ANNEX A – Detailed definition of common defects

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Lancashire County Council

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Introduction

This annex contains detailed information for the most common defects or hazards including a detailed definition, sample photographs, risk impact rating and associated investigation criteria, individual risk matrices and recommended actions.

Changes and additions to the definitions, risk matrix and recommended actions will be approved by the Head of Service – Highways.

Each defect will have the following information:

- Defect Code – the code used in HAMS to assign the defect to the correct element of the highway asset and the type of defect.
- Detailed Definition – provides a detailed description of the defect if required and any additional notes for consideration.
- Sample Photograph – to illustrate typical occurrences of each defect
- Impact Rating and Investigatory Criteria – Detailed investigatory criteria linked to impact rating.
- Risk Matrix – a matrix comparing impact rating against network hierarchy and providing the associated response category
- Recommended Action – provides guidance on action required to repair or make safe the defect.
- **Low impact defects will be actioned at the discretion of the Highway Inspector and therefore will only be recorded as part of the inspection if action is going to be taken.**

Dynamic Risk Assessment and Inspector Discretion

- The various types of defect that may be encountered on the highway are detailed in this annex. Defects with a High or Medium impact will be actioned in line with the details set out in this policy. Defects with a low priority will only be actioned at the discretion of the highway inspector. In addition highway inspectors have discretion to vary the response categories for high and medium defects due to reasons present at the time of inspection This will be based on an on-site risk assessment taking account of factors such as but not limited to:-
    - Position of the defect in the street
    - Size and nature of the defect
    - Frequency of inspection
    - Volume and nature of traffic and pedestrians using that section of the street
    - Vulnerable road users
- A full explanation must be provided by the inspector as to the reasons for taking action and/or varying the response category. This must be noted in the "Description" field within the HAMS system.

Investigatory Levels

Where defects exceed specific investigatory measurements they will be actioned. However, highway inspectors will have discretion to vary the point at which action will be taken and the response category. This will be based on a dynamic risk assessment as described above.

Footway investigatory levels will be applied to carriageway defects at controlled crossing points such as zebra, toucan and pelican crossings.

Recommended Treatments

Typically the actions resulting from highway safety inspection would be to adopt an infill or excavate and reinstate repair method as described in this annex, the latter being the preferred method. Annex G also describes other repair techniques which may be used depending upon the prevailing circumstances as described in annex G.

Network Hierarchy

Lancashire County Council's network hierarchy is based on the recommendations set out in the Well Managed Highway Infrastructure Code of Practice. It is set out in section 11 and 12 of the Highway Inspection Policy and repeated here for ease of reference.

Carriageway Hierarchy

Category	Ref. No	Type of Road General Description	Description	Inspection Frequency
Motorway	1	Limited access - motorway regulations apply	Routes for fast moving long distance traffic. Fully grade separated and restrictions on use	Monthly
Strategic Route	2	Trunk and some Principal 'A' class roads between primary destinations	Routes for fast moving long distance traffic with little frontage access or pedestrian traffic. Speed limits are usually in excess of 40 mph and there are few junctions. Pedestrian crossings are either segregated or controlled and parked vehicles are generally prohibited	Monthly
Main Distributor	3a	Major Urban Network and Inter-Primary Links. Short - medium distance traffic	Routes between Strategic Routes and linking urban centres to the strategic network with limited frontage access. In urban areas speed limits are usually 40 mph or less, parking is restricted at peak times and there are positive measures for pedestrian safety	Monthly
Secondary Distributor	3b	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	3 Monthly
Link Road	4a	Roads linking between the Main and Secondary Distributor Network with frontage access and frequent junctions	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	6 Monthly
Local Access Road	4b	Unclassified roads providing access to residential and business areas.	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	12 Monthly

			are often residential loop, access and estate roads or cul-de-sacs.	

Footway Hierarchy

Category	Ref. No	Description	Inspection Frequency
Primary Walking Route	1	Busy urban town/city centre shopping areas and main pedestrian routes linking interchanges between different modes of transport e.g. railways, bus stations/interchanges.	Monthly
Secondary Walking Route	2	Medium usage routes through local areas feeding into primary routes, local shopping centres, large schools and industrial and commercial centres etc.	3 Monthly
Link Footway	3	Linking local access footways through urban areas and busy rural footways	6 Monthly
Local Access Footway	4	Footways associated with low usage, short estate roads to the main routes and cul-de-sac etc.	12 Monthly

1. CARRIAGEWAY POTHOLE

Definition

Loss of material from part or all of the surfacing layers creating a sharp edged hole or void.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Greater than 150mm diameter & 100mm or greater in depth	HIGH
Greater than 150mm diameter & 40mm or greater in depth	MEDIUM
Greater than 150mm diameter & less than 40mm in depth	LOW
Less than 150mm diameter	LOW

Risk matrix

		RISK PROBABILITY					
		Carriageway Network Hierarchy					
		1	2	3a	3b	4a	4b
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector; see 17.7**					

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
Road surface deterioration is such that no neat edge is available or can be saw cut	SI01 – CW Pothole	Infill Repair Method – See Annex G
There is little or no road surface deterioration and a neat edge is available or can be saw cut.	SX01 – CW Pothole	Excavate & Reinstate Repair Method – See Annex G

2. CARRIAGEWAY EDGE DETERIORATION

Definition

Localised breaking away or erosion of the edge of an unrestrained carriageway to such an extent that it is encroaching into the running line of vehicles or cycles.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Greater than 100mm deep AND greater than 300mm long AND protruding into carriageway more than 250mm	HIGH
Greater in depth of 40mm up to 100mm AND greater than 300mm long AND protruding into carriageway more than 250mm	MEDIUM
Less than 40mm depth	LOW

Risk matrix

		RISK PROBABILITY					
		Carriageway Network Hierarchy					
		1	2	3a	3b	4a	4b
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector; see 17.7**					

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
No suitable edge support or road surface deterioration is such that no neat edge is available or can be saw cut	SI02 – CW Edge Deterioration	Infill Repair Method – See Annex G
There is good edge support and little or no road surface deterioration and a neat edge is available or can be saw cut.	SX02 – CW Edge Deterioration	Excavate & Reinstate Repair Method – See Annex G

3. CARRIAGEWAY DEPRESSION

Definition

A rapid change in the surface profile of the carriageway creating a depression with a difference in vertical level greater than 100mm.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
150mm to 300mm diameter AND greater than 100mm in depth	HIGH
Less than 600mm diameter AND greater than 100mm in depth	MEDIUM
Over 600mm diameter and less than 100mm in depth	LOW

Risk matrix

		RISK PROBABILITY					
		Carriageway Network Hierarchy					
		1	2	3a	3b	4a	4b
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector; see 17.7**					

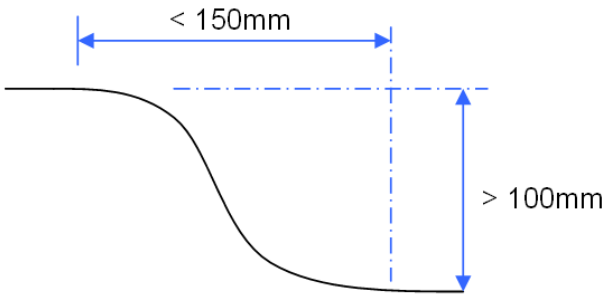
Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
No suitable edge support or road surface deterioration is such that no neat edge is available or can be saw cut	SI03 – CW Edge Deterioration	Infill Repair Method – See Annex G
There is good edge support and little or no road surface deterioration and a neat edge is available or can be saw cut.	SX03 – CW Edge Deterioration	Excavate & Reinstate Repair Method – See Annex G

4. CARRIAGEWAY HUMP or HEAVE

Definition

A rapid change in the surface profile of the carriageway creating a hump or heave in the surface of the carriageway with a difference in vertical level greater than 100mm.



Investigatory level and impact Rating

Investigatory Level	Impact Rating
Difference in vertical level of greater than 100mm over a width of 150mm or Less	HIGH
Difference in vertical level of 40mm up to 100mm over a width of 150mm or Less.	MEDIUM
Difference in vertical level of 40mm up to 100mm over a width of more than 150mm	LOW

Risk matrix

		RISK PROBABILITY					
		Carriageway Network Hierarchy					
		1	2	3a	3b	4a	4b
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector; see 17.7**					

Recommended Action

Criteria	*HAMS Defect Code*	*Treatment*
No suitable edge support or road surface deterioration is such that no neat edge is available or can be saw cut	SI04 – CW Edge Deterioration	Infill Repair Method – See Annex G
There is good edge support and little or no road surface deterioration and a neat edge is available or can be saw cut.	SX04 – CW Edge Deterioration	Excavate & Reinstate Repair Method – See Annex G

5. CARRIAGEWAY – LOSS OF MATERIAL AROUND IRONWORK

Definition

Loss of carriageway surfacing layers adjoining ironwork, such as inspection cover or gully grate, leaving a pothole like defect. The ironwork is sound and does not need re-setting.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Greater than 150mm wide AND 100mm or greater in depth	HIGH
Greater than 150mm wide AND 40mm or greater in depth up to 100mm	MEDIUM
Less than 40mm in depth	LOW

Risk matrix

		RISK PROBABILITY					
		Carriageway Network Hierarchy					
		1	2	3a	3b	4a	4b
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector; see 17.7**					

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
Full repair to be undertaken	SX05 – CW Loss of Material around Ironwork	Excavate & Reinstate Repair Method – See Annex G

6. CARRIAGEWAY SUNKEN TRENCH

Definition

Where the surface height of a trench reinstatement creates a vertical difference in level with the adjoining carriageway surface. If it appears to be a utility trench within its guarantee period (typically 2 years) then this must be reported via utility CW defect.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Up to 300mm wide & 100mm or greater in depth	HIGH
Up to 300mm wide & Greater than 40mm up to 100mm depth	MEDIUM
Greater than 300mm wide & greater than 40mm in depth	MEDIUM
Greater that 300mm wide & and less than 40mm in depth	LOW

Risk matrix

		RISK PROBABILITY					
		Carriageway Network Hierarchy					
		1	2	3a	3b	4a	4b
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector; see 17.7**					

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
Road surface deterioration is such that no neat edge is available or can be saw cut	SI06 – CW Pothole	Infill Repair Method – See Annex G
There is little or no road surface deterioration and a neat edge is available or can be saw cut.	SX06 – CW Pothole	Excavate & Reinstate Repair Method – See Annex G

7. CARRIAGEWAY GULLY MISSING/BROKEN GRATE

Definition

A missing or broken gully grating.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Missing or broken	HIGH

Risk matrix

		RISK PROBABILITY					
		Carriageway Network Hierarchy					
		1	**2**	**3a**	**3b**	**4a**	**4b**
IMPACT RATING	**High**	4hrs	4hrs	4hrs	4hrs	4hrs	4hrs

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
---	SX07 – CW Missing/broken cover or grate	Repair/replace gully grate/frame

8. CARRIAGEWAY GULLY SUNK/ROCKING

Definition

Gully frames and gratings and which are sunk, raised, rocking or broken and causing a step in level to the surrounding carriageway surface. This may be causing a problem with the surrounding surfacing which will need reinstating.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Greater than 100mm difference in level	HIGH
Greater than 40mm and up to 100mm difference in level	MEDIUM
Less than 40mm difference in level	LOW

Risk matrix

		RISK PROBABILITY					
		Carriageway Network Hierarchy					
		1	2	3a	3b	4a	4b
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector; see 17.7**					

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
Full repair to be undertaken	SX08 – CW gully sunk/raised/rocking	Replace/reset ironwork and excavate & reinstate surfacing.

9. FOOTWAY POTHOLE

Definition

Loss of material from part or all of the surfacing layers creating a sharp edged hole or void.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Greater than 100mm diameter AND 75mm or greater in depth	HIGH
Greater than 100mm diameter AND 25mm or greater in depth	MEDIUM
Less than 25mm in depth	LOW

Risk matrix

		RISK PROBABILITY									
		Carriageway Network Hierarchy						**Footway Network Hierarchy**			
		1	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3**	**4**
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days	5 Days	10 Days	20 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector; see 17.7**									

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
Footway surface deterioration is such that no neat edge is available or can be saw cut	SI09 – FW Pothole	Infill Repair Method – See Annex G
There is little or no footway surface deterioration and a neat edge is available or can be saw cut.	SX09 – FW Pothole	Excavate & Reinstate Repair Method – See Annex G

10. FOOTWAY – LOOSE OR ROCKING PAVING

Definition

Where a paving unit (e.g. flag stone or block paviour) is moving or rocking and creating a vertical difference in level with the adjoining footway surface.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Greater than 75mm in height or depth	HIGH
Greater than 25mm/20mm and up to 75mm in height or depth	MEDIUM
Less than 25mm/20mm in height or depth	LOW

Investigatory level is 20mm on Primary Walking Routes

Risk matrix

		RISK PROBABILITY									
		Carriageway Network Hierarchy						**Footway Network Hierarchy**			
		1	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3**	**4**
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days	5 Days	10 Days	20 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector see 17.7**									

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
Paving units are **not** broken. This is generally used when on high amenity/primary walking/conservation streets. Surrounding paving units are sound and not moving or rocking.	SX10 – FW Loose/rocking paving	Reset paving unit.
Paving units are **not** broken. This is generally used when **not** on high amenity/primary walking/conservation streets. Surrounding paving units are not sound and are moving or rocking.	SI10 – FW Loose/rocking paving	Infill with bituminous material

11. FOOTWAY BROKEN, MISSING PAVING

Definition

Where a paving unit (e.g. flag or block paviour) is broken or missing and creating a vertical difference in level with the adjoining surface.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
Greater than 75mm in height or depth	HIGH
Greater than 25mm/20mm and up to 75mm in height or depth	MEDIUM
Less than 25mm/20mm in height or depth	LOW

Investigatory level is 20mm on Primary Walking Routes

Risk matrix

		RISK PROBABILITY									
		Carriageway Network Hierarchy						**Footway Network Hierarchy**			
		1	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3**	**4**
IMPACT RATING	**High**	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days	2 Days
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days	5 Days	10 Days	20 Days	20 Days
	Low	**Action will be taken at the discretion of the inspector see 17.7**									

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
This is generally used when on high amenity/primary walking/conservation streets.	SX11 – FW Broken/missing paving	Replace and reset paving unit.
This is generally used when **not** on high amenity/primary walking/conservation streets.	SI11 – FW Broken/missing paving	Infill with bituminous material

12. KERB – SUNKEN/RAISED

Definition

Where a kerb or kerbs are sunk, raised, moving and rocking creating a vertical difference in level with the adjoining **footway** surface.

Investigatory level and impact Rating

Investigatory Level	Impact Rating
Greater than 75mm in height of depth	HIGH
Greater than 25mm and up to 75mm in height or depth	MEDIUM
Less than 25mm in height or depth	LOW

Risk matrix

		RISK PROBABILITY									
		Carriageway Network Hierarchy						Footway Network Hierarchy			
		1	2	3a	3b	4a	4b	1	2	3	4
IMPACT RATING	High	2 Days	2 Days	2 Days	5 Days	5 Days	5 Days	2 Days	5 Days	5 Days	5 Days
	Medium	20 Days	20 Days	20 Days	Action will be taken at the discretion of the inspector			20 Days	Action at discretion of inspector		
	Low	**Action will be taken at the discretion of the inspector; see 17.7**									

Recommended Action

Criteria	*HAMS Defect Code*	*Treatment*
---	SX12 – KC Kerb sunk or raised	Reset kerb

13. DAMAGED BOLLARD

Definition

A non-illuminated concrete, metal, plastic or self-righting bollard which is damaged and or unstable which poses a risk to highway users.

Investigatory level and impact Rating

Investigatory Level	**Impact Rating**
knocked over and dangerous	HIGH
Damaged, unstable, leaning	MEDIUM

Risk matrix

		RISK PROBABILITY									
		Carriageway Network Hierarchy						**Footway Network Hierarchy**			
		1	**2**	**3a**	**3b**	**4a**	**4b**	**1**	**2**	**3**	**4**
IMPACT RATING	**High**	4hrs	4hrs	4hrs	4hrs	4hrs	4hrs	4hrs	4hrs	4hrs	4hrs
	Medium	5 Days	5 Days	5 Days	10 Days	10 Days	20 Days	5 Days	10 Days	20 Days	20 Days

Recommended Action

Criteria	***HAMS Defect Code***	***Treatment***
---	SI13 – Dangerous Bollard	Make safe, repair or remove bollard
---	SX13 – Damaged Bollard	Repair or remove bollard