CEREDIGION COUNTY COUNCIL

Report to:	Cabinet
Date of meeting:	07/09/2021
Title:	Code of Practice for Highway Safety Inspection and Response on County Roads
Purpose of the report:	To gain approval for the new Ceredigion County Council Code of Practice for Highways Safety Inspection and Response on County Roads
For:	Decision
Cabinet Portfolio and Cabinet Member:	Highways and Environmental Services, Housing and Customer Contact – Cllr Dafydd Edwards

Ceredigion County Council's Code of Practice for Highway Safety Inspection and Response on County Roads (the 'Code of Practice') sets out the policy and standard for undertaking inspections of the adopted highway network. It forms part of the overall Highways Asset Management Plan and its constituent Appendix C – 'Highway Maintenance Manual', and is designed for use by staff carrying out highway inspections. It sets out inspection frequencies and also intervention levels for most circumstances (although inspection staff will always be expected to apply judgement). The primary aim of the code is to ensure that inspection, defect and suggested repair details are correctly assessed and accurately recorded, in addition to the subsequent recording of details of actual response and repairs undertaken.

In 2016, the UK Roads Liaison Group published the *Well Managed Highway Infrastructure Code of Practice*, this replacing the *Well-Maintained Highways Code of Practice for Highway Maintenance Management* dated July 2005*.* To ensure compliance with the new code it has been necessary to review and update Ceredigion County Council's Code of Practice. The underlying principle of the code is that Highway Authorities will adopt a risk-based approach to asset management in accordance with local needs, priorities and affordability.

The County Surveyors Society Wales (CSSW) developed a methodology that would allow a nationally consistent approach to the management of local highways in accordance with the new code, and this methodology has been utilised for the review of the Council's existing code.

The Authority is currently performing well in its duty to maintain the highway asset. However, the reduction in the level of resources available to Highway Authorities means that the focus on reaction to safety defects has prohibited assignment of resource to maintenance activities that would reduce these defects. The inability to

programme works leads to inefficiencies and risks an increasing inability to manage repairs, leading to deterioration in the condition of the network.

The new code addresses this by targeting its highest risk areas. It does this through focus on the frequency of inspection, and the determination of an appropriate threshold of intervention. The result will be an ability to reassign resources to maintenance rather than urgent repair.

The County Surveyors Society Wales (CSSW) developed its methodology in respect of the new Code of Practice in consultation with Insurance Companies and Highway Authorities across Wales with a view to creating a unified approach to interpretation and implementation.

All Welsh Authorities have adopted the code.

	Has an Integrated Impact Assessment been completed? If, not, please state why	Yes
Wellbeing of Future Generations:	***Summary:***	
	Long term:	The new Code of Practice provides a risk based approach to Highway Safety Inspections and offers the opportunity to optimise resource through prioritisation and planning of maintenance works.
	Collaboration:	The new Code of Practice will improve the condition of the adopted highway within Ceredigion and impact positively on its people, economy, environment and culture.
	Involvement:	Ceredigion County Council will continue to work with other stakeholders including County Surveyors Society Wales, insurance Companies and Highway Authorities to implement the new Code successfully.
	Prevention:	Continued involvement from stakeholders will be encouraged via meetings and regular review, which will be informed by the feedback received.

Integration:	The methodology behind the code utilises data relating to the risk of damage to persons or property, and recommends a way of optimising available resources that allows this to be mitigated effectively.
Recommendation(s):	**IT IS RECOMMENDED THAT** Cabinet approve the Code of Practice for Highway Safety Inspection and Response on County Roads 2021
Reasons for decision:	To refocus our resources, enhance our maintenance and improve our ability to comply with our statutory legal duties as outlined in Section 41 of the Highways Act 1980 and provide a defence by virtue of Section 58 of the Highways Act 1980 through a unified all-Wales approach. To comply with national guidance, namely the *Well Managed Highway Infrastructure Code of Practice 2016*
Overview and Scrutiny:	Thriving Communities
Policy Framework:	N/A
Corporate Priorities:	Boosting the Economy Promoting Environmental and Community Resilience
Finance and Procurement implications:	None
Legal Implications:	Provides the Council with a better defence with regards to S58 of the Highways Act 1980
Staffing implications:	None
Property / asset implications:	The focus of resource on more cost effective routine planned cyclical/preventative maintenance works will improve the condition of the highway asset.
Risk(s):	The new code will enhance our maintenance and our defence under section 58 of the Highways Act through a unified all-Wales approach.
Statutory Powers:	Highways Act 1980
Background Papers:	Thriving Communities Scrutiny Report • 15 July 2021

Appendices:	Appendix 1 - Summary Paper: Code of Practice 2021 Appendix 2 - Code of Practice for Highway Safety Inspection and Response on County Roads 2021 Appendix 3 - Highway Asset Risk Review Appendix 4 - CSSW Risk Based Approach Rationale 2019 Appendix 5 - IIA CoP Highway Safety Inspections
Corporate Lead Officer:	Rhodri Llwyd
Reporting Officer:	Phil Jones, Corporate Manager
Date:	17/08/21

2021-06-09

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County Council

Summary Paper: Code of Practice for Highway Safety Inspection and Response on County Roads 2021

Overview

The final version of the Well-Managed Highway Infrastructure Code of Practice was published on 28 October 2016. The Council must comply with this code. If the Council were not to comply with the code then it would be at increased financial risk in terms of liabilities and claims, higher insurance premiums or restriction of insurance cover. In addition to financial risk, Ceredigion County Council's reputation would be compromised in terms of the public's perception and confidence in the way in which it delivers its services if not complaint with the code. Approval of the new Code of Practice for Highway Inspection and Response will provide the Council with a reasonable protection in unity with an all-Wales approach.

The code recommended that all Highway Authorities should consider new ideas, methods of working and innovation in order to drive greater efficiency. The underlying principle of the code is that Highway Authorities will adopt a **risk-based approach** to asset management in accordance with local needs, priorities and affordability.

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way_infrastructure_c

The new Code replaces the Well-Maintained Highways Code of Practice for Highway Maintenance Management dated July 2005

The County Surveyors Society Wales (CSSW) code harmonises the approach to the new code across Wales, informed by Insurance Companies and Highway Authorities across Wales. It addresses the reduction in the level of resources available to Authorities by targeting its highest risk areas. It does this through focus on two main areas: the frequency of inspection, and the determination of an appropriate threshold of intervention.

FREQUENCY OF INSPECTION

THE RISK-BASED APPROACH ("RBA")

Previously, the category of road determined the inspection frequency, and the size of the defect determined the response required.

Authorities have historically based inspection frequency on class of road i.e. A road, B road, C road and unclassified. This has little reference to the frequency of its use or its importance within the local network. However, a risk based hierarchy is predominantly based upon road usage, which reflects the fact that if a hazard or hazardous feature exists on an asset then **the risk is a direct function of the number of users exposed to it**.

It is generally accepted by the courts and insurers that it is considered to be both reasonable and defendable that a safety defect recorded against a "busy" road, which is inspected monthly (every 30 days), is made safe by the end of the next working day.

For the purpose of the code the "busy" road is considered to have a usage of between 20,000 and 30,000 vehicles a day.

If this number is multiplied by 30 (days between inspection) + 1 for the defect to be rectified this gives the number of exposures to the hazard/risk of 930,000 highway users.

This is then converted to a risk exposure index (REI) of 930.

It then follows that a road having 10,000 vehicles a day (a third of the above) could potentially have an inspection frequency of three times that amount, 90 days + 1 for it to have the same risk index, i.e. an REI of 930. Local variation can then be applied for strategic routes, operational, seasonal variation and routine maintenance reasons.

For example, many of our roads in Ceredigion are low use roads. These may have below 1000 vehicle movements a day which, to give an equal REI, would give a theoretical inspection frequency of over 2 years. It is understood that this would be unacceptable to the Authority and would be adjusted for the reason of **routine maintenance** to 365, i.e. 12 months. The current Ceredigion Code identifies these as Local Access Roads Category 4B and are also currently recorded as 12 month inspection frequency. Ceredigion's strategic routes are identified in a document from 2004, 'Strategic Routes in Ceredigion', which is currently under review.

Currently inspection frequencies are determined by road hierarchy (class) with exception.

- **4 Weekly** Strategic Routes, Main distributor.
- **12 Weekly** Secondary Distributor,
- **26 Weekly** Local Link Roads
- **52 Weekly** Local Access Roads (Currently inspected at 26 Weeks)
- **104 Weekly** Green Roads or BOATS

The new code recommends that inspection frequency is determined primarily by usage.

- **CHSR Traffic Count 20,000- 30,000** 4 Weekly
- **CH1 Traffic Count 10,000- 20,000** 4 Weekly
- **CH2 Traffic Count 5,000- 10,000** 12 Weekly
- **CH3 Traffic Count 1000 – 5000** 26 Weekly
- **CH4 Traffic Count 200 – 1000** 52 Weekly
- **CH5 Traffic Counts <200** Reactive i.e., Request for service only.

Ceredigion currently has limited traffic count data but, in line with other Authorities and as approved by CSSW, estimates for vehicle and footfall numbers data are arrived at through extrapolation and use of local knowledge. It is essential that we start a programme of comprehensive data collection to support the code and inform regular risk reviews. Plans are currently being made to carry out this work via electronic monitoring equipment.

The principle of a risk based approach is also applied to the establishment of inspection regimes. To provide a rational basis for establishing an inspection regime, the concept of risk exposure has been adopted. Risk exposure is a measure of the exposure of users to a hazard and this is used to assess the primary and initial frequency assessments and adjustments are then applied for it being a Strategic Route, volume of HGVs, if it’s part of a diversionary route, if it crosses the county boundary and its current condition and routine maintenance needs.

Assessment Examples

A4120 FROM HEOL Y BONT TO SOUTHGATE ISLAND

Traffic Count or Estimate*	Exp HGV Volume	Strategic* or Diversionary Route	X County Boundary	Condition	Current CoP Frequency	Proposed Frequency
16336	No	Yes* Yes	No	Good	4 Weeks	1 Month

B4577A FROM CROSS INN TO THE ENTRANCE OF FORESTRY COMMISSION ROAD

1145	No	Yes*	No	Good	12 Weeks	3 Months

A486 FROM FFOSTRASOL TO BWLCHYGROES

1000-5000*	No	Yes*	No	Good	4 Weeks	1 Month

A484 FROM THE HOLT TO PROPERTY KNOWN AS KYNANCE

4460	No	Yes*	No	Good	4 Weeks	1 Month

C1019 FROM BOW STREET TO THE JUNCTION OF THE C1010

1000-5000*	No	No	No	Good	12 Weeks	6 Month

C1010 FROM FFYON CARADOG TO C1019

1705	No	No	No	Good	12 Weeks	6 Month

C1008 FROM LLANGEITHO TO PRIVATE ROAD TO CEFNGWIDDIL

1000-5000*	No	No	No	Good	12 Weeks	6 Month

C1009 FROM ABERPORTH TO LLETY CARAVAN PARK

1000-5000*	No	No	No	Good	12 Weeks	6 Month

U1365 FROM THE JUNCTION OF THE B4343 TO GWARCASTELL

54	No	No	No	Fair	52 Weeks	12Month**

**For reasons of basic maintenance needs

U1461 FROM THE JUNCTION OF THE B4576 TO BWLCH

200-1000*	No	No	No	Good	52 Weeks	12Month

U1616 FROM BRO DERI BETTWS BLEDRWS TO THE C1071

200-1000*	No	No	No	Good	52 Weeks	12Month

Consequences of the new code

1. The low traffic volumes within Ceredigion indicate that the inspection frequency could be reduced on approximately 30% - 40% of our network. In practice, it is likely to be no more than 30%

2. Although frequency of inspections would be less the total number of defects identified would not be reduced.

3. The number of Critical defects would show no change.
   (CSSW's minimum standard for an emergency defect is to make safe within 2 hours)

4. The number of Safety defects are likely to go down in the short term.
   (CSSW's minimum standard for a safety defect is to make safe By End of Next Working Day (CHSR, CH1, CH2) and Within 5 Working Days (CH3, CH4, CH5**)

5. The number of Maintenance defects are likely to go up.
   (CSSW's minimum standard for a maintenance defect is 1 month (CHSR, CH1, CH2), 3 months (CH3, CH4, CH5**)

6. The programmed repairs are likely to stay the same.
   (CSSW's minimum standard for a programmed repair is as per the local works programme)

Positives

Risk based deployment of resources. The inspection resource could be utilised to strengthen the service's response to other issues such as:

1. Inspection of other highway assets and/or concerns and activities including but not restricted to

    a. Streetworks functions e.g. management of skips/scaffolding/hoarding permits, response to defect complaints
    b. General bridge inspections e.g. inspection of parapet, training walls and decks
    c. Safety fences e.g. tensioned, un-tensioned, box-beam

2. Dealing with enforcement issues

    a. Overhanging trees e.g. site visits, issuing notices, follow up
    b. Highway encroachment/obstruction e.g. site visits, issuing notices, follow-up

3. Providing a more holistic approach to inspection and maintenance by supplementing the work carried out by the superintendents and vice versa thus improving -

4. Effectiveness of reactive planned works which should prevent maintenance defects becoming safety defects/issues.
5. Enabling a unified reaction to third party requests for service, claims and complaints.
6. Asset type data collection e.g. details of signs, drainage systems

Potential Negatives

1. Possible public perception of a reduction in current response to defects.
2. Possibility of increase in workload as a result of more customer requests.
3. Potential for more attempts by third party claimants.

Opportunities

1. To redeploy resources as outlined above
2. To benefit from a unified all Wales response to third party claims.
3. To assemble treatments into more cost effective planned maintenance works.

The code is built on Vehicle Traffic and footfall counts. This data collection will need resourcing on an ongoing basis.

DEFECT RECORDING

The Council's existing code of practice already advocates the use of risk assessment for defects via the use of a risk matrix (see below). The method is conceptually simple and requires identification of the potential impact of an event and evaluation of the probability of that event occurring. The difficulty it presents is that the table does not specify to what event it refers.

If it refers to the risk of a fatality, then the impact is very high but the probability could be low. If it refers to the risk as being 3rd party property damage the impact could be low but the probability could be considerably higher. Both of these events, and others, are possible as a result of a highway defect. The current method therefore requires highway inspectors to concurrently analyse a range of potential events and a range of probabilities to arrive at an appropriate response to a defect. This is a difficult task as relevant data is not available. Without data on impacts and probability this becomes an exercise in individual judgement.

Probability and impact	Very Low	Low	Medium	High
Negligible	1	2	3	4
Low	2	4	6	8
Noticeable	3	6	9	12
High	4	8	12	16

Current Responses

Category 1 defect — reactive time - make safe or repair within 24 hours

Category 2H defect — reactive time - 5 working days

Category 2M defect — reactive time – 20 working days

Category 2L defect — - to be referred for assessment and programming

Proposed Responses

Defect Categories	Description	Response Time
Critical Defect Category 1	A situation where the inspecting officer considers the risk to safety high enough to require immediate action, e.g. collapsed cellar, missing utility cover, fallen tree, unprotected opening, • Requiring an immediate response to make the site safe	2 Hours
Safety Defect Category 1.1 Category 1.5	Defects that pose an imminent risk of injury to road users, • Requiring a response as soon as possible to remove a potential risk of injury to users	By End of Next Working Day (CHSR, CH1, CH2) Within 5 Working Days (CH3, CH4)

Maintenance Defect Category 2.1 Category 2.3	Defects that warrant treatment to prevent them deteriorating into a safety defect prior to the next scheduled inspection. • Requiring a response to prevent them becoming a safety defect	1 month (CHSR, CH1, CH2) 3 months (CH3, CH4)
Programmed Repairs Cat 3	Defects that warrant treatment, in order to prevent them deteriorating to such an extent that additional works or costs are incurred.	As per the local works programme

Due to a reduction in resources, Highway Authorities have found that their reactive services are having to focus on responding to a large increase in safety defects, primarily due to routine treatments and repairs being behind schedule and/or beyond available resources. The new code attempts to bolster the reaction to safety defects (while advocating a higher intervention level) whilst preventing those defects that would, if not treated, otherwise develop into safety defects. It does this by creating intervention levels which change relative to the risk exposure index (REI).

Determining an Appropriate Threshold

The major determinant in categorising a carriageway defect that is not immediately dangerous is how rapidly it may deteriorate into that state. The regime is designed to provide preventative repair which will minimise the number of defects that become potentially dangerous in terms of injury to people or damage to property.

Roads that have been engineered will invariably have a discreet layer of wearing course, typically of a depth of up to 45mm. It is common for repairs to be initiated by a hole (pot-hole) appearing in that wearing course. Where the layer below is intact the defect may remain relatively stable in the short term i.e. deterioration into a much larger defect is less probable than for a defect that has already extended into the lower layers. For this reason, a threshold between “small defects” and “larger defects” of 50mm has been chosen. A defect that is 50mm in depth will typically be deteriorating at both the wearing course and the subsequent layer and as such is prone to more rapid deterioration. The regime is based upon differentiating between defects either side of this threshold.

Carriageway Repair Regime: Response Times				
Carriageway Hierarchy	**Safety Defect**		**Maintenance Defect**	
CHSR	>50mm	By the end of the next working day	>40mm	1 month
CH1	>50mm		>40mm	
CH2	>50mm		>40mm	
CH3	>75mm	5 days	>50mm	3 months
CH4	>75mm		>50mm	
CH5**	>75mm		>50mm	

Defect Size

The defect sizes chosen for each type of defect and REI road hierarchy reflect the fact that carriageway defects deteriorate more rapidly on more heavily trafficked roads as a result of the volume of vehicles running over it. A defect of 50mm depth on CH2 and above will be subjected to repeated trafficking as all these roads carry >5,000 vehicles per day. Therefore, a pot hole could deteriorate rapidly into a much bigger and more hazardous hole/defect if not repaired promptly. For this reason, a differential standard of safety defect size has been adopted for the minimum standard shown in the table above.

Response Times

The proposed response times are also based upon taking into account the different REI levels. The table below shows how risk exposure has been calculated and used to show what response times are required to deliver a consistent REI level of risk exposure.

Safety Defect					
Carriageway Hierarchy	**AADT**	**AADT level for use in calculation**	**Exposure (vehicles exposed to a defect before it is repaired)**	**Response time (days) required to normalise exposure**	**Proposed Minimum Standard**
CHSR	30,000	30,000	30,000	1	same day
CH1	10,000 - 20000	20,000	30,000	2	By end of Next Working
CH2	5,000 -10000	10,000	30,000	3	By end of Next Working
CH3	1,000 - 5000	5,000	30,000	6	5 working days
CH4	200 - 1000	1,000	30,000	30	5 working days
CH5	<200	200	30,000	150	5 working days

The New Code suggests the following responses per level of defectiveness;

Critical Defect Cat 1.0 (2 Hour Response)

These are defects that pose an immediate or imminent risk of injury to road users and typically include items such as a collapsed cellar, missing utility cover, fallen tree, unprotected opening etc. Critical defects should be made safe at the time of the inspection if practicable or attended by the inspector until such time as the defect can be made safe. Making safe may constitute displaying warning notices, signing & guarding to protect the public from the defect or the inspector parking their vehicle over the defect until it can be made safe

The response time for critical defects refers to the time to attend site, make safe or repair. It will then be remedied ASAP thereafter.

Safety defect Cat 1.1 & 1.5 (1-5 Working Days)

A defect that requires prompt attention because it presents an imminent hazard.

Safety defects require a response as soon as possible to remove a potential risk of injury to users and they will typically include items such as particular sizes of potholes, trip hazards cracks, dislodged kerbs etc. If practical, safety defects should be made safe at the time of the inspection. This may constitute displaying warning notices, erecting cones or fencing off to protect the public from the defect. If it is not practical to correct or make safe the defect at the time of the inspection, repairs of a permanent or temporary nature should be carried out within the response time specified.

*[CSSW's minimum standard for a safety defect is to make safe By End of Next Working Day (Category 1.1 on CHSR, CH1, CH2) and Within 5 Working Days (Category 1.5 on CH3, CH4, CH5**)]*

CSSW's minimum standard provides dimension data that can be used as a guide to identifying safety defects. *(The recording inspector always has discretion/ability to alter any defect to a higher/lower priority if his training or experience dictates they should)*

Maintenance Defects Cat 2.1 & 2.3 (1 to 3 months)

A defect that is not a safety defect but requires repair at an appropriate time to guard against further deterioration.

They do not present an imminent hazard to users. Maintenance defects are those that warrant treatment in order to prevent them deteriorating into a safety defect prior to the next scheduled inspection.

*CSSW's minimum standard for a maintenance defect is 1 month (Category 2.1. on CHSR, CH1, CH2), 3 months (Category 2.3 on CH3, CH4, CH5**)*

Programed Repairs Cat 3 (To be compiled into Works Program)

A defect that is not a safety defect or a maintenance defect but requires repair at an appropriate time to guard against further deterioration.

They do not present an imminent hazard to users. Programmed repairs are defects that warrant treatment at an appropriate intervention time, in order to prevent them deteriorating to such an extent that additional works or costs are incurred.

(*CSSW's minimum standard for a programmed repair is as per the local works programme)*

**Defect intervention levels on CH5 roads are to be considered an investigatory level. An investigatory level does not automatically trigger a response. It will be incumbent upon the inspector to assign an appropriate response to each defect based upon its type, size, location and the level of use of the road. CH5 roads are low use roads therefore defects will frequently present low risk to users and can be responded to accordingly e.g. it may not always be appropriate to record a 75mm pothole on a Byway Open to All Traffic (BOAT), a low trafficked road, as a category 1 defect. In this case the Inspector will investigate and consider what action to take.

Positives

1. The reactive maintenance teams will have a greater ability to manage the response to defects within the required time frames.

2. Temporary repairs can be minimised.

3. An all Wales approach to defending third party claims.

Potential Negatives

1. The benefits of the code will only be realised by being able to manage the Maintenance Defects successfully. If this is not achieved the network is likely to suffer a negative impact due to the relaxation in Safety Defect intervention levels.

Opportunities

1. Better programming of work flows which should have cost and resource benefits.

2. Focus on preventing a maintenance defect becoming a safety defect, and therefore the need to constantly and immediately react.

3. To make works programs of planned cyclical/preventative maintenance such as ditch, grip, gully cleaning, inlay patching etc.

What are the motivators?

1. Successful execution of our Section 41 duties as specified by legislation' namely the Highways Act 1980

2. Compliance/adherence with national UK guidelines (UKLRG), namely the 2016 Code of Practice Well-Managed Highway Infrastructure Code of Practice (Risk Based Approach)

3. Compliance/adherence with the regional County Surveyors Society Wales (CSSW) Risk Based Approach to Highway Management

4. Insurance changes (Premium costs pay-outs and the perceived Risk)

5. Pre Court evidence gathering (Evidence that risk has been evaluated and prioritised)

6. More efficient use of financial and human resources

7. The Council's requirement to demonstrate that it has acted reasonably and therefore provide itself with a Section 58 defence.

The Authority is currently performing well in its duty to maintain the highway and the intention of the new code is to enhance our maintenance and our defence under section 58 of the Highways Act through a unified all-Wales approach.

Recommendation

To approve the Code of Practice for Highway Inspection and Response on County Roads 2021

Code of Practice

Highway Safety Inspection and Response on County Roads

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Code of Practice

Highway Safety Inspection and Response on County Roads

2021

Preface

The establishment of an effective regime of inspection, assessment and recording is the most crucial component of highway maintenance. The characteristics of the regime, which includes frequency of inspection, items to be recorded and nature of response, are defined following an assessment of their relative risks.

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1. Introduction

Legislation

Ceredigion County Council as the Highway Authority has a statutory duty to maintain its highways as outlined in the Highways Act 1980.

In particular, Section 41 imposes a duty to maintain highways maintainable at public expense. There is no definition in the Act regarding the level of maintenance required although national codes have been produced to offer some guidance. The document, *"Well-Managed Highway Infrastructure: A Code of Practice (October 2016)*" produced by the Roads Liaison Group, makes recommendations for surveys and inspections of the adopted highway network, except where local constraints or demands have required local solutions.

Section 58 of the Highways Act 1980 provides the Local Highway Authority with a special defence:

> *"58 Special defence in action against a highway authority for damages for non-repair of highway.*
>
> *(1) In an action against a highway authority in respect of damage resulting from their failure to maintain a highway maintainable at the public expense it is a defence (without prejudice to any other defence or the application of the law relating to contributory negligence) to prove that the authority had taken such care as in all the circumstances was reasonably required to secure that the part of the highway to which the action relates was not dangerous for traffic."*

Intention of this document

This Highway Safety Inspection and Response Approved Code of Practice for Ceredigion County Council sets out the policy and standard for undertaking inspections of the adopted highway network. It is designed for use by staff carrying out highway inspections and forms part of the overall Highway Maintenance Manual. Intervention levels are stated for most circumstances, but inspection staff will always be expected to apply judgement as every eventuality cannot be covered. The primary aim of the code is to ensure that inspection, defect, and suggested repair details are correctly assessed and accurately recorded, together with subsequent details of actual repairs undertaken. All those involved in this process must be conversant with the contents of this document in order to ensure a consistent understanding.

The Authority's Highways Services carries out safety inspections of the public network within Ceredigion. The purpose of this is to ensure that, as far as is reasonable, publicly maintained carriageways, footways and other designated assets are safe for the highway user.

Implementation of a formal inspection regime and maintenance of, as far as is reasonable, the network and other assets, provides the Authority with a defence under Section 58 of the Highways Act 1980 against claims made for damages resulting from incidents on the public highway.

2. The Status of the Code

It is good practice to monitor and regularly review the efficacy, relevance and compliance of the Authority's Code of Practice. This revision of the 2010 Code has been driven and informed by the publication in October 2016 of the guidance document *"Well Managed Highway Infrastructure: A Code of Practice"*. Whilst there is no requirement to adopt this guidance, the purpose of the code is to encourage best practice in highway maintenance and management.

In the 2016 publication the most significant change from the previous code was a recommendation that authorities adopt a risk-based approach, although no detail was provided on how this was to be achieved. County Surveyors Society Wales (CSSW) worked to develop a nationally consistent response through design of a methodology that would allow authorities to, through its adoption, benefit from working to a national standard. Ceredigion County Council's Highways Services has utilised this methodology in the development of the Authority's 2021 code.

This document will confirm that Ceredigion County Council will accept the principles of the 2016 Code, which allows for local variations. Some principles are stated in this document, which specifically deals with Highway Safety Inspections.

Whilst it is accepted by the courts that a public highway can never be in perfect condition at all times the Highway Authority must show that it is meeting its responsibilities in a reasonable manner. An adequate inspection regime is an essential part of that requirement.

Review

This document is subject to regular review at an operational level in accordance with the County Council's commitment to a process of continuous improvement. This document shall be revised to record changes to service standards or the implementation of any newly defined service standards and policies including additional data on network traffic volume.

Risk reviews which collate appropriate data will be carried out periodically and used to inform refinements to hierarchy, inspection and repair regimes.

3. Objectives

The "*Well Managed Highway Infrastructure: A Code of Practice (October 2016)"* identifies the types of highway inspection that should be carried out to address three key objectives of a highway maintenance strategy.

1) Network Safety – Ensure compliance with statutory obligations.
2) Network Serviceability – Ensuring availability, integrity, reliability.
3) Network Sustainability – Maximising value to the community.

This document, *"Ceredigion County Council Code of Practice: Highway Safety Inspection and Response on County Roads"*, deals specifically with Objective 1, Network Safety, and updates the previous 2010 *"Code of Practice for Highway Safety Inspection of County Roads"*.

Ceredigion County Council's Highway Asset Management Plan provides the strategic framework that the Council has adopted and links to the Council's corporate aims and objectives.

The overarching corporate objective relating to highway maintenance is to provide safer and better roads to access services, employment and tourism.

Ceredigion County Council as local authority for highways maintainable at public expense within its boundaries will take reasonable steps to ensure these highways are safe and in discharging its duties will carry out:-

a) Regular inspections of the highways maintainable at public expense.
b) Additional reactive ad-hoc inspections in response to service requests or queries received about the condition of the maintained highway.
c) Inspections in accordance with this code of practice.

The aims of safety inspections are to record ‘defects’ within the highway in order that a maintenance regime can maintain the highway in a safe condition for users. This will be achieved by carrying out regular inspections, identifying any defects present and attaching a priority rating for them to be rectified in accordance with the guidance in this Code.

All elements of the inspection and assessment regime should be applied systematically and consistently. This is particularly important in the case of network safety, where information may be crucial in respect of legal proceedings.

4. Training and Development

Ceredigion County Council is committed to continual staff development and training.

It is important that all those involved in the process of highway maintenance understand the extent and nature of Ceredigion County Council's, as the Local Highway Authority, legal obligations for highway maintenance, and how these relate to their particular responsibilities, including the important distinction between duties and powers.

It is therefore implicit that for each component of the authority's maintenance strategy that those involved in the process will have received training to enable them to demonstrate the necessary level of competence.

The authority shall provide the necessary training by both in-house and external bodies to ensure that support is provided for such competence to be maintained. On appointment, all Ceredigion highway inspectors will take part in and internal induction and training programme. This will be followed by formal external training and professional qualification. Further training will be provided as appropriate to ensure continual professional development.

All Ceredigion highway Inspectors are trained to City and Guilds 6033 - unit 301 and 311. Additional training will be provided to ensure compliance with the new code, including any regional or national Highway Inspector Competency Scheme or Accreditation.

UNIT 301: HEALTH AND SAFETY

- Intended to provide appropriate basic health and safety training for highways inspectors, to give them an appreciation of how to carry out a basic risk assessment and assist them to work safely on the highway.

UNIT 311 - HIGHWAY INSPECTION TECHNICAL

- Intended for those carrying out highways inspection in their first year of appointment and as a useful refresher for more experienced highway inspectors. The course provides a good basic knowledge of all areas of highways maintenance and inspection in which they might be involved.

5. Risk Management

The *"Well Managed Highway Infrastructure: A Code of Practice (October 2016)"* recommends that authorities apply a risk-based approach to highway management. In doing so authorities must acknowledge the fact that risk varies across the asset and between asset groups. Managers have always considered risk in their decision making about inspections, repair priorities and works programming. The new code creates a need to formalise such decision making and to ensure that all decisions are, as far as possible, fact based, and that the rationale for these decisions are recorded .

6. Network Safety – Safety Inspections

Safety inspections identify all observed defects likely to create a danger or serious inconvenience to users of the network or the wider community. Such defects should include those that require urgent attention as well as those where the location and size are such that longer periods of response would be appropriate.

Safety inspections shall normally be undertaken by slow moving vehicle travelling at a maximum speed of 20mph. Walked safety inspections shall be carried out where and when appropriate. The mode of inspection for each location, either walked or by means of slow moving vehicle, will be influenced by risk assessing the location.

The highway safety inspections are generally carried out by single driver inspectors. Exceptions include urban locations and those where risk assessments have indicated a need for inspections to be carried out on foot. The mode of inspection is reviewed to reflect national working practices guidelines and health and safety advice/guidelines.

Additional inspections may be necessary in response to user or community concern, as a result of incidents or extreme weather conditions, or in the light of monitoring information. These shall be identified through the risk management process.

The parameters that are to be adhered to are:

- Frequency of inspection
- Items for inspection
- Degree of deficiency
- Nature of response

7. Ad-Hoc Inspections (Service Requests)

Ad-hoc inspections are to be carried out to identify any required maintenance works following requests for service from the public or third party. These are relayed to the inspectorate via the service's Infrastructure Asset Management System, namely Symology *Insight*. The request is given a priority rating by the corporate call centre for response / inspection/investigation. All reported defects should be inspected within the allocated time period following receipt, unless they are already known to the inspector and have been previously entered on the Authority's *Insight* system for rectification on a priority basis.

All ad-hoc inspections are recorded on a mobile device. Any identified defects falling within prescribed intervention criteria are entered onto the *Insight* defect database with instructions to make safe and/or repair within prescribed response times.

Category 1 defects are automatically sent to the relevant works team.

Note

Missing or damaged ironwork may be the responsibility of a Utility Company. In these circumstances the Highway Safety Inspector will enter onto the Authority's asset management system details of the defect for action by the Authority's Streetworks section who will manage any non-action by the Utility Company.

If such defects are reported to the corporate call centre by a member of the public they are recorded and forwarded to the relevant Streetworks Inspector, who will initiate contact with the relevant statutory utility undertaker or other contractor employed on the highway. If applicable they will record the defect and instruct the utility to make safe. If the statutory utility undertaker or other contractor cannot make safe within the specified 2hr period imposed then the works will be carried out by the authority's contractor with the costs re-charged.

8. Network Hierarchy

A viable network hierarchy is the foundation of a coherent, consistent and auditable maintenance strategy.

The requirement to split the asset into hierarchies exists in the current code. It has been retained in the new code but with the onus placed upon authorities to determine how best to apply the risk -principle in determining appropriate hierarchies. The new code states that *"Carriageway hierarchy will not necessarily be determined by the road classification, but by functionality and scale of use."* For example, roads that carry 10,000 vehicles a day have a greater potential for an adverse event to occur than ones carrying 500 vehicles a day.

It is possible to estimate use for all roads based upon available traffic count data. County Surveyors Society Wales (CSSW) has chosen to recommend that a risk-based hierarchy should be set predominantly based upon use. This does not preclude authorities from making necessary adjustment in response to particular local use patterns and issues. Ceredigion has undertaken a highway asset risk review which, in addition to traffic count data, takes into consideration additional factors such as whether the road is considered strategic, if it is part of a diversionary route or is travelled by a large volume of HGVs.

It is important that the hierarchy reflects the needs, priorities and actual use of each road in the network. Roads may be categorised as: classified numbered ('A' and 'B' roads), classified un-numbered ('C' roads) or unclassified ('U' roads). However, this system of classification does not necessarily reflect the priority and actual use of each road within the network.

Footway priorities may sometimes conflict with carriageway priorities, and hence it is necessary to define footway and cycleway hierarchies.

For operational efficiency reasons when any highway element (either footway, cycleway or carriageway) runs adjacent to another element, the individual element

having the highest hierarchy will determine the frequency of inspection of these other elements.

Walked safety inspections are carried out where applicable.

The defined operational processes seek to take into account the safety of all highway users whilst at the same time retaining an awareness of the constraints placed upon the Authority by defined and limited budgets and human resources.

These hierarchies are dynamic and reviewed to reflect any changes in network characteristics which may result due to the actual use of the network rather than the use expected when the hierarchy was originally defined.

"Well-Managed Highway Infrastructure: A Code of Practice (2016)" offers a reference point from which Highway Authorities can develop local hierarchies and for this purpose Ceredigion will apply the following as its main criteria with adjustments for usage:

Code of Practice Hierarchy Level Names	CSSW Hierarchy Level	Traffic Volume Band (approx.)
Strategic Route	CHSR	Based on local importance rather than traffic flow but often in the range >20,000 [30,000 for calculations]
Main Distributor	CH1	10,000 to 20,000
Secondary Distributor	CH2	5,000 - 10,000
Link Road	CH3	1,000 - 5,000
Local Access Road	CH4	200 – 1000
Minor Road	CH5	<200

Table 8.1 – Highway (Carriageway) Hierarchy

Highway (Footway) Hierarchy

The same principle has been adopted for the establishment of footway hierarchy. There is substantially less data available for footfall and this will need to be gathered over time.

Footway hierarchy is based predominantly upon use/traffic volumes and

– can be adjusted to reflect local conditions;

– is intended to create national consistency;

– is to be documented with reasons for any variances from the method.

It is expected that officer judgement will be used to estimate footfall for different footways in order to apply the method in the absence of data.

In addition, and for operational efficiency reasons, when a highway element runs adjacent to another element, be it cycleway, footway or carriageway, the element which has the highest inspection frequency will determine the frequency of all elements.

Ceredigion will adopt the hierarchy detailed in Table 8.2:

Code of Practice Footway Network Hierarchy Category	CSSW Footway Hierarchy	Footfall Level (indicative)
City Centre Pedestrian Area	FHVHU	> 10,000 (15,000 used for calculations)
Town Centre Pedestrian Area	FH1	5,000 - 10,000
Footway Outside Public Facilities	FH2	1,000 - 5,000
Link Footway (between estates / areas)	FH3	500 - 1,000
Housing Estate Footway	FH4	< 500
Little Used Rural Footway	FH5	< 100

Table 8.2 – Highway (Footway) Hierarchy

Highway (Cycleway) Hierarchy

There are increasing developments in promoted routes for cyclists therefore, and subject to review, Ceredigion will adopt the guidance in the Code of Practice and continue to apply the following table to signify the relative hierarchy.

In addition for operational efficiency reasons the highway element cycleway, when running adjacent to another element (footway or carriageway), or forming a lane of the carriageway, the element having the highest hierarchy will determine the frequency of inspection of this cycleway.

Category	Category Name	Description
A	Cycle Lane	Lane forming part of the carriageway, commonly a strip adjacent to the nearside kerb.
B	Cycle Track	A highway route for cyclists not contiguous with the public footway or carriageway. Shared cycle/pedestrian paths, either segregated by white line or other physical segregation, or un-segregated.
C	Cycle Trails	Leisure routes through open spaces.

Table 8.3 – Highway (Cycleway) Hierarchy

9. Inspection Regime

Safety Inspections

A risk based establishment of hierarchies is being undertaken predominantly based upon use. Table 9.1 details the recommended inspection frequency. See Appendix B.

Frequency of Inspection

The frequency of inspection is again broadly set in accordance with *"Well Managed Highway Infrastructure: A Code of Practice (October 2016)"* with minor adjustments to avoid conflict between carriageway and footway hierarchy. Where conflicts do exist, for example at a pelican crossing, the footway hierarchy will always take precedence in determining of inspection frequency.

Changes in the stipulated frequencies must be approved by the Corporate Lead Officer for Highways and Environmental Services before implementation.

In addition the council has authorised deferment of the inspection regime in its entirety during periods where inspection is not possible. The authorisation form for the suspension of highway inspections is provided as Appendix D.

Safety Inspections shall normally be carried out at the fixed intervals set out in table 9.1. However, the programme of inspections may be suspended for extraordinary reasons. These include but are not restricted to statutory or fixed holidays, periods of exceptional weather where flooding or snow prevents a proper inspection of the road network, and other emergency or extreme events. Where inspections are suspended for periods of 2 days or less the roads and footways which were due to be inspected on these days shall be inspected within 2 weeks of the date that inspections resume. Where the period of suspension exceeds 2 days then, with the approval of the Corporate Lead Officer Highways and Environmental Services, and the cabinet member, the whole inspection programme shall be rolled forward/reset and resumed as if the period of suspension had not happened. Where approval is given to roll

forward the inspection programme the reasons for and duration of the suspension must be logged on the Asset Management System.

Feature	Category	Inspection Frequency
Roads	CHSR	Monthly
	CH1	Monthly
	CH2	Every 3 months
	CH3	Every 6 months
	CH4	Annually
	CH5	Reactive Inspections
Footways	FHVHU	Monthly
	FH1	Monthly
	FH2	Every 3 months
	FH3	Every 6 months
	FH4	Annually
	FH5	Reactive Inspections
Cycle Routes	A	As for roads
	B	Every 6 months
	C	Every 6 months
Car Parks		Monthly

Table 9.1 – Inspection Frequency

Operational Factor

Inspections shall be carried out on a route optimisation basis to ensure maximisation of operational efficiencies with the resources available. This will result in certain sections of the network now classified as having a lower frequency of inspection being inspected at a higher frequency than specified, for example, a section of the network specified as being inspected on a frequency of 3 months actually being expected on a monthly return period if it is operationally more efficient.

Inspection Tolerances

A tolerance should be included to allow for unavoidable incidences such as bad weather, training, inspector sickness etc. When these are necessary it is recommended that the tolerance applied to each inspection frequency is 50% of the prescribed inspection interval or 3 months (whichever is the least).

Any changes to the above frequencies must be approved by the Corporate Lead Officer for Highways and Environmental Services and the cabinet member before they are implemented. See Appendix D.

Defects

A Critical Defect is one that the inspector considers presents a risk to safety high enough to require immediate action. Defects that pose an immediate or imminent risk of injury to road users typically include items such as a collapsed cellar, missing utility cover, fallen tree, unprotected opening etc. Critical defects should be made safe at the time of the inspection if practicable or attended by the inspector until such time as the defect can be made safe. Making safe may constitute displaying warning notices, coning or fencing off to protect the public from the defect. The minimum standard for a critical defect is a response time of 2 hours (to attend and make safe as soon as possible thereafter).

- **A Safety Defect** is one that requires prompt attention because it presents an imminent hazard. Safety defects requiring a response as soon as possible to remove a potential risk of injury to users will typically include items such as particular sizes of potholes, trip hazards, dislodged kerbs etc. If practical, safety defects should be made safe at the time of the inspection. This may constitute displaying warning notices, coning or fencing off to protect the public from the defect. If it is not possible to correct or make safe the defect at the time of the inspection, repairs of a permanent or temporary nature should be carried out within the response time specified. CSSW's minimum standard

provides dimension data that can be used as a guide to identifying safety defects for different network hierarchies.

- **A Maintenance Defect** is one that is not a safety defect but requires repair at an appropriate time to guard against further deterioration. They do not present an imminent hazard to users. Maintenance defects should be categorised as higher priority: defects that warrant treatment in order to prevent them deteriorating into a safety defect prior to the next scheduled inspection, and lower priority other defects that warrant treatment in order to prevent them deteriorating to such an extent that additional works or costs are incurred.

Degree of Deficiency

The degree of deficiency in highway elements will be crucial in determining the nature and speed of response. The table below provides a baseline. Highway Inspectors will maintain the right to investigate and possibly intervene on a risk basis at any time. Risk based assessments will be informed by the use of Ceredigion's Inspection Defect Recording Manual, training, briefing and quality control mechanisms.

Carriageway Repair Regime: Response Times				
Carriageway Hierarchy	**Safety Defect**		**Maintenance Defect**	
CHSR	>50mm	By the end of the next working day	>40mm	1 month
CH1	>50mm		>40mm	
CH2	>50mm		>40mm	
CH3	>75mm	5 days	>50mm	3 months
CH4	>75mm		>50mm	
CH5**	>75mm		>50mm	

Table 9.2 – Carriageway Repair Regime: Response Times

** Defect triggers on CH5 roads are to be considered to be at an investigatory level

Defect Size

The defect sizes chosen for each type of defect and hierarchy reflect the fact that carriageway defects deteriorate more rapidly on more heavily trafficked roads as a result of the volume of vehicles running over them. A defect of 50mm depth on CH2 and above will be subjected to repeat trafficking. All these roads carry >5,000 vehicles per day and as such a pot hole could deteriorate rapidly into a more hazardous feature if not repaired promptly. For this reason, a differential standard of safety defect size has been adopted for the minimum standard shown within Table 9.2.

Response Times

The proposed response times are also based upon taking into account the different levels of use. Appendix A shows how risk exposure has been calculated and used to show what response times are required to deliver a consistent level of risk exposure across all levels of the hierarchy.

See Appendix A.

10. Defects associated with other parties

Some defects occurring on the highway are associated with defective utility or private apparatus that include covers to inspection chambers, boxes or meters. Acting as highway authority and following an on site risk assessment, the Council will in order to protect the public from encountering such a dangerous defect, erect the necessary temporary signing and guarding to make the area safe.

After determination of the fault, the Council accepts the responsibility or passes the responsibility to the utility company or third party.

Other defects associated with other third parties, such as overhanging vegetation and encroaching fencing, or illegal obstructions of the highway that cause interference to the free and safe flow of road users, shall be recorded and may be dealt with by undertaking the remedial works and recharging or by means of an enforcement letter, and submitted for further investigation. These actions may include legal proceedings.

11. Management System and Data Capture

Highways Services utilises an integrated Infrastructure Asset Management System (IAMS) across a number of business areas. This system is used to collect, update and manage key data linked to sections of road, which are identified using the National Street Gazetteer's Unique Street Reference Number (USRN). Data can be GIS linked and the system allows for the linked storage of photographs and documents.

The main IAMS is web-based and is accessed via personal computers and laptops. Inspection and works modules are accessed via handheld mobile devices. Mobile working by Highways Inspectors facilitates receipt and communication of real time information.

The IAMS is used (although not exclusively) to schedule inspections, record defects, issue works tickets and receive/respond to customer enquiries. Features of these processes include:

- Inspection dates for all roads to be inspected are scheduled in advance and downloaded weekly to mobile devices.
- Defects are recorded and prioritised by Highways Inspectors on mobile devices via selection from standard menus and sent back to the main system in real time, or stored when out of signal for later transmission.
- To facilitate a quick response, selected Category 1 defects are sent direct to works gangs via mobile devices when they are recorded.
- Where appropriate, Inspectors will plot defects on a map, and take and attach photographs to defects.
- Customer service requests are sent direct to mobile devices to prompt reactive ad-hoc inspections.

- Responses to customer requests where reactive inspections do not generate defects are recorded and notification returned to customer services.

- Any agreed deferral or suspension of inspections is facilitated via the system and recorded.

Reporting from the IAMS system is used for strategic planning as well as operational, performance management and claim defence purposes.

Appendix A

Defect Criteria – Response Times

Defect Categories	Description	Response Time
Critical Defect Cat 1	A situation where the inspecting officer considers the risk to safety high enough to require immediate action, e.g. collapsed cellar, missing utility cover, fallen tree, unprotected opening, ➢ Requiring an immediate response to make the site safe	2 Hours
Safety Defect Cat 1.1 Cat 1.5	Defects that pose an imminent risk of injury to road users, ➢ Requiring a response as soon as possible to remove a potential risk of injury to users	By End of Next Calendar Day (CHSR, CH1, CH2) Within 5 Calendar Days (CH3, CH4)
Maintenance Defect Cat 2.1 Cat 2.3	Defects that warrant treatment to prevent them deteriorating into a safety defect prior to the next scheduled inspection, ➢ Requiring a response to prevent them becoming a safety defect	1 month (CHSR, CH1, CH2) 3 months (CH3, CH4)
Programmed Repairs Cat 3	Defects that warrant treatment, in order to prevent them deteriorating to such an extent that additional works or costs are incurred.	As per the local works programme

Appendix B

Risk Assessment – *See separate Excel file.*

Appendix C

Supporting Rationale – *See separate PDF file.*

Appendix D

CYNGOR SIR CEREDIGION COUNTY COUNCIL

Gwasanaeth Priffyrdd ac Amgylcheddol
Highways and Environmental Services

GOHIRIO ARCHWILIADAU DIOGELWCH Y FFYRDD SIROL
SUSPENSION OF HIGHWAY SAFETY INSPECTION

Cyfnod y gohiriad: *Period of suspension:*	**O** *From*	**Hyd** *To*
Rheswm am y gohiriad: *Reason for suspension:*		

Rhoddir awdurdod i ohirio'r archwiliadau diogelwch ffyrdd sirol dros y cyfnod a nodir am y rhesymau a roddir uchod.
The suspension of highway safety inspections is duly authorised for the period noted due to the reasons given above.

Corfforaethol – Gwasanaethau Priffyrdd ac Amgylcheddol *Corporate Lead Officer - Highways and Environmental Services*	**Dyddiad** *Date*
Aelod Cabinet *Cabinet Member*	**Dyddiad** *Date*

End of Document

1. Carriageway Hierarchy

Complete this sheet by filling in the yellow cells	When completed…	Click on here to Return to Record of Completion

NETWORK/ASSET DETAILS									USE ASSESSMENT										REGIONAL CONSISTENCY CHECK			CONFIRMATION OF FINAL HIERARCHY			INSPECTION SCHEDULE	
a. Enter network data in here from the street gazeteer						b. Identify strategic routes		Initial Proposed Road Hierarchy will populate here based on road class	c. Review assumed traffic flow band, does it appear a reasonable assumption?			Insert traffic count figures used. These may be actual or extrapolated or estimated			d. Does this road carry levels of HGV that warrant different inspection and repair?	A recommendation as to whether a review should be undertaken will populate here based on the primary considerations	e. Is this section of road part of a major designated diversion route (e.g. for pre-planned diversion for motorway or trunk road closures) such that it warrants different inspection and repair	A recommendation as to whether a review should be undertaken will populate here based on the secondary considerations	Insert the Road Hierarchy you have decided upon based on your review of secondary considerations	Is this section of road one that crosses into the neighbouring authority?	Is the hierachy the same as in the neighbouring authority		Insert the reasons for the hierarchy you have decided upon following your review/s	The Final Road Hierarchy will populate here based on initial road class and the reviews undertaken	Any additional comments that have a bearing on the hierarchy or notes to carry through to the setting of inspection regime etc.		
									Primary Consideration: Traffic Volumes/Use								Secondary Considerations						Enter in the Yellow cells the reasons for				
USRN	Road Name	Road Number (A,B,C,U)	Section Number	Speed Limit (mph)	Existing Hierarchy	Is Road a Strategic Route?	For strategic routes state the reason for considering it strategic	1. Initial Proposed Road Hierarchy	Is the assumed traffic flow within the band indicated below?			AADT (insert actual where known.) (Insert extrapolated / estimated where it is not within the assumed traffic flow band)	State the source of Traffic Data quoted in col M (actual count, extrapolated or estimated)	Basis of Estimate	Does the road have a large volume of HGVs?	Consider reviewing the Road Hierarchy?	Is this part of a major "designated" diversion route? (e.g. for pre-planned diversions for motorway or trunk road closures)	Does the Road Hierarchy need reviewing?	2. Reviewed Road Hierarchy	Does this road cross a regional boundary? i.e. into the neighbouring authority?	Enter the hierarchy on the neighbouring authority road section	3. Reviewed Road Hierarchy		4. Final Road Hierarchy	Comments	Projected Inspection Schedule	Current Schedule
471/22668	A4120 FROM HEOL Y BONT TO SOUTHGATE ISLAND	A			4	Yes	2004 Report Strategic Routes in Ceredigion	CHSR	20,000 - 30,000	No	No	16336	Traffic Count	DfT 2018	No	Yes	Yes	Yes	CHSR	No			Strategic Route of Local Importance	CHSR	Div Route, Link between A44 & A487	1 Month	4 Weeks
471/00762	B4577A FROM CROSS INN TO THE ENTRANCE OF FORESTRY COMMISSION ROAD	B			12	Yes	2004 Report Strategic Routes in Ceredigion	CHSR	20,000 - 30,000	No	No	1145	Traffic Count	DfT 2009	No	Yes	No	Yes	CH2	No			Strategic Route of Local Importance	CH2		3 Months	12 weeks
471/22746	A486 FROM FFOSTRASOL TO BWLCHYGROES	A			4	Yes	2004 Report Strategic Routes in Ceredigion	CHSR	20,000 - 30,000	No	No	1000 -5000	Extrapolated	Local Knowledge	No	Yes	No	Yes	CHSR	No			Strategic Route of Local Importance	CHSR		1 Month	4 weeks
471/00471	A484 FROM THE HOLT TO PROPERTY KNOWN AS KYNANCE	A			4	Yes	2004 Report Strategic Routes in Ceredigion	CHSR	20,000 - 30,000	No	No	4460	Traffic Count	DfT	No	Yes	No	Yes	CHSR	No			Strategic Route of Local Importance	CHSR		1 Month	4 weeks
471/01348	C1019 FROM BOW STREET TO THE JUNCTION OF THE C1010	C			12	No		CH3	1,000 - 5,000	Yes					No	No	No	No		No				CH3		6 Months	12 weeks
471/00457	C1010 FROM PFYNON CARADOG TO THE JUNCTION OF THE C1019	C			12	No		CH3	1,000 - 5,000	Yes	Yes	1,705	Traffic Count	DfT	No	No	No	No		No				CH3		6 Months	12 weeks
471/00902	C1008 FROM LLANGEITHO TO PRIVATE ROAD LEADING TO CEFNGWEDDIL	C			12	No		CH3	1,000 - 5,000	Yes					No	No	No	No		No				CH3		6 Months	12 weeks
471/01096	C1009 FROM ABERPORTH TO THE ENTRANCE OF LLETY CARAVAN PARK	C			12	No		CH3	1,000 - 5,000	Yes					No	No	No	No		No				CH3		6 Months	12 weeks
471/01443	C1063 FROM THE ENTRANCE TO COEDPERTHI TO THE JUNCTION OF THE C1042	C			12	No		CH3	1,000 - 5,000	No	No	307	Traffic Count	DfT 2009	No	Yes	No	Yes	CH4	No			Low use	CH4	Low use	12 Months	12 weeks
471/00961	C1005 FROM THE YSTWYTH TRAIL CROSSING TO THE JUNCTION WITH THE B4340	C			12	No		CH3	1,000 - 5,000	Yes					No	No	No	No		No				CH3		6 Months	12 weeks
471/00269	CHURCH STREET	A486			4	Yes	2004 Report Strategic Routes in Ceredigion	CHSR	20000 - 30000	No	No	2500	Extrapolated	DfT 2018	No	Yes	No	Yes	CHSR	No			Strategic Route of Local Importance	CHSR		1 Month	4 weeks
471/00925	U1044 FROM MILL STREET TO TRACK ENTRANCE NEAR LLETY LWYDIN	U			24	No		CH4	200 - 1000	Yes					No	No	No	No		No				CH4		12 Months	24 weeks
471/07465	U1365 FROM THE JUNCTION OF THE B4343 TO GWARCASTELL	U			24	No		CH4	200 - 1000	No	No	54	Traffic Count	DfT 2017	No	Yes	No	Yes	CH5	No		CH4	Preventative Maintenance	CH4	To prevent deterioration of highway	12 Months	24 weeks
471/07807	U1461 FROM THE JUNCTION OF THE B4576 TO BWLCH	U			24	No		CH4	200 - 1000	Yes					No	No	No	No		No				CH4		12 Months	24 weeks
471/15078	U1616 FROM BRO DERI BETTWS BLEDRWS TO THE JUNCTION OF THE C1071	U			24	No		CH4	200 - 1000	Yes					No	No	No	No		No				CH4		12 Months	24 weeks

Cymdeithas Syrfewyr Sirol Cymru

County Surveyors' Society Wales

Highway Asset Management Planning:

Risk Based Approach to Highway Management

Rationale Behind the Approach

1. Introduction

CSSW is advocating a nationally consistent approach to the management of local highways. A method has been developed under CSSW's HAMP project designed to allow all authorities to adopt the risk-based approach recommended by the new code of practice (Code of Practice). This paper sets out the rational that was adopted in developing that approach.

Common Needs

The national local road network is varied, ranging from heavily trafficked major routes to barely used rural lanes. There is however commonality between groups of roads and assets. It is appropriate that the travelling public can expect similar standards to apply to roads that are equivalent in their function and level of use nationally. This principle underpins CSSW's desire to create a nationally consistent response to the Code of Practice.

Code of Practice Risk-Based Approach

The new Code of Practice recommends that authorities apply a risk-based approach to highway management. In doing so authorities must acknowledge the fact that risk varies across the asset and between asset groups. Managers have always considered risk in their decision making about inspections, repair priorities and works programming. The new code creates a need to formalise such decision making and to ensure that such decisions are, to the extent that such is possible, fact based.

Current Approach

The current code of practice already advocates the use of risk assessment via the use of a risk matrix as shown. The method is conceptually simple and requires identification of the impact of an event and evaluation of the probability of that event occurring. The difficultly is that the table does not specify to what event it refers. If it refers to the risk of a fatality, then the impact is very high and the probability low. If it refers to the risk of 3rd party property damage the impact is low and the probability considerably higher. Both of these events, and others, are possible as a result of a highway defect. The current method therefore requires highway inspectors to concurrently analyse a range of potential events and a range of probabilities to arrive at an appropriate response to a defect. This would be a difficult task if data were available. Without data on impacts and probability this becomes an exercise in individual judgement alone.

Table 5 – Risk Matrix

Probability →Impact↓	Very low (1)	Low (2)	Medium (3)	High (4)
Negligible (1)	1	2	3	4
Low (2)	2	4	6	8
Noticeable (3)	3	6	9	12
High (4)	4	8	12	16
Response Category	Category 2(L) response	Category 2(M) response	Category 2(H) response	Category 1 response

Proposed Approach

The proposed approach to CSSW's risk-based method is to use asset data to inform risk assessment. The intent is to allow decisions to be supported by factual data. It is possible to acquire and analyse data on the events that occur at defects, to collect data on the type, size and location of the defects themselves and to use this as a reference when establishing the key elements of a highway management approach; setting a hierarchy, setting inspection and repair regimes and using the records collected from these to influence budget allocation.

Annual Risk Review

The method proposed by CSSW has been integrated into the CSSW HAMP recommended practices. The updated HAMP practice now recommends completion of a **risk review at least every 2 years.** The risk review assesses all relevant data to assist authorities to refine their hierarchies, inspection and repair regimes based upon analysis of the records generated from their performance records (PIs and operational performance measures).

Refinement and Improvement

There are many areas where improved data will enable better risk assessment. It is expected that the method will be refined as authorities collect and analyse relevant data and are able to document more refined risk assessments. This process will be managed by CSSW using the national HAMP project.

CSSW's Risk-Based Method:
- **is based on using asset data to enable a fact-based assessment of risk** - **uses available asset data** - **will be refined as better data is collected and analysed** - **uses regular reviews of risk data to inform refinement of hierarchies and inspection and repair regimes.**

The basis upon which the key steps of the method have been created are explained below.

2. Establishing Risk-Based Hierarchies

The requirement to split the asset into hierarchies exists in the current code. It has been retained in the new code but with the onus placed upon authorities to determine how best to apply the risk -principle in determining appropriate hierarchies. The new code states that *"Carriageway hierarchy will not necessarily be determined by the road classification, but by functionality and scale of use."* and provides a table, an extract from which is shown below.

Secondary Distributor	B and C class roads and some unclassified urban routes carrying bus, HGV and local traffic with frontage access and frequent junctions	In residential and other built up areas these roads have 20 or 30 mph speed limits and very high levels of pedestrian activity with some crossing facilities including zebra crossings. On-street parking is generally unrestricted except for safety reasons. In rural areas these roads link the larger villages, bus routes and HGV generators to the Strategic and Main Distributor Network.

This is a reference but does not include the most significant factor that affects risk; use. Roads that carry 10,000 vehicles a day have a much greater potential for an adverse event to occur than ones carrying 500 vehicles a day. Simple fact.

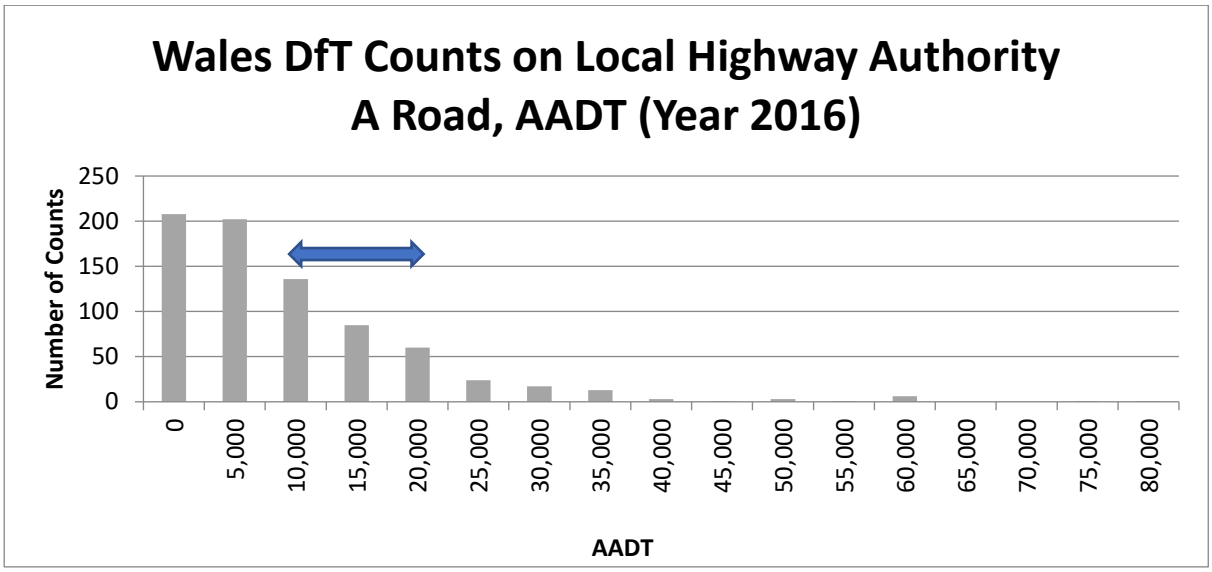
It is possible to estimate use for all roads based upon available traffic count data. CSSW has chosen to recommend that a risk-based hierarchy should be set predominantly based upon use. This does not preclude authorities making necessary adjustment to consider particular local use patterns and issues.

Other Considerations

Additional consideration may influence the choice of hierarchy level. The principle advocated however is that any adjustment is justified by reference to appropriate data.

Road Class

All local roads are already ascribed a class; A, B or C if classified or unclassified. Road class has been used by many authorities to date either as their de facto network hierarchy or as the basis for establishing it. Road class is broadly indicative of use and thus risk. However. There are major variations nationally that means the creation of a hierarchy based solely on road class is not appropriate. The traffic count data collected by the Department for Transport includes 761 counts on local authority managed Welsh A roads. The most recent figures for these sites show a range of average annual daily traffic (AADT) from 83,000 to 431. 29% of the counts fall in the range 10,000 to 20,000 vehicles per day. All authorities except Powys and Anglesey have roads in this usage band. The very heavily trafficked roads are predominantly in areas around Cardiff and are atypically high. The results are shown in the graph below



The graph illustrates the range of traffic volume represented in the DfT data. There are many A roads with volumes in the 10,000 to 20,000 range. There are almost double that with volumes below this. The proposed method of establishing hierarchy is recommending that authorities differentiate between road based on their use and as such should for example adopt a different regime of inspection and repair for roads carrying 15,000 vehicles a day to roads carrying 5,000 a day regardless of whether they are designated as an A road.

To establish a means of referencing hierarchy by traffic volume the following table was developed. The range of 10,000 to 20,000 vehicle per day has been adopted as the starting point. This range was taken to represent a type of busy road that exists in most authorities. These have been allocated as “CH1”. CSSW has adopted a nomenclature for hierarchy based on codes as shown below. This is to avoid potential confusion that could be created from the descriptions used in the code, which are only provided as guidance.

Code of Practice Hierarchy Level Names	**CSSW Hierarchy Level**	**Traffic Volume Band (approx.)**
Strategic Route	CHSR	Based on local importance rather than traffic flow but often in the range >20,000 [30,000 for calculations]
Main Distributor	CH1	10,000 to 20,000
Secondary Distributor	CH2	5,000 - 10,000
Link Road	CH3	1,000 - 5,000
Local Access Road	CH4	200 – 1000
Minor Road	CH5	< 200

a figure of 30,000 has been adopted for calculations later in this method. This represents the busiest level of roads nationally. It is accepted that there are a small number of roads that have volumes that exceed this level. The authorities with these roads shall need to specifically assess the risk associated with these roads to warrant if they require inspection and repair regimes that exceed those ascribed to CHSR.

The risk-based method recommends that authorities document their carriageway hierarchies by considering predominantly traffic volume. Secondary/local considerations can also be applied but should be supported with appropriate justification for variances from table above. In reality factors referred to in the Code, such as access to hospitals, would often be a factor of usage level and should be considered when estimating traffic flows.

CSSW's Risk-Based Method: Carriageway Hierarchy:
- is based predominantly upon use/traffic volumes - can be adjusted to reflect local conditions - is intended to create national consistency - is to be documented with reasons for any variances from the method

Footway Hierarchy

The same principle has been adopted for the establishment of footway hierarchy. There is substantially less data available for footfall. As with carriageways the method uses a benchmark of the most heavily used footways. A "FHVHU" level has been used as the common starting point. It is known that Cardiff, Newport and Swansea may have footway areas in the city centre that fit into this band of use and other authorities may have too. A limited amount of footfall data was available to inform the choice of levels of use. Two footfall counts were available for FH1 level, which is expected to be the smaller towns across Wales e.g. such as Pontypridd (population 33,000), Port Talbot (population 36,000) and Aberdare (population 32,000).

Street	**Town**	**Footfall Count**
Canon Street	Aberdare	6376
Taff Street	Pontypridd	9235
Shopping Centre (Main Entrance)	Port Talbot	7250 –(8am - 6pm)

On the assumption that these locations are representative of many towns around Wales a banding of 5,000 to 10,000 footfall has been assumed for FH1 "Town Centre Pedestrian Area".

Other available data has been used to create the table shown below. CSSW has adopted a code-based nomenclature that relates broadly to the categories used in the code of practice as shown below. The names used in the code are for guidance only and this method does not use them in order to be clear that the primary determinant of hierarchy level is its use. (footfall)

Code of Practice Footway Network Hierarchy Category	CSSW Footway Hierarchy	Footfall Level (indicative)
City Centre Pedestrian Area	FHVHU	> 10,000 (15,000 used for calculations)
Town Centre Pedestrian Area	FH1	5,000 - 10,000
Footway Outside Public Facilities	FH2	1,000 - 5,000
Link Footway (between estates / areas)	FH3	500 - 1,000
Housing Estate Footway	FH4	< 500
Little Used Rural Footway	FH5	< 100

It is expected that officer judgement will be used to estimate footfall for different footways in order to apply the method. It is recommended that where estimates are used authorities should undertake sample surveys to validate their assumptions. Reference can also be made to a range of sample count data undertaken by RCT to inform the bandings. This data is available to authorities via CSSW's HAMP khub website.

Other considerations

The Code of Practice contains a list of a number of criteria that may be relevant to establishing a footway hierarchy including pedestrian composition, proposed usage etc. No evidence was available when developing this guidance to indicate that these factors are habitually associated with increased risk. It has therefore been decided to exclude them from the method unless and until evidence is collected that warrants their inclusion. It is planned to carry out targeted data collection by authorities coordinated by the HAMP project to improve the data available. Such evidence would most likely be in the form of statistical evidence of the increased incidence of adverse events at locations with these features.

CSSW's Risk-Based Method: Footway Hierarchy
- **is based predominantly upon use/footfall volumes** - **can be adjusted to reflect local conditions** - **Is intended to create national consistency** - **to be documented with reasons for any variances from the method**

Structures Hierarchy

Structures require a slightly different approach to carriageways and footways and the hierarchy should be based more on risks to the functionality of the network. Whilst use is a key consideration it is important to consider the consequences of a structure being out of service or restricted (weight or use restrictions introduced). It is possible for example for there to be 3 bridges over a river in a town each on a different road hierarchy road but each equally important in terms of potential traffic disruption. Closure of any of these structures would cause equally significant traffic disruption. It is important that the structures hierarchy is able to include such considerations and to allocate them as equally important.

Some structures on roads at the lower end of the road hierarchy may be on the only route into a rural community while restricted use of others may involve very long diversion routes or impacts on public transport. Closure of the structure would represent a major disruption albeit to a relatively small number of people, they however require managing with this in mind. Structure hierarchy has been defined as below:

1. **Vital:** a structure that is vital to the network i.e. if restricted or out of service it would cause a very significant adverse effect such as major traffic delays with the potential to affect other important services or community severance
2. **Important:** a structure that is important to the functioning of the network, i.e. if restricted or out of service would have an adverse effect on the operation of the network
3. **Standard:** all other structures

To derive the hierarchy all structures are to be assigned an initial hierarchy category based on the hierarchy of the road or footway that the structure carries or crosses. The initial structure hierarchy should be based on the table below using the highest hierarchy for either carriageway or footway. For footbridges and other structures that are solely associated with a footway or footpath the initial structure hierarchy should be based on relating it to the footway hierarchy of the adjacent footway

Road Bridges, Culverts, Retaining Walls etc	
C-way Hierarchy	**Structure Hierarchy**
CHSR, CH1, CH2	Important Structure
CH3, CH4, CH5	Standard Structure
F-way Hierarchy	**Structure Hierarchy**
FHVHU, FH1	Important structures
FH2, FH3, FH4, FH5	Standard Structure

At this stage the rating of a **Vital Structure** is not used and is only populated following the assessment of other relevant considerations as shown below.

Rule	**Suggested Hierarchy**
Sole Access to community	Vital Structure
Both major traffic disruption **and** lengthy diversion route	Vital Structure
Either major traffic disruption **or** lengthy diversion route	Important Structure
Susceptible to rapid failure	Important Structure
Significant social or economic impact	Important Structure
Structure of local significance	Important Structure

Retaining Walls

The method can be applied to retaining walls. It is however acknowledged that many authorities do not hold a full inventory of their retaining walls and as such this cannot be fully applied until the inventory is captured.

CSSW's Risk-Based Method: Structures Hierarchy
- **is based initially on the relevant carriageway or footway hierarchy** - **can be adjusted to identify vital structure the restriction of which has been assessed as having the potential to cause major disruption**

Street Lighting

The function of street lighting can be broadly split into two categories:

- Highway Safety Lighting
- Community Lighting

The risks associated with the existence and operation of street lighting are related to the purpose of the lighting. There are however overarching risks that are largely independent of the category and location of the lighting. Safety risks relate predominantly to critical defects, for example where there is potential for electrocution. In theory the risk like the risk of a carriageway defect is a function of the number of people potentially exposed to the hazard. For lighting however, this is not as directly related to flow as it is for carriageways and footways. A light by the side of a heavily trafficked road with no footway is exposed to a large number of vehicles but the risk of them coming into contact with a unit that has become live is small. The unit may even be behind a safety fence, consequently the response to these is not driven by considerations of use. The risk is considered to be at such a level that as immediate a response as possible is considered appropriate regardless of where the asset is on the network. Safety risks apply equally to each category of lighting.

It is noted that a column that has collapsed would be treated as a carriageway and/or footway hazard and thus the inspection and repair regime for carriageways and footways would apply and set the appropriate response.

The risks associated with an individual light that has failed/gone out is considerably less than a safety defect. If an individual unit fails it is invariably part of a collection of lights in a road and will not create absolute darkness as light from adjacent units will provide some lighting albeit at a reduced level.

At this stage the CSSW method does not promote the use of a street lighting hierarchy as the basis for setting inspection and repair regimes. This may be reviewed when risk data is analysed as part of the required annual risk review.

Hierarchy as the Basis for Part-Night Lighting and Dimming

Where an authority has chosen to adopt a regime of part-night lighting and/or dimming they should have done so after the completion of a risk assessment. This method is consistent with the tenets of the new code of practice and the CSSWs risk-based method. It is recommended that this risk assessment is appropriately referenced in that authority's response to the code and the various sections of the lighting asset, subject to the adopted regime, being identified as the street lighting hierarchy for that purpose.

CSSW's Risk-Based Method: Streetlighting Hierarchy
- **is limited to differentiating between assets under different management regimes i.e. part night lighting and/or dimming** - **will be reviewed as risk data is analysed.**

Traffic Signals

All traffic management assets are to be assigned an initial category based on the hierarchy of the road where it is located based on the table below. For junctions that serve more than one road hierarchy the highest hierarchy should be used:

Carriageway Hierarchy	**Traffic Management Hierarchy (As per highest Carriageway hierarchy)**
CHSR	Primary Junction
CH1	
CH2	Secondary Junction
CH3	Local Junction
CH4	

All other traffic management assets (including pedestrian crossings) will initially be assigned the hierarchy of the adjacent road or footway hierarchy (the highest of the two). Further refinement of the hierarchy should be based upon local factors such as the importance of the junction to traffic management of the town/city it is located in.

Other Highway Assets not covered above e.g. Drainage, Street Furniture

Drainage and street furniture assets have not had separate hierarchies applied to them. They are mainly items that are inspected during routine inspections and as such the appropriate carriageway or footway hierarchy dictates the frequency of inspection and influence the categorisation and response to defects.

3. Risk Data Review

The method is built around a regular reviews of risk data (a minimum of every 2 years is recommended). It is recognised that there is potential for improvement in the data that can be analysed to improve understanding of risk. It is also accepted that risks change over time as the condition and use of the asset changes. The review is therefore the key step of the method from which proposed refinement of hierarchies, inspection frequencies and the repair regime can be made.

The risk review records data that relates to risk categorised as:

- Safety; the risk of user injury
- Maintenance; the risk of escalating maintenance needs (and cost)
- Financial Loss; the risk of incurring avoidable financial loss (e.g. 3rd party claim payout)

Risk Data Summary

Enter Relevant Data									Consider what it may mean	Record Observation on risks
		Enter data items, many of which come from the performance reporting regime						*What is trend of the period?*		*Consider if the data reflects a changing risk profile and thus need to refview the inspection regime*
Asset		**Data**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Trend**	**Interpretation**	**Observations**
Carriageways	Safety	Number of Cat 1 Defects							Increasing number of potential dangerous defects = increasing risk to road users	
		% of A Roads in poor condition (red, scanner)							Roads in poor condition have greater potential for dangerous defects	
		% of B Roads in poor condition (red, scanner)							^"	
		% of C Roads in poor condition (red, scanner)							^"	
		% of U Roads in poor condition (red, scanner) and or visual							^"	Unknown ? !!
		KSI (where road condition was a contributory factor)								
	Maintenance	Number of Cat 2 defects recorded							Escalating levels of minor defects can indicate increasing maintenance needs (now and in the future)	
		Number of Cat 2 defects not repaired (repair backlog)							If increasing numbers of repairs are not being repaired it	
		(% of roads to be considered for maintenance A roads (red and amber)							increasing amount of road requiring maintenance …. Will need to be addressed sometime	
		(% of roads to be considered for maintenance A roads (red and amber)								
		(% of roads to be considered for maintenance A roads (red and amber)								
		(% of roads to be considered for maintenance A roads (red and amber)								
	Financial	Value of payout of 3rd party claims								
		Number of claims received								
		Number of claims lost due to not adhering to inspection regime								
		Number of claims lost for other reasons								

The data collected is based around data that authorities already collect (for example for performance monitoring and reporting) and data that is readily collectable during normal operational activities (during inspections and repairs).

The method requires that the results are reviewed for significant changes and trends in the risk they represent. The data is also an input into risk assessment used to establish inspection and repair regimes.

4. Establishing an Inspection Regime

Risk based establishment of hierarchies is being undertaken predominantly based upon use. This reflects the fact that if a hazard or hazardous feature exists on an asset then the risk is a direct function of the number of users exposed to it. This principle is also applied to the establishment of inspection regimes. To provide a rational basis for establishing an inspection regime the concept of risk exposure has been adopted. Risk exposure is a measure of the exposure of users to a hazard. For carriageways the risk exposure has been calculated based upon the following:

- An individual defect. The exposure is measured based upon the number of people/vehicles exposed to an individual defect. It could have been developed based upon actual historical numbers of defects on different parts of the asset but the data on defects is not reliable enough at present to make this appropriate. Fluctuating numbers of defects would have created a constantly changing exposure making it impossible to derive a regime that could be adopted in practice
- Risk exposure is based upon an assumed response time to a safety defect of 24 hours.
- The inspection frequency for strategic routes (CHSR) have been adopted as the baseline level against which other hierarchy's inspection frequencies are developed from.
- The inspection interval for strategic routes (CHSR) recommended by the previous Code is a monthly regime (hence 30 days). This has been widely accepted as reasonable by Courts as suitable for the highest categories of local authority roads.
- A maximum exposure has been calculated using the maximum time a defect could be present before being repaired and the maximum number of vehicles being exposed to it (the top traffic volume in the band).

Baseline Inspection Frequency

As a baseline from which inspection frequencies for other levels of hierarchy can be derived the strategic route level has been chosen. It has been assumed that these roads carry traffic volumes in excess of 30,000 per day and exist in most authorities. A review of current inspection frequencies revealed that most authorities currently inspect these roads on a monthly basis.

The appropriateness of this has been considered by considering the categories of risk in turn as follows:

Safety Risk; is there evidence that current inspection regimes are providing inadequate protection against safety risk for users?

There is little detailed data available to enable detailed analysis of this question. Some broad analysis is possible which has been used as a reference to the choices of existing levels of inspection as a baseline position.

Data is available on safety outcome in the form of records of KSI (killed and seriously injured). These statistics are published annually by the police and used by councils as an input into their road safety programmes. They can be used to provide an overarching reference for the level of safety provided.

In 2016 there were 4,921 injury accidents recorded in Wales by the police(1). Of these contributory factors were recorded 2,257 times. The contributory factors record the attending police officer's opinion of the factors that contributed to the accident. They include driver error, impairment or distraction etc as well as Road Environment. Road environment includes condition as well as other factors such as alignment etc. It is therefore an over estimate of the effect of condition to include all of these for the calculation that has been made. Road environment was quoted as contributory factor 208 times. A prorate calculation therefore estimates 454 accidents where road environment was a potential contributory factor.

Accident Statistics	Source	Police recorded road accidents in Wales, 2016
Total	4921	29
Contributory Factors (total)	2257	June
Road Environment a CF (very likely or likely)	208	201
With Road Environment as a CF	**454**	**approx. injury per year with road environment as a contributory factor**
Traffic Volume Statistics	Source	Road Traffic in Wales, 2016
Vehicle Km travelled.	18.2	bn vehicle km
	1,000,000,000	bn
	18,200,000,000	vehicle kms
1 injury accident in every	40,131,579	km travelled
1 injury accident in every	40	million vehicle km travelled

Traffic volume statistics(2) show that an estimated 18.2bn vehicle km were travelled on local roads (excluding trunk roads). This means that there was on average 1 injury accident recorded by the police for which road environment was a contributory factor, for every 40 million vehicle km travelled. This indicates that on the whole local roads are reasonably safe. The accident statistics (1) also show there were 95 incidents that resulted in fatalities (representing 1 incident per 2,079million km travelled) and that there were 975 incidents that resulted in killed or serious injury (representing 1 per 203 million km travelled).

These statistics illustrate that overall local roads in Wales have a reasonably good safety record. Furthermore, this evidence does not indicate a large contribution of road condition to the statistics that do exist. As these outcomes are in part a result of the inspection and repair regimes currently employed it is reasonable to assume that current regimes are not fundamentally flawed.

For the purpose of developing a rational differential between different road hierarchies a baseline inspection frequency of monthly inspection on strategic routes (CHSR) has been adopted. This is a frequency which was recommended by the previous Code, is used currently by most authorities for their busier roads and has been generally accepted by Courts as reasonable.

Using the method outlined above the risk exposure has been calculated as shown below. This results in the figure of 930,000 per annum as the Risk Exposure Index (REI). This is the maximum number of vehicles exposed to a safety defect before it would be repaired. Considering the overarching statistics above this has been adopted as a starting point until better data is available.

Hierarchy	AADT	Response Time (days)	Initial Inspection Interval (days)	Initial Exposure Time (days)	**Initial REI (k pa)**
CHSR	30,000	1	30	31	930.0

The inspection intervals for the other levels of hierarchy are calculated by working out what inspection interval delivers the same level of risk exposure across all levels of the hierarchy. As illustrated below this means that minimum inspection frequencies could be as little as once every 12 years theoretically for minor roads. It is recognised that the condition information required to inform proper asset management of the network will be required much more frequently than this, and for the lower hierarchy roads it is considered that condition inspection requirements should drive the inspection regime. While there is little condition data available for the lower hierarchy roads at present, it is considered reasonable that for roads known to be in good condition a two-year inspection interval would be suitable to provide condition information.

Typical Current Inspection Regime						**Routine Inspection Frequency for Safety to provide the same level of risk exposure across all hierarchies**					
Asset Information	**Use Data**	**Time Data**			**REI (k pa)**	**REI (k pa)**	**Time Data**				
Hierarchy	AADT	Response Time (days)	Initial Inspection Interval (days)	Initial Exposure Time (days)	**Initial REI (k pa)**	**Standard REI (K pa)**	Exposure Time (Days)	Inspection Interval (days)	Theoretical Interval to normalise risk exposure (inspections per year)	Safety Inspection Interval for Same Exposure	Comment
CHSR	30,000	1	30	31	930.0	930.0	31	30	12	Monthly	**Baseline interval**
CH1	20,000	1	30	31	620.0	930.0	46.5	46	8	Every 6 weeks	
CH2	10,000	1	60	61	610.0	930.0	93	92	4	Every 3 months	
CH3	5,000	1	180	181	905.0	930.0	186	185	2	Every 6 months	
CH4	1,000	1	365	366	366.0	930.0	930	929	0.4	Every 2 years	
CH5	200	1	365	366	73.2	930.0	4650	4649	0.08	Every 13 years	

The method is recommending a default minimum inspection regime on roads of CH4 and above of two years where condition data is available to show the assets are in good condition and annually if condition data is not

available or the asset is known to be in a poor condition. This means the recommended minimum inspection intervals are as shown below:

Routine Inspections		
Hierarchy	**Theoretical Routine Inspections (CSSW Minm)**	**Recommended Minimum**
CHSR	Monthly	Monthly
CH1	Every 6 weeks	Monthly
CH2	Every 3 months	Every 3 months
CH3	Every 6 months	Every 6 months
CH4	Every 2 years	Every 2 years (good condition), annually poor condition or condition unknown
CH5	Every 13 years	Reactive inspections.

The concept of use has been adopted as the basis for establishing a proposed inspection regime. The regime has focused on what is required to manage basic safety i.e. to discharge the authority's duty of care as the highway authority to maintain a safe highway. In the case of CH5 the theoretical minimum frequency of inspection to provide equivalent risk exposure is so infrequent that it is considered appropriate to only carry out reactive inspections on these roads. This is based on the assumption that this category of road is used predominantly by locals who will report required repair before a regime of inspection would identify them.

There is a logic used to determine an appropriate differential inspection regime based upon use such that an approximately similar level of risk exposure is delivered across the asset.

It is expected that over time in the coming years that data will be increasingly available that will inform refinement of the risk assessment and thus all aspects of this approach can be refined.

Ideally future data will include defect type, size and location and records of resulting adverse outcomes when such occur, for example the accident data references above and other records of adverse safety outcome such as 3rd party claims made for personal injury.

Data that is available indicates that a safety defects are more frequently identified from reactive inspection resulting from a notification by the public or other 3rd party. RCT report 2/3 of their cat 1 defects emanate from reactive inspections, Bridgend report 60% of their Cat 1 (safety) defects are identified from reactive inspection/3rd party notification.

Footways Inspection Regime

To determine an appropriate method of establishing an inspection regime for footways the same method as that above for carriageway has been adopted. For footways however, there is a research paper that provides some very useful references. TRL Report PPR171 "Development of a Risk Analysis Model for Footways and Cycleway, 2006 has been used as outlined below. Footways are rarely the scene of accidents recorded by the police hence the accident data used for carriageways is not relevant.

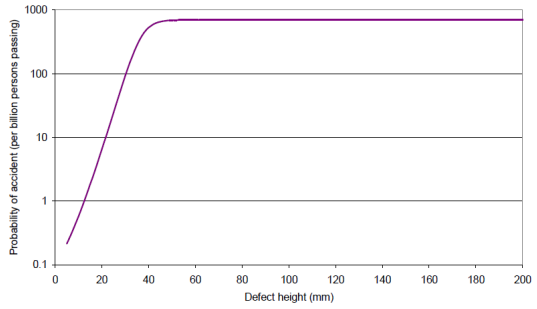


Figure 5 Probability of an accident

PPR171 (3) has however analysed the incidence of accidents based on claims data from a number of local authorities and derived the relationship illustrated below. This output is useful for both the establishment of inspection frequencies and to inform the setting of investigatory levels in the repair regime (see section below).

The graph illustrates that the probability of an accident for a 40mm defect is approximately 1000 per billion persons passing and for a 20mm defect it is approximately 10 per billion. Using these probabilities and the estimated footfall figures for different hierarchies as shown below it is possible to estimate the time between potential accidents on each level of the hierarchy for 20mm and 40mm defects.

Hierarchy	Footfall	Probability of an Accident at 20mm defect	Days between Accidents	Years Between Accidents	Accidents Per Year
FHVHU	15,000	0.00000001	6,667	18	0.055
FH1	10,000	0.00000001	10,000	27	0.037
FH2	5,000	0.00000001	20,000	55	0.018
FH3	1,000	0.00000001	100,000	274	0.004
FH4	500	0.00000001	200,000	548	0.002
FH5	100	0.00000001	1,000,000	2,740	0.000

For a 20mm defect potentially causing an accident the risk that is being managed is equivalent to the probability of 0.05 of accident per year in town centre areas.

Managing 20mm defects is therefore more of an exercise of preventing deterioration to a bigger defect than it is a direct safety management action.

Probability of an Accident Based upon PPR771: 40mm Defect					
Hierarchy	Footfall	Probability of an Accident at 20mm defect	Days between Accidents	Years Between Accidents	Accidents Per Year
FHVHU	15,000	0.000001	67	0	5
FH1	10,000	0.000001	100	0	4
FH2	5,000	0.000001	200	1	2
FH3	1,000	0.000001	1,000	3	0.4
FH4	500	0.000001	2,000	5	0.2
FH5	100	0.000001	10,000	27	0.0

40mm defects are predicted to potentially create 4 accidents per year on FH1 (town centre pedestrian areas) with footfall of 10,000 per day).

Most authorities currently adopt a regime of monthly inspection for these areas, a regime that is 3 times more frequent than the predicted incidence of accidents.

A baseline inspection frequency of monthly inspection on FHVHU (city centre) areas has been adopted based upon the analysis above. This data was considered to be the best available. Using the same method as for carriageways a baseline risk exposure score has been calculated for FHVHU (city centre) footways as shown below.

Asset Information	Use Data	Time Data			REI (k pa)
Hierarchy	Ave Footfall	Response Time (days)	Initial Inspection Interval (days)	Initial Exposure Time (days)	**Initial REI (k pa)**
FHVHU	15,000	1	30	31	465.0

The baseline REI figure has then been used to derive inspection frequencies that would deliver the same level of exposure across the other levels of the hierarchy as shown below:

CSSW Minimum Standard Routine Inspection for Safety											
Typical Current Inspection Regime						Routine Inspection Frequency for Safety to provide the same level of risk exposure across all hierarchies					
Asset Information	Use Data	Time Data			REI (k pa)	REI (k pa)	Time Data				
Hierarchy	Ave Footfall	Response Time (days)	Initial Inspection Interval (days)	Initial Exposure Time (days)	Initial REI (k pa)	Standard REI (K pa)	Proposed Exposure Time (Days)	Proposed Inspection Interval (days)	Theoretical Interval to normalise risk exposure (inspections per year)	Safety Inspection Interval for Same Exposure	Comment
FHVHU	15,000	1	30	31	465.0	465.0	31	30	12	Monthly	**Baseline interval**
FH1	10,000	1	30	31	310.0	465.0	46.5	46	8	6 weekly	
FH2	5,000	1	60	61	305.0	465.0	93	92	4	Every 3 Months	
FH3	1,000	1	180	181	181.0	465.0	465	464	1	Annually	
FH4	500	1	180	181	90.5	465.0	930	929	0.4	Every 2 Years	
FH5	100	1	365	366	36.6	465.0	4650	4649	0.08	Every 13 Years	

As with carriageways this calculation identifies a low level of inspection required on the more lightly used part of the network to manage safety. Following this calculation could mean inspections at intervals of 10 years on minor rural footways and 2 years on housing estate footways. This is considered too infrequent as inspection are required in order to manage maintenance and to plan any renewals required. A minimum inspection frequency is therefore recommended as:

Routine Inspections		
Hierarchy	**Theoretical Routine Inspections (CSSW Minm)**	**Recommended Minimum**
FHV HU	Monthly	Monthly
FH1	6 weekly	Monthly
FH2	Every 3 Months	Every 3 Months
FH3	Annually	Every 6 months
FH4	Every 2 Years	Every 2 years (good condition), annually poor condition or condition unknown
FH5	Every 13 Years	Reactive inspections only

Reactive Inspections

Many authorities rely as much on reactive inspections as they do on their regime of routine inspections. Standards relating to these inspections vary greatly as do the methods by which they are managed. There is insufficient data available to enable analysis of the contribution these inspections currently provide to the management of risk. The limited data that does exist indicates that approximately 2/3 of some authorities' footway safety defects are identified by reactive inspection/3rd party notification. It is proposed that authorities ensure that the same data is recorded for reactive inspections as for routine inspection in future such that the influence of reactive inspection can be analysed and suitable recommendation for applying a risk-based approach subsequently provided.

FH5 footways are very lightly used. So much so that the equivalent inspection regime to meet the risk exposure accepted on other levels of the hierarchy would only require inspection every 13 years. FH5 footways are predominantly used by local residents who will report defects long before a regime of this scale of interval would be able to identify defects. As the risk on these footways is so low it is considered appropriate to specify reactive inspections only as the minimum regime.

5. Establishing a Risk-Based Repair Regime

In order to assess the repair regime attempts were made to review repair data held by authorities. This data was found to lack the detail required to rationally assess the effect of the intervention criteria that are currently being applied.

Authorities typically record the data required in order to demonstrate that defects have been identified, categorised and then subsequently repaired. An inspector will usually record an assessment of a defect as a type (cat 1, cat 2 etc) rather than recording the dimensions of the defect.

The risk-based method is recommending that in future dimension data is recorded for all defects. This will in many instances need to be visually estimated. The subsequent analysis and use of this data will need to recognise this but will allow there to be an assessment of the number, type, location and size of defects against the adverse incidents that occurred as a result of or partially because of the defect.

This is not a big change from current practice as inspections currently require inspectors to assess the size of a defect in order to categorise it.

Current Standards

CSSW's stated wish is to create a nationally consistent approach. To assess how plausible this is a review was undertaken of current standards (defect definitions and response times). The review revealed some variation between authorities but also a high degree of commonality. Many authorities apply the same or similar standards to each other.

The Effect of Current Standards

To assess how well current standards are delivering safety an attempt was made to examine the results of the application of current standards. This involved a very broad assessment of safety outcomes and claims (injury and property damage) as referenced above in inspection section.

Carriageway Safety Outcomes

Accidents that have road environment as contributory factor are statistically rare. 1 injury accident (Slight, serious or fatal) for every 40 million vehicle km travelled.

Footway Safety

The estimated probability of an accident resulting from a 40mm defect (many authorities safety defect investigatory level) is 1000 per billion persons passing (or 1 per million persons passing).

Accidents as a result of a highway defect are rare and this outcome is being achieved from the application of current standards. It has therefore been considered a reasonable place to start to reference current standards when addressing a risk-based approach.

As noted in several places above, once better data is available a more detailed rational assessment of risk can be undertaken, and the results used to refine the method. In the meantime, however, it is considered useful to define a national minimum standard.

National Minimum Standards

CSSW has made previous attempts to define national minimum standards for repair. This project has reinvigorated that work and includes a set of minimum standards. As noted above analysis of data from repairs is not currently detailed enough to support assessment of differing intervention criteria. i.e. it is not possible from this data to determine if defects of a certain size are currently resulting in a higher incidence of injury.

The reasoning behind the standards are as follows:

Safety Defects are those that warrant rapid repair/making safe. Dimensions are provided to guide their identification

For carriageways a depth of >50mm has been defined. A defect of 50mm has deteriorated into the layer below the wearing course. Wearing courses are often in the range of 40-45mm . When the wearing course alone is defective the defect will typically deteriorate comparatively slowly. Once the defect extends into the layer below the risk of it deteriorating more rapidly into a much greater depth and thus risk to users is greater. Inspectors can usually see when inspecting a defect if the hole has developed into the lower layer. In some instances, defects of less than 50mm will just be laminated wearing course layers missing . These are maintenance defects but, in most instances, do not pose an immediate safety risk to users.

The minimum standard is set at a level which all defects exceeding the level should be repaired. It assumes that all defects will be encountered by users regardless of their position in the highway. It does not preclude inspectors using their judgement to assign lesser defects to a higher category if they believe, for example that rapid deterioration is likely.

Footway Defects

The report referenced above in the inspection section provides a useful guide on the risk associated with differing levels of footway defects. PRR171 estimates the probability of an accident at a 20mm and 40mm defect to be 10 in a billion and 1 in a million respectively i.e. it is 100 times more likely that an accident will occur at a 40mm defect than at a 20mm one.

Furthermore, the risk of an accident, according to this report does not increase significantly above 40mm. Using 40mm as intervention still only relates to defects that have a very low probability of causing accidents especially on the lower levels of hierarchy.

The analysis indicates that the process of footway management is largely a preventative one. By identifying and repairing defects at an initial level of deterioration they are prevented from deteriorating into safety defects with a much higher risk to users (albeit still a low risk in absolute terms).

The development of this method has highlighted that the predominant activity is the repair of maintenance defects as opposed to safety defects. The accompanying training material that is being developed to train inspectors uses 3 levels of defect definition as follows:

- **A Critical Defect** is one that the inspector consider the risk to safety high enough to require immediate action. Defects that pose an immediate or imminent risk of injury to road users typically include items such as, a collapsed cellar, missing utility cover, fallen tree, unprotected opening etc. Critical defects should be made safe at the time of the inspection if practicable or attended by the inspector until such time as the defect can be made safe. Making safe may constitute displaying warning notices, coning off or fencing off to protect the public from the defect. CSSW's minimum standard for a critical defect is a response time of 2 hours (to attend and make safe as soon as possible thereafter)
- **A Safety Defect** is one that requires prompt attention because it presents an imminent hazard. Safety defects requiring a response as soon as possible to remove a potential risk of injury to users will typically include items such as particular sizes of potholes, trip hazards, dislodged kerbs etc. If practical safety defects should be made safe at the time of the inspection. This may constitute displaying warning notices, coning off or fencing off to protect the public from the defect. If it is not possible to correct or make safe the defect at the time of the inspection, repairs of a permanent or temporary nature should be carried out within the response time specified. CSSW's minimum standard provides dimension data that can be used as a guide to identifying safety defects for different network hierarchies.
- **A Maintenance Defect** is one that is not a safety defect but requires repair at an appropriate time to guard against further deterioration. They do not present an imminent hazard to users. Maintenance defects should be categorised as higher priority; defects that warrant treatment, in order to prevent them deteriorating into a safety defect prior to the next scheduled inspection and lower priority; other defects that warrant treatment, in order to prevent them deteriorating to such an extent that additional works or costs are incurred.

The carriageway repair regime is focused upon the response to defects once they have been identified. Identification is via the inspection regime. This may be from a routine inspection or from reactive inspection. It

is acknowledged that many defects are notified to the council by a 3rd party, e.g. a request for repair from a member of the public.
The minimum standards for carriageway repair regime have been based upon the application of the risk-based principle used to establish the hierarchy and the inspection regime.

There was no research information available to indicate the outcomes that are associated with differing sizes of defect. Logic dictates that larger defects pose a great risk to user but there are not available reliable studies that quantify this. Current regimes appear to have been based upon accepted practices that have evolved over time. This is not to discredit these regimes. It is a fact that roads are comparatively safe with low and decreasing incidence of injury accidents. This is enabled by regimes of repair that aim to prevent defects becoming dangerous.

The repair regime acknowledges that from time to time, sometimes as a result of external factors, defects may appear that clearly have the potential to cause harm to users. These defects are of a high risk to users and have been categorised as “critical” defects in the regime. It is expected that the response to these defects will be to make it safe as soon as is practical. It is not appropriate to try to define dimensional criteria for such defects. Trained personnel should be able to identify critical defects based on their nature and location without reference to specific “intervention” criteria.

The remaining regime has been based upon the following assumptions:

- The probability of accident occurring at a carriageway defect increases with the size of the defect (as logic would suggest)
- Defects that only affect the wearing course will typically deteriorate slower than defects that extend into the basecourse/beyond the wearing course
- Prevention of further deterioration is a key consideration in determining the response to defects that are at a level that do not pose an immediate hazard of injury to users
- Where the carriageway is habitually used by pedestrians such as defined or likely crossing points footway standards should apply

Determining an Appropriate Threshold

The major determinant in categorising a carriageway defect that is not immediately dangerous is how rapidly it may deteriorate into that state. The regime is designed to provide preventative repair such that defects that are actually potentially dangerous are minimised in terms of injury to users. There is also a need to repair defects that may cause property damage.

Roads that have been designed will invariably have a discreet layer of wearing course typically of a depth of up to 45mm. It is common for repairs to initiate by a hole appearing in the wearing course. Where the layer

below is intact the defect may remain relatively stable in the short term i.e. deterioration into a much larger defect less probable than for a defect that has already extended into the lower layers. For this reason, a threshold between "small defects" and "larger defects" of 50mm has been chosen. A defect that is 50mm in depth will typically be deteriorating at both the wearing course and the subsequent layer and as such is prone to more rapid deterioration. The regime is based upon differentiating between defects either side of this threshold.

Carriageway Repair Regime: Response Times				
Carriageway Hierarchy	**Safety Defect**		**Maintenance Defect**	
CHSR	>50mm	By the end of the next working day	>40mm	1 month
CH1	>50mm		>40mm	
CH2	>50mm		>40mm	
CH3	>75mm	5 days	>50mm	3 months
CH4	>75mm		>50mm	
CH5**	>75mm		>50mm	

** defect triggers on CH5 roads are to be considered an investigatory level rather than an intervention level as on these very low use roads, the risk to road users may vary considerably depending on the nature and location of the route and the individual defect.

Defect Size

The defect sizes chosen for each type of defect and hierarchy reflect the fact that carriageway defects deteriorate more rapidly on more heavily trafficked roads as a result of the volume of vehicles running over it. A defect of 50mm depth on CH2 and above will be subjected to repeated trafficking. All these roads carry >5,000 per day and as such a pot hole could deteriorate rapidly into a much bigger and more hazardous hole if not repaired promptly. For this reason, a differential standard of safety defect size has been adopted for the minimum standard shown above.

Response Times

The proposed response times are also based upon taking into account the different levels of use. The table below shows how risk exposure has been calculated and used to show what response times are required to deliver a consistent level of risk exposure across all levels of the hierarchy.

Safety Defect					
Carriageway Hierarchy	**AADT**	**AADT level for use in calculation**	**Exposure (vehicles exposed to a defect before it is repaired)**	**Response time (days) required to normalise exposure**	**Proposed Minimum Standard**
CHSR	30,000	30,000	30,000	1	same day
CH1	10,000 - 20000	20,000	30,000	2	By end of Next Working
CH2	5,000 -10000	10,000	30,000	3	By end of Next Working
CH3	1,000 - 5000	5,000	30,000	6	5 working days
CH4	200 - 1000	1,000	30,000	30	5 working days
CH5	<200	200	30,000	150	5 working days

Adopting a same day repair response time for busiest roads means that a maximum of 30,000 vehicles would potentially be exposed to the defect before it was made safe or repaired. The response times required to deliver the same level of exposure on the other levels of hierarchy are shown. For example, on CH3 roads a repair response time of 6 days would deliver the same level of exposure to the defect as for 1 day in CHSR.

The same logic has been applied for maintenance defects. A response time of 1 month (28-days) has been adopted for CHSR. This is a standard in common use currently and in the absence of data to the contrary it has been adopted as a reasonable period to repair non-safety defects to prevent them deteriorating to the extent of becoming a safety defect.

Maintenance Defect					
Carriageway Hierarchy	**AADT**	**AADT level for use in calculation**	**Exposure (vehicles exposed to a defect before it is repaired)**	**Response time (month) required to normalise exposure**	**Proposed Minimum Standard**
CHSR	30,000	30,000	840,000	1	1 month
CH1	10,000 - 20000	20,000	840,000	2	1 month
CH2	5,000 -10000	10,000	840,000	3	1 month
CH3	1,000 - 5000	5,000	840,000	6	3 months
CH4	200 - 1000	1,000	840,000	30	3 months
CH5	<200	200	840,000	150	3 months

Footway Repair Regime

The repair regime is focused upon the response to defects once they have been identified. Identification is via the inspection regime. This may be from a routine inspection or from reactive inspection. It is acknowledged that many defects are notified to the council by a 3rd party, e.g. a request for repair from a member of the public.

The minimum standards for footway repair regime have been based upon the application of the risk-based principle used to establish the hierarchy and the inspection regime. Reference has been made to relevant research, specifically the graph below reproduced from “PPR 171 The Development of a Risk Analysis Model for Footways and Cycletracks”. The graph illustrates:

- The probability of accident occurring at a footway defect increases with the size of the defect (as logic would suggest)
- The probability does not increase significantly once that defect is approximately 40mm in depth

- The probability of an accident happening per person passing the defect is less than 1 in a million for a 40mm defect

Unlike carriageway defects footway defects do not typically deteriorate as a function of use. A carriageway defect can deteriorate as a result of vehicles running over it. It would be rare for footfall to be a function of the rate of deterioration of a footway defect {it may be a consideration where the footway is habitually crossed by vehicles or subject to parked vehicles}.

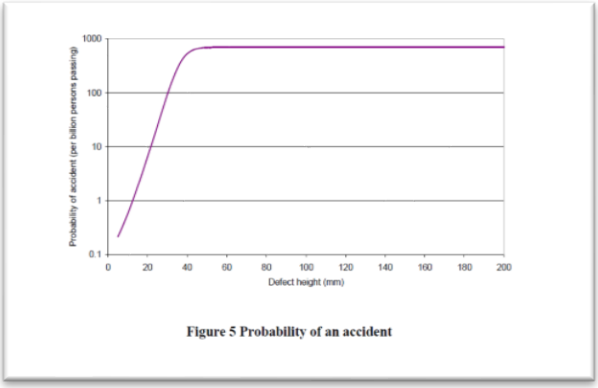


Figure 5 Probability of an accident

Based upon the graph the probability of an accident for a 40mm footway defect has been estimated at 800 per billion persons passing.

This equates to 1 per 1.25 million persons passing.

The table below uses this probability to estimate how the exposure of users to a defect could be normalised such that the number of people exposed to an individual defect before it is repaired is approximately the same across the network.

Footway Hierarchy	Daily Footfall	Footfall level of calculation	Annual Footfall (daily x 365)	Probability of an accident at a 40mm defect = 1 per :	Years between accidents	Accidents per year	Response time (hours) required to normalise exposure		Normalised Response time (days)	Proposed Minimum Standard
FHVHU	>10,000	15,000	5,475,000	1,250,000	0.2	4	24	15,000	1	same day
FH1	5,000 - 10,000	10,000	3,650,000	1,250,000	0.3	3	36	15,000	1.5	By end of Next Working Day
FH2	1,000 - 5,000	5,000	1,825,000	1,250,000	0.7	1	72	15,000	3	By end of Next Working Day
FH3	500 - 1,000	1,000	365,000	1,250,000	3.4	0	360	15,000	15	15 days
FH4	100 -500	500	182,500	1,250,000	6.8	0	720	15,000	30	15 days
FH5	<100	100	36,500	1,250,000	34.2	0	3600	15,000	150	15 days

Using the maximum footfall levels used in the hierarchy bands it is possible to calculate the predicted time between accidents by dividing the probability value (1.25m) by the annual footfall. This illustrates the predicted frequency of accidents. For FH1 footways this equates to approximately 3 accidents per year.

The FHVHU (city centre footway) hierarchy level has been chosen as the baseline. City centre footways are the highest use footways on national footway asset. This is an appropriate level to establish a national

minimum standard regime against. A “same day response” has been adopted as appropriate for these footways with the next busiest level adopting a “by the end of the next working day” standard.

Taking the response time for FHVHU as being a day it is possible to normalise the level of exposure by calculating the repair response times for each level of hierarchy that would result in the same level of exposure i.e. to limit the number of people exposed to a defect to the same level as for FHVU i.e. 15,000. This results in response times as shown below.

<table>
<tr><th colspan="4">Safety Defects</th></tr>
<tr><th>Footway Hierarchy</th><th>Footfall daily</th><th>Normalised Response time (days)</th><th>Proposed Minimum Standard</th></tr>
<tr><td>FHVHU</td><td>>10,000</td><td>1</td><td rowspan="3">By the end of the next working day</td></tr>
<tr><td>FH1</td><td>5,000 - 10,000</td><td>1.5</td></tr>
<tr><td>FH2</td><td>1,000 - 5,000</td><td>3</td></tr>
<tr><td>FH3</td><td>500 -1,000</td><td>15</td><td rowspan="3">15 days</td></tr>
<tr><td>FH4 #</td><td>100 -500</td><td>30</td></tr>
<tr><td>FH5 #</td><td>< 100</td><td>150</td></tr>
</table>

It is impractical to use 6 different levels of response. The above regime is based upon averages and estimated volumes and as such it is not considered appropriate to introduce too many different responses.

To create a practical repair regime two minimum standard response times have been adopted next working day and 15 days. The next working day response on town centre footways reflect their higher levels of use. The 15-day response reflects the significantly lower level of use on other categories of footway. In applying a minimum standard like this a workable regime is possible that is at a level of response that is higher (significantly higher for some categories of footway) than is theoretically necessary to manage risk across the footway network equally.

To complete the regime, it is appropriate to consider the risk associated with smaller defects. A value of 25mm has been adopted as the basis for this analysis. PPR 171 illustrates that smaller defects present a much-reduced risk of an accident as logic would dictate.

Using the same graph from PRR171 a probability of accident for a 25mm defect has been estimated as shown below.

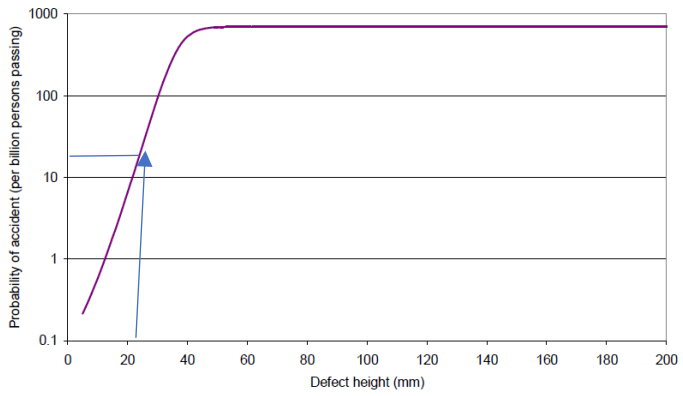


Figure 5 Probability of an accident

Based upon the graph the probability of an accident for a 25mm footway defect has been estimated at 30 per billion persons passing.

This equates to 1 per 33 million persons passing.

To establish a baseline response time for a defect with a lower probability of an accident occurring the probabilities have been contrasted as shown below:

	Probability of an accident 1 per	Response time (days)
40mm defect	1,25 million	1
25mm defect	33.33 million	27

The equivalent response time for a 25mm defect to provide the same predicted probability of an accident to a 1-day response time for a 40mm defect is calculated at 27 days. This is very close to the 28 days used by many authorities already.

It however makes sense to relate the repair regime to the inspection regime and it is therefore recommended that a minimum standard response time for a 25mm defect on a town centre footway is 1 month.

Using the same logic as used for the 40mm defects different response times for different categories of footway can then be derived as shown below.

Footway Hierarchy	Daily Footfall	Footfall level of calculation	Annual Footfall (daily x 365)	Probability of an accident at a 25mm defect = 1 per :	Years between accidents	Accidents per year	Response time (hours) required to normalise exposure	Exposure	Normalised Response time (months)	Proposed Minimum Standard
FHVHU	>15,000	15,000	5,475,000	33,333,333	6	0.164	24	420,000	0.9	
FH1	5,000 - 10,000	10,000	3,650,000	33,333,333	9	0.110	36	420,000	1.3	1 month
FH2	1,000 - 5,000	5,000	1,825,000	33,333,333	18	0.055	72	420,000	2.6	
FH3	500 - 1,000	1,000	365,000	33,333,333	91	0.011	360	420,000	12.9	
FH4	100 -500	500	182,500	33,333,333	183	0.005	720	420,000	25.7	
FH5	<100	100	36,500	33,333,333	913	0.001	3600	420,000	128.6	

As with the 40mm defect a simplified minimum standard is recommended at intervals that far exceed what is theoretically required to normalise risk. Based upon the analysis above the following minimum repair regime standard is proposed.

The analysis above shows that for a 25mm maintenance defect on FH3 footway the predicted frequency of an accident would be one every 91 years and an even less frequency for FH4 and FH5. For this reason it is not considered appropriate to set a minimum response time for defects of this size on those levels of footway hierarchy. This does not preclude an authority deciding to treat them as programmed repair if they so choose.

Footway Repair Regime: Response Times		
Footway Hierarchy	**Safety Defect >40mm**	**Maintenance Defect >25mm**
FHVHU	By end of next working day	1 month
FH1		
FH2		
FH3	15 days	
FH4		
FH5 #		

6. Competencies

The Code of Practice requires authorities to demonstrate the competency of both those involved in developing and those implementing the risk-based approach.

CSSW Accreditation Role

CSSW has recognised that the people most able to manage the competencies of those engaged in managing Welsh local highway assets are the authorities themselves. No one else external to this activity could or should have better knowledge of what is required than the authorities themselves. What is needed in order to meet the requirements of the Code is a systematic way of enabling authorities to evaluate their own level of capability and to address any areas that require strengthening via appropriate training.

CSSW represents all 22 Welsh highway authorities and has already adopted an accreditation role for training for visual condition assessment for carriageways, footways and structures. The training and method of managing accreditation was developed under the HAMP project.

CSSW has decided to use the national HAMP project again and the basics of the method used for visual condition assessment to assist with the following activities:

- Developing a documented definition of the competencies required to apply the risk-based method
- Creating training materials for inspector training
- Creating online training material for ongoing inspector refresher training
- Providing training for highway managers via the CSSW HAMP project

References

1. Police recorded road accidents in Wales, 2016, 29th June 2017, Welsh Government, Statistical First Release, Statistics for Wales
2. Road Traffic in Wales, 2016, 8th November 2017, Welsh Government, Statistical Bulletin, Statistic for Wales
3. Development of a Risk Analysis Model for Footways and Cycle Tracks, Bird, Sowerby and Atkinson, TRL, Report Number PPR171

Cyngor Sir Ceredigion County Council - Integrated Impact Assessment (IIA)

An integrated tool to inform effective decision making

This **Integrated Impact Assessment tool** incorporates the principles of the Well-being of Future Generations (Wales) Act 2015 and the Sustainable Development Principles, the Equality Act 2010 and the Welsh Language Measure 2011 (Welsh Language Standards requirements) and Risk Management in order to inform effective decision making and ensuring compliance with respective legislation.

1. PROPOSAL DETAILS: (Policy/Change Objective/Budget saving)	
Proposal Title	Code of Practice for Highway Safety Inspection and Response on County Roads

Service Area	Highways & Environmental Services	Head of Service	Rhodri Llwyd	Strategic Director	Barry Rees

Name of Officer completing the IIA	Caroline Wride	E-mail	Caroline.wride@Ceredigion.gov.uk	Phone no	01970 633817

Please give a brief description of the purpose of the proposal

The purpose of the new *Code of Practice for Highway Safety Inspection and Response on County Roads* ('Code of Practice') is to enable the Council to comply with the *Well-Managed Highway Infrastructure Code of Practice* published by the UK Roads Liaison Group on 28 October 2016. It is a revision of Ceredigion County Council's 2010 Code of Practice *Highway Safety Inspections of County Roads*, and has been formulated utilising the methodology derived and recommended by the County Surveyors Society Wales (CSSW). CSSW carried out consultation with Insurance Companies, Consultants and Highway Authorities throughout Wales as part of this project.

The *Well-Managed Highway Infrastructure Code of Practice* sets out the policy and standard for undertaking inspections of the adopted highway network. Its primary aim is to ensure that inspection, defect, and recommended repair details are correctly assessed and accurately recorded, together with subsequent details of response and repairs undertaken on the highway. The underlying principle of the code is that Highway Authorities will adopt a risk-based approach to asset management in accordance with local needs, priorities and affordability.

The new Code of Practice will allow for a more holistic approach to inspection and maintenance The aim then is to take the opportunity to improve the condition of adopted roads within Ceredigion through an increased focus on a resource-effecient controlled reaction to highway maintenance issues, and thus prevent these from becoming urgent safety issues that require a highly reactive and less effecient response.

Compliance with the *Well-Managed Highway Infrastructure Code of Practice* will also provide the Council with reasonable protection from financial risk in terms of liabilities and claims, higher insurance premiums or restriction of insurance cover, and from the reputational risk of undermining of the public's perception of, and confidence in, the way in which it delivers its Services.

Who will be directly affected by this proposal? (e.g. The general public, specific sections of the public such as youth groups, carers, road users, people using country parks, people on benefits, staff members or those who fall under the protected characteristics groups as defined by the Equality Act and for whom the authority must have due regard).
• All users of the Ceredigion's highways will be affected by the revised Code of Practice.

VERSION CONTROL: The IIA should be used at the earliest stages of decision making, and then honed and refined throughout the decision making process. It is important to keep a record of this process so that we can demonstrate how we have considered and built in sustainable development, Welsh language and equality considerations wherever possible.

Author	Decision making stage	Version number	Date considered	Brief description of any amendments made following consideration
Caroline Wride	Scutiny	01	July 21	

COUNCIL STRATEGIC OBJECTIVES: Which of the Council's Strategic Objectives does the proposal address and how?	
Boosting the Economy	The new code will allow more effective management of the adopted highway network. This will result in safer access to services and improvement of the physical infrastructure to support a growing economy.
Investing in People's Future	The new code will result in better maintained roads, improving future opportunities for work, leisure and social travel
Enabling Individual and Family Resilience	The new code will result in better maintained roads, making it safer and easier for individuals to travel for work and leisure, and for families to travel and meet together.
Promoting Environmental and Community Resilience	The new code will allow resources to be deployed in such a way that highway maintenance activities can be programmed, preventing deterioration of maintenance defects into safety defects, prolonging the life of the road and facilitating safer travel. Planned rather than reactive reponse will result in a reduction in travel time and therefore emmissions. The purchase of materials can be planned more easily, reducing numbers of deliveries. Community resilience will be improved through the provision of better maintained and safer access

NOTE: As you complete this tool you will be asked for **evidence to support your views**. These need to include your baseline position, measures and studies that have informed your thinking and the judgement you are making. It should allow you to identify whether any changes resulting from the implementation of the recommendation will have a positive or negative effect. Data sources include for example:

- *Quantitative data - data that provides numerical information, e.g. population figures, number of users/non-users*
- *Qualitative data – data that furnishes evidence of people's perception/views of the service/policy, e.g. analysis of complaints, outcomes of focus groups, surveys*
- *Local population data from the census figures (such as Ceredigion Welsh language Profile and Ceredigion Demographic Equality data)*
- *National Household survey data*
- *Service User data*
- *Feedback from consultation and engagement campaigns*
- *Recommendations from Scrutiny*
- *Comparisons with similar policies in other authorities*
- *Academic publications, research reports, consultants' reports, and reports on any consultation with e.g. trade unions or the voluntary and community sectors, 'Is Wales Fairer' document.*
- *Welsh Language skills data for Council staff*

2. SUSTAINABLE DEVELOPMENT PRINCIPLES: How has your proposal embedded and prioritised the five sustainable development principles, as outlined in the Well-being of Future Generations (Wales) Act 2015, in its development?

Sustainable Development Principle	Does the proposal demonstrate you have met this principle? If yes, describe how. If not, explain why.	What evidence do you have to support this view?	What action (s) can you take to mitigate any negative impacts or better contribute to the principle?
Long Term Balancing short term need with long term and planning for the future.	The collection of pertinent data such as traffic counts and identifying trends in defect types and severity will be carried out. The impact of the Code of Practice will be monitored and regular reviews will take place as this data is made available. The Code of Practice provides a risk based approach to Highway Safety Inspections and offers an opportunity to optimise resource	Well-Managed Highway Infrastructure Code of Practice CSSW Methodology	The purpose of the Code of Prectice is to prevent longer term deterioration of the highway network through targeted maintenance. The Code of Practice will be subject to regular review and revision if necessary

	through prioritisation and planning of maintenance works.		
Collaboration Working together with other partners to deliver.	Ceredigion County Council will continue to work with other stakeholders including: ○ County Surveyors Society Wales ○ Insurance Companies ○ Highway Authorities to implement the new Code successfully.	Dates, times, minutes of meetings. Reports	Regular meetings Ongoing monitoring and reporting Local and National PIs Ongoing data collection will inform regular review
Involvement Involving those with an interest and seeking their views.	Preperation of the code involved consultation with and involvement from: ○ CSSW ○ Insurance Companies ○ Welsh Highway Authorities ○ Cabinet Member for Highways and Environmental Services	Dates, times, minutes of meetings. Reports	• Comtinued involvement will be encouraged via meetings and regular review. • Feedback received from stakeholders and the general public in response to the code will inform review.

Prevention Putting resources into preventing problems occurring or getting worse.	The key principle of the Code of Practice is to implement a risk based approach to Highway Inspection and Response The methodology behind the code utilises data relating to the risk of damage to persons or property, and recommends a way of optimising available resources that allows this to be mitigated effectively.	The Code of Practice has been developed in accordance with the CSSW recommended methodology.	• The collection of pertinent data will be ongoing. • Regular reporting will be in place to facilitate monitoring of the impact of the new Code of Practice. • All data, reports and stakeholder feedback will be considered as part of regular review and revision.
Integration Positively impacting on people, economy, environment and culture and trying to benefit all three.	By taking a risk based approach and focussing on preventative maintenance, the code will improve the condition of the adopted highway within Ceredigion and impact positively on its people, economy, environment and culture.	The Code of Practice has been developed in accordance with the CSSW recommended methodology.	• The collection of pertinent data will be ongoing. • Regular reporting will be in place to facilitate monitoring of the impact of the new Code of Practice. • All data, reports and stakeholder feedback will be considered as part of regular review and revision.

3. WELL-BEING GOALS: Does your proposal deliver any of the seven National Well-being Goals for Wales as outlined on the Well-being of Future Generations (Wales) Act 2015? Please explain the impact (positive and negative) you expect, together with suggestions of how to mitigate negative impacts or better contribute to the goal. We need to ensure that the steps we take to meet one of the goals aren't detrimental to meeting another.			
Well-being Goal	Does the proposal contribute to this goal? Describe the positive or negative impacts.	What evidence do you have to support this view?	What action (s) can you take to mitigate any negative impacts or better contribute to the goal?
3.1. A prosperous Wales Efficient use of resources, skilled, educated people, generates wealth, provides jobs.	The plan will ensure the efficient use of public resources – both within the County Council and those of other public agencies and organisations The plan will benefit all road users, local businesses and Service providers by improving the condition of the adopted highway within Ceredigion and providing safe and effecient travel	Well-Managed Highway Infrastructure Code of Practice CSSW Methodology and Standards	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
3.2. A resilient Wales Maintain and enhance biodiversity and ecosystems that support resilience and can adapt to change (e.g. climate change).	Efficiencies and targeted response / planning will serve to reduce the impact on the environment and at all times where it is possible protect and enhance that environment Work programmes will be planned / programmed in a targeted and efficient manner which will reduce travel time and associated negative impacts such as CO2 emmissions.	Planned Maintenance and well-maintained highways will be more energy efficient.	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code

	Better maintained roads will contribute towards ease of travel, reducing traffic congestion and emissions from transport and travel across the County.		
3.3. A healthier Wales People's physical and mental wellbeing is maximised and health impacts are understood.	The Code details how to manage risks which will provide a safer environment for highway users. Highways that are in a good condition will make access to the services of the Council and other organisations that support health and wellbeing safer and easier. Improved condition of the highway will also encourage active and leisure travel.	Department of Transport statistics identify road environment including poor or defective roadsurface as a contributory factor in some reported road accidents	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
3.4. A Wales of cohesive communities Communities are attractive, viable, safe and well connected.	The code will support the continued economic, social and cultural viability of towns and local communities across the County by allowing the Council's resources to be managed more effeciently, improving maintenance of the highway and thus providing safe access to services and opportunities.		The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the CodeThe

3.5. A globally responsible Wales Taking account of impact on global well-being when considering local social, economic and environmental well-being.	Work programmes will be planned / programmed in a targeted and efficient manner which will reduce travel time and associated negative impacts such as CO2 emmissions. Better maintained roads will contribute towards ease of travel, reducing traffic congestion and emissions from transport and travel across the County.	Planned maintenance and well maintained highways will be more energy efficient.	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code

<table>
<tr>
<td>3.6. A more equal Wales
People can fulfil their potential no matter what their background or circumstances.

In this section you need to consider the impact on equality groups, the evidence and any action you are taking for improvement.
You need to consider how might the proposal impact on equality protected groups in accordance with the Equality Act 2010?
These include the protected characteristics of age, disability, gender reassignment, marriage or civil partnership, pregnancy or maternity, race, religion or beliefs, gender, sexual orientation.
Please also consider the following guide::
Equality Human Rights - Assessing Impact & Equality Duty</td>
<td>Describe why it will have a positive/negative or negligible impact.

Using your evidence consider the impact for each of the protected groups. You will need to consider do these groups have equal access to the service, or do they need to receive the service in a different way from other people because of their protected characteristics. It is not acceptable to state simply that a proposal will universally benefit/disadvantage everyone. You should demonstrate that you have considered all the available evidence and address any gaps or disparities revealed.</td>
<td>What evidence do you have to support this view?

Gathering Equality data and evidence is vital for an IIA. You should consider who uses or is likely to use the service. Failure to use data or engage where change is planned can leave decisions open to legal challenge. Please link to involvement box within this template. Please also consider the general guidance.</td>
<td>What action (s) can you take to mitigate any negative impacts or better contribute to positive impacts?

These actions can include a range of positive actions which allows the organisation to treat individuals according to their needs, even when that might mean treating some more favourably than others, in order for them to have a good outcome. You may also have actions to identify any gaps in data or an action to engage with those who will/likely to be effected by the proposal. These actions need to link to Section 4 of this template.</td>
</tr>
<tr>
<td>Age
Do you think this proposal will have a positive or a negative impact on people because of their age? (Please tick ✓)
<table>
<tr><td>Children and Young People up to 18</td><td>Positive</td><td>Negative</td><td>None/ Negligible</td></tr>
<tr><td></td><td></td><td></td><td>✓</td></tr>
<tr><td>People 18-50</td><td>Positive</td><td>Negative</td><td>None/ Negligible</td></tr>
<tr><td></td><td></td><td></td><td>✓</td></tr>
<tr><td>Older People 50+</td><td>Positive</td><td>Negative</td><td>None/ Negligible</td></tr>
<tr><td></td><td></td><td></td><td>✓</td></tr>
</table>
</td>
<td>The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them.</td>
<td>Ceredigion has one of the highest proportions of older people in Wales.

25% of people in Ceredigion are of pensionable age, (2011 Census).

15% of people in Ceredigion are under 16 years old, (2011 Census).

Census data show that Ceredigion has an ageing population and high levels of private car ownership and</td>
<td>The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code</td>
</tr>
</table>

					access to services and opportunities by public transport is limited in rural areas beyond main transport corridors.	

Disability Do you think this proposal will have a positive or a negative impact on people because of their disability? (Please tick ✓)				The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them. The new Code of Practice will have a positive impact on those who have a physical or visual impairment as it allows for more resource to be focussed on enforcement issues such as footway obstruction, defective cellar covers etc.	21% of people living in Ceredigion have a limiting long term illness, (2011 Census). The Social Model of Disability states that people are disabled by barriers in society, not by their impairment or difference.	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Hearing Impartment	Positive	Negative	None/ Negligible			
			✓			
Physical Impairment	Positive	Negative	None/ Negligible			
	✓					
Visual Impairment	Positive	Negative	None/ Negligible			
	✓					
Learning Disability	Positive	Negative	None/ Negligible			
			✓			
Long Standing Illness	Positive	Negative	None/ Negligible			
			✓			
Mental Health	Positive	Negative	None/ Negligible			
			✓			
Other	Positive	Negative	None/ Negligible			

Transgender			

Do you think this proposal will have a positive or a negative impact on transgender people? (Please tick ✓)				The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them. It will not impact on people disproportionately in relation to whether they are transgender.		The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Transgender	Positive	Negative	None/ Negligible			
			✓			

Marriage or Civil Partnership Do you think this proposal will have a positive or a negative impact on marriage or Civil partnership? (Please tick ✓)				The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them. It will not impact on people disproportionately in relation to whether they are married or in a civil partnership.		The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Marriage	Positive	Negative	None/ Negligible			
			✓			
Civil partnership	Positive	Negative	None/ Negligible			
			✓			

Pregnancy or Maternity Do you think this proposal will have a positive or a negative impact on pregnancy or maternity? (Please tick ✓)				The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them.		The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Pregnancy	Positive	Negative	None/ Negligible			
			✓			
Maternity	Positive	Negative	None/ Negligible			

			✓	It will not impact on people disproportionately in relation to pregnancy or maternity.		

Race Do you think this proposal will have a positive or a negative impact on race? (Please tick ✓)				The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them. It will not impact on people disproportionately in relation to race.	3% of people living in Ceredigion are from a non-white background, (2011 Census). 4% of people in Ceredigion were born in an EU Country. This is greater than the Welsh national average of 3%. ONS, Population of the UK by country of birth and nationality (June 2018)	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
White	Positive	Negative	None/ Negligible			
			✓			
Mixed/Multiple Ethnic Groups	Positive	Negative	None/ Negligible			
			✓			
Asian / Asian British	Positive	Negative	None/ Negligible			
			✓			
Black / African / Caribbean / Black British	Positive	Negative	None/ Negligible			
			✓			
Other Ethnic Groups	Positive	Negative	None/ Negligible			
			✓			

Religion or non-beliefs Do you think this proposal will have a positive or a negative impact on people with different religions, beliefs or non-beliefs? (Please tick ✓)				The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them. It will not impact on people disproportionately in relation	In the 2011 Census, 58% of people in Ceredigion said that they were Christian, 2% other religions, 31% no religion and 9% preferred not to say.	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Christian	Positive	Negative	None/ Negligible			
			✓			
Buddhist	Positive	Negative	None/ Negligible			

			✓	to their religions, beliefs or non-beliefs		
Hindu	Positive	Negative	None/ Negligible			
			✓			
Humanist	Positive	Negative	None/ Negligible			
			✓			
Jewish	Positive	Negative	None/ Negligible			
			✓			
Muslim	Positive	Negative	None/ Negligible			
			✓			
Sikh	Positive	Negative	None/ Negligible			
			✓			
Non-belief	Positive	Negative	None/ Negligible			
			✓			
Other	Positive	Negative	None/ Negligible			
			✓			

Sex Do you think this proposal will have a positive or a negative impact on men and/or women? (Please tick ✓)				The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them. It will not impact on people disproportionately in relation to whether they are men or women	50% of people in Ceredigion are male and 50% are female, (2011 Census).	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Men	Positive	Negative	None/ Negligible			
			✓			
Women	Positive	Negative	None/ Negligible			
			✓			

Sexual Orientation Do you think this proposal will have a positive or a negative impact on people with different sexual orientation? (Please tick ✓)				The new Code of Practice will benefit all age groups by improving the condition of carriageways and footways, providing a safer environment for all those who use them. It will not impact on people disproportionately in relation to their sexual orientation	Between 5 to 7% of people in Wales are lesbian, gay or bisexual, (Stonewall Cymru).	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Bisexual	Positive	Negative	None/ Negligible			
			✓			
Gay Men	Positive	Negative	None/ Negligible			
			✓			
Gay Women / Lesbian	Positive	Negative	None/ Negligible			
			✓			
Heterosexual / Straight	Positive	Negative	None/ Negligible			
			✓			

Having due regards in relation to the three aims of the Equality Duty - determine whether the proposal will assist or inhibit your ability to eliminate discrimination; advance equality and foster good relations.
3.6.2. How could/does the proposal help advance/promote equality of opportunity? *You should consider whether the proposal will help you to: ● Remove or minimise disadvantage ● To meet the needs of people with certain characteristics ● Encourage increased participation of people with particular characteristics*
The new Code of Practice will assist in creating equality of opportunity and removing any disadvantage to users caused by the deterioriation in condition of Ceredigion County Council's adopted highways.
3.6.3. How could/does the proposal/decision help to eliminate unlawful discrimination, harassment, or victimisation? *You should consider whether there is evidence to indicate that: ● The proposal may result in less favourable treatment for people with certain characteristics ● The proposal may give rise to indirect discrimination ● The proposal is more likely to assist or imped you in making reasonable adjustments*
It is not anticipated that the document will have any negative impacts resulting in unlawful discrimination, harassment or victimisation.
3.6.4. How could/does the proposal impact on advancing/promoting good relations and wider community cohesion?

You should consider whether the proposal with help you to: ● Tackle prejudice ● Promote understanding
The proposed code promotes a good relationship with the wider community by addressing any potential risks to persons or property associated with poorly maintained highways.

Having due regard of the Socio-Economic Duty of the Equality Act 2010. **Socio-Economic Disadvantage is living in less favourable social and economic circumstances than others in the same society.** *As a listed public body, Ceredigion County Council is required to have due regard to the Socio-Economic Duty of the Equality Act 2010. Effectively this means carrying out a poverty impact assessment. The duty covers all people who suffer socio-economic disadvantage, including people with protected characteristics*.
3.6.5 What evidence do you have about socio-economic disadvantage and inequalities of outcome in relation to the proposal? Describe why it will have a positive/negative or negligible impact.
The New Code will not result in any socio-economic disadvantage or inequality. Improved maintenance of adopted highways will facilitate safe travel for all.
What evidence do you have to support this view?
What action(s) can you take to mitigate any negative impacts or better contribute to positive impacts?
No negative impacts are expected

3.7. A Wales of vibrant culture and thriving Welsh language Culture, heritage and Welsh Language are promoted and protected. *In this section you need to consider the impact, the evidence and any action you are taking for improvement. This in order to ensure that the opportunities for people who choose to live their lives and access services through the medium of Welsh are not inferior to what is afforded to those choosing to do so in English, in accordance with the requirement of the Welsh Language Measure 2011.*				Describe why it will have a positive/negative or negligible impact.	What evidence do you have to support this view?	What action (s) can you take to mitigate any negative impacts or better contribute to positive impacts?
Will the proposal be delivered bilingually (Welsh & English)?	Positive ✓	Negative	None/ Negligible	The service operates a bilingual policy in respect of communication with members of the public and within the workplace.	County Council Welsh Language Scheme.	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Will the proposal have an effect on opportunities for persons to use the Welsh language?	Positive ✓	Negative	None/ Negligible	A society that promotes and protects culture, heritage and the Welsh language, and which encourages people to participate in the arts, sports and recreation will benefit from improvements in infrastructure access.	County Council Welsh Language Scheme.	The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Will the proposal increase or reduce the opportunity for persons to	Positive	Negative	None/ Negligible ✓	The service operates a bilingual policy in respect of communication with		The Code of Practice will be subjected to regular review. Each formal review will take

access services through the medium of Welsh?				members of the public and within the workplace.		into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Codefurther strengthen the Code
How will the proposal treat the Welsh language no less favourably than the English language?	Positive	Negative	None/ Negligible ✓	The proposals will have no impact on the treatment of the Welsh language		The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code
Will it preserve promote and enhance local culture and heritage?	Positive ✓	Negative	None/ Negligible	The service operates a bilingual policy in respect of communication with members of the public and within the workplace A society that promotes and protects culture, heritage and the Welsh language, and which encourages people to participate in the arts, sports and recreation will benefit from		The Code of Practice will be subjected to regular review. Each formal review will take into account any negative responses, lessons learnt, improvement opportunities and any innovative techniques available to further strengthen the Code

				improvements from infrastructure access.		

4. STRENGTHENING THE PROPOSAL: If the proposal is likely to have a negative impact on any of the above (including any of the protected characteristics), what practical changes/actions could help reduce or remove any negative impacts as identified in sections 2 and 3?			
4.1 Actions.			
What are you going to do?	When are you going to do it?	Who is responsible?	Progress
N/A. No negative impacts indentified			

4.2. If no action is to be taken to remove or mitigate negative impacts please justify why.
(Please remember that if you have identified unlawful discrimination, immediate and potential, as a result of this proposal, the proposal must be changed or revised).

No negative impacts are considered to arise from the proposed Code of Practice for Highway Safety Inspection and Response on County Roads. It is anticipated that the proposed changes will benefit all existing and future road users through an improvement in preventative maintenance of the adopted highway within Ceredigion.

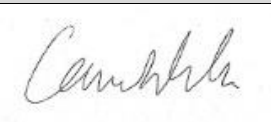
4.3. Monitoring, evaluating and reviewing.
How will you monitor the impact and effectiveness of the proposal?

The impact will be monitored through data collection, performance monitoring and reporting. Regular reviews of the code will allow adjustments to be made if necessary

5. RISK: What is the risk associated with this proposal?					
Impact Criteria	1 - Very low	2 - Low	3 - Medium	4 - High	5 - Very High
Likelihood Criteria	1 - Unlikely to occur	2 - Lower than average chance of occurrence	3 - Even chance of occurrence	4 - Higher than average chance of occurrence	5 - Expected to occur

Risk Description	Impact (severity)	Probability (deliverability)	Risk Score
Cabinet non-approval of proposed Code of Practice	4	2	8
Lack of resource to carry out planned maintenance works	4	3	12

Does your proposal have a potential impact on another Service area?
The new Code of Practice may impact on the following service areas: Highway & Environmental Services- The new code will improve maintenance of the highway asset, and allow increased support for street works ativities and other business areas within HES, Economy & Regeneration- The new code will provide safe and improved access for facilities, services and opportunities Finance & Procurement- The new code will provide reasonable protection from financial risk in terms of liabilities and claims, higher insurance premiums or restriction of insurance cover. Legal & Governance- The new code will allow the assignment of more esource to investigation enforcement issues Customer Contact- The new code will result in fewer safety defects, leading to fewer customer service requests

6. SIGN OFF			
Position	Name	Signature	Date
Service Manager	Caroline Wride		11/6/21
Head of Service			
Strategic Director			
Portfolio Holder			

Cyngor Sir CEREDIGION County Council

REPORT TO:	**Cabinet**
DATE:	**7 September 2021**
LOCATION:	**Remotely via video conferencing**
TITLE:	**Feedback from the Thriving Communities Overview and Scrutiny Committee on the Code of Practice for Highway Safety Inspection and Response on County Roads**
PURPOSE OF REPORT:	**To provide feedback from the Thriving Overview and Scrutiny Committee held on 15 July 2021**

The Thriving Communities Overview and Scrutiny Committee considered the report on the Code of Practice for Highway Safety Inspection and Response on County Roads. The code sets out the policy and standard for undertaking inspections of the adopted highway network.

The current situation was set out to the Committee. It is necessary to update the Council's existing Code of Practice in order to comply with the updated national code 'Well-Managed Highway Infrastructure Code of Practice', published in 2016. This code recommends that all Highway Authorities consider new methods of working and in order to drive greater efficiency.

The Authority is currently performing well in its duty to maintain the highway asset. The reduction in the level of resources available to Highway Authorities and the pressures this brings has resulted in greater focus on reaction to safety defects. The new code addresses this by targeting its highest risk areas in a planned fashion creating efficiencies. It does this through focus on two main areas: firstly the frequency of inspection, and secondly in the determination of an appropriate threshold of intervention. This will result in a better ability to reassign resources to planned preventative maintenance regimes rather than reactive urgent repair.

The new code will enable the Council to refocus the resources, enhance the maintenance and improve the ability to comply with the statutory legal duties as outlined in Section 41 of the Highways Act 1980 and provide a defence by virtue of Section 58 of the Highways Act 1980 through a unified all-Wales approach.

Following a lengthy discussion Members AGREED to recommend **that Cabinet approve the Code of Practice for Highway Inspection and Response on County Roads 2021.**

Councillor Marc Davies
Chairman of the Thriving Communities Overview and Scrutiny Committee