



**Worcestershire County Council
Highway Maintenance Plan**

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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.