

Cabinet

Thursday, 27 September 2018, 10.00 am, County Hall, Worcester

Membership: Mr S E Geraghty (Chairman), Mr A T Amos, Mr A I Hardman,
Mr M J Hart, Mrs L C Hodgson, Ms K J May, Mr A P Miller,
Dr K A Pollock, Mr A C Roberts and Mr J H Smith

Agenda

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**Worcestershire County Council
Highway Maintenance Plan**

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Team: Highways, Economy and Infrastructure Directorate

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1. Introduction

The adopted highway is Worcestershire County Council's most valuable asset. As the Local Highway Authority, the Council is responsible for ensuring the Highway Network is managed and maintained for the safe and convenient movement of people and goods.

The Highways Act 1980 sets out the duties of the Local Highway Authority in respect of highways maintenance. In particular, Section 41 imposes a duty to maintain the adopted highway at public expense. The Highway Maintenance Plan (HMP) sets out Worcestershire County Council's operational requirements to maintain the highway network and to deliver the highway maintenance service in accordance with the 'Well Managed Highway Infrastructure' Code of Practice published in October 2016. This Code of Practice replaced:

- Well Maintained Highways - Code of Practice for Highway Maintenance Management;
- Well-lit Highways - Code of Practice for Highway Lighting Management; and
- Management of Highway Structures - A Code of Practice.

The Well Managed Highway Infrastructure Code of Practice encourages Highway Authorities to develop a locally determined risk-based approach to highway maintenance that fits with the asset management approach recommended by central government.

The Well Managed Highway Infrastructure Code of Practice advocates an asset management approach to highways maintenance. This code provides Highway Authorities with guidance on highway management and adopting a good practice approach to its delivery. It has 36 key recommendations with the emphasis on inspections, recording Defects, repairs and training of competent staff linked to risk assessment and effective asset management principles.

Worcestershire County Council has reviewed the 36 recommendations and has documented its approach and response to each of the recommendations with a separate document called "A Review and Response to the Code of Practice: Well Managed Highway Infrastructure".

2. Objectives and Scope of Highway Maintenance

The Highway Maintenance Policy and Highway Maintenance Plan are the delivery mechanisms to set standards for undertaking inspections and maintenance in accordance with a risk based approach in order to achieve network safety, serviceability and sustainability in line with highway asset management principles.

The main types of highway maintenance are shown overleaf as follows in Table 1:

Table 1: Types of Highway Maintenance

Type of maintenance	Description	Examples
Reactive	Responding to inspections, reports, severe weather and emergencies	<ul style="list-style-type: none"> • Repairing identified safety Defects and responding to emergencies on the Highway Network • Winter Service such as gritting and snow clearance
Routine and Cyclic	Providing works or services to a regular consistent schedule, generally for cleaning and landscape maintenance	Trees/hedges <ul style="list-style-type: none"> • Grass cutting • Weed control • Gully emptying • White lining
Programmed	Design and Build programmes providing larger schemes to a planned schedule	<ul style="list-style-type: none"> • Surface dressing • Public Realm schemes • Resurfacing/patching • Reconstruction
Regulatory	Includes for example - Inspecting and regulating the activities of others.	<ul style="list-style-type: none"> • Utilities and external contractors working on the public highway under NRSWA etc

3. Maintenance Objectives

The maintenance operational objectives for each of the key highway asset groups are shown in Table 2 below:

Table 2: Operational objectives for asset types

Asset type	Operational Objectives
Carriageways, footways and cycleway	<ul style="list-style-type: none"> • To maintain the condition and safety of carriageways, footways and cycle ways appropriate to their hierarchy and usage. • To undertake safety inspections, service inspections and condition surveys in accordance with DfT guidance. • To respond to Category 1 and 2 Defects in

	accordance with Department for Transport guidance.
Drainage	<ul style="list-style-type: none"> • To maintain the drainage network to ensure it operates effectively and contributes to mitigating flooding where reasonably practicable based upon a prioritised asset management approach. • Where appropriate to liaise with relevant landowners for them to maintain their roadside ditches. • To provide for an optimised asset based cleansing regime for all gullies.
Bridges and Structures	<ul style="list-style-type: none"> • Undertake maintenance inspections of highway structures in accordance with Design Manual for Roads and Bridges – Volume 3, Section 1, Part 4: BD63/17 – Inspection of Highway Structures, CSS documents Highway Structures Inspection Manual Volumes 1 and 2 and Bridge Condition Indicators Volume 2. • To remove graffiti from highway structures. • To complete the Government’s bridge assessment and strengthening programme. • To process abnormal load notifications.
Lighting and signals	<ul style="list-style-type: none"> • To comply with statutory powers and duties. • To comply with the Code of Good Practice TA 84/01 on Traffic signals. • To provide for an effective asset based approach in managing the safety and reliability of the network, by working in close collaboration with Worcestershire’s maintenance contractors, for lighting and traffic signals • To minimise the hazards due to the structural decay of lighting columns by a system of inspections, condition tests and replacement within existing budget allocations. • To maintain the network in partnership with Parish, Town and District Councils where appropriate.

	<ul style="list-style-type: none"> To pursue sustainability objectives in energy and maintenance by efficient management of maintenance operations, encouraging recycling and the use of low energy lamps.
Road signs, bollards and road markings	<ul style="list-style-type: none"> To provide for an effective prioritised system for the management of road signs, bollards and road markings. To define by use of markings or studs, carriageway lanes and edges, warning, parking and waiting restrictions at appropriate locations across the Highway Network.
Weed Control	<ul style="list-style-type: none"> To provide for Weed control management on footways, cycle ways and channels to control weed growth as appropriate. Ragwort shall be dealt with in accordance with the DEFRA “Code of Practice on how to prevent the spread of Ragwort”, where appropriate. Other “injurious” weeds shall be dealt with as required under The Weeds Act 1959 and The Wildlife and Countryside Act 1981.
Safety Barriers and Fences	<ul style="list-style-type: none"> To maintain safety fencing, handrails and other barriers as appropriate at relevant locations to protect the safety of the highway user.
Sweeping	<ul style="list-style-type: none"> The District Councils as the cleansing Authorities, are responsible for general sweeping of the Public Highway under the Environmental Protection Act 1990. The Highway Authority may address issues relating to sweeping where a specific hazard is identified, not relating to general sweeping and removal/reduction of detritus. This will be completed based upon a prioritised approach and in consideration of the type and scale of hazard presented.
Unauthorised signs	<ul style="list-style-type: none"> Unauthorised signs/fly posters where this creates a hazard or distraction to the highway user, will be assessed and where appropriate removed without notice to a highway depot where they can be reclaimed by the owner. Other unauthorised signs may be removed following service of a notice under

	<p>the 1980 Highways Act.</p> <ul style="list-style-type: none"> • Encroachment by traders in front of shops to display goods or to advertise will be assessed in accordance with County Council guidance and if necessary appropriate action taken to secure its relocation or removal. • Where appropriate, District Councils may also remove such signs under “Anti-Social Behaviour Orders”.
Hedges and trees	<ul style="list-style-type: none"> • Trees and Hedges will be managed in accordance with the Tree Risk Management Plan.
Verges	<ul style="list-style-type: none"> • Rural verges are to be managed to provide for the effective maintenance and safety of the Highway Network, this will include cuts as appropriate to the carriageway edge and to key identified visibility splay and safety hotspot locations. • Urban verges are to be maintained to provide for the effective maintenance and safety of the Highway Network. This will include cuts as appropriate to the carriageway edge and to key identified visibility locations. In urban areas, these works are undertaken by the District Councils and generally include a greater number of cuts than applied to rural areas, to also take account of amenity value to some degree.

4. Carriageway, Footway and Cycleway Hierarchies

Worcestershire County Council uses a defined hierarchy for its carriageways, footways and cycle ways in order to prioritise them for maintenance. The hierarchies are shown below.

4.1 Carriageway Hierarchy

The descriptions of the carriageway hierarchy have been reviewed in line with the guidance from the Well-Managed Highway Infrastructure Code of Practice. Having regard for the type and volume of the traffic flows on the network, and also taking into account the strategic importance that particular sections of a carriageway may have in the network, the descriptions have been amended to reflect our Highway Network. The revised descriptions are shown below:

Category	Hierarchy Description	Type of Road General description	Description
2	Strategic Route	Principal 'A' roads between Primary Destinations	Routes for fast moving long distance traffic. National primary route with signing for Primary Destinations.
3a	Main Distributor	Major Urban Network and Inter-Primary Links. Short – medium distance traffic	Routes between Strategic Routes and linking urban centres to the strategic network.
3b	Secondary Distributor	Classified Road (B and C class) and unclassified urban bus routes carrying local traffic with frontage access and frequent junctions	In rural areas these roads link the larger villages and HGV generators to the Strategic and Main Distributor Network and are signed for local destinations.
4a	Link Road	Roads linking between the Main and Secondary Distributor Network with frontage access and frequent junctions	In rural areas these roads link the smaller villages to the distributor roads. They are of varying width and not always capable of carrying two way traffic. In urban areas they are residential or industrial inter connecting roads.
4b	Local Access Road	These roads give access to the properties and land that front them and are not intended or signed as routes for through traffic.	In rural areas these roads serve small settlements and provide access to individual properties and land. They are often only single lane width and may be unsuitable for HGVs. In urban areas they are residential streets.

- Motorways and the one Trunk Road (the A46) in the County are the responsibility of Highways England.
- A Private Street is a highway not maintainable at public expense but which the public have a right to use. The local Highway Authority is, therefore, under no obligation to pay for its maintenance. Responsibility for the cost of maintaining a Private Street rests with the frontages (owners of properties with frontages on such streets). However statutory provision exists in the Highways Act to enable the local Highway Authority to require frontages to put complete necessary repairs if there is a danger to traffic in that street. Where the frontages fail to act as required the authority may execute the repairs itself and recover the costs from the frontages.

It should be noted that some Private Streets within urban areas may have street lighting provided and maintained by the County Council for public safety reasons, this does not signify adoption.

- A Private Road is a road to which the public does not have a right to access. It will be owned and maintained by a private individual, organisation, or private company. Most Private Roads are defined by signage or, and gates. The local Highway Authority has no powers or duties over Private Roads.

Private Streets and Private Roads are, therefore, not included within the County Council's Road Hierarchy and will not be part of the Highway Inspection systems.

4.2 Footway Hierarchy

The following table has been developed from the guidance given in the Code of Practice, Well-Managed Highway Infrastructures on a risk based approach having regard for the functionality of the footway and the scale of use. In urban areas the contribution of the footway to the quality of public space and street scene will be particularly important. Local factors, such as the proximity of schools or other establishments attracting higher than normal numbers of pedestrians to the area, have been taken into account. As a general guide, five broad maintenance categories are recommended for footways, as described in the table below:

Category	Category Name	Description
1a	Prestige Walking Zones	Very busy areas of towns and cities with high public space and street scene contribution.
1	Primary Walking Routes	Busy urban shopping and business areas and main pedestrian routes.
2	Secondary Walking Routes	Medium usage routes through local areas feeding into primary routes local shopping centres etc.
3	Link Footways	Linking residual estates to shopping centres, schools and industrial areas. These may be either footways or divorced footpaths through urban or

		rural areas.
4	Local Access Footways	Footways and footpaths associated with low usage in residential or industrial estate roads and those connecting to the main pedestrian routes.

The footway hierarchy, as with the carriageway hierarchy, is not necessarily determined by the road classification, but the functionality of the footway and scale of use. In urban areas the contribution of the footway to the quality of public space and street scene will be particularly important.

Where carriageway and footway hierarchies intersect, for example at pelican or zebra crossings, or other defined crossing points at junctions, the footway hierarchy should always take precedence in determining the inspection frequencies, defect definition and responses. This principle should also apply to intersections between carriageways and cycle routes and between cycle routes and footways.

4.3 Cycle Route Hierarchy

The categories for cycle routes suggested by the Well Managed Highway Infrastructure Code of Practice are shown in the table below. They are categorised not by use or functionality but by location, as the level of use is generally low and not related to maintenance need. This approach also reflects the differing risks associated with shared, partially segregated and fully segregated cycle routes.

Category	Description
A	Cycle lane forming part of the carriageway, commonly 1.5 metre strip adjacent to the nearside kerb. Cycle gaps at road closure point (no entries allowing cycle access).
B	Cycle track, a highway route for cyclists not contiguous with the public footway or carriageway. Shared cycle/pedestrian paths, either segregated by a white line or other physical segregation, or un-segregated.
C	Cycle trails, leisure routes through open spaces. These are not necessarily the responsibility of the Highway Authority, but may be maintained by an authority under other powers or duties.

5. Risk Based Approach

All reported Defects that reach the investigatory level should be evaluated for their significance and the likelihood of injury or damage to a highway user. Response times for remedial action on reported Defects will depend on the severity of the defect and where it

is located on the Highway Network. WCC's risk based approach is detailed in the Highway Maintenance Policy and the Highway Inspection Manual.

6. Safety Inspections

Local Highway Authorities are under a duty to maintain public highways by virtue of Section 41 of the Highways Act 1980, to enable safe passage of highway users. There is an acknowledgement that not all highways can be in perfect condition all of the time and, in this circumstance, a defence under Section 58 (i.e. that reasonable care has been taken to ensure that the highway is not dangerous) is relied on in the event of third party claims.

All carriageways, footways and cycle ways are inspected at regular intervals ranging between monthly to 12 monthly periods, depending on their hierarchy. Holistic safety inspections are undertaken to identify Defects within the road network, including those that are likely to create a danger or serious safety risk to road users or the wider community and therefore require immediate or urgent attention.

During safety inspections, all observed Defects that provide any foreseeable relevant degree of safety related risk to users are recorded in accordance with Department for Transport guidance. The degree of deficiency in the road elements will be crucial in determining the nature and speed of response. Judgement will always need to take account of particular circumstances. For example, the degree of risk from a pothole depends upon not only its depth but also its surface area and location within the Highway Network.

All safety inspections are carried out by Highway Inspectors in accordance with the Council's Highway Inspection Manual. The risk is assessed on site, and the defect where appropriate, is identified either as a Category 1 or 2, with an appropriate priority response.

Below is a typical list of Defects that are identified during safety inspections. It is not exhaustive and is provided as a check list for guidance only:

Carriageways:

- Surface Defects and other local Defects
- Abrupt level differences in running surface
- Edge deterioration of the running surface and other local Defects
- Excessive standing water and significant amount of water discharging onto (and/or flowing across) the road
- Blocked gullies and obstructed drainage channels or grips which could lead to ponding or flooding
- Debris and/or spillages or contamination
- Missing cats eyes
- Missing or damaged covers
- Sight-lines obstructed by trees and other vegetation
- Trees in a dangerous condition
- Displaced road studs lying on running surface;

- Potholes, cracks or gaps in the running surface;
- Crowning, depression and rutting in the running surface;
- Kerbing edging or channel Defects;
- Apparently slippery running surface;
- Ironwork (gully lids, manholes etc) broken or missing;

Footways:

- Surface and other local Defects
- Excessive standing water and significant water discharging onto and or flowing across the foot/cycleway
- Dangerous rocking paving slabs
- Large cracks or gaps between paving slabs
- Missing or damaged covers
- Debris and or spillages likely to be a hazard
- Rocking or otherwise unstable footpath or cycleway surfaces;
- Abrupt level differences in the running surface;

Street furniture:

- Damaged safety fencing
- Damaged parapet
- Damaged handrail
- Damaged road structures
- Damaged boundary fence where children or animals could gain access

Traffic signs:

- Signs, signals or lighting damaged, defective, obstructed, missing or unstable;
- Missing, damaged or faded regulatory or warning sign
- Major sign plate or structural failure
- Electrically or otherwise unsafe apparatus
- Damage which may cause a dangerous obstruction to road traffic or other road users

Lighting:

- Damaged Column
- Exposed, live electrical equipment

Road markings:

- Road markings and studs missing, misleading or badly worn;
- Signs, signals or lighting dirty or significantly obscured;
- Badly worn Stop or Give Way sign
- Give Way or double continuous white line badly worn

Other Safety Defects:

- Overhead wires damaged or unstable
- Earth slips where debris has encroached or is likely to encroach the road
- Unstable rocks or rock faces constituting a hazard to road users
- Damaged and exposed electrical wiring;
- Embankments and cuttings apparently unstable;
- Sight-lines obscured by trees, unauthorised signs and other obstructions;

6.1 Frequency and Method of Safety Inspections

All safety inspections are carried out by Highway Inspectors in accordance with the Council's Highway Inspection Manual as follows:

Table 1 – Safety Inspections

Feature	Reference	Category	Frequency of Inspection
<u>Carriageways</u>	2	Strategic Routes	1 month
	3(a)	Main Distributors	1 month
	3(b)	Secondary Distributors	1 month
	4(a)	Link Roads	3 months
	4(b)	Local Access Roads	1 year
<u>Footways</u>	1(a)	Prestige walking Zones	1 month
	1	Primary walking Routes	1 month
	2	Secondary Walking Routes	3 months
	3	Link Footways	1 year
	4	Local Access Footways	1 year
<u>Cycle ways*</u>	A	Part of Carriageway	As carriageway
	B	Remote from Carriageway	1 year
	C	Cycle Trails	1 year

* Those cycle ways that are now part of an existing footway and carriageway will be inspected as part of the footway and carriageway hierarchy. Those cycle ways that belong to Canals and Rivers Trust or other landowners will be inspected and maintained by them.

Carriageway safety inspections are carried out by an inspector and a driver from a slow moving vehicle (20 –25 mph) using predetermined routes. However, in key urban areas or due to the volume of traffic and the presence of parked vehicles, it may be necessary to complete walked inspections.

Senior Inspectors have the power to increase the inspection frequency for the period of a major diversion route, if necessary.

During safety inspections, a holistic approach is taken using a risk based approach to identify any safety issues for the user of the highway. A wide range of items will be considered including the road/footway surface, kerb edges, lining, signs, fencing and verge/tree issues.

Defects identified during these safety inspections are captured and recorded using map based computer software which has Global Positioning System (GPS) functionality (Bentley Exor System called MapCapture).

On single two-way carriageways, driven inspections are carried out in one direction only. The reverse direction is carried out in the following inspection. All dual carriageways are inspected in both directions on each occasion.

All footway inspections are carried out on foot. cycle ways and divorced footways are either walked or cycled. The same approaches for the identification of safety issues as above are completed during walked footway inspections and Defects are entered into MapCapture.

7. Reactive maintenance

The Well Managed Highway Infrastructure Code of Practice notes that local Highway Authorities should adopt a risk based approach and a risk management regime for all aspects of the Highway Maintenance Policy. There are no prescriptive or minimum standards prescribed by the Code of Practice enabling Worcestershire County Council to establish and implement levels of service appropriate to the county for dealing with safety Defects categorised as Category 1 and Category 2 Defects.

WCC already has an established risk based approach that has been in place since 2005. This approach is detailed in the Highway Maintenance Policy.

8. Defects

Defects identified are treated as either Category 1 or 2 dependent on the particular circumstances and severity of the defect. This approach is outlined in the Highway Maintenance Policy and the Highway Inspection Manual.

8.1 Defects - Drainage

The following drainage Defects are likely to be the most commonly identified but the list is not exhaustive. Distinction between Category 1 and 2 Defects should be based upon the same risk assessment principals outlined earlier:

- Standing water, water significantly discharging onto or overflowing across the highway.
- Blocked drains or grips.
- Blocked culverts or ditches

- Missing or broken ironwork (gully lids, manholes etc)

Remedial action is taken by placing an order with Worcestershire's Term Service Maintenance Contractor who following receipt, will complete the works within the timescales indicated for Category 1 and Category 2 Defects.

8.2 Defects – Street lighting and illuminated signs

Defects that are identified during inspections, via remote monitoring or following reports from the public, are prioritised for rectification into defect categories based on risk and are resolved by the Term Service Maintenance Contractor.

Defects that may occur with electrical supplies are outside of the control of the Council as these are governed by statutory performance targets determined by the electricity industry regulator, OFGEM (Office of Gas and Electricity Markets) as part of their licence conditions.

8.3 Defects – Traffic signals and Bollards

Defects that are identified during inspections, via remote monitoring or following reports from the public, are prioritised for rectification based on risk, within defined response times where reasonably practicable.

8.4 Defects – NRSWA

Defects identified during inspections are reported to the relevant statutory undertaker for rectification within the statutory undertakers defined response times where reasonably practicable. Should the statutory undertaker fail to meet the response time for a potentially dangerous defect, then the Council has the power to undertake the works and then recharge the costs.

9. Service Inspections

Service inspections are focused on ensuring that the network meets the needs of the user and comprise more detailed specific inspections of particular elements to ensure that they meet the requirements for network serviceability and integrity.

Service inspections are carried out at the same time as safety inspections, condition surveys and community requirements in order to identify deficiencies compromising the reliability, quality, comfort and ease of use of the network, from the users' point of view. Safety inspectors shall raise Advisory Defects to be considered by the relevant teams such as Design and Build team, Footway Programme team, Drainage team or Street Lighting team.

Improvements to the network to overcome identified deficiencies are considered and undertaken subject to the availability of funding.

Where footways, cycle routes or PROW remote from carriageways form part of an integrated route or network intended to encourage walking or cycle use, consideration

should be given to adopting a consistent service inspection frequency for the route or network as a whole.

9.1 Drainage Service Inspections

HMEP Guidance on the management of Highway Drainage Assets was published in 2012 and was produced as a consequence of the increasing frequency of flooding events in the UK over the previous 10 years. The Guidance also relates to The Flood and Water Management Act, which requires upper tier authorities to have new responsibilities in relation to flood risk management. WCC has reviewed and adopted an approach for each of the 11 recommendations, that were designed to provide an overall improvement into the management of highway drainage Defects.

WCC has a clear and robust drainage asset management system in place with over 5 years of data, enabling the effective development of an optimised system for gullies and their management. Using an asset management system and approach, our gullies, connections and culverts are managed by our Highway Maintenance Service Contractor (HMSC) Ringway. The service delivery is managed with defined outcomes which are reviewed as part of our Performance Management Framework.

WCC uses appropriate technology to monitor and manage its drainage assets; a comprehensive list of flooding hotspots are mapped into the County's Geographic Information System (GIS), together with ford crossings and CCTV cameras are in situ at key locations in the county to monitor flooding. Toughbooks and the GPS Causeway system is utilised in conjunction with a comprehensive GIS database. WCC's GIS has the necessary security protocols in place to share relevant and appropriate data with our key partners such as the Environment Agency, District Councils, Highways England and neighbouring lead Local Flood Authorities.

The County adopts a risk based approach in identifying the condition of the drainage network by carrying out inspections as follows:

- 1) Inspection of known significant areas susceptible to risk of flooding are carried out before, during or immediately following periods of very heavy rain. These flooding locations are mapped in our Geographic Information System (GIS).
- 2) Culverts under highways, outfalls and manholes are inspected for structural damage and blockages. The frequency of those inspections shall be based on risk assessments, but by default every five years.
- 3) Piped drainage and soakaways are inspected and cleansed as required, particularly at known flooding locations of significance, but at not more than 10 year intervals.

Particular note is taken to identify potential Defects associated with drainage as follows:

- Gullies, grips and ditches, which may be obstructed by the growth of vegetation or damaged by traffic. (In most cases the responsibility for maintenance of ditches will rest with the adjoining landowner);
- Other piped drainage which may be affected by blockage or subsidence;
- Surface boxes and ironwork for both drainage and non-drainage applications, which may be affected by subsidence or obstructed access.

Where possible and in order to create greater efficiency, these inspections are combined with safety inspections, particularly in the case of gullies and ironwork. Culverts under roads should be inspected every five years.

Improvements to the network to overcome identified deficiencies are considered and undertaken subject to the availability of funding, with priority given to locations involving flooding of property or businesses and critical infrastructure.

9.1.1 Roadside Ditches and Field Run Off

Where a ditch lies between the hedge and the metalled carriageway there is a legal presumption that the ditch does not form part of the highway, but belongs to the owner of the adjoining land. Such a presumption may be rebutted by evidence to the contrary, where, for instance the Highway Authority has purchased land for road improvements and therefore, holds the Title Deeds or other conveyances that have been tied to Ordnance Survey boundaries.

In Common Law, a duty exists on the part of the owner of a roadside ditch to maintain and clear it so as not to allow water on the highway. Public Health legislation requires the same owner to take action to prevent his ditches becoming prejudicial to health or creating a nuisance. The Highways Act makes landowners responsible for avoiding nuisance on carriageways caused by soil and water being washed off fields and private access.

The Highway Authority has permissive powers to take action to drain the highway or prevent surface water from flowing onto it, but it is emphasised that this is a power and not a duty and there is no legal compulsion for the County Council to undertake such works.

The County Council will focus its activity and time in relation to roadside ditches, in a prioritised manner, primarily dealing with issues in relation to key locations where flooding has occurred or been identified as a key risk, alongside identified issues of field run-off, which may cause an issue of significance for the highway user. In addition, where the neglect of roadside ditches is impacting the integrity and long terms strength of the road and its sub-base, the Council may seek to take action to resolve such matter as is appropriate.

9.2 Embankments and Cuttings Service Inspections

Significant embankments and cuttings are defined and an inspection regime is carried out based upon the geological characteristics and the potential risk of slippages or rockslides.

Service inspection arrangements are based on specialist geotechnical advice, and are programmed in accordance with this advice. It may be necessary to complete service inspections at identified locations, following periods of heavy rain, prolonged soil saturation, in particular, after severe winters, or prolonged spells of dry weather.

A risk based approach is adopted to identify key issues and locations critical to network performance, after which an enhanced service inspection regime may be considered.

9.3 Tree Service Inspections

Highway trees include trees within the highway boundary and trees that are outside of the highway boundary but deemed to be within falling distance of the highway. These trees may be owned by the County Council or privately. The Tree Risk Management Plan recognises the amenity and nature conservation value of trees and also seeks constructively to manage ongoing risk to the authority. The Tree Risk Management Plan includes the approach to be taken for service inspections by appropriately qualified officers with defined intervals and response times.

The Tree Risk Management Plan also outlines the requirements for the installation, management, removal and replacement of highway trees and landscaping, where appropriate.

9.4 Safety Barriers and Fencing Service Inspections

Steel safety fences and pedestrian guard rails are inspected at regular intervals determined through risk assessment in respect of mounting height, surface protective treatment and structural condition, to ensure that they remain fit for purpose.

Tensioning bolts of tensioned safety fences are checked and reset to correct torque at intervals determined risk assessment methodology in accordance with agreed guidelines. Safety barriers adjacent to bridges are inspected as part of the highway asset.

Inspection and testing of safety barriers with respect to mounting height and integrity are undertaken by default no less frequently than 5 years.

Sections of safety fence that are found to be mounted at heights outside the limits specified or for which structural integrity is not in doubt, are treated as Category 2 Defects.

Pedestrian safety fences and guard rails are used primarily in urban areas at busy road junctions and to encourage use of pedestrian crossings rather than other potentially unsuitable locations. Damaged sections are treated as Category 1 Defects and made safe

within 24 hours, unless damage is clearly superficial with no loss of integrity of the fence or barrier.

Pedestrian safety fences, boundary fences and environmental barriers for which the authority is responsible, are also inspected in respect of integrity, and where appropriate stock proof qualities, during the course of service inspections of carriageways, footways and cycle routes. A higher frequency may be necessary in some locations (e.g. in areas with known higher incidence of vandalism). Inspections of structural condition and protective treatment are carried out at regular intervals. All inspection intervals are determined using a risk based approach.

Safety barriers and fences adjacent to railway lines are inspected by the Highway Authority irrespective of liability. Generally, inspection intervals are determined using a risk based approach.

Worcestershire County Council also has separate Policies in place for the inspection of level crossings and fords with defined inspection intervals.

9.5 Traffic Signs and Bollards Service Inspections

Traffic signs are the most visible elements of the Highway Network, highly valued by users and contribute significantly to network serviceability through facilitating efficient and effective use of the network.

The primary objective is to keep traffic signs legible, visible and effective as far as is reasonably practicable, in relation to the road use and traffic speeds. The following provides examples of the types of issues which may arise and will be risk assessed as necessary and given relevant priority for resolving:

- Damage, deterioration, or vandalism to signs and bollards leaving either the sign or situation to which it applies in a dangerous condition;
- Missing traffic cylinders across gaps in central reserve fence at emergency crossing points.
- Inspection of Stop and Give Way Signs at minor roads are included in the inspections of signs on the major road to which they control entry.
- Vegetation potentially obscuring road signs are recorded during safety inspections and service inspections of carriageways, footways and cycle routes and treated accordingly.
- Special signing schemes, for example blockwork chevron treatments at roundabouts and traffic calming schemes using special signing may deteriorate more quickly than conventional signing. Where it is identified that such schemes are wearing more readily than normal locations, these will be considered for inclusion in the 'hardware' locations list, which will then be inspected/checked more frequently with appropriate cleaning/re-tracing occurring in accordance with the Term Service Maintenance Contract outcome based specification.
- The condition of non-illuminated road signs should be inspected in daylight, and

also at night for degradation of colour, retro-reflectivity, deteriorating fittings, legibility distance, and average surface luminance. The frequency is to be determined by risk assessment. More frequent inspections may be necessary for strategic routes and main distributors, where more consistent high standards are desirable. Cleaning of such signing will be completed where necessary, based upon an agreed level of cleanliness of the signs identified.

- Optical inspections and cleaning of illuminated signs is carried out at regular intervals determined by risk assessment or by default every two years. A visual inspection of the sign supports is carried out at the same time. Night-time inspections are undertaken in conjunction with those for street lighting faults. Due to the legal requirements for the illumination of traffic signs it is recommended that a group lamp replacement strategy be adopted for illuminated traffic signs and bollards. The lamp replacement period will depend upon the type of lamp and its annual burning hours.

Inspections are initially visual, and condition is assessed against the criteria set out in TD 25/01. Any suspect areas identified by the visual inspection should be noted and further testing as described in TD 25/01 instigated. The coefficient of retro-reflection of sign face sheeting is a specialist site test that may require the services of a specialist organisation. TD25/01 states that the acceptable level of retro-reflection is 80% of the 'as new' value for motorways and trunk roads, where higher performance materials are used. Authorities will obviously wish to allow for local variation, and choose sign performance levels depending on the overall risk assessment and road hierarchy, but the 80% of the 'as new' level should be applied for replacement planning purposes.

Service inspections should ideally identify signing that is inappropriate or no longer necessary and may be a distraction to users, or detrimental to the Streetscene. Such signing is noted for removal or replacement either as part of future programmed works or more urgently, if necessary.

The speed of permanent repair will depend on the degree of danger but important warning and regulatory signs should be replaced as a matter of urgency.

9.6 Road Markings and Studs Service Inspections

Inspections in respect of wear, spread, colour, skid resistance and retro-reflectivity is undertaken for paint markings and for thermoplastic markings, at frequencies determined by a risk assessment. Inspections for reflective conspicuity for road studs are carried out during the hours of darkness. An organised programme of works to maintain a standard level of road markings and studs in good working order, will be completed in accordance with the specification as detailed in the Term Service Maintenance Contract outcome based specification.

9.7 Lighting Service Inspections

The Code of Practice called "Street Lighting Service Inspections" that was published in 2004 has now been superseded by the Code of Practice called "Well Managed Highway

Infrastructure" published by UK Roads Liaison Group in October 2016. Part D Lighting covers the scope of street lighting services and the competency required to which the County Council complies with.

9.8 Bridges and Structures

Bridges and structures are inspected by Jacobs on behalf of Worcestershire County Council.

All bridges and structures are inspected every two years, in accordance with BD63/17. This being either General Inspection (GI) or Principal Inspection (PI). PI's are undertaken on all bridges with a span of 8m or greater; as well as lower-span 'high-risk' structures (i.e. heritage bridges, early reinforced concrete bridges, cast iron bridges and certain retaining walls).

As well as a standard GI, bridges with spans below 8m have a more thorough GI every six years. These are recorded as an Inspection by the relevant Engineer.

Whilst BD63/17 allows for an increase in the PI interval, a similar exercise was carried out in 2013/14 in accordance with IAN171/12. Following this exercise, the PI interval of some bridges was increased with the missing PI being replaced with a GI to maintain the two-year inspection interval.

All bridges which cross a major river are inspected for scour by divers on a yearly basis, as well as after a significant flood event.

In addition to the above, additional Safety Inspections are carried out as and when required following concerns raised by members of the public, Council Officers or Members, where appropriate.

All inspections are recorded on the County's bridge management system called AMX.

9.9 Service Inspections - New Developments

Developers may request for the highway within a new development to be adopted and then maintained by the Council under Section 38 of the Highways Act 1980.

Developers may request for the existing Highway Network to be modified to facilitate a new development under Section 278 of the Highways Act 1980.

The Developer will be responsible for the maintenance of all elements of their works, delivered under either of the above legal agreements, including all Defects, until the Final Certificate of Completion has been issued. Once this is completed and all elements in place, then the Highway Authority will look to incorporate the inspection and management of the Highway within its appropriate inspection regimes as necessary.

9.10 Service Inspections – NRSWA

Statutory undertakers are utility companies with apparatus in or below the highway. Statutory undertakers have legal rights under the New Roads and Street Works Act 1991 (NRSWA) to undertake works on the highway to install, inspect, maintain, repair or replace apparatus. Section 50 of the Act also permits private builders to install, maintain or remove private apparatus such as sewers and drains in the highway under license. The builder or person granted a 'Street Works License' becomes an 'undertaker' for the purposes of the NRSWA and, therefore, attracts the relevant duties and responsibilities imposed by the Act and associated secondary legislation and codes of practice. Reinstatement of the highway is the responsibility of the statutory undertaker.

The role of the County Council is to monitor all statutory and non-statutory performance, but not to supervise the whole works. The legal duty for the provision of a safe highway still resides with the local Highway Authority, notwithstanding any other duties imposed upon statutory undertakers.

Following any works, statutory undertakers are required to reinstate the highway to an appropriate standard and provide a guarantee on the quality of the works ranging from 2 to 3 years.

The Council has the power to inspect the reinstatement of the highway to ensure that it is done to the appropriate standard and issue reinstatement Defects when it falls below that standard.

The Traffic Management Act 2004 (TMA) impacts upon how the County Council co-ordinates works. As a result, the County Council has appointed a Traffic Management Team to oversee the co-ordination of all works within the highway to minimize inconvenience to road users. To facilitate co-ordination and inspection, works are notified in advance to the County Council under a formal notice system. The amount of notice required will vary dependent on the type of work and location. The County Council has powers to designate certain streets to restrict the working hours or to require special procedures or materials to be used, for instance in conservation areas.

Sample inspection, for which a fee is recoverable from the relevant undertaker, ensures work complies with national standards. Target levels of sample inspections are set and agreed with the statutory undertakers on a yearly basis. Internal targets help ensure that inspections are representative and fee income is maximised.

10. Condition Surveys

The most significant financial investments in highway maintenance will be in repairing, reconditioning and reconstructing highway surfaces. Condition surveys identify the current condition of the network and from this condition; both long term and short-term maintenance funding decisions can be made. Repeatable condition surveys allow trend analysis to be used to confirm the original decisions or allow for changes as a result of the changing network condition.

As part of the highway asset management approach, the following condition surveys are undertaken to collect information about the condition of the Highway Network:

- **SCANNER** – Machine survey that measures surface condition, road geometry and ride quality.
- **Coarse Visual Survey (CVI)** – Visual survey mainly undertaken from a slow moving vehicle.
- **SCRIM** – Machine survey that measures the wet skidding resistance of the road surface.

All condition survey information is loaded into the United Kingdom Pavement Management System (UKPMS) for processing and analysis which enables Worcestershire County Council to:

- Plan maintenance schemes
- Monitor effectiveness of maintenance treatments
- Monitor trends in highway condition
- Identify sites below standard for wet skidding resistance
- Comply with statutory requirements (Single Data List Item 130-01 "Condition of Principal Roads" and Single Data List Item 130-02 "Condition of Non-Principal B & C class roads")

11. Programmed Maintenance

Programmed maintenance involves planned schemes primarily of resurfacing, reconditioning or reconstruction. There is an annual programme which is selected based on asset management principles within approved budgets in accordance with the Transport Asset Management Plan (TAMP). The table below outlines the key programmed maintenance activities for each of the different asset groups:

Table 2: Programmed Maintenance for the different asset groups

Asset Group	Description of treatment	Benefit
Carriageways and footways	Reconstruction	Fully restores the condition of the highway that is showing serious signs of structural failure.
	Partial reconstruction	To halt the deterioration of a carriageway that is showing signs of structural failure.
	Resurfacing	Halts the deterioration of highways that are starting to show the signs of structural failure before they get to the stage requiring reconstruction.
	Surface dressing	Halts the deterioration of

		highways showing the signs of surface failure only
	Structural patching and edge of carriageway	Removing areas of the carriageway which are damaged and replacing this with new material to extend its life.
Footways	Siding out and micro-asphalt	Siding out restores footway to original width and micro-asphalt is laid over the top of the existing surface to seal and protect it.
Street Lighting and traffic signals	Replacement	Where the asset is life expired.
Structures	Structures – refurbishing, repainting, re-waterproofing and resurfacing	Restoration of an existing structural asset without increasing the assets designed carrying capacity
	Replacement, creation or upgrading	Works that either create a structure that previously didn't exist or upgrade an existing asset beyond its existing design capacity.
Highway drainage	Repair/replacement	Works to correct highway drainage problems that cannot be carried out as either routine and cyclic works or as part of other programmed works
Embankments and cuttings	Stabilisation	Works to stabilise areas of embankments or cuttings that have been identified as potentially failing in order to prevent a full failure resulting in the need for large scale reactive works.
Fences and barriers	Replacement	Fully restores the condition of a highway fence or barrier that is showing signs of deterioration and no longer meets current Specifications.
Road markings, signing and studs	Replacement	Works to replace missing or damaged road markings, signing and studs.

12. Winter Service

Worcestershire County Council carries out annual winter service operations that cover three basic categories: pre-treatment; post-treatment; and snow clearance. The Winter Service Policy is available on the County Council's website and details how adverse winter weather is addressed. The Winter Service Plan is an operational plan that is reviewed annually and links to the County Council's Emergency Response Plan and resilient network. Resilience is defined by the Cabinet Office as the 'ability of the community, services, area or infrastructure to detect, prevent, and, if necessary to withstand, handle and recover from disruptive challenges.' In order to reduce risk on the resilient network, Worcestershire County Council's Winter Services carries out the following operational activities in response to the four components of resilience:

- **Resistance – preventing damage;** In this context, our resistance is derived by pre-treatment in advance of adverse weather and proactive management and operations as the adverse weather arrives.
- **Reliability – operation under a range of conditions;** Our plant, labour and materials (salt/brine) are continually checked throughout the season. Through the summer, our fleet and depot infrastructure are reviewed, repaired and upgraded as best able within budgetary constraints.
- **Redundancy – availability of backups or spare capacity (e.g. a suitable diversion route);** Additional vehicle and staff capability can be utilised as back-up or spare capacity. Where short term planned road closures are in effect, diversion routes are treated if the closed section forms part of the prescribed treatment network. Where long term closures are in place, then amendments are made to the prescribed network to ensure network resilience in conjunction with treatment completion requirements to timescale are adhered to.
- **Recovery – enabling a fast response and recovery;** During severe weather events, Worcestershire County Council is very responsive with arrangements in place with third party contractors countywide to assist frontline gritters and with snow clearance.

Worcestershire County Council's Winter Policy also defines a minimum Winter Service network. In extreme circumstances, such as during a national salt shortage or during prolonged sub-zero periods with associated industry restricted salt supply capacity, the Minimum Winter Service Network may be applied if necessary. It provides a minimum essential service to the public, including links to the strategic network, access to key facilities such as emergency services, hospitals, water treatment works, and key transport needs. The Minimum Winter Service Network does not include routes unless they are absolutely vital.

13. Routine and Cyclic Maintenance

13.1 Grass cutting

From a Highway's Authority perspective, grass is cut for safety purposes to maintain visibility for highway users and to ensure that road widths are not reduced by overgrowing

vegetation. Section 96 of the Highways Act 1980 does not define either the frequency at which grass should be cut, nor does it describe the maximum height it may grow to before it is cut. However, grass verges should be maintained so that it does not create 'such a situation as to hinder the reasonable use of the highway by any person entitled to use it, or so as to be a nuisance or injurious to the owner or occupier of premises adjacent to the highway'. Worcestershire County Council adopts the following grass cutting regime which is reviewed annually.

13.2 Dual Carriageways

WCC generally commences grass cutting of the dual carriageway network late April or into May (subject to weather and growing conditions at the time). Throughout the County there are a considerable number of dual carriageways that require both verge and the central reserve to be maintained, these are generally cut twice per year, (this could be less in exceptional dry weather, or more in very wet/warm weather conditions, where growth may be significant). Traffic management is required for lane closures to carry out the work safely. All full cuts on dual carriageways usually take between four and six weeks dependent upon weather conditions.

To provide for efficient and cost effective delivery, these works are programmed and co-ordinated with District Council partners and other relevant agencies to include other maintenance works that can be carried out at the same time as the grass cutting as appropriate. The type and variety of works will vary, but to maximise 'value for money', the variety of works may include tree works, weed spraying, litter picking, gully cleaning and road sweeping.

13.3 Visibility splays and key hotspots

Pre- identified visibility splays and site lines on key bends that are known hazard hotspots are monitored throughout the season and cut as and when required. A small number of other known 'localised' hotspots will also be cut to ensure good visibility is maintained.

13.4 General rural cut

The county is divided into a series of zones for ease of operational distribution of tractors throughout the grass cutting season; this is usually from April through to September, subject to weather and growing conditions. This allows for the County Council to have continuous grass cutting resource availability, ensuring a quick and efficient response to the various requirements necessary in providing an efficient service delivery for highway verge maintenance. Verges are maintained not only with safety as the key consideration, but also with pollinators being considered as a part of the cutting regime. Worcestershire has been a pollinator friendly County since October 2015 and uses its designated Roadside Verge Nature Reserves (RVNRs) which are rich in wild flowers and key pollinator species, and its highway verges, WCC land, where reasonably practicable, to help achieve this aim.

The cutting regime may be altered in light of weather conditions experienced during the growing season, with safety being the priority consideration. The establishment of scrub

and self-set saplings on verges are managed by programmed work. The programming of these works may very dependent upon the impacts of the relevant growing season.

13.5 Rural and Urban Grass Cutting

The rural and urban grass cutting for Worcestershire's roads is divided into four zones for rural cuts. These are directly maintained by Worcestershire County Council and amount to approximately 2,500 kilometres (or around 1,800 miles). They are managed through a service level agreement with our Term Service Maintenance Contractor Ringway. This also includes a programme (on A and B roads) of the cleaning and removal of vegetation that obscures road signs. All works are specifically focussed on safety and core maintenance requirements. They are not designed for the purposes of amenity.

Our six District Council partners also carry out urban grass cutting within their own areas on our behalf. WCC recommends (and provides funding) for between three and five service cuts in urban areas for highway safety purposes. The District Councils may choose to exceed this number for amenity and aesthetic purposes.

13.6 Weed Control

Weed growth can impair safety for highway users by reducing available road widths. Uncontrolled weed growth can significantly deteriorate the structure of metalled surfaces reducing their longevity and requiring more frequent repairs. The Weeds Act 1959 lists a number of weeds which can be injurious to human or animal health. It places a duty on controllers of land to eliminate the following scheduled weeds from their land to prevent seeds contaminating their neighbours' land:

- Spear thistle (*Cirsium vulgare*)
- Creeping or field thistle (*Cirsium arvense*)
- Curled dock (*Rumex crispus*)
- Broad leaf dock (*Rumex obtusifolius*)
- Common ragwort (*Senecio Jacobaea*)

The Wildlife and Countryside Act 1981 specifies control of certain plants such as giant hogweed or Japanese knotweed. Giant hogweed can cause problems in the form of blistering to the skin.

13.6.1. Treatment intervals for weed control

Location	Frequency
Footways and immediately adjacent kerbed channels	Generally twice a year; carried out in the spring and late summer using a systemic weed killer but with an additional mid-season treatment should growth conditions require. <i>NB. WCC's Term Service Maintenance</i>

	<p><i>Contractor carries out this work in Worcester City, Malvern Hills and Bromsgrove Districts.</i></p> <p><i>Redditch, Wychavon and Wyre Forest DC's receive a grant from WCC to carry out this work within their areas</i></p>
Noxious weeds	Where a problem is identified then a one-off treatment, or series of treatments, will be arranged (see 13.6.2 below).

13.6.2 Treatment of noxious weeds

The treatment of noxious weeds is addressed in accordance of requirements under various legislation and Department for Transport guidance. The County Council has in place a Noxious Weeds action plan, which details the approach adopted to address such issues where appropriate.

14 Recycling, nature Conservation, biodiversity and carbon reduction

WCC's commitment and overview of its practices to recycling, nature conservation, biodiversity and carbon reduction is outlined in the Highway Maintenance Policy.



**Worcestershire County Council
Highway Maintenance Policy**

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1. Introduction

The adopted highway is Worcestershire County Council's most valuable asset. As the Local Highway Authority, the Council is responsible for ensuring the Highway Network is managed and maintained for the safe and convenient movement of people and goods.

The Highways Act 1980 sets out the duties of the Local Highway Authority in respect of highway maintenance. In particular, Section 41 imposes a duty to maintain the adopted highway at public expense. Whilst the Highways Act does not specify the level of maintenance required, this document sets out Worcestershire County Council's policy to maintain the highway network and to deliver the highway maintenance service in accordance with the 'Well Managed Highway Infrastructure' (WMHI) Code of Practice published in October 2016. This Code of Practice replaces the following:

- Well Maintained Highways - Code of Practice for Highway Maintenance Management;
- Well-lit Highways - Code of Practice for Highway Lighting Management; and
- Management of Highway Structures - A Code of Practice.

Worcestershire's Highway Maintenance Policy demonstrates how the highway maintenance service of the County Council supports the County Council's vision and key priorities over the medium to long term and how it links to the Corporate Plan called [Shaping Worcestershire's Future 2017 – 2022](#).

2. Background

The WMHI Code of Practice encourages Highway Authorities to develop a locally determined risk-based approach to highway maintenance that fits with the asset management approach recommended by central government.

The WMHI Code of Practice advocates an asset management approach to highway maintenance. It provides Highway Authorities with guidance on highway management for good practice and has 36 key recommendations with the emphasis on inspections, recording defects, repairs and training of competent staff linked to risk assessment with the view that "*practical and reasonable approach to the risks and potential consequences identified*" is adopted.

Worcestershire County Council has reviewed each of the 36 recommendations and has documented its approach and compliance to each recommendation in a separate document called "A Review and Response to the Code of Practice: Well Managed Highway Infrastructure".

3. Risk Based Approach

Worcestershire County Council manages risk carefully. At a strategic level there is the Corporate Risk Register, which details a broad range of high level risks for which the Council has oversight and how these risks are managed and mitigated. This mechanism feeds into the Economy and Infrastructure Directorate, where risk management and mitigation is addressed in more detail and links to key areas including highway maintenance.

Historically, the County Council has already adopted a risk based approach to highway maintenance and defect management which is in line with the current WMHI Code of Practice. This approach has been reviewed to ensure it fully meets the guidance and recommendations detailed in the WMHI Code of Practice.

This systematic risk based approach to highway safety inspections, determines whether identified defects should be defined as either a Category 1 response (within 24 hours) or a Category 2 (planned response), as per the response times detailed below:

- R.1 Make safe or repair within 1 hour (emergency situations);
- R.2 Make safe or repair within 24 hours;
- R.3 Repair within 7 working days;
- R.4 Repair within 4 weeks. (28 working days)

This approach is detailed further in this document.

4. Core objective of Highway Maintenance and Highway Asset Management Framework

The core objective of highway maintenance is to deliver, as much as is reasonably practicable, a safe, serviceable and sustainable network. This objective takes into account the need to contribute to the wider objectives of asset management, integrated transport and corporate policy. The foundation for highway maintenance and asset management is based on the following key elements:

- Asset Inventory;
- Network hierarchy;
- Inspections;
- Reports from the public;
- Condition surveys;
- Reactive maintenance;
- Routine and Cyclic maintenance; and
- Programmed maintenance.

In context, the Highway Maintenance Policy and the Highway Maintenance Plan form part of the highway asset management framework and other key plans that Highway Authorities

are required to develop. The principle documents are shown in the Asset Management Framework diagram below:

Figure 1: Highway Asset Management Framework



4.1 Network Safety, Serviceability and Sustainability

The Highway Maintenance Plan is the operational delivery mechanism to set standards for undertaking inspections and maintenance, as far as is reasonably practicable, in accordance with a risk based approach in order to achieve:

- a) Network Safety
 - i) complying with statutory obligations
 - ii) maintaining a safe network

- b) Network Serviceability
 - i) ensuring availability
 - ii) achieving integrity
 - iii) maintaining reliability
 - iv) maintaining condition

- c) Network Sustainability
 - i) minimising cost over time
 - ii) maintaining value to the community
 - iii) maintaining appropriate environmental standards

4.2 Operational Objectives

The Highway Maintenance Plan provides the detail of key operational objectives covering a range of asset groups across highway maintenance activities, including:

- Carriageways, footways and cycleways
- Drainage
- Bridges and structures
- Lighting and signals
- Road signs and markings
- Weed control
- Safety barriers and fencing
- Unauthorised signs
- Hedges and Trees
- Verges
- Traffic signs and bollards

The Highway Maintenance Plan also details the scope and frequency of safety and service inspections for the above asset groups in conjunction with the Highway Inspection Manual that provides guidance for routine carriageway, footway and cycleway safety and service inspections.

4.3 Highway Maintenance management and delivery arrangements & effective work activity prioritisation

Different types of asset have their own asset management plans that reflect national codes of practice and the individual needs of each asset. Each group of assets have their own asset manager and are managed in different ways to reflect their need.

The highway asset groups are managed and delivered through a number of different contractual models depending upon the asset group, with WCC Client teams in place in relation to each key contract delivery area:

- **Highway maintenance, design and construction services** are delivered through our Highway Maintenance Service Contractor (HMSC) with Ringway. The current HMSC was an evolution of the County's previous Term Highway Maintenance Contract and was procured using an NEC Term Service Contract after a thorough commissioning process. This is a strategic partnership to achieve measurable outcomes and is

monitored and reviewed through 12 Key Performance Indicators as part of a Performance Management Framework.

- **Bridges and Highway Structures** are delivered through a Term Professional Services Contract by Jacobs who in turn, is managed by the County's Infrastructure Asset Manager.
- **Street lighting** is delivered through a Term Service Contract (TSC) with Prysmian Group.

The principle role of the County Council and the contractors are as follows:

Worcestershire County Council:

- Lifecycle planning of the assets
- Identify/design works and set high level prioritisation of works
- Long term programming of work
- Manage funding and budgetary issues
- Manage public enquiries and act as a customer interface
- Monitor and manage the performance of the service
- Appoint and manage consultants and contractors
- Audit
- Review performance

Contractors:

- Develop an efficient integrated programme of works
- Complete programmes of highway and associated works
- Ensure work quality and meet requirements as detailed in the Term Service Contract for highways
- Compliance with legislation and response timeframes in accordance with the Term Service Contract arrangements

Funding and efficient and effective prioritisation of Asset groups and work:

Part of the budget strategy process is to assess the effect of budget decisions for an asset group and across asset groups on the delivery of corporate priority outcomes. Worcestershire County Council, therefore, ensures the effects of all strategic funding decisions are considered at an early stage to achieve the most efficient and effective outcome for the authority and our customers within the finance available for the service in relation to the County's Highway Network.

By the use of robust evidence based decision making processes, Worcestershire County Council is able to optimise assets by the appropriate prioritisation of work within the available funding. One element of the decision making prioritisation process is the potential for schemes to be clustered and coordinated across asset groups, for example; resurfacing a road in conjunction with a road safety scheme. Such alignment of schemes within the Works Programmes is fundamental to optimising available funding across our service delivery.

These form part of the Annual Contractor's Plan (a key component of the Term Service Contract) for highway maintenance.

With all key works, quality management systems are in place to ensure the durability and quality of products and works completed.

5. Network Hierarchy

The network hierarchy is the foundation of a coherent, consistent and auditable maintenance strategy. It is also crucial to asset management in establishing levels of service and to the statutory network management role to co-ordinate and regulate the occupation of road space for roadworks. The latter operates under the West and Shires Permit (WaSP) scheme that Worcestershire County Council has been operating since April 2016.

It is important that the hierarchy adopted reflects the needs, priorities and actual use of each road in the network. These may be determined by importance e.g. a strategic route or main distributor, or a route leading to a major hospital. They may be determined by environment, for example, a rural, urban, busy shopping street or a busy residential street etc. They may be determined by non-vehicular traffic factors such as pedestrian usage. Footway priorities may differ from carriageway priorities, and hence it is necessary to define separate footway and cycle route hierarchies. Collectively, these issues may be referred to as the 'functionality' of the section of the highway in question.

The hierarchy definitions for carriageways, footways and cycleways are defined in the Highway Maintenance Plan.

6. Network Inventory

Worcestershire County Council maintains a Network Inventory (or asset register) of highway asset items that includes data relating to their quantity, nature and locations to be maintained, such as the length, width and surfacing materials used for both carriageways and footways. The network inventory and how it is maintained, is detailed in the Highway Asset Management Strategy.

7. Inspection and Assessment

The Highways Act 1980 sets out the duties of the Local Highway Authority in respect of highway maintenance. In particular, Section 41 imposes a duty to maintain the adopted highway at public expense. The Highways Act does not specify the level of maintenance although the Code of Practice: Well Managed Highway Infrastructure offers guidance and recommendations in line with national best practice.

WCC's safety inspections are designed to identify all defects likely to potentially create danger or serious risk to users of the network or the wider community. Associated processes and procedures for condition inspection, assessment and recording for major assets are described in the Highway Asset Management Strategy.

WCC's safety inspection regime forms a key part of the Council's strategy for managing liabilities and risk. It comprises the following elements:

- frequency (and mode) of inspections
- items for inspection
- degree of deficiency
- nature of response

Worcestershire County Council's highway maintenance inspections are categorised into:

- Safety Inspections - leading to reactive maintenance and including maintenance in response to severe weather and other emergencies.
- Service Inspections - leading to routine and cyclical maintenance of carriageways, footways and cycle routes, drainage system, fences and lighting.
- Bridge and Structure Inspections.
- Street Lighting Inspections.
- Winter Service Inspection and Assessment.
- Development and Regulatory Inspections.
- Condition surveys - leading to programmed maintenance to resurface or reconstruct carriageways, footways and cycle routes.

All inspections are carried out by appropriate competent professionals (such as Highway Safety Inspectors and qualified bridge engineers), in their relevant fields in accordance with Government guidance.

8. A risk based approach to highway inspections

WCC's risk based approach to highway inspections means that the prioritisation of the defect will depend on the level of risk that it poses for the highway user.

The approach to selecting the appropriate action for a reported defect is the risk assessment process. All reported or identified issues should be evaluated for their significance and the likelihood of injury or damage to a highway user.

Response times for remedial action on reported defects will depend on the severity of the defect and where it is located on the Highway Network. The Highway Infrastructure Asset Management Guidance Document produced by HMEP and the UK Roads Liaison Group provides a guide and methodology to assess risk;

'Risk assessment involves determination of the likelihood and consequence of an event. Risk assessment allows the identified risks to be analysed in a systematic manner to highlight which risks are the most severe and which are unacceptably high. An authority can then determine its level of exposure to the risk and the actions necessary to minimise that risk. Overall risk is normally described as:

Risk = Likelihood x Severity

8.1 Risk Identification

Safety inspections are carried out to regular specified intervals (detailed in the Highway Inspection Manual). In general, this is monthly for A and B roads, quarterly for most C roads and annually for Unclassified roads (quiet rural roads and urban streets/roads in general).

These inspections are holistic and cover a range of issues to be considered and the risks therein in relation to them, for example: carriageways surface condition, potholes, tree issues, faded road markings and damaged signs. A clear methodology for the identification of defects and risks therein, is provided in detail in the Highway Inspection Manual. This includes the suggested inventory to be observed and examples of investigatory levels.

8.2 Risk Evaluation

All risks identified through this process have to be evaluated in terms of their significance, which means assessing the likely impact should the risk occur and the probability of it actually happening. A defect Risk Register will considerably assist the risk evaluation process. Although it may not be possible to include every conceivable risk, the register identifies a wide range of risks likely to be encountered. This enables the vast majority of all risks actually encountered through comparison, interpolation or extrapolation, to be assessed with the identified risks. The risks contained in the Register are based upon the highest assumed risk attributable to the type of defect, position and assessed type of usage. Local knowledge could assess the risk differently.

8.3 Risk Impact or Consequence of Event occurring

The impact of a risk occurring should be quantified on a scale of 1 to 5 assessed using the following table as guidance:

Impact Rating	Score	Description	Possible Indicators
High	5	The hazard presented by the defect or due to the short term structural deterioration in the defect, could result in serious injury or fatality.	Impact will result in serious damage to persons or property. Highway users will instinctively react to avoid the defect and this will place them in peril. The defect could destabilise a vehicle and will place the highway user in peril.
Medium	4	The hazard presented by the defect, or due to the short term structural deterioration in the defect, could result in injury or serious claim against the	Impact will result in damage to persons or property, from which they are likely to recover. Highway users will instinctively react

		authority.	to avoid the defect.
Low	3	The hazard presented by the defect, or due to the short term structural deterioration in the defect, could result in a minor injury or claim against the Authority. If untreated the defect will contribute to the deterioration in the overall condition of the highway asset. The defect is likely to deteriorate further before the next safety inspection.	Most impacts will not result in any injury. Highway users are unlikely to react to avoid the defect and the impact will not interrupt their passage. The defect will be felt and recognised as a defect by most highway users, and its presence will be a negative on their perception of the highway asset.
Very Low	2	The hazard presented by the defect, or due to the short term structural deterioration in the defect, is unlikely to result in injury or claim, but the defect will contribute to the deterioration of the overall condition of the highway asset. The defect is unlikely to deteriorate further before the next safety inspection.	The defect will be recognised by highway inspectors as requiring consideration, but is unlikely to be felt or recognised as a defect by most highway users. The defect is unlikely to cause injury or damage.
Negligible	1	The hazard presented by the defect, or due to the short term structural deterioration in the defect, is unlikely to result in injury or claim, but the defect will contribute to the overall condition of the highway asset. The defect is unlikely to deteriorate further before the next safety inspection.	The defect will be recognised as requiring consideration, but is unlikely to be felt or recognised as a defect by highway users. The defect is very unlikely to cause injury or damage.

8.4 Risk Probability or Likelihood of Event Occurring

The probability of the risk occurring should also be quantified on a scale of 1 to 5 assessed using the following table overleaf as guidance.

Probability Ratings	Score	Description	Possible Indicators
Severe	5	More than a 75% chance of occurrence.	<p>Vehicle, cycle and/or pedestrian flows are high.</p> <p>A high % of vulnerable users may pass.</p> <p>The location of the defect and the topography will mean that it is difficult for a highway user to recognise and avoid. Forward visibility may be compromised.</p>
High	4	60% to 75% chance of occurrence.	<p>Vehicle, cycle or pedestrian flows may be high, but differing modes are less likely to share the highway at this location.</p> <p>Some highway users would recognise and take action to mitigate the impact of the defect.</p> <p>Forward visibility is good.</p>
Medium	3	40% to 60% chance of occurrence.	<p>Vehicle, cycle or pedestrian flows may be moderate, but differing modes are less likely to share the highway at this location.</p> <p>The majority of highway users will be able to recognise and take action to mitigate the impact of the defect.</p> <p>Forward visibility is good.</p>
Low	2	10% to 40% chance of occurrence.	<p>Vehicle, cycle or pedestrian flows are moderate or low.</p> <p>Different modes are unlikely to share the highway at this location.</p> <p>The majority of highway users will be able to recognise and take action to mitigate the impact of the defect.</p>
Negligible	1	Less than 10% chance of	<p>Vehicle, cycle or pedestrian flows are very low.</p> <p>The speed differential between users is very</p>

			likely to be low. The majority of highway users will be able to avoid the defect.
--	--	--	--

8.5 Risk Factor

The risk factor for a particular risk is the product of the risk impact and risk probability and is therefore, in the range of 1 to 25. It is this factor that identifies the overall seriousness of the risk and consequently the appropriateness of the speed of response to remedy the defect. Accordingly, the priority response time for dealing with a defect can be determined by correlation with the risk factor, as shown in the Risk Matrix below.

LIKELIHOOD OF EVENT OCCURRING	CONSEQUENCE OF EVENT OCCURRING				
	NEGLIGIBLE 1	LOW 2	MEDIUM 3	HIGH 4	SEVERE 5
NEGLIGIBLE 1	1	2	3	4	5
VERY LOW 2	2	4	6	8	10
LOW 3	3	6	9	12	15
MEDIUM 4	4	8	12	16	20
HIGH 5	5	10	15	20	25

KEY TO RISKS					
RESPONSE TIMES	CONTINUE TO MONITOR	28 DAYS R4	7 DAYS R3	24 HOURS R2	1 HOUR R1

The response time categories for actionable defects are:-

R.1 Make safe or repair within 1 hour (emergency);

R.2 Make safe or repair within 24 hours;

R.3 Repair within 7 working days;

R.4 Repair within 4 weeks. (28 working days)

The timescales are designed to enable highway defects to be, wherever practicable, actioned in a programme of permanent repairs. This balances the immediate risk posed to the highway user with the ongoing risk that will be posed as a consequence of a failed temporary repair. In some situations, it may be necessary to respond to certain defects as an emergency and that only a temporary repair can be achieved in the short term. However, it will be necessary to programme for the permanent repair to follow.

Where defects with potentially serious consequences for network safety are made safe by means of temporary signing or repair, arrangements should be made for a special inspection regime to ensure the continued integrity of the signing or repair is maintained, until a permanent repair can be made.

8.6 Risk management

Having identified a particular risk, assessed its likely impact and probability and calculated the risk factor, the category and the timescale to rectify actionable defects should be defined and prioritised as either a Category 1 response (within 24 hours) or a Category 2 (planned response), as detailed further below.

The timescales for response commence at the point in time that the authority has knowledge of the reported defect, has undertaken the risk assessment and as a consequence has categorised and prioritised the reported defect.

It should be appreciated that the Authority and its contractors will make every effort to complete the defects within the target response times, however, in times of extreme weather conditions (during and immediately following severe snow, storm or flood events), it may not always be possible to achieve 100% compliance with target response times.

Identified defects are treated as Category 1 or 2 dependent on the particular circumstances and severity of the defect. Therefore the nature and speed of response will depend upon, amongst other things, the assessed risk posed by:-

- The depth, surface area or other degree of deficiency of the defect or obstruction;
- The volume, characteristics and speed of traffic;
- The location of the defect relative to highway features such as junctions and bends;
- The location of the defect relative to the positioning of users, such as in traffic lanes or wheel tracks;
- The nature of interaction with other defects;
- Forecast weather conditions.

Category 1 and Category 2 defects are defined and prioritised as follows:

Category 1 – Defects that require prompt attention because they represent an immediate or imminent hazard or there is a risk of short-term structural damage. If it is not possible to correct or make safe the defect at the time of inspection, which will generally be the case, repairs of a permanent or temporary nature should be carried out as soon as possible and in any case within a period of 24 hours. Permanent repairs should be completed as soon as reasonably practicable, where appropriate.

Category 2 – Defects which following a risk assessment are deemed not to represent an immediate or imminent hazard to users or risk of short term structural deterioration. Such defects may have lesser safety implications, although of a far lesser significance than Category 1 defects, but are more likely to have serviceability or sustainability implications. These defects are not required to be urgently rectified, and those for which repairs are required shall be undertaken within a planned programme of works, with the priority as determined by risk assessment. These priorities together with access requirements, other works on the road network, traffic levels, and the need to minimise traffic management, should be considered as part of the overall asset management programme.

9. Routine and Cyclic Maintenance

Routine and cyclic maintenance is concerned with providing works to a regular and consistent schedule such as grass cutting and gully cleansing and emptying operations. This type of maintenance is primarily carried out for the purpose of providing defined standards of network serviceability, availability, reliability and integrity.

Priorities and programmes are determined for the key areas of routine maintenance and consideration is given to combining a number of operations into a co-ordinated programme, for routine and cyclical operations, where practicable.

10. Reactive Maintenance

Reactive maintenance refers to works that are a response to an issue that has been raised, which may not be viable to include via normal cyclical programmed works activity. This may be in relation to a safety issue (eg; a pothole), or where another issue has been raised for

example a complaint, that needs to be reacted to. The priority of response is determined on the basis of a risk assessment and a decision is made to complete works based around this assessment.

11. Programmed Maintenance for carriageways and footways

Programmed maintenance for carriageways and footways (via the Design and Build function), is completed based around sound Asset Management principles. Condition surveys of carriageways and footways are completed regularly. This information is combined with other key data from other inspections and data sets. From this, a programme of highway maintenance is defined and implemented. More detailed information on this issue is provided in the Highway Asset Management Strategy.

12. Skid Resistance Management Policy

As part of the Transport Asset Management Plan (TAMP), Worcestershire County Council has a Highway Skid Resistance Management Policy in support of the Local Transport Plan. The policy and methodology for its implementation is detailed in the Highway Asset Management Strategy.

13. Programming and priorities of work types

WCC's approach to considering the Highway Network as an integrated set of assets is detailed in the Highway Asset Management Strategy and Policy.

The Forward Highway Works Programme and series of rolling Annual Plans in the form of the Contractor's Plan, detail the specific activities for different types of works on the highway. In addition, for carriageways there is a 3 year rolling list of roads which require consideration for treatment (potential repair). This is reviewed and updated each year.

Reactive, routine and programmed maintenance follows a structured approach to programming and prioritisation. The cycle and review of highway works takes account of the relative priorities of these types of work, having regard to historical conditions, and seeks to increase the proportion of programmed to reactive maintenance, where possible, which leads to a corresponding decrease in reactive maintenance in the longer term (subject to available funding).

Safety of the network relating to fulfilling relevant statutory duties and requirements is clearly a key priority for the maintenance of the Highway Network in the County. In light of this, programming of works on the network, take account of a number of issues, including;

- Safety matters;
- Asset condition data.
- Other survey and relevant information (eg; Public Enquiries).
- Service inspection information.

- Potential impacts of works on the network.
- Road category and surrounding issues.
- Impacts on businesses and communities.

To ensure effective network management and co-ordination, our Forward Works Programme for carriageways is identified and planned 1 year in advance (with a broad high level 3 years' rolling plan). This is refined and agreed in an annual programme of works that is managed and implemented via the Highway Maintenance Service Contract delivered by Ringway in the form of the Contractor's Plan, covering all key areas of work on the Highway Network for WCC. The Contractor's Plan provides for an integrated approach, bringing together all areas of work and delivery. This ensures that works programming, co-ordination and management is more effective and joined-up to increase efficient use of resources across the board.

The above works are coordinated in conjunction the County Council Streetworks function, which is responsible for ensuring that all works on the Highway Network in the County (including Utility and other works), are coordinated as effectively as is reasonably practicable.

14. Lifecycle Planning

Lifecycle planning is a technique which enables Worcestershire County Council to monitor and anticipate the future condition of assets and to know when we need to maintain or replace them. Through detailed knowledge of the size, safety, condition and value of our highway's asset, the information gathered enables us to take in to consideration whole life costs when maintaining our assets.

Lifecycle planning tools have been developed which enable the development of work programmes which make best use of the available funding and resources in meeting long-term objectives, mitigating risks by allocating funds to where they will be most beneficial. It must be noted that this type of allocation moves away from a more traditional "worst first" approach and targets work programmes at those parts of the infrastructure which present the greatest 'asset' risk and where a strong element of timely 'preventative' treatment can achieve the most beneficial 'whole of life' cost. This approach is advocated in the 'Going the Distance Report' by the Audit Commission in 2011.

Worcestershire County Council uses lifecycle planning to develop investment strategies to deliver an agreed level of performance or, where funding becomes constrained, a prediction of the effect of particular funding scenarios on the levels of service that can be delivered. This approach enables service delivery to be as effective as possible, allowing a cogent allocation of resources providing a balance between focussed asset management and contributing to the objectives and priorities of the Council and allow an assessment to be made of any residual risk.

This lifecycle approach allows Worcestershire County Council to demonstrate what level of investment is required to achieve identified outcomes and where this investment is not available, the likely shortfall, to aid effective decision-making. As part of its Lifecycle

planning approach and methodologies, the Asset Management team have developed a Financial Impact Modelling Tool (FIMT) for carriageways which is used in conjunction with the HMEP Lifecycle Planning Toolkit. The FIMT enables the future condition of any class of road to be predicted given a particular level of funding and helps the council to understand and manage risk in terms of asset deterioration in relation to available funding.

This is a fundamental approach that is used for decision-making in relation to the budget setting cycle, identifying performance targets and monitoring achievement of targets as part of the Performance Management Framework.

The lifecycle planning approach also allows tracking of performance against investment for each asset group and, thereby, informs future strategies to ensure the investment achieves the outcomes planned.

For the major asset groups, the Council utilises the asset management approach, as detailed in the asset management framework, in conjunction with the risk based approach, outlined above, to target its maintenance resources effectively.

15. Performance Management Framework

Worcestershire County Council operates a Performance Management Framework (PMF) that supports the Highway Asset Management Strategy and is used to measure its performance and continuous improvement in general. Shown in Fig 2 overleaf, the framework provides:

The link between the corporate vision, asset management strategy, levels of service and maintenance operations.

- A systematic approach to measure progress in the implementation of asset management.
- Set levels of service and performance targets to enable auditing and monitoring of the delivery of the asset management strategy.
- The mechanism for demonstrating how funding is being used effectively to meet the levels of service and performance targets.
- Effective communications with key stakeholders by demonstrating performance against requirements.
- Aids decision making to deliver value for money.

[The NHT Network](#) is a service improvement organisation providing a range of benchmarking services for the Highways & Transport sector. The NHT Network has developed a generic Performance Management Framework for Highway Authorities to adopt in full or in partial support of their own PMF. The WCC Performance Framework for Highways (outlined overleaf), links in with this.

Figure 2: Performance Management Framework



Highways Performance Management Framework

Worcestershire Corporate Plan: key themes:

- Championing 'Open For Business'
- Supporting Children and Families
- Protecting The Environment
- Promoting Health and Well-Being



Local Transport Plan v4 (LTP4)



E&I Directorate Business Plan
 Transport Asset Management Plan (TAMP)
 Highways Asset Management Policy & Strategy

66085 lighting assets
 4093 km of road
 3307 km of footways
 3,000 miles of Public Rights of Way
 140 miles of waymarked trails and circular walks
 99,193 drainage gullies
 1339 bridges/structures

HPROW Business Unit Plan:



Example
 HPROW
 Performance
 Targets



Safe, reliable & efficient transport network with Balanced Score Card KPIs	Highways Maintenance Service Contract Key Performance Indicators (KPIs) x 12	Footways requiring treatment Reduced to 25% by 2020
By 2020 strive to be in the upper Quartile of condition of A, B, C & U Roads.	Public Realm schemes and D & B schemes delivered on time and in budget	PROW: % of high priority defects & mapping orders resolved within target time

Highways Maintenance Service Contract



Weekly Contract Management Team review meetings
 Weekly Area Response Team (ART) defect meetings

Sharing Best Practice and Collaboration

Members of WMHA, HMEP and MSIG to share best practice and collaborate with external parties such as Highways England, Environment Agency and with District/Borough and Parish/Town Councils for joined up service delivery

Public Satisfaction

Viewpoint and NHT public satisfaction survey results are reviewed and benchmarked nationally and locally with ViewPoint survey and NHT survey Results to measure public satisfaction. Reviewed by Public Perception Working group to identify lessons learned and action planning.

Review Mechanism

LTP is reviewed regularly.
 TAMP – regularly reviewed and updated.
 Corporate Strategy Planning process
 Business Plan - Annual review by Directorate Leadership Team (linking to the Corporate Plan and providing for the broader framework.)
 Quarterly Cabinet Member with Responsibility (CMR) and Directorate review meetings
 Strategic Quarterly Review (SQR) mechanism in place.
 Performance Management Framework Group – quarterly meetings.
 Weekly contract management team meetings by senior managers to review Targets & Contractors Plan
 Regular Member Led Scrutiny Panels and Process and meetings with Cabinet Member with responsibility for highways

16. The Resilient Network

Worcestershire County Council has a Highway Emergency and Resilient Network Plan that details how the network in Worcestershire is managed, and in response to, severe weather impacts, emergencies and other key resilience issues as identified in the Department for Transport's Policy paper published in 2014 called Transport Resilience Review: Recommendations.

The resilient network in Worcestershire is made up of routes in the County that are considered essential for economic activity and for key services and access in the event of extreme weather events, major incidents and other disruption. The primary gritting routes equate to the large majority of the resilient network and we treat these roads as a priority in the event of any such incidents, and focus our resources on keeping them available for use, where practicable.

WCC treat adopted sections of the highway that relate to major infrastructure assets including, for example, hospitals, emergency services and crematoria.

WCC also has a defined network of category 1 and 1A footways which cover the predominance of town centres. These are treated in advance of severe weather and as an ongoing activity once resources become available. Additional resources via District Council workforces augment our resources and increase our potential coverage. Co-ordination arrangements with all adjacent authorities for Winter Service Networks are confirmed in advance of the season by comparison of each Authority's networks.

WCC focusses a strong element of its associated maintenance and management activity on the resilient network, for example in terms of surfacing and repair, management and resolution of flooding and drainage issues, reaction to major emergency events and co-ordinated management of street works and congestion matters in such events, where practicable.

During very severe weather events, such as extreme levels of snow or flooding, there may be times when it is not possible to ensure that all elements of the resilient network are maintained and available for use. In addition, if such events are very prolonged at a national level, this can lead to other impacts, such as shortages/restrictions in salt supply for winter highways' management. In such circumstances, the County Council has plans in place to address how it reacts to such events and issues.

To ensure that its approach to managing a resilient network is effective and cohesive, WCC have put in place a delivery framework comprising the following partnership groups; the Local Resilience Forum, Worcestershire Emergency Planning Tactical Control group, Worcestershire Severe Weather group and the Highway Flood Adaptation Programme Board. The Emergency and Resilient Network Plan defines Worcestershire County Council's approach to responding to highway emergencies and managing a resilient network.

The resilient network is reviewed every two years.

17. Materials and Treatments

WCC pay careful consideration to the environmental impact of highway maintenance works with the aim to sustain the County's biodiversity, character and heritage by the adoption of good environmental management procedures. WCC maintains an inventory of its 'structures' with particular attention to bridges that are either national monuments or are listed.

In maintaining the Highway Network to meet the challenges of safety, serviceability and sustainability, and in order to provide best value for the Council and local community; materials, products and treatments are considered using an asset management approach and focussed upon cost effective materials (to extend the life of the road in terms of preventative maintenance) and the safety of the highway user.

For Public Realm schemes, the Local Transport Plan v4 includes a Public Realm Policy (14) that prescribes the materials, grades and specification to be used. For sustainability, 10% of additional materials is ordered for contingency/future repairs and Worcestershire County Council have acquired a storage facility of materials for Public Realm schemes. Wherever possible, WCC will endeavour to re-use existing materials from other sites for Public Realm schemes that have been identified.

17.1 Recycling

Worcestershire County Council has a designated recycling unit at Stanford depot with recycling targets in place with Ringway. The Council will also carefully consider, whenever commercially viable, the use of products and services, where appropriate, that are:

- selected from sustainable material sources
- that are recycled, or
- are recyclable.

The Term Maintenance Contract requires its supplier to recycle at least 40% of arisings, generated from highway works back into programmed works.

17.2 Nature Conservation and Biodiversity

Worcestershire County Council has a duty to 'Enhance & Conserve' Biodiversity (under the Biodiversity Duty (Section 40) under the Natural Environment and Rural Communities (NERC) Act 2006) and recognises the importance of nature conservation and biodiversity. By managing our highway works carefully, any adverse effects on biodiversity can be avoided or minimised. WCC have taken positive steps to promote biodiversity through its practices of:

- Creating and maintaining designated Roadside Verge Nature Reserves (RVNRs) around the county.

- Variable grass cutting regimes that take into consideration these RVNRs and other areas for conservation whilst ensuring safety of the Highway Network.
- Establishing partnerships for joint biodiversity projects, for example, with the Malvern Hills Area of Outstanding Natural Beauty (AONB) Partnership
- The careful control of invasive and injurious weeds.
- Mapping conservation areas, principle protected species and Areas of Outstanding Natural Beauty into its Geographic Information System.

As a 'pollinator-friendly' organisation, WCC encourages new developments to incorporate botanically diverse verges containing flowering herbs of value for local pollinators.

Trees are important for amenity and nature conservation reasons and should be preserved but they can present risks to highway users and adjoining land users if they are allowed to become unstable. All trees within falling distance of the highway are collectively termed 'highway trees'. Section 154 of the Highways Act 1980 empowers the authority to deal, by notice, with hedges, trees and shrubs growing on adjacent land which overhang the highway, and to recover costs. Safety inspections and the management of highway trees are outlined in the Tree Risk Management Plan. The plan also outlines ecological measures that should be taken and observed such as the replacement planting of appropriate trees for its location and consideration to roosting bats and the bird nesting season, (subject to issue of significant safety).

17.3 Carbon Reduction

Through its supply chain in highways, the County Council continues to promote the use of recycled materials and materials that consume less energy in their production, where appropriate.

Over recent years, the Street Lighting contract has introduced Light Emitting Diode (LED) technology and variable lighting levels that is lower energy consuming. Over the life of this Strategy, Worcestershire County Council will continue to mitigate energy consumption against the planned growth of the street lighting asset.

18. Reports from the Public

Members of the public are able to use our website to report defects online via our Public Enquiry Management (PEM) system. This has a tracking facility and allows our Highways and Transport Control Centre to review all requests received each day and determine the most appropriate action based on both the details that are provided and the policies and procedures we use. The PEM system allows members of the public to be updated about the progress of their reported issue.

All safety inspections and repairs are recorded using WCC asset management systems. Reports raised by the public, are investigated and where required, action is taken as necessary. The information is retained electronically in the Public Enquiry Management (PEM) system and Customer Relationship Management (CRM) system.



**Worcestershire County Council
Highways Inspection Manual 2018:
Guidance for Routine Safety Inspections**

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Team: Highways, Economy and Infrastructure Directorate

Foreword

This document is a guide and training manual for all members of staff involved in carrying out safety inspections on the highways, maintainable at public expense, within Worcestershire, but excludes Motorways and Trunk Roads.

This guide has been produced following the Code of Practice, Well-Managed Highway Infrastructure published by Department of Transport.

Although every effort has been made to cover all possible aspects of maintenance which are likely to be encountered during a safety inspection, there is always a possibility that an inspector will be presented with a matter that has not been covered in this document. In these circumstances the inspector should use the general principals of a Risk Based Approach and the need of protecting public safety as their approach to resolving the issue before them.

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1 Introduction

This document is intended as a procedural and operational guide for all employees involved in the inspection of Worcestershire's highway network. It covers only highway safety inspections and does not attempt to address more detailed inspections and condition surveys. This guide is not intended to cover inspections of Public Rights of Way (generally unmetalled rural footpaths and bridleways, as shown on the Definitive Map record), Street Lighting, or detailed specialist tree inspections.

This manual is based on the County's Highways Maintenance Plan. These documents were updated in 2018 and follow the guidance and recommendations contained in the national Code of Practice called Well Managed Highway Infrastructure published in October 2016.

Worcestershire County Council uses a Geographical Information System (GIS) to map assets, data and information. In Highways, GIS provides many information layers that are relevant to the Highway Inspection Manual and should be used as an integral tool for mapping and recording information, where appropriate.

2 Service Inspections

Service inspections are carried out as an integrated part of the safety inspections system by raising advisory Defects for the attention of the programmed works teams, for any works that are considered non safety issues but potential maintenance issues. Inspections for network integrity should be ongoing by all highways staff when going about their normal duties, reporting deficiencies to their manager or designated engineer.

These may include for example :-

- Discontinuous footways, cycleways and facilities for the disabled.
- Redundant traffic signs or markings.
- Poorly sighted traffic signs or markings that are incorrect or confusing legends.
- Discontinuous safety barriers.
- Inadequate drainage systems.
- Opportunities to improve/modify layouts as part of future planned maintenance schemes

3 The need for Highway Safety Inspections

Under Section 41 of the Highways Act 1980, Worcestershire County Council has a Statutory Duty to maintain a highway maintainable at public expense. 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 **1980 Highways Act**, the Highway Authority can use a "**Special Defence**" 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 defence 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 have to show 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 :-

- 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 should also record 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. It is important to show by recording, that the complaint was investigated, the Defect was risk assessed, and what action or non-action was taken. Highways Management System (Exor) records may also be used as evidence to show that the Highway Authority has acted reasonably.

4 Safety Inspections

The aim of the safety inspections are to provide:-

- (i) An effective regime of safety inspection, assessment, recording and implementation of remedial actions, is a crucial component of highway maintenance.
- (ii) To accurately record all defects together with the actions taken to provide the County Council with a defence against claims.
- (iii) To carry out safety inspections on all parts of the network to the frequency given in tables below, as set by the County Council following the guidance in the code of Practice, Well-Managed Highway Infrastructure.

The person(s) undertaking the inspection is responsible for the accuracy of that inspection. In certain circumstances, that person may be called into Court to substantiate their inspection results.

Please note, all defects must be recorded on the Mapcapture system in real time. To ensure defects are entered in real time entry, checks will be made as to the times when defects are entered.

5 Frequency of Highway Safety Inspections

Worcestershire County Council has set the frequency of its highway safety inspections following the risk based approach set out in the national guidelines, issued in the latest Code of Practice called *Well-Managed Highway Infrastructure*.

The frequencies set are based upon a risk-based approach, having regard for the volume, speed and type of traffic using that part of the network. These are shown in the table below:

Table 1 – Frequency of Highway Safety Inspections

Feature	Reference	Category	Frequency of Inspection
<u>Carriageways</u>	2	Strategic Routes	1 month
	3(a)	Main Distributors	1 month
	3(b)	Secondary Distributors	1 month
	4(a)	Link Roads	3 months
	4(b)	Local Access Roads	1 year
<u>Footways</u>	1(a)	Prestige walking Zones	1 month
	1	Primary walking Routes	1 month
	2	Secondary Walking Routes	3 months
	3	Link Footways	1 year
	4	Local Access Footways	1 year
<u>Cycleways</u>	A	Part of Carriageway	As carriageway
	B	Remote from Carriageway	1 year
	C	Cycle Trails	1 year

NOTE: All metalled Public Rights of Way (PRoW) will be inspected to the appropriate category as defined in the hierarchy. Some of these urban PRoWs are still not identified on the highway network (F/number). The inspector should carry out the inspection of these PRoWs attaching any defects to the nearest network i.d., with a detailed location description. A note should be made of these PRoWs and the information passed to the Inspection Systems Engineer, in the Asset Management Team.

The defined inspection frequencies should be maintained wherever possible. However, where severe weather events/impacts take place, a degree of flexibility will enable the effects of weather and resource availability to be managed more effectively. The following flexibilities are acceptable for **one** inspection cycle:

<u>Set Frequency</u>	<u>Flexibility</u>
1 Month	3 Working Days
3 Months	7 Working Days
6 Months	10 Working Days
1 Year	15 Working days

The Inspector Team Leader will ensure that the routes include the correct highways and that, new 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 is subject to a diverted traffic for a prolonged period. If an inspector believes such conditions apply, the matter should be discussed with the Inspector Team Leader and then record any agreed additional (ad-hoc) inspections that are required on the Highway Management System.

Adverse Weather Conditions

There may be times when all routine inspections are suspended due to extreme severe weather conditions (e.g. snow, storm or floods). During these periods when either lying snow or floods prevent the effective inspection of the highway surface, the resource of the inspection teams will be required for more urgent reactive works, to ensure the highway network is managed safely as far as is reasonably practicable. The decision to suspend inspections will only be made by the Highway Operations Manager (Routine & Cyclic) in consultation with the Highways and Public Rights of Way Operations Manager (or a similar level of Senior Manager within the Economy and Infrastructure Directorate. Details of this period of suspension will be notified to the Insurance Teams.

6 Method of Inspection

Carriageway safety inspections will normally be carried out by an inspector and a driver from a slow moving vehicle (20 –25 mph). The driver will be expected to be actively involved in the identifying of defects and would normally observe, (signs, lines). However in heavy traffic, in urban areas, it may be necessary to walk carriageway inspections, due to the volume of traffic and the presence of parked vehicles.

All driven inspections carried out on single two way carriageways are carried out in one direction only, but in the reversed direction on the following inspection. All dual carriageways will be inspected in both directions on each occasion.

- All footway inspections shall be carried out on foot.
- Cycleways and divorced footways can be either walked or cycled.

If for any reason, the highway to be inspected is obstructed by roadworks, hoardings or is flooded, it shall be recorded on the Mapcapture system, that, a particular section was unable to be fully inspected, and the reason why. The “Defect Type” recorded as “None”, “Road Flooded”, status recorded as NOT and closed. Consideration must be given to, when it would be possible to revisit this road to complete the inspection that had been missed. Please consult with the Senior Inspector on this matter.

7 Health and Safety

Inspections must be carried out in a safe manner so as not to endanger WCC Officers or the public. **All operations will have a current risk assessment**, which must be followed by WCC Officers. If in doubt, consult your Senior Inspector or Manager.

8 Information to be Recorded

The **location details** shall be recorded in the following manner :-
(Using abbreviations given in Glossary of Terms Appendix A)

- Town / Village / Parish,
- Street Name
- Outside / opposite / near
- The **speed limit** of the road, 20mph, 30mph, 40mph, 50mph, 60mph, 70mph
- A defect photograph will be taken if safe to do so.
- The **repair description**, giving as :- Where, What, How (Using Glossary of Terms, Appendix A)
- Where on the highway :- f/w, c/w, verge.
- What the defect is :- p/h, grip, kerb, sign
- How you require it fixed:- repr, recut, renew, remove.
- Details of repair solutions for the various defect types is given in the **Repair Matrix**
The recommended **Traffic Management** (See Appendix D)
- The presence of **Overhead services** (See Appendix P)

When identifying surface defects (potholes, etc.), all defects must be identified and recorded as separate items, giving each item its own defect I.d. number and grid reference. This will assist in both the defect monitoring, and insurance claims management.

Only if, a number of small defects appear within close proximity, (that they can be repaired under the same traffic management set up, and without moving the repair vehicle), can one item be recorded. However, the number of defects must be recorded, with each individually marked up with spray paint. Details of maximum size of Area response Team (ART) defect is shown in the **Repair Matrix**.

9 Coverage

Safety inspections should identify and record all highway defects, that are likely to create a safety issue to the users of the network, such as :-

- Debris, spillage or contamination on footways, cycleways, carriageways, hard shoulders, or lay-bys.
- 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 are likely to endanger the public
 - Potholes, cracks and gaps in footways, cycleways, carriageways or hard shoulders, the results of which are likely to endanger the public
 - Damaged, broken or displaced kerbs representing a safety hazard
 - Edge deterioration of the carriageway
 - Apparent severe loss of skid resistance of the carriageway
 - Missing or broken ironwork e.g. gully gratings, manhole covers etc.
 - Standing water of significance, or significant water discharging onto or overflowing across the highway if present at the time of inspection. Any condition where the likelihood of ice developing in freezing conditions, which may significantly impact the road user.
 - Blocked drains and grips
 - Damaged, defective, displaced, missing or misleading traffic signs, traffic bollards, signals or lighting columns
 - Badly worn road markings, missing road studs.
 - Dirty or otherwise obscured traffic signals and signs
 - Public Utility apparatus defects
 - 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
 - Obstructions and Encroachments of the highway.
 - Obvious dead trees, or trees with obvious die-back, which could fall on the highway (to be referred to relevant officer for specialist advice, unless deemed an emergency issue)
- Whilst lighting and signals; bridges and structures; winter service and public utilities street works are subject to separate specialist inspections, obvious defects such as exposed electrical wiring, leaning lighting columns, inadequate signing and guarding of road works or street works should be recorded and reported to the relevant responsible unit, via the Highways Control Team, thus ensuring a paper trail on the Public Enquiry Management (PEM) system.
 - The inspector could rectify some minor defects encountered at the time of the inspection, if safe to do so: e.g. removal of loose cats eyes lying on the running surface; illegal signs creating a danger or obstruction, or minor vegetation/branches obstructing signs/footways which are easy and safe to deal with. These actions should however still be recorded on to the EXOR system and closed.
 - Some defects will require specialist gangs or procedures to be used; e.g. road-markings, trees, safety barriers, etc; or encroachments, overgrown hedges, blocked ditches etc which should be reported to the manager or designated engineer for action.
 - The following other highway matters should be identified and recorded as “NOTs” during the inspection as part of the County Council’s Highway Maintenance Policy. These matters will be passed to the relevant Officer/team to deal with.

- (i) Ragwort – see appendix F (separate operational document)
- (ii) Japanese Knotweed - see appendix K (separate operational document)
- (iii) Giant Hogweed – see appendix L (separate operational document)
- (iv) Illegal signs and A boards
- (v) Fly tipping
- (vi) Illegal Accesses
- (vii) Overhanging Vegetation & Obstruction.
- (viii) Dangerous buildings or structures
- (ix) Building works affecting the highway
- (x) Dangerous cellar openings or cellar lights
- (xi) Building works obstructing on the highway.
- (xii) Abandoned road works signs.

The above list is not exhaustive, however if you are unsure about a potential hazard you should consult your Senior Inspector or manager. However, the important issue to remember at all time, is to ensure the safety of the highway user.

10 Overhead Services

All overhead service cables above the area of the work or within 15 m, must be recorded within the traffic management requirements of the Mapcapture system.

If the works proposed, involve the use of high vehicles or plant, or tree or sign works, then the service type must be identified, either telephone or power cables. (If unable to confirm service type, treat as high voltage).

For power cables, both the voltage and the height above ground level must be provided in the works description. The height above ground level shall be obtained by the use of the Suparule Cable Height Meter.

For the majority of surface defect repairs, it will not be necessary to provide this additional information.

Full details and guidance can be found in Appendix P as a separate operational document.

11 Noxious Weeds

A number of plant species exist which can be harmful to either humans, animals, property or the environment by way of their invasive or toxic nature. (See Weeds Act 1959 and Wildlife and Countryside Act 1981).

These species include the following:- (See separate operational documents for identifications)

- Common Ragwort

- Broad Leaved Dock
- Curled Dock
- Creeping of Field Thistle
- Spear Thistle
- Japanese Knotweed
- Giant Hogweed

Should you become aware of an infestation of any of these plants, please refer the matter to your manager for advice and action. Separate operational Appendices referring to the treatment of these noxious weeds should be referred to.

12 Footway Maintenance

General Principals for Repair of Slabbed Footways

To ensure the integrity and character of a location is preserved, the use of appropriate replacement materials and treatment types are carefully selected in consideration of their environmental impact, especially in designated conservation areas.

Therefore, when carrying out safe repairs to individual defective slabs, (identified during a safety inspection,) the defective broken slab should be removed and replaced with bitumen macadam. If the defective slab is whole and can be relaid to remove the defect, this will be the method of repair. It is fully appreciated that this will, in the interim period before full reconstruction, reduce the visual appearance of the street. However, having due regard for both public safety and the health and safety requirements of our work force, this course of action is necessary.

The exception to this rule will be for conservation areas and Public Realm areas where high quality paving has been provided as a street enhancement. In these areas, the original materials should be, wherever possible, retained, reused, or replaced to match the existing. If urgent safety repairs are required, but a matching replacement is not available, then a temporary bitumen macadam repair can be carried out, but must be followed up with a permanent repair as soon as reasonably practicable. If you are unsure, if a particular area falls in to this category, please ask your unit manager.

Should it be necessary to create a "ramp" to remove a hazard such as a tree root or where settlement has occurred next to a utility cover, the that ramp should be laid to a gradient of 1 in 10 if this is achievable in the individual circumstances.

13 Verge Maintenance

Verges in rural areas are part of the highway and do form a useful safety refuge for pedestrians and, therefore, should be kept in a 'reasonable' condition. The question remains as to what defines 'reasonable'? This can only be answered after taking a risk based approach by considering all the relevant factors, such as:-

- Is there an adequate footway on one side of the road?
- Is the route regularly used by pedestrians?
- Would the verge be safe to use due to roadside ditches?
- The other factor is the degree of undulation. No rural verge will be expected to be a bowling green, but deep wheel ruts would be seen as unacceptable.

The repair of deep ruts in the verge at the side of the carriageway, can be with the use of stone fill with top soil for the top 75 mm. Under no circumstances should verges be filled with stone or bitmac only. If necessary, consideration should be given for, edge of carriageway marking, to define the edge of the road surface to the road user.

Consideration should also be given to utility covers and other apparatus in the verge, which may have become exposed by vehicles eroding away the verge. Therefore it is not just a matter of maintaining what is there, but to consider by risk assessment, what needs to be done to remove or reduce the likelihood of an incident occurring. Each issue needs to be risk assessed as each issue may call for a different solution according to the circumstances, and these may include:

- Can the item in question be removed?
- Does it require protection in the form of kerbs?
- Can it be highlighted with marker posts?
- Would edge of carriageway road marking assist?
- If a utility apparatus, can it be lowered to carriageway level?

If an inspector is unsure, then photograph the issue and ask your Senior Inspector or manager for guidance.

14 Pedestrian Barriers and Bollards

A separate Appendix (T) refers to the use of pedestrian barriers and bollards. It has been agreed that where necessary, the removal of inappropriate barriers (eg; where there appears to be no safety or other reason for their presence at a particular location), will be an option when barriers get damaged, rather than automatically being replaced. This will also aid our general practice on "de-cluttering" and reduce future maintenance liability where appropriate.

When a situation arises, where barriers have been damaged, the situation should be photographed and referred to the Sustainable Schemes Manager, for investigation and a decision on their appropriate removal or replacement.

15 Verge Marker Posts

Verge Marker Posts are black and white edge of carriageway posts and are used as a safety feature (see photograph below).

Guidance is available for their appropriate use (**see separate appendix V document**), to assist all inspectors and County Highways Liaison Engineers (CHLES), in making an assessment of their requirement.



16 Illuminated Traffic Bollards

As part of all safety inspections, the condition of illuminated traffic bollards should be observed. Should there be an issue of a missing or damaged bollard, or one with an incorrect aspect (direction arrow), then the matter should be referred to the street lighting team (see example photograph overleaf). This can be done by either using the County Council website to report the matter or if considered an urgent matter, by ringing the Highways & Transport Control Centre who will raise the matter via the PEM system for you. This will provide the necessary audit trail for record keeping.



Example of illuminated traffic bollards

17 Roadside Ditches, grips and Spillways

Most road side ditches are the responsibility of the adjacent land owner as riparian owner of the watercourse. Therefore, it is the land owner's duty to maintain the ditch, with the relevant District Council being the Land Drainage Authority to enforce non compliance. Exceptions to this will be where road improvements or new roads (e.g. bypasses) have been constructed, with purpose made highway drainage systems in built (see photograph below).

Grips in verges, between the carriageway and the ditch are part of the highway drainage system and therefore, must be keep clear and operational at all times.

Spillways are larger hard paved grips installed at critical locations to ensure good drainage and prevent flooding at low points.



18 Lay-bys

Highway lay-bys form an integral part of the highway network. They provide a safe stopping place for road users. Some lay-bys provide a storage facility for surface dressing chippings. As these lay-bys vary greatly in their design and construction, it is not possible to have a "one size fits all" approach .

However, they can be categorised by their construction and by their design.

1 Un-paved areas of highway verge.

These tend to be unauthorised and created by vehicles parking illegally on the verge. Consideration should be given to either, providing a safe surface or closing the lay-by and returning the area to verge. If it is accepted that the lay-by is a danger or a hazard to the public and needs to be closed, the area should be reinstated back to a verge with topsoil and seeded, creating a level difference between the carriageway and the verge to prevent future overrunning. Temporary fencing or barriers may be required to allow the verge to be re-established.

If it is accepted that the lay-by is required and needs to be made safe, it is recommended that the construction should be by the use of road scalplings.

The decision on, closing or formulating the lay-by will only be made after consultation with the Traffic Management, Road Safety teams and Senior Managers.



Example Lay-by on rural road that is unsigned and unsurfaced.

2 Hard paved / Loose stone construction.

These tend to be more established lay-bys which have been allowed to develop over time. It would be very difficult to remove such lay-bys unless there was a major safety issue apparent from their use. These lay-bys need to be inspected at the same frequency as the carriageway and kept in a safe condition. It is recommended that consideration is given to

the use of road scalplings in carrying out repairs to these areas, as this will help to establish a bonded surface.



Example of a lay-by on rural road that is unsigned but stone surfaced

3 Surfaced Lay-bys

These tend to be either full carriageway construction, created due to a road realignment, or purpose made lay-bys. These should be inspected at the same frequency as the carriageway and maintained in the same way.



Example of a Lay-by surfaced and signed.

4 Separated or Divorced Lay-bys.

These are either part of the original road which has been realigned, or they are purpose built as part of a scheme. Many of this type, have their own road section number, and therefore, their own inspection frequency. They should be inspected and maintained in the same way as the carriageway.

Further consideration should also be given to the general appearance of the lay-by. If possible all lay-bys should be visually open to passing traffic. This will help to prevent fly tipping and any other illegal activities from taking place. If the lay-by is separated by an area of landscaping, consideration should be given to the clearance of any low vegetation, to open up the visual appearance.



Purpose built Lay-by on the A44 Surface, signed and with a footway.

19 Obstructions and Encroachments

Obstructions fall into two clear categories.

- (i) Obstruction by vegetation (Hedges and Trees)
- (ii) Obstruction by small removable items. (“A” boards, signs, banners, rocks, posts, etc.)

During the inspections, any overhanging hedge, tree or other vegetation, which is causing a potential hazard to either pedestrians or vehicle traffic, shall be identified and recorded on Mapcapture. The inspector will then raise the appropriate standard letter to be sent to the property owner for action to be taken.

A hazard is defined as, any vegetation, which increases the danger to the highway user, including obstruction of visibility or obstruction of street lighting/road sign or when a clear height above a footway or paved area, is less than 2.4 m or above the carriageway is less than 5.05 m.

The current procedure is to issue a standard letter requesting the appropriate action within 14 days, followed by a formal notice under the Highways Act, giving a further 28 days, if the matter is still unresolved. . After this period, enforcement action can be taken in the form of, placing an order with the appropriate contractor to remove the vegetation causing the obstructing. Where practicable, the County Council will recover all reasonable costs incurred.



Example photograph showing that the road sign has been obscured by vegetation

For those items referred to as “removables”, (usually stones or small posts on the verge, illegal signs, banners attached to highway furniture) will require a similar procedure to the overhanging vegetation. Following a risk assessment of the obstruction, to assess the degree to which the individual item presents a danger, action may be taken to remove the obstruction. In the majority of cases, it is anticipated that the property owner will heed the warning and take the necessary action to remove the obstruction. However if all attempts to get the property owner to remove the items fail, we can ultimately remove them in default. **This action should only be taken after careful consideration by your manager.**

To assist in the risk assessments, the following guidance notes are given on the different types of obstructions for different locations:

- Small rocks, posts and low picket type fences placed on rural grass verges. These are considered to be a hazard to the highway user and will presents a liability on the County Council, and should be removed.

- Advertising banners fixed to street furniture and fixed advertising signs erected on verges. These are considered to be a distraction to motorists and an obstruction to the visibility of both pedestrian and traffic, and should be removed. Most will have either an address or a telephone number on them, so that immediate contact can be made to request the banner is removed.
- “A” boards in urban areas will only be tolerated if the individual board is adjacent to the property to which it relates, is less than 1 metre high and 1 metre wide, allows a minimum of 1.8 metres of clear pedestrian footway and is of a design which does not present any hazards to pedestrians (moving or rotating signs).
- Obstructions of visibility splays in urban areas by vegetation. Criteria for visibility splays in urban areas is 2.5 metres by 60 metres, however individual risk assessments will be required for each situation. If there is any doubt please refer the matter to your manager for decision.



Example of rocks obstructing the verge



Example of an Illegal concrete ramp in channel.

Encroachments (*Any encroachment on the public highway that preventing the legitimate use of that part of the highway*)

Permanent encroachments (where it is considered that part of the highway has been built over or fenced off) will need to be passed to the Searches Team, to carry out a status check to determine the exact limits of the highway thereby establishing whether an encroachment has occurred or not. The matter will then be considered for action, by Legal, Community & Response and the Enforcement team, who will work closely to resolve the issue.



Example of wall built over an adopted service strip

For other minor **encroachment** issues such as extended driveways over verges, or illegal works on the highways. These must be assessed individually on a risk basis and then passed to your manager for decision on any action.



This example shows a verge crossing constructed in block paving by the property owner without Highway Authority consent. However the paving appears to be to a good standard with no hazards to the public. The only issue in this example are the two timber posts which are an unnecessary obstruction and will require removing. This matter will need to be addressed by letter to the owner for action to be taken.

20 Overhanging Trees and Vegetation

Under the Highways Act 1980 highways should be kept clear of obstructions. Specifically section 154 gives powers to require the removal or cutting back of trees, shrubs and hedges that obstruct or endanger the highway users.

While there is no specific guidance given in the Act, it is generally accepted that the minimum clearance should be 2.4m (8' 0") over a footway and 5.05m (16' 6") over a carriageway. These clearances should allow for a cyclist on the footway and a double-decker bus or lorry on the carriageway.

Although the majority of HGVs are around 4m in height, there is no upper height limit in the UK. This is due to the prevalence of double-decker buses and double decker HGVs to transport high loads.

Following a risk assessment of any potential or actual danger, one of the following actions should be taken:

- A standard letter requesting that the offending vegetation is cut back or removed within the next two weeks, or
- An enforcement letter and notice requiring removal, or
- If considered a Category 1 defect, and the owner cannot be contacted, then arrange for removal by our contractor.

21 Highway Trees

Highway trees are defined as, all trees within the highway limits or within falling distance of the highway. Please also refer to the Tree Risk Management Plan.

All Highway Inspectors are provided with the Tree Survey and Inspection training course (through LANTRA) . This training is designed to help inspectors recognise hazardous trees as part of their highway inspections duties and then report what they have seen to an appropriate Officer (Highway Tree Officer). Where necessary a qualified Arboriculture expert will then define the necessary actions to be taken in respect of the identified issue; eg; tree removal, pruning etc.

During all inspections, the highway inspector should make note of any obviously dead, dying or dangerous trees, whether within the highway itself or within falling distance of the highway. If it is found that there has been any accident or damage to a tree, that it is unstable in any way, large branches have been broken or, if in leaf, there is any sign of wilting or die-back, then the facts shall be reported to the Highways Tree Officer, who will arrange for further examination and for any follow-up action found to be necessary.

22 Defective Utility Apparatus / Covers

Any utility apparatus or surface cover within the Highway which is considered, following a risk assessment, to be defective, must be reported to the owning utility via a Section 81 Notice under the New Roads and Street Works Act (NRSWA), as soon as reasonably practicable. If the apparatus is considered a Category 1 defect, then immediate action should be taken to make the highway safe. This may require barriers and signage or even closure if deemed necessary.

A follow up procedure will be carried out to ensure that the necessary action and reinstatement is taken by the utility company via the Streetworks team.

23 Cross Footway Drainage Channels

Cross footway drainage channels will be treated as part of the highway and maintained as such by the County Council.



Example of Cross Footway Drainage Channel

24 Malvern Hills Conservators (known as the Malvern Hills Trust)

Many roads in and around the Malvern area, adjoin or run through open land under the jurisdiction and management of the Malvern Hills Conservators. The Conservators manage most parts of the Hills and the surrounding Commons, some other parcels of land that include many roadside verges, according to the Malvern Hills Acts 1884 to 1995. The total area under their jurisdiction is now over 1200 hectares (3000 acres). By law, it is their duty to prevent encroachments on these areas in order;

- to keep for the recreation and enjoyment of the public;

- to conserve the Hills and Commons; and
- to protect the ancient rights of the registered commoners.

The extent of the highway running through these areas, for the most, is only up to the edge of the carriageway or the back of the kerb. There is, therefore no highway verge in these situations and care and consideration must be given when carrying out maintenance works.

The Malvern Hills Conservators are not opposed to us using the adjacent land when carrying out maintenance works so long as the details are agreed first. No works should be undertaken on this common land unless prior agreement has been reached with their senior management. A good working relationship has been developed over many years with the M.H.C. and it is imperative that this relationship is not harmed. If you consider that your works may have any possible impact on the adjoining common land, please consult your manager, so that the appropriate contact can be made with the M.H.C.

Those inspectors working in these areas should familiarise themselves with the areas of jurisdiction.

Details of the area covered by the Malvern Hills Conservators can be found as an information layer on the GIS/ Maps/ Countryside.

Contact details for Malvern Hills Trust:-

Address:- Manor House
Grange Road
Malvern WR14 3EY Tel 01684 892002
Website: <http://www.malvernhills.org.uk>

25 Areas of Outstanding Natural Beauty (AONB)

There are two designated Areas of Outstanding Natural Beauty within Worcestershire. The Malvern Hills AONB and the Cotswold AONB. The Malvern Hills AONB has a Guidance document for Highways. This guidance can be applied to both areas.

The highways within an AONB are an integral part of these nationally protected areas. The separate guidance aims to ensure that the environmental impacts of highways, and the ways in which they are managed, are completed sympathetically where practicable, in respect to the nature beauty of the AONB. Key to this principle, is the desire to retain the special character of the area while ensuring that highways provide a convenient and safe network for users.

The most significant impacts on the area from the highway, is from road signs and road markings. The aforementioned document gives guidance on how these impacts can be reduced, by reducing "x" heights on directional signs to reduce the overall size and reducing sign clutter by removing unnecessary signage and redundant posts.

The above is only a sample of the details which are included in the guidance and all inspectors who are required to work in this area should be aware of this document and its contents.

26 Wet Spots (or flooding hotspots)

The Identification and Treatment of "Wet spots" on the Carriageway

Wet spots can be categorised into three main types

- 1 Surface Water running from adjacent land or property across a road
- 2 Significant standing water where highway drainage is inadequate, damaged or blocked
- 3 Significant leaks from water supply pipes.

To ensure that a comprehensive action plan is carried out the following system is followed.

Known flooding hotspots are mapped into our GIS system which are reviewed monthly during the non-winter period and weekly during the winter (mid Nov – mid April), at the relevant depot meeting.

The following information is recorded for each wet spot.

- Road Number, Location, Date Identified, Category, Investigating Officer, Actions, Date addressed.
- The purpose of this list is to identify each problem, give it ownership, find a solution and resolve it (where practicable).
- Category 1 issues may need actions from or co-ordinated with, the District Council's Land Drainage Officer. This would be best carried out via our Flood Risk Management Team.
- Category 2 issues can vary between a blocked gully to a collapsed drainage system. They all need to be investigated to identify the cause and what remedials are required to resolve. Sometimes a temporary solution may be necessary, but then referred on for a permanent fix.
- Category 3, water leaks will for the most be a simple referral to the Water Company, (recording their reference number). If a private supply, a letter to the owner will be required.



Example of a wet spot

These wet spots will be identified in many different ways; highways inspections, PEMs or out of hours, but all need recording and issuing to the correct team. If you are in any doubt please refer to your depot manager.

From this "active" list, decisions can be made in the event of freezing road conditions. These decisions need to be made following a risk assessment of each location.

The more difficult situations are where running water exits and therefore salt will have little or no use. The options are, to sign the hazard or to close the road and set up the appropriate diversion. The risk assessment must take into account the speed, volume, and type of traffic, the location and the alternatives for the diversion. (Is the diversion route on a gritting route?) There will be situations where appropriate signage will be adequate, but each location must be risk assessed and the decisions recorded.

27 Category of Defects

Category 1 – Defects that require prompt attention because they represent an immediate or imminent hazard or there is a risk of short-term structural damage. If it is not possible to correct or make safe the defect at the time of inspection, which may be the case, repairs of a permanent or temporary nature should be carried out as soon as possible, and in any case within a period of 24 hours. Permanent repair should be carried out within 28 days, if necessary.

Those category 1 Defects, which present such a danger that they require action within 1 hour, should not be left unattended, unless they can be adequately protected by barriers, road signs or road cones. These defects will be, a major road collapse, missing manhole cover or other similar hazard which will cause serious incident if left unattended.

Each and every decision could be critical to the safety of users and may also potentially be subject to legal scrutiny in the event of an accident occurring at or near to the site, and complete and accurate records will be essential.

Category 2 – Defects which following a risk assessment are deemed not to represent an immediate or imminent hazard to users or risk of short term structural deterioration. Such defects may have safety implications, although of a far lesser significance than Category 1 defects, but are more likely to have serviceability or sustainability implications. These defects are not required to be urgently rectified, and those for which repairs are required shall be undertaken within a planned programme of works, with the priority as determined by risk assessment. These priorities together with access requirements, other works on the road network, traffic levels, and the need to minimise traffic management, should be considered as part of the overall asset management strategy.

Category 2 defects should default to 28 days planned works, unless the risk assessment of the defect, requires a shorter response time of 7 days.

28 Out of Hours

All out of hours calls, must be entered on to the 'out of hour log'. The Log records of all the actions taken and will help to provide the necessary defence for any actions taken against the Authority. The log can be found on U/163/119/Out of hours. See example below.

MAINTENANCE UNIT SOUTH CALL LOG

WEEK BENNING AREA NAME

DATE	TIME	FROM	LOCATION	COMPLAINT	ACTION	DIP
21.11.11	17.18	Police	Incident No:378S211111 Pem No: Details:	A449 Claines Island to M5 Junction 6 Nr Blackpole Rd Exit	6no Traffic Cones on C/way	Passed to Ringway
21.11.11	17.35	Police	Incident No:392S211111 Pem No: Details:	B4202 Masons arms P.H.to Martley Village	Oil/Fuel on C/way Very <u>slippy</u> .	Site visit by C.G.G.as requested signs already in place driven all area no further action needed
21.11.11	22.19	Police	Incident No:594S211111 Pem No: Details:	A38.O/s The Tything Clifton to Severn Stoke	R.T.C.Glass/debris on C/way	Passed to Ringway
22.11.11	00.16	Police	Incident No:4S221111 Pem No: Details:	O/s Worcester Hearing Centre Corn Market Worcester	Blood on Pavement	Site visit by C.G.G.as requested dispensed and cleared with water and broom
22.11.11	05.13	Police	Incident No:35S221111	Castle Street / Forgeate Street	Traffic Lights Failure	Passed to Prusmain

29 Examples of Defects to be Risk Assessed

Carriageways

(1) Debris, spillage or contamination of the road surface.

With any debris or spillage on the highway, a risk assessment must be undertaken to determine if it is a safety hazard or not. *If it is not a hazard, then we should advise the relevant District Council, under their Environment Protection Act responsibilities.* If it is regarded as a safety hazard, then remove within 24 hours if practical or sign and guard. If there is a possibility of contamination to the drainage system, advise your manager immediately.



Example of loose gravel at road junction.

(2) Displaced road studs lying in the carriageway.

Defects of this nature, which present an immediate hazard to the highway user and can be dealt with at the time of inspection and should be removed by the inspector (if safe to do so) and the stud placed in vehicle. Make arrangements for the hole to be filled within 28 days. *Please not that this action needs to be recorded on Mapcapture*

(3) Overhead wires in dangerous condition.

Category 1 – *Close road, arrange for any necessary additional signing and advise utility company.*

(4) Vandalism, particularly if electrical equipment.

Category 1 – *Exposed electrical wiring – advise street lighting section and protect as necessary.*

(5) Abrupt level differences in the running surface.

e.g. Resurfacing joints not ramped, sunken utility trenches and subsidence.



Example of abrupt level difference in carriageway

(6) Potholes, cracks or gaps in the running surface.

Example of surface defect, (pothole between carriageway and entrance to off street car park. The example of the defect below was measured at over 100mm)



(7) Edge deterioration of the running surface.

An example of edge deterioration, on rural road caused by vehicles over running verges is shown in the picture overleaf.



(8) Damaged, broken or displaced kerbs.

Example of displaced kerb over gully pot. This will require a steel plate to support the kerb over the gully pot.





Example of gap in kerb line



Example of damage granite set kerbs

(9) Missing/defective ironwork or other utility apparatus.

The example below shows a sewer manhole, with very poor skid resistance. This requires a section 81 Notice to be served on relevant utility provider.



Example of collapsing manhole cover and frame. Section 81 Notice to be issued on owner of apparatus.



Example of a broken marker post for a fire hydrant. The defect should be marked with paint to highlight the danger to the public. This requires section 81 Notice to be served on utility provider.

(10) Damaged, defective, displaced, missing or misleading traffic signs
Example of warning sign, which requires cleansing



Example of advanced directional sign obscured by overhanging vegetation



Example of accident damaged ADS

(11) Badly worn road markings, and missing road studs.

Example of badly worn stop line on pelican crossing shown below:



(12) Damaged safety fencing, parapet fencing, handrail or other barriers.

Example of damaged pedestrian barrier shown below:



(13) Overhanging vegetation causing obstruction to pedestrians or vehicle traffic.

Example of cycleway obstructed by landscaping shown below.



(14) Dead tree, or trees with obvious die-back, which could fall on to the highway.

Example of large dead tree in hedgerow.



(15) Highway Tree causing obstruction of the carriageway.

Highway clearance between the kerb face and any highway furniture or structure should be 450 mm. Please also see the Tree Risk Management Plan.

Please note, especially in respect of urban areas, highway tree matters should to be referred to your manager, for the appropriate action. Consultation will need to be carried out with local Members, Highway Tree Officer and with District Council Tree Officers, before any relevant action may be taken

Footways

(16) Abrupt level differences in the surface.



(17) Damaged or missing ironwork.

Example of missing utility cover on pedestrian island at traffic signal junction.



(18) Highway Tree causing obstruction of the footway



(19) Footway damage, caused by tree root action, either highway trees or private trees.



(20) Blocked Drains and Grips

Blocked gullies and grips will be identified on all inspections, driven, walked or wet weather. Special attention shall be given to those gullies and grips, which are “critical”. These are gullies and grips, which are situated at the lowest point and will result in flooding at that

location. All blocked road gullies are to be recorded and passed to designated drainage engineer.

Example of a totally blocked gully.



Example of a critical grip (Spillway), which has been improved to be self cleansing, by kerbing and surfacing.



(21) Abandoned Roadworks signs

Any road works signs, identified during an inspection should be collected at the time of inspection, if using a suitable works vehicle. If not an ARTs instruction should be raised.



Example of abandoned loose chipping sign.

(22) Dangerous cellar Openings and Cellar Lights

Example of missing glass block from cellar light. (This matter needs to be brought to the property owner attention immediately).



(23) Obstruction and Encroachments

Example of “A “boards placed on a road junction, advertising businesses not at that location. This type of obvious obstruction/distraction should be removed at the time of the inspection. The example is shown overleaf.



(24) Low Road Signs over Footways and Cycle Tracks

The traffic Signs manual states that road signs above footways or areas where pedestrians may walk should be at a recommended 2.3m high, with a minimum of 2.1m. Signs on rural verges may be erected between 900mm and 1.5m above the level of the adjacent road. However any signs within urban areas where it may be expected that pedestrians may walk, this will include verges, splitter islands and central reserves should be erected and maintained at the 2.3m height (see example below).



30 Investigatory and Intervention Levels

The risk assessment process is key to deciding if a defect is actionable and selecting the appropriate action in terms of response times for a repair. All defects that reach the investigatory level should be evaluated for their significance and the likelihood of injury of damage to a highway user.

The following Investigatory and Intervention levels have been reviewed in line with the recommendations and guidance in the DfT Code of Practice 'Well Managed Highways Infrastructure'.

When the surface course of the road starts to fail, defects may develop presenting a hazard to the highway user. Most surface courses are between 20mm and 40mm in thickness and therefore, once the surface course has failed, it becomes more likely that a defect will develop. This may include the failure of the binder course and/or the sub-base of the carriageway.

For footways, the levels have been set having due regard to the opinions of the courts in these matters.

Investigatory Levels

The level at which a risk assessment is carried out, taking into account, the volume, speed and type of the traffic, the position on the highway, the general location, and the prevailing weather conditions :-

(It should be noted that the inspector can also use their discretion if they consider that a defect below the investigatory level will present a hazard or develop in to an actionable defect before the next inspection)

Item	Defect	Investigatory Level
Carriageway	Pothole	25 mm depth
	Crowning	50 mm (area less than 2 sq.m.)
	Depression	50 mm (area less than 2 sq.m.)
	Rutting	25 mm
	Gap / crack	20 mm width x 20 mm depth
	Sunken ironwork	25 mm level difference
Pedestrian Xing	Trip / pothole	15 mm depth
Footway	Trip / pothole	15 mm depth
	Rocking slab / block	15 mm vertical movement
	Open joint	20 mm width x 20 mm depth
	Sunken ironwork	15 mm level difference

Intervention Levels

These are the “safety net” at which action **must** be taken, using the risk assessment to determine the Defect Category and the response time.

Item	Defect	Intervention Level
Carriageway	Pothole	40mm depth and over 150mm dia.
	Ironwork upstand	20 mm
	Ironwork Depth	40 mm

Intervention Level

footway	Potholes	20 mm depth
	Trips	20 mm upstand

N.B. Investigatory and Intervention levels for pedestrian areas, pedestrian crossings and busy urban streets with shared vehicle and pedestrian use, the footway levels shall be used.

31 Defect Risk Assessment

The principles of a system of defect risk assessment for application to safety inspections are set out below. Any item with a defect level, which corresponds to, or is in excess of, the stated defect investigatory level adopted by the authority, is to be assessed for likely risk. The procedure for risk assessment shall be as follows:

Risk Identification

An inspection item for which the defect investigatory level is reached or exceeded is to be identified as a risk. The suggested inventory to be observed and examples of investigatory levels are detailed in section 29.

Risk Evaluation

All risks identified through this process have to be evaluated in terms of their significance, which means assessing the likely impact should the risk occur and the probability of it actually happening. A defect risk register will considerably assist the risk evaluation process. Although it may not be possible to include every conceivable risk, the register identifies a wide range of risks likely to be encountered. This enables the vast majority of all risks actually encountered through comparison, interpolation or extrapolation, to be assessed with the identified risks. The risks contained in the register are based upon the highest assumed risk attributable to the type of defect, position and assessed type of usage. Local knowledge could assess the risk differently.

Risk Impact or Consequence of Event occurring

The impact of a risk occurring should be quantified on a scale of 1 to 5 assessed using the following table as guidance.

Impact Rating	Score	Description	Possible Indicators
High	5	The hazard presented by the defect or due to the short term structural deterioration in the defect, could result in serious injury or fatality.	Impact will result in serious damage to persons or property. Highway users will instinctively react to avoid the defect and this will place them in peril. The defect could destabilise a vehicle and will place the highway user in peril.
Medium	4	The hazard presented by the defect, or due to the short term structural deterioration in the defect, could result in injury or serious claim against the authority.	Impact will result in damage to persons or property, from which they are likely to recover. Highway users will instinctively react to avoid the defect.
Low	3	The hazard presented by the defect, or due to the short term structural deterioration in the defect, could result in a minor injury or claim against the Authority. If untreated the defect will contribute to the deterioration in the overall condition of the highway asset. The defect is likely to deteriorate further before the next safety inspection.	Most impacts will not result in any injury. Highway users are unlikely to react to avoid the defect and the impact will not interrupt their passage. The defect will be felt and recognised as a defect by most highway users, and its presence will be a negative on their perception of the highway asset.
Very Low	2	The hazard presented by the defect, or due to the short term structural deterioration in the defect, is unlikely to result in injury or claim, but the defect will contribute to the deterioration of the overall condition of the highway asset. The defect is unlikely to deteriorate further before the next safety inspection.	The defect will be recognised by highway inspectors as requiring consideration, but is unlikely to be felt or recognised as a defect by most highway users. The defect is unlikely to cause injury or damage.
Negligible	1	The hazard presented by the defect, or due to the short term structural deterioration in the defect, is unlikely to result in injury or claim, but the defect will contribute to	The defect will be recognised as requiring consideration, but is unlikely to be felt or recognised as a defect by highway users. The defect is very unlikely to cause injury or damage.

		the overall condition of the highway asset. The defect is unlikely to deteriorate further before the next safety inspection.	
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Risk Probability or Likelihood of Event Occurring

The probability of the risk occurring should also be quantified on a scale of 1 to 5 assessed using the following table as guidance.

Probability Ratings	Score	Description	Possible Indicators
Severe	5	More than a 75% chance of occurrence.	Vehicle, cycle and/or pedestrian flows are high. A high % of vulnerable users may pass. The location of the defect and the topography will mean that it is difficult for a highway user to recognise and avoid. Forward visibility may be compromised.
High	4	60% to 75% chance of occurrence.	Vehicle, cycle or pedestrian flows may be high, but differing modes are less likely to share the highway at this location. Some highway users would recognise and take action to mitigate the impact of the defect. Forward visibility is good.
Medium	3	40% to 60% chance of occurrence.	Vehicle, cycle or pedestrian flows may be moderate, but differing modes are less likely to share the highway at this location. The majority of highway users will be able to recognise and take action to mitigate the impact of the defect. Forward visibility is good.
Low	2	10% to 40% chance of occurrence.	Vehicle, cycle or pedestrian flows are moderate or low. Different modes are unlikely to share the highway at this location. The majority of highway users will be able to recognise and take action to mitigate the impact of the defect.
Negligible	1	Less than 10% chance of	Vehicle, cycle or pedestrian flows are very low. The speed differential between users is very likely to be low. The majority of highway users will be able to avoid the defect.

Risk Factor

The risk factor for a particular risk is the product of the risk impact and risk probability and is therefore in the range of 1 to 25. It is this factor that identifies the overall seriousness of the risk and consequently the appropriateness of the speed of response to remedy the defect. Accordingly, the priority response time for dealing with a defect can be determined by correlation with the risk factor, as shown in the Risk Matrix in the table below.

Timescales are designed to enable highway defects to be , wherever practicable, actioned in a programme of permanent repairs. This balances the immediate risk posed to the highway user with the ongoing risk that will be posed as a consequence of a failed temporary repair. In some situations, it may be necessary to respond to certain defects as an emergency and that only a temporary repair can be achieved in the short term. However, it will be necessary to programme for the permanent repair to follow.

Risk Management

Having identified a particular risk, assessed its likely impact and probability and calculated the risk factor, the category and the timescale to rectify actionable defects should be defined as either a Category 1 response (within 24 hours) or a Category 2 (planned response), as per the response times detailed overleaf:

LIKELIHOOD OF EVENT OCCURRING	CONSEQUENCE OF EVENT OCCURRING				
	NEGLIGIBLE 1	LOW 2	MEDIUM 3	HIGH 4	SEVERE 5
NEGLIGIBLE 1	1	2	3	4	5
VERY LOW 2	2	4	6	8	10
LOW 3	3	6	9	12	15
MEDIUM 4	4	8	12	16	20
HIGH 5	5	10	15	20	25
KEY TO RISKS					
RESPONSE TIMES	CONTINUE TO MONITOR	28 DAYS R4	7 DAYS R3	24 HOURS R2	1 HOUR R1

Table 5 - Risk Matrix

These response time categories for actionable defects are:-

- R.1 Make safe or repair within 1 hour;
- R.2 Make safe or repair within 24 hours;
- R.3 Repair within 7 working days;
- R.4 Repair within 4 weeks. (28 working days)

Where defects with potentially serious consequences for network safety are made safe by means of temporary signing or repair, arrangements should be made for a special inspection regime to ensure the continued integrity of the signing or repair is maintained, until a permanent repair can be made.

32 Further Help and Advice

If you are unsure, or need further guidance on any matter related to highway safety inspections, please talk to your Senior Inspector or Manager.

33 Separate Operational Appendices

These are separate operational documents that are in the filepath:

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Appendix A	Glossary of Terms
Appendix B	Standard Kerb Details
Appendix C	Standardisation of Bollards
Appendix D	Traffic Management Considerations & Safety @ Road Works
Appendix E	Traffic Signs Manual (extract)
Appendix F	Ragwort Identification
Appendix G	Broad Leaved Dock Identification
Appendix H	Curled Dock Identification
Appendix I	Creeping or Field Thistle Identification
Appendix J	Spear Thistle Identification
Appendix K	Japanese knotweed Identification
Appendix L	Giant Hogweed Identification
Appendix M	Mapcapture Manual
Appendix N	Inspectors Vehicle Standard Kit
Appendix P	Guidance on Working Near Overhead Services
Appendix Q	Standard Letters
Appendix R	Repair Matrix
Appendix S	Guidance Notes for Highway Signs Orders
Appendix T	Policy Notes on the use of Pedestrian Barriers and Bollards.
Appendix U	Malvern Hills Area of Outstanding Natural Beauty.
Appendix V	Verge Marker Posts.
Appendix W	Tree Surveys. A Guide To Good Practice.
Appendix X	Response to Reports of Mud on Road and Oil/Fuel Spillages.
Appendix Y	A Guide for Riparian Owners

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