Safety at Street Works and Road Works

A Code of Practice

This is a draft copy of the Safety at Street Works and Road Works Code of Practice, published on GOV.UK for public consultation. We will publish a link to the final version of this code as part of the eventual consultation outcome.

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Contents

Introduction

Creating and maintaining an accessible public realm is crucial for ensuring that disabled people are not excluded from playing a full role in society. Good, inclusive road works design benefits all users, including those who have visible or non-visible disabilities.

Throughout the document, references to pedestrians and walking include people using: mobility aids such as wheelchairs and rollators; ‘invalid carriages’ including mobility scooters designed for use on the footway, and people with physical, sensory or cognitive impairments who are travelling on foot.

People travelling with small children or carrying luggage or heavy shopping will all benefit from an accessible environment, as will people with temporary mobility problems (e.g. a leg in plaster) and many older people.

Ask yourself these questions:

> *Will someone using the road or footway from any direction understand exactly what is happening and what is expected of them?*

> *Have I made the site safe to work in and for the general public?*

Legal status of this code of practice

This code of practice (referred to from here on as the Code) is issued:

- by the Secretary of State for Transport and by the Welsh Ministers pursuant to section 65(3) of the New Roads and Street Works Act 1991 and section 174(1A) of the Highways Act 1980
- by the Scottish Ministers pursuant to section 124(3) of the New Roads and Street Works Act 1991 and section 60A(1) of the Roads (Scotland) Act 1984, and

- by the Department for Infrastructure (Northern Ireland) pursuant to Article 25(3) of the Street Works (Northern Ireland) Order 1995

The Code applies to all “street works” and “road works” (as they are defined in the New Roads and Street Works Act 1991 and the Street Works (Northern Ireland) Order 1995). It also applies to “works of any description in a street” or “works in a road” (as they are defined in the Highways Act 1980 and the Roads (Scotland) Act 1984, respectively) and to “works for road purposes” (as they are defined in the New Roads and Street Works Act 1991).

Undertakers carrying out street works and road works should comply with the Code. Compliance with the Code will be taken as compliance with their legal obligations to sign, light and guard street works and road works. Non-compliance with this Code is evidence of failing to fulfil those legal obligations.

Highway authorities in England and Wales must have regard to this Code when carrying out works for road purposes. Road authorities in Scotland should comply with this Code when carrying out works in a road (other than road works) as compliance with the Code will be taken as compliance with their legal obligations to mark, light, sign and guard those works whereas non-compliance with this Code is evidence of failing to fulfil those obligations.

This Code comes into force on [**date to be inserted**].

Warning: Failure to comply with this Code is evidence of failing to fulfil your legal obligations to sign, light and guard works. Compliance with the Code will be taken as compliance with the legal requirements to which it relates. Additionally, highway authorities in England and Wales must have regard to this Code when carrying out works for road purposes.

Foreword

Purpose of this Code of Practice

This Code explains the principles you should follow when signing, lighting and guarding works on and in streets and roads.

This Code is directed at operatives, supervisors, managers, planners and designers who are responsible for making sure that works on and in streets and roads are safe for the public through the provision of adequate signing, lighting and guarding. The provision of signing, lighting and guarding in accordance with the Code will also provide safer working areas for road workers.

Road users including pedestrians, cyclists and equestrians should not be put at risk by obstructions to or works on or in streets and roads. Road users should be able to see or detect the nature and extent of any obstruction or works well before they reach them.

You must pay particular attention to the needs of disabled people, and you should also consider other vulnerable groups such as older people, people using push chairs or with small children. This Code will help you to do this.

Application of the Code

This Code applies to works executed on or in all streets and roads, except motorways and dual carriageways with a speed limit of 50 mph or more.

This Code applies to street works, road works, works for road purposes, and other works in streets and roads.

Guidance for works to motorways and dual carriageways with a speed limit of 50 mph or more can be found in Chapter 8 of the Traffic Signs Manual published for the Department for Transport by The Stationery Office.

Note: Further guidance on safe working on highways or roads, including for some situations not covered by this Code, is available in Chapter 8 of the Traffic Signs Manual, published for the Department for Transport.

Other obligations not covered by this Code

Everyone on site has a personal responsibility to behave safely.

Under the Health and Safety at Work etc. Act 1974 (in Northern Ireland, the Health and Safety at Work (Northern Ireland) Order 1978), employers have duties to safeguard employees from dangers to their health, safety and wellbeing and to protect others who might be affected by the work activity (for example pedestrians, cyclists, equestrians and motorists).

Employers should ensure that there are appropriate arrangements in place for the design (including planning and risk assessment) and management (including supervision) of their works.

Under the Equality Act 2010, works promoters and undertakers have a duty to have regard to the needs of people with protected characteristics including disabled people and older people in the planning and execution of works.

Record keeping

It is strongly recommended that all works promoters and undertakers keep records of the measures that

they put in place to adequately guard, light and sign their works. Records should also be kept of any accidents or near misses on their sites, with a description of the situation and any causes or contributing factors identified. These records should be made available on request to any investigators and/or to:

- The Department for Transport;
- The Scottish Government;
- The Welsh Government; or
- The Department for Infrastructure (Northern Ireland)

1. Basic principles

1.1 Using this code

This Code explains the principles you should follow when signing, lighting and guarding in scope works to the highway (see 'Legal Status of this Code of Practice' and 'Application of this Code'). For the purposes of this Code, the highway includes the carriageway, footway, cycle routes and verge.

This Code shows typical layouts, equipment and working methods. However, you must read the text alongside the illustrations in this Code to fully understand the requirements.

Each section of this Code explains the requirements for each stage of the works from planning through to completion. The requirements of the Code set control measures that can be used to satisfy the signing, lighting and guarding requirements for works. These control measures can also be recorded in the risk assessment that you are required to prepare under the Health and Safety at Work etc. Act 1974 (in Northern Ireland, the Health and Safety at Work (Northern Ireland) Order 1978).

This Code does not address every situation you could encounter, and additional measures may be necessary to address site specific conditions. It may be necessary for your supervisor or other competent person to liaise with the relevant highway, road or traffic authority to establish any local factors or measures that could further reduce the impact of your works on highway users.

Always consult your supervisor or other competent person if you are in any doubt about correct procedures or if you are concerned about safety.

Further guidance on traffic safety measures and signs for road works and temporary situations is given in Chapter 8 of the Traffic Signs Manual, including for motorways and dual carriageways with speed limits of 50 mph or more, which are not covered here.

This Code makes reference to Temporary Traffic Regulation Orders (TTRO) and Temporary Traffic Notices (TTN) that apply to Great Britain only. For Northern Ireland, reference should be made to the Road Traffic Regulation (Northern Ireland) Order 1997.

1.2 Wording of this Code

Many of the requirements contained in this Code reflect legal obligations on highway authorities, works promoters and undertakers. These legal obligations are identified using mandatory words such as “must” or “must not”.

A failure to comply with other requirements in this Code does not constitute a breach of a legal obligation, but such a failure may be used in evidence to establish that a highway authority, works promoter or undertaker has breached their legal duty to adequately light, guard and sign street and road works. Undertakers should therefore pay careful attention to all requirements in this Code, including those that are described using permissive words such as “should”, “should not”, “recommended” or “may”.

1.3 Responsibilities

It is everyone’s responsibility to:

- undertake their work in accordance with this Code at all times;
- consult their supervisor or other competent person if in any doubt about compliance with this Code or if concerned about site safety.

It is the responsibility of the operative/supervisor to:

- ensure that before works start, a site-specific risk assessment has been undertaken, paying particular attention to the requirements of highway users, including pedestrians and other vulnerable users;
- ensure that before you start, the site layout has been planned, necessary equipment has been identified and that you know how to set the site out;

- ensure that the team understands the risk assessments related to the activity;
- review the risk assessment whenever your site layout, or the work you are undertaking, changes;
- sign, light, guard and maintain your works safely at all times; and
- consult a competent person immediately if you are unsure about any requirements contained in your work instruction.

It is the responsibility of the works manager/planner to:

- ensure that the correct procedures have been followed for works that involve the need for prior consultation, consent or agreement (e.g. permits, notices, traffic management, working in the vicinity of railways and/or tramways, etc.);
- ensure that the team are provided with, and understand, the risk assessment related to the activity; and
- ensure that any and all site-specific safety hazards have been identified and the principles of safety risk control and management have been followed.

Warning: Always consult your supervisor or other competent person if you are in any doubt about compliance with this Code or if you are concerned about safety.

1.4 Training and competence

Only appropriately trained and competent operatives, supervisors, managers or other competent persons should be engaged in the assessment, design, setting up, maintaining and removing of signing, lighting, guarding and temporary traffic control.

Anyone conducting Street Works and Road Works should:

- have sufficient knowledge of the task to be undertaken;
- understand the risks involved;

- have the competency to carry out their duties; and
- be able to take appropriate action to amend the site layout if the situation changes

Anyone placing portable traffic signals on a public highway must have a full understanding of the requirements and correct operation of the signals.

1.5 Planning

Throughout the works design and planning stage, you should refer to the requirements of this Code in relation to site layouts.

Works should cause minimum impact to all road and highway users including pedestrians and cyclists. Local highway or road authorities have a statutory duty to co-ordinate all works in the streets for which they are responsible. Similarly, undertakers have a statutory duty to co-operate with the highway or road authority and with other undertakers.

The site location, nature of the works and their duration will determine the traffic control layout that will be required. For planned works, a competent person should visit the site in advance and carry out a risk assessment to determine the appropriate traffic management layout so that the correct equipment can be arranged.

Liaison with the highway or road authority and other authorities or statutory bodies may be required in planning the works to obtain any necessary licences, approvals and temporary traffic regulation orders/notices in advance of the works commencing.

For emergency works, as much warning must be given to road users as is reasonably practical and full signing, lighting and guarding must be provided as quickly as possible.

1.6 Risk assessment

While this Code provides guidance on the requirements for signing, lighting and guarding your site, it cannot cover every situation and a site-specific risk assessment must be undertaken for all works sites. Where a risk assessment is carried out and additional control measures to those required by this Code are deemed necessary to mitigate risks, these must be implemented.

The risk assessment required by the Code is part of the risk assessment process needed to comply with health and safety legislation. The process of assessing risks and putting control measures in place is commonly referred to as RAMS (Risk Assessment Method Statement).

2. Preparing for work

2.1 Works instructions

When you receive a work instruction, look for the information relating to the proposed type of work as well as the road conditions, such as:

- type and classification of the road;
- road width;
- size and shape of the site;
- approaches to the site and visibility for traffic;
- volume and type of traffic (including pedestrian and cyclist activity); and
- speed limit.

You need to be aware of any particular conditions or restrictions that would affect the temporary traffic management, for example approval for portable traffic signals, temporary traffic regulation orders, or permit condition details, where relevant. If in doubt, ask your supervisor or other competent person.

From this information you will be able to decide what signs and equipment you will need to guard the works, together with any specific traffic control equipment (e.g. Stop/Go boards, portable traffic signals, etc).

2.2 Equipment

Before you start setting out the site, check that you have all the equipment you need to safely sign, light and guard your site. You should use your work instruction, pre-works design and a risk assessment to establish what equipment you will need to set up a compliant site. You should also include additional equipment to manage any changes to original designs or instructions.

For emergency works, immediate signing and guarding should include warning signs for road users and barriers for pedestrians as appropriate.

Further guidance on equipment is given in Section 11.

2.3 At the work site

2.3.1 Before you start

All works require adequate measures to be implemented to ensure the safety of all road users and operatives.

One of the first things you need to decide for any job or work site is whether the standards for signing, lighting and guarding given in this Code will be sufficient for this purpose, or whether you are going to need to take extra precautions. The layouts shown in this Code are likely to be suitable in most cases, but they will not be adequate for every situation that you come across.

Remember that this Code deals specifically with signing, lighting and guarding. Any risks associated with carrying out the works themselves are not covered in this Code.

Additionally, before you start, you will need to look at the job, review existing risk assessments, and make your own assessment of on-site risks. If you have any doubts whether the instructions you have been given or the arrangements set out in this Code are sufficient to keep all road users and operatives safe, do not start until you have discussed these with your supervisor or other competent person.

Warning: To comply with health and safety legislation you must carry out and regularly review the risk assessment to ensure that a safe system of work in respect of signing, lighting and guarding is in place and maintained at all times.

These are some of the things you should consider when making your assessment of on-site risks before starting. These lists are not exhaustive and other factors may have to be considered.

Look at the road

- What is the unobstructed road / footway width?
- Will the carriageway, footway or footpaths be too narrow for safe passage to be maintained?
- Is there a cycle or bus lane?
- Is there a vehicle entrance, traffic junction or pedestrian crossing nearby and will the works obstruct visibility?
- How much visibility do approaching road users have? Consider bends, crests of hills, trees and bushes, parked vehicles.
- Are there any level crossings or tramways that will be affected?
- Are there any overhead cables?
- Are there any other works going on, or other traffic management measures in place, nearby?
- Could your works obstruct traffic signal detectors?
- Are your works near traffic signals or signs? Could they reduce visibility of signal heads or signs? Consult a competent person where this is a possibility, they will need to contact the highway or road authority.

Look at the traffic

- What is the makeup of the traffic? Heavy goods vehicles, agricultural traffic, cyclists, horses etc.
- Is the traffic control appropriate for all aspects of the work? Can it be amended with the required equipment on site?
- Will bus routes or bus stops be affected?
- What is the speed limit and traffic volume?
- Is the traffic speed greater than the posted speed limit?

Look at the local area

- What are the needs of the emergency services? Are there nearby police, ambulance or fire

stations?
- Are there bus stops, loading bays or designated parking bays nearby and will the road be obstructed when they are in use? Can disabled parking bays be maintained?
- Are there any nearby hospitals, surgeries, residential homes etc.
- Are there vehicle entrances/exits and will access be affected, particularly considering traffic turning right?
- Are there any schools, nurseries or playgrounds nearby?
- Are there any leisure venues, licensed premises, clubs or special events nearby? Is there likely to be a need for greater site security overnight?

Look at pedestrians

- Consider both safe routes and the standards of fencing/barriers needed to protect pedestrians from risks from inside the workspace.
- Will the works affect access to premises?
- Is there a high level of pedestrian traffic? Consider users of pushchairs, wheelchairs and mobility scooters.
- Will pedestrian crossings or school crossing points be affected?
- Are there likely to be people with reduced mobility or people who are vision impaired passing the works who might have difficulty with for example, uneven surfaces or trip hazards?
- Are there many children around who might have difficulty understanding signage and hazards?
- Are there other pedestrian risks, such as people leaving pubs/clubs, sports matches or events?

Look at what might change

Estimate how long the works may be in place, then think about how any of the below issues might change within that time, as they may impact the frequency of site attendance. Consider:

- rush-hour traffic flows;
- school run parking;
- pub/club licensing hours;
- match days at sports grounds;
- one-off events, concerts etc;
- street lighting levels;
- weather and surface conditions;
- incidents (consider emergency temporary diversions);
- deliveries and collections from nearby premises e.g. bin lorries, deliveries etc.; and
- deliveries to the site.

Remember

- Use the signing, lighting and guarding that is necessary for the risks, not just the equipment you happen to have available at the time. Work must not start until you have the right equipment set up correctly.
- For emergency works, full signing, lighting and guarding must be provided as quickly as possible.
- Ensure the works team are given a formal briefing on all key safety issues and local site risk assessment related to the activity.
- If you have any concerns, contact your supervisor or other competent person.

2.3.2 Arriving on site

Parking

The technical standards for vehicles are provided in Section 11. On arrival you must:

- Park your vehicle safely before you unload or set up signs, lights and barriers. If you can't park off the road, make sure the vehicle can be seen clearly by other drivers.
- If parking your vehicle outside the working space, you must ensure that it is parked legally and it does not

obstruct any traffic sign or traffic signal head.

- Turn on your roof-mounted amber beacon(s) and ensure that any high visibility markings on the vehicle are facing on-coming traffic.
- If a vehicle is part of, or enters, the works site, it must be correctly incorporated into the traffic management used. Once within the works site, beacons may be turned off.
- On arrival, do not park on a footway or cycle track except where necessary to carry out works. You should respect access to premises and driveways.

Vehicle movements

Works drivers intending to stop at the roadside or enter/leave established works should follow normal Highway Code practice and must switch on their roof-mounted amber beacon(s). Roof mounted amber beacons, hazard warning lights and similar are not to be operated during normal travel unless the vehicle is travelling slowly or causing an obstruction.

The works layout may be amended to allow vehicles and plant to access and egress the working space. If the works layout needs to be amended, the layout should always be reinstated as soon as practicably possible. Plant movements should always be undertaken within the working space where practical.

2.4 Traffic signing

2.5 Advance signs

The purpose of advance signing is to ensure that someone using the road, cycle route, footpath or footway from any direction can understand exactly what is happening and what is expected of them.

Before any works in the carriageway commence, advance signing must be erected. For exceptions associated with works between parked vehicles, mobile and short duration works, see Sections 6.1 and 8.

The principle of advance signs placed for works in the carriageway is to Warn, Inform and Direct (WID) approaching road users. The distances, including safety zone dimensions, should be determined before starting to set out the signs. Signs must be set out for traffic approaching from all directions.

On single carriageway roads with speed limits of 50 mph or more, the warn and inform advance signs should have supplementary distance plates giving the distance to the works. These must be in yards or miles not metres.

Warning: Do not place ‘Keep left’ or ‘Keep right’ sign frames on their sides to make them point in the correct direction, as this could cause a hazard to road users, and might cause confusion. These signs must not be used for directing pedestrians.

Warn

Road works ahead – the first sign to be seen by approaching traffic. Its size, the minimum distance from the start of the lead-in taper, and clear visibility distance will vary according to the type of road and its speed limit – see Table 1.

The range of distances is given to allow the sign to be placed in the most convenient position, bearing in mind the available space and visibility for drivers. Do not simply choose the minimum distance – assess each site carefully. If your works are within 20 metres of a give way/stop junction, you should position additional Road Works Ahead signs with the appropriate supplementary arrow plates on all roads approaching the junction.

Inform

Road narrows ahead – the second sign to be seen by approaching traffic, this sign warns the driver which side of the carriageway is obstructed. Place it between the 'Road works ahead' sign and the beginning of the lead-in taper. Make sure that the correct sign (i.e. narrows on left or right) is used.

Traffic control warning signs – include advance signing for any traffic control systems in use.

Direct

Directional arrow – place 'Keep right' or 'Keep left' signs as appropriate at the beginning and end of the lead-in taper of cones. If practicable, these signs should be the same size as the 'Road works ahead' sign. Make sure that the signs point in the correct direction.

2.5.1 Position of advance signs

It is important that the distances, including safety zone dimensions are determined before starting to set the signs out. From Table 1 select the size and distance for the advance signs. The basic site layout for works on a single carriageway road with a works vehicle present is shown on Figure 2. If there is limited visibility on the approach to the proposed works site, e.g. on a bend, on a dip in the road, or on the brow of a hill, additional advance signs may be required to warn road users of works ahead. These signs will need to be placed first.

Table 1 Sign size and positioning

Type of road and speed limit of road	Minimum size of signs (mm)	Minimum visibility distance to first sign (m)	Distance from first sign to start of lead-in taper (m) (D)	Distance from last cone to End of works sign (m) (E)
Single carriageway – 30 mph or less	600	60	20 to 45	10 to 30
Single carriageway – 40 mph	750	60	45 to 100	30 to 45
Single carriageway – 50 mph or more	750	75	275 to 450	30 to 45
All-purpose dual carriageway – 40 mph or less	750	60	110 to 275	30 to 45

The lower edge of all signs should be no less than 300 mm from ground level, and they should be level, particularly if the ground is uneven.

Caution: Consult your supervisor or other competent person if the works are going to make it impossible for drivers to comply with a permanent traffic sign. Such signs may need to be covered or relocated; the highway or road authority must be consulted before this is done.

Advance signs should be placed so that they:

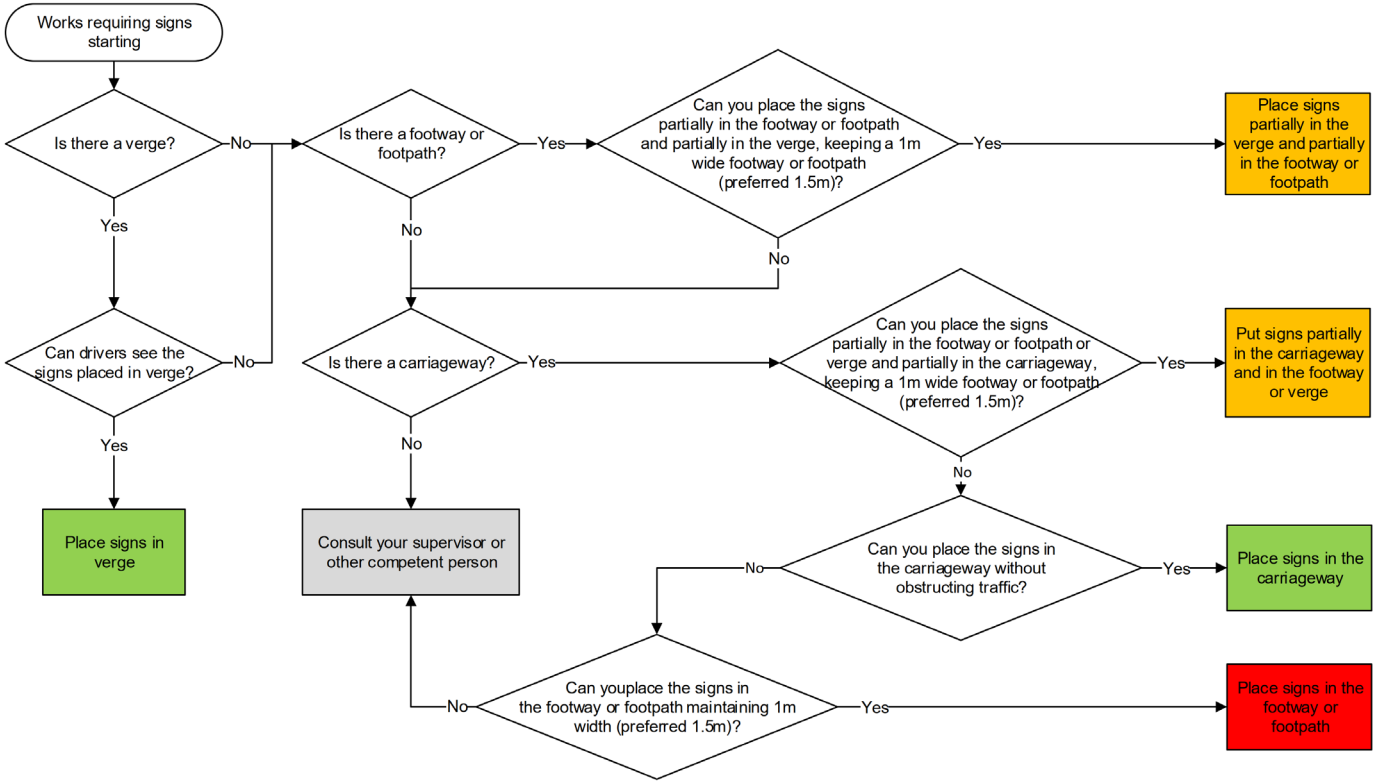
- are in the correct sequence;
- are within the correct distances as shown in Table 1;
- can be clearly seen;
- cause minimum inconvenience to all road users (see Figure 1);
- are at a minimum risk of being struck by vehicles;
- cannot be obscured by parked vehicles.

Figure 1 shows the hierarchy to place signs. Where there is a grass verge, the signs should be placed there. **Placing signs fully in the footway is permitted if there is no other option** (see Figure 1). If placed in the footway, signs must be positioned to minimise inconvenience or hazard to pedestrians, with particular consideration given to vision impaired people and people using pushchairs, wheelchairs and mobility scooters. Section 5.2 details minimum usable footway widths.

Warning: The footway width should not be reduced below 1.0 metre.

Where a minimum footway width of 1.0 metre cannot be maintained, you should consult your supervisor or other competent person.

Figure 1 Placing signs - hierarchy of alternatives.



2.5.2 Additional requirements

Sometimes you may have to duplicate the warning signs on both sides of the road. An example of this would be where signs on the left-hand side become obscured by heavy traffic.

Warning: Where no controlled crossing is available, you should only cross a live carriageway on foot when traffic flows are low enough to regularly produce sufficient gaps between vehicles to allow time to cross safely. For dual carriageways if the signs need to be placed in the central reservation you should consult your supervisor or other competent person before you proceed.

If the permanent speed limit changes within a length of road covered by a temporary speed restriction:

- the sign indicating the change in permanent speed limit (and any other permanent speed limit signs) should be covered up; and
- at the end of the temporary speed restriction, in addition to the end sign, signs must be provided to indicate the permanent speed limit that applies from that point onwards.

The road width and volume of traffic at the works site may make traffic control necessary. See Section 7.2 for details of which type of control is appropriate.

Signs should be set out for traffic approaching from all directions.

If you place a pedestrian walkway in the carriageway, or create obstructions such as spoil or plant outside the working space, sign, light and guard them separately, and to the same standard.

2.5.3 Information sign

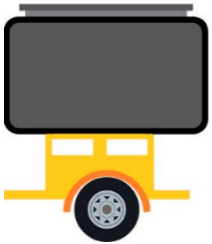
An information sign must be displayed at every street and road works site except mobile works, short duration works and minor works that do not involve excavation. Information signs may be displayed for mobile works, short duration works and minor works that do not involve excavation where it is safe and practicable to provide them. This sign should be placed so that it does not obstruct footways or carriageways but can be clearly read by pedestrians, and any drivers who have stopped close to the sign.

The information sign must give the name of the organisation undertaking the works, any Principal Contractor and an up to date emergency contact telephone number. In England the permit number may be required. This may form part of the “nature of the works” description.

Wherever practical, it should also contain other information that will be helpful in explaining to the public why the work is being done, how long it will take and a message apologising for inconvenience.

For mobile and short duration works that do not involve excavation or advance signing, information may be displayed on works vehicles, so long as it does not cause a distraction to drivers.

2.5.4 Variable message signs



Variable message signs (VMS) can be used. The use of VMS and their location must be agreed with the highway or road authority. Any wording, symbols and text colour must be in accordance with the TSRGD (TSR (NI) in Northern Ireland). The VMS must display the whole message on a single screen, i.e. must not scroll or page.

Depending on their location, these signs may require temporary signing, lighting and guarding. Messages displayed on a temporary VMS must not conflict with any other signing – you may need to cover existing road signs and repeater signs (with the permission of the highway or road authority).

2.5.5 End sign

An end sign, consisting of a 'Road works ahead' sign in conjunction with a supplementary 'End' plate, indicates the end of works and the end of any temporary restrictions. You should place an end sign (in both directions) beyond works that are 50 metres or more in length (measured between the end of the lead-in taper and the beginning of the exit taper, i.e. excluding the length of the tapers). If there is a series of two or more sites close together, an end sign should only be placed after the last of these sites (in both directions), i.e. end signs should not be placed between closely spaced sites.

The use of an end sign is optional for works less than 50 metres in length unless there are two or more such sites close together. End signs are not necessary at works on minor roads restricted to 30 mph or less that do not carry a significant volume of through traffic or many large vehicles.

3. Coned area

3.1 Cones

- The maximum spacing between cones in longitudinal lengths should be 9 metres.
- No fewer than two cones should be used in any length between tapers.
- Where two-way traffic control is used, the maximum spacing between cones in longitudinal lengths should be 1.2 metres.

3.2 Warning lights

- All street and road works on roads with a speed limit of 40 mph or more should have warning lights (formerly known as road danger lamps) illuminated in poor visibility or during the hours of darkness.
- If it is stated in the risk assessment, warning lights should also be used on lower-speed roads.
- Steady warning lights can be used on all lit or unlit roads regardless of the speed limit.
- Where street lighting is present and illuminated, and where the speed limit is 40 mph or less, flashing warning lights are permitted as an alternative. See Table 10.

3.3 Auxiliary lights

Road and street work sites may be floodlit, and in some cases, temporary lighting may be installed to enable work to be undertaken after dark. Special attention should be given to the orientation of the lighting units to ensure that road users or residents are not dazzled. Barriers may be necessary around temporary lighting if positioned outside of the working space.

3.4 Traffic barrier

When a traffic lane is closed for fixed (i.e. not short duration or mobile) works to take place, a traffic barrier with a retroreflective red and white barrier sign as shown below should be placed across the lane as shown in the layout diagrams. See Section 11.6 for fixing of barriers.

3.5 Site layout

You should include the works area, working space and safety zone in the area to be marked off with cones, and/or barriers. Warning lights should be placed where necessary (see Section 4.1).

You should provide safety zones when either:

- operatives are present; or,
- a hazard is located in the carriageway; or,
- a pedestrian walkway is located in the carriageway.

3.5.1 Works area

The works area is the excavation or opening. This area is surrounded by the working space and the appropriate safety zones.

3.5.2 Working space

The working space includes the works area and the space around the works area where it is permitted to store tools, materials, equipment, vehicles and plant.

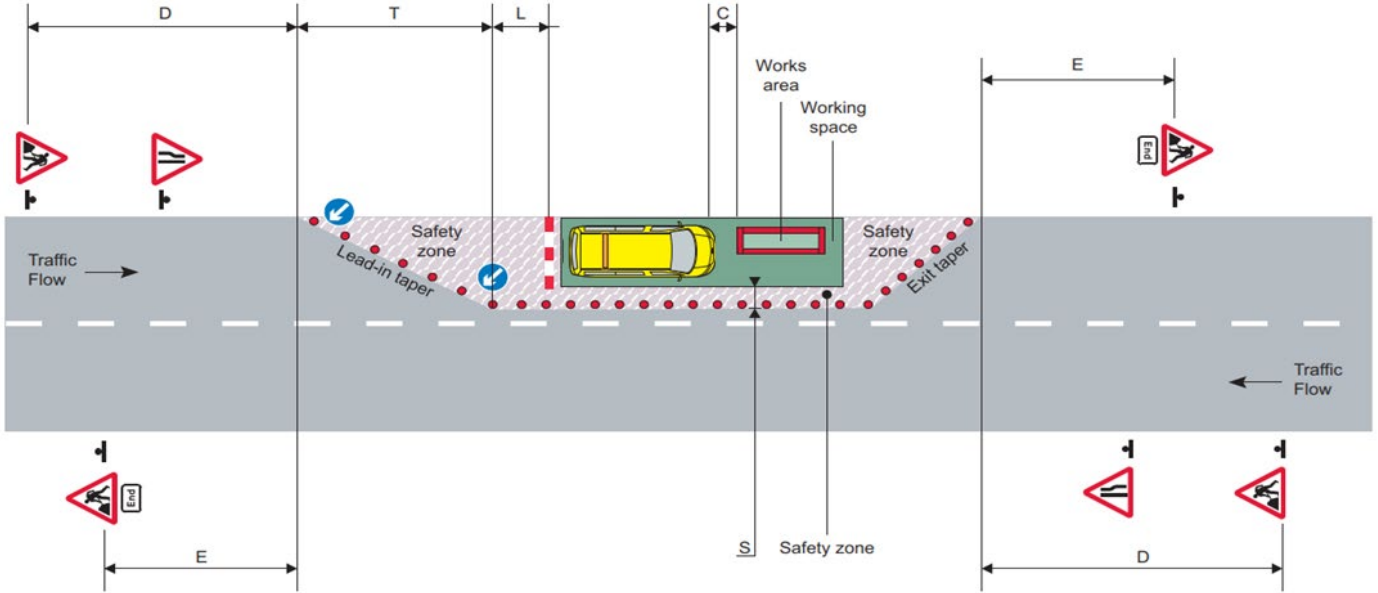
You must leave enough working space to ensure that movement and operation of vehicles and plant (e.g. swinging of buckets or counterweights) is clear of passing traffic and does not encroach into the safety zone or any adjacent footway, walkway or cycle route.

Where materials or welfare facilities cannot be accommodated within the site, the location and arrangement of the storage area should be agreed with the highway or road authority.

If you want to park a works vehicle in front of the works area to give some physical protection or to work from it, keep a minimum distance (C) between the vehicle and the works of:

- 2 metres, for a speed limit of 30 mph or less; or
- 5 metres, for a speed limit of 40 mph; or
- 8 metres, for a speed limit of 50 mph or more.

Figure 2 Basic layout with a works vehicle



Notes

1 For numbers and minimum size of cones and dimensions D and E see Table 1, for dimension L see Table 3, for dimension S see Table 4, for dimension T see Table 2 and for dimension C see Section 4.5.2.

2. An information sign (omitted here for clarity) must be displayed

3. Dimensions measured from the outside edge of the base of the cone.

3.5.3 Safety zone

The safety zone is an area of cones provided to separate you from traffic and the traffic from you.

The safety zones define the footprint of the working space and provide guidance to traffic.

Warning: Do not enter the safety zone in the normal course of work. Materials, equipment and vehicles should not be placed in this zone. You should only enter the safety zone to maintain cones, barriers and other road signs.

The basic safety zone including a works vehicle, (see Figure 2) is made up of:

- a lead-in taper of cones whose length (T, see 4.5.3.1) varies with the speed limit and the width of the works (although a 45° lead-in taper is used for shuttle working and short duration stops);
- the longways clearance (L, see 4.5.3.2), which is the distance between the end of the lead-in taper and the first traffic barrier placed across the lane. L will vary with the speed limit;
- the sideways clearance (S, see 4.5.3.3), which is the width between the working space (or in some cases, the pedestrian walkway) and moving traffic; and
- the exit taper.

At times when no operatives or hazards within the site (e.g. open excavation, plant, materials or spoil heap) are present, and no pedestrian walkway is provided in the carriageway, the overall size of the layout can be temporarily reduced to make less of an obstruction to traffic. Dimensions of the longways clearance (L) and sideways clearance (S) can be reduced (or these spaces omitted altogether) and the length of taper (T) adjusted to match the reduced width. L, S and T should be restored to the appropriate dimensions when work restarts.

Where the coned off area is simply protecting a hazard, the size of the working space may be temporarily reduced. In this case however, dimensions L, S and T will still be required, even though no works are taking place.

Warning: Where the width of the usable carriageway does not permit the necessary sideways clearance to be maintained and a full road closure is not practicable, a safe method of work must be agreed before starting work. Such agreement must be between the works promoter and the appropriate highway or road authority.

3.5.3.1 Lead-in taper

The lead-in taper is a line of cones tapering out from the kerb in advance of the working space or hazard. Its purpose is to guide approaching traffic past the working space or hazard.

The recommended lead-in taper is given in

Table 2. Sometimes it may not be practicable to provide the full taper. If this happens on congested roads with speed limits of 30 mph or less:

- Shorter lengths of taper may be used.
- A risk assessment must be carried out to check whether additional controls are needed to minimise any increased risk from reduced tapers.
- Reduced tapers should always be as long as permitted under the circumstances.
- Reduced tapers should not be reduced to less than 45º unless there are restrictions associated with parked vehicles (see Section 6.1).

On roads with a speed limit greater than 30 mph, the minimum length of taper should be maintained.

Caution: Where reduced taper lengths are used, the siting distance (D) of the first sign in advance of the taper should be no less than 20 metres.

Table 2 Lead-in taper length

Type of road and speed limit of road	(Minimum numbers)	Maximum width of works						
		1 m	2 m	3 m	4 m	5 m	6 m	7 m
Single carriageway – 30 mph or less	**T** Taper length (m) No. of cones No. of warning lights	13 4 -	26 4 -	39 6 -	52 7 -	65 9 -	78 10 -	91 12 -
Single carriageway – 40 mph	**T** Taper length (m) No. of cones No. of warning lights	20 4 3	40 6 5	60 8 7	80 10 9	100 13 12	120 15 14	140 17 16
Single carriageway – 50 mph or more	**T** Taper length (m) No. of cones No. of warning lights	25 4 3	50 7 6	75 10 9	100 13 12	125 15 14	150 18 17	175 21 20
All-purpose dual carriageway – 40 mph or less	**T** Taper length (m) No. of cones No. of warning lights	25 4 3	50 7 6	75 10 9	100 13 12	125 15 14	150 18 17	175 21 20

3.5.3.2 Longitudinal safety zone (longways clearance) (L)

The longitudinal safety zone is an open or unoccupied space between the end of the lead-in taper and the working space and provides a margin of safety for both the traffic and the operatives. It is important that the longitudinal safety zone is free of equipment, operatives, materials and parked vehicles. The minimum longitudinal clearance should be based on the road's speed limit in force.

The recommended longitudinal safety zone dimensions are given in Table 3. The longitudinal clearance should be as great as is practicable, and should in no case be less than 0.5 metres regardless of speed limit.

Table 3 Longways clearance

Speed limit of road (mph)	20	30	40	50	60
Minimum longways clearance (m) (L)	0.5	0.5	15	30	60

3.5.3.3 Sideways safety zone (Sideways clearance) (S)

The sideways safety zone is an open or unoccupied space between the working space and any moving traffic which provides a margin of safety for both traffic and operatives. It is important that the sideways safety zone is free of equipment, operatives, materials, and parked vehicles.

Sideways safety zone dimensions (S) depend on the speed limit in force, see Table 4.

Table 4 Sideways safety zone

Type of road	Single carriageway			All-purpose dual carriageway
Speed limit of road (mph)	30 or less	40 or less	50 or more	40 or less
Minimum sideways Safety Zone (m) (S)	0.5	0.5	1.2	0.5

The sideways safety zone should be as wide as possible, especially on roads with a high speed limit or if traffic consistently exceeds the speed limit. This may result in a restricted width available to traffic, and could cause particular problems for drivers of large vehicles at junctions and bends. If so, other traffic management options may be used. See Section 7.1 regarding unobstructed widths.

When working in a footway, verge or cycle track adjacent to the carriageway, you should provide a safety zone in the carriageway if works are closer than:

- 0.5 metres to the carriageway edge in 40 mph or less single carriageway roads; or
- 1.2 metres to the carriageway edge in dual carriageway roads or in 50 mph or more single carriageway roads.

If cones are placed in the road, advance signing will be required.

3.5.3.4 Exit taper

The exit taper is a line of cones tapering to the kerb after the working space or hazard. Its purpose is to guide passing traffic back to its original running path.

An exit taper should be at 45° to the kerb line or road edge. For works on a dual carriageway where a works vehicle exit is needed, the exit taper may be omitted as long as the end of the works is properly signed as a works vehicle exit.

4. Setting out the works

4.1 Sequence for setting out signs, lights and barriers

You are at increased risk when setting out signing, lighting and guarding, so great care is needed to ensure that you can see the traffic and the traffic can see you:

- Put your high visibility clothing on before leaving the vehicle.
- Turn on your roof mounted amber beacon(s)
- It may be safer to get out of the vehicle on the passenger side, rather than stepping into the traffic stream.
- Look out for cyclists, motorcyclists and pedestrians. If able to do so, you should open the door using the hand on the opposite side to the door so your head turns to look over your shoulder (Dutch reach).

When the 'Road works ahead' sign is more than 440 yards (1/4 mile) from the works, or when extra advance signs are needed because visibility is limited, set up the initial and then the additional advance signs you need before moving on to the works site and setting out the rest of the layout.

When setting out the works:

- face oncoming traffic;
- take particular care when crossing the road to place signs; and
- you must not be distracted by mobile phones (including hands-free phones), radios, or other devices during this operation.

Follow the sequence on the following pages.

1. You must park your vehicle safely. You can park off the road in a position that does not obstruct a footway or cycle route. Set up a ‘Keep right’ sign at the outside corner of the vehicle, along with a traffic cone.

2. Set out the ‘Road works ahead’ sign. Measure or pace out the appropriate distance (D) from the point where your lead-in taper will begin. Then put one sign on the left-hand side (viewed from the perspective of traffic facing the sign). (Consult Table 1 for the appropriate distance D for different sites).

   If there is limited visibility on the approach to the proposed works site, e.g. on a bend, on a dip in the road, or on the brow of a hill, you should provide extra advance signs, and these should be placed first.

3. Using the appropriate diagrams in this Code to help you, work back towards the site, placing more signs as necessary, then cone off the works. Keep on the verge or footway if you can and watch out for other road users.

4. Face the oncoming traffic when you place the cones for the lead-in taper. Start from the kerb or road edge, working out towards the works. Complete the coning around the works, leaving enough room for working space and safety zones.

5. Use cones, ‘Keep right’ signs, barriers and road warning lights, and an information sign to complete the warning, guidance and protection for the works.

6. Where appropriate, set up an ‘End of road works’ sign.

7. Once you have finished setting out the side where the works are, place signs in the opposite direction if stated in the risk assessment or if you are on a two-way road.

When you need to remove the signs, reverse the procedure shown here, but remove the ‘End of road works’ sign second to last and the ‘Road works ahead’ sign last of all.

4.2 Footway and footpath works – safe routes for pedestrians

Where footways, footpaths and pedestrian areas are affected by street works and road works, it is your responsibility to make sure that everyone affected by the works is safe. This means protecting them from both the works and passing traffic.

4.2.1 Footway works

If your work is going to obstruct a footway or part of a footway, you must provide a safe and accessible route for pedestrians that should include access to adjacent buildings, properties and public areas where necessary. You must provide a suitable barrier system (see Section 11.5) that safely separates pedestrians from hazards.

You must take into account the needs of vulnerable users, such as:

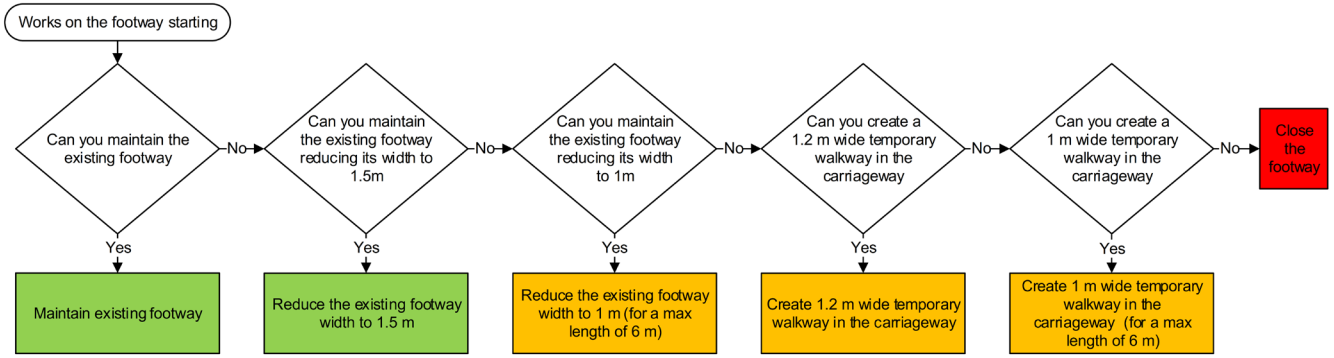
- children,
- older people,
- disabled people including vision-impaired people, people using wheelchairs, and people using mobility scooters,
- people using prams or pushchairs,
- people with reduced mobility.

You should be on the lookout for pedestrians who seem confused or who are having difficulty negotiating a temporary route, and be prepared to offer assistance.

There are several options to be considered when setting up safe routes for pedestrians:

- the priority should be to keep pedestrians on the footway;
- if this is not possible, the footway may be closed, with walkways diverted onto the carriageway or,
- if this is not possible, provide a safe crossing point to an alternative footway, see Figure 3.
- The final alternative, at attended sites only, could be to preserve safe access for the majority of pedestrians and to offer assistance to those who may find a reduced width more difficult to navigate, including wheelchair or mobility scooter users, vision-impaired people, or people using pushchairs.

Figure 3 Footway works – hierarchy of alternatives

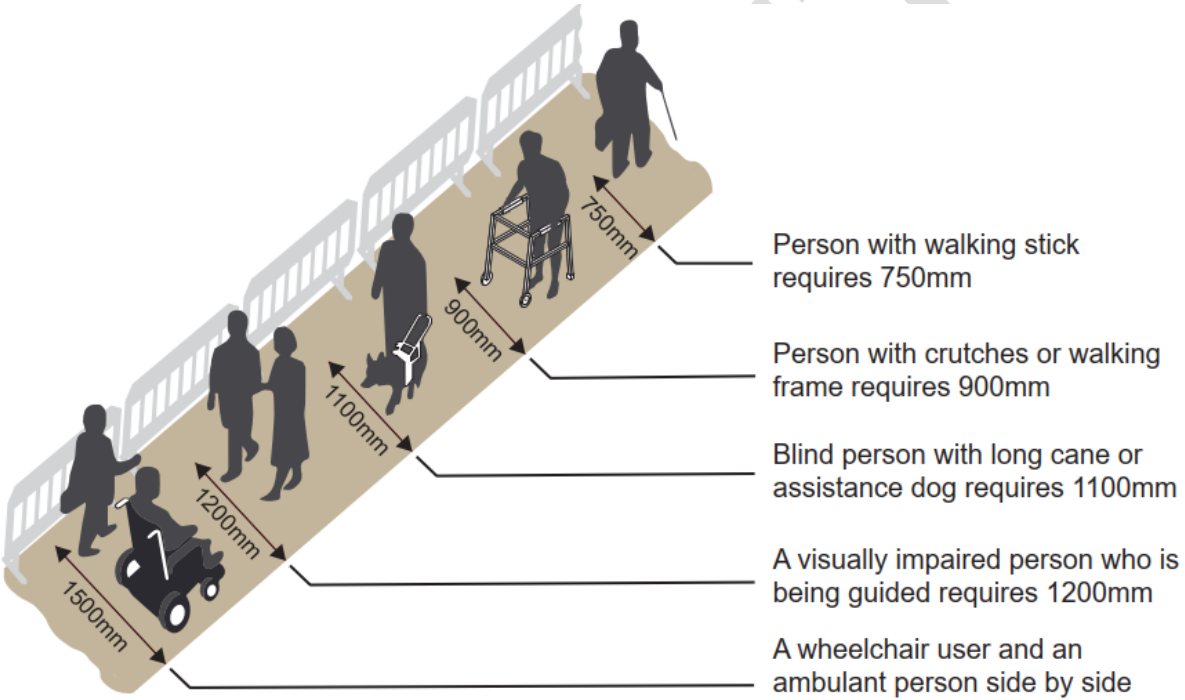


All pedestrian routes must be fit for purpose and able to be used safely by all pedestrians, including older people and disabled people. These routes should be properly drained and have adequate headroom.

Surfaces should be reasonably smooth without steep gradients or crossfalls. A suitable barrier should be placed between a pedestrian route and any adjacent drops or steep slopes.

Figure 4 illustrates the potential space needed for different pedestrian types. If your footway, footpath or walkway is narrower than the stated widths, some pedestrians may be excluded from its use.

Figure 4 Potential space needed for different pedestrian types

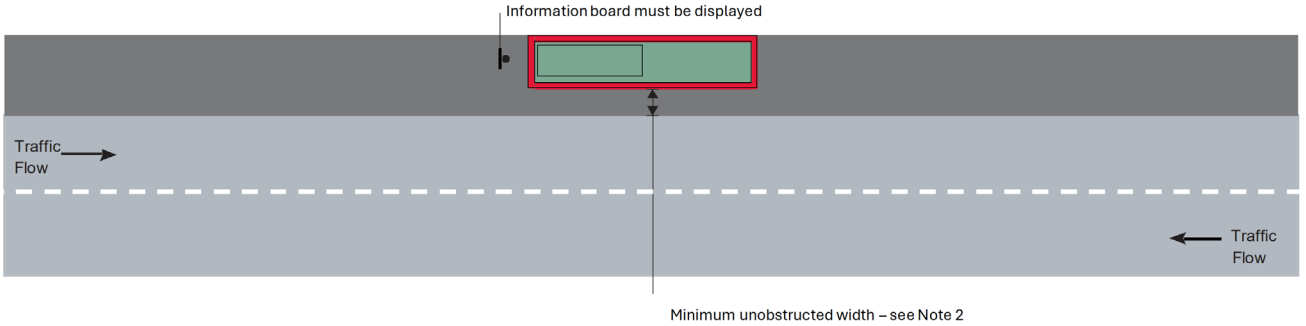


4.2.2 Maintaining existing footways

You should always try to enable pedestrians to remain safely on the footway. Ideally, the footway should be a minimum of 1.5 metres wide to prevent pinch points where pedestrian flows are high. A width of 1.2 metres is allowed for walkways and areas with low pedestrian flow.

Where there is an obstacle, such as lamp columns, sign posts or electric vehicle charging points, or the 1.5 metres minimum width cannot be achieved, the existing footway can be reduced to a recommended absolute minimum of 1 metre unobstructed width, but the **maximum length of such a restricted space should be 6 metres.** See Figure 5.

Figure 5 Works entirely in the footway - Maintaining existing footway



Notes
1 Advance signs are not required when the works, signing, lighting and guarding are entirely on the footway.
2 1.5 metres preferred minimum unobstructed width, 1.0 metre absolute minimum for no more than 6 metres.

Note: The unobstructed width should not include any trip hazards such as barrier feet, spoil or ballast. Barrier feet which have a raised profile of less than 10 mm are not considered an obstruction/trip hazard.

Where the existing footway is narrower than 1 metre, you are not required to provide an alternative footway wider than the existing footway, but you should consider whether this is possible.

Where suitable in the context, footway boards may be used on footways to maintain a route for pedestrians and provide light vehicle access to premises during excavation works. These should be fit for purpose and strong enough to support pedestrians and mobility scooters, and the weight of vehicles needing access. They are deemed as fixed if they do not move through ordinary use. Further guidance and good practice can be found in industry guidance documents, such as “Highway Authorities & Utilities Committee (HAUC) Advice Note 2018/01”.

Warning: Where the minimum footway width of 1 metre on the footway cannot be maintained, you must consult your supervisor or other competent person. Where a road closure or pedestrian lights are required, the highway or road authority must be informed and appropriate orders or permissions obtained.

Signing requirements when maintaining the footway

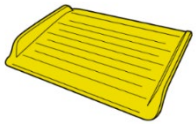
An information sign must be displayed.

4.2.3 Temporary walkways in the carriageway

If it is not possible to maintain safe pedestrian access on the footway, you should provide a walkway in the carriageway.

In general, **a minimum 1.2 metre width of walkway should be provided** (this allows for a vision-impaired person being guided). A wider walkway should be provided in high pedestrian flow areas. In low pedestrian flow areas, it is recommended that a wider walkway is provided if it can be done without resulting in a road closure or a reduction to shuttle working.

If the 1.2 metres minimum width for the walkway cannot be achieved, it is recommended that it can be reduced to an absolute minimum of 1 metre unobstructed width.



Suitable ramps or raised footway boards or other reasonable adjustment must always be provided to enable people using wheelchairs or pushchairs to negotiate kerbs safely, including enabling wheelchair and mobility scooter users to enter and exit a temporary walkway safely. Ramps and boards should be fit for purpose – see Sections 11.7 and 11.8.

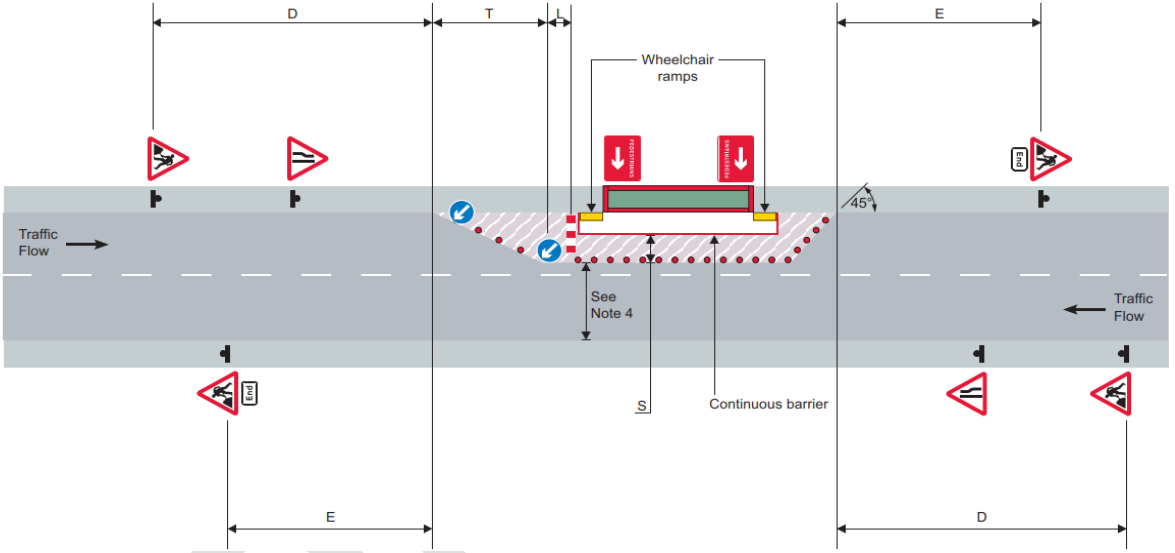
Signing requirements when temporary walkways in the carriageway are used

When a temporary walkway has to be placed in the carriageway, make sure the signing, lightning and guarding barriers are put into place before the footway is closed. You should place pedestrian arrows as appropriate at either entrance to the walkway. Any additional entrances must also be signed. See OBJOBJFigure 6OBJ.

Make sure the sideways clearance (S) of the safety zone is on the traffic side of the

barriers.

Figure 6 Temporary walkways in the carriageway



Notes
1 For numbers and minimum size of cones and dimensions D and E see Table 1, for dimension L see Table 3, for dimension S see Table 4 and for dimension T see Table 2.
2 An information sign (omitted here for clarity) must be displayed.
3 Wheelchair ramps must be provided at the transition from footway to carriageway and they should allow wheelchair and mobility scooter users to enter and exit a temporary walkway safely
4 See Section 7.1 for guidance on unobstructed width past the works.
5 Additional pedestrian barriers may be provided parallel or at right angles to the kerb, as site conditions require, to guide pedestrians past the works.

4.2.4 Closing a footway or a footpath

Where footways and pedestrian areas are affected by street works and road works, closing the footway or footpath should be the last option to consider. Maintaining the existing footway or footpath, or arranging a temporary walkway should be considered first. However, if this is not possible or practicable then the works planner or manager will need to apply to the highway authority for a Temporary Traffic Regulation Order or Notice to close the footway. If it becomes necessary to close a footway adjacent to a road that remains open to vehicular traffic, a safe alternative route for pedestrians is required. This may require an appropriate facility to enable pedestrians to safely cross the carriageway.

Warning: A footway or a footpath should only be closed as a final option when all other methods, such as maintaining the existing or a temporary pedestrian walkway, have been assessed as either not possible or practicable.

Signing requirements when closing a footway or footpath

When a Temporary Traffic Regulation Order or Notice, is in place permitting the closure of a footway or a footpath, you must place a 'Footway closed' or a 'Footpath closed' sign at the works and an advance 'Footway ahead closed' or 'Footpath ahead closed' sign at a location where it is safe for all footway users to cross the road. Where such facilities are not available, the sign should be placed at least 20 metres in advance of the closure. You must also place a 'Road works ahead' sign and a 'Pedestrians in road ahead' sign in advance of the works.

When diverting pedestrians into a temporary alternative route, you must place pedestrian directional arrows as appropriate at either end of the route.

4.2.5 Temporary obstruction of a footway

Sometimes works are required that temporarily restrict or prevent the free passage of pedestrians past the works (traffic-sensitive times are to be avoided whenever possible). Such activities include the collection and delivery of materials, and limited excavation or reinstatement activities. In some circumstances it will not be possible to provide an alternative footway because of restricted widths or other factors.

A temporary, short-duration obstruction of a footway may be appropriate in limited circumstances to enable works to take place. In such cases, the following factors should be considered:

- no alternative footway is available or can be provided;
- the footway will be obstructed for very short periods, no longer than absolutely necessary and for example, no longer than 15 minutes in every full hour. Any works taking longer than this should be covered by an order or notice from the highway authority.

- sufficient operatives are available at all times to advise, assist and direct footway users safely past the works;
- pedestrians requiring assistance should not wait longer than 5 minutes for help;
- all overhead operations are suspended when assisted pedestrians pass the works;
- temporary footway closure signs are placed at a suitable location that is within visibility of the works.

The highway or road authority should be notified and agree with the plan in place for short duration obstructions to the footway to enable the works.

This section does not apply to the closure of a footway. If the conditions above cannot be met, or if the restriction is expected to cause an obstruction for more than very short periods, a formal diversion or closure should be arranged with the highway authority.

Signing requirements for temporary obstruction of a footway

For short delays on footways, the sign “Temporary footway closure – Pedestrians Wait Here” should be displayed at all approaches to the work.

The sign should be placed at a suitable location, where footway users can see the works taking place and operatives can see any footway users.

4.2.6 Pedestrian crossings and pedestrianised areas

If permanent signs or visibility is being compromised at a crossing point by plant, vehicle and/or the works, the pedestrian crossing must be closed and signals switched off as per Section 6.2.

If shuttle working is in place, affecting the traffic direction approaching a crossing, additional signs advising pedestrians to ‘look both ways’ when crossing may be used.

In pedestrianised areas the working space and vehicles, plant or materials, must be enclosed by pedestrian barriers.

4.2.7 Protecting pedestrians during works

If the works are on or near a footway, then there is a risk that pedestrians might enter the working space. This could happen if they trip and fall into the working space, because they make a mistake and take the wrong route, or because they deliberately enter the space.

The working space will often contain a number of hazards that could harm pedestrians. For example, pedestrians might trip over material, barrier feet, fall into excavations or be struck by moving or falling equipment. Pedestrians must be protected from any hazards arising from the works by a continuous system of barriers.

Where a works site can be approached by pedestrians crossing from the opposite side of the road, you must adequately guard the area by placing barriers all around the works, even when pedestrians are not diverted into the carriageway.

Most barriers are designed to be put up as part of a system. If not properly erected, they will not be sufficiently stable and could be blown or knocked over. You should follow the manufacturer's instructions when erecting barriers. If you are unable to correctly install the barriers available, you should contact your supervisor or other competent person before starting work.

The use of portable traffic signals is covered in Section 7.9. Guidance on portable pedestrian crossing facilities can be found in other documents such as 'Guidance on the use of portable signals' published by the Association for Road Traffic Safety and Management (ARTSM). If you are considering the use of portable traffic signals incorporating pedestrian facilities, the highway or road authority must give prior written approval.

Whilst you are working at a site:

- keep checking that signs and barriers are still in place;
- make sure that materials or machinery does not encroach into any designated pedestrian route;
- if you need to move barriers or signs to allow access to the works, replace them as soon as possible (whilst they are open you must have someone at the opening to prevent pedestrians from entering); and
- keep a lookout and if you see pedestrians entering the working space, stop all machinery movements immediately and escort the pedestrians back onto a safe route.
- Special consideration must be given to disabled people (including wheelchair or mobility scooter users) and people with pushchairs or prams at all times.

4.2.8 Unattended works

If it is necessary to leave a site unattended, then remove as many hazards from the site as you can before leaving it. For example:

- remove or securely immobilise all plant and machinery;
- remove as much equipment and material as possible. Make sure any that is left on site is stored in a tidy manner and in such a way that it cannot fall, be knocked over or tampered with.

If an unattended site contains an open excavation then you should either:

- put temporary covers over the excavation (see Section 11.9); or
- provide an enhanced barrier around the excavation;

unless a site specific risk assessment shows that such additional protection is not justified.

4.3 Cycle routes – safe routes for cyclists

It is your responsibility to make sure that cyclists passing or crossing the works are safe from risk arising from the work activity.

Cyclists might have to use other parts of the carriageway, a temporary cycle track, or an alternative route. Consult your supervisor or other competent person as they may need to discuss these alternatives with the highway or road authority.

There are several options to be considered when setting up safe routes for cyclists, when a cycle lane or track is present (see Figure 7):

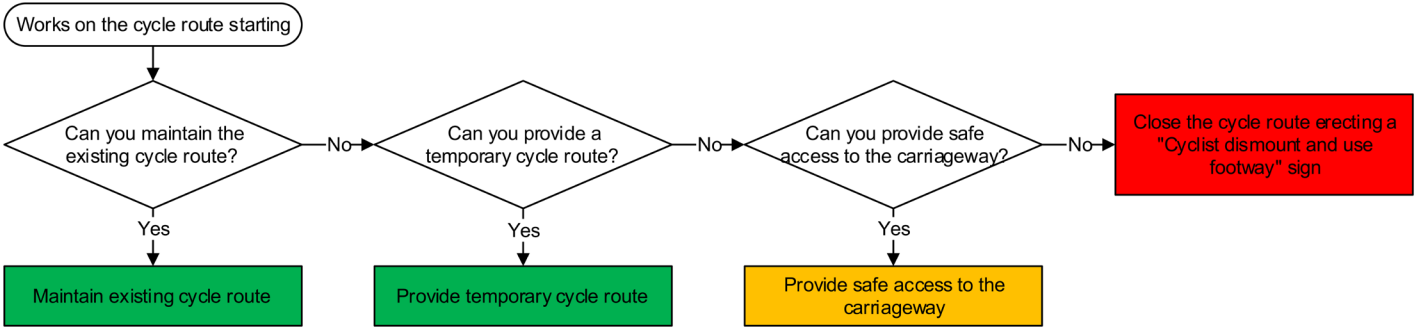
- the priority should be to keep cyclists on the existing cycle lane or track;
- if this is not possible, a temporary cycle lane or track should be provided;
- if not possible, access to the carriageway may be provided; or,
- as the last option, consider closing the cycle lane or track and erecting a 'Cyclist dismount and use footway' sign.

If cyclists are using the carriageway, the aim is to keep them on the carriageway.

A cycle lane marked with a solid white line may have been created by means of a Traffic Regulation Order. Where one of these is affected by planned works, consult your supervisor or other competent person as

they will need to discuss with the highway or road authority, well before work starts, to obtain the appropriate consent to suspend the cycle lane, e.g. a TTRO or TTRN. Consent is not required in advance for emergency works, but must be applied for retrospectively at the earliest opportunity after commencement.

Figure 7 Cycle routes works – hierarchy of alternatives



4.3.1 Maintaining existing cycle route or shared use route

You should always try to enable cyclists to remain safely on the cycle route or shared use route. The characteristics of cycling provision can vary significantly, especially in design and location. You should undertake a risk assessment to understand:

- the locality of street furniture and pinch points;
- access to properties;
- flows of cycles and pedestrians when the works are taking place;
- whether the route has any form of segregation;
- likelihood of cyclists entering the work site;

- the length of works;
- phasing works to avoid poor temporary surface or raised ironworks;
- the nature of the adjacent carriageway (if any) and available space.

Where partial obstruction of a segregated cycle track is required, the minimum widths to be maintained are:

- 2 metres for bi-directional cycle traffic;
- 1.5 metres for single direction cycle traffic.

Where the minimum width of a shared use route cannot be maintained, but access for pedestrians can be maintained, provisions for cyclists should be agreed with the highway or road authority.

4.3.2 Using the carriageway

Where there is cycle provision, such as cycle lanes or tracks, efforts should be made to keep these open or to provide an acceptable alternative during the works. It might be possible to create a temporary segregated or delineated cycle lane within the carriageway to allow cyclists to pass the works safely using temporary signs, cones, barriers and road markings as required. If a suitable alternative facility is not achievable, provision for cyclists to share the carriageway could be established where the following criteria are met:

- safe access and egress from and to the cycle lane is available. Dropped kerbs and ramps should be provided to aid manageable transitions between levels;
- there is more than 4 metres lane-width free of pinch-points and corners; or,
- if the lane-width is less than 3.2 metres and the area is free of pinch-points and corners and the speed limit is 30 mph or less, shared use may still be possible using ‘Narrow Lane’ signs. A temporary mandatory or advisory reduced speed limit may be suitable for this option.

Warning: Where cyclists share the road with motor vehicles, avoid road widths between 3.2 metres and 3.9 metres to deter unsafe overtaking.

Where a cycle lane is closed within the carriageway and cycles are directed to join the traffic by blue and white arrows and cone tapers, the 'cycle lane closed' or 'cycle lane closed ahead' signs should be placed so cyclists and road users may alter their road position in good time.

A closure of the carriageway, or lane, to motor traffic may be necessary with an exception for cycles, which can use relatively narrow widths see Section 7.12.1. Lanes should be no less than 1.5 metres wide.

When shuttle working with traffic control is needed, refer to the table of unobstructed road widths past the works set out on Section 7.1 to prevent unsafe conditions for cyclists. When operating shuttle working the 'Narrow lane' sign may be used, to minimise the risk to cyclists.

When portable traffic signals are used, bear in mind when setting the timings that cyclists might take longer than motor vehicles to clear the controlled section.

4.3.3 Using the footway

Where the carriageway is closed but the footway remains open, a 'Cyclists dismount and use footway' white-on-red temporary sign can be used.

You may have to provide a safe place for cyclists to dismount. Consider that not all people cycling can easily dismount, particularly when a cycle is used as a mobility aid.

4.4 Equestrian routes – safe routes for horse riders

If the route is used by equestrians, you must ensure suitable provisions are made to ensure the safety of people riding or leading horses past the works. Some operations such as noisy activities, works causing vibration, flashing lights or vehicle movements should be suspended when horses are passing the works.

Where it is necessary to close a bridleway a Temporary Traffic Regulation Order or Notice will be required. Your supervisor or other competent person will need to discuss the situation with the highway or road authority before work starts.

5. Carriageway works

This Code gives guidance on typical layouts, equipment and working methods. It does not include every situation you could encounter and it might be necessary for a competent person to liaise with the relevant highway or road authority to establish any local factors that could reduce the impact from the works upon highway users. You must read the text alongside the illustrations in order to fully understand the requirements.

5.1 Works on single carriageway roads

The basic layouts on Figure 5, Figure 6, Figure 8 and Figure 9 cover approach signing and guarding in areas with speed limits of 30 mph or less.

For three or more lane single carriageways you should consult your supervisor or other competent person.

Exceptions are permitted in the case of works undertaken between parked vehicles (see below).

Parked vehicles

On roads where vehicles are parked and are likely to be present for the duration of the works:

- works in the space between parked vehicles need no advance signing or lead-in or exit taper of cones, provided that the whole works, including the safety zone, does not extend beyond the line of vehicles;
- provision is to be made to ensure that the site is adequately signed and guarded if the vehicles move, with the site reverting to the basic site layout if reasonably practicable.
- if there are disabled persons parking bays, there should be enough space for rear access to a vehicle for a wheelchair user;
- your pre-works and ongoing risk assessments need to reflect the conditions on the site, such as parking on one or both sides of the street, and possible changes to the parked vehicles at or near the site; and
- if you are working within designated parking spaces, the consent of the highway or road authority will be required before carrying out the works.

All other signing (other than advance signing) and the necessary guarding are still required at sites with parked vehicles.

Works vehicle

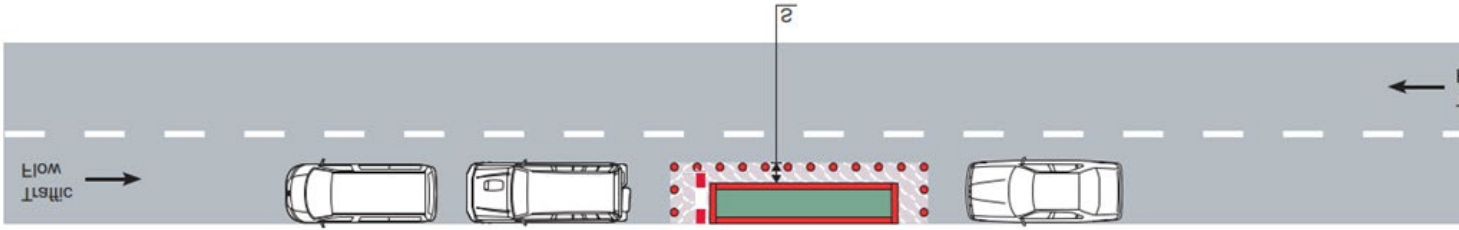
If you want to park a works vehicle in front of the works area to give some physical protection or to work from it, keep a minimum distance (C) between the vehicle and the works of:

- 2 metres, for a speed limit of 30 mph or less; or
- 5 metres, for a speed limit of 40 mph; or
- 8 metres, for a speed limit of 50 mph or more.

This distance will provide some protection for operatives if the vehicle is struck by another vehicle.

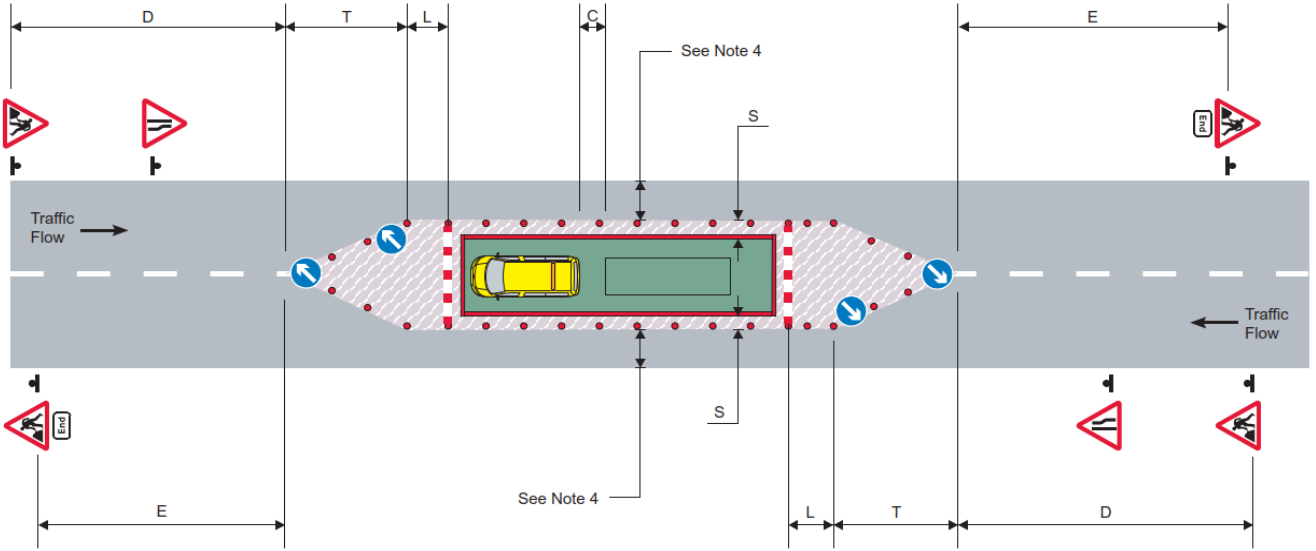
Note: When you are parking a conspicuous works vehicle in front of the working space, a traffic barrier will still be required, as shown on Figure 2. It should be placed in front of the vehicle. The barrier is also required if the vehicle is not present.

Figure 8 Works between parked vehicles



Notes
1 No advance signing, lead-in taper or exit taper required provided that the whole works, including the safety zone, do not extend beyond the line of vehicles.
2 An information sign (omitted here for clarity) must be displayed.
3 If parked vehicles move away, tapers and advance signing should be provided.

Figure 9 Works in the centre of a two-way road



Notes

1 For numbers and minimum size of cones and dimensions D and E see Table 1, for dimension L see Table 3, for dimension S see Table 4, for dimension T see Table 2 and for dimension C see Section 4.5.2.
2 An information sign (omitted here for clarity) must be displayed.
3 Supplementary distance plates are required for advance signs where the speed limit is 50 mph or more.
4 See Section 7.1 for guidance on unobstructed width past the works.

Road widths

If there is not enough space for two-way traffic, traffic control may be used. See Section 7.1 for the minimum road width required for two-way working.

5.1.1 Works on dual carriageways with a speed limit of 50 mph or more

Consult your supervisor or other competent person about what to do as such works are not covered by this Code. Guidance is available in Chapter 8 of the Traffic Signs Manual.

5.1.2 Works on dual carriageways with a speed limit of 40 mph or less

Consult your supervisor or other competent person about what to do. The layouts contained in this Code are basic examples and further guidance is available in Chapter 8 of the Traffic Signs Manual.

Warning: Only persons who are competent with signing, lighting and guarding on dual carriageways are to be used for the planning and setting up works.

Right lane closure

This is shown on Figure 10.

Left lane closure

If the left lane is closed, you should normally merge traffic into the left lane using a guide island, then return the traffic to the right lane(s). This is shown on Figure 11. For certain short-term works, it may be an acceptable alternative to merge traffic to the right. See Chapter 8 of the Traffic Signs Manual for further guidance.

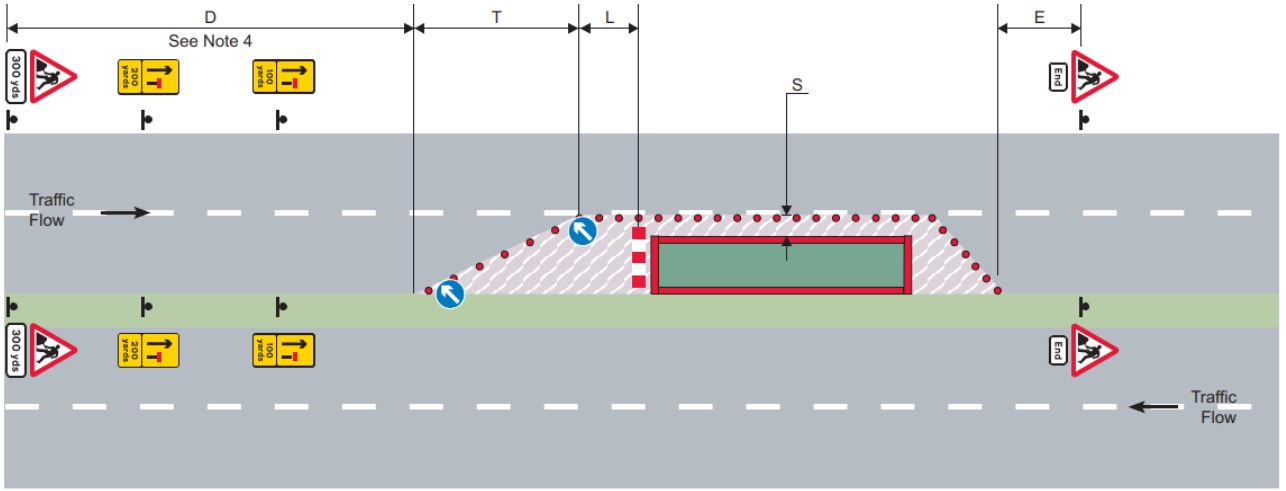
If you think that mobile lane closure methods may be required for setting out guarding, you must consult your supervisor or other competent person.

Signing requirements for dual carriageways

Table 5 Signing requirements for dual carriageways

Speed limit	Signing requirements
30 mph or less	As shown on Figure 10 and Figure 11, except that distance plates may be omitted
40 mph	As shown on Figure 10 and Figure 11.

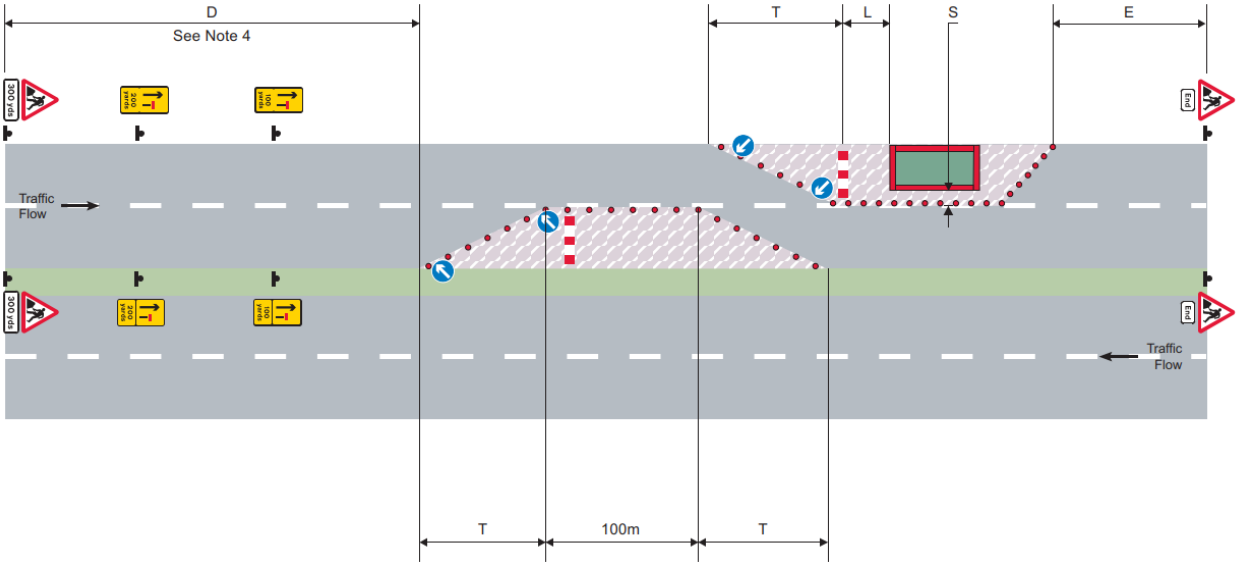
Figure 10 Dual carriageway with a speed limit of 40 mph, works in right lane



Notes

1 For numbers and minimum size of cones, and dimensions D and E see Table 1, for dimension L see Table 3, for dimension S see Table 4 and for dimension T see Table 2.
2 An information sign (omitted here for clarity) must be displayed.
3 If access by a works vehicle is required refer to Chapter 8 of the Traffic Signs Manual for signing of access and exit.
4 Dimension D = 275 metres (300 yds) in this example.

Figure 11 Dual carriageway with a speed limit of 40 mph, works in left lane



Notes

1 For numbers and minimum size of cones, and dimensions D and E see Table 1, for dimension L see Table 3, for dimension S see Table 4 and for dimension T see Table 2.
2 An information sign (omitted here for clarity) must be displayed.
3 If access by a works vehicle is required refer to Chapter 8 of the Traffic Signs Manual for signing of access and exit.
4 Dimension D = 275 metres (300 yds) in this example.
5 The guide island in the right lane may be omitted in certain circumstances. Refer to Chapter 8 of the Traffic Signs Manual for guidance.

5.1.3 Works at road junctions

When carrying out works at road junctions, you can keep two-way traffic flowing past the works only when all of the following apply:

- the speed limit is 30 mph or less;
- the length of the works from first cone to last cone is 50 metres or less;
- visibility of the junction is not obscured;
- two-way traffic flow is no more than 20 vehicles counted over 3 minutes (400 veh/h);
- no more than 20 heavy goods vehicles pass the works per hour; and
- parking near the works, especially in front and opposite is controlled/prohibited, unless visibility or lane width is unaffected.

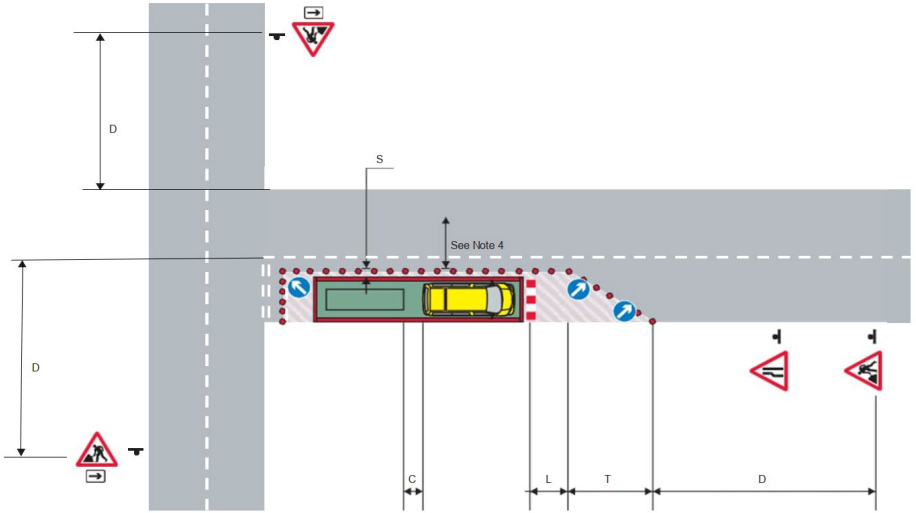
See Figure 12 and Figure 13 for details. Other traffic control methods such as the use of temporary signals are preferred.

Warning: Keeping the two-way traffic flow past the works on a junction has an increased risk for drivers, as they might face oncoming traffic when turning. This risk may prevent you from using this traffic control option.

If you can't keep two-way traffic flowing past the works, traffic control or a diversion will be required and you must refer to your supervisor or other competent person who must in turn contact the traffic authority. If the works are in a side road, place 'Road works ahead' signs with supplementary arrow plates on the main route.

Where works are situated near but just past a side road junction, the cone taper can start on the approach to the junction.

Figure 12 Works in a side road at a T-junction, maintaining 2-way traffic



Notes

1 For numbers and minimum size of cones, and dimension D see Table 1, for dimension see Table 3, for dimension S see Table 4, for dimension C see Section 4.5.2 and for dimension T see Table 2

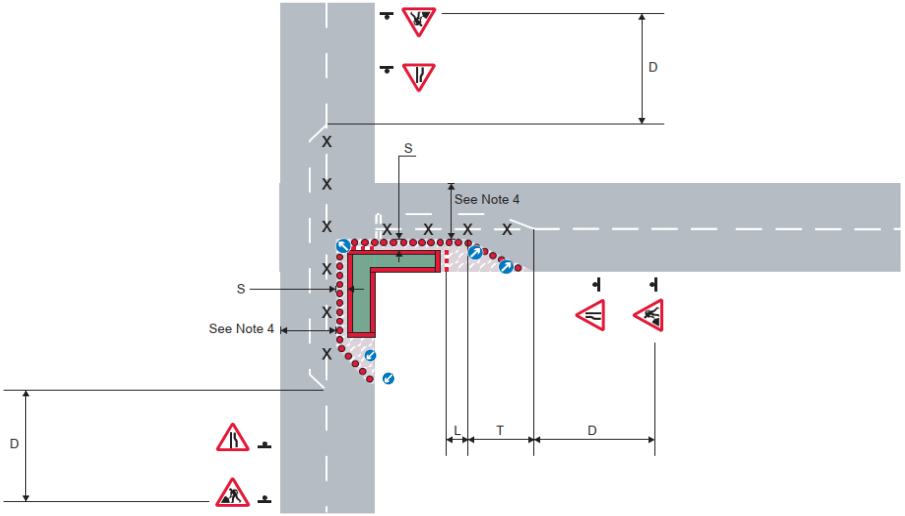
2 An information sign (omitted here for clarity) must be displayed.

3 Appropriate advance warning signs must be placed on all roads approaching a junction to ensure the site is adequately signed

4 See Section 7.1 for guidance on unobstructed width past the works.

5 If two-way flow cannot be maintained past the works, some form of traffic control will be required – see Section 7.1. Alternatively, flow could be made one-way, using advance No left turn/right turn signs placed in the main road to prevent vehicles from turning into the side road. This will require a TTRO / TTRN.

Figure 13 Works in both roads at a T-junction



Notes

1 For numbers and minimum size of cones, and dimension D see Table 1, for dimension L see Table 3, for dimension S see Table 4 and for dimension T see Table 2.

2 An information sign (omitted here for clarity) must be displayed.

3 Appropriate advance warning signs should be placed on all roads approaching the junction. A temporary road layout sign may be required.

4 See Section 7.1 for guidance on unobstructed width past the works.

5 If two-way flow cannot be maintained past the works, some form of traffic control will be required – see Section 7.1. Alternatively, flow could be made one-way, using advance No left turn/right turn signs placed in the main road to prevent vehicles from turning into the side road.

Approaches to signal controlled junctions

A works site on the approach to a signal controlled junction can cause significant traffic disruption at the junction itself. If there is a risk of the works obstructing visibility of signals at crossing facilities, the crossing point should be closed off in a similar manner to that shown for pedestrian crossings (see Section 6.2).

Warning: When working adjacent to or on road junctions controlled by permanent traffic signals, an adjustment of the traffic signals may be required, so you should consult your supervisor or other competent person, who must contact the highway or road authority or the responsible for the traffic signals.

At signal controlled junctions

If permanent traffic signals are not working, or have been turned off, you must ensure that 'signals not in use' to diagram 7019 signs are put on the signal post facing towards approaching traffic, and that the suspended signals are covered.

Permanent traffic signals are often replaced by temporary or portable traffic signals for the duration of the works. If pedestrian lights at a junction are affected by the works, the crossing point should be closed off in a similar manner to that shown for pedestrian crossings (see Section 6.2).

Caution: Permanent traffic signals or pedestrian crossings can only be switched off or replaced by temporary or portable signals with the approval of the highway or road authority or the party responsible for the traffic signals.

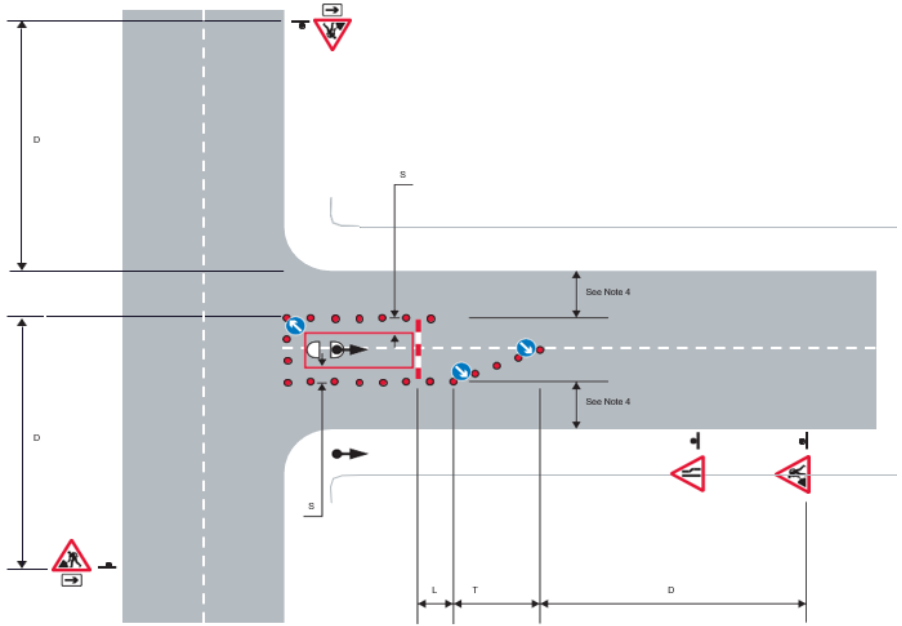
Figure 14 shows signing and guarding for works at traffic signals on a road with a speed limit of 30 mph or

less.

Appropriate advance warning signs should be placed on all roads approaching the junction.

Consult your supervisor or other competent person where the road has a speed limit of 40 mph or more.

Figure 14 Works on a signal island at a T-junction



Notes

1 For numbers and minimum size of cones, and dimension D see Table 1, for dimension L see Table 3, for dimension S see Table 4 and for dimension T see Table 2.

2 An information sign (omitted here for clarity) must be displayed.

3 Appropriate advance warning signs should be placed on all roads approaching the junction.

4 See Section 7.1 for guidance on unobstructed width past the works.

5 The length of the coned area may be extended to accommodate a works vehicle.

5.1.4 Works at roundabouts

Works at the entrance to or exit from a roundabout

Use advance signs to warn traffic on all approaches that there are works at or near the roundabout. Use 'Keep right/left' signs to guide traffic around the coned-off works site.

For single-carriageway approaches, try to keep two-way traffic flowing if possible, but remember the width restrictions (see Section 7.1). However, if the works site makes the road too narrow to allow two-way traffic to pass and shuttle working is not practicable, you will need to consider restricting the road to 'Exit only' from the roundabout (see Figure 15, Case A). In this case, the traffic usually entering the roundabout on this road will need to be diverted. This requires the permission of the highway or road authority and needs to be pre-planned, as adequate notice has to be given. Consult your supervisor or other competent person.

Extra cones may be needed to restrict traffic to one lane going towards this exit with additional advance warning using 'Road narrows' signs provided on all approaches. Use 'Keep right/left' signs to guide traffic past coned areas.

Works in the circulatory area of a roundabout

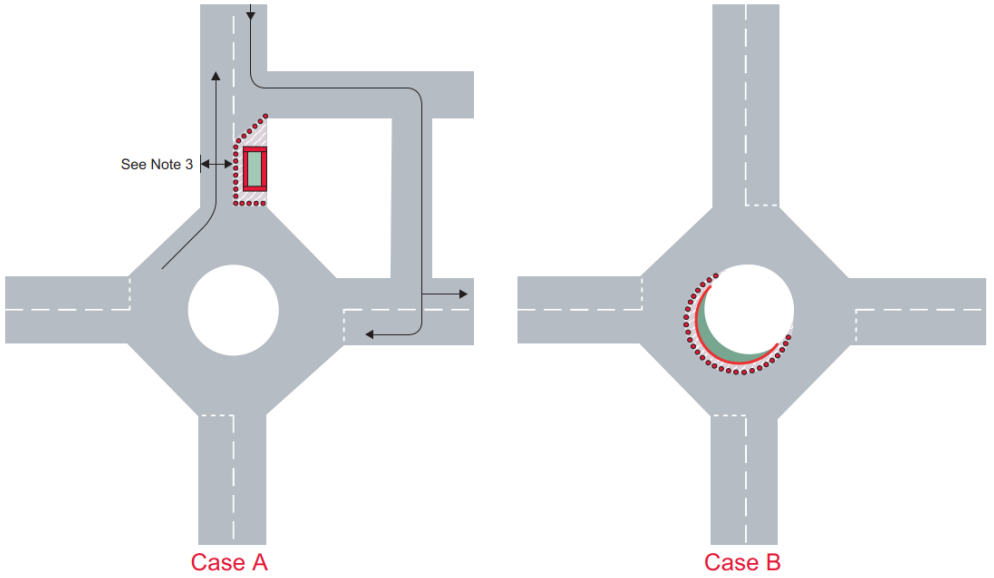
Movement of traffic should be maintained if possible. Guard and cone the works and provide advance 'Road narrows' signs on all approaches. Use 'Keep right/left' signs to guide the traffic past the works site.

Where works are going to completely obstruct the circulatory area of a roundabout, consult your supervisor or other competent person.

Varying the number of lanes on the circulatory section of a roundabout can distract drivers, therefore, you should cone down to the same number of lanes on the approaches unless the traffic pattern dictates otherwise. Lane dedication signs may be needed.

You should ensure there is adequate width on the restricted approach for vehicles turning and that the rear wheels of long vehicles do not hit the cones.

Figure 15 Works at a roundabout, Cases A and B



Notes

1 Appropriate diversion and advance warning signs must be placed on all roads approaching roundabout.
2 Other signs should be placed as necessary.
3 See Section 7.1 for guidance on unobstructed width past the works.

5.2 Works at pedestrian, cycle and equestrian crossings

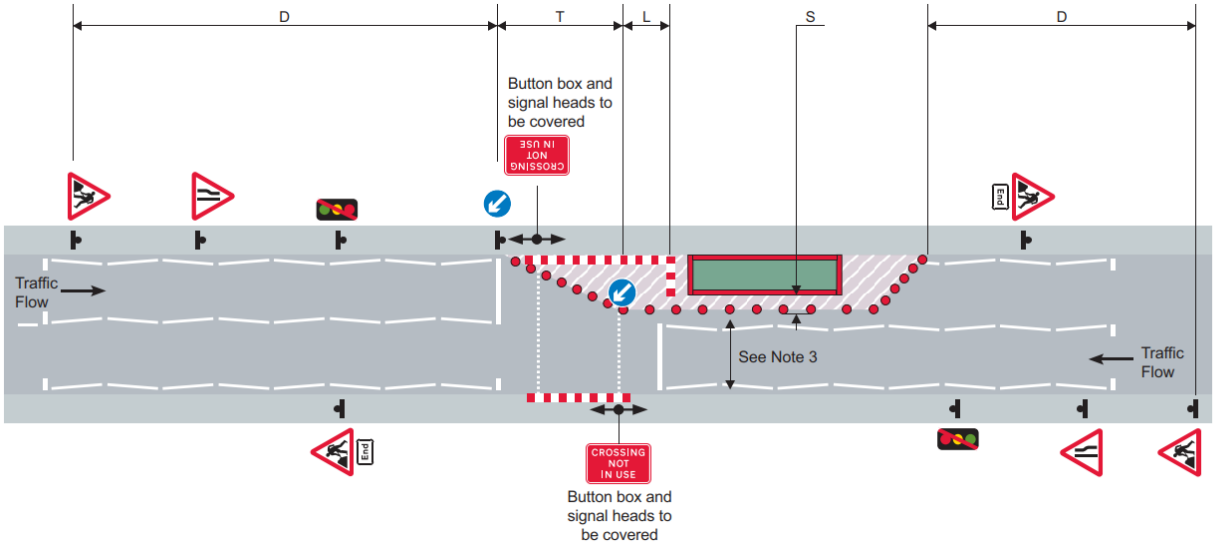
If a pedestrian, cycle or equestrian crossing has to be suspended owing to works (see Figure 16), you should:

- ensure the suspension has been authorised by the highway or road authority or the party responsible for the traffic signals;
- agree with the highway or road authority what, if any, alternative arrangements such as ramps or temporary traffic lights will be provided for users of the crossing prior to suspension. Temporary traffic lights with rotating cones may be used for a pedestrian crossing to help those visually impaired, where needed;
- ensure 'Crossing not in use' signs have been erected;
- ensure Zebra or Parallel crossing yellow globes, signal heads and push button units (including any tactile rotating cones under the push button units for visually impaired people) are covered;
- disable any audible warnings or Bluetooth functionality for vision-impaired people;
- erect barriers across the accesses to the crossing; and
- close both crossings if the works spread into one or both sides of a crossing that has a central refuge.

If you are planning works using a shuttle lane, you can find further guidance on the use of portable traffic signals or portable pedestrian crossing facilities in other documents such as 'Guidance on the use of portable signals' published by the Association for Road Traffic Safety and Management (ARTSM).

Warning: If there is a pedestrian, cycle or equestrian crossing within the limits of the advance signing, you must consult your supervisor or other competent person.
Only the highway or road authority can authorise a crossing to be taken out of service.

Figure 16 Works obstructing a signal controlled pedestrian crossing



Notes

1 For numbers and minimum size of cones, and dimension D see Table 1, for dimension L see Table 3, for dimension S see Table 4 and for dimension T see Table 2.

2 An information sign (omitted here for clarity) must be displayed.

3 See Section 7.1 for guidance on unobstructed width past the works.

5.3 Works in a bus lane

Any works within a bus lane might require additional signing (relocation of bus stops for example) and traffic management provision. Consult your supervisor or other competent person, who will need to liaise with the highway or road authority (and where different, the bus authority). A Temporary Traffic Regulation Order or Notice may be required if the bus lane is to be closed. For emergency works, consult your supervisor or other competent person.

5.3.1 Works that require diversion into a bus lane

If your works are going to result in pedestrians or other traffic being diverted into a bus lane, it will be necessary to discuss suspending the bus lane with the highway or road authority before work commences. A Temporary Traffic Regulation Order or Notice may be required if the bus lane restriction is to be removed. For emergency works, consult your supervisor or other competent person.

6. Traffic control

Adequate unobstructed width is required to allow two-way traffic to flow safely past the work site. Where such widths cannot be maintained, traffic control should be provided.

6.1 Unobstructed widths

Table 6 shows standard and restricted carriageway widths for different types of traffic. The standard widths are designed to maintain access for buses and heavy goods vehicles, and should be provided wherever practicable. Where this is not practicable, a risk assessment should be carried out to ensure restricted lane widths are appropriate and that all risk control measures are in place, following agreement with the highway or road authority.

If you are intending to use restricted lane widths that will prevent the passage of HGVs and buses, a suitable diversion route for these vehicles will need to be agreed with the highway or road authority and bus operator. In these circumstances you must consult your supervisor or other competent person who will advise the relevant highway road authority to facilitate co-ordination of the works.

When operating shuttle working the 'Narrow lane' sign may be used to minimise risk to cyclists.

Warning: Where the minimum width cannot be met, your supervisor or other competent person should consult the highway or road authority regarding alternative traffic management methods that may be deployed.

Table 6 Widths for working

	Standard: Normal traffic including buses and HGVs	Restricted: Cars and light vehicles only
Two-way working	6.75 metres minimum	5.5 metres minimum
Shuttle working*	3.2 metres desirable width 3.0 metres absolute minimum	3 metres desirable width 2.75 metres absolute minimum
* This range avoids certain widths that create opportunities for unsafe overtaking of cyclists and is based on Department for Transport guidance (LTN 1/20). Lane widths between 3.2 metres and 3.9 metres are less likely to be acceptable for cycling in mixed traffic.		

6.2 Choice of traffic control method

Caution: If the situation is not covered by the methods shown, your supervisor or other competent person should consult the highway or road authority.

Table 7 shows various methods of traffic control together with the required conditions for each method. For a given method of traffic control, the relevant conditions in the table should be complied with.

Table 7 Traffic control methods

Method	Max speed limit (mph)	Coned area length	Traffic flow (maximum)	Notes
Passive				
Give and take	30	50 m maximum	20 vehicles over 3 mins and 20 HGVs per hour	Signing as per Figure 17.
Priority	60	80 m maximum	42 vehicles over 3 minutes	Signing as per Figure 18. Supplementary 'End' plates needed if over 50 m
Positive				
Stop/Go boards	60	Up to 100 m	70 vehicles/3 mins	Signing as per Figure 19. Consult your supervisor or other competent person if greater than 500 m or near a railway level crossing. See also Section 7.8.
		Up to 200 m	63 vehicles/3 mins	
		Up to 300 m	53 vehicles/3 mins	
		Up to 400 m	47 vehicles/3 mins	
		Up to 500 m	42 vehicles/3 mins	
Portable traffic signals	60	300 m maximum	No limit	Highway or road authority permission needed. Signing as per Figure 20. Consult your supervisor or other competent person if at or near a railway level crossing. See also Section 7.9.
Speed reduction	60	N/A	N/A	See Section 7.10.

Method	Max speed limit (mph)	Coned area length	Traffic flow (maximum)	Notes
Convoy working	Temporary limit of 10 mph	N/A	N/A	See Section 7.11
Road closure or one-way traffic	60	N/A	N/A	See Section 7.12.
'Stop – works' sign	60	N/A	N/A	Max period – 2 mins. See Section 7.13.1
'Temporary obstruction' sign	60	N/A	N/A	Max period – 15 mins. See Section 7.13.2

6.3 Setting up traffic control

Where a positive traffic control method is chosen, notification must be given to the relevant highway or road authority.

For the use of portable traffic signals, prior permission is required from the relevant highway or road authority. However, in the case of urgent and emergency works, the authority must be informed at the time and an application submitted at the earliest opportunity.

Warning: When implementing any form of passive or positive traffic control operatives and road users are at increased risk until the measures are completely installed.

6.4 Traffic control near tramways or railway level crossings

Extreme care must be taken to ensure that stationary traffic **never** tails back across a tramway line or railway level crossing when street works or road works are being carried out, see Section 9.

Warning: Under no circumstances should portable traffic signals be used at works that straddle a railway level crossing, nor to control road traffic within **50 metres** of a level crossing equipped with wig-wag traffic signals.

6.5 Works at or near traffic signal controlled junction or pedestrian crossing

Extreme care must be taken to avoid stationary traffic tailing back through a signal controlled junction or pedestrian crossing. When you are carrying out any works in a location where this might be the case, the highway or road authority must be consulted.

In these circumstances it may be necessary for the traffic signal at the junction or crossing to be turned off, in which case alternative means of controlling traffic and pedestrians may be needed (see Section 6.2).

Caution: To proceed with this option, at the earliest opportunity your supervisor or other competent person must consult the highway or road authority.

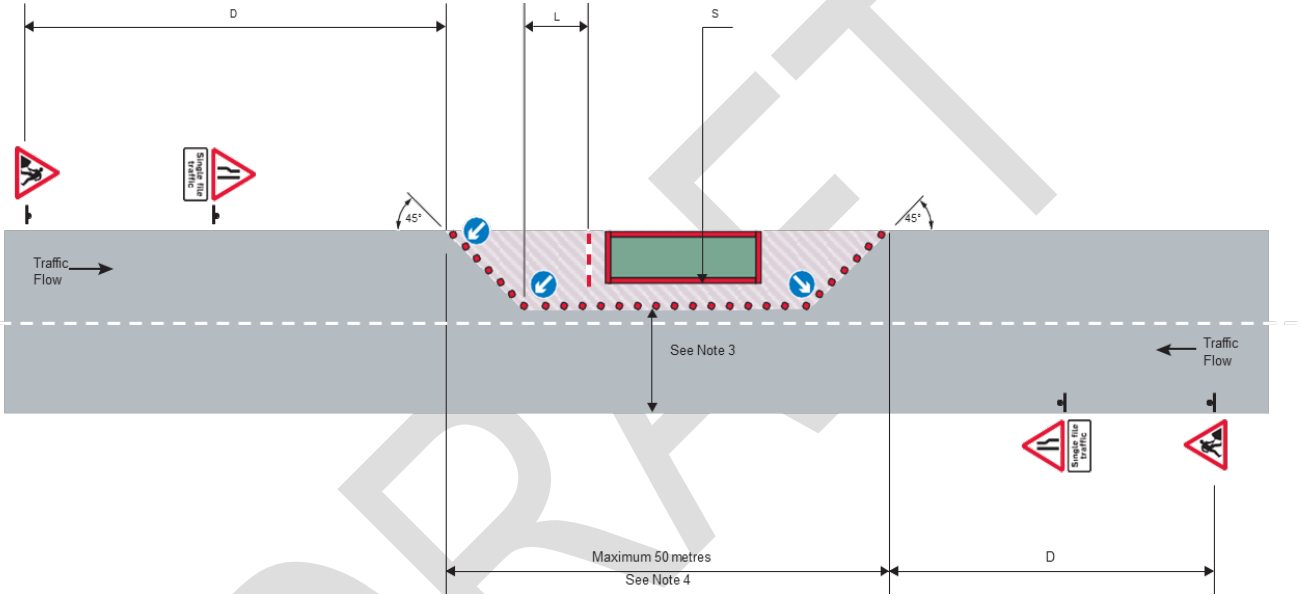
6.6 Traffic control by ‘give and take’

You can use ‘give and take’ only when **all** of the following apply:

- the speed limit is 30 mph or less;
- the length of the works from first cone to last cone is 50 metres or less;
- drivers approaching from either direction can see 50 metres beyond the end of the works;
- two-way traffic flow is no more than 20 vehicles counted over 3 minutes (400 veh/h);
- no more than 20 heavy goods vehicles pass the works per hour; and
- parking near the works, especially in front and opposite is controlled/prohibited, unless visibility or lane width is unaffected.

The signing you will need is shown on Figure 17.

Figure 17 Traffic control by 'give and take' for roads with a speed limit of 30 mph or less



Notes

1 For numbers and minimum size of cones, and dimension D see Table 1, for dimension L see Table 3 and for dimension S see Table 4.

2 An information sign (omitted here for clarity) must be displayed.

3 See Section 7.1 for guidance on unobstructed width past the works.

4 50 metres maximum applies only where two-way flow cannot be maintained past the works.

6.7 Traffic control by priority signs

You can use priority signs only when **all** of the following apply:

- the speed limit is 60 mph or less;
- the length of the works from first cone to last cone is 80 metres or less;
- two-way traffic flow is no more than 42 vehicles counted over 3 minutes (840 veh/h); and
- drivers approaching from either direction have visibility before and beyond the works as shown in the table below.

Table 8 Priority signs location

Speed limit of road	Visibility before and beyond works
30 mph or less	60 m
40 mph	70 m
50 mph	80 m
60 mph	100 m

Warning: The sign and supplementary plate 'Give way to oncoming vehicles' must be positioned on the same side of the road as the works.

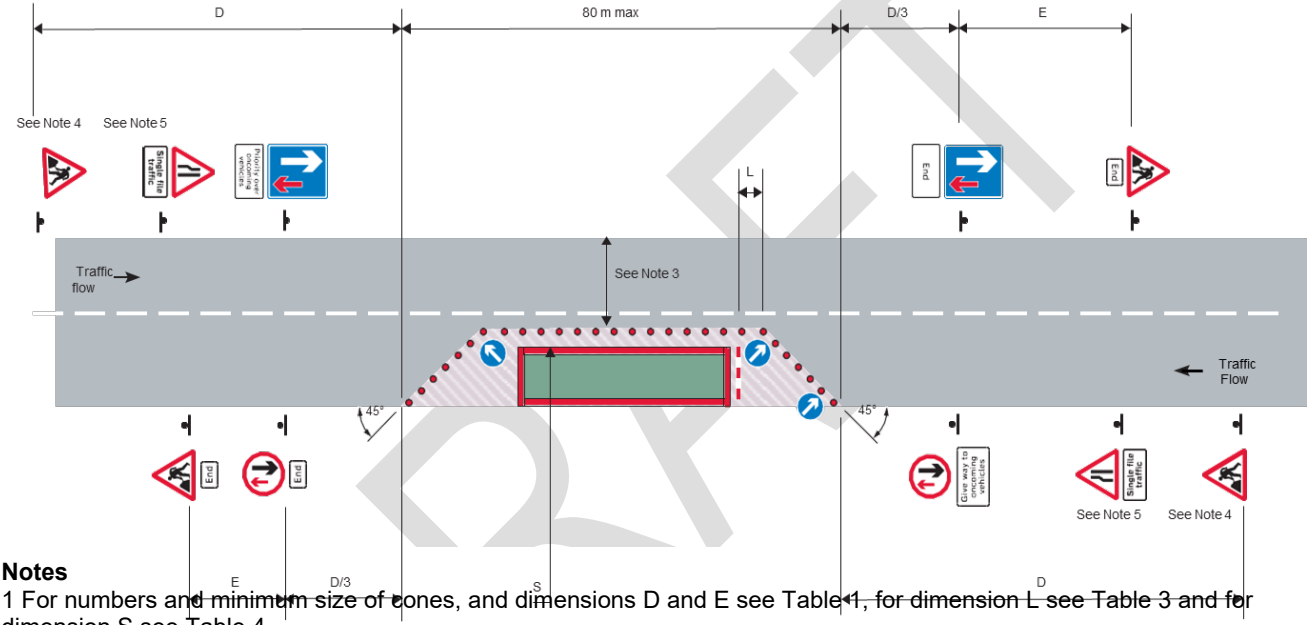
A ‘Give way to oncoming vehicles’ sign in conjunction with a supplementary ‘End’ plate may be used:

- where the works are more than 50 metres long and the nature of the works obscures the view of the road downstream of the single file lane.
- where the site extends well past the priority section such that the ‘End of road works’ sign is over 100 metres from the end of priority working.

If the ‘Give way to oncoming vehicles’ sign is used, then the ‘Priority over oncoming vehicles’ sign must be placed for traffic flowing in the opposite direction (see Figure 18).

The end of the priority section must be marked with a ‘Priority over oncoming vehicles’ sign in conjunction with a supplementary ‘End’ plate.

Figure 18 Traffic control by priority signs



Notes

1 For numbers and minimum size of cones, and dimensions D and E see Table 1, for dimension L see Table 3 and for dimension S see Table 4.
2 An information sign (omitted here for clarity) must be displayed.
3 See Section 7.1 for guidance on unobstructed width past the works.
4 A supplementary distance plate is required for roads with a speed limit of 50 mph or more.
5 For roads with a speed limit of 50 mph or more an assessment should be made as to whether 'for' and a distance should be included on a supplementary plate.

6.8 Traffic control by Stop/Go boards

Stop/Go boards can only be used for 2-way shuttle working. If there is an uncontrolled junction joining the shuttle lane, portable signals should be used.

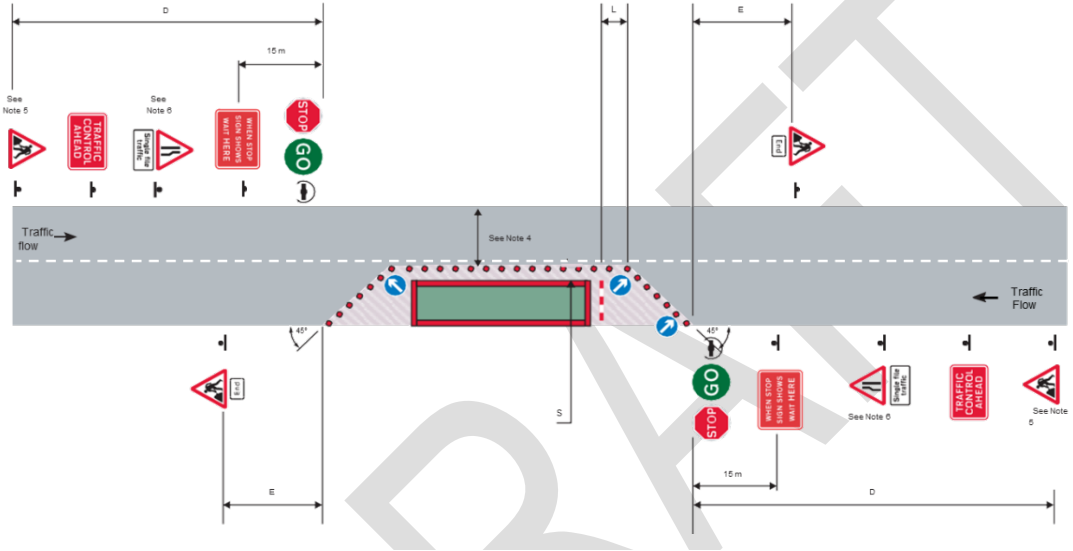
6.8.1 Remote controlled Stop/Go boards

Remote controlled Stop/Go boards should be used where possible. This should be controlled by an operative on site. When these boards are used, **all** the following conditions should be met:

- the distance between the 'Stop/Go' boards is no more than 200 metres;
- use of the boards is restricted to daylight hours;
- an unobstructed view of both approaches is maintained;
- the operative is less than 100 metres from both boards; and
- traffic flow is less than 42 vehicles counted over 3 minutes (850 veh/h).

The signing you will need is shown on Figure 19.

Figure 19 Traffic control by Stop/Go boards



Notes

1 For numbers and minimum size of cones, and dimensions D and E see Table 1, for dimension L see Table 3 and for dimension S see Table 4.

2 An information sign (omitted here for clarity) must be displayed.

3 Stop/Go boards should be placed where they will be in full view of approaching drivers, they may be located on either side of the carriageway.

4 See Section 7.1 for guidance on unobstructed width past the works.

5 A supplementary distance plate is required for roads with a speed limit of 50 mph or more.

6 For roads with a speed limit of 50 mph or more an assessment should be made as to whether ‘for’ and a distance should be included on a supplementary plate.

6.8.2 Manually rotated Stop/Go boards

Manually rotated boards should only be used during the day where:

- the operator can be located in a position of safety (which must not be within the safety zone), and
- the works length or traffic flow prohibits the use of remotely operated boards; or
- if your risk assessment identifies that remotely operated boards retain an unacceptable level of residual risk.

The reasons for not using remotely operated boards should be documented.

You can use manually rotated Stop/Go boards under the following circumstances:

Table 9 Traffic flow when using Stop/Go boards

Coned area length (metres)	Maximum two-way traffic flow	
	Vehicles per 3 minutes	Vehicles per hour
Up to 100	70	1400
Up to 200	63	1250
Up to 300	53	1050
Up to 400	47	950
Up to 500	42	850

If the site length for manually rotated boards is 20 metres or less, then:

- a single board positioned at one end or in the middle may be used, provided that it can be clearly seen from both directions.
- If two boards are used, then the operative showing 'Go' to oncoming traffic will be the one to control the change of traffic flow. Adequate time should be allowed for vehicles to clear before the other board is reversed to show 'Go', with both boards displaying 'Stop' while the shuttle lane clears.

Where two boards are in use and the operatives are not in direct line of sight, then two-way radio communication between operators should be used.

If portable traffic signals have failed and manually rotated boards are in use at night as an interim measure, they must be directly illuminated uniformly across the sign face. Partial illumination is not permitted, nor is intermittent illumination.

Warning: When the Stop/Go boards are to be used at or near a railway level crossing, consult your supervisor or other competent person.

6.9 Traffic control by portable traffic signals

The use of portable (temporary) traffic signals is a positive method of traffic control that can be appropriate in many environments, 24 hours a day, where works are no more than 300 metres long.

All signal heads should be placed in a position where they are clearly visible to approaching traffic. Additional guidance on the use of portable traffic signals can be found in other documents such as 'Guidance on the use of portable signals' published by the Association for Road Traffic Safety and Management (ARTSM).

Prior to using portable signals to control traffic, you **must** assess the following:

- speed of the traffic. If these signals are to be used on roads where traffic speed is greater than the road's posted speed limit, speed reducing measures should be considered on the approach;
- position of bus stops and parking bays;
- position of pedestrian crossings, either signal-controlled, Zebra or Parallel;
- location of existing traffic controls, junctions and roundabouts that could affect or be affected by traffic flow beyond the works;
- needs of cyclists and other vulnerable road users;
- any junctions that are so close to the shuttle section that multi-phase control may be required;
- potential for the shuttle section to become blocked by stationary traffic; and
- potential for the waiting traffic to block any level crossing (see Section 9).

Warning: Under no circumstances should portable traffic signals be used at works that straddle a railway level crossing, nor to control road traffic within 50 metres of a level crossing equipped with wig-wag traffic signals.
Your supervisor or other competent person must contact the railway owner or tramway operator if this applies.

The minimum requirement is for one signal head on each approach. For safe operation, drivers must be able to see a signal on approach and while waiting at the 'Wait here' sign. This may require the use of more than one signal head on each approach.

6.9.1 Two-way traffic control

Two-way portable traffic signals may only be used under the following circumstances:

- the distance between the 'WAIT HERE' signs does not exceed 300 metres;
- they are vehicle-actuated, unless otherwise instructed by the highway or road authority. Requests for manual control should be site specific, in exceptional circumstances and for short periods only;
- the equipment is registered with Traffic Open Products and Specifications (TOPAS) for use on the highway;
- Stop/Go boards are available on site in case of signal failure. If the site length is 20 metres or less, then a single board positioned at one end or in the middle may be used, provided that it can be clearly seen from both directions; and
- the highway or road authority has given written permission for their use.
- For emergency works, permission can be sought retrospectively but as soon as possible for the use of portable traffic signals

The use of two-way signals should be avoided when the shuttle section includes a road junction. If it is necessary to include a side road junction in the shuttle section, the highway or road authority's approval must be given.

The joining street must have appropriate signing, including a 'Traffic under signal control' sign, and 'Joining traffic not signal controlled' on approaches to the junction.

Those waiting at the road junction should be able to see the front vehicle in both queues of traffic for the shuttle lane.

6.9.2 Three-way and four-way traffic control (multi-phase)

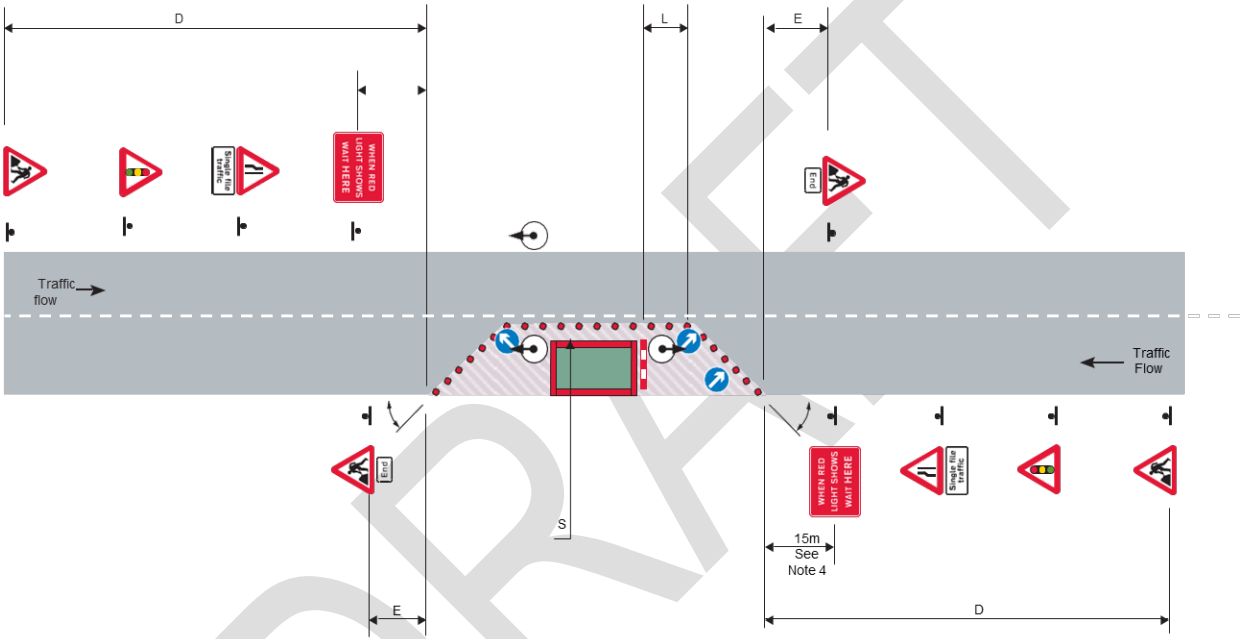
Three-way or four-way control may be appropriate where a side road junction is within the shuttle length, depending on the level of traffic flow. All multi-phase signal systems must have the written permission of the highway or road authority, including express approval for placing the signals at a particular site. The site approval must be retained for the whole time the system is in operation, and the approved plan must be followed.

Three and four-way portable traffic signals may only be used under the following circumstances:

- the distance between the 'WAIT HERE' signs does not exceed 300 metres;
- they are vehicle-actuated, unless otherwise instructed by the highway or road authority. Requests for manual control should be site specific, in exceptional circumstances and for short periods only; and
- It is recommended that the equipment is registered with Traffic Open Products and Specifications (TOPAS), demonstrating compliance with relevant technical standards.

Stop/Go boards must not be used for three-way and four-way traffic (multi-phase).

Figure 20 Traffic control by portable traffic signals



Notes

1 For numbers and minimum size of cones, and dimensions D and E see Table 1, for dimension L see Table 3 and for dimension S see Table 4.

2 An information sign (omitted here for clarity) must be displayed.

3 A supplementary distance plate is required for roads with a speed limit of 50 mph or more.

6.9.3 Installation and commissioning

Further advice on setting up and adjusting the timings of portable traffic lights can be found in other documents such as 'Guidance on the use of portable signals' published by the Association for Road Traffic Safety and Management (ARTSM).

To ensure traffic disruption is kept to a minimum, advance warning signs and equipment should be placed ready for use, and portable traffic signals tested in accordance with the manufacturer's instructions.

Most portable signals are radio-controlled, but some are connected by cable. Where power cables cross the carriageway, a cable crossing protector must be used where vehicles have to pass over the cable. 'Ramp' and 'Ramp ahead' signs must be used where the cable protector exceeds 15 mm in height, and the 'Ramp' signs should be placed adjacent to the cable crossing.

Warning: Multi-phase traffic signals should only be installed and adjusted by suitably competent operatives.

An emergency contact telephone number for the traffic signal provider should be displayed on site.

The signing you will need is shown on Figure 20.

6.10 Traffic control by speed reduction

Speed reduction can form part of a traffic management option and should be considered at the works planning stage, especially in circumstances where the 1.2 metres sideways clearance required for speed limits of 50 mph or more cannot be maintained. Where this is the case, implementing speed control measures that reduce speeds to 40 mph or less can enable a smaller sideways clearance of 0.5 metres to be used.

Signing and illumination requirements must be in accordance with TSRGD.

6.10.1 Reduction of speed limit

Any reduction in speed limit must be supported by a Temporary Traffic Regulation Order or Notice and in accordance with the TSRGD.

Caution: To proceed with this option, your supervisor or other competent person must consult the highway or road authority at the earliest opportunity. Temporary Traffic Notices may be issued for emergency works and should be requested as soon as their need is recognised.

The use of a temporary speed restriction must be indicated by the display of the appropriate speed limit as part of the normal signing of the works.

Where a temporary speed limit is applied on a standard two-way road with shuttle working, the length of road covered by the temporary speed limit should include at least one chicane, and only positive types of traffic control should be used, e.g. Stop/Go boards or portable traffic signals.

Note that the advance signing layout must be appropriate for the permanent speed limit.

6.10.2 Use of chicanes

For short lengths of shuttle working, i.e. 50 metres or less, chicanes can be used to reduce traffic speeds to less than 10 mph, guidance can be found in Chapter 8 of the Traffic Signs Manual.

6.11 Use of convoy working

Where normal traffic management arrangements are not feasible because of restricted highway width, and diversion is impracticable, convoy working may be used. In this method, traffic is brought to a halt in advance of the works and is then led slowly in single file past the works by an appropriately signed works vehicle. If convoy working is to be used, the highway or road authority will need to be consulted well in advance of the works being undertaken.

Where there is little or no safety zone clearance, traffic speeds past the working space should be reliably reduced to 10 mph or less, and an agreed safe method of working imposed on the site. A risk assessment of the actual work activity and the effects of convoy working on the workforce and road users must be conducted in order to determine whether this system is appropriate for the particular task and location. In the risk assessment the relevant hazards should be considered resulting from the work activity and consider the points set out in Section 7.11.1.

Convoy working may be used during the hours of daylight or darkness and can be used on:

- single carriageway roads where traffic travels either in a single direction or in alternating directions;
- individual carriageways of two-lane all-purpose dual carriageway roads where traffic travels in one direction only and works have reduced the traffic to single file; and
- carriageways during surface dressing operations when it may be necessary to ensure traffic speeds are low.

6.11.1 Planning for convoy working

The planning should include:

- early liaison with the highway or road authority. A Temporary Traffic Regulation Order or Notice will be required to reduce the speed limit;
- reference to Chapter 8 of the Traffic Signs Manual;
- consideration of how to keep disruption to a minimum;
- consideration for pedestrians, cyclists and other vulnerable road users;
- arranging the works to avoid junctions within the convoy section;
- a queue management strategy, including levels of congestion that trigger special action, and safe methods for the withdrawal of convoy working;
- determining the method to be adopted for the management of any side road traffic;
- establishing suitable locations for the convoy vehicle to pull out of the running lane at the end of the works;
- termination or suspension of any bus stops within the convoy section; and
- provision for access and services to premises within the convoy site.

Warning: The planning, installation and operation of a convoy working system must be undertaken by appropriately competent personnel. Convoy working can only be used with the approval of the highway or road authority.

6.12 Traffic control by road closure

In certain cases, the location or nature of the works being undertaken will make it impossible to achieve a safe working area and maintain traffic or pedestrian flows around the works. In these cases, a carriageway, footway or footpath closure will be required. This option should be the last resort where all other potential traffic management systems have been examined and deemed unsuitable and can only be used if there is a suitable diversion route for the affected traffic or pedestrians, and under no circumstances should pedestrian access be denied to any property or premises.

Phasing of the works will be required to reduce the duration of any closure to an absolute minimum with shuttle working or other traffic management systems used for those parts of the work where they are feasible.

A suitable diversion route should be identified.

6.12.1 Temporary closure of a carriageway to traffic

If it is necessary to close a road to vehicular traffic, the approval of the highway or road authority must be obtained. A Temporary Traffic Regulation Order or Notice will be required, and sufficient notice must be given to the highway or road authority to enable them to comply with statutory obligations. For emergency works, Temporary Traffic Regulation Orders or Notices should be requested as soon as their need is recognised.

Pedestrian access past the works and vehicular access to all properties and premises should be maintained. Under no circumstances may pedestrian access be completely denied to any property or premises.

If a safe route past the works for motor vehicles cannot be provided, consider whether there is sufficient room to maintain access for pedal cycles. To accommodate two-way cycle traffic past a temporary works site, the desirable minimum available road width is 2 metres but 3 metres is preferable.

Where cycle flow is light, and/or give-and-take working operates, it may be acceptable to reduce the width to 1.5 metres. A 0.5 metre safety zone will be required between the works and the cycle track. Where a road is closed to all but pedal cycles, the 'Road closed except cycles' sign should be used.

In order to close the road except for cycles, you will need a Temporary Traffic Regulation Order or Notice, so you will need to discuss this in advance with the highway or road authority.

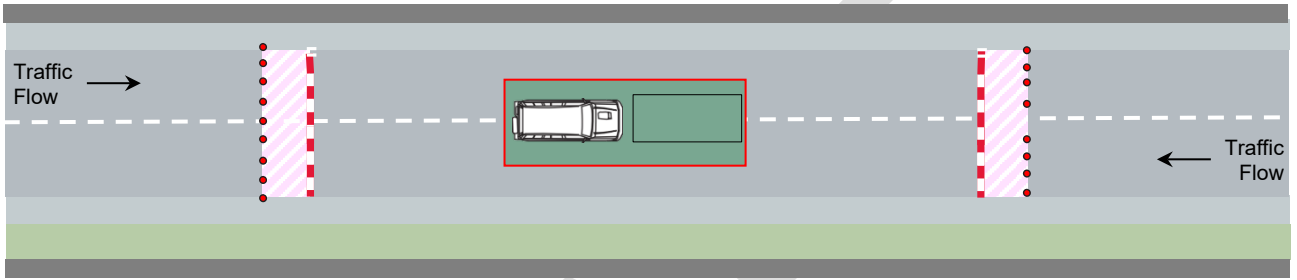
Road closed (hard closure)

When installing a road closure, it is recommended that a 'hard' closure point is constructed to prevent un-authorised access by vehicular traffic (see Figure 21). The hard closure point is constructed to prevent easy tampering as a single row of cones/pedestrian barriers is unlikely to be sufficient.

The guarding may need to be extended beyond the carriageway extents to prevent vehicles attempting to breach the closure. In this instance, a walkway of 1.5 metres should be maintained for pedestrians that must include access to adjacent buildings, properties and public areas where necessary. This can be reduced to an absolute minimum 1 metre over a maximum length of 6 m past any obstructions.

Warning: If vehicular traffic is passing through the road (hard) closure point all incidents need to be reported and additional measures may need to be considered, please consult with your supervisor or other competent person.

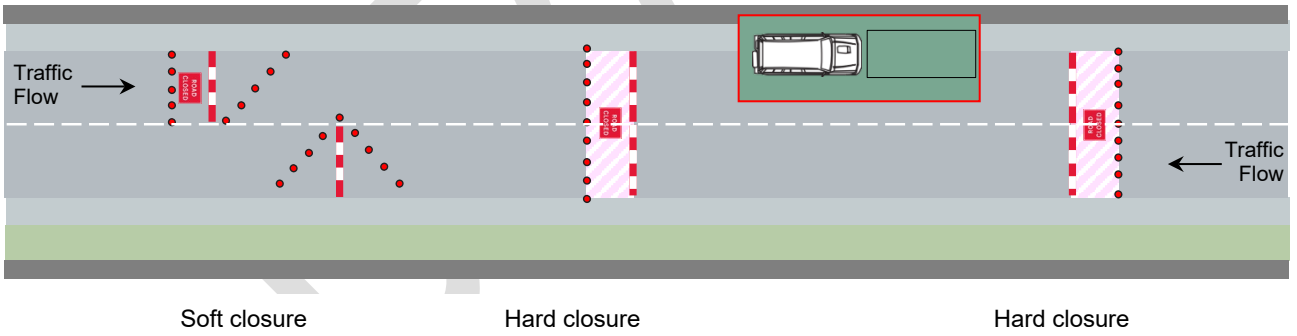
Figure 21 Hard closure



Advanced Closure point (soft closure)

In some instances, where access is required prior to the point of closure (hard closure) a soft closure may be needed (see Figure 22).

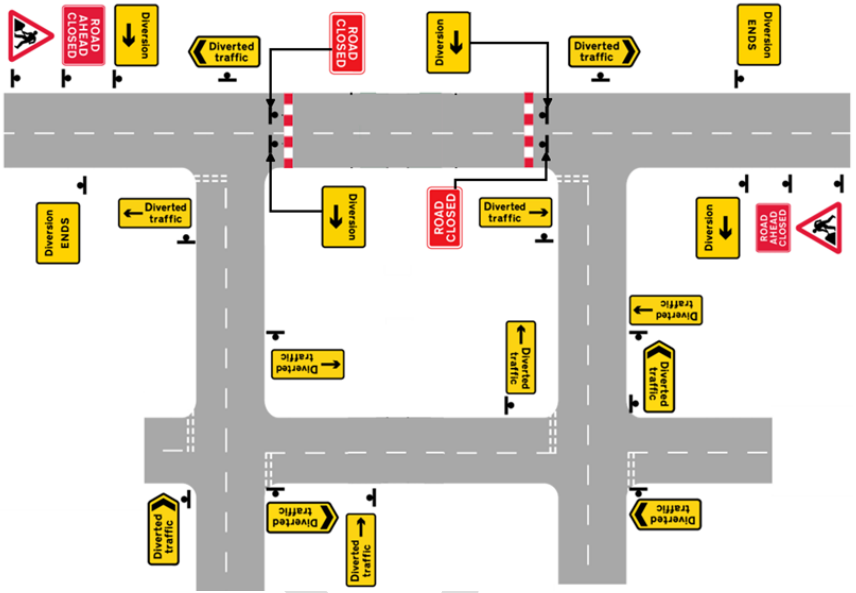
Figure 22 Soft and hard closure



Basic diversion layout and signs

Figure 23 shows the basic layout and sequence of signs required when installing a diversion route. All ‘Diversion’, ‘Diverted traffic’ and ‘Diversion ENDS’ signs must be in place prior to physical closure of the road.

Figure 23 Diversion layout



Notes

1 Refer to soft / hard closure diagrams for actual worksite signs.

2 Operatives will need to refer to the Traffic Management plans for more complex diversions.

3 Diagram would be reflective of a 40mph or less, please refer to risk assessment if speed of road is different.

4 For emergency closures, please refer to Traffic control by road closure.

6.12.2 Traffic control by one-way traffic flow

In some circumstances a full road closure may be avoided by the introduction of one-way traffic to reduce disruption and enable traffic flows to be maintained. This option can only be used if there is a suitable diversion route for the affected traffic. A Temporary Traffic Regulation Order or Notice will be required. Sufficient notice must be given to the highway or road authority to enable them to comply with statutory obligations. For emergency works, Temporary Traffic Regulation Orders or Notices should be requested as soon as their need is recognised.

Warning: An assessment must be carried out on the diversion route to ensure it is suitable for the diverted traffic.

6.12.3 Planning for a road closure

The planning should include:

- co-ordination with highway or road authority;
- providing information to affected residents/businesses;
- reference to Chapter 8 of the Traffic Signs Manual;
- consideration of how to keep disruption to a minimum;
- provision for pedestrians and other vulnerable road users; and
- termination, suspension or creation of bus stops within site or diversion route.

Caution: To proceed with this full road closure or reduction to one way flow, your supervisor or other competent person should consult the highway or road authority at the earliest opportunity.

6.13 Traffic control for temporary obstruction of the carriageway

On occasions, activities are required in the carriageway or footway that temporarily restrict or prevent the free passage of road users past the works, or reduce the width of carriageway to less than 2.5 metres.

Such activities include the collection and delivery of materials. In some circumstances it is not possible or practical to provide an alternative route because of widths or other factors, or to apply a full road closure. A 'Stop – works' sign or 'Temporary obstruction 15 minutes delay' sign may be appropriate in these situations.

6.13.1 Traffic control by 'Stop – works' sign

The 'Stop – works' sign can only be used to stop vehicular traffic for short periods during works on or near a road.

Each period of use can last no more than 2 minutes in any 15 minutes.

This sign must not be used as a substitute for other forms of traffic control and should only be used at sites where the risk is assessed as being low.

'Stop – works' signs are needed for traffic marshals to stop traffic on roads.

The sign must be double-sided, mounted on a black/yellow banded pole and held by the operator, who must be wearing high visibility clothing (see Section 11.1). This sign should not be used at night unless directly illuminated. Illumination must be uniform across the sign face. Partial illumination is not permitted, nor is intermittent illumination. Two 'Stop – works' signs may be required in circumstances such as manoeuvring plant or works vehicles.

You can only use the 'Stop – works' sign when the road is single carriageway and the minimum clear visibility for drivers to the sign is:

- 60 metres for speed limits of 40 mph or less;
- 75 metres for speed limits of 50 mph or more.

'Traffic control ahead' signs should be positioned on both approaches when **any** of the following conditions apply:

- the two-way traffic is greater than 20 vehicles counted over 3 minutes (400 veh/h); or
- bends in the road or other obstructions affect visibility; or
- the speed limit is 50 mph or more.

See Table 1 for the siting distances for these signs.

6.13.2 Traffic control by 'Temporary obstruction' sign

This sign may be placed in advance of the works if **all** the following apply:

- no alternative method of operation is practicable;
- other forms of temporary traffic management are not practicable;
- works are not on a dual carriageway or A or B classified roads;
- works are not close to a level crossing;
- there is good visibility (i.e., not poor weather, not at night);
- the highway or road authority is notified in advance and agrees to the expected use of this measure;
- traffic is delayed for no more than 15 minutes at any one time. It cannot be used again until all backlogs have cleared and traffic flow has returned to normal;
- the 'Temporary obstruction' sign is placed within sight of the obstruction; and
- activities and the method of operation are such that operatives can reopen the road immediately for emergency purposes or on request from an appropriate authority.

Warning: This measure should only be used after consultation with your supervisor or other competent person. It is an offence under section 137 Highways Act 1980, under the Road (Scotland) Act 1984 and under the Roads (Northern Ireland) Order 1993 to obstruct the highway or road without lawful excuse.

7. Mobile works and short duration works

Warning: If the requirements for mobile or short-duration works are not met, you must use full standard signing, lighting and guarding appropriate for the site conditions. The footway width should not be reduced below 1.0 metres. Where a minimum footway width of 1.0 metre cannot be maintained, you must consult your supervisor or other competent person.

7.1 Mobile works

Mobile works are carried out by operatives on foot or from a vehicle moving significantly more slowly than the prevailing traffic speed and involve continuous mobile operations. They will include activities such as grass cutting, hedge cutting and weed spraying.

7.1.1 Signing requirements for mobile works

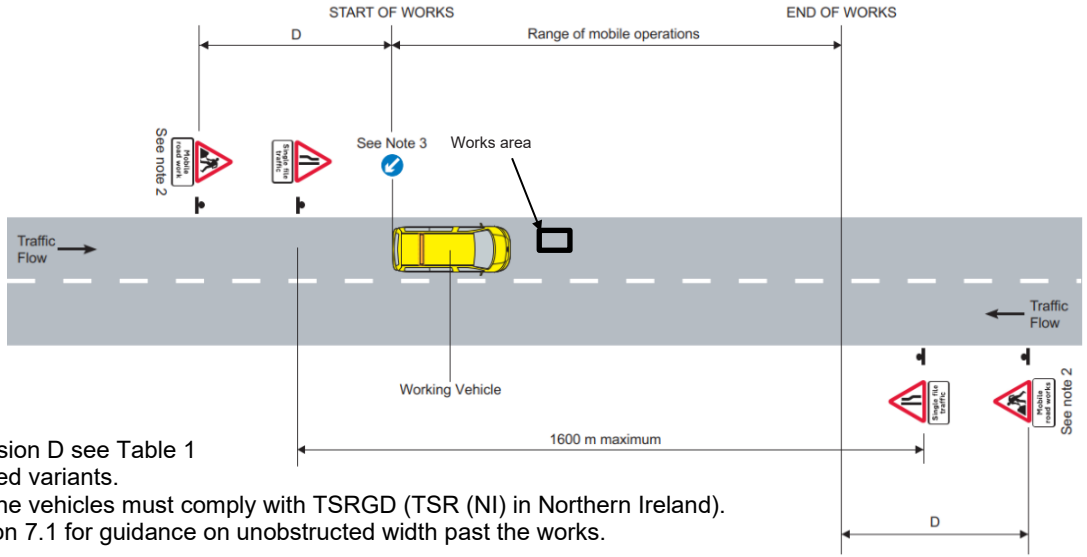
For mobile works signing must be as per Figure 24 and Figure 25. A 'Keep right/left' sign must be displayed for drivers approaching the works on the same side of the carriageway, showing which side to pass. In addition:

- display 'Road works ahead' signs to drivers approaching on all side roads;
- supplementary plates with the 'Road works ahead' signs can be varied e.g. the length of the works could be shown as well as the nature of the works (where appropriate); and,
- supplementary plates with the 'Road narrows' signs can be varied e.g. the distance to the works could be shown.

Erect additional ‘Road works ahead’ signs as appropriate where any of the following occur nearby:

- severe bend (often identified by a chevron sign);
- double, or series of bends;
- brow of a hill.

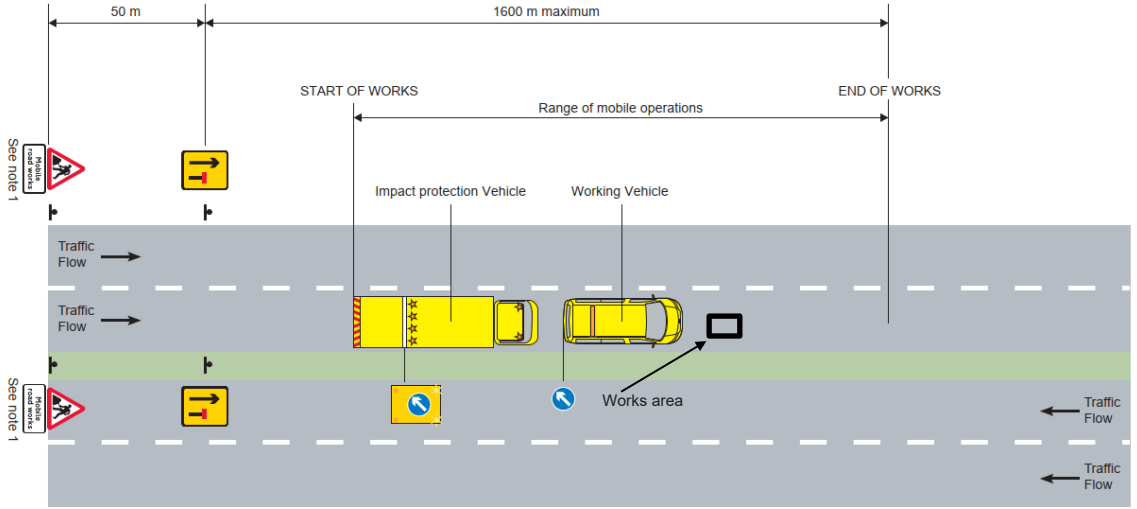
Figure 24 Mobile works on a single carriageway road



Notes

1 For dimension D see Table 1
2 Or permitted variants.
3 Signs on the vehicles must comply with TSRGD (TSR (NI) in Northern Ireland).
4 See Section 7.1 for guidance on unobstructed width past the works.

Figure 25 Mobile works on a dual carriageway with a speed limit of 40 mph or less



Notes

1 Or permitted variants.

2 The need to place signs in the central reservation should be assessed before you proceed and you should consult your supervisor or other competent person.

3 It is recommended that, on dual carriageways, works are carried out with an impact protection vehicle to safeguard operatives.

4 Signs on the vehicles must comply with TSRGD (TSR (NI) in Northern Ireland).

7.2 Short duration works

Short duration works involve operatives, a single vehicle or a small number of vehicles undertaking one or more intermittent stops that could be static for a maximum period of 60 minutes. They include activities such as street light maintenance, pole testing, road markings, compliance testing, jetting of sewers, jet or velocity patching, pothole repairs, leak detection, fault finding, tree cutting or felling, installation of traffic loops, coring and grab lorry activities. Short-duration works can include working from mobile elevating work platforms.

The time period must include all time needed to set up and dismantle signing, lighting and guarding.

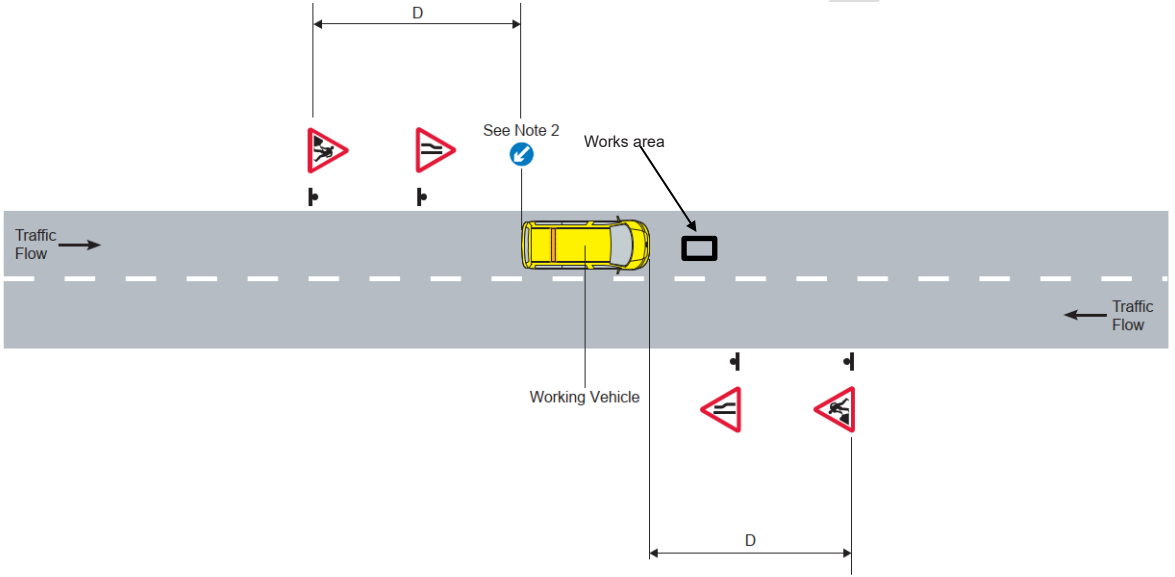
Works involving stops that are expected to be more than strictly temporary should have the signing and guarding as for a fixed site. The estimate of the time taken to complete a specific task should include an allowance for work not going smoothly. If works overrun significantly, you must review your risk assessment and consider whether to revert to the requirements for a fixed site or to proceed as quickly as possible to clear the road.

Caution: Mobile and short-duration static works should only be carried out when there is good visibility and outside of peak hours. Consult your supervisor or other competent person if work is to take place in the centre of the carriageway with traffic passing on both sides.

7.2.1 Signing requirements for short duration works less than 15 minutes

As shown on Figure 26, Figure 27 and Figure 28 Advance warning signs must be displayed for drivers approaching the works on each side of the carriageway and a ‘Keep right/left’ sign must be displayed on the back of the vehicle. For a temporary carriageway closure, a Temporary obstruction (TO15) may be used, see Section 7.13.2.

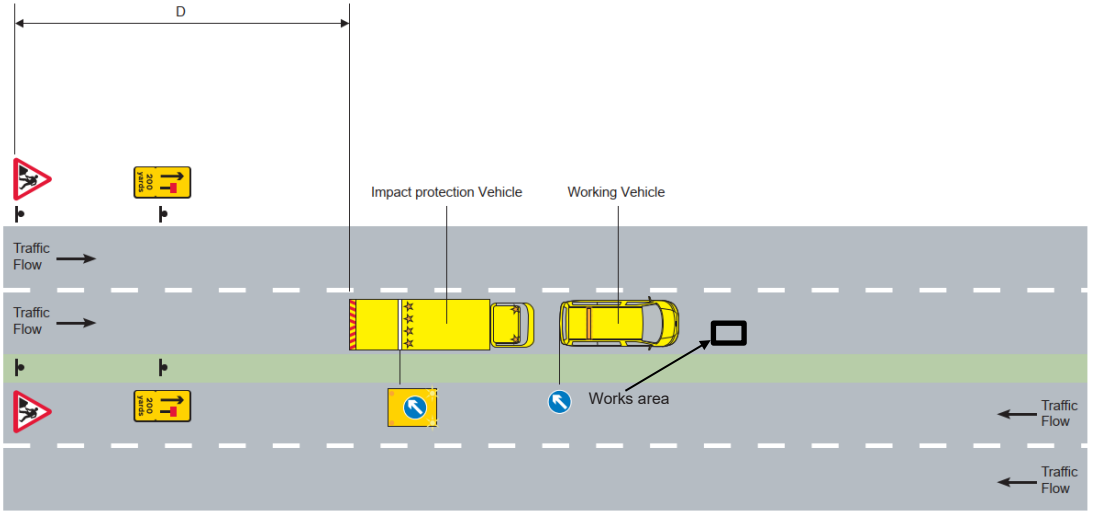
Figure 26 Short duration works less than 15 minutes on a single carriageway road



Notes

1 For dimension D see Table 1.
2 Signs on the vehicles must comply with TSRGD (TSR (NI) in Northern Ireland).
3 See Section 7.1 for guidance on unobstructed width past the works.

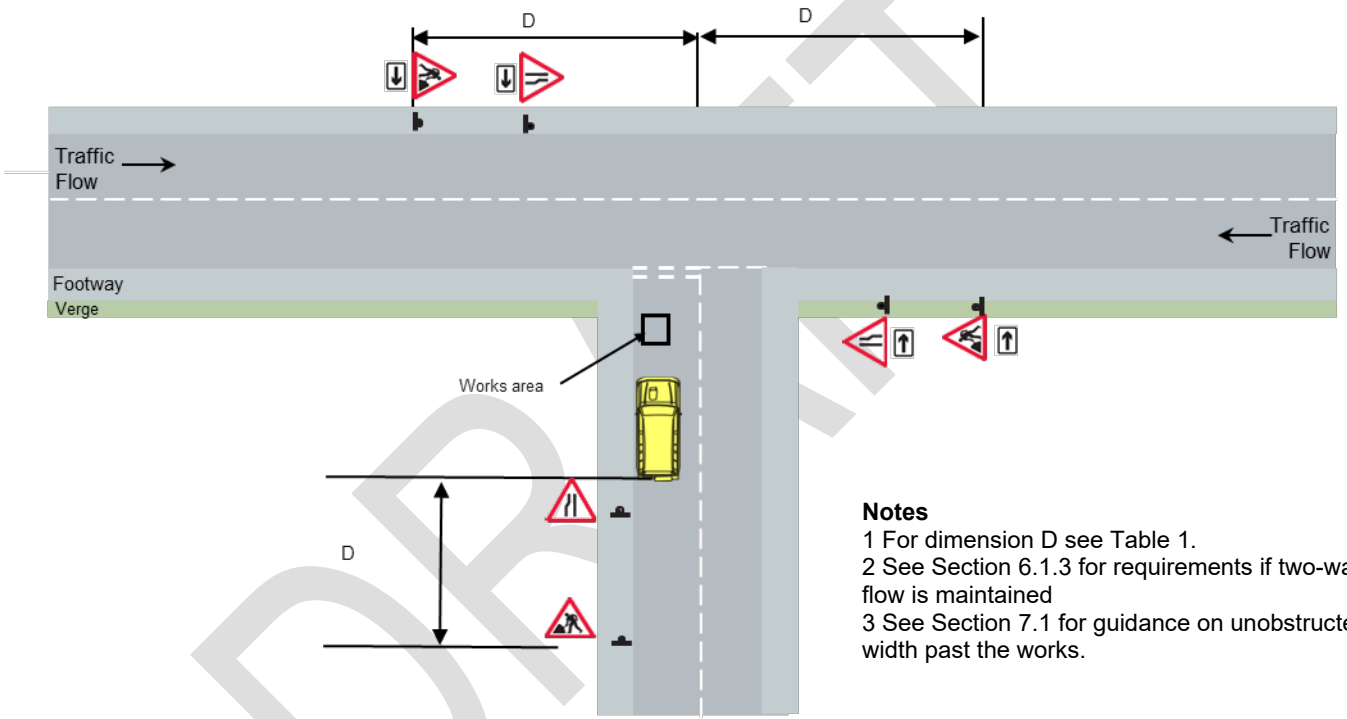
Figure 27 Short duration works less than 15 minutes on a dual carriageway with a speed limit of 40 mph or less



Notes

1 For dimension D see Table 1 – dimension D = 275 metres (300 yds) in this example.
2 The need to place signs in the central reservation should be assessed before you proceed and you should consult your supervisor or other competent person.
3 It is recommended that, on dual carriageways, works are carried out with an impact protection vehicle to safeguard operatives.
4 Signs on the vehicles must comply with TSRGD (TSR (NI) in Northern Ireland).

Figure 28 Short duration works less than 15 minutes near a junction



Notes

1 For dimension D see Table 1.

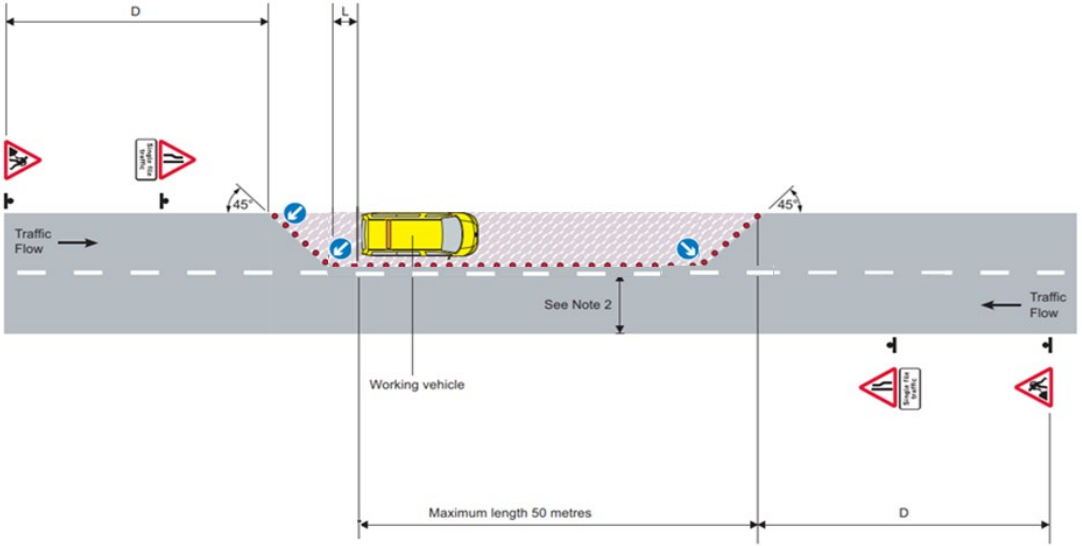
2 See Section 6.1.3 for requirements if two-way flow is maintained

3 See Section 7.1 for guidance on unobstructed width past the works.

7.2.2 Signing requirements for short duration works between 15 and 60 minutes

Advance warning signs must be displayed for drivers approaching the works on each side of the carriageway and a ‘Keep right/left’ sign must be displayed as shown on Figure 29, Figure 30, Figure 31 and Figure 32.

Figure 29 Short duration works more than 15 minutes on a single carriageway road

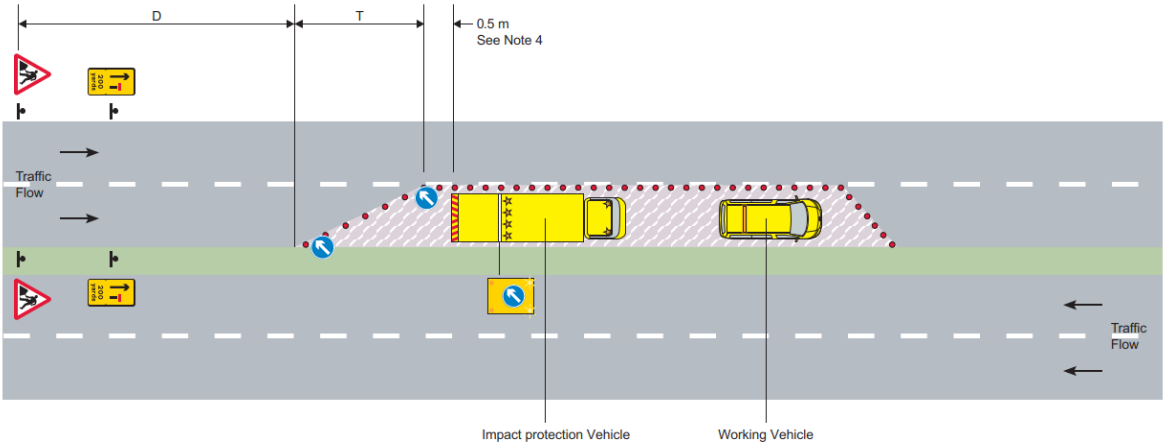


Notes

1 For dimension D see Table 1 and for dimension L see Table 3.

2 See Section 7.1 for guidance on unobstructed width past the works.

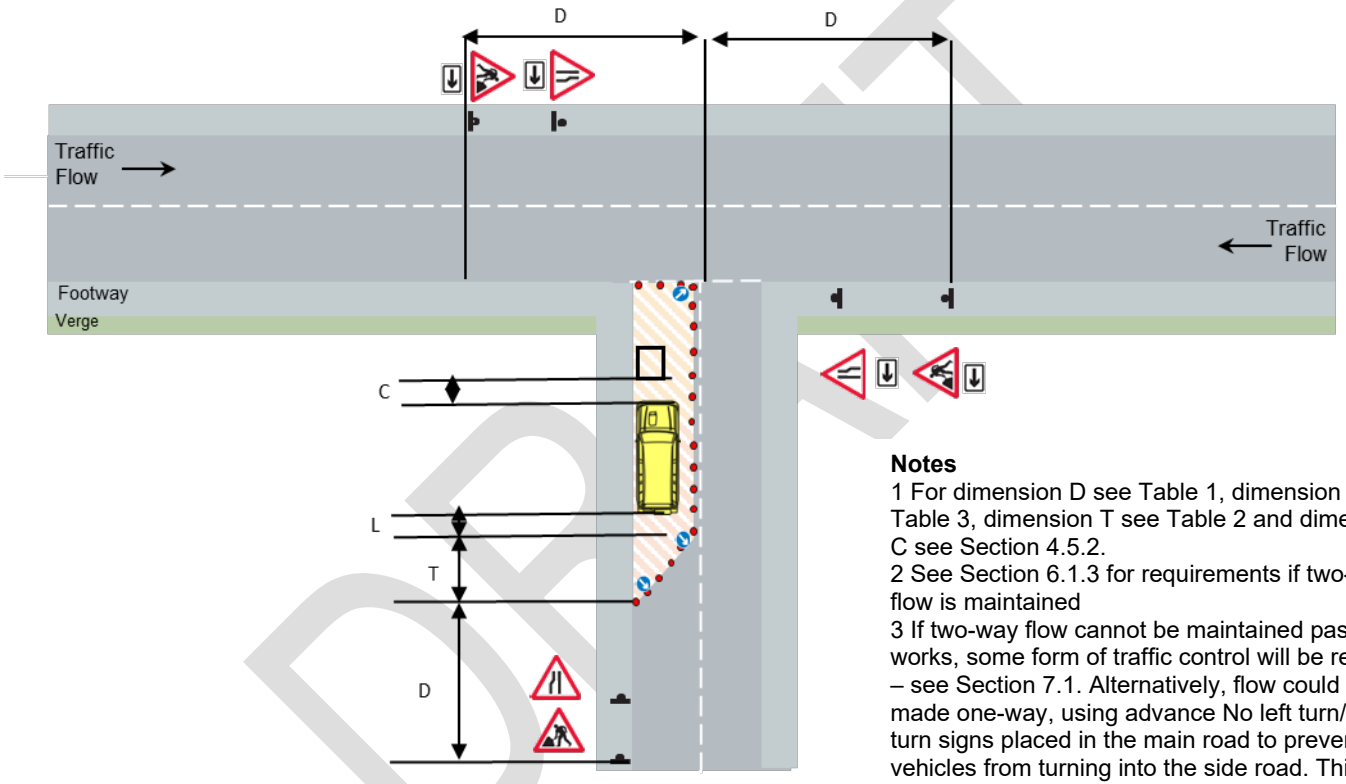
Figure 30 Short duration works more than 15 minutes on a dual carriageway with a speed limit of 40 mph or less



Notes

1 For dimension D see Table 1 and for dimension T see Table 2 – dimension D = 275 metres (300 yds) in this example.
2 The need to place signs in the central reservation should be assessed before you proceed and you should consult your supervisor or other competent person.
3 It is recommended that, on dual carriageways, works are carried out with an impact protection vehicle to safeguard operatives.
4 This dimension only applies where an impact protection vehicle is present and there is a 5 metres gap between the front of this vehicle and the rear of the working vehicle. Where no impact protection vehicle is present, use dimension L instead (see Table 3).
5 Signs on the vehicles must comply with TSRGD (TSR (NI) in Northern Ireland).

Figure 31 Short duration works for more than 15 minutes near a junction



Notes

1 For dimension D see Table 1, dimension L see Table 3, dimension T see Table 2 and dimension C see Section 4.5.2.

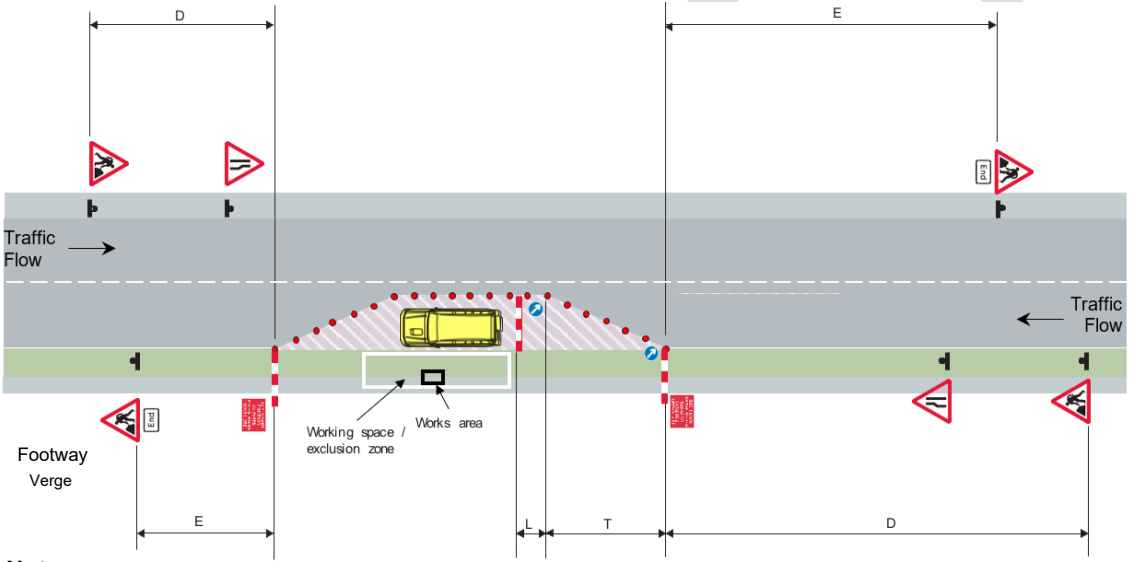
2 See Section 6.1.3 for requirements if two-way flow is maintained

3 If two-way flow cannot be maintained past the works, some form of traffic control will be required – see Section 7.1. Alternatively, flow could be made one-way, using advance No left turn/right turn signs placed in the main road to prevent vehicles from turning into the side road. This will require a TTRO / TTRN

Signing requirements for short duration works at height

Advance warning signs must be displayed for drivers approaching the works on each side of the carriageway and a ‘Keep right/left’ sign must be displayed as shown on Figure 32. In this scenario the footway may be closed to protect pedestrians from falling objects, see Section 5.2.5.

Figure 32 Short duration works at height



Notes

1 For dimension D and E see Table 1, for dimension L see Table 3 and for dimension T see Table 2
2 See Section 7.1 for guidance on unobstructed width past the works.
3 The exclusion zone to be determined by the risk assessment.

7.3 Risk assessment

A risk assessment must be carried out for all works before work begins. Road layout and speed of traffic, the works to be undertaken, location, duration and restoration of work site to original state must be taken into account. Additional signing, lighting and guarding that is needed to ensure the safety of all road users and operatives may be identified in the risk assessment or method statement.

Operatives carrying out the works must understand the requirements and be clear how they are going to sign, light and guard the site before work begins. The following requirements are the minimum standards for mobile works or sites of short duration activities.

When undertaking work on foot the vehicle may be used as a means of protection, subject to it meeting the vehicle requirements below. This additional method of protection can be used even if an individual is working off carriageway on the footway or verge.

Some short duration works may be undertaken without the use of static signs or cones provided that a site specific risk assessment states that it is unnecessary, and it has been demonstrated that traffic can pass the works vehicle safely and without difficulty, and there is low risk to operatives and road users. Examples may include meter reading, leak detection or gully emptying alongside a single carriageway road where operatives are working wholly on the footway or verge.

It is recommended that on single carriageway roads with more than two lanes and on dual carriageways, the works are carried out with an impact protection vehicle to safeguard operatives (see Figure 25, Figure 27 and Figure 30). You should decide, through risk assessment, whether impact protection vehicles are needed in other situations.

Full traffic management and a Temporary Traffic Regulation Order or Notice reducing the speed limit may be required for safe working, which will require advance planning.

A static lane closure may be appropriate where work is being carried out on a central reservation.

If mobile works or short-duration works will affect footways or pedestrian areas, the priority should be to keep pedestrians in the existing footway, narrowing it (see section 5.2.2). If the minimum unobstructed widths for footways cannot be maintained for mobile or short duration works, then full static traffic management is needed. The same applies for cycle routes unless cyclists can be accommodated on the carriageway (see section 5.3.2).

If mobile works or short-duration works will affect cycle routes, the priority should be to keep cyclists in the existing cycle route, narrowing it (see section 5.3).

If there is a risk that the activity will exceed 60 minutes then the activity should be cleared before the 60 minutes or the site reverted to a permanent setup with all the associated signing, lighting and guarding.

7.4 Vehicle requirements

When you are carrying out mobile or short duration works, the vehicle must be conspicuous: high visibility rear chevron markings should be used (see Section 11.11).

The vehicle must have one or more amber warning beacons such that at least one beacon can be seen from any direction. The beacon/s must be used for mobile works when the vehicle is travelling at less than the general speed of traffic. An Impact Protection Vehicle may be utilised to protect the workforce.

For short-duration static works, amber warning beacons should remain on at all times.

Warning: Vehicle mounted 'Keep right/left' signs must be covered when the vehicle is travelling to and from the site. Do not simply turn the sign to point up or down.

8. Railways and tramways

8.1 Works adjacent to railways

Warning: Working at or near railways presents an increased safety risk – communication should be made with the relevant Rail Operator in advance of works taking place, and caution should be taken while on site.

Network Rail (England, Scotland and Wales) and Translink (Northern Ireland) are transport and rail authorities, but they are also street managers for the portion of street or road within the stop lines at their railway level crossings. In addition, there are some heritage railways that may have level crossings for which they are responsible. This Code is equally applicable to other railway authorities.

Care must be taken when positioning portable traffic signals near railways because they could be mistaken for railway signals. Where works require portable signals adjacent to a railway, in addition to obtaining highway or road authority approval, the railway authority should be consulted.

Warning: At all times plant or machinery should be positioned so that no part of it or its load overhangs the railway outer boundary.

Electronic asset and cable location equipment (e.g. Cat & Genny) can potentially interfere with railway signalling apparatus and should not be used on railway land without the express permission of the rail authority. There is no specific safe distance from the railway to avoid this interference, as equipment

varies.

8.2 Works at or near railway level crossings

Level crossings are points where railway lines meet roads or footpaths at the same level. Street or road works at or near level crossings may impact one or more of the following:

- Safety of all road users, railway passengers and operatives.
- Train operation.
- Structural integrity of railway track infrastructure and associated assets, including overhead traction cables, electrified third rails, feed & continuity cables, and underground railway apparatus.

There are three main types of railway level crossings:

- **Automatic or manually controlled level crossings** with either half-width or full-width barriers and road traffic signals that display a steady amber light for 3 or 5 seconds followed by twin red flashing lights as a train approaches. The barriers either descend automatically (automatic crossings) or are controlled manually by the signaller.
- **User-worked crossings** are usually found on private roads such as through farmland or industrial estates. They have barriers and may have miniature red and green lights, which are activated by approaching trains. Users open the barrier themselves, following instructions on adjacent signs.
- **Open level crossings that have neither gates nor barriers** which rely on traffic signs to warn users of the crossing. Some open level crossings have wig-wag signals, similar to automatic crossings.

8.2.1 Precautionary area

The precautionary area of a level crossing is any part of any road, including side roads, that can be reached by following a route leading away from the centre of the crossing for a distance of 200 metres or less. Any

works planned by any promoter within the precautionary area must be advised to either the Network Rail Regional Asset Protection Team or Northern Ireland Railway Third Party Works Team.

Precautionary area location data is provided by Network Rail to the National Street Gazetteer and the Scottish Road Works register.

8.2.2 Planned works in the vicinity of a level crossing

Anyone working in the vicinity of a level crossing must follow special safety precautions agreed with the relevant rail authority in advance of works:

- Risk assessments and safe systems of work must be agreed with the relevant rail authority prior to street or road works starting. Any changes to the agreed risk assessment must be agreed with the rail authority. Approved safe systems of work, including risk assessments, must be in place and maintained during all works.
- Stationary traffic tailing back across any railway level crossing should be avoided at any time using manually operated Stop / Go boards. Particular attention should be paid to situations where works might cause traffic to tail back over the crossing as a result of long traffic delays, even where works are outside the precautionary area.
- When work is being carried out in the vicinity of overhead traction cables, electrified third rails or feeder / continuity cables, great care must be taken to avoid danger of overhead electrocution.
- Portable traffic signals must not be used to control traffic at a level crossing unless permission has been obtained from the relevant traffic authority.

Warning: Road traffic must never be stopped on a level crossing. Your supervisor or other competent person must contact the railway owner when works are to take place at or near a level crossing, or where traffic queues could affect a level crossing.

An example layout for works is shown on Figure 33.

8.2.3 Urgent or Emergency works in vicinity of a level crossing

Where a need to carry out urgent or emergency works at or near a level crossing is identified, it is vital that the relevant rail authority (as well as highway or road authority) are contacted immediately to inform and discuss. **Work should not begin until the relevant rail authority has confirmed that all necessary safety precautions have been put in place to minimise the risk of serious incident or injury.**

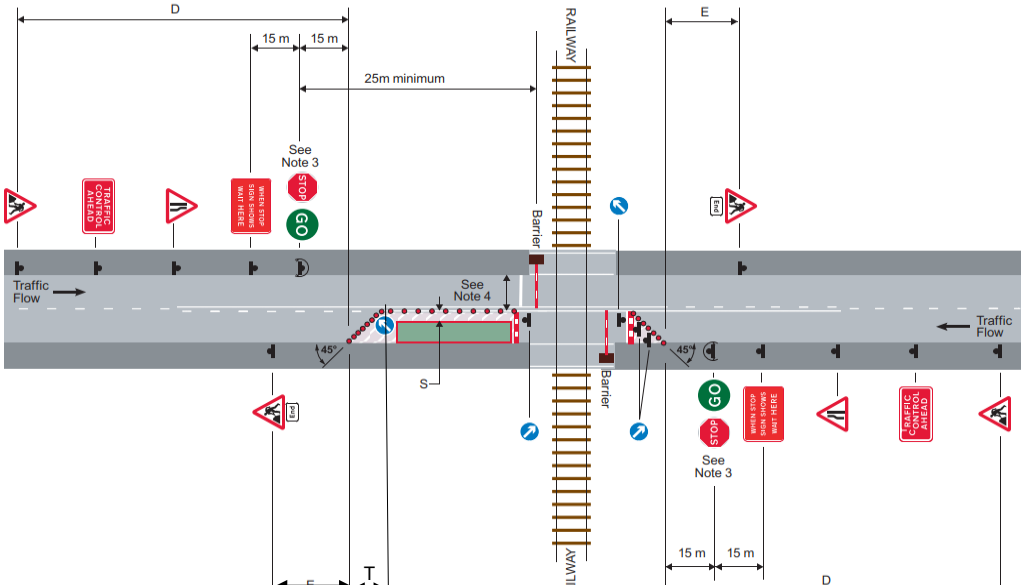
For emergency or urgent works issues, Works Promoters must contact:

England, Wales & Scotland: Network Rail National Helpline **03457 11 41 41**

Northern Ireland: Translink **028 9023 8170**

As soon as possible.

Figure 33 Works at a level crossing using Stop/Go boards



Notes

1 For numbers and minimum size of cones, and dimensions D and E see Table 1, for dimension S see Table 4, for dimension C see Section 4.5.2 and for dimension T see Table 2

2 An information sign (omitted here for clarity) must be displayed.

3 Stop/Go boards should be placed where they will be in full view of approaching drivers. They may be located on either side of the carriageway.

4 See Section 7.1 for guidance on unobstructed width past the works.

8.3 Works over and under railways – bridges and tunnels

Any planned works on a railway structure over or under the track must be advised to the relevant rail authority before serving the initial highway or road authority notice or permit application.

Work above the railway can be hazardous to the safe running of trains. There is the potential to damage rail infrastructure or cause foreign objects to be introduced into the track environment. All works must be assessed by the Network Rail Asset Protection Team or Translink to ensure a safe system of work is in place.

Urgent or Emergency works on or near rail authority structures must be notified to the relevant authority at the earliest possible time. **Work must not begin until the relevant rail authority has confirmed that all necessary safety precautions have been put in place to minimise the risk of serious incident or injury.**

8.4 Working near tramways

Warning: Working at or near tramways presents an increased safety risk – tram operating hours should be avoided wherever possible. Always ensure communication is made with the relevant Tram Network Operator in advance of works taking place.

Tram networks operate in many cities, presenting an increased risk of danger and disruption. Tram Network Operators (TNOs) must be contacted to gain approval for works at the planning stage, in advance of any site setup in proximity to tramways or overhead lines. Activities and diversions affecting the tram hazard zone should be reduced, to minimise risk and avoid disruption.

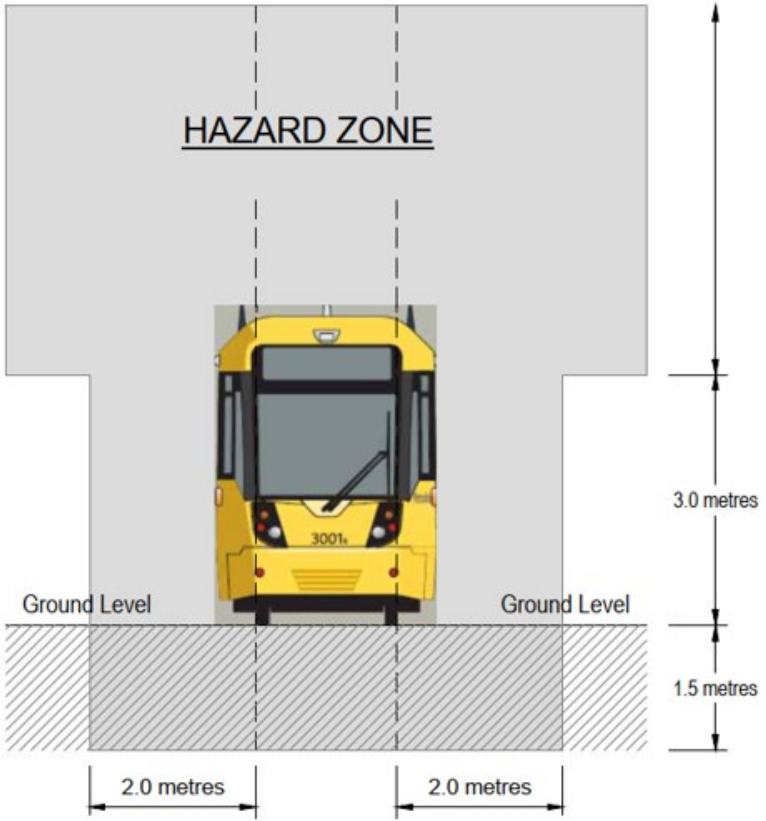
Tram Hazard Zone

The high-risk area in proximity to tramway assets is known as the **Tram Hazard Zone** (see Figure 34):

- **Ground Level and Below Ground Level**: 2 metres out from rail level, including any central areas between rails.
- **Overhead**: 3 metres out from rail level, to avoid electrocution risk of overhead lines.

Activity in the Hazard Zone should be avoided wherever possible. If unavoidable, works should be suitably planned and permissions obtained by the relevant network operator. A risk assessment must be carried out while on site to ensure risks are minimised throughout works activities.

Figure 34 Tram hazard zone



Notes

1 Dimensions for the hazard zones vary between TNOs.

2 Check the dimensions of the hazard zone with the appropriate TNO before starting work.

3 Where there is more than one track, the whole area between the tracks is in the hazard zone

8.4.1 Planned works at or near tramways

Street or road works at or near tramways might impact one or more of the following:

- safety of all road users, tram passengers and operatives;
- tram operations; and/or,
- structural integrity of tramway network infrastructure and associated assets, including tramlines, overhead power cables, feed & continuity cables, and underground apparatus.

All activities in the vicinity of tramlines or associated infrastructure should be thoroughly planned in advance and specific permissions must be obtained from the relevant Tram Network Operator.

Operators can often be contacted via email, telephone or via websites – please ensure you are aware of how best to contact any operators that you need to engage with.

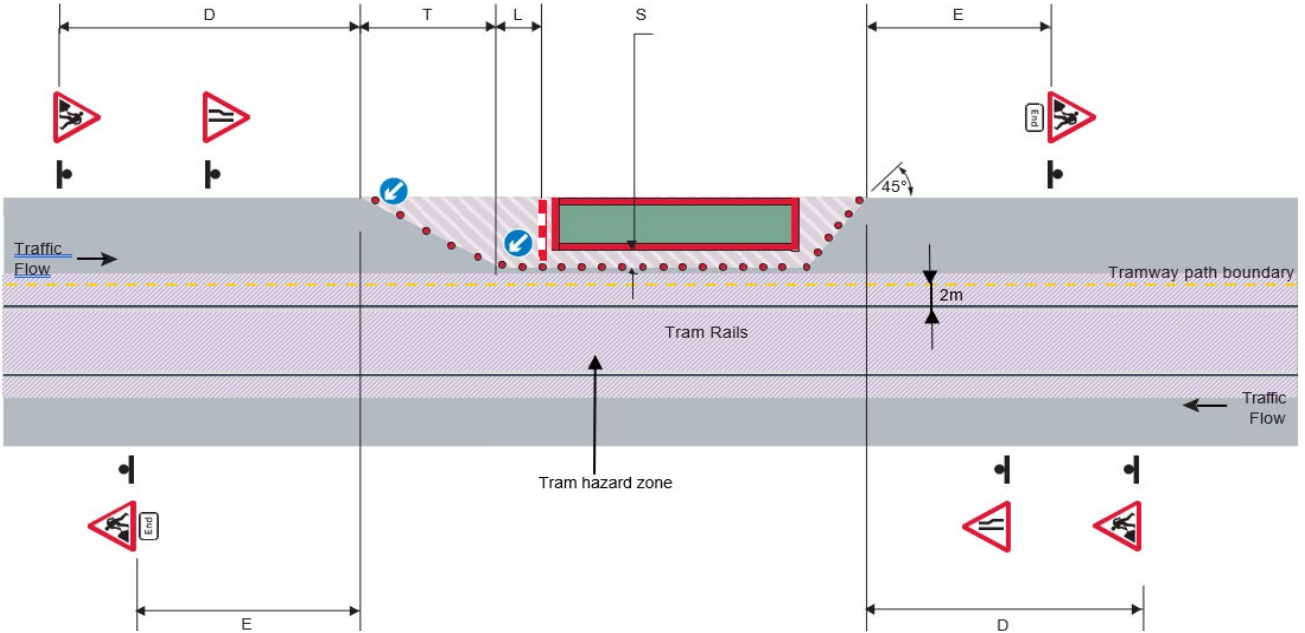
Due to the high risk and potential impact of disruption to travel, all conditions and instructions from the Tram Network Operator must be followed at all times. If the nature or scope of works changes at any point, amendments must be communicated and agreed with the relevant operator before activities commence.

Be aware that operators will typically prefer planned works to take place outside normal network operating hours wherever possible.

Warning: Road traffic should never be stopped on a tram crossing. Your supervisor or other competent person must contact the tramway operator when works are to take place at or near a tram crossing, or where traffic queues could affect a tram crossing.

Traffic and pedestrian management for works at tramways will typically be specific to the works in question. An example typical setup is show in Figure 35.

Figure 35 Works at or near tramways



Notes

1 For numbers and minimum size of cones, and dimensions D and E see Table 1, for dimension L see Table 3, for dimension S see Table 4 and for dimension T see Table 2.

2 An information sign (omitted here for clarity) must be displayed.

3 Overhead electrocution risk must be considered

8.4.2 Urgent or Emergency works in vicinity of a tram network

Where a need to carry out urgent or emergency works at or near tram networks is identified, it is vital that the relevant TNO (in addition to any relevant highway or road authority) are contacted immediately to inform and discuss. Work should not begin until the relevant TNO has confirmed that all necessary safety precautions have been put in place to minimise the risk of serious incident or injury, e.g. trams stopped from running.

8.4.3 Risk of collision with the tramcar

Tramcars operating on networks pose a serious risk of collision injury to operatives and members of the public. Special care should be taken when designing and setting out alternative pedestrian and cycle routes to minimise all contact with the tram hazard zone. In addition to planning risk assessment and permissions obtained from the relevant tram network operator, risk assessments must always be in place during site operations and reviewed whenever the nature of activities changes throughout the course of works.

8.4.4 Risk of electrocution

Due to the overhead power supply to many tram networks, care must be taken at all times to avoid the risk of electrocution. Activities within 3 metres of overhead tramlines and associated infrastructure should be specifically risk assessed and made clear to all operatives before any activities commence.

8.4.5 Pedestrian and cycle provisions

The position of facilities for pedestrians and cyclists is a crucial aspect of site setup and design. As altering running lanes for vehicles can often change the position of facilities required for pedestrians and cyclists, suitable advance warning signs must be maintained at all times. The risk of cyclists getting stuck in the rails should be considered. If the nature of works changes, amendments to signs should be considered, and must be communicated to all relevant TNOs and highway or road authorities.

8.4.6 Diversion routes crossing tramlines

Where pedestrian, cyclist or vehicle provision requires a diversion route that crosses tramlines, permission must be obtained from the relevant TNO and special consideration made to signing and awareness of tram movements. Interaction with the Tram Hazard Zone should be minimised at all times – any alterations to traffic or pedestrian management must be communicated & agreed with the relevant network operator at the earliest possible time.

8.4.7 Other works in proximity of tramways

Many tram networks have special structures that need specific consideration when planning or undertaking works in the vicinity. These include:

- bridges;
- tunnels;
- platforms; and,
- pedestrian facilities.

Similarly, tram networks also have additional infrastructure equipment and assets which often fall outside of the Tram Hazard Zone, which require specific consideration if works are taking place in the vicinity. These include:

- signalling equipment;
- TNO power & electrical assets; and,
- concrete rafts.

Advance contact and discussion with the relevant TNO is required if any works activity is likely to affect any special consideration asset.

9. Checking and maintaining sites

9.1 Attended sites

Sites must be checked to ensure that the site set-up is still appropriate and that signs, lighting and guarding have not moved, become damaged or obscured:

- every time you start work on an existing site;
- regularly during active work; and
- before you leave a site.

9.2 Unattended sites

An information sign must be displayed in accordance with section 3.1.3.

Sites that are unoccupied at any time still require the traffic management to be routinely checked and maintained. The frequency and timing of checks should be determined by the level of risk. The timing of checks might also need to be set to meet local circumstances.

You should carry out a site check every day (including on weekends) unless your risk assessment deems this unnecessary. If the site is not going to be visited the next day, contact your supervisor or other competent person to discuss when the site should next be visited.

The level of risk might be affected by the following:

- how busy the highway is during the hours the site is unattended, e.g. the site is near:
  - high-volume pedestrian areas;
  - pubs and clubs;
  - hospitals;
  - shopping centres;
  - schools and colleges;
  - commuter routes and traffic sensitive areas;
  - sports grounds and concert venues;
- sites where vandalism is found to be a problem;
- weather conditions;
- risks of the works site, e.g.
  - deep excavations;
  - exposed services;
  - trench crossings;
  - plant and machinery;
  - portable traffic signals;
- pedestrian crossing, footway or road closures; and
- results of previous checks.

The above list is not exhaustive. Any problems should be dealt with immediately upon discovery.

9.3 Removing the works

9.3.1 Site clearance

On completion of the works, ensure that all plant, equipment and surplus materials are removed promptly from the site, followed immediately by all signs, lighting and guarding equipment. If signs become unnecessary during works, they should be removed or covered.

If temporary traffic control is removed or altered during the works, ensure that all surplus signs are removed or covered to minimise confusion.

Signs should not be laid flat, as they might form a trip hazard, and members of the public might pick them up again, thinking they have been knocked over.

10. Equipment and vehicles

10.1 High visibility clothing

High visibility clothing must conform to the relevant current British or European standards. The standard of high visibility clothing required should be determined by a risk assessment. High visibility jackets must have full length sleeves. Sleeves may be varied to three quarter length where a risk assessment shows full length sleeves would present increased risk due to the activity being undertaken.

High visibility clothing must be worn when operating outside the working space e.g. when setting out, maintaining or removing signing, lighting, guarding and temporary traffic control, etc. Your employer may also require you to wear high visibility clothing when operating within the working space.

High visibility clothing must be correctly fastened and maintained in a clean and useable condition. You must report any loss, destruction or obvious defect to your supervisor immediately.

10.2 Signs

The size shape and appearance of all signs and any supplementary plates used with them must comply with the TSRGD (TSR (NI) in Northern Ireland), including lighting and reflectorisation. Additional guidance on signs can be found in the “Traffic Signs Manual”. See Figure 36 and Figure 37 for some examples.

Signing and illumination requirements must be in accordance with TSRGD.

The standard of reflectorisation must be in accordance with the relevant current British or European standards. Where a sign is reflectorised, the whole of the sign face must be reflectorised, except for any parts coloured black.

In Wales signs should be bilingual. Reference should be made to The Traffic Signs (Welsh and English Language Provisions) Regulations and General Directions 1985. In exceptional cases, road safety or technical reasons might prevent fully bilingual signing. This might be the case on very narrow single carriageways or where the proximity of hedges or walls results in there being insufficient room for bilingual signs. In such circumstances, it is a reasonable mitigation to provide two separate signs (one English, one Welsh) but you should consult your supervisor or other competent person first.

All signs should be checked regularly to ensure that they are kept clean and are clearly visible. Where site or traffic conditions change, appropriate adjustments should be made to signing, lighting and guarding.

Caution: Consult your supervisor or other competent person at times of poor visibility or bad weather conditions, as you may need to provide additional signs or suspend the work.

10.3 Cones

The size shape and appearance of traffic cones must comply with the TSRGD (TSR (NI) in Northern Ireland.

- The minimum height of cones is 450 mm for a carriageway with a speed limit of 40 mph or less.
- The minimum height of cones is 750 mm for a carriageway with a speed limit of 50 mph or more.

Additional guidance on signs can be found in the Traffic Signs Manual.

The retroreflective sleeves of cones must be kept clean. Damaged sleeves or cones must not be used.

All cones should be checked regularly to ensure that they are kept clean and are clearly visible. Where site or traffic conditions change, appropriate adjustments should be made to signing, lighting and guarding.

10.4 Warning lights

Warning lights must be no more than 1.5 metres above the road for speed limits of 40 mph or less, and no more than 1.2 metres above the road for speed limits of 50 mph or more. Warning lights must conform to the TSRGD (TSR (NI) in Northern Ireland).

Table 10 Warning lights

Warning lights	Lights can be used	Lights must be used		
Speed limit	30 mph or less	40 mph	50 mph	60 mph
Maximum height	1.5 m	1.5 m	1.2 m	1.2 m
Flashing option permitted? (on street lit roads only)	Yes	Yes	No	No

Figure 36 Basic signs and equipment you will need

Road works ahead

Road narrows on left-hand side ahead

Road narrows on right-hand side ahead

Keep right

Keep left

End of road works

Traffic cone

Warning light

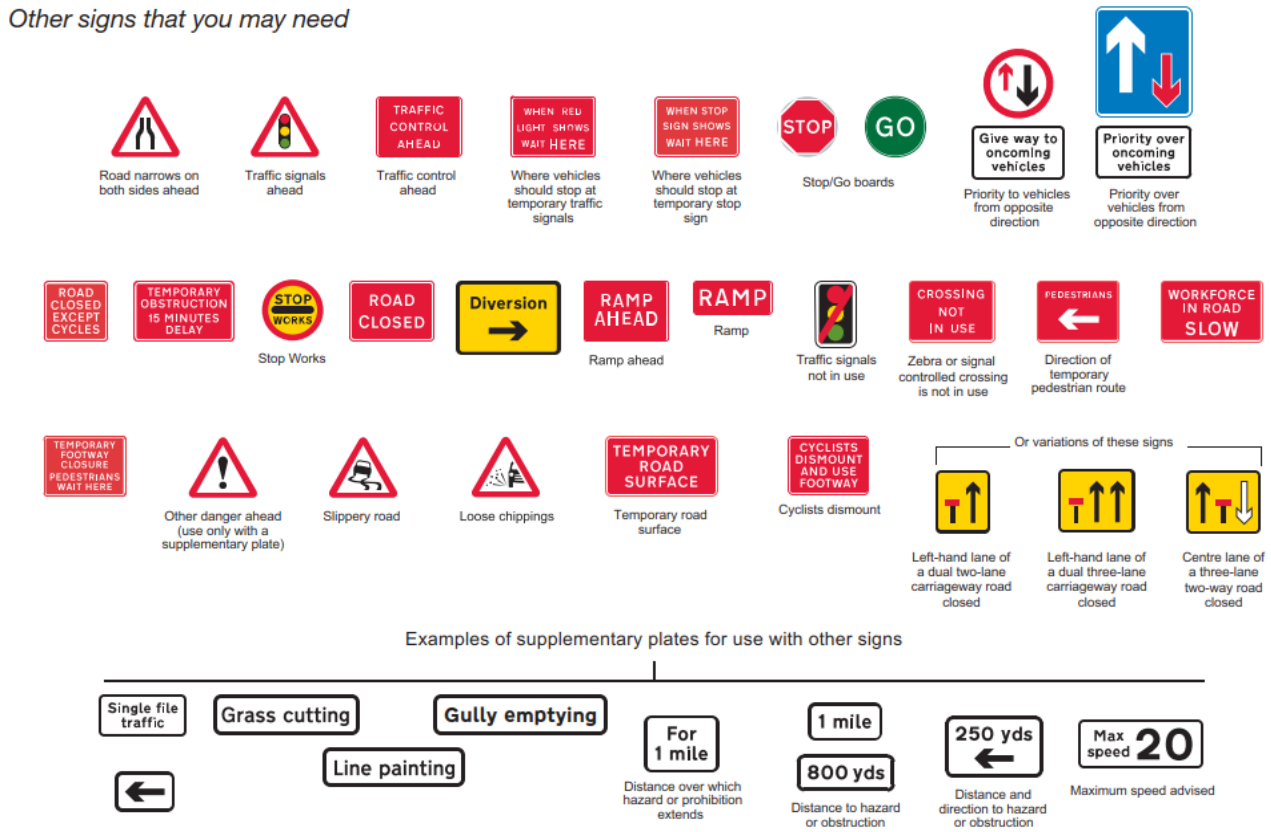
Typical pedestrian barrier with tapping rail

Typical traffic barrier

Information sign

High visibility clothing

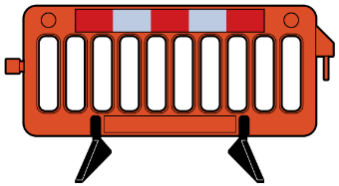
Figure 37 Other signs that you may need



10.5 Pedestrian barriers

Pedestrian barriers should have:

- a handrail fixed at between 1 metre and 1.2 metres above ground level, which should be reasonably smooth and rigid to guide pedestrians and give them some measure of support;
- a visibility panel at least 150 mm deep, which may be integral with the handrail or, if separate, should be fixed so that its upper edge is a minimum of 0.9 metres above ground level and may contain the red and white barrier sign; and
- a tapping rail with a minimum depth of 150 mm and a lower edge at ground level or set at up to 200 mm above ground level.



Individual barriers should be joined together to form a continuous barrier to the working space. Barriers should be joined in a way that resists tampering. If, through monitoring visits or in any other way, you find that barriers are being tampered with and separated, then you should take additional measures to secure the barriers, for example by the use of clamps or ties that require a tool for removal.

Barriers should be placed so they are not a trip hazard for pedestrians.

You must risk assess whether level of guarding required by the Code is sufficient and whether enhanced guarding is needed – for example if the site is:

- to be left unattended;
- next to a busy pedestrian thoroughfare;
- near to pubs, clubs, football grounds or schools; or
- has a deep excavation present.

10.6 Fixing of signing, lighting and guarding

Signing, lighting and guarding equipment should be capable of withstanding winds of Class C (8.7 m/s) blowing from any direction.

Wind classes are given in BS 8442 Miscellaneous Road Traffic Signs and Devices – Requirements and Test Methods. Wind force should be calculated in accordance with Annex B (B.1) of that standard. This can be achieved through the use of equipment with built-in weights, recommended option. Alternatively, it can be achieved by adding appropriate weights e.g. sacks containing suitable granular material or a specifically designed ballast product, placed at low level.

If winds in excess of Class C are forecast, additional ballast and more frequent inspections of the signs may be required.

Warning: Barrels, kerbstones, spoil, road pins or similar objects should not be used for the purpose of weighting or fixing road signs and barriers – they could create a danger for highway users if struck by a vehicle.

10.7 Footway ramps

Where pedestrians are diverted to temporary walkways in the carriageway, suitable ramps must be provided to enable people using wheelchairs or pushchairs to negotiate kerbs safely. The layout should allow wheelchair and mobility scooter users to enter and exit a temporary walkway safely, including turning space at the top and bottom of the ramp.

Ramps should:

- be securely fixed in position (a ramp is deemed fixed if it does not move through ordinary use);
- be at least 1 metre wide (1.5 metre wide if possible);
- be constructed from materials strong enough to support pedestrians and wheelchair and mobility scooter users;
- have a slip-resistant surface and edging to prevent wheelchairs etc. slipping over the edge;
- allow for rainwater to run along the gutter.

For footway ramps a maximum gradient should be no more than 1 in 10, with an absolute maximum acceptable of 1 in 12, to enable people using manual wheelchairs to mount the kerb without undue difficulty, and to avoid grounding by mobility scooters (some of which have low ground clearances and long wheelbases). There should also be enough space at the bottom of the ramp to allow wheelchair and mobility scooters users to manoeuvre.

Additional guidance can be found in industry guidance, such as HAUC's document "Ramps, Plates and Boards".

10.8 Footway boards

Footway boards may only be used on footways to maintain foot and light vehicle access during excavation works. **They should not be used on the carriageway**.

Footway boards used for bridging excavations:

- should extend the full width of any temporary footway;
- should be strong enough to support pedestrians and mobility scooters and, where light vehicle access is needed, the weight of those vehicles;
- should be made from material that is unlikely to become distorted;
- should cover the whole width of any vehicle crossover;
- should have chamfered edges to prevent tripping;
- should have a slip-resistant surface;
- should be securely fixed in position (a footway board is deemed fixed if it does not move through ordinary use). On non-bituminous surfaces, the use of bituminous material should be avoided, as the surfacing will be affected after works are completed;
- should only be used where the sides of the excavation under the boards are stable or suitably supported; and
- should be fenced to prevent falls where the edges of the boards are adjacent to an excavation.

10.9 Temporary covers over excavations

Temporary covers should be capable of preventing a person from falling into the excavation. These covers should resist being displaced by wind. As such, they may require ballasting or some other method for fixing them in place.

10.10 Road plates

Road plates might be required to bridge excavations in order to open the carriageway to traffic, e.g. during traffic-sensitive periods, at night or at weekends. The use of road plates should be planned in advance. An assessment will be required to identify the appropriate size and thickness of plate to be used.

Open excavations within the works area may also be plated.

Road plates should be made of suitable material with an appropriate skid-resistant surface. Their installation must not present a hazard to cyclists or motorcyclists.

The sides of the excavations should be suitably supported beneath the road plates, which should be securely fixed in position (a road plate is deemed fixed if it does not move through ordinary use).

Special consideration should be given to vehicles turning on or accelerating off a plate from a static position as this might cause the plates to move out of position.

Road plates should have chamfered edges, integral ramps, be sunk into the surface or have a suitable bituminous material to provide a ramp to the plate level. Where ramps exceed 15 mm in height, appropriate ramp warning signs should be used.

An alternative to plating is using interim reinstatements. Reinstatements must be in accordance with the relevant specification that applies in the part of the UK in which you are working.

Warning: The use of road plates must always be authorised by your supervisor or other competent person who will decide on the appropriate size and strength of plate to be used. This will depend on the width of excavation to be spanned and the type and speed of traffic expected to use the plates at all times.

10.11 Vehicles

Any vehicle used for mobile or short-duration works must have one or more amber warning beacons such that at least one beacon can be seen from any direction, at a sufficient distance to allow approaching vehicles to stop safely.

Any vehicle stopping on the highway for works purposes must be equipped with either a roof-mounted flashing amber warning light bar (comprising at least two independent light sources) or a minimum of two independent vehicle roof-mounted flashing amber warning beacons, visible through 360°.

In addition, all vehicles, except agricultural vehicles, stopping on a road or highway for works purposes or being used for mobile works should be marked with high visibility rear chevron markings comprising alternate strips of fluorescent orange or red retroreflective material and fluorescent yellow non-retroreflective material, of not less than 150 mm width each, inclined at 45–60° to the horizontal and pointing upwards.

The chevrons should cover as much of the rear-facing portion of the vehicle as possible without obscuring windows, vehicle lighting or the registration plate.

Glossary

Competent person – A person with the skills, knowledge, training and experience to be able to provide information and instructions about how to carry out an activity safely.

Exclusion zone – area to protect pedestrians and operatives from the risk of falling objects.

Exit taper – a line of cones tapering into the kerb downstream of the working space.

High pedestrian flow - above 1,200 pph (people per hour).

Lead-in taper – a line of cones tapering out from the kerb upstream of the working space.

Lighting-up time – the time between half an hour after sunset and half an hour before sunrise.

Longways clearance (L) – the distance between the end of the lead-in taper and the first traffic barrier placed across the lane.

Low pedestrian flow – less than 600 pph.

Minor works – works with a planned duration of three days or less, excluding immediate or major works (see the Co-ordination Code of Practice for more details).

Mobile works – work carried out from a vehicle moving significantly more slowly than the general traffic.

Precautionary area – any part of any road, including side roads, that can be reached by following a route leading away from the centre of the level crossing for a distance of 200 metres or less.

Safety zone – additional space around the working space provided to separate the workforce from traffic and the traffic from the workforce.

Short-duration static works – works carried out at one or more intermittent stops, each lasting less than 60 minutes.

Sideways clearance (S) – the part of the safety zone between the working space and moving traffic.

Supervisor - A competent and qualified person nominated by an employer to supervise the activity being carried out.

Tapping rail – a rail at the base of pedestrian barriers used by visually impaired long-cane users.

TOPAS – TOPAS maintain technical equipment specifications and a register of products certified to meet them. Purchasers should specify TOPAS-registered equipment as a straightforward way to ensure it complies with requirements.

Tramway path – the space needed by tramcars, which includes a safety zone around the tram.

TSRGD – Traffic Signs Regulations and General Directions, available at www.legislation.gov.uk

Vulnerable road users - road users requiring extra care, including disabled people pedestrians, motorcyclists, cyclists, horse riders, older drivers, learners, inexperienced drivers, etc.

Wig-wag signals – light signals used to control traffic at level crossings, swing bridges, etc.

Setting out site

(Distances in metres unless stated otherwise, numbers are minimum numbers)

Type of road	Minimum visibility distance to first sign	**D** Distance from first sign to start of lead-in taper	Lead-in taper	Width of works including sideways safety zone 1m	2m	3m	4m	5m	6m	7m	**S** Minimum width of sideways safety zone	**E** Distance from last cone to End of works sign	Minimum size of signs (mm)
Single carriageway – speed limit 30 mph or less	60	20 to 45	**T** Taper length	13	26	39	52	65	78	91	0.5	10 to 30	600
			No of cones	4	4	6	7	9	10	12			
			No of lights	–	–	–	–	–	–	–			
Single carriageway – speed limit 40 mph	60	45 to 110	**T** Taper length	20	40	60	80	100	120	140	0.5	30 to 45	750
			No of cones	4	6	8	10	13	15	17			
			No of lights	3	5	7	9	12	14	16			
Single carriageway – speed limit 50 mph or more	75	275 to 450	**T** Taper length	25	50	75	100	125	150	175	1.2	30 to 45	750
			No of cones	4	7	10	13	15	18	21			
			No of lights	3	6	9	12	14	17	20			
All-purpose dual carriageway – speed limit 40 mph or less	60	110 to 275	**T** Taper length	25	50	75	100	125	150	175	0.5	30 to 45	750
			No of cones	4	7	10	13	15	18	21			
			No of lights	3	6	9	12	14	17	20			

Speed limit mph	20	30	40	50	60
L Longways clearance	0.5	0.5	15	30	60

Speed limit mph	30 or less	40	50 or more
C Clearance to works vehicle	2	5	8

Notes

1 For roads covered by this Code, the minimum height of cones is 450 mm where the speed limit is 40 mph or less, and 750 mm where the speed limit is 50 mph or more.

2 The maximum spacing between cones in longitudinal lengths should be 9 metres, but no fewer than two cones should be used in any length between tapers.

3 Lead-in tapers where two-way traffic control is used, and all exit tapers should be at about 45º to the kerb line with cones spaced 1.2 metres apart maximum.

4 In certain circumstances on congested roads with speed limits of 30 mph or less, the lead-in taper may be reduced to 45º (see page Section 4.5).

5 The longways clearance (L) is the distance between the end of the lead-in taper and the first traffic barrier placed across the lane.