Interim Advice Note 115/08, Revision 2

Guidance for Works on the Hard Shoulder and Road Side Verges on High Speed Dual Carriageways

Summary

Guidance for works on the hard shoulder and road side verges on high speed dual carriageways, in order to reduce risk to road workers

This IAN 115/08 Revision 2 amends IAN 115/08 Revision 1 (published in November 2012)

Contents

GUIDANCE FOR WORKS ON THE HARD SHOULDER AND ROAD SIDE VERGES ON HIGH SPEED DUAL CARRIAGEWAYS

1. Introduction

This document gives guidance on safe methods of working practice for any work activity undertaken on the hard shoulders and road side verges on high speed dual carriageways. This document builds upon the guidance given in the Traffic Signs Manual: Chapter 8 Part 1: Design and Part 2: Operations, in particular that given in those sections dealing with works undertaken in the verge and the hard shoulder, such as single vehicle works and inspections stops (reference D3.31 and O8) and safety clearances (reference D3.2 and O3.2). This document will be reviewed regularly to maintain the currency of its advice.

Any work activity carried out on the hard shoulder and road side verges of high speed roads is hazardous. The selection of the actual method of work should be made by a competent service provider and should reflect the risks of the planned work, for example the type of road, type of works, duration and location specific circumstances.

This document relates primarily to high speed dual carriageways, but can equally be transferred to high speed single carriageways and lower speed roads where similar principles may be applied. This IAN applies to the HA network in England. Application of the guidance in this document on any road is subject to approval for its use being given by the appropriate Highway Authority (or Road Authority in Scotland).

The document provides guidance relating to works, inspection stops and breakdown and vehicle recovery. It does not relate to incident management or the operational procedures applied to the Highways Agency Traffic Officer Service or the emergency services.

The intent is that the guidance principles given in this document may be included within future revisions of the Traffic Signs Manual Chapter 8.

The service provider responsible for the installation and removal of temporary traffic management shall consider the guidance given in the Traffic Signs Manual Chapter 8 Part 1 : Design (in particular Section D1) and additional guidance given in “Guidance for Safer Temporary Traffic Management” (as referenced in Section D3.14.3 of Chapter 8 Part 1: Design).

The planning of such operations shall consider how **RISK ELIMINATION**, that is seeking to eliminate potential conflicts, may be achieved. Where it is not possible to eliminate the risk, then **RISK REDUCTION, ISOLATION AND/OR CONTROL** shall be used to reduce the effect of conflicts.

Set out in this document are a series of good working practice guidelines for any work activity undertaken on the hard shoulder and road side verges on high speed roads.

1.1 Status of this document

The status of this document aligns with that of the Traffic Signs Manual Chapter 8 given in Section D1.3 of Part 1 and Section O1.3 of Part 2.

This document presents a standard of good practice that is considered reasonably practicable for work activity undertaken on the hard shoulders and road side verges of high speed dual carriageways.

1.2 Mutual Recognition

Any reference in this specification to a “British Standard”, or to a “British Standard which is an adopted European Standard”, is to be taken to include reference also to the following standards:

(a) a standard or code of practice of a national standards body or equivalent body of any EEA state or Turkey;

(b) any international standard recognised for use as a standard or code of practice by any EEA state or Turkey;

(c) a technical specification recognised for use as a standard by a public authority of any EEA state or Turkey; and

(d) a European Technical Approval (ETA) issued in accordance with the procedure set out in regulation (EU) No. 305/2011.

Where there is a requirement in this specification for compliance with any part of a British Standard or a British Standard which is an adopted European Standard, that requirement may be met by compliance with any of the standards given above, provided that the relevant standard imposes an equivalent level of performance and safety provided for by a British Standard or a British Standard which is an adopted European Standard.

“EEA State” means a state which is a contracting party to the EEA Agreement.

“EEA Agreement” means the agreement on a European Economic Area signed at Oporto on the 2nd of May 1992 as adjusted or amended.

2. Definitions

High speed dual carriageway
A dual carriageway road which is subject to a permanent speed limit of 50mph or more.

Verge
The verge is the area situated between the earth works slope or highway boundary and either the back of the hard shoulder or the edge of the carriageway.

Hard Shoulder
The hard shoulder is the lane clear of main line traffic provided adjacent to the nearside of a dual carriageway road that offers a place for vehicles to stop in emergencies and in which authorised vehicles may be parked during routine maintenance operations.

Live lane
A traffic lane open to main line traffic that does not form part of the works area or safety zone. Unless signing advises to the contrary, the hard shoulder should not be classified as a live lane.

Smart motorway – hard shoulder running
A smart motorway (formerly known as managed motorway) incorporating Hard Shoulder Running (i.e. incorporating the operational regime of controlled use of the Hard Shoulder during times of heavy congestion or incident management) [see IAN111]

Smart motorway – all lane running
A smart motorway (formerly known as managed motorway) incorporating permanent conversion of the hard shoulder to a running lane, whilst retaining the ability to dynamically control traffic [see IAN 161].

Lane Below Signal 1 (LBS1)
On smart motorways - hard shoulder running, the lane on the nearside (left) of the carriageway adjacent to the verge, equivalent to the Hard Shoulder on a conventional motorway. Lane Below Signal 1 may be either subject to controlled use as a running lane (Hard Shoulder running) or be permanently converted to a running lane (all lane running).

Emergency Refuge Area (ERA)
On smart motorways, an area to the side of the carriageway where drivers can stop in an emergency and in which maintenance vehicles may stop when carrying out work in the vicinity of the ERA [see IAN111 and 161].

Maintenance Hardstanding / Maintenance Access Area
A designated area for maintenance activity, usually consisting of a section of verge that has been reinforced to provide a location off the carriageway/hard shoulder in which authorised vehicles may be parked during maintenance operations [see IAN111, IAN161 and TD 69/07].

Short, medium and long duration stops
The following definitions apply to any work activity that requires a works vehicle to stop at the side of a high speed road:

- Short duration stops: up to 15 minutes
- Medium duration stops: up to 90 minutes
- Long duration stops: over 90 minutes

Lateral Clearance

The lateral clearance is the distance measured horizontally between the edge of the working space or vehicle and the edge of the carriageway in use by main line traffic [see paragraph D3.2.4 of the Traffic Signs Manual Chapter 8 Part 1: Design].

3. Planning Issues

Good planning is a key component for safe operations when working on the highway. For further guidance see the Traffic Signs Manual Chapter 8 Part 1: Design Sections D2 and D3 and the document “Guidance for Safer Temporary Traffic Management”, as referenced in Section D3.14.3 of Chapter 8 Part 1: Design.

Any assessment for carrying out work should include the following considerations:

P(1) Information that helps to ensure the safety of those involved with the activity must be provided by the service provider to the persons undertaking the works prior to commencement of the works.

Examples of information relating to highway features and traffic that must be provided could include:

- Narrow and discontinuous hard shoulders.
- The availability of variable signs and signals (VSS) for warning of works activity.
- Roadside furniture.
- Smart motorway sections (hard shoulder running and/or all lanes running)
- Specific locations with provision for stationary vehicle(s) off carriageway (i.e. safe pull off areas, maintenance hardstandings / MAAs or ERAs).
- Traffic data.
- Any relevant information relating to the hard shoulder, verge and any boundaries.
- Environmental considerations relating to stopping on the verge (e.g. locations of protected wildlife habitats)
- Specific risk assessment that has been carried out for the equipment being worked upon, or for a specific local hazard such as the road being adjacent to a river or canal, or overhead cables.
- Additional important advice that may be available in relation to a specific location, for example when lone working or when work is being carried out during the hours of darkness.

P(2) The service provider responsible for planning and undertaking the works must ensure that suitable and sufficient risk assessments are undertaken by a competent person and appropriately documented. The assessment process must consider whether the site or location can be accessed safely without the need to stop on the hard shoulder or verge, thus eliminating the risk associated with stopping. The assessment should also include, but may not be limited to, an evaluation of the degree of risk, time of exposure to risk and ways of eliminating, reducing, isolating or controlling risk.

If the need to stop on the hard shoulder or verge cannot be eliminated, the assessment should consider how risks will be reduced, whether workers can be isolated from risk of harm and if not how risk will be controlled.

The following mitigation measures should be applied when planning work that requires stopping in a vehicle at the side of a high speed road, as detailed in the applicable paragraph shown on the right:

The stopped vehicle is:

Lower risk	Off the carriageway, completely on the verge	**P(4)**
	On the hard shoulder, lateral clearance ≥1.5m	**P(5)**
Increasing ⇩ **risk**	On the hard shoulder, lateral clearance ≥0.5m	**P(7)**
Higher risk	On the hard shoulder, lateral clearance <0.5m	**P(8)**

P(3) Any assessment should demonstrate that consideration has been given at an early stage of the scope, nature and duration of the work to be undertaken and the type of traffic management that will be used to minimise the risks of working at the side of the road.

The assessment should demonstrate that consideration has been given as to how the risk mitigation measures in P(2) will be applied, particularly in the following situations:

Hard Shoulder

- Short duration stops.
- Medium duration stops.
- Long duration stops.

Verges on roads with or without hard shoulders

- Short or medium duration stops.
- Long duration stops.

P(4) Vehicles should be parked off the carriageway completely on the verge whenever possible, provided that there is an appropriate route for the vehicle to access the parking location safely without causing infrastructure or environmental damage, e.g. to a drainage channel, buried services or vegetation. Vehicles should be parked in a location that allows for the driver and passenger(s) to exit the vehicle and access the work location safely.

Vehicles should not be parked in a location that would adversely affect the performance of any safety barrier (or any energy absorbing terminal device fitted to a barrier) in the event of an impact.

P(5) Where vehicles cannot be parked off the carriageway, they should be parked on the hard shoulder or at the side of the road in such a way to maximise the lateral clearance between the vehicle and the trafficked carriageway. Where practicable the verge should be used to maximise this clearance, provided this can be achieved without causing infrastructure or environmental damage.

For off-peak work activity on a smart motorway – hard shoulder running section, parking in a maintenance hardstanding / MAA or parking in an ERA when LBS1

running is not active may assist in maximising the lateral clearance. Vehicles should be parked in such a way as to minimise the risk of secondary incidents occurring.

P(6) The Traffic Signs Manual Chapter 8 Part 1:Design, Paragraphs D3.2 and O3.2 (Safety Clearances) provide details of the safety zone or minimum lateral clearance required within traffic management and the objective should be to achieve these clearances where practicable. This will generally require a clearance of not less than 1.5m from the side of a vehicle to the edge of the trafficked carriageway (representing a 0.3m access zone adjacent to the vehicle while maintaining the required 1.2m minimum lateral clearance between personnel and the nearest live lane).

P(7) During short and medium duration stops, road users are given some level of advance warning of the presence of a stationary vehicle on the hard shoulder or verge by means of the high visibility markings and warning beacons fitted to the vehicle. When parked on the hard shoulder or verge, in order to minimise the risk of impact from passing traffic the stationary vehicle should be positioned to provide an absolute minimum lateral clearance of 0.5m between the nearest part of the parked vehicle and the edge of the trafficked carriageway, as specified in Tables 1 and 2.

P(8) If an adequate lateral clearance cannot be achieved then other traffic management measures will be required.

P(9) The signing and coning for medium and long duration stops (as defined in Figs 1 & 2) are intended to provide advance warning to road users of activities on the hard shoulder or verge and as such do not provide formally designated work areas or safety zones. For long duration stops on the hard shoulder, the closure of the hard shoulder (and where appropriate the adjacent traffic lane) should be carried out in accordance with the guidance given in the Traffic Signs Manual Chapter 8.

P(10) Where a series of short or medium duration stops are made which comprise mobile works on the verge, in support of activity such as walk through surveys or litter picking, a minimum separation distance of 1.2m must be maintained between personnel and the nearest live lane. The risks involved in such work must be assessed, and any risk assessment must demonstrate that consideration has been given to providing appropriate protective measures such as lane closures, protection of a blocking vehicle in the hard shoulder (in accordance with the Traffic Signs Manual Chapter 8 Part 2: Operations Plan MLC6, shown as Figure 3 in this document), coning along the edge of the verge or a combination of measures appropriate to the risks involved.

P(11) Vehicle procurement should consider the need for vehicles that facilitate driver entry and exit from the near side (non-traffic side) as well as the off side (traffic side) in order to allow minimisation of the risks associated with exiting the vehicle when stopped on the hard shoulder or verge.

P(12) Additional requirements specific to the recovery or repair of broken down vehicles are given in the section “Vehicle Breakdown and Recovery”.

P(13) The number of vehicles stopping/attending the site or location should be kept to a minimum.

P(14) When working on a smart motorway – hard shoulder running section, there may be an increased risk of abuse of the hard shoulder by road users. This should be considered at the planning stage, with the use of appropriate protective measures such as protection of the works vehicle by a blocking vehicle in the hard shoulder (in accordance with the Traffic Signs Manual Chapter 8 Part 2: Operations Plan MLC6, shown as Figure 3 in this document) considered as part of the risk assessment.

P(15) When working on sections of dual carriageway with hard shoulder that are downstream of (or between) smart motorway – all lane running sections, there may also be an increased risk of abuse of the hard shoulder by road users. This should be considered at the planning stage, with the use of appropriate protective measures such as protection of the works vehicle by a blocking vehicle in the hard shoulder (in accordance with the Traffic Signs Manual Chapter 8 Part 2: Operations Plan MLC6, shown as Figure 3 in this document) considered as part of the risk assessment.

4. Vehicle Issues

V(1) Any vehicle undertaking short, medium or long durations stops should comply with the conspicuity and lighting requirements for vehicles in accordance with the Traffic Signs Manual Chapter 8 Part 2: Operations. In summary: the minimum requirements are that the vehicle is a conspicuous colour, has high-visibility rear markings, has two roof-mounted amber beacons or a light bar comprising at least two independent light sources (visible 360°) and has a “Highway Maintenance” or “Motorway Maintenance” sign (as shown in Diagram 7404 of the Traffic Signs Regulations and General Directions 2002) externally mounted on the rear of the vehicle.

V(2) The Traffic Signs Manual Chapter 8 Paragraphs D3.2, O7.2.74 and O8.3 provide details and procedures for stopping on the highway.

V(3) The conspicuity of the parked vehicle may offer partial protection from impact with the vehicle itself and so may offer limited protection to the area where there are people and works are being undertaken during short and medium duration stops. Subject to suitable site specific risk assessment, when work activity is being undertaken on the hard shoulder vehicles should be parked at least 18m but no more than 50m upstream of the works area. When works are being carried out off the hard shoulder but site conditions require vehicle to be parked on the hard shoulder, vehicles should be parked at least 3m downstream of a point adjacent to the location of personnel off the carriageway.

V(4) Vehicles should face in the direction of traffic flow at all times when on the hard shoulder.

V(5) The conspicuity of vehicles should be maintained at all times. For example:

- Placing red retroreflective tape on rear facing edges
- Duplication of lighting clusters and/or beacons where standard lighting is obscured.
- Ensuring the cleanliness of conspicuity markings and lights.

V(6) As specified in PAS 43(Safe working of vehicle breakdown, recovery and removal operations – Management system specification), breakdown and recovery vehicles should be fitted with a minimum of two high level amber coloured warning lights independent of the vehicle’s normal lighting system or beacons capable of emitting a flashing or rotating beam of light through 360º. The vehicle owner/manager should ensure that lights or beacons are fitted in such a position that they are not obscured from either the side or rear by other equipment carried by or fitted to the vehicle. Road recovery vehicles, trailers and any lifting apparatus should also be conspicuously liveried to maximize their visibility at the scene of a breakdown, recovery or removal.

PAS 43 is reviewed and updated biennially by the SURVIVE Group.

Vehicle operators should comply with the requirements of MCHW Specification Clause 120, and should ensure that policies and procedures are in place to monitor the safety of vehicles used for recovery operations and that checks are carried out for safety and operational critical aspects of vehicle recovery and removal vehicles.

5. Personnel Issues

PI(1) Personnel should be assessed to ensure that they:

- have appropriate use of neck, trunk, arms and legs;
- are capable of giving, receiving, understanding and acting upon instructions;
- are capable of reading a vehicle registration (number) plate at a distance of 20.5 metres (when wearing glasses or contact lenses if required);
- have good hearing;
- are suitable for the work required, and that safety is not compromised by them suffering from specific conditions or illnesses; and
- are not adversely affected by medication, drugs or alcohol.

PI(2) Service providers should adopt policies regarding the inappropriate use of medication, drugs and alcohol. Such policies, as a minimum should comply with the Transport and Works Act 1992.

PI(3) Personnel should wear, as a minimum, a high visibility jacket to BS EN ISO 20471:2013 Table 1: Class 3 or BS EN471:2003, Table 1: Class 3. In addition, the use of high visibility trousers and other suitable PPE should be considered in accordance with the requirements of the Traffic Signs Manual Chapter 8.

PI(4) Work activities should be organised such that personnel work facing oncoming traffic, wherever practicable.

PI(5) Personnel who are required to install or remove medium duration stop traffic management to Figure 1 or Figure 2 should have received externally validated training ensuring an appropriate level of competence and understanding of the signing requirements. The Traffic Signs Manual Chapter 8 Part 2:Operations Paragraph O6.2 provides details of appropriate standards of training.

PI(6) Personnel should consider their own, and other people's safety when working on elevated sections of motorways or dual carriageways or in areas where the hard shoulder or grass verge is narrower than usual.

PI(7) Personnel should endeavour to access and/or egress vehicles from the side of the vehicle that presents the least risk and should wear the appropriate PPE as described in PI(3) when they alight from the vehicle.

PI(8) In addition, wherever practicable, the loading and unloading of tools and equipment should not be undertaken from the live traffic side of a vehicle.

6. Traffic Management Issues

TMI(1) Traffic management should be provided in accordance with the following tables (figures refer to the plans given at the end of this interim advice note).

- If any personnel are working on the hard shoulder refer to Table 1.
- If no personnel are working on the hard shoulder refer to Table 2.

It should be noted that the tables below do not form checklists from which actions can simply be selected but are intended to demonstrate the change in risk level associated with working in different locations on the hard shoulder or verge, as well as presenting possible measures that could be taken to manage these risks.

Table 1: Work activity on the hard shoulder

Risk mitigation hierarchy	**Stop duration**		
	Short	Medium	Long
Vehicle stopped off the carriageway, completely on the verge	None (see Note 1)	Figure 1	Chapter 8 HS closure
Vehicle stopped on the hard shoulder, lateral clearance ≥1.5m	None	Figure 1	Chapter 8 HS closure
Vehicle stopped on the hard shoulder, lateral clearance ≥0.5m	None	Figure 1	Chapter 8 HS closure
Vehicle stopped on the hard shoulder, lateral clearance <0.5m	Note 2	Chapter 8 closure	Chapter 8 closure

Table 2: Work activity on the verge

Risk mitigation hierarchy	**Stop duration**		
	Short	Medium	Long
Vehicle stopped off the carriageway, completely on the verge	None	None (see Note 3)	Figure 2
Vehicle stopped on the hard shoulder, lateral clearance ≥1.5m	None	None (see Note 3)	Chapter 8 HS closure
Vehicle stopped on the hard shoulder, lateral clearance ≥0.5m	None	None (see Note 3)	Chapter 8 HS closure
Vehicle stopped on the hard shoulder, lateral clearance <0.5m	Note 2	Chapter 8 closure	Chapter 8 closure

Notes for Tables 1 and 2

Note 1: *Where the works vehicle is parked a long distance away from the work location, it may not provide adequate advance warning of the presence of road works and personnel on the hard shoulder. In such situations, any assessment should demonstrate that consideration has been given to providing alternative forms of advance warning.*

If the risk assessment indicates the requirement to provide an alternative form of advance warning, the provision of traffic management as shown in Figure 1 should be considered.

Note 2: *Whenever possible, vehicles should not stop on the hard shoulder where lateral clearances are less than 0.5m and personnel are working on the hard shoulder or verge adjacent to or downstream of the vehicle.*

Where personnel are working on the hard shoulder or verge and the lateral clearance is less than 0.5m, any assessment should demonstrate that consideration has been given to stopping the vehicle at a place downstream of the work location where a clearance greater than 0.5m can be achieved.

Where personnel are working on the carriageway and the works vehicle is parked a long distance downstream from the work location, the vehicle may not provide advance warning of the works being undertaken. In this case, any assessment should demonstrate that consideration has been given to providing alternative forms of advance warning as per Note 1 above.

If the vehicle cannot be positioned in such a way that a lateral clearance greater than 0.5m can be achieved or is practicable, an appropriate risk assessment should be carried out to determine whether a Chapter 8 closure of the hard shoulder and adjacent traffic lane is required.

Note 3: *Any risk assessment should demonstrate that consideration has been given to using the traffic management shown in Figure 1 or Figure 2, as appropriate, subject to an assessment of site location and conditions.*

TMI(2) Beacons should be used in accordance with the following:

- Beacons should be in use when entering, leaving or moving on the hard shoulder or verge, or when travelling in traffic at a speed significantly less than the general speed of the traffic when approaching or leaving the site.
- For all short duration stops, the beacon should remain on at all times unless the vehicle is parked completely off the carriageway.
- For medium duration stops where no traffic management is required, the beacon should remain on at all times unless the vehicle is parked off the carriageway completely on the verge.
- Where traffic management to Figure 1 or Figure 2 is required, the beacons should be switched off once the traffic management is in place.
- For all long duration stops, the beacon should switched off when the vehicle is stationary.

TMI(3) All temporary traffic management equipment should be clean and fit for the purpose when deployed and should be regularly maintained in such condition until completion of the work.

TMI(4) For the ease of transportation, the use of collapsible signs and cones for medium duration stops should be considered.

TMI(5) Measures must be taken to stabilise traffic signs/frames, for example by the use of ballast in the form of sacks containing fine granular material, or to otherwise secure them to permanent fixtures.

TMI(6) Cone bases, sign plates and frames should be marked with the owner's name to enable identification of the service provider responsible for deploying, maintaining and removing any particular traffic management scheme.

TMI(7) Placement of vehicles in the hard shoulder or verge should avoid restricting the sightlines of passing vehicles.

7. Breakdown and vehicle recovery

In addition to the hard shoulder and verge being used for maintenance works, the hard shoulder is also used for the repair or recovery of broken down vehicles. This section identifies some of the issues to be considered for breakdown and vehicle recovery.

BVR(1) The risks to the broken down vehicle, its occupants and other road users must be kept to a minimum.

Any assessment should consider how the risk is to be minimised and whether this can be best achieved by repairing the vehicle at the roadside or moving the vehicle and all the occupants to a safe location.

BVR(2) If repair or recovery is expected to take more than 15 minutes and advance warning equipment i.e. cones or signs, are already carried on the breakdown/recovery vehicle, then this equipment should be deployed to help provide protection to the scene.

When traffic protection equipment is not available and the breakdown / recovery operator, having carried out a risk assessment, considers that additional protection is required at the scene, then they should request assistance from the Highways Agency Traffic Officers or the Police as appropriate. This may take the form of attendance by Traffic Officer or the Police or by a service provider arranging for suitable temporary signing measures to be provided. Where immediate assistance is not available in such instances, then the breakdown / recovery operator should consider removing the vehicle occupants from the scene to a safer place.

BVR(3) Breakdown/recovery vehicle personnel should ensure that when either repairing a vehicle or attaching recovery equipment, that they avoid or minimise the time that they are working either near a live lane or between any two vehicles. Wherever possible they should work in a position where they can observe oncoming traffic and be vigilant at all times.

BVR(4) Breakdown/recovery vehicle personnel should assess the safety of all persons present at the scene of a breakdown or recovery and advise them to stand in a place of relative safety, wherever possible away from their vehicle and moving traffic and behind the safety barrier if one is present and it is safe to do so.

Additional information on safe operating methods for undertaking breakdown / recovery operations on the hard shoulder can be found in *'Best Practice' Guidelines for dealing with Breakdowns / Removals on Motorways and High Speed Dual Carriageways*, which has been produced by the SURVIVE Group. Copies of this document can be obtained from the SURVIVE website - www.survivegroup.org

It is also recommended that breakdown / recovery operators familiarise themselves with the content of appropriate operational and quality management guidance such as PAS 43(safe working of vehicle breakdown, recovery and removal operations – Management system specification) and the National Highway Sector Scheme 17/17B. PAS 43 is reviewed and updated biennially by the SURVIVE Group.

The National Vehicle Recovery Manager Contract requires vehicle recovery operators employed through the contract to be compliant with National Highway Sector Scheme 17/17B.

8. Normative References

BSi (2003) BS EN471:2003 High-visibility warning clothing for professional use - Test methods and requirements; published by the British Standards Institution and online on the BSI Group website (www.bsigroup.com) Note: a fee is payable for this document.

BSi (2013) BS EN ISO 20471:2013 High visibility clothing — Test methods and requirements (ISO 20471:2013); published by the British Standards Institution and online on the BSI Group website (www.bsigroup.com) Note: a fee is payable for this document.

BSi (2012) PAS 43 Safe working of vehicle breakdown recovery and removal operations - Management system specification; published by the British Standards Institution and online on the BSI Group website (www.bsigroup.com) Note: a fee is payable for this document.

9. Informative References

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HA (October 2002) Temporary Traffic Management on High Speed Roads – Good Working Practice
http://webarchive.nationalarchives.gov.uk/+/http:/www.highways.gov.uk/aboutus/700.aspx

HA (2007) TD 69/07: The Location and Layout of Lay-Bys and Rest Areas
www.dft.gov.uk/ha/standards/index.htm

HA (2009) Interim Advice Note 111/09: Managed Motorways implementation guidance - Hard shoulder running
www.dft.gov.uk/ha/standards/ians/index.htm

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HMSO (1992) The Transport and Works Act, 1992 c.42, published by the Controller of HMSO
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HSE/HA/CSS(2002) Guidance for Safer Temporary Traffic Management; published on behalf of HA, HSE and CSS by TRL Limited.
http://webarchive.nationalarchives.gov.uk/+/http://www.highways.gov.uk/aboutus/1091.aspx

UKAS National Highway Sector Scheme 12A/12B – Static temporary traffic management on motorways and high speed dual carriageways including on-line widening schemes (Edition 3, July 2010)

UKAS National Highway Sector Scheme 12C – Mobile Lane Closure Traffic Management on Motorways and Other Dual Carriageways (Edition 8, January 2012)

UKAS National Highway Sector Scheme 12D – Installing, maintaining and removing temporary traffic management on rural and urban roads (Edition 5, January 2012)

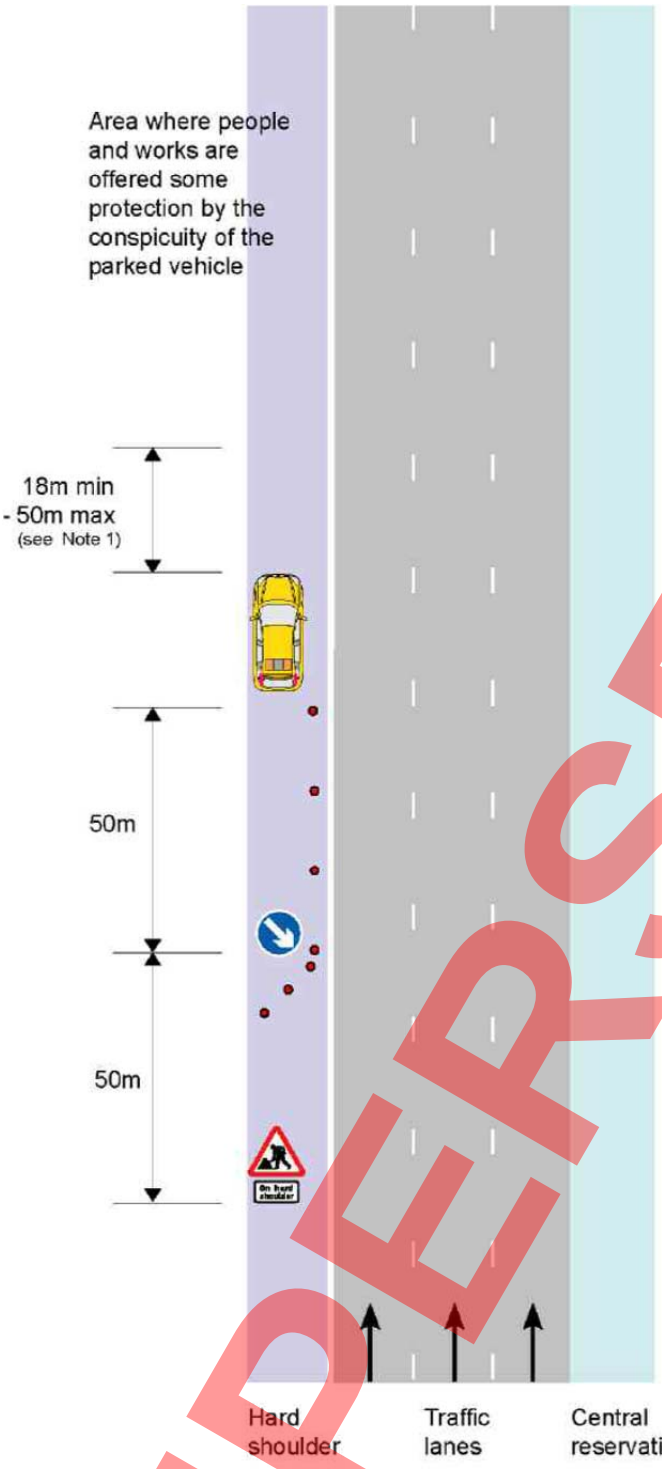

Figure 1

Medium duration stops on motorways and high speed roads with hard shoulders

Notes:
1) This distance should be determined by a site specific risk assessment. See paragraph V(2)
2) Sign and cone size as recommended in Chapter 8
3) Longitudinal cone spacing: 18m

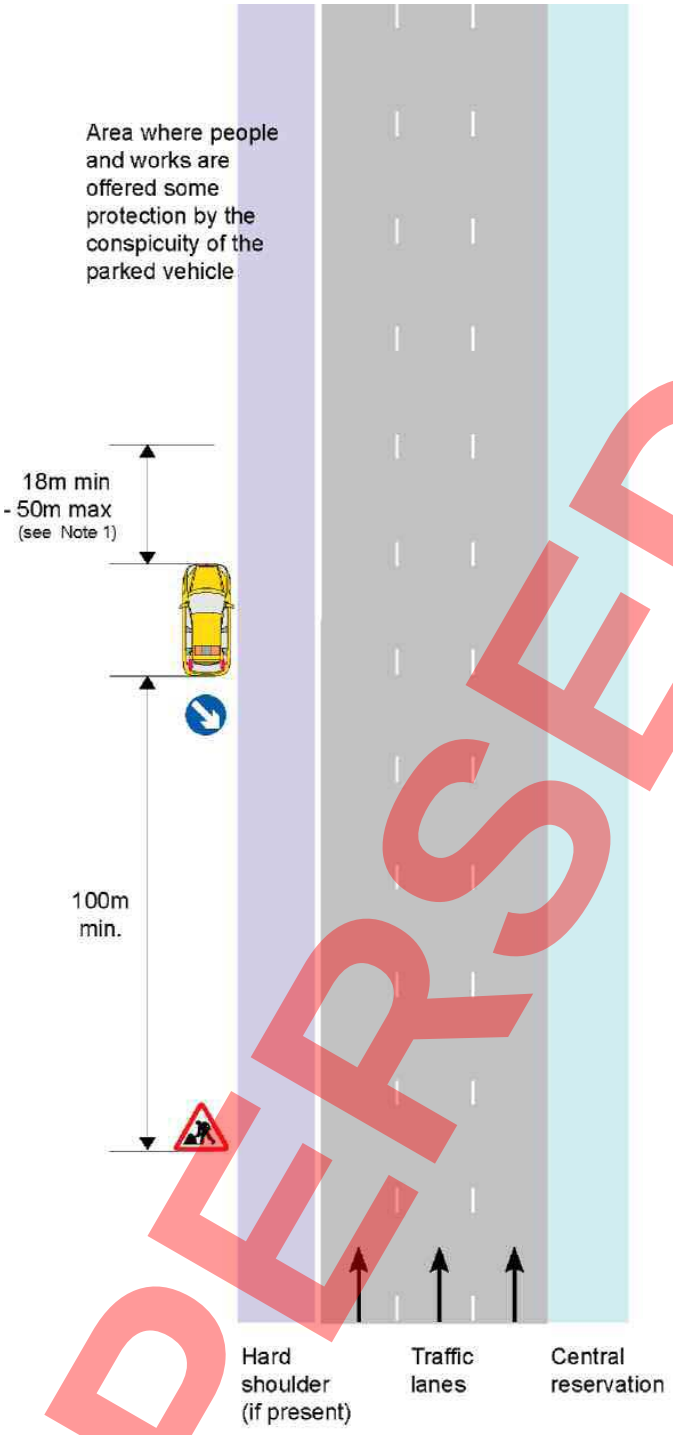

Figure 2

Verge working on motorways and high speed roads with or without hard shoulders

Notes:
1) This distance should be determined by a site specific risk assessment. See paragraph V(2)
2) Minimum sign height: 750mm

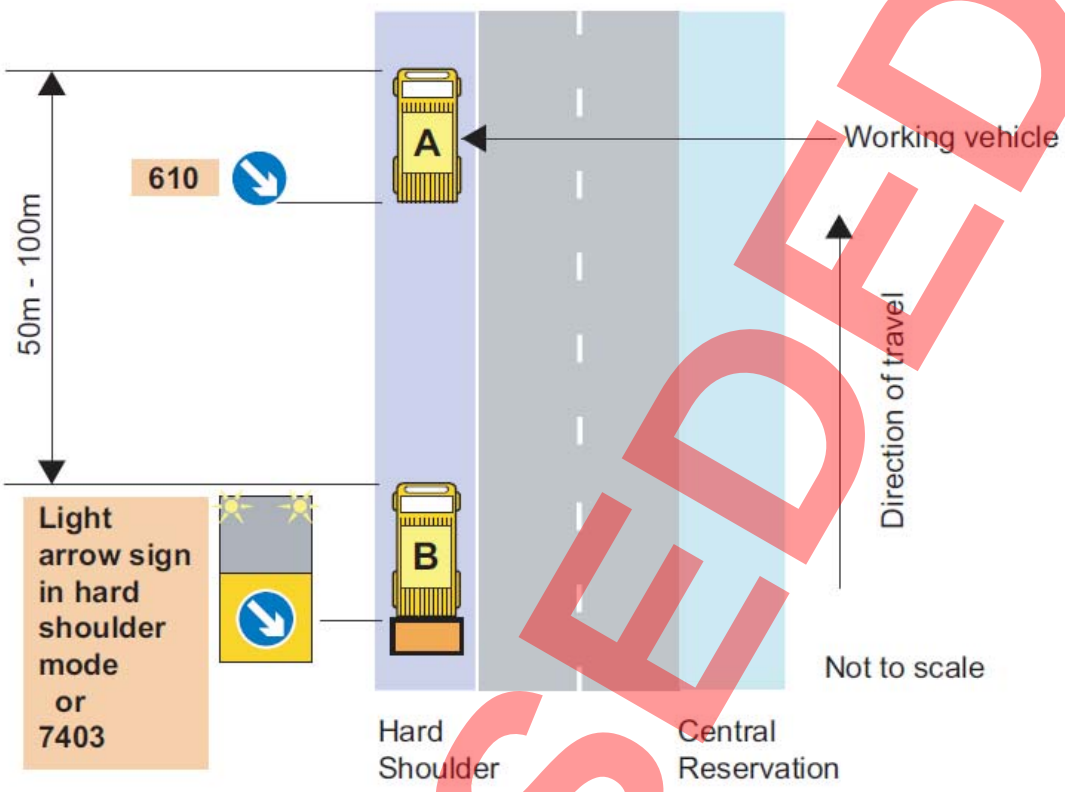

Figure 3: Plan MLC6

(reproduced from the Traffic Signs Manual Chapter 8 Part 1: Design, 2009)