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

Version: 2.0
Date Issue: October 2018
Review date: October 2020
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 be 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
Carriageways	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 Assess Roads	1 year
Footways	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
Cycleways	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:

Set Frequency	Flexibility
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 been 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 scalpings.

The decision on, closing or formulising 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 scalpings 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.

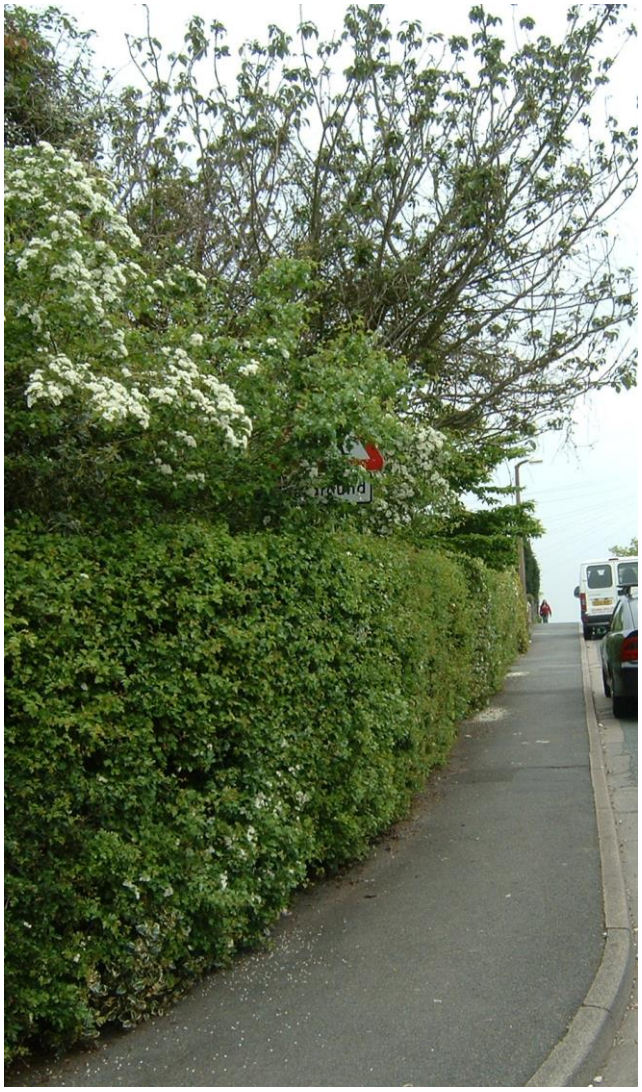
(i) Obstruction by vegetation (Hedges and Trees)

(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 BENINNING Monday 21.11.2011 AREA Malvern Hills /Worcester city NAME Colin Grosvenor

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 slippy	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 / Forgate Street	Traffic Lights Failure	Passed to Prysmain	

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 warn 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 felt or recognised as a defect by highway users. The defect is very unlikely to cause injury of damage.

		the overall condition of the highway asset. The defect is unlikely to deteriorate further before the next safety inspection.	

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:
U:\U163 ES\U119 Hway Works N\000 REACTIVE\Highway Inspections Operational Manual Version 2

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