

The background of the slide features a large, faint, light blue watermark of the City of Vancouver coat of arms. The crest includes a crown at the top with four maple leaves, a shield divided into four quadrants (top-left: a ship, top-right: a stag, bottom-left: a ship, bottom-right: a grizzly bear), and a banner at the bottom with the motto 'CITY OF VANCOUVER' in French. The text 'Agenda Item 7' is centered over the shield.

## **Agenda Item 7**

### **A Risk Based Approach to Road Asset Safety Inspections**

**Falkirk Council**

**Title:** A Risk Based Approach to Road Asset Safety Inspections  
**Meeting:** Executive  
**Date:** 19 February 2019  
**Submitted By:** Director of Development Services

**1. Purpose of Report**

- 1.1 This report presents for approval a revised policy on road safety inspections to comply with “Well Managed Highway Infrastructure – A Code of Practice” (2016). The policy for approval refers to the suite of guidance documents, provided for use nationally by the Society of Chief Officers for Transportation in Scotland (SCOTS), which introduce a risk based approach to safety inspection surveys. These have been used as the basis for the Council's proposed new policy documents. These are:

- Road Safety Inspection Strategy – Version 1.0 (Appendix 1)
- Safety Inspector Operations Manual – Version 1.0 (Appendix 2)

Implementation of the new arrangements is supported by a SCOTS training toolkit together with a reference document “SCOTS Rationale for guidance on a Risk Based Approach to Asset Management”. This document outlines the approach and the basis for specific content within the guidance. It also details the competencies of those involved in its development.

**2. Recommendation**

**Members are requested to:**

- (1) Approve the adoption of the revised road safety inspection policy to fulfil the requirements of the Code of Practice in implementing a risk based approach to the maintenance and management of the road network.**

**3. Background**

- 3.1 The Roads (Scotland) Act 1984 states that a local roads authority shall manage and maintain all such roads in their area that are included in the list of public roads held by the authority. These are commonly referred to as adopted roads and the inspection policy referred to in this paper refers to only these.
- 3.2 The policy does not apply to Trunk Roads, which are the responsibility of Scottish Ministers.
- 3.3 The Council's current inspection regime, was prepared in accordance with the previous guidance contained in “Well-Maintained Highways’ the Code of

Practice for Highway Maintenance Management’<sup>1</sup> However, the new ‘Well-Managed Highway Infrastructure - A Code of Practice’ (October 2016)<sup>2</sup> recommends a risk based approach to managing all aspects of the road network which includes inspection and repair.

- 3.4 Recommendation 7 in the new code of practice provides that roads authorities should adopt the risk based approach to all aspects of road maintenance. This specifically relates to the adoption of this approach when conducting road safety inspections - the area of service that results in our greatest number of claims.
- 3.5 A risk based approach is also recommended by the Institute of Highway Engineers in their guidance on managing risk and liability, ‘Well Managed Highway Liability Risk’<sup>3</sup>.

#### **4. Considerations**

- 4.1 Road safety inspections are designed to identify and repair defects to minimise, as far as reasonably practicable, the exposure to danger or serious inconvenience to users of the road network or the wider community. Such defects include those that require immediate attention, as well as those where the defect location and nature are such that longer periods of response are possible. Having a robust process for prioritising responses to identified defects is therefore crucial.
- 4.3 A risk based approach is a major move away from the prescriptive descriptions of defects (such as pothole depth < 40mm) in previous codes and the tendency for worst case scenario thinking used in assigning categories of response. The revised approach includes a risk assessment process whereby a defect is analysed in relation to the context in which it exists. Using a risk matrix tool to evaluate the hazard in terms of likelihood and most probable consequence, the risk posed is objectively categorised and the corresponding required level of response determined.
- 4.4 The road authority must ensure that all road asset safety inspectors are competent in carrying out safety defect inspections. The policy adopts the Institute of Highway Engineers (IHE) – Highways Safety Inspection Training scheme. Subsequently, all Falkirk Council Inspectors undertook training in April 2018 in readiness for the implementation of the change and are now on the IHE Highway Inspectors Register.
- 4.5 Currently, the Council has an adopted road length of 982km and over 1,034km of footways / footpaths.
- 4.6 An effective inspection regime requires having an appropriate hierarchy to which the local network assets are categorised. Guidance on the appropriate hierarchy for carriageways, footways and cycleways / cycletracks is given in the Code of Practice which the proposed policy adopts. Inspection frequencies

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<sup>1</sup> ‘Well-Maintained Highways, the Code of Practice for Highway Maintenance Management’ , UKRLG, July 2005

<sup>2</sup> ‘Well-Managed Highway Infrastructure: A Code of Practice’, UKRLG, October 2016

<sup>3</sup> ‘Well Managed Highway Liability Risk’, IHE, March 2017

are then set for each level of the hierarchy and, as a result, a programme of inspections is developed for the stated asset types.

## **5. Implications**

### **Financial**

- 5.1 The Council has finite resources for managing and maintaining the road network. As well as its critical safeguarding purpose, the implementation of this risk based approach will improve efficiency and provide greater value for money through more appropriate categorisation of defects and responses based on risk to road users that is likely to lead to a reduction in the number of temporary repairs and an increase in permanent programmed work. As well as being more cost effective, this policy should have a positive impact on network road condition in the longer term, assuming current levels of investment are retained.

### **Resources**

- 5.3 There will be no changes required to staff resources.

### **Legal**

- 5.4 The Roads (Scotland) Act 1984 provides roads authorities with a duty to maintain a list of public roads and to ensure the roads on that list are serviceable and fit for purpose. The Safety Inspection methodology allows Councils to demonstrate that legal responsibilities, in relation to the inspection and maintenance of adopted roads, are fulfilled. While the number of claims made against the Council may not necessarily be reduced, through the implementation of this risk based policy, the Council will be better placed to defend them.

### **Risk**

- 5.5 In adopting this new approval the Council's exposure to risk will be mitigated and enable a robust defence to claims of loss. To do otherwise would be to operate a regime which is not in accordance with national guidance thus creating a risk.

### **Equalities**

- 5.6 An initial Equality and Poverty Impact Assessment has been undertaken. The new approach will have a positive impact on the road network and thus road users.

### **Sustainability/Environmental Impact**

- 5.7 It is not felt that there are any sustainability/environmental impacts as a result of the recommendations. The materials used and the processes followed when undertaking repairs will not change.

## **6. Conclusions**

6.1 The recommendations from the new national Code of Practice and guidance produced by SCOTS enables Falkirk Council to implement a risk based approach for road safety inspections and categorise any necessary repairs identified. It is anticipated that this will:

- minimise the exposure of danger or serious inconvenience to users of the network or the wider community,
- mitigate the Council's exposure to risk and enable a robust defence to claims of loss,
- ensure compliance with statutory requirements and increase best value by reducing the number of defects allocated to the incorrect category/priority and potentially increase the number of permanent repairs

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Director of Development Services

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Date: 5 February 2019

## **Appendices**

1. Appendix 1 – Falkirk Council Road Safety Inspection Strategy
2. Appendix 2 – Falkirk Council Road Asset Safety Inspector Operations Manual

## **List of Background Papers:**

The following papers were relied on in the preparation of this report in terms of the Local Government (Scotland) Act 1973:

'Well-Maintained Highways, the Code of Practice for Highway Maintenance Management', UKRLG, July 2005

'Well-Managed Highway Infrastructure: A Code of Practice', UKRLG, October 2016

'Well Managed Highway Liability Risk', IHE, March 2017

SCOTS Rationale for Risk Based Approach to Road Asset Management

SCOTS Risk Based Approach to Road Safety Inspections - Overview

# **ROADS SERVICES**

## **ROAD ASSET SAFETY INSPECTION STRATEGY**

### **VERSION 1 – DEC. 2018**



**Falkirk Council**

## Document Information

<b>Title</b>	Road Asset Inspections: A Risk Based Approach Road Safety Inspection Strategy
<b>Author</b>	Gary Neill – Area Roads Engineer
<b>Description</b>	This document is the Road Safety Inspections Strategy document for Falkirk Council. It outlines the SCOTS recommended methodology which complies with the code of practice requirement for a risk based approach. It has been amended to accommodate local context where appropriate.

## Document Control

<b>Version</b>	<b>SCOTS Template Version</b>	<b>Date</b>	<b>Author</b>	<b>Changes from Previous Version</b>
1.0	1.0	4/12/18	Gary Neill	

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# Introduction

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This Road Safety Inspection Strategy has been developed with the primary aim of providing operational guidance to those Officers and Inspectors responsible for managing road asset safety inspections. This is in order to encourage a consistent approach by utilising a formalised system that recommends the frequency of inspections as well as the method of assessing, recording and responding to defects in the road asset.

This strategy is based on the Society of Chief Officers of Transportation in Scotland (SCOTS) Risk Based Approach (RBA) guidance and compiled using their Road Safety Inspection Strategy template.

The document is one of a suite of Risk Based Approach documents, a description of which can be found in the overview document: "[Risk Based Approach Overview](#)". 'Well-Managed Highway Infrastructure: A Code of Practice'<sup>1</sup> has specific recommendations regarding inspections of all road elements. This Strategy document specifically relates to the procedure for carrying out road safety inspections. Recommendation 7 of the code of practice is that Road Authorities should adopt a Risk Based Approach to all aspects of road maintenance.

A Risk Based Approach is also recommended by the Institute of Highway Engineers in their guidance on managing risk and liability, 'Well Managed Highway Liability Risk'<sup>2</sup>.

The establishment of an effective regime of safety inspections is a crucial component of road maintenance in accordance with the Code of Practice, The Society of Chief Officers of Transportation in Scotland (SCOTS) seeks to encourage the benefits that will be gained by harmonising such procedures across Scotland. Recommendation 6 within the Code of Practice refers to Consistency with Other Authorities and is stated below:

"To ensure that users' reasonable expectations for consistency are taken into account, the approach of other local and strategic highway and transport authorities, especially those with integrated or adjoining networks, should be considered when developing highway infrastructure maintenance policies."

This Road Safety Inspection Strategy has been developed in partnership with the roads authorities associated through SCOTS to focus on safety inspections and categorisations, and is now being made available for all Scottish roads authorities to consider adopting for their network.

Officers across all Scottish Local Authorities recognise that Councils are currently faced with delivering services within an environment of increasing fiscal austerity and are aware of the benefits that can be achieved by adopting a common approach which follows the principles of 'Well-Managed Highway Infrastructure'.

Adoption of this strategy will provide a consistent methodology for the management of the road network, while focusing on delivering a proactive programme of permanent repairs. It is intended that

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<sup>1</sup> 'Well-Managed Highway Infrastructure: A Code of Practice', UKRLG, October 2016

<sup>2</sup> 'Well Managed Highway Liability Risk', IHE, March 2017

its implementation will also allow performance to be monitored and reviewed, implementing any necessary improvements identified through its use.

## **Legislative Requirements**

The Roads (Scotland) Act 1984 Section 1, states that "...a local roads authority shall manage and maintain all such roads in their area as are for the time being entered in a list (in this Act referred to as their "list of public roads") prepared and kept by them under this section."

## **This Document**

This Road Safety Inspection Strategy contains guidance to assist road authorities in managing safety inspections on public roads on the roads authority network including the nature and priority of response to defects encountered.

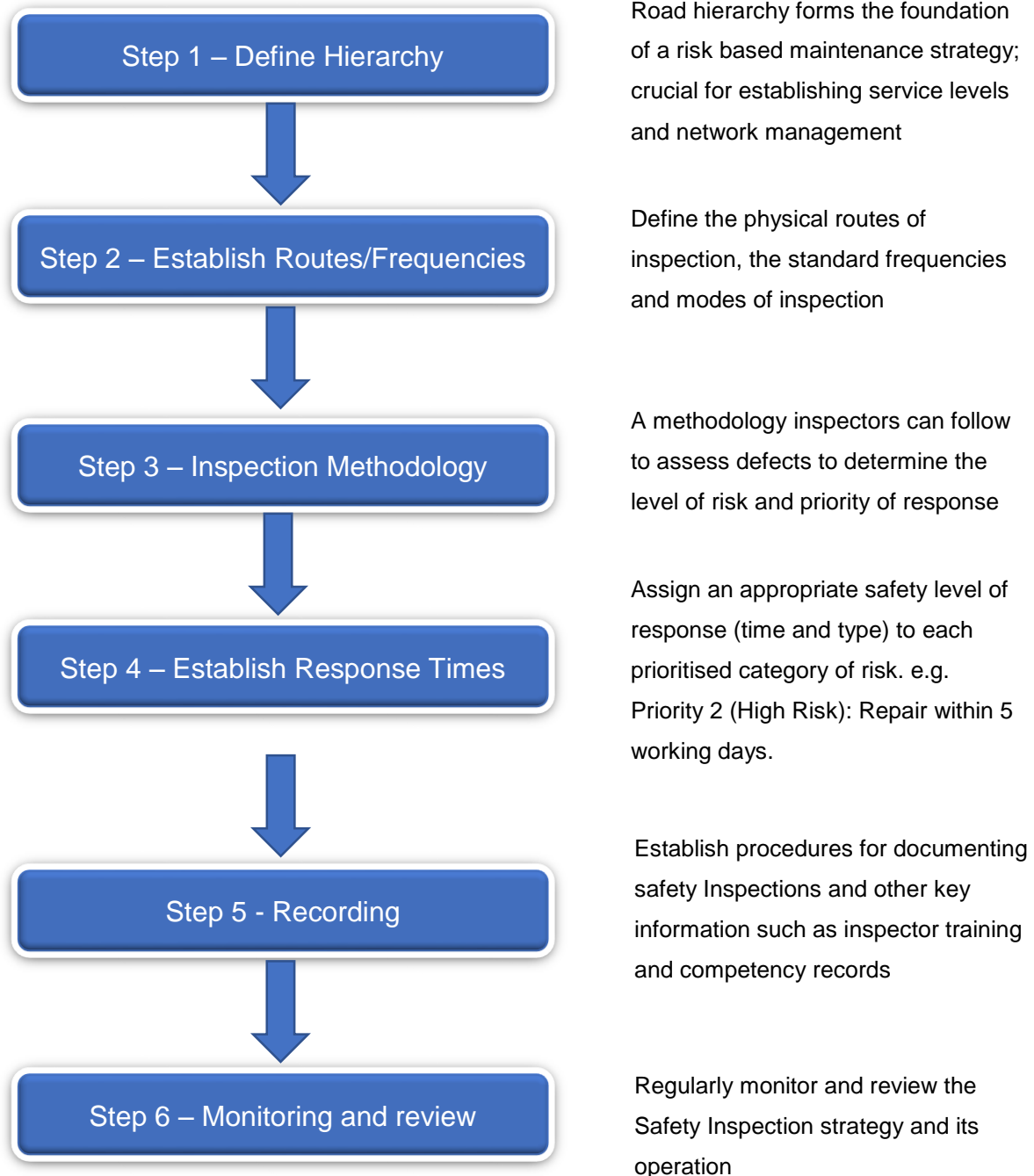
SCOTS formed a focus group to develop this Risk Based Approach documentation. The rationale for producing it and the approach taken to key content is contained in the following document held within the SCOTS Road Asset Management Knowledge Hub (Khub): [‘SCOTS Rationale for Risk Based Approach to RAM Guidance.doc’](#)

The training, competency and experience of all persons involved in developing the SCOTS risk based approach guidance documentation is also detailed in the rationale document.

## Overview

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The safety inspection strategy involves requires several key steps, explained in detail within this document. They are:



## Hierarchy

“Well-Managed Highways Infrastructure – Code of Practice” (WMHI CoP) indicates that a network hierarchy is the foundation of a risk based maintenance strategy; crucial for establishing service levels and network management.

The hierarchies contained within the WMHI Code of Practice, replicated in the tables below, are adopted as described. These are:

- Table 1 Carriageway Hierarchy
- Table 2 Footway Hierarchy
- Table 3 Cycle Route Hierarchy

### Carriageways

Table 1 below provides descriptions for carriageway categories based on those in ‘Well-Managed Highway Infrastructure: A Code of Practice’.

**Table 1 Carriageway Hierarchy**

Category	Hierarchy	Description
1	Strategic Route	Routes for fast moving long distance traffic with little frontage access or pedestrian traffic. Speed limits generally in excess of 40mph with few junctions. Parked vehicles are generally not encountered out with urban areas.
2	Main Distributor	Routes between strategic routes and linking urban centres to the strategic network with limited frontage access. In urban areas speed limits are usually 40mph or less.
3	Secondary Distributor	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.
4	Link Road	In urban areas these are residential or industrial interconnecting roads with 20 or 30 mph speed limits, random pedestrian movements and uncontrolled parking. In rural areas these roads link the smaller villages to the distributor roads. They are of varying width and not always capable of carrying two-way traffic.
5	Local Access Road	In rural areas these roads serve small settlements and provide access to individual properties and land. They are often only single lane width and unsuitable for HGVs. In urban areas they are often residential loop roads or cul-de-sacs.

## Footways

Table 2 below is based on the recommendations of 'Well-Managed Highway Infrastructure: A Code of Practice' and should be used as a starting point when allocating a footway / footpath to a particular category.

The following should also be taken into consideration:

- pedestrian volume,
- designation as a traffic sensitive pedestrian route,
- current usage and proposed usage,
- contribution to the quality of public space and streetscene,
- age and distribution of the population, proximity of schools or other establishments attracting higher than normal numbers or specific groups of pedestrians,
- accidents and other risk assessments and
- character and traffic use of adjoining carriageway.

**Table 2 Footway Hierarchy**

Category	Category Name	Description
1	Prestige Walking Zones	Very busy areas of town centres with high public space and Streetscene contribution.
2	Primary Walking Routes	Busy urban shopping and business areas and main pedestrian routes, including links to significant public transport locations.
3	Secondary Walking Routes	Medium usage routes through local areas feeding into primary routes, local shopping centres etc.
4	Link Footways / Footpaths	Linking local access footways through urban areas and busy rural footways.
5	Local Access Footways / Footpaths	Footways associated with low usage, short estate roads to the main routes and cul-de-sacs.

## Cycle Routes

Cycle routes are categorised by location and a proposed hierarchy is shown in Table 3 below.

**Table 3 Cycle Route Hierarchy**

Category	Description
1	Cycle lane forming part of the carriageway, commonly a strip adjacent to the nearside kerb. Cycle gaps at road closure point (no entry to traffic, but allowing cycle access).
2	Cycle track - a designated route for cyclists not contiguous with the public footway or carriageway. Shared cycle/pedestrian paths, either segregated by a white line or other physical segregation, or un-segregated.

Category	Description
3	Cycle trails, leisure routes through open spaces, remote from carriageway or footway / path where on the list of public roads.

## Road Network Assessment

It is important that the road network categorisation reflects the needs, priorities and actual use of the network and infrastructure assets.

The following process was adopted for assessing the road network categories:

Roads Officers in conjunction with the Senior Roads Asset Management Officer considered the hierarchies outlined in WMHI:CoP and applied them to list of public roads held by Falkirk Council.

It is recognised that through time, the nature and use of the network changes, therefore, the list of hierarchies is dynamic and can change to reflect this. Officers and Inspectors are encouraged to question hierarchies applied to the list of public roads as they know the network and traverse it on a daily basis.

The following personnel were involved in establishing/reviewing the road network categories:

Name/Role	Experience	Qualifications/Training
Dorothy Reid – Roads and Grounds Manager	20+ years	MBA IEng HNC
Gary Neill – Area Roads Engineer	10+ Years	BSc(Hons) IEng HNC
Gordon Henderson – Asset Management Officer	2+ Years	MA
5 x Roads Officers	Various	Various

Documents in relation to the above (e.g. meeting agendas, minutes, correspondence) detailing the discussion, assumptions or reasons for key decisions are held in the Roads Asset Management folder on the Network Drive.

## Review of Road Network Categories

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Road networks are dynamic, therefore network categories should be regularly reviewed, considering any changes in the network as it evolves, to ensure that assigned categories remain relevant.

### **Review Frequency**

A review of the network hierarchy is taken on an annual basis to take account of any major development or changes in use to the network. A further more detailed review will take place every 4 years to coincide with the publication of the Council's Road Asset Management Plan.

Date when next hierarchy review due: 28 October 2019

### **Continuity of safety and serviceability with neighbouring Highway Authorities**

The adoption of the WMHI Code of Practice hierarchy and common SCOTS safety inspection methodology should, while allowing for management of hierarchies with regard to local circumstances, enable a high degree of continuity of safety and serviceability across neighbouring authorities.



## Inspection Frequencies

Falkirk Council is adopting the 'Well-Managed Highway Infrastructure: A Code of Practice' Frequencies for safety inspections as follows:

**Table 5 Frequency of Inspection – Carriageways**

Category	Hierarchy Description	Frequency
1	Strategic Route	Monthly
2	Main Distributor	Monthly
3	Secondary Distributor	Monthly
4	Link Road	Quarterly
5	Local Access Road	Annually

There is currently no dedicated safety inspection process in place for identifying safety defects on footways, footpaths and cycleways. The exceptions are the monthly and quarterly safety survey inspections which are undertaken in the town centre areas of Falkirk, Grangemouth, Bo-ness, Camelon, Denny, Dunipace, Stenhousemuir and Bonnybridge.

Attention is paid to footways adjacent to carriageways during driven carriageway safety survey inspections. These are carried out in line with the frequencies dictated by carriageway hierarchy and therefore may not be in line with the frequency recommended for footway surveys.

Whilst we have adopted the hierarchy definitions based upon the Code of Practice, we have opted for different safety inspection frequencies on some categories, this is based on operational resources available and risk factors applied. Our safety inspection frequencies are as follows:-

**Table 6 Frequency of Inspection – Footways & Footpaths**

Category	Category Name	Code of Practice Frequency	Falkirk Council Frequency
1	Prestige Walking Zones	Monthly	Monthly
2	Primary Walking Routes	Monthly	3 Monthly
3	Secondary Walking Routes	Quarterly	Not Undertaken*
4	Link Footways / Footpaths	Six Monthly	Not Undertaken*
5	Local Access Footways / Footpaths	Annually	Not Undertaken*

**Table 7              Frequency of Inspections – Cycleways**

<b>Category</b>	<b>Code of Practice Frequency</b>	<b>Falkirk Council Frequency</b>
1	As for adjacent road	Not Undertaken*
2	Six Monthly	Not Undertaken*
3	Annually	Not Undertaken*

\*Whilst it is noted in the aforementioned paragraphs that some frequencies are at odds with the Code of Practice recommendations, where these routes are adjacent to or adjoining a carriageway, then they will be subject to inspection attention per the frequency for the adjoining carriageway route.

## Safety Inspection Routes

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Safety inspection routes need to be determined. This can be either manually done, or using an optimisation tool.

Safety Inspection routes are determined by hierarchy category and split into each sub domain across the Falkirk Council Area. There are 4 domains – Areas A, B, C & D with an Inspector responsible for each. The frequency of each inspection is detailed in Table 5 above.

Carriageway safety inspections are normally be undertaken from a slow moving conspicuously marked survey vehicle, proceeding as close to the left hand side of the carriageway as possible. The speed of the inspection is appropriate to allow defects to be recorded but also allow for the safety of staff, other road users and weather conditions. If conditions are unsuitable to inspect safely and effectively, then inspection shall be rescheduled.

Factors such as carriageway hierarchy, speed and volume of vehicles on each survey route have been taken into account when determining the number of personnel required to undertake surveys.

Type of Survey	Personnel Required
Monthly	1 Driver + 1 Inspector
Quarterly	1 Driver + 1 Inspector
Annual	1 Inspector
Car Park	1 Inspector

In instances where there is only one member of staff within the vehicle, and prior to recording information on the nature of defects, the survey vehicle should be stopped with the engine turned off and parked in a safe location.

In heavily trafficked urban areas it may be difficult to obtain the necessary level of accuracy from vehicle based inspections and walking should be used in these circumstances, for example where there are a significant number of parked cars.

All routes are recorded in WDM Works Management System and are reviewed whenever our Roads Asset Management Plan is reviewed. Current date for review is 2021.

Inspection frequency and programming is managed through WDM and Inspectors are alerted to upcoming due surveys. In addition, a calendar is created at the beginning of each year with the upcoming due dates for each inspection frequency.

All inspections are recorded in the WDM Works Management System. Records are transferred electronically from the data capture device used on route inspections. All records are referenced to the USRN (Unique Street Reference Number). The inspection records are a valuable resource for the Council when defending 3rd party liability claims and also for locating and prioritising reactive repairs.

All works should be instructed using the standard format of issuing a Works Instruction clearly specifying the location, nature and extent of the work, providing sufficient information, including a plan where necessary, to enable work to be completed without the need for any further clarification.

The order should clearly state the priority for the work and, if necessary any critical dates for completion. The intention is that all Works Instructions will be transmitted electronically. For emergency defects, work should be initiated by telephone with a confirmation order following. This process should be used for Category 1 defects.

The detailed programming of all planned roadworks will be subject to agreement of arrangements for road space occupation for inclusion within the Scottish Road Works Register.

Urgent and emergency works also require to be recorded within the Scottish Road Works Register, if not classed as mobile works, i.e. less than half an hour in duration.

A key concern for road users and communities is the apparent early failure of temporary, and sometimes permanent, repairs and consequent need for duplication. The greater flexibility within the response categories should promote a more cost-effective use of better materials and methods to provide a first visit permanent repair.

Immediately after work is complete on any identified defect the squad Fore Person should confirm this by completing the forms allowing the correct information to be inserted into the works database. This process is crucial for 'closing the loop' in case of any subsequent legal issue and to reconcile cost for work undertaken. This is also required to enable the originator, if requested, to inspect the completed work although this should not normally be necessary.

## Inspection Tolerances

All road safety inspections will be carried out to the SCOTS recommended frequencies detailed in the following tables and should be completed within the tolerances shown in Table 4, as follows:

**Table 4            Inspection Tolerances**

Frequency of Inspection	Inspection Tolerances
Monthly	± 5 working days of the Due Date
Quarterly	± 10 working days of the Due Date
Six Monthly	± 15 working days of the Due Date
Annual	± 20 working days of the Due Date

### Definition of above terms

- **Frequency of Inspection - Monthly** indicates that twelve regular spaced inspections will be carried out per year.
- **Frequency of Inspection - Quarterly** indicates that four regular spaced inspections will be carried out per year.
- **Frequency of Inspection - Six Monthly** indicates that two regular spaced inspections will be carried out per year.
- **Frequency of Inspection - Annual** indicates that one regular spaced inspection will be carried out per year.
- **Due Date** is the programmed date of an inspection.

### Staff Contingency and Alterations to the Inspection Programme

- Due to the nature of the weather in Scotland it is probable that the road surface will be wet with some elements of standing or running water whilst an inspection is in progress. However if the quantity of water is excessive or across the full width of the carriageway then the inspection should be abandoned and an entry should be made to document the circumstances.
- If an inspection Due Date falls during an extended period of absence e.g. inspector holiday or illness, then the inspection should be allocated to another suitably experienced member of staff who has the capacity to undertake the inspection.
- If and for reasons beyond the control of the roads authority (e.g. substantial snow fall), any inspection cannot be carried out in compliance with Table 4 the roads authority will decide on the viability of a safety survey being undertaken, taking into account the availability of staff and the prevailing weather conditions.
- As soon as reasonably practicable following the above events a deferred programmed safety inspection should be carried out on the affected length of road.
  - Where a monthly inspection is more than 2 weeks late due then the programmed inspection will be missed and the cycle resumed at the next due inspection date.

- Where substantial unavoidable delays are incurred to other inspection frequencies the manager may assess the impact and adjust the programme.
- A record must be kept of change decisions and reasons for them.

# Inspection Methodology

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## Safety Inspections

Road Safety Inspections are designed to identify defects likely to cause a hazard or serious inconvenience to users of the network or the wider community. Such defects include those that require urgent attention as well as those where the locations and sizes are such that longer periods of response are appropriate.

### Planned Cyclic Safety Inspections

The Safety Inspection regime forms a key aspect of the road authority's strategy for managing liability and risk. Planned, cyclic safety inspections are carried out to identify defects which are hazardous (to any user of the road including drivers, pedestrians, equestrians and cyclists) so that an effective repair can be carried out within a predetermined response time.

The specified frequency of these inspections is dependent upon the **hierarchy category** of each section of road but may be varied after a documented risk assessment.

During safety inspections, observed defects that provide any foreseeable degree of risk to users will be recorded and processed for repair as appropriate following the methodology detailed in the 'Defect Risk Assessment' section of this document. The degree of deficiency in the road elements will be crucial in determining the nature and speed of response. Judgement will always need to take account of particular circumstances. For example, the degree of risk from a pothole depends upon not only its depth but also its surface area, location within the road network and usage of the road or footway.

The objectives of safety inspection activity are to:

- Minimise the risk of injury and disruption to road users as far as is reasonably practicable,
- Provide a regular, structured inspection of the public road network, within available resources,
- Deliver a consistent, reliable response to identified defects, within available resources,
- Maintain accurate and comprehensive records of inspections and response and
- Provide a clear, accurate and comprehensive response to claims.

### Items for Inspection

The following are examples of the types of defect which, when identified, should be assessed and an instruction for repair issued with an appropriate response time specified. The list identified below is not exhaustive.

#### Carriageways

- Surface defects
- Abrupt level differences in running surface
- Edge deterioration of the running surface
- Excessive standing water, water discharging onto and / or flowing across the road

- Blocked gullies and obstructed drainage channels or grips which could lead to ponding or flooding
- Debris and/or spillages likely to be a hazard
- Missing road studs
- Badly worn Stop, Give Way, double continuous white line or markings associated with TRO's
- Missing or significantly damaged covers

#### **Footways, Footpaths and Cycleways**

- Surface defects
- Excessive standing water and water discharging onto and or flowing across the foot/cycle way
- Dangerous rocking paving slabs
- Large cracks or gaps between paving slabs
- Missing or significantly damaged covers
- Debris and / or spillages likely to be a hazard
- Damaged kerbs

#### **Street Furniture**

- Damaged vehicle restraint systems, parapets, handrails or guardrails
- Damaged boundary fence where animals or children could gain access
- Damaged or missing signs, such as Give Way, Stop, Speed Limit

#### **Road Lighting**

- Damaged column, cabinet, control pillar, wall mounting
- Exposed, live electrical equipment

#### **Others**

- Overhead wires in dangerous condition
- Sight-lines obstructed by trees and other vegetation,
- Trees in a dangerous condition
- Earthslips where debris has encroached or is likely to encroach the road or causing the road to fall away
- Rocks or rock faces constituting a hazard to road users
- Damaged road structures



# Risk Management Process

Inspectors undertaking safety inspections or responding to reported incidents require to use judgement in determining likelihood and consequences of the observed or reported defects. This approach is consistent with 'Well-Managed Highway Infrastructure: A Code of Practice' recommendation that roads authorities adopt a system of defect risk assessment for determining the response categories to road defects. However, it represents a step change in the way that defects are assessed. Taking a risk based approach, as per the above Code, means that there are NO prescriptive investigation or intervention levels to apply. The rationale for removing these is that the same defect will represent a different level of risk in a different context. In the past this has led to inappropriate and often unnecessary, costly, temporary repairs. Instead, by using a risk based approach, councils can reduce such reactive interventions and target more of their scarce resources towards programmed work that in the longer term will lead to an overall improvement of road condition.

So while not providing any minimum or default standards, the Code does support the development of local levels of service in accordance with local needs, priorities and affordability.

## Establishing Context

Establishing context requires the inspector to utilise experience and knowledge during the inspections to assess the road characteristics, such as giving consideration to environment (speed limit, width, rural/urban, road hierarchy, visibility, bend, hill - incline/decline, road camber/crossfall, etc.), relevant road user types (pedestrians, cyclists, horse riders, cars, LGV's, HGV's, PSV's, etc.), traffic volumes, maintenance history, historical incidents/claims/complaints (e.g. experience/knowledge of similar hazards being a contributory factor to incidents/claims within the authority or a neighbouring authority), demographics and key local amenities (proximity to doctors surgery, hospitals, shopping areas, schools, etc.).

## Risk Assessment

Taking the context into consideration, Risk Assessment is a three step process:

### 1. Hazard Identification

An inspection item for which the inspector identifies road asset defects which may pose a risk to road users i.e. lead to a negative consequence. The types of asset to be inspected and the potential associated hazards from defects are detailed in the Inspectors' Operations Manual.

### 2. Risk Analysis

All risks identified through this process must be evaluated in terms of their significance which means assessing the **likelihood** of encountering the hazard and the **most probable** (not worst possible) **consequence** should this occur.

The procedure is designed to mitigate 'worst scenario' thinking and ensure an objective assessment is carried out. It is important therefore that the analysis is carried out in this

defined step sequence to determine the appropriate level of risk and corresponding priority response.

### **Risk Likelihood**

The risk likelihood is assessed with regard to how many users are likely to pass by or over the defect, consequently the network hierarchy and defect location are important considerations in the assessment.

The likelihood of encountering a hazard, within the established context, will be quantified on a scale of Remote to Almost Certain as follows:

**Table 8          Risk Likelihood**

<b>Likelihood / Probability</b>	<b>Likelihood Description</b>		
<b>Almost Certain</b>	Will undoubtedly happen	Over 90%	Daily
<b>Likely</b>	Will probably happen, but not a persistent issue	Up to 90%	Monthly
<b>Possible</b>	May happen occasionally	Up to 65%	Annually
<b>Unlikely</b>	Not expected to happen, but it is possible	Up to 20%	10 Years
<b>Remote</b>	Improbable	Less than 5%	20 Years

## Risk Consequence

The risk consequence is assessed by considering the most probable (NOT worst possible) outcome (impact) should the risk occur and will be quantified on a scale of Negligible to Catastrophic as follows:

**Table 9 Consequence (Impact/Severity) Score**

<b>Consequence (Impact/Severity)</b>	<b>Description</b>			
	<b>Impact on Service Objectives</b>	<b>Financial Impact</b>	<b>Impact on people</b>	<b>Impact on Reputation</b>
<b>Catastrophic</b>	Unable to function, inability to fulfil obligations	Severe financial loss	Death	Highly damaging, sever loss of public confidence
<b>Major</b>	Significant impact on services provision	Major financial loss	Extensive injury, major permanent harm	Major adverse publicity, major loss of confidence
<b>Moderate</b>	Service objectives partially achievable	Significant financial loss	Medical treatment required, semi- permanent harm up to 1 year	Some adverse publicity, legal implications
<b>Minor</b>	Minor impact on service objectives	Moderate financial loss	First aid treatment, non-permanent harm up to 1 month	Some public embarrassment, no damage to reputation
<b>Negligible</b>	Minimal impact, no service disruption	Minimal financial loss	No obvious harm/injury	No interest to the press, internal only

### 3. Risk Evaluation

The risk factor for a particular risk is the product of the risk impact and risk. It is this factor that identifies the overall seriousness of the risk and consequently therefore the appropriateness of the speed of response to remedy the defect. Accordingly, the priority response time for dealing with a defect can be determined by correlation with the risk factor as shown in the risk matrix, table 10:

**Table 10 Risk Matrix**

Consequence	Negligible	Minor	Moderate	Major	Catastrophic
Likelihood					
Remote	NR	NR	NR	NR	P3
Unlikely	NR	NR	P4	P4	P3
Possible	NR	P4	P4	P3	P2
Likely	NR	P4	P3	P2	P1
Almost Certain	NR	P3	P2	P1	P1

### Risk Management Response

Having identified a particular risk, assessed the likelihood of it occurring and most probable consequence (impact/severity) and thus calculated the risk factor, the appropriate response is identified in the form of a risk management (response) matrix, Table 11.

**Table 11 Risk Management Matrix**

Risk Category	Priority Response
Critical Risk	Priority 1 response
High Risk	Priority 2 response
Medium Risk	Priority 3 response
Low Risk	Priority 4 response
Negligible Risk	No response

## **Intersections and Multiple Road Users Types**

The hazard context considers the location and the types of road users which could be impacted by the defect. Inspectors should consider the different impacts and consequences for each road user type (e.g. pedestrians, cyclists, vehicle drivers, etc.) and at intersections, consider the hierarchy of each route. Inspectors **must therefore assess the likelihood and consequence for each road user type and/or route hierarchy**. The priority of the response is based on the highest priority determined from the risk matrix (Table 10).

## **Utility Company Defects**

Defects identified may be due to the activities of the utility companies, which are governed and managed by the requirements of NRSWA<sup>3</sup>. However, the road authority still retains duty of care responsibility.

Insert the local procedure for dealing with such defects:

Such defects will be recorded by the Road Safety Inspectors and then reported to the owning utility company.

In the case of urgent attention being required, the following process applies:

It may not always be immediately clear to inspectors whether road defects are a result from normal wear and tear or are associated with defective reinstatements by utilities and others. Road users, other employees and Councillors will have even more difficulty and will rarely be able to discriminate.

In cases where defects present an immediate and critical hazard to road users, inspectors should take immediate action to make safe irrespective of the cause or owner. If they have reason to suspect defective reinstatement they should then advise the NRSWA Team or where this is not possible, advise the utility company directly, recording a reference number and date and time for future reference, allowing the appropriate utility to initiate the appropriate repair required. This should also be confirmed by entering the defect into the Scottish Road Works Register (SRWR).

In cases where the risks to road users is less immediate and inspectors have reason to suspect defective reinstatement or apparatus they should notify the appropriate.

### **Inspection Records**

All inspections are recorded in the WDM Works Management System. Records are transferred electronically from the data capture device used on route inspections. All records are referenced to the USRN (Unique Street Reference Number). The inspection records are a valuable resource for the Council when defending 3rd party liability claims and also for locating and prioritising repairs.

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<sup>3</sup> New Roads and Street Works Act 1991

## Priority Response Times

### Safety Levels

The Priority Response Times for each Defect Category are shown in Table 12 below.

**Table 12 SAFETY LEVELS - Defect Priority and Response Times**

Defect Priority	1	2	3	4	NR
Standard Response Time	24 Hours	5 Working Days	60 Working Days	Programmed work	No Action required

#### **Priority 1: Make safe within 24 Hours**

Priority 1 represents a critical risk to road users and should be corrected or made safe at the time of inspection, if reasonably practicable. In this context, making safe may constitute displaying warning signs and / or coning off to protect the public from the defect. Where reasonably practicable, safety defects of this Priority should not be left unattended until made safe or, a temporary or permanent repair has been carried out.

When a Priority 1 defect is identified within a larger group / area of defects, only that particular element shall be treated as a Priority 1 defect. The remaining defects shall be categorised accordingly.

#### **Priority 2: Repair within 5 Working Days.**

This allows a more proactive approach to be adopted for those defects that represent a high risk to road users or because there is a risk of short-term structural deterioration. Such defects may have safety implications, although of a lesser significance than Priority 1 defects, but are more likely to have serviceability or sustainability implications.

#### **Priority 3: Action within 60 Working Days.**

Defects that require attention although they represent a medium risk to road users. This allows defects of this nature to be included in medium term programmes of work.

#### **Priority 4: Consider for Planned Works Programme**

The defect is considered to be of low risk; no immediate response is required. Defects in Priority 4 are not classed as safety defects and are collected to assist the development and prioritisation of Planned Maintenance Works Programmes.

#### **NR: No Action Required**

The defect is considered to be of negligible risk, no intervention is required and monitoring will continue as per the inspection regime

## Service Levels

**Table 13 FALKIRK COUNCIL SERVICE LEVELS - Defect Priority and Response Times**

Defect Priority	1	2	3	4	NR
Response Time	24 HOURS	5 DAYS	25 WORKING DAYS	Programmed work	No Action required

Falkirk Council, as a road authority, has also set the above Service level response times that are the same as or higher than the Safety levels. It is recognised that we are able to exceed to expectations set out in the Safety Levels for Priority 3 defects. A target response time of 25 working days has been set for the resolution of Priority 3 defects. This will be subject to review based on the performance output in relation to the new rationale in WMHI:CoP.

### Meeting Target Response Times

It may not be possible, particularly at certain times of year, to meet target response times, due to pressure on resources. This could, but not exclusively, be due to the high number of defects that can arise in a short period of time after periods of adverse weather, such as prolonged spells of heavy rain or snow, or freeze / thaw conditions. Prolonged periods of adverse weather may also prevent remedial measures being carried out.

During periods of extreme weather, the Area Roads Engineer will make a decision regarding the viability of a safety survey being undertaken, taking into account the availability of staff and the prevailing weather conditions.

In the case of absence of an inspector due to annual leave or ill health it will be the responsibility of the Area Roads Engineer to ensure a suitably trained substitute Inspector undertakes any inspection due within the time frames set down in this document.

The appropriate response time commences from the time that the defect was identified and categorised. For a programmed inspection this will be from the time that the defect was inspected.

### Performance Monitoring

Regular monitoring and review of hierarchy, standards, procedures and records is an essential aspect of the system, for a number of reasons:-

- To enable changes in risk to be identified, if necessary, in new standards or procedures
- To enable any uncertainties or problems in responsibilities, procedures or treatments to be discussed and resolved
- To enable actual or potential claims to be reviewed and strategy for defence agreed where appropriate

- To review inspection and response performance and enable any possible improvements or efficiencies to be discussed and introduced.

Regular discussion should take place as necessary between the network and operations sides of the area office regarding the inspection and repair cycle. This will encourage joint planning co-operation and communication at all levels.

Random inspections and interrogation of survey data will be undertaken to ascertain if a level of consistency is achieved across all four sub-domains and areas. In addition, regular weekly meetings between the Area Roads Engineer and Inspectors will take place to discuss any patterns and any other issues that may arise in data collection.



## Inspector Competency

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For the purpose of this document, the term 'Inspector' is defined as 'a person who the road authority has assessed and certified as competent to identify and undertake a risk assessment of a road asset defect and if required, determine the risk treatment'. Therefore, within this document, 'inspector' is not utilised exclusively for a person who mainly completes the routine road asset safety inspections, but can include technicians, engineers or other staff within the authority who have been assessed by the authority to achieve the authority's required level of competency.

### Training

Road Authorities must ensure that all Road Asset Safety Inspectors are competent in carrying out safety defect inspections.

All Inspectors shall attend relevant training courses such as SCOTS Risk Based Approach Training or those approved by the Institute of Highway Engineers (IHE) – Highways Inspectors Board.

The IHE accredits the UK Highway Inspectors training and certification scheme approved by the UK Roads Board in 2010. It established the Highway Inspectors Board in 2011. All Inspectors have been trained and passed an IHE approved training course based on Scottish legislation and the new risk based approach. Subsequently, all Inspectors are on the IHE Highway Inspectors Register.

### Training Plans

Courts accept that there may be circumstances where an inspector is new to the role and will have to build up their experience, training and competency. In such cases, or where an existing inspector does not meet the required standard, the Area Roads Engineer shall work with the Inspector to develop, document and implement a Training Plan to assist them to meet the necessary level of competency.

The Training Plan is evidence that the road authority is supporting the inspector, assisting them to achieve the level of competency required and ensuring consistency across the authority's inspectors.

Review of inspector training plans will be conducted at regular intervals to ensure the plan is progressing as anticipated, to sign off key areas completed and to amend the plan, if required.

Records of the reviews and any actions shall be maintained and held against the inspector's "Training and Competency" record.

### Training and Competency Records

Inspector training and competency records will be maintained and reviewed annually for completeness and to identify when inspector re-assessment is due to ensure that they continue to meet the road authority's minimum competency requirements.

The Training and competency records are held in the employee's training and personnel file.

## **Other Inspections**

### **Service Request Inspections – Externally Reported Defects**

Road authorities receive reports of defects from a number of different sources, such as the Police, Emergency Services, general public, public utilities and other agencies; these service request reports are managed as follows:

All Roads Service employees may identify potential safety problems in the general course of their duties. Reports by the Police, roads users and others may also identify items requiring inspection by the service, but are not an alternative to the process of programmed safety inspections.

All users, including Councillors and employees should be encouraged to report road and footway defects through the Council's online fault reporting tool – 'Report It'

### **Road Condition Inspections (or Structural Condition Surveys)**

These are undertaken to consider the general condition of the individual roads and footways and the need for planned structural maintenance which can be programmed accordingly. Inspections for the carriageway asset are presently undertaken through the national Scottish Road Maintenance Condition Survey (SRMCS). Visual condition surveys of assets may also be undertaken with SCOTS guidance.

Visual surveys are undertaken by the Area Roads Engineer. The planned maintenance programme is formulated using data from a variety of sources including SRMCS, Scheme Manager Pavement Management Tool, Roads Officer recommendations and accident clusters.

### **Utility Company Apparatus**

Undertaken in accordance with the requirements of the New Roads and Street Works Act 1991. Where identified, defects will be notified to the relevant Statutory Undertaker.

If any Roads staff have reason to suspect a defective reinstatement or utility related defect, they should advise the NRSWA Team or where this is not possible, advise the utility company directly, recording a reference number and date and time for future reference, allowing the appropriate utility to initiate the appropriate repair required. This should also be confirmed by entering the defect into the Scottish Road Works Register (SRWR).

In all cases, the defects must be recorded through the Scottish Road Works Register via the NRSWA team.

### **Service Inspections**

These are detailed inspections to ensure that particular road assets meet serviceability requirements. An example would be a General Inspection of a road bridge. Such inspections are not covered in this document.



# **ROADS SERVICES**

## **ROAD ASSET SAFETY INSPECTOR OPERATIONS MANUAL**

**VERSION 1 – DEC. 2018**



**Falkirk Council**

## Document Information

<b>Title</b>	Road Asset Safety Inspections: A Risk Based Approach Inspectors Operations Manual
<b>Author</b>	Gary Neill – Area Roads Engineer
<b>Description</b>	To provide information and guidance to inspectors on the method to be deployed in undertaking risk assessment and the prioritisation of defects.

## Document Control

<b>Version</b>	<b>SCOTS Template Version</b>	<b>Date</b>	<b>Author</b>	<b>Changes from Previous Version</b>
1.0	1.0	23/10/18	Gary Neill	Updated SCOTS Template Document to include F.C's policy.

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## Purpose

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The Inspections Operations Manual is one of several documents in the SCOTS Risk Based Approach suite; this document is aimed at Road Asset Safety Inspectors, providing information and guidance regarding the method to be deployed in undertaking risk assessment and the prioritisation of defects.

The adoption of this SCOTS recommended approach across Scottish Authorities promotes a consistency in the management of the road network that focuses on delivering a programme of permanent repairs to improve its condition and safety.

## Background

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### Legislative Requirements

The methodology described in this document has been designed to comply with the following current legislative requirements:

#### Roads (Scotland) Act 1984

The Roads (Scotland) Act 1984 Section 1, states that “...a local roads authority shall manage and maintain all such roads in their area as are for the time being entered in a list (in this Act referred to as their “list of public roads”) prepared and kept by them under this section.”

#### Common Law – Duty of Care

Road Authorities have a Duty of Care under Common Law. The criteria commonly used by the courts to determine if a defendant is liable are:

1. The harm which occurred must be a reasonable foreseeable result of the defendant's conduct;
  - Was the authority aware of the defect?
  - Was the route inspected within assigned timescales?
  - Experience of similar defects and the deterioration/degradation rates? Will the defect deterioration/degradation cause the likelihood and/or impact of the defect to increase before the next inspection?
  - Has there been similar incidents on the authorities' network or is the authority aware of similar incidents occurring?

2. It is fair, just and reasonable to impose liability.
  - Did the authority assess, prioritise and maintain the defect in accordance with their Maintenance Strategy/Manual or equivalent documents?
  - What was the defect risk and priority?
  - If necessary, what action(s) had been taken to repair the defect? Timescale for the repair?
  - Was the defect repaired within specified timescales?

## **Well Managed Highway Infrastructure – a Code of Practice**

On 28<sup>th</sup> October 2018, Well Maintained Highways will be superseded by Well Managed Highway Infrastructure (WMHI), removing all prescriptive intervention levels, action timescales, inspection frequencies, etc.

The Inspection Operations Manual does not provide any minimum or default standards but provides guidance and advice to support the objective risk assessment of defects.

## **Inspector Competency**

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### **Competency and Training**

Road Authorities must ensure that all Road Asset Safety Inspectors are competent. Taking a consistent approach to this requirement, Falkirk Council are utilising the SCOTS Risk-based Approach to Safety Defect Inspections methodology. All safety inspectors are therefore required to undertake training and achieve a pass grade on the course assessment. This will be arranged by Gary Neill – Area Roads Officer

All Inspectors shall attend relevant training courses such as SCOTS Risk Based Approach Training or those approved by the Institute of Highway Engineers (IHE) – Highways Inspectors Board.

The IHE accredits the UK Highway Inspectors training and certification scheme approved by the UK Roads Board in 2010. It established the Highway Inspectors Board in 2011. All Falkirk Council Roads Inspectors have been trained and passed an IHE approved training course based on Scottish legislation and the new risk based approach. Subsequently, all Falkirk Council Roads Inspectors are on the IHE Highway Inspectors Register.

### **Competency Training Records and Plans**

A “Training and Competency” record will be kept locally and reviewed at 5 years by Area Roads Engineer. If an inspector does not meet Falkirk Council’s minimum competency requirements, a Training Plan will be developed by the Area Roads Engineer to assist the inspector achieve the necessary level of competency.



# Inspection Procedures

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## Safety Inspections

### Planned Cyclic Safety Inspections

The Safety Inspection regime forms a key aspect of the road authority's strategy for managing liability and risk. Its purpose is to systematically identify defects which are hazardous (to any user of the road including drivers, pedestrians, equestrians and cyclists) so that an effective repair can be carried out within an appropriate response time, determined by the level of risk the defect poses.

Cyclic Safety Inspections are carried out to specified frequencies, dependent upon the hierarchy of each section of road.

Carriageway safety inspections is normally undertaken from a slow moving conspicuously marked survey vehicle, proceeding as close to the left hand side of the carriageway as possible. The speed of the inspection must be appropriate to allow defects to be recorded but also allow for the safety of staff, other road users and weather conditions. If conditions are unsuitable to inspect safely and effectively, then inspection shall be rescheduled.

The objectives of safety inspection activity are to:

- Minimise the risk of injury and disruption to road users as far as is reasonably practicable,
- Provide a regular, structured inspection of the public road network, within available resources,
- Deliver a consistent, reliable response to identified defects, within available resources,
- Maintain accurate and comprehensive records of inspections and response and
- Provide a clear, accurate and comprehensive response to claims.

During safety inspections, observed defects that provide any foreseeable degree of risk to users will be recorded. The degree of deficiency in the road elements will be crucial in determining the nature and speed of response. Judgement will always need to take account of particular circumstances. For example, the degree of risk from a pothole depends upon not only its depth but also its surface area, location within the road network and other factors such as the volume and speed of traffic.

To address risk on our busiest footways and footpaths, Safety Inspections are undertaken as follows:-

<b>HIERARCHY</b>	<b>FREQUENCY</b>
Prestige Routes	Monthly Walked
Primary Routes	3 Monthly Walked
Secondary Routes	Not Undertaken
Link Routes	Not Undertaken
Local Access Routes	Not Undertaken

Otherwise, attention is paid to footways adjacent to carriageways during driven carriageway safety survey inspections. These are carried out in line with the frequencies dictated by carriageway hierarchy and therefore may not be in line with the frequency recommended for footway surveys.

## Inspection Routes

Inspection routes are assigned as follows:

Falkirk Council's road network is split into four domains and an Inspector is allocated a domain. Inspectors undertake all surveys regardless of frequency in their own domains. Factors such as carriageway hierarchy, speed and volume of vehicles on each survey route have been taken into account when determining the number of personnel required to undertake surveys.

Type of Survey	Personnel Required
Monthly	1 Driver + 1 Inspector
3 Monthly	1 Driver + 1 Inspector
6 Monthly	1 Inspector
12-Monthly	1 Inspector
Street Lighting (night inspections)	1 Inspector
Car Park	1 Inspector

## Inspection Tolerances

All road safety inspections will be carried out to the SCOTS recommended frequencies detailed in the following tables and should be completed within the tolerances shown in Table 1, as follows:

Frequency of Inspection	Inspection Tolerances
Monthly	± 5 working days of the Due Date
Quarterly	± 10 working days of the Due Date
Six Monthly	± 15 working days of the Due Date
Annual	± 20 working days of the Due Date

**Table 1      Inspection Tolerances**

In the event of being aware that the due date for a programmed inspection cannot be met, the inspector must, without delay, inform the manager and provide the reason(s) for this.

In the case of absence of an inspector due to, for example, annual leave or ill health the roads authority will ensure that another competent replacement undertakes any inspection due within the time frames set down in this document. Inspectors receive weekly notifications of safety inspections due dates so that adequate planning can be undertaken.

During periods of extreme weather, the roads authority will decide on the viability of a safety survey being undertaken, taking into account the availability of staff and the prevailing weather conditions.

If a monthly inspection is more than 2 weeks late then that inspection will be missed and an inspection carried out at the next due date. The reason for this will be recorded as follows:

An export of the (nil return) survey is uploaded through the Roads Management System at the earliest opportunity post cut-off date or at the next survey interval whichever is sooner and recorded as not undertaken and the reason – absence should be avoided as the reason for a nil return survey, if possible. In all other cases where inspection tolerances are exceeded, the manager will decide whether the programme can be accelerated or adjust the inspection programme appropriately and record this decision.

### **Ad-Hoc reactive Safety Inspections**

Safety inspections are not the only means of identifying safety defects. Employees may identify potential safety problems in the general course of their duties. Reports by the Police, roads users and others may also identify items requiring inspection by the service, but are not an alternative to the process of programmed safety inspections.

The process for assigning ad-hoc inspections is as follows:

Staff shall investigate and report on requests for service, complaints and enquiries reported through the Roads Management System, Customer Relations Manager or any other medium, following Quality Process 103. The risk assessment methodology outlined in the 'Defect Identification and Risk Assessment Process' section of this document will also be adopted for reactive safety inspections.

Any individual safety-related defect identified and inspected outside a planned or ad-hoc cyclic safety inspection must be recorded.

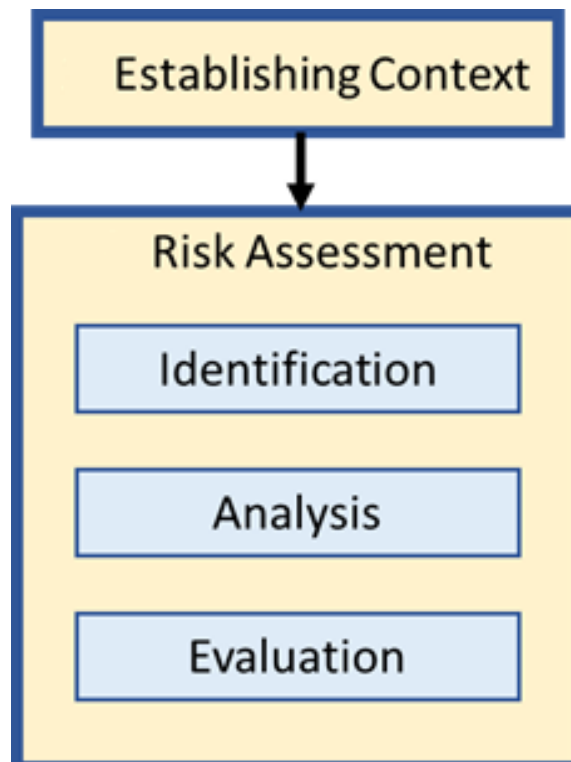
## Defect Identification and Risk Assessment Process

Inspectors undertaking safety inspections or responding to reported incidents require to use judgement in assessing the risk posed by reported defects. 'Well-Managed Highway Infrastructure: A Code of Practice' recommends that roads authorities adopt a system of defect risk assessment for determining the response categories to road defects.

***Note on the rationale behind a risk based approach:***

***For many councils this guidance represents a step change in the way that defects are assessed. Taking a risk based approach, as per the above Code of Practice, means that there are NO prescriptive investigation or intervention levels to apply. The rationale for removing these is that the same defect will represent a different level of risk in a different context. In the past this has led to inappropriate and often unnecessary, costly, temporary repairs. Instead, by using a risk based approach, councils can reduce such reactive interventions and target more of their scarce resources towards programmed work that in the longer term will lead to an overall improvement of road condition.***

Falkirk Council is adopting the SCOTS recommended procedure for risk assessment that is based on the ISO31000 Risk Management Process (contained in Appendix B). In undertaking assessment of safety defects, the following steps are applicable:



## Step 1: Establishing Context

Establishing context requires the Inspector to utilise experience and knowledge during the inspections to assess the road characteristics, such as giving consideration to environment (speed limit, width, rural/urban, road hierarchy, visibility, bend, hill - incline/decline, road camber/crossfall, etc.), relevant road user types (pedestrians, cyclists, horse riders, cars, LGV's, HGV's, PSV's, etc.), traffic volumes, maintenance history, historical incidents/claims/complaints (e.g. experience/knowledge of similar hazards being a contributory factor to incidents/claims within the authority or a neighbouring authority), demographics and key local amenities (proximity to doctors surgery, hospitals, shopping areas, schools, etc.).

## Step 2: Risk Assessment

### Step 2a: Hazard Identification

The risk identification stage involves the Inspector identifying road asset defects (hazards) which might pose a risk to road users i.e. lead to a negative consequence. Appendix C of this document provides a list of example hazards that inspectors should consider risk assessing during the inspections, however it should be noted that the list is not exhaustive. Inspectors must utilise experience and judgement, the intention is not to limit identification of hazards to those provided in Appendix C.

Inspectors may identify defective equipment or assets which are NOT the responsibility of the authority, such as Statutory Undertakers reinstatements or equipment (e.g. sunk inspection chamber); in these circumstances a duty of care still applies. The Inspector should conduct a risk analysis to determine the defect's risk category and priority response as well as following the Falkirk Council procedure – In cases where defects present an immediate and critical hazard to road users, Inspectors should take immediate action to make safe irrespective of the cause or owner. If they have reason to suspect defective reinstatement they should then advise the NRSWA team or where this is not possible, advise the utility company directly, recording a reference number and date and time for future reference, allowing the appropriate utility to initiate the appropriate repair required. This should ALWAYS be confirmed by entering the defect into the Scottish Road Works Register (SRWR). In cases where the risks to road users is less immediate and inspectors have reason to suspect defective reinstatement or apparatus they should notify the appropriate utility via the Scottish Road Works Register (SRWR).

## Step 2b: Risk Analysis



**In general, when assessing risk, the human tendency is to consider the worst possible outcome, rather than the most probable. Psychologically, the word 'risk' forces our thinking down that route.**

The following risk analysis procedure is designed to mitigate this 'worst case scenario' thinking and ensure an objective assessment is carried out.

It is important that the analysis is carried out in the defined step sequence to determine the appropriate level of risk and corresponding priority response,

**DO NOT WORK BACKWARDS** from a Priority conclusion.

Hazards identified through the hazard identification step must therefore be analysed in terms of their significance which means assessing the **likelihood** of the risk occurring followed by the most probable **consequences (impact/severity)** should the risk occur.

## 1. Assess Risk Likelihood

Table 2 (below) should be used to assess Risk Likelihood.

It contains descriptions of the possible likelihood of encountering the hazard, quantified on a scale of Remote to Almost Certain.

The information ascertained in “Step 1 – Establish Context” should inform the Inspector’s judgement in assessing the likelihood of a road user encountering the hazard.

<b>Likelihood / Probability</b>	<b>Likelihood Description</b>		
<b>Almost Certain</b>	Will undoubtedly happen	Over 90%	Daily
<b>Likely</b>	Will probably happen, but not a persistent issue	Up to 90%	Monthly
<b>Possible</b>	May happen occasionally	Up to 65%	Annually
<b>Unlikely</b>	Not expected to happen, but it is possible	Up to 20%	10 Years
<b>Remote</b>	Improbable	Less than 5%	20 years

**Table 2**                      **Risk Likelihood**

## 2. Assess Risk Consequence (Impact/Severity)

Table 3 (below) should be used to assess the **most probable** (NOT worst possible) Consequence of a road user encountering the hazard (reasonably foreseeable extent of the impact on Service, Finance, People and Reputation). It contains descriptions of the possible consequences of encountering the hazard, quantified on a scale of Negligible to Catastrophic.

Consequence (Impact/Severity)	Description			
	Impact on Service Objectives	Financial Impact	Impact on people	Impact on Reputation
<b>Catastrophic</b>	Unable to function, inability to fulfil obligations	Severe financial loss	Death	Highly damaging, severe loss of public confidence
<b>Major</b>	Significant impact on services provision	Major financial loss	Extensive injury, major permanent harm	Major adverse publicity, major loss of confidence
<b>Moderate</b>	Service objectives partially achievable	Significant financial loss	Medical treatment required, semi-permanent harm up to 1 year	Some adverse publicity, legal implications
<b>Minor</b>	Minor impact on service objectives	Moderate financial loss	First aid treatment, non-permanent harm up to 1 month	Some public embarrassment, no damage to reputation
<b>Negligible</b>	Minimal impact, no service disruption	Minimal financial loss	No obvious harm/injury	No interest to the press, internal only

**Table 3 Consequence (Impact/Severity)**

All hazards identified must be assessed against each of the four consequence categories (Service Objectives, Financial, People and Reputation) contained in Table 3 (above); **the consequences with the highest severity** of the four categories should be considered in the Risk Analysis.



With practice and experience conducting the above risk assessment process steps is a quick assessment. Inspectors are not required to record their reasons for selecting a particular category of likelihood and impact, only the result of this assessment. The rationale for this is that to do so would slow down the inspection process and make it impractical to carry out with the current level of resources.



## Step 2c: Risk Evaluation

The outcomes from the Likelihood and Consequence assessment are used to determine the risk category of the hazard (Table4).

*Inspectors will record their decision on the likelihood and impact through the Roads Management System on their handheld data capture devices. This will, in turn, generate a the risk category and assign a priority response time automatically based on this decision. This will be recorded against the defect.*

Consequence	Negligible	Minor	Moderate	Major	Catastrophic
Likelihood					
Remote	NR	NR	NR	NR	P3
Unlikely	NR	NR	P4	P4	P3
Possible	NR	P4	P4	P3	P2
Likely	NR	P4	P3	P2	P1
Almost Certain	NR	P3	P2	P1	P1

**Table 4 Risk Matrix**

Risk Category	Priority Response
Critical Risk	Priority 1 response
High Risk	Priority 2 response
Medium Risk	Priority 3 response
Low Risk	Priority 4 response
Negligible Risk	No response <sup>#</sup>

**Table 5 Risk Category & Priority Response**

The associated response times have been deliberately omitted from this guidance to encourage Inspectors to be objective in their assessment and not be influenced by consideration of response times.

## Intersections and Multiple Road Users Types

The hazard context considers the location and the types of road users which could be impacted by the defect. Inspectors should consider the different impacts and consequences for each road user type (e.g. pedestrians, cyclists, vehicle drivers, etc.) and at intersections, consider the hierarchy of each route. Inspectors **must therefore assess the likelihood and consequence for each road user type and/or route hierarchy**. The priority of the response is based on the highest priority determined from the risk matrix (Table 4).

## Inspection Records

All inspections are recorded in the WDM Roads Management System. Records are transferred electronically from the data capture device used during route inspections. All records are referenced to the USRN (Unique Street Reference Number). The inspection records are a valuable resource for the Council when defending 3rd party liability claims and also for locating and prioritising reactive repairs.

All works should be instructed using the standard format of issuing a Works Order instruction clearly specifying the location, nature and extent of the work, providing sufficient information, including a plan where necessary, to enable work to be completed without the need for any further clarification.

The Instruction should clearly state the priority for the work and, if necessary any critical dates for completion. The intention is that all works orders will be transmitted electronically. For emergency defects work should be initiated by telephone with a confirmation instruction following. This process should be used for category 1 defects.

The detailed programming of all planned road works will be subject to agreement of arrangements for road space occupation for inclusion within the Scottish Road Works Register.

Urgent and emergency works also require to be recorded within the Scottish Road Works Register, if not classed as mobile works, i.e. less than half an hour in duration.

A key concern for road users and communities is the apparent early failure of temporary, and sometimes permanent, repairs and consequent need for duplication of instruction. The greater flexibility within the response categories should promote a more cost-effective use of better materials and methods to provide a first visit permanent repair. In extreme weather events, any intention to undertake a temporary repair shall be discussed and authorised by the Area Roads Engineer prior to undertaking.

Immediately after work is complete to repair any identified defect the squad foreperson should confirm this by completing the forms allowing the correct information to be inserted into the works database. This process is crucial for 'closing the loop' in case of any subsequent legal issue and to reconcile cost for work undertaken. This is also required to enable the originator, if requested, to inspect the completed work although this should not normally be necessary. Regular monitoring and review of

hierarchy, standards, procedures and records is an essential aspect of the system, for a number of reasons:-

- To enable changes in risk to be identified, if necessary, in new standards or procedures
- To enable any uncertainties or problems in responsibilities, procedures or treatments to be discussed and resolved
- To enable actual or potential claims to be reviewed and strategy for defence agreed where appropriate
- To review inspection and response performance and enable any possible improvements or efficiencies to be discussed and introduced.

## Health and Safety

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### General

In General road inspections are conducted from a slow-moving motor vehicle, bicycle or foot.

The Council's Lone Working Procedures must be followed when an inspector is undertaking a safety inspection on their own. When working alone it is important that the line manager is aware of general work location and that regular contact with base is maintained.

Vehicles must be driven or ridden at an appropriate speed to allow any defects to be identified.

### Health and Safety

Inspections are to be conducted in accordance with Council procedures for the health, safety and health of its employees and others:

All staff engaged in inspections must wear high visibility clothing to BS EN 471 class 3.

All vehicles used to carry out inspections shall be liveried to an appropriate standard and all necessary vehicles and equipment (e.g. Data Capture Device, Software, etc.) checks shall be carried out prior to inspections being undertaken.

Drivers must abide by Regulation 110 of the Road Vehicles (Construction and Use) Regulations, which prohibits a person from driving a motor vehicle from using a held-hand mobile telephone or a hand-held device. Staff should refer to and comply with Falkirk Council use of mobile telephone policy

Communication devices must only be utilised by drivers when the vehicle is safely parked, unless it is an emergency and the driver needs to dial 999 and it is unsafe or impractical to stop.

When parking the vehicle, vehicles should be parked off the live carriageway wherever possible. If this cannot be achieved then there must be clear visibility in both directions and the roof mounted beacon must be switched on. Traffic must not be forced across continuously solid white lines. If this cannot be achieved, advanced temporary traffic signing must be installed.

Inspectors are responsible for their own personal safety and the safety of others affected by their work, and must ensure that relevant personal protective equipment is worn.

Inspections can normally be undertaken at any time except during periods of poor visibility and high traffic flows. If visibility deteriorates to such an extent that the Inspector in charge of the operation considers that it is unsafe to continue, the operation shall be suspended immediately.

## **Make Safe**

If a defect is assessed as a serious hazard (Critical Risk - Priority 1 response) to road users, the inspector should remain at the hazard until the risk treatment is implemented.

## **Equipment**

All inspection vehicles should carry a minimum of three 750mm traffic cones. The cones should be kept clean and should be inspected quarterly and replaced as necessary. Falkirk Council will keep a record of the cone inspections.

In addition to any other equipment they consider necessary, SCOTS recommend, where it is locally feasible, that Inspectors carry a digital camera to record defects and a GPS enabled system to accurately record the location of defects. In this respect, each Inspector has an assigned smartphone with camera, gps, and email capability. In addition, each data capture device has an in built camera and in-built GPS.

### **Documents**

The safety inspection team should also carry a copy of:

- a) This guidance document
- b) New Roads & Street Works Act 1991 – Code of Practice for Inspections
- c) Safety at Street Works and Road Works, A Code of Practice



## Appendix A – ISO31000 Risk Management Process

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