordingly.

21 Inspector Competency

The inspection regime is based on risk assessment and provides a practical and reasonable approach to potential hazards, it is important therefore that inspections and records are consistent across the network and county. To this end inspectors will be required to demonstrate competence, have experience in highway maintenance and to have received internal training until they are deemed to be competent prior to the commencement of inspection duties.

In addition to the above, all Highway Inspectors must have received and attained the following training and development within the first 12 months of appointment and receive refresher training as necessary:

- NRSWA Supervisory Qualification.
- City & Guides Inspection Qualification.
- Court Room Training and attended court in a viewing or witness capacity.

Appendix 01 - Types of Highway Defect

The following are **examples** of highway defects together with a description of those classed as **Category 1**, **2 & 3.**
The list is *not* exhaustive and the Inspector will need to use their risk assessment as detailed in Section 14, 15 & 16 to what is likely to be hazardous.

a) Carriageways, Category C1 and C3 Cycleways

DEFECT	CAT. 1 DEFECT IF:	CAT 2 DEFECT IF:	CAT 3 DEFECT IF:	ADDITIONAL ADVICE
POTHOLE / SPALLING * DEPRESSIONS * RUTTING * GAP / CRACK * SUNKEN IRONWORK *	See Appendix 2 – Table 2 below.	See Appendix 2 – Table 2.	See Appendix 2 – Table 2.	See Appendix 2 – Table 2.
EDGE DETERIORATION * Constituting a hazard to the travelling public especially cyclists.	Greater than 100mm 'drop off' on the edge of an unconstrained road. If a designated cycle route 50mm should be used. Edge deterioration that has broken away will be considered as a pothole see Appendix 2 - Table 2.	See section 15(c)(Cat 2) definition.	See section 15(d)(Cat 3) definition.	
DEBRIS, SPILLAGE, CONTAMINATION* Constituting a hazard on any part of the carriageway or cycleway.	Diesel / oil spillage etc., mud on road, hazardous debris, dead animals.	Not Applicable.	Not Applicable.	General non-emergency debris/rubbish clearance is a District Council responsibility. May require serving of notice under Highways Act or NRSWA. For Cat 1 making safe can include signing / treatment or removal of hazard.

DEFECT	CAT. 1 DEFECT IF:	CAT 2 DEFECT IF:	CAT 3 DEFECT IF:	ADDITIONAL ADVICE
DRAINAGE COVERS ETC. * Defective gully grates, manholes, service covers etc. constituting a hazard, especially for powered 2 wheeled vehicles and cyclists.	Missing or collapsed covers. 20mm trip within the frame. Broken gully grates, manholes, service covers etc.	As Cat 3 unless likely to deteriorate within 28 days. Also, drainage gully grate with grating parallel to kerb.	Not Applicable.	Utility should be dealt with under NRSWA Section 81. Cat 1 defects should be made safe if a full repair is not possible within the allocated time.
SURFACE WATER * Ponding / discharging across highway. Constituting a hazard of aquaplaning, vehicle avoidance measures or skidding, especially during winter.	Where excess water requires signing and guarding.	Minor discharge across the carriageway.	Not Applicable.	Where applicable serve notice to landowner. During Winter months as defined in the Winter Service Plan. Winter Maintenance Manager to be advised in excessive circumstances.
DISPLACED LEVEL CROSSING PADS. Must be reported to Network Rail as soon as possible.	Must be reported to Network Rail as soon as possible.	Not Applicable.	Not Applicable.	
LONGITUDINAL AND TRANSVERSE TRENCHES* (Utilities / NCC).	Refer to NRSWA tolerances in 2002 NRSWA Specification and Table 2 for NCC tolerances.	Refer to NRSWA tolerances in 2002 NRSWA Specification appendix and Table 2 for NCC tolerances.	Refer to NRSWA tolerances in 2002 NRSWA Specification appendix and Table 2 for NCC tolerances.	Utility should be dealt with under NRSWA Section 81, but defect must be made safe. Repair should be undertaken if utility does not respond to Section 81 notice.

***Subject to Risk Assessment as detailed in Section 16 - Defect Category Selection**

b) Footways and Category C2 Cycleways

DEFECT	CAT. 1 DEFECT IF:	CAT 2 DEFECT IF:	CAT 3 DEFECT IF:	ADDITIONAL ADVICE
POTHOLE *	See Appendix 2 – Table 3.	See Appendix 2 – Table 3.	See Appendix 2 – Table 3.	
TRIP HAZARD * Crack in surface. Raised/damaged paving slab. Trip/pothole. Street furniture. Rocking slab/block. Tree root damage. ** Sunken / raised ironwork.	See Appendix 2 – Table 4.	See Appendix 2 – Table 4.	See Appendix 2 – Table 4.	** Tree root damage – Seek Advice from Tree Officers.
DEBRIS, SPILLAGE, CONTAMINATION * Constituting a potential hazard.	Such that require signing and guarding before clearance.	Obviously slippery inspection covers.	Not Applicable.	General non-emergency debris/rubbish clearance is a District responsibility May require serving of notice under Highways Act or NRSWA. For Cat 1 making safe may include signing / treatment or removal of hazard.
KERBING * Damaged, rocking, missing or dislodged kerbs.	Creating a trip hazard greater than 20mm where a risk assessment indicates substantial risk within pedestrian desire lines. If there is not substantial risk within the desire line the defect can be categorised as Cat 2 or Cat 3 depending on the level of risk.	See section 15(c) (Cat 2) definition.	See section 15(d) (Cat 3) definition.	

DEFECT	CAT. 1 DEFECT IF:	CAT 2 DEFECT IF:	CAT 3 DEFECT IF:	ADDITIONAL ADVICE
DEFECTIVE AND MISSING IRONWORK AND SERVICE COVERS * Refer to Section 81 of the New Roads & Street Works Act 1991 (see below).	Raised, low or broken gully grates, manholes, service covers etc. Trip hazard greater than 20mm.	*See section 15(c) (Cat 2) definition.*	See section 15(d) (Cat 3) definition.	Utility should be dealt with under NRSWA Section 81, but defect must always be made safe, where they meet the investigatory level. Repair should be undertaken if utility does not respond to Section 81 notice.

***Subject to Risk Assessment as detailed in Section 16 - Defect Category Selection**

New Roads & Street Works Act 1991, Section 81 - Duty to maintain apparatus:

"An undertaker having apparatus in the street shall secure that the apparatus is maintained to the reasonable satisfaction of the street authority, as regards the safety and convenience of persons using the street (having regard, in particular, to the needs of people with a disability), the structure of the street and the integrity of apparatus of the authority in the street"

c) Verges / Visibility Splays

DEFECT	CAT. 1 DEFECT IF:	CAT 2 DEFECT IF:	CAT 3 DEFECT IF:	ADDITIONAL ADVICE
Overgrown verges/vegetation or obstruction at road junctions and roundabouts.*	Visibility at junctions & roundabouts severely restricted.	See section 15(c) (Cat 2) definition.	Not applicable	Contact 3rd parties and service notice if appropriate for Cat 2 and monitor progress.
Overgrown verges / vegetation or obstruction to footway.*	Footway impassable.	See section 15(c) (Cat 2) definition.	Not applicable	Contact 3rd parties and service notice if appropriate for Cat 2 and monitor progress.
Nuisance Items in the verge.*	Items causing a potential danger.	See section 15(c) (Cat 2) definition.	Not applicable	Contact 3rd parties and serve notice if appropriate for Cat 2 and monitor progress.

***Subject to Risk Assessment as detailed in Section 16 - Defect Category Selection**

d) Traffic signs, Road Markings, Street Lighting and Street Furniture.

DEFECT	CAT. 1 DEFECT IF:	CAT 2 DEFECT IF:	CAT 3 DEFECT IF:	ADDITIONAL ADVICE
SIGNS* ROAD MARKINGS* ROAD STUDS*	Badly damaged or missing Stop or Give Way Sign. Loose sign face likely to fall on pedestrian, or fall into carriageway.	Obscured or dirty hazard / warning sign face. Significantly faded or missing road 'Stop' or other mandatory lines at major junctions. Missing "cat's eyes".	Partly obscured or dirty sign face. Faded sign face. Damaged or missing advance Give Way sign. Faded or missing other mandatory road markings.	Lining defects to be identified for lining programme. Major junction lining faults to be passed to maintenance manager.
STREET LIGHTING ALL ELECTRICAL HAZARDS MUST BE REPORTED IMMEDIATELY TO STREET LIGHTING TEAM APPARATUS NOT TO BE TOUCHED. EXCLUSION ZONE CREATED.	**THIS MAY CONSTITUTE AN EMERGENCY CATEGORY** Lighting column or illuminated sign knocked down. Exposed live electrical wiring.	Lighting column or illuminated sign minor damage. Lighting column or illuminated sign inspection door loose. Illuminated bollard damaged, missing or unlit.	Lighting column or illuminated sign minor damage. Lighting column or illuminated sign inspection door loose. Illuminated bollard damaged, missing or unlit.	Category to be determined based on severity of damage and location of apparatus

DEFECT	CAT. 1 DEFECT IF:	CAT 2 DEFECT IF:	CAT 3 DEFECT IF:	ADDITIONAL ADVICE
TRAFFIC SIGNALS **ALL SIGNAL DAMAGE MUST BE REPORTED TO THE TRAFFIC CONTROL CENTRE**	**THIS MAY CONSTITUTE AN EMERGENCY CATEGORY** Exposed live electrical wiring. Seriously damaged or defective traffic signals.	Not applicable	Not applicable	
FENCING / BARRIERS* Safety fencing Private fencing Pedestrian barriers Knee rail fencing Highway fencing	Obviously damaged fencing or barriers causing immediate danger to highway users	See section 15(c) (Cat 2) definition.	See section 15(d) (Cat 3) definition.	Contact 3rd parties and service notice if appropriate for private fencing.

***Subject to Risk Assessment as detailed in Section 16 - Defect Category Selection**

Appendix 02 - Investigatory Levels for Highway Defects

Table 2 Carriageways, Category C1 and C3 Cycleways

Pothole / spalling, depressions, rutting, gap / crack width and sunken ironwork or other hazard

Road Type		Resilient Network	Main Distributor	Secondary Distributor	Tertiary Distributor	Local Access Road	Local Road	Minor Road	Track	Unsuitable for Vehicles
Hierarchy Category		R	H1	H2	H3	H4	H5	H6	H7	H8
Inspection Frequency		1 month	1 month	1 month	3 monthly	3 monthly	Annual	Annual	Annual	Reactive Only
Category 1 Defect	1 Working Day*	Investigatory Level >As per adjacent footway if within 'desire line' of pedestrian crossing or pedestrian route Investigatory Level >40mm elsewhere								
Category 2 Defect	28 Day Repair	May potentially become Category 1 within 3 months if not attended to, allowing for tolerances as detailed in Section 10 of this document.								
Category 3 Defect	90 Day Repair	May potentially become Category 1 within 3-12 months if not attended to, allowing for tolerances as detailed in Section 10 of this document.								

***Subject to Risk Assessment as detailed in Section 16 - Defect Category Selection**

Table 3 Footway and Category C2 Cycleways - Potholes

Footway Type		Primary Walking Route	Secondary Walking Route	Tertiary Walking Route	Local access footway	Rights of Way (Footpath)
Footway Hierarchy		F1	F2	F3	F4	F5
Inspection Frequency		1 month	3 monthly	6 monthly	Annual	NCC Countryside Access Policy
Category 1 Defect	1 Working Day*	Investigatory Level >20mm if within footway desire lines				
Category 2 Defect	28 Day Repair	May potentially become Category 1 within 3 months if not attended to, allowing for tolerances as detailed in Section 10 of this document.				
Category 3 Defect	90 Day Repair	May potentially become Category 1 within 3-12 months if not attended to, allowing for tolerances as detailed in Section 10 of this document.				

***Subject to Risk Assessment as detailed in Section 16 - Defect Category Selection**

Table 4 Footway and Category C2 Cycleways - Trip Hazard

Crack in surface, raised/damaged paving slab, trip/pothole, rocking slab/block, sunken or raised ironwork or other tripping hazard

Footway Type		Primary Walking Route	Secondary Walking Route	Tertiary Walking Route	Local access footway	Rights of Way (Footpath)
Footway Hierarchy		F1	F2	F3	F4	F5
Inspection Frequency		1 month	3 monthly	6 monthly	Annual	NCC Countryside Access Policy
Category 1 Defect	1 Working Day*	Investigatory Level >20mm vertical face/movement/crack if within footway desire lines				
Category 2 Defect	28 Day Repair	May potentially become Category 1 within 3 months if not attended to, allowing for tolerances as detailed in Section 10 of this document.				
Category 3 Defect	90 Day Repair	May potentially become Category 1 within 3-12 months if not attended to, allowing for tolerances as detailed in Section 10 of this document.				

***Subject to Risk Assessment as detailed in Section 16 - Defect Category Selection**

Appendix 03 - Items covered as enquiries in the HAMS

- Debris, spillage and contamination
- Manholes and gullies
- Nuisance items in the verge
- Overgrown verges / vegetation or obstruction to carriageway
- Overgrown verges / vegetation or obstruction to footway
- Signs
- Street lighting
- Traffic signals
- Fencing / Barriers / Private Fencing

Appendix 04 - Network Hierarchy – Carriageway

HIERARCHY		STREET PROPERTIES
R	Resilient Network	Is an 'A' class road or Has a Key Service* located on it or is required by the Key Service to gain access to the Resilient Network or Is an Emergency Diversion Route for the Trunk Road network or Is a road identified with an isolation factor associated with the winter maintenance plan (severe weather gritting route) #
H1	Main Distributor	Is RURAL and has an AADT of > 5000 or Is URBAN and has an AADT of > 2000 #
H2	Secondary Distributor	Is RURAL and has an AADT of > 1500 or Is URBAN and has an AADT of > 1700 #
H3	Tertiary Distributor	Is a 'B' class road or Is RURAL and has an AADT of > 151 or Is URBAN and has an AADT of > 101 or Has > 200 Residential Properties or Has > 10 Commercial Properties with a density of ≥ 50 Properties per Km
H4	Local Access Road	Is an URBAN 'C' class road or Is an URBAN Bus Route or Is RURAL and has ≥ 28 Residential Properties with a density of 50 to 100 Properties per Km or Is URBAN and has ≥ 28 Residential Properties with a density of < 100 Properties per Km
H5	Local Road	Has ≥ 50 Residential Properties with a density of < 10 Properties per Km
H6	Minor Road	Is Metalled
H7	Track	Un-Metalled. Is suitable for some Motor Vehicles
H8	Unsuitable for Motor Vehicles	Un-Metalled. Unsuitable for Motor Vehicles

Appendix 04 - Network Hierarchy - Footway & Cycleway

FOOTWAYS		
HIERARCHY		PROPERTIES
F1	Primary Walking Route	Is a Pedestrianised Zone ① or Has Belisha Beacons ② located on it or Has Flashing Amber Warning Lights (FAWLS) ③ located on it or Has an Educational Facility located on it #
F2	Secondary Walking Route	Is URBAN and is on a BUS ROUTE or Has > 10 Commercial Properties ④ located on it #
F3	Tertiary Walking Route	Has > 5 Commercial Properties ④ located on it #
F4	Local Access Footway	Has a 'bound' or slabbed surface
F5	Rights of Way (footpath)	See NCC 'Countryside Access' for info

CYCLEWAYS		
HIERARCHY		PROPERTIES
C1	Cycleway	On Carriageway
C2	Cycleway	On Footway
C3	Remote Cycleway/ Trails on Highway	Cycleway or route on designated facility off carriageway or footway

Appendix 04 Key

This framework assumes the carriageway / footway / cycleway in question is adopted and has extents.

Carriageway

***** Key Services = Fire, Police, Ambulance, A&E Hospital, Gritting Depot, Emergency Diversion for Trunk Road Network or connects these to the Strategic (Trunk) Road Network.

AADT = Annual Average Daily Traffic (Ave no. of vehicles per day)

= Is Metalled and suitable for traffic.

Footway

① = Pedestrian Zone indicated by the presence of this sign (Diagram 618.3B in Traffic Signs Regulations & General Directions 2016) or a derivative of it.

② = Belisha Beacons indicates the location of a Zebra Crossing.

③ = Flashing Amber Warning Lights indicate the location of a School Crossing Patrol.

④ = Commercial Properties includes Retail and Key Services.

= Assumes the Footway does not have an 'un-bound' surface.

Appendix 05 - Policy and Strategic Documentation

Highway Network Management Plan (HNMP)

The following is a direct link to Nottinghamshire County Councils Highway Network Management Plan which is published on the NCC website.

Highway Network Management Plan

Highway Infrastructure Asset Management Plan (HIAMP)

The following is a direct link to Nottinghamshire County Councils Highway Infrastructure Asset Management Plan which is published on the NCC website.

Highway Infrastructure Asset Management Plan

Highway Inspection & Risk Manual (HIRM)

The following is a direct link to Nottinghamshire County Councils Highway Inspection & Risk Manual which is published on the NCC website.

Highway Inspection & Risk Manual

Well-Managed Highway Infrastructure – A Code of Practice (WMHI)

The following is a direct link to Nottinghamshire County Councils website were a copy of the national document, Well-Managed Highway Infrastructure – A Code of Practice is displayed.

Well Managed Highway Infrastructure – A Code of Practice.

Highway Infrastructure Asset Management Guidance Document (HIAMGD)

The following is a direct link to Nottinghamshire County Councils website were a copy of the national document, Highway Infrastructure Asset Management Guidance is displayed.

Highway Infrastructure Asset Management Guidance Document