Safety at Street Works and Road Works

A Code of Practice

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This Code of Practice is issued by the Secretary of State for Transport and Welsh Ministers under section 65 of the New Roads and Street Works Act 1991 (NRSWA) and section 174 of the Highways Act 1980, by Scottish Ministers under section 124 of the NRSWA, and by the Department for Regional Development (Northern Ireland) under article 25 of the Street Works (Northern Ireland) Order 1995 and Article 31 of the Road Traffic Regulation Order (Northern Ireland) 1997.

Contents

Key questions

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?*

Foreword

Purpose of this Code of Practice

This Code of Practice (referred to from here on as the Code) is intended to help you to safely carry out signing, lighting and guarding of street works and road works on all highways and roads, except motorways and any dual carriageways with a speed limit of 50 mph or more. This Code is directed at operatives, supervisors, managers, planners and designers who are responsible for making sure that all street and road works are safe for both operatives and the public. Road users including pedestrians, cyclists and equestrians (horse riders) should not be put at risk, and should be able to see the extent and nature of any obstruction well before they reach it.

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

Warning: Failure to comply with this Code is evidence of failing to fulfil the legal requirements to sign, light and guard works. Compliance with the Code will be taken as compliance with the legal requirements to which it relates.

Note: Further guidance on safe working on highways, 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 et al by The Stationery Office.

Application of the Code

This Code applies to all highways and roads, except motorways and any dual carriageways with a speed limit of 50 mph or more. This Code applies to works carried out by or on behalf of both highway authorities and statutory undertakers. It does not cover skips and scaffolding placed in the highway.

Guidance on some situations not covered by this Code can be found in Chapter 8 of the Traffic Signs Manual published for the Department for Transport et al by The Stationery Office. This gives authoritative advice, but it does not have the status of a Code of Practice under the Act. In Northern Ireland Article 31 of the Road Traffic Regulation Order (Northern Ireland) 1997 makes Chapter 8 mandatory for undertakers' works on motorways or any dual carriageways with a speed limit of 50 mph or more. Elsewhere in the United Kingdom undertakers should refer to Chapter 8 when carrying out such works. For other roads, Chapter 8 or other relevant documents may provide further applicable guidance.

Legal status of the Code

Local highway authorities in England and Wales, and the road authority in Northern Ireland must comply with this Code for their own works. Roads authorities in Scotland should comply with this Code for their own works, as recommended by Scottish Ministers. All references in the text to 'highway authorities' are to be read as references to 'roads authorities' in Scotland and Northern Ireland.

An undertaker, and those working on its behalf, carrying out work under the New Roads and Street Works Act 1991 must comply with this Code for their own works.

With the exception of Scottish roads authorities, failure to comply with this Code is a criminal offence and may lead to criminal prosecution in addition to any civil proceedings. Compliance with the Code will be taken as compliance with the legal requirements to which it relates.

This Code is issued by the Secretary of State for Transport and Welsh Ministers under Section 65 of the New Roads and Street Works Act 1991 and Section 174 of the Highways Act 1980, by Scottish Ministers under Section 124 of the New Roads and Street Works Act 1991, and by the Department for Regional Development under article 25 of the Street Works (Northern Ireland) Order 1995 and Article 31 of the Road Traffic Regulation Order (Northern Ireland) 1997.

This Code comes into force on 1 October 2014.

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 protect their employees from dangers to their health and safety and to protect others who might be affected by the work activity (for example pedestrians, cyclists, equestrians and motorists). These include proper arrangements for design (including planning and risk assessment) and management (including supervision) of the works. Under the Equality Act 2010, works promoters also have a duty to have regard for the needs of disabled people and older people in the planning and execution of works.

Record keeping

In order to assess the efficacy of this Code in preventing accidents at street and road works sites, and to gather evidence for future revisions, it is strongly recommended that all works promoters keep records of any accidents or near misses on their sites, with a description of the situation, a cause or contributing factor if possible, and send these records to the relevant Highway Authorities and Utilities Committee on an annual basis for collation.

Department for Transport

The Scottish Government

The Welsh Government

The Department for Regional Development (Northern Ireland)

Using this Code

Everyone on site has personal responsibility to behave safely. This includes proper arrangements for design (including planning and risk assessment) and management (including supervision) of the works. Under the Equality Act 2010, works promoters also have a duty to have regard for the needs of disabled people and older people in the planning and execution of works.

This Code shows the principles you must follow when signing, lighting and guarding works on all highways except motorways and any dual carriageways with speed limits of 50 mph or more. The highway includes the carriageway, footway and verge.

This Code shows typical layouts, equipment and working methods. It does not include every situation you could encounter and it might be necessary for your supervisor, manager or other competent person to consult the highway authority to discuss safe methods of working that have minimum impact upon highway users. You must read the text alongside the illustrations to understand the requirements fully.

Each section within this Code will give you the requirements for each stage of the works from planning through to completion. Following a risk assessment, additional measures may be necessary for site specific conditions.

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 higher speed dual carriageways, which are not covered here. Always consult your supervisor, manager or other competent person if you are in any doubt about correct procedures or if you are concerned about safety.

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

Responsibilities

It is your responsibility to:

- ensure that the correct procedures have been followed for works that involve the need for prior consultation, consent or agreement (e.g. highway closures, working in the vicinity of railways and/or tramways, etc);
- ensure that before you start that a site specific risk assessment has been carried out, paying particular attention to the requirements of highway users, including pedestrians and vulnerable users such as disabled people. If circumstances change, you should consider whether the risk assessment needs revising;
- ensure that before you start that the works site layout has been planned, necessary equipment has been identified and that you know how you will set the site out;
- understand and implement pre-planned site safety requirements before starting the works;
- sign, light, guard and maintain your works safely at all times;
- ensure that your works remain compliant and safe as works progress or following any alteration;
- ensure that the safety of yourself and others who pass near or through the works;
- consult your supervisor, manager or other competent person immediately if you are unsure about any requirements contained in your work instruction; and
- ensure that the work team understands all key safety issues and the local site risk assessment related to the activity.

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

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 placing portable traffic signals on a public highway must have a full understanding of the requirements and correct operation of the signals. Reference should be made to *An Introduction to the Use of Portable Vehicular Signals*, also known as the 'Pink Book'.

Planning

Works should cause minimum inconvenience to road users. Local highway 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 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 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.

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 should be undertaken for all works sites. Where a risk assessment identifies that measures are needed in addition to those required by this Code, these must be implemented.

Before going to site

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:

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

Equipment

Check that you have all of the equipment you need to safely sign, light and guard your site.

High visibility jackets must be worn when you are operating outside the working space, e.g. setting out, maintaining or removing signing, lighting, guarding and temporary traffic control. Your employer may also require you to wear high visibility clothing to the same standard within the working space. High visibility clothing must be correctly fastened and must be maintained in a clean and usable condition.

Further guidance on equipment, and technical standards for high visibility jackets, are given in Part 3 of this Code.

At the work site

Before you start

All works require measures to ensure the safety of road users (including pedestrians) 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. You will need to consider separately any risks associated with carrying out the works themselves.

For planned works, a competent person should visit the site in advance, carry out a risk assessment based on the road layout and nature of the works to be undertaken, and give clear instructions on the signing, lighting and guarding layout required.

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 road users and operatives safe, do not start until you have discussed these with your supervisor, manager or other competent person.

Warning: To comply with health and safety legislation you must carry out and regularly review the site specific risk assessment to ensure that a safe system of working 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.

Look at the road

- Are there awkward or complex junctions?
- Are the road or footway widths too narrow to allow the safe use of the standard layouts?
- How much visibility do approaching road users have? – consider bends, crests of hills, trees and bushes, parked vehicles.
- Are there any railway 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?
- Are your works near permanent traffic signals or signs? If so, could they obstruct above-ground or sub-surface detectors, signal heads or signs? Contact the highway authority if this is a possibility.

Look at the traffic

- Is the intended type of traffic control appropriate for the prevailing traffic flow? – what about the number of heavy or large vehicles passing?
- What is the speed limit, and does a significant amount of traffic appear to be travelling faster than the speed limit?
- What is the type or make up of the traffic? – e.g. cars, heavy or large vehicles?
- Is there a cycle lane? Are there many cyclists using the route?
- Will bus routes or bus stops be affected?

Look at the local area

- Are there likely to be frequent deliveries to shops or premises? – delivery vehicles may park in a way that blocks signs etc. or reduces road width.
- Will the works restrict access to premises that have a lot of traffic entering or leaving? e.g. schools, large stores, car parks, fast-food stores – particularly consider right turning traffic.

- What are the needs of the emergency services? – e.g. are there nearby police, ambulance or fire stations?
- Are there facilities for disabled people, e.g. parking bays, and can these be avoided?

Look at pedestrians

- Consider both safe routes and the standards of fencing/barriers needed to protect pedestrians from risks from inside the work space.
- Is there a high level of pedestrian traffic? – consider users of pushchairs, wheelchairs and mobility scooters.
- Are there significant numbers of people with reduced mobility or walking difficulties (who may have problems with steps, cable protectors, or uneven surfaces), or blind and partially sighted people? – consider any nearby hospitals, surgeries, residential homes etc.
- Are there many children around? – consider nearby schools, parks, playgrounds etc.
- Will pedestrian crossings or school crossing points be affected?
- 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 above issues might change within that time, e.g:

- 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; 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, manager or other competent person.

Arriving on site

Parking

On arrival you must park your vehicle safely before you unload or set up signs. If you can't park off the road, make sure the vehicle can be seen clearly by other drivers. Turn on your roof-mounted amber beacon(s), if you have them. Do not obstruct a footway or cycle route when parking off the road, and respect access to premises and driveways. If parking your vehicle outside the working space, you must ensure that it does not obstruct any traffic sign or traffic signal head. If a vehicle is part of, or enters, the works site, it must be correctly incorporated into the traffic management used. Roof-mounted beacon(s) must be switched on if the vehicle carries them.

The technical standards for vehicles are given in Part 3 of this Code.

Vehicle movements

Works drivers intending to stop at the roadside or enter established works should follow normal Highway Code practice and must switch on their roof-mounted amber beacon(s), if they have them.

Advance signing

Signing of the works

It is important that the distances, including safety zone dimensions are determined before starting to set the signs out. From the table inside the back cover 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 page 21. 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 must provide extra advance signs. These extra signs will need to be placed first.

Where there is a grass verge the signs should normally be placed there. Placing signs in the footway is permitted, but they must be positioned so as to minimise inconvenience or hazard to pedestrians, with particular consideration given to those with visual impairments, pushchairs, wheelchairs and mobility scooters. A minimum usable footway width of 1.5 metres should be maintained where possible. See page 28 for details.

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

Warning: In no circumstances must the footway width be reduced below 1.0 metres. Where the minimum footway width of 1.0 m cannot be maintained, you must consult your supervisor, manager or other competent person.

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

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 inside the back cover. 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.

Road narrows ahead – 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.

On roads with speed limits of 50 mph or more, the above advance signs should have supplementary distance plates giving the distance to the works in yards or miles (not metres).

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

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 and footway users, and may cause confusion. These signs must not be used for directing pedestrians.

Advance signs should be placed so that they:

- are in the correct sequence;
- are within the correct distances as shown in table inside back cover;
- can be clearly seen;

- cause minimum inconvenience to road and footway users;
- are at a minimum risk of being struck by vehicles; and
- cannot be obscured by parked vehicles.

Fixing of signing, lighting and guarding

Signing, lighting and guarding equipment must be fixed to prevent it being blown over or out of position by wind or passing vehicles. The use of equipment with built-in weights is recommended. Alternatively you may add appropriate weights e.g. sacks containing suitable granular material placed at low level.

Warning: Do not use barrels, kerbstones, spoil, road pins or similar objects for the purpose of weighting or securing road signs and barriers – they could create a danger for highway users if struck by a vehicle.

Additional requirements

Sometimes you might 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. On dual carriageway roads, the warning signs may need to be duplicated in the central reservation – consult your supervisor, manager or other competent person.

Caution: For dual carriageways, the need to place signs in the central reservation must be assessed before you proceed and you should consult your supervisor, manager or other competent person.

The road width and volume of traffic at the works site might make traffic control necessary. See page 53 for details of which type of control is appropriate.

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

Before any works equipment is placed in the carriageway, advance signing must be provided. (For exceptions associated with works between parked vehicles see page 37).

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.

Coned area

Cones and road danger lamps

For the minimum size of cones and their placement in lead-in tapers, exit tapers, and safety zones, refer to the table inside the back cover. The retroreflective sleeves of cones must be kept clean. Damaged cones/sleeves must not be used.

All street and road works on roads with a speed limit of 40 mph or more must have road danger lamps illuminated in poor visibility or during the hours of darkness (lighting-up time). Where street lighting is present, road danger lamps should flash at a rate of between 55 and 150 flashes per minute. Where there is no street lighting, the lamps should be steady. If your risk assessment requires it, road danger lamps must also be used on lower-speed roads.

Lead-in taper

The recommended lead-in taper is given in the table inside the back cover. Sometimes it might 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. Reduced tapers should always be as long as permitted under the circumstances. However, they must not be reduced to less than 45° unless there are restrictions associated with parked vehicles (see page 37.)

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

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 here) should be placed across the lane.

Site layout

You must include the works area, working space and safety zone in the area to be marked off with cones, and/or barriers. Road danger lamps should be placed where necessary (see page 94).

You must provide safety zones when either:

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

Working space

The working space includes the works area (e.g. the excavation or chamber opening) and the space around the works area where it is permitted to store tools, excavated material, equipment and plant. You must leave enough working space to ensure that movement and operation of 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.

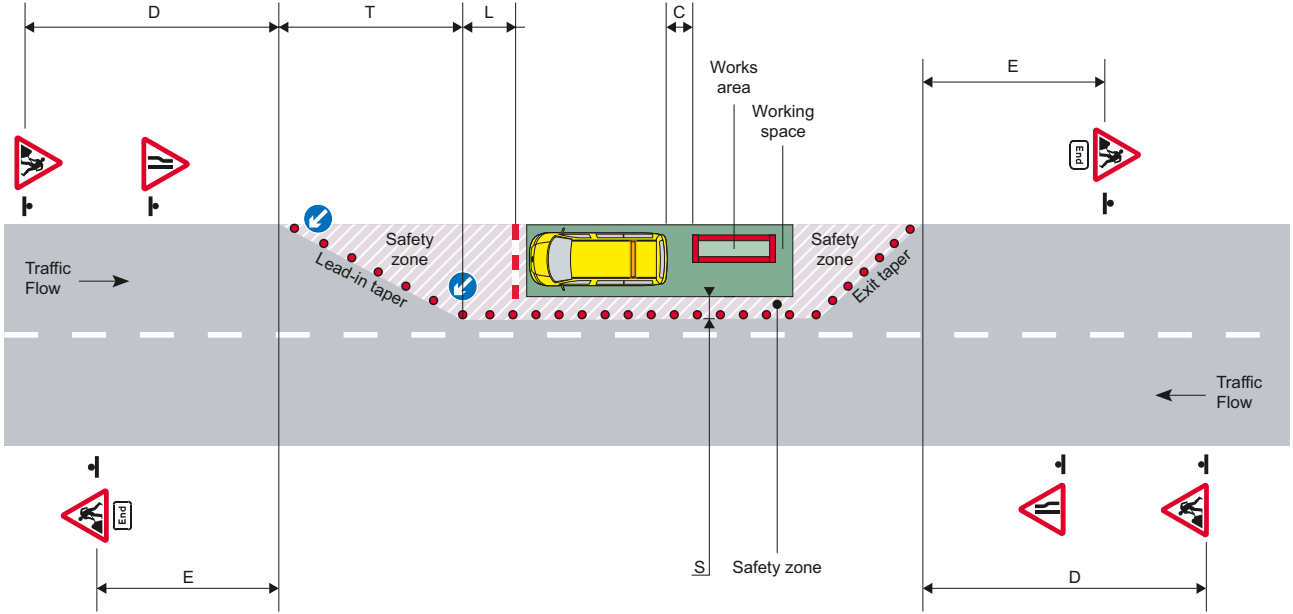
Safety zone

The safety zone is provided to protect you from traffic and to protect the traffic from you.

When working in a footway, remember you must provide a safety zone in the carriageway if the working space is closer to the edge of the carriageway than the width of the sideways clearance (S). If cones are placed in the road, advance signing will be required.

These same principles apply when working in a verge or cycle track adjacent to the carriageway.

Basic layout with a works vehicle



Notes

1 For numbers and minimum size of cones, and dimensions D, T, C, L, S and E, see table inside back cover.

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

Warning: Do not enter the safety zone in the normal course of work. Materials, equipment and vehicles must 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 page 21) is made up of:

- a lead-in taper of cones whose length (T) generally 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), 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 vehicle to works area clearance (C);
- the sideways clearance (S), which is the width between the working space (or in some cases, the pedestrian walkway) and moving traffic; and
- the exit taper.

See inside the back cover for dimensions T, L, C and S.

Sideways clearance (S) depends on the speed limit in force, although you should consider as part of your risk assessment if a greater width than stated in the table would be appropriate, especially on roads with a high speed limit. If traffic consistently exceeds the speed limit, this should also be taken into consideration when reviewing the width of the safety zone. 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, you might need to consider other traffic management options. See page 52 regarding unobstructed widths.

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 must be restored to the appropriate dimensions when work restarts.

Where the coned off area is simply protecting a hazard, it may be possible to temporarily reduce the size of the working space. 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 authority.

Exit taper

An exit taper is normally required and should be at 45° to the kerb line or road edge. However, 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.

Information board

An information board 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 boards are still highly desirable at these sites where it is safe and practicable to provide them. This board 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 board.

The information board must give the name of the organisation undertaking the works, any principal contractor and an emergency contact telephone number. 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.

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 must 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 m 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.

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 on both sides of the carriageway to indicate the permanent speed limit that applies from that point onwards.

Variable message signs

Variable message signs (VMS) can be used. The use of VMS and their location must be agreed with the highway authority. Any wording and text colour must be in accordance with the Traffic Signs Regulations and General Directions or, in Northern Ireland, the Traffic Signs Regulations (NI), and must not be scrolling or paging. 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 authority).

Setting out the works

Sequence for setting out signs

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.

On arrival, or at any stop to set out signs, you must park your vehicle safely before you unload or set up signs, lights and barriers. Where possible the vehicle should be parked off the road in a position that does not obstruct a footway or cycle route. If you cannot park off the road, the vehicle must be clearly visible to other road users. Turn on your roof-mounted amber beacon(s) if you have them, and aim to ensure that any high visibility markings on the vehicle are facing on-coming traffic. It may be safer to get out of the vehicle on the passenger side, rather than stepping into the traffic stream.

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.

Face the traffic when you set out signs and take particular care when crossing the road to place them.

Follow the sequence on pages 26–27.

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. If you park in the road, you must protect it from traffic going past. 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) and another on the right-hand side of the road if your risk assessment deems it necessary. (Consult the table in the inside back cover of this Code for the appropriate distance D for different sites).

3. Using the appropriate diagrams in this Code to help you, work back towards the site, placing more signs as necessary. Keep on the verge or footway if you can. If you are on a two-way road, repeat this procedure and place signs for traffic going in the opposite direction, then cone off the works.

4. Always face the oncoming traffic when you set out 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 board to complete the warning, guidance and protection for the works.

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

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.

Footway and footpath works – look after pedestrians

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

You **must** take into account the needs of children, older people and disabled people, having particular regard for visually impaired people. In order to do this you must provide a suitable barrier system (see page 97) that safely separates pedestrians from hazards and provides a safe route suitable for people using wheelchairs, mobility scooters, prams or pushchairs. Always be on the lookout for pedestrians who seem confused or who are having difficulty negotiating a temporary route, and be prepared to offer assistance.

Safe routes for pedestrians

If your work is going to obstruct a footway or part of a footway, you must provide a safe route for pedestrians that should include access to adjacent buildings, properties and public areas where necessary. This route must consider the needs of those with small children, pushchairs and those with reduced mobility, including visually impaired people and people using wheelchairs or mobility scooters.

You should always try to enable pedestrians to remain safely on the footway if at all possible. Ideally, **the footway should be a minimum of 1.5 metres wide for temporary situations** but if this cannot be achieved, the existing footway can be reduced to an absolute minimum of 1 metre unobstructed* width. 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.

If it is not possible to maintain safe pedestrian access on the footway, consider whether there are other safe alternatives. This could mean, for example, closing the footway and placing a 'Footway closed' sign at the works and an advance 'Footway closed ahead' sign at a location where it is safe for people to cross the road (possibly with the use of portable pedestrian crossing facilities). It may be necessary to provide footway ramps on either side of the road at this location. Another alternative,

at attended sites only, could be to preserve safe access for the majority of pedestrians and to offer assistance to those who might find a reduced width more difficult to navigate, including wheelchair or mobility scooter users, visually impaired people, or people with pushchairs.

If it is not possible to maintain safe pedestrian access on the footway and a safe off-carriageway alternative cannot be found, 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 visually impaired person being guided), with an absolute minimum of 1 metre unobstructed* width. It is recommended that a wider walkway be provided if it can be done without resulting in a road closure or a reduction to shuttle working.

*It is not permitted for barrier feet or other equipment to obstruct this space.

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

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.

Footway boards may be used on footways to maintain a route for pedestrians and provide light vehicle access to premises during excavation works.

Walkways in the carriageway

You should provide a walkway in the carriageway only if it is not possible to maintain safe pedestrian access on the footway and a safe off-carriageway alternative cannot be found. When temporary pedestrian routes have to be placed in the carriageway, make sure the signing and guarding barriers are put into place before the footway is blocked. Make sure the sideways clearance (S) of the safety zone is on the traffic side of the barriers.

When pedestrians are diverted to temporary walkways in the carriageway, suitable ramps or raised footway boards must be provided to enable people using wheelchairs or pushchairs to negotiate kerbs safely. The layout should allow wheelchair and scooter users to enter and exit a temporary walkway safely. Ramps and boards must be fit for purpose – see pages 98 to 99.

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, fall into excavations or be struck by moving or falling equipment. You must ensure that they are adequately protected against being exposed to these risks. You must also take into account the needs of children, elderly people and people with disabilities, having particular regard to visually impaired people.

At all static works, pedestrians must be protected by a continuous system of barriers.

Where a works site can be approached by pedestrians crossing from the opposite side of the road, you should place barriers all around the excavation, 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 must follow the manufacturer's instructions when erecting barriers. If you are unable to correctly install the barriers available, you should contact your supervisor, manager or other competent person before starting work.

The use of portable traffic signals is covered on page 62. Guidance on portable pedestrian crossing facilities can be found in Traffic Advisory Leaflet 3/11: *Signal-controlled pedestrian facilities at portable traffic signals.* If you are considering the use of portable traffic signals incorporating pedestrian facilities, the highway 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 do not go above or move into the pedestrian space;
- 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.

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 within 2 metres of a temporary or permanent footway, then you should consider either:

- putting temporary covers over the excavation (see page 99); or
- providing an enhanced barrier around the excavation;

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

Short delays on footways

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 obstruction of the footway is permissible if ALL the following apply:

- no alternative footway is available or can be provided;
- the footway is closed for no longer than absolutely necessary, and in any case no longer than 15 minutes in every full hour;
- sufficient operatives are available at all times to advise, assist and direct footway users safely past the works;
- pedestrians requiring assistance need wait no longer than 5 minutes for help;
- all overhead operations are suspended when assisted pedestrians pass the works;
- temporary footway closure signs are placed a recommended minimum of 20 metres in advance of the works; and
- the highway authority has been notified and agrees with the use of this measure.

Special consideration must be given to disabled people (including wheelchair or mobility scooter users) and people with pushchairs or prams at all times.

Warning: This measure should only be used with the agreement of the highway authority and after consultation with your supervisor, manager or other competent person and an on-site risk assessment has been undertaken.

Pedestrian crossings and pedestrianised areas

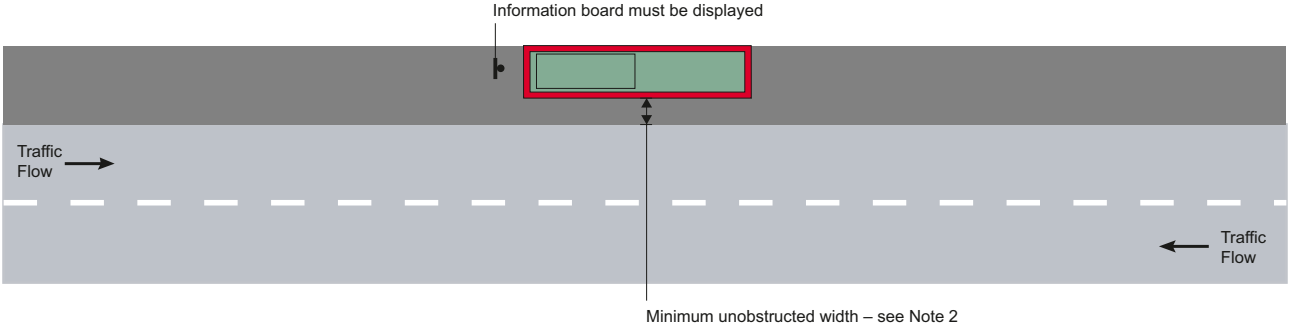
For works on or near a pedestrian crossing, see pages 50 and 51 for advice. In pedestrianised areas the working space and vehicles, plant or materials, must be enclosed by pedestrian barriers.

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 Traffic Advisory Leaflet 2/11: *Portable traffic signals for the control of vehicular traffic* and Traffic Advisory Leaflet 3/11: *Signal-controlled pedestrian facilities at portable traffic signals*.

Temporary closure of a footpath

Where it is necessary to close an independent footpath (i.e. not adjacent to a carriageway), a Temporary Traffic Regulation Order or Temporary Traffic Notice will be required in a similar way to when a carriageway is closed. Pedestrian access to all properties and premises must be maintained at all times.

Works entirely on the footway

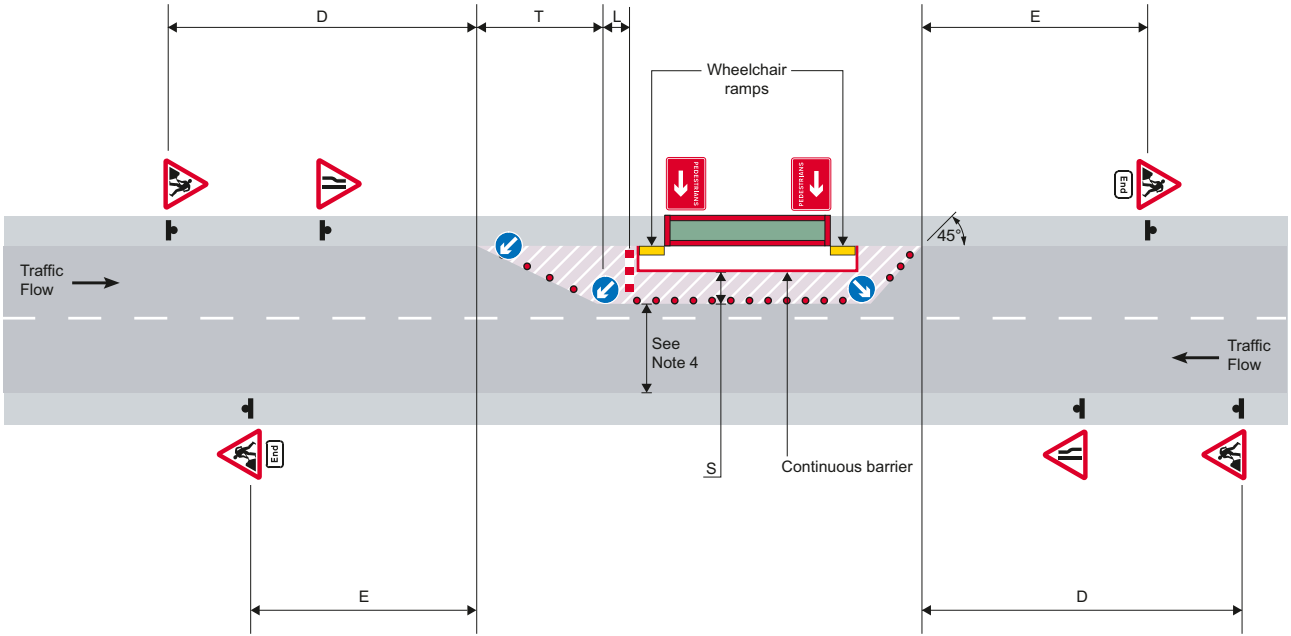


Notes

1 Advance signs are not required when the works, signing, lighting and guarding are entirely on the footway.

2 1.5 m preferred minimum unobstructed width, 1.0 m absolute minimum.

Works on footway with pedestrian diversion into carriageway



Notes

1 For numbers and minimum size of cones, and dimensions D, T, L, S and E, see table inside back cover.

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

3 Wheelchair ramps must be provided at the transition from footway to carriageway.

4 See page 52 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.

Cycle routes – look after cyclists

You must ensure suitable provisions are made for the safety of cyclists passing or crossing the works. Particular care is needed where cycle lanes or cycle tracks are affected by street works or road works because these routes may be especially popular with cyclists.

Cyclists might have to use other parts of the carriageway, a temporary cycle track, or an alternative route. You should consider whether access on the carriageway can be preserved for cyclists, even if it needs to be closed to motor vehicles. See page 70. Where the carriageway is closed but the footway remains open, a 'Cyclists dismount and use footway' white-on-red temporary sign can be used. Your supervisor, manager or other competent person may need to discuss these alternatives with the highway authority.

When shuttle working with traffic control is needed, you need to refer to the table of unobstructed road widths past the works set out on page 52 in order to help prevent unsafe conditions for 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.

A cycle lane marked with a solid white line will have been created by means of a Traffic Regulation Order. Where one of these is affected by planned works, your supervisor, manager or other competent person will need to discuss the situation with the highway authority well before work starts because it may be necessary to obtain the appropriate consent to suspend the cycle lane. Consent is not required in advance for emergency works, but must be applied for retrospectively at the earliest opportunity after commencement.

Equestrian routes – look after 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. Consideration should be given to suspending all operations when horses are passing the works.

Where it is necessary to close a bridleway a Temporary Traffic Regulation Order or Temporary Traffic Notice will be required.

Your supervisor, manager or other competent person will need to discuss the situation with the highway authority before work starts.

Carriageway works

This Code gives guidance on typical layouts, equipment and working methods. It does not include every situation you might encounter, and it might be necessary to consult the highway authority to discuss safe methods of working that have minimum impact upon road users. You must read the text alongside the illustrations in order to fully understand the requirements.

Works on single carriageway roads

The basic layouts on pages 33, 34, 38 and 39 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, manager or other competent person.

Exceptions are permitted in the case of works undertaken between parked vehicles (see page 37).

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 must be made for the possibility that parked vehicles might be moved. Should this happen, the site must, as far as is practicable, revert to the basic site layout with lead-in taper of cones;
- 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 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 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 more.

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

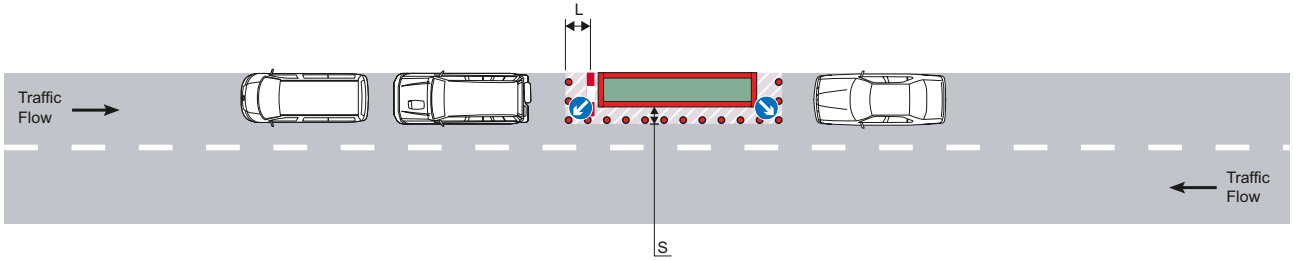
Note: When you are parking a conspicuous works vehicle in front of the working space, a traffic barrier will still be required, as shown on page 21. It must be placed in front of the vehicle, and replaced if the vehicle is removed.

The longways clearance (L) is measured from the end of the lead-in taper to the traffic barrier. This is part of the safety zone, **not** part of the works area.

The existing speed limit or temporary speed limit approved by the highway authority should be used to determine the appropriate clearances.

Caution: If you are working from the back of a vehicle, try to park it so that its back is facing the works.

Works between parked vehicles with a speed limit of 30 mph or less



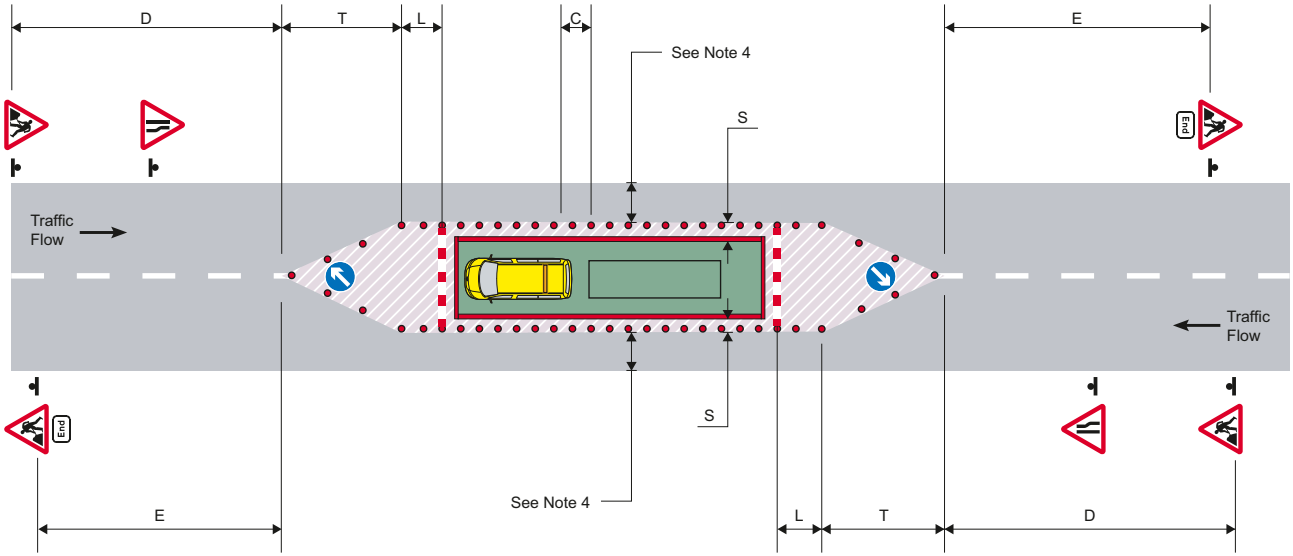
Notes

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 board (omitted here for clarity) must be displayed.

3 If parked vehicles move away, tapers and advance signing should be provided.

Works in the centre of a two-way road



Notes

1 For numbers and minimum size of cones, and dimensions D, T, C, L, S and E, see table inside back cover.

2 An information board (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 page 52 for guidance on unobstructed width past the works.

Road widths

Turn to page 52 for the minimum road width required for two-way working. If there is not enough space for two-way traffic, it might be appropriate to use traffic control.

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

Consult your supervisor, manager 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.

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

Consult your supervisor, manager 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, lining and guarding on dual carriageways are to be used for the planning and setting up works.

Right lane closure

This is shown on page 41.

Left lane closure

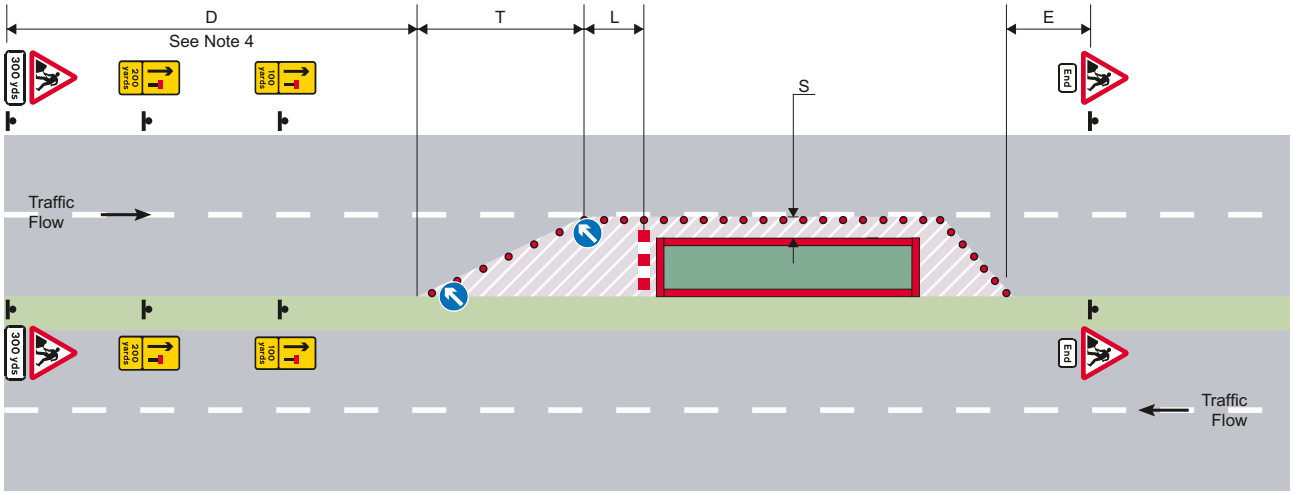
If the left lane is closed, you should normally merge traffic into the left lane using a guide island, then return the traffic to the right lane(s). This is shown on page 42. For certain short-term works, it may be an acceptable alternative to merge traffic to the right. See Chapter 8 of the Traffic 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, manager or other competent person.

Signing requirements for dual carriageways

Speed limit	Signing requirements
30 mph	As shown below and on page 42, except that distance plates may be omitted
40 mph	As shown below and on page 42

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



Notes

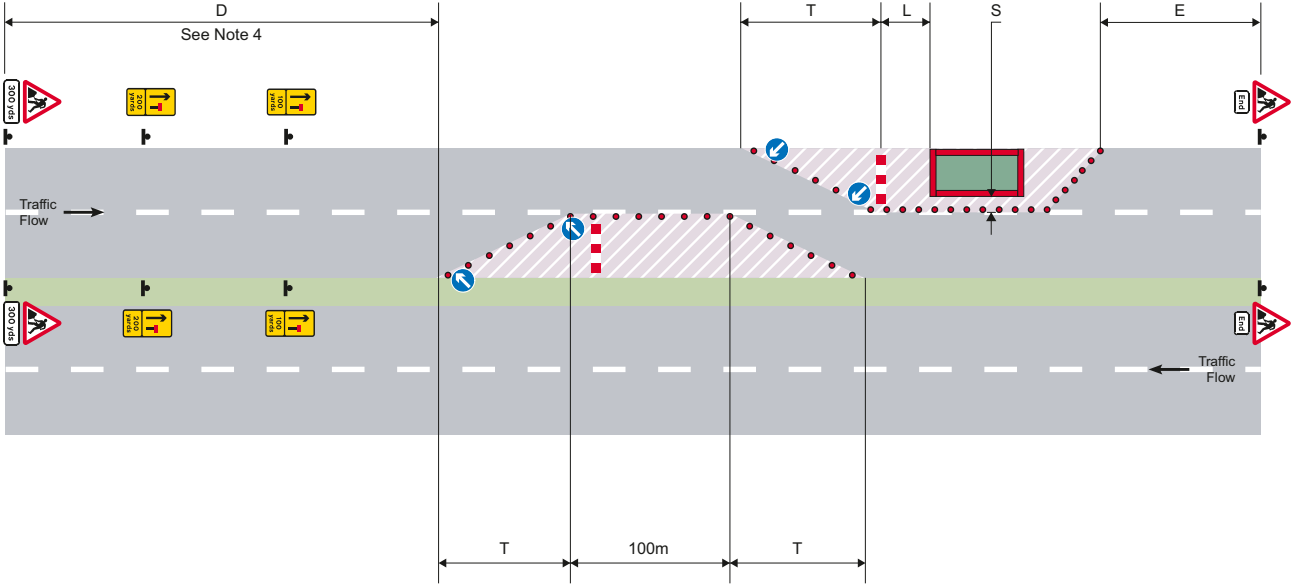
1 For numbers and minimum size of cones, and dimensions D, T, L, S and E, see table inside back cover.

2 An information board (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 m (300 yds) in this example.

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, T, L, S and E. see table inside back cover.

2 An information board (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 m (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.

Works at road junctions

Keep two-way traffic flowing past the works if possible. If you can't, traffic control or a diversion will be required and you should refer to your supervisor, manager or other competent person. If the works are in a side road, place 'Road works ahead' signs with supplementary arrow plates on the main route. Turn to pages 44 and 46 for details. Where works are situated near but just past a side road junction, the cone taper can start on the approach to the junction.

Warning: When working adjacent to or on road junctions controlled by permanent traffic signals, you should consult your supervisor, manager or other competent person, and the highway authority must be contacted.

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. An adjustment of the traffic signals may be required, so consult your supervisor, manager or other competent person, who will then consult the highway authority.

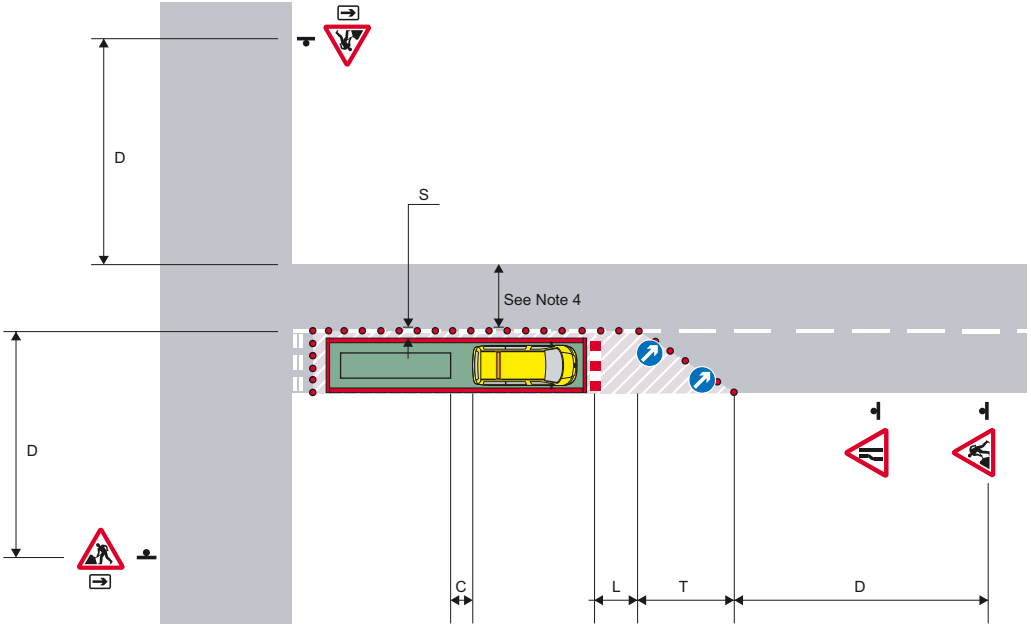
At signal controlled junctions

If permanent traffic signals are not working, or have been turned off, you must ensure that 'Light signals ahead not in use' signs are erected on all approaches. 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 page 51).

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 authority.

The diagram on page 46 shows guarding and signing for works at traffic signals on a road with a speed limit of 30 mph or less.

Works in a side road at a T-junction



Notes

1 For numbers and minimum size of cones, and dimensions D, T, C, L and S, see table inside back cover.

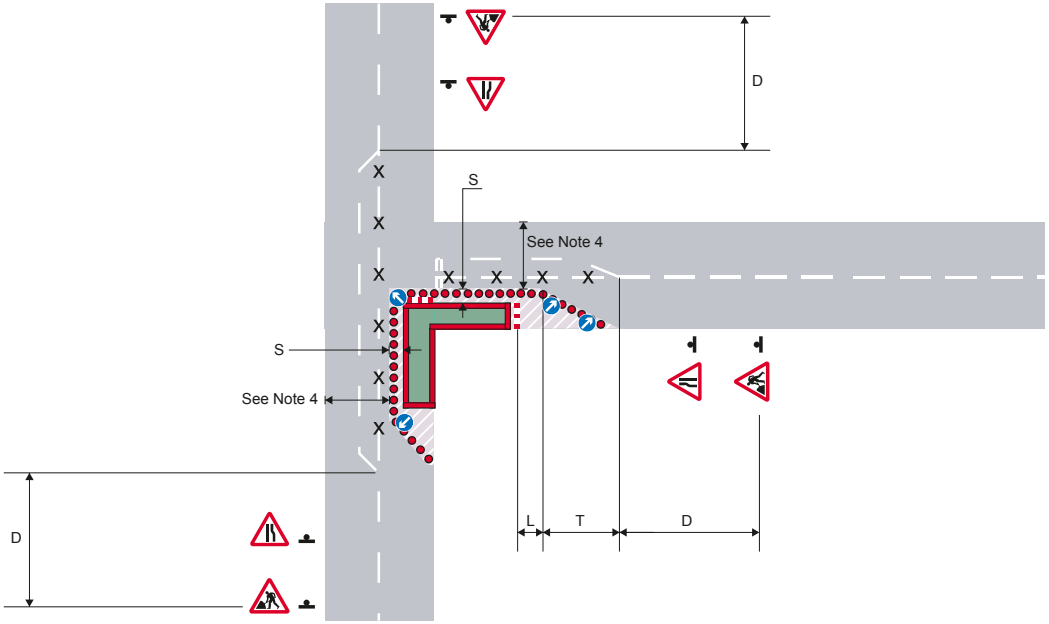
2 An information board (omitted here for clarity) must be displayed.

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

4 See page 52 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 page 52. 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.

Works in both roads at a T-junction



Notes

1 For numbers and minimum size of cones, and dimensions D, T, L and S, see table inside back cover.

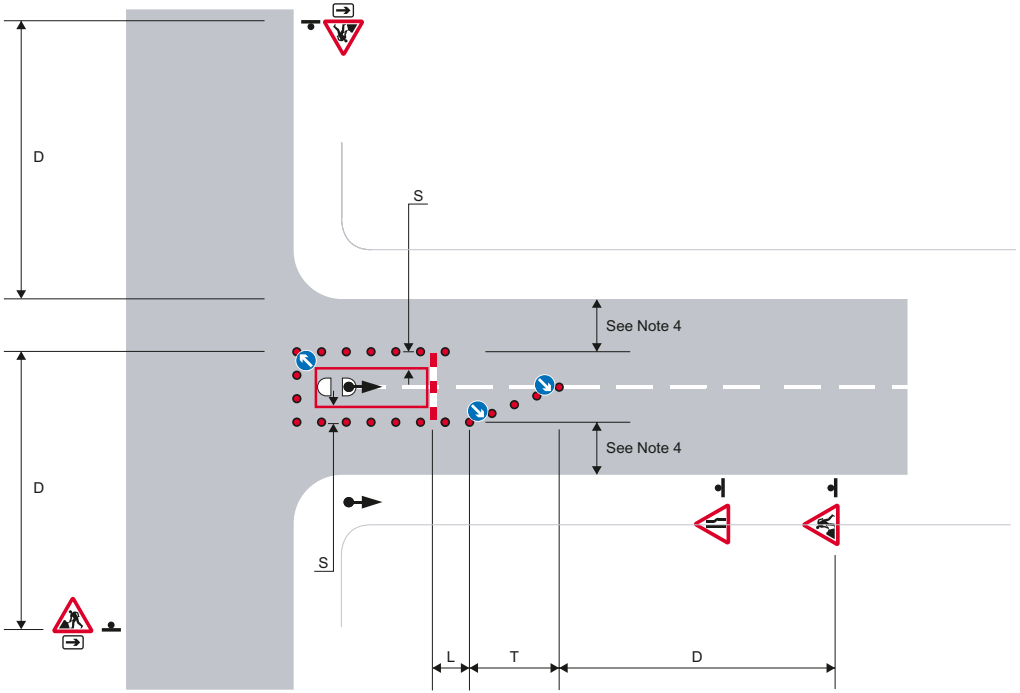
2 An information board (omitted here for clarity) must be displayed.

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

4 See page 52 for guidance on unobstructed width past the works.

5 If two-way flow cannot be maintained past the works in the side road, some form of traffic control will be required – see page 52. Alternatively, flow in the side road 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.

Works on a signal island at a T-junction



Notes

1 For numbers and minimum size of cones, and dimensions D, T, L and S, see table inside back cover.
2 An information board (omitted here for clarity) must be displayed.
3 Appropriate advance warning signs should be placed on all roads approaching the junction.
4 See page 52 for guidance on unobstructed width past the works.
5 The length of the coned area may be extended to accommodate a works vehicle.

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

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

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.

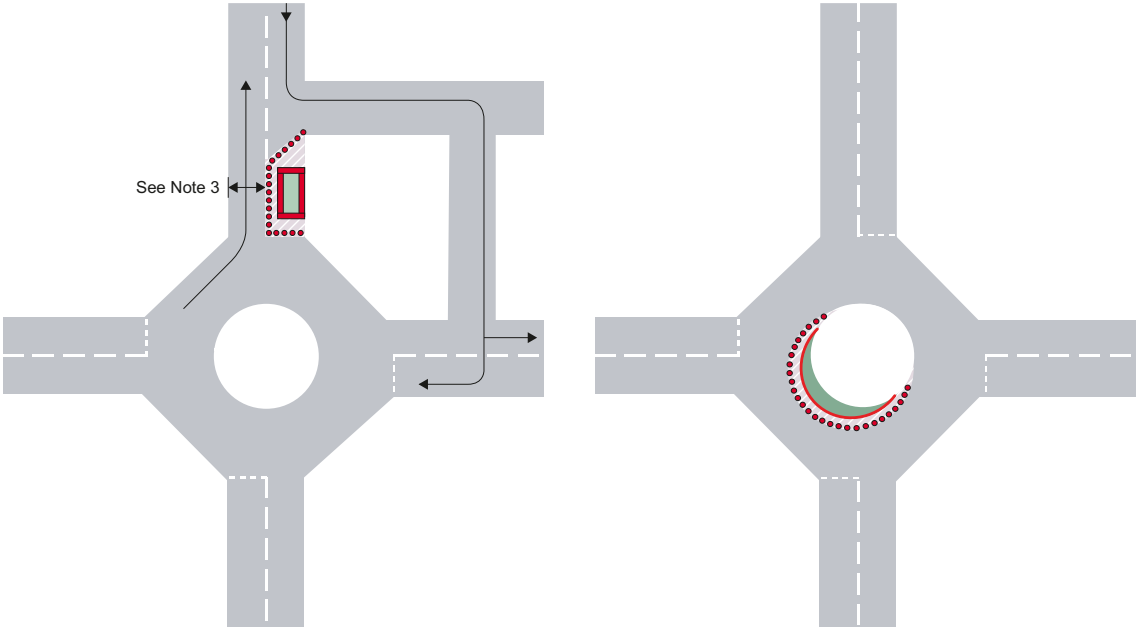
For single-carriageway approaches, try to keep two-way traffic flowing if possible, but remember the width restrictions (see page 52). However, if the works site makes the road too narrow to allow two-way traffic to pass and shuttle working is not practicable, you will need to consider restricting the road to 'Exit only' from the roundabout (see page 48, 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 authority and needs to be pre-planned, as adequate notice has to be given. Consult your supervisor, manager 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.

Works at a roundabout, Cases A and B



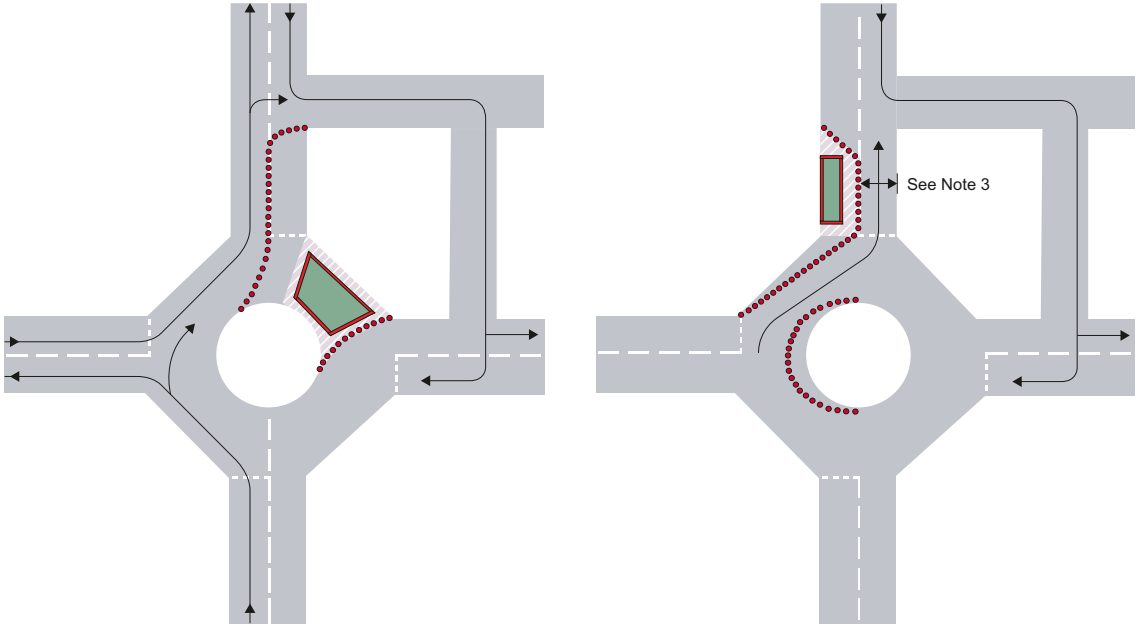
Notes

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 page 52 for guidance on unobstructed width past the works.

Works at a roundabout, Cases C and D



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 page 52 for guidance on unobstructed width past the works.

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

Varying the number of lanes on the circulatory section of a roundabout can distract drivers, therefore consider coning down to the same number of lanes on the approaches unless the traffic pattern dictates otherwise. Lane dedication signs might be needed. Vehicle turning paths need to be carefully considered to ensure the rear wheels of long vehicles do not hit the cones, and to ensure there is adequate width on the restricted approach.

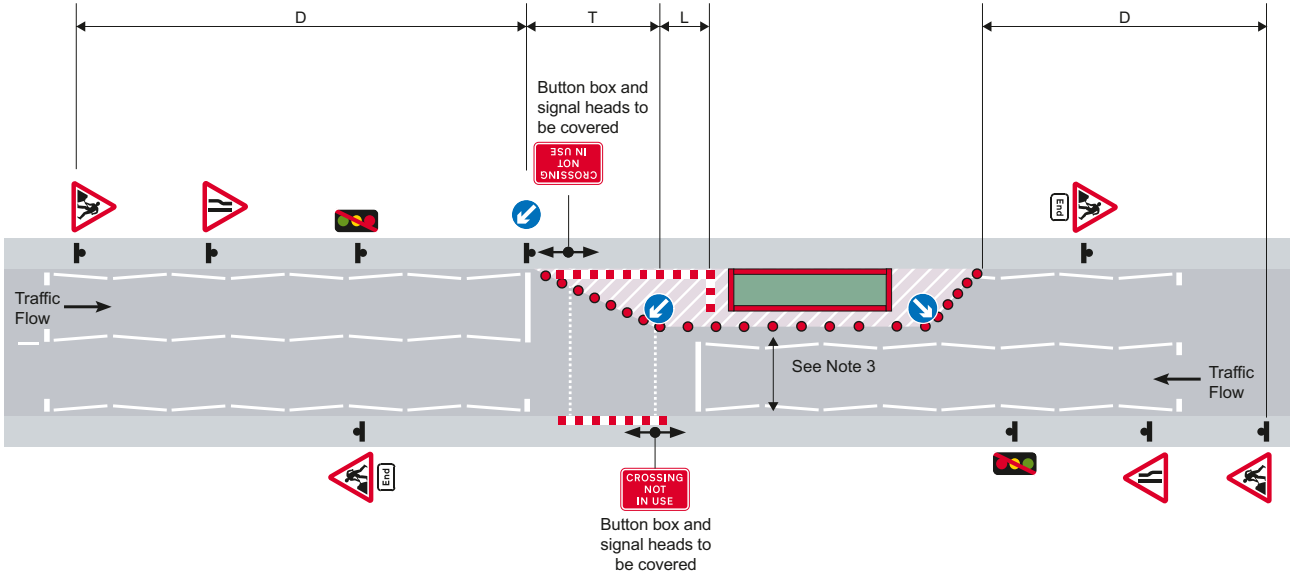
Works at pedestrian, cycle (Toucan) and equestrian crossings

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

If a pedestrian, cycle (Toucan) or equestrian crossing has to be suspended owing to works (see illustration on page 51), you must:

- ensure the suspension has been authorised by the highway authority;
- agree with the highway authority what, if any, alternative arrangements will be provided for users of the crossing prior to suspension;
- ensure 'Crossing not in use' signs have been erected;
- ensure Zebra crossing 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 for visually 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.

Works obstructing a signal controlled pedestrian crossing



Similar arrangements should be made for cycle crossings

Notes

1 For numbers and minimum size of cones, and dimensions D, T and L, see table inside back cover.

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

3 See page 52 for guidance on unobstructed width past the works.

Works in a bus lane

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

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 authority before work commences. For emergency works, consult your supervisor, manager or other competent person.

Traffic control

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

Unobstructed widths

The following table 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 must be provided wherever practicable. Where this is not practicable and where your risk assessment concludes that it is appropriate to do so, restricted lane widths are permissible.

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 authority and bus operator. In these circumstances you must consult your supervisor, manager or other competent person who will advise the relevant highway authority to facilitate co-ordination of the works.

The desirable width for shuttle working with normal traffic (i.e. including buses and HGVs) lies between 3.25 and 3.5 m. This range avoids certain widths that create opportunities for unsafe overtaking of cyclists, and is based on Department for Transport guidance. (Research found that for

widths between 2.75 and 3.25 m, most cars could overtake cyclists, but with reduced safety. Similarly, it found that for widths between 3.5 and 3.75 m it was possible for HGVs to overtake cyclists, but again with reduced safety.)

Consideration must be given to this before deciding to use widths other than 3.25–3.50 m for normal traffic in shuttle working. Where shuttle working is restricted to cars and light vehicles only, the upper bound of 3.50 m (which is aimed at preventing HGVs from overtaking cyclists) is not relevant, and a desirable minimum only is given.

	Standard: Normal traffic including buses and HGVs	**Restricted: Cars and light vehicles only**
Two-way working	6.75 m minimum	5.5 m minimum
Shuttle working	3.25–3.50 m desirable width range 3.0 m absolute minimum	3.25 m desirable minimum width 2.5 m absolute minimum

Warning: Where the minimum width cannot be met, your supervisor, manager or other competent person must consult the highway authority.

Choice of traffic control method

The table beginning on page 54 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 must be complied with.

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

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 page 57
Priority	60	80 m maximum	42 vehicles over 3 minutes	Signing as per page 59. Supplementary 'End' plates needed if over 50 m
Positive				
Stop/Go boards	60	Up to 100 m	70 vehicles/3 mins	Signing as per page 61. Consult your supervisor, manager or other competent person if greater than 500 m or near a railway level crossing. See also pages 77 to 80.
		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 authority permission needed. Signing as per page 65 Consult your supervisor, manager or other competent person if at or near a railway level crossing. See also pages 77 to 80.

Method	Max speed limit (mph)	Coned area length	Traffic flow (maximum)	Notes
Speed reduction	60	N/A	N/A	See page 67.
Convoy working	Temporary limit of 10 mph	N/A	N/A	See convoy working page 68.
Road closure or one-way traffic	60	N/A	N/A	See pages 70 and 71.
'Stop – works' sign	60	N/A	N/A	Max period – 2 mins. See page 72.
'Temporary obstruction' sign	60	N/A	N/A	Max period – 15 mins. See page 73.

Setting up traffic control

Before setting up any traffic control, a risk assessment must be undertaken. Where a positive traffic control method is chosen, notification must be given to the relevant highway authority. For the use of portable traffic signals, **prior permission** is required from the relevant highway authority. However, in the case of immediate works (as defined in the *Code of Practice for the Co-ordination of Street Works and Works for Road Purposes and Related Matters*), the authority must be informed at the time and an application submitted at the earliest opportunity (but not later than 10 am the next working day).

Warning: When setting up any form of traffic control, the operative must be aware of their own and other road users' safety.

Traffic control near railway level crossings

Extreme care must be taken to ensure that stationary traffic **never** tails back across a railway level crossing when street works or road works are being carried out. See page 79 for further details.

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.

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 may be the case, the highway authority must be consulted.

In these circumstances it might 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, as appropriate, must be agreed with the highway authority and put in place.

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

Traffic control by 'give and take'

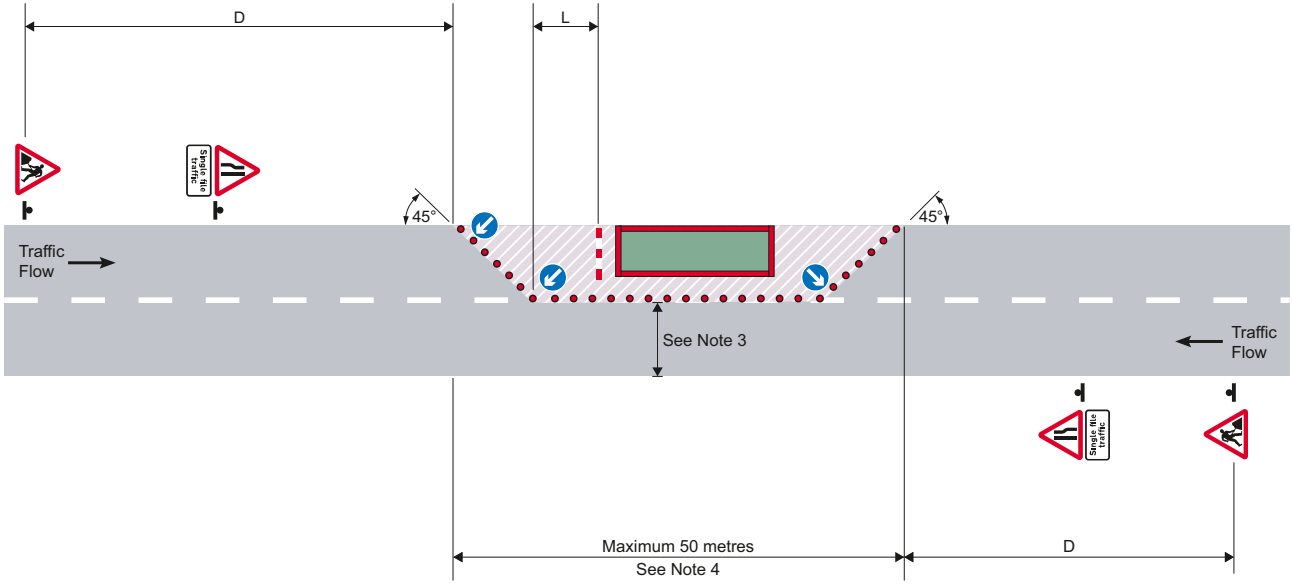
You can use 'give and take' only when **all** of the following apply:

- 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 below.

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 dimensions D and L, see table inside back cover.

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

3 See page 52 for guidance on unobstructed width past the works.

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

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.

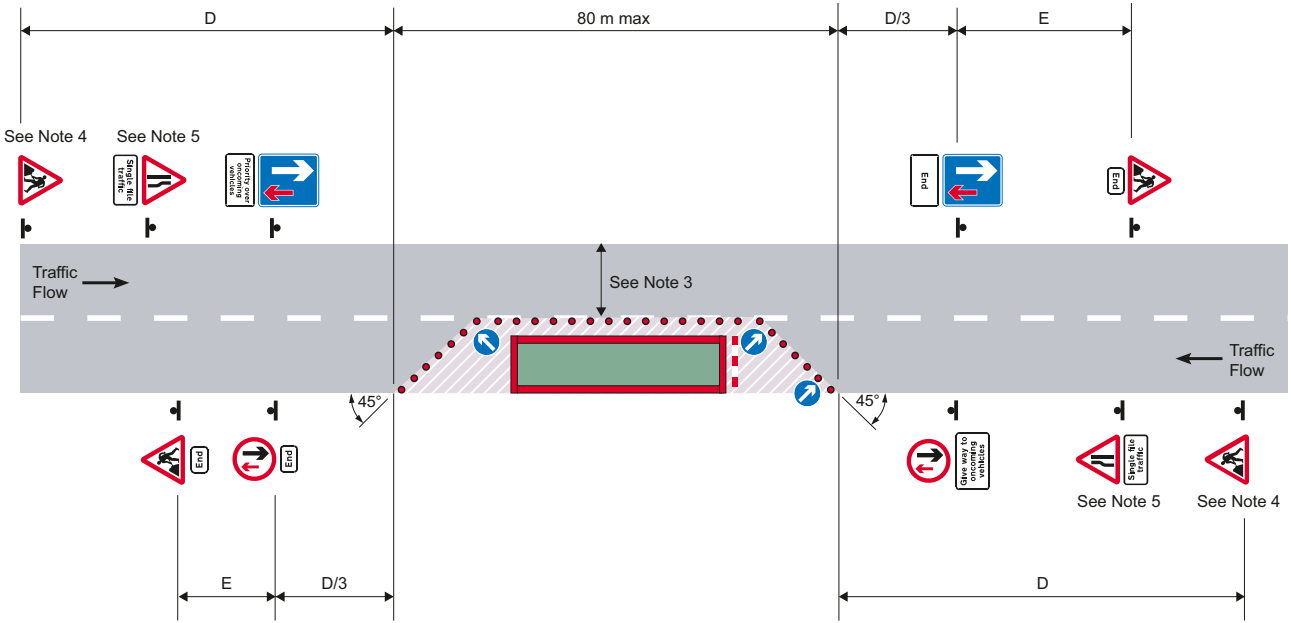
Speed limit of road	Visibility before and beyond works
30 mph or less	60 m
40 mph	70 m
50 mph	80 m
60 mph	100 m

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' roundel in conjunction with a supplementary 'End' plate should be considered 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. Use of this sign combination can also be considered 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 page 59).

Traffic control by priority signs



Notes

1 For numbers and minimum size of cones, and dimensions D and E, see table inside back cover.

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

3 See page 52 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.

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

Traffic control by Stop/Go boards

Remotely controlled Stop/Go boards should be used where possible. When these boards are used, **all** the following conditions must be met:

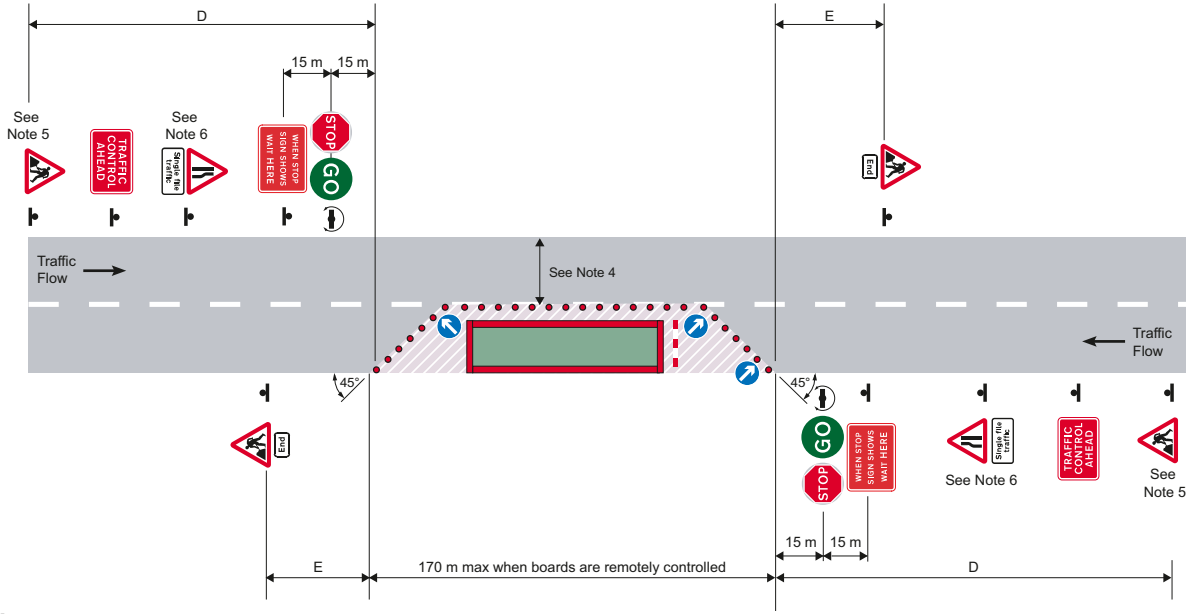
- length of the coned area is no more than 170 metres;
- use of the boards is restricted to daylight hours;
- an unobstructed view of both approaches is maintained;
- the operative is less than 100 metres from both boards; and
- traffic flow is less than 850 veh/h.

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

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

The signing you will need is shown on page 61.

Traffic control by Stop/Go boards



Notes

1 For numbers and minimum size of cones, and dimensions D and E, see table inside back cover.

2 An information board (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 page 52 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.

Manually rotated boards should only be used 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. They can also be used if a risk assessment has determined that remotely operated boards are not appropriate. The reasons for not using remotely operated boards should be documented.

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 must 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 must be used. When manually rotated boards are in use at night, they must be directly illuminated uniformly across the sign face. Partial illumination is not permitted, nor is intermittent illumination. Stop/Go boards must not be used where there is an uncontrolled junction joining the shuttle lane.

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

Traffic control by portable traffic signals

The use of portable 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 *An Introduction to the Use of Portable Vehicular Signals,* commonly known as the 'Pink Book', and in Traffic Advisory Leaflet 2/11: *Portable traffic signals for the control of vehicular traffic*. Guidance on portable pedestrian

facilities can be found in Traffic Advisory Leaflet 3/11: *Signal-controlled pedestrian facilities at portable traffic signals.*

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, manager or other competent person must contact the railway owner or tramway operator when works requiring portable signals are to take place at or near a level crossing, or where traffic queues could affect a level crossing.

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

- the site length (first cone to last cone) does not exceed 300 metres;
- they are vehicle-actuated (unless otherwise instructed by the highway authority);
- the equipment is type approved for use on the highway;
- Stop/Go boards are available on site in case of signal failure; and
- the highway authority has given written permission for their use (for emergency works, it is permitted to use the portable traffic signals and seek permission retrospectively as soon as possible).

When using two-way portable signals to control traffic, you **must** consider the following:

- the speed of the traffic. If these signals are to be used on roads where the 85th percentile speed is 35 mph or more, speed reducing measures should be considered on the approach;
- the position of bus stops and parking bays;
- the position of pedestrian crossings, either signal-controlled or Zebra;
- the location of existing traffic controls, junctions and roundabouts that could affect or be affected by traffic flow beyond the works;
- the 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;
- the potential for the shuttle section to become blocked by stationary traffic; and
- the potential for the waiting traffic to block any level crossing (see page 79).

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 might require the use of more than one signal head on each approach.

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 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 must be able to see the front vehicle in both queues of traffic for the shuttle lane.

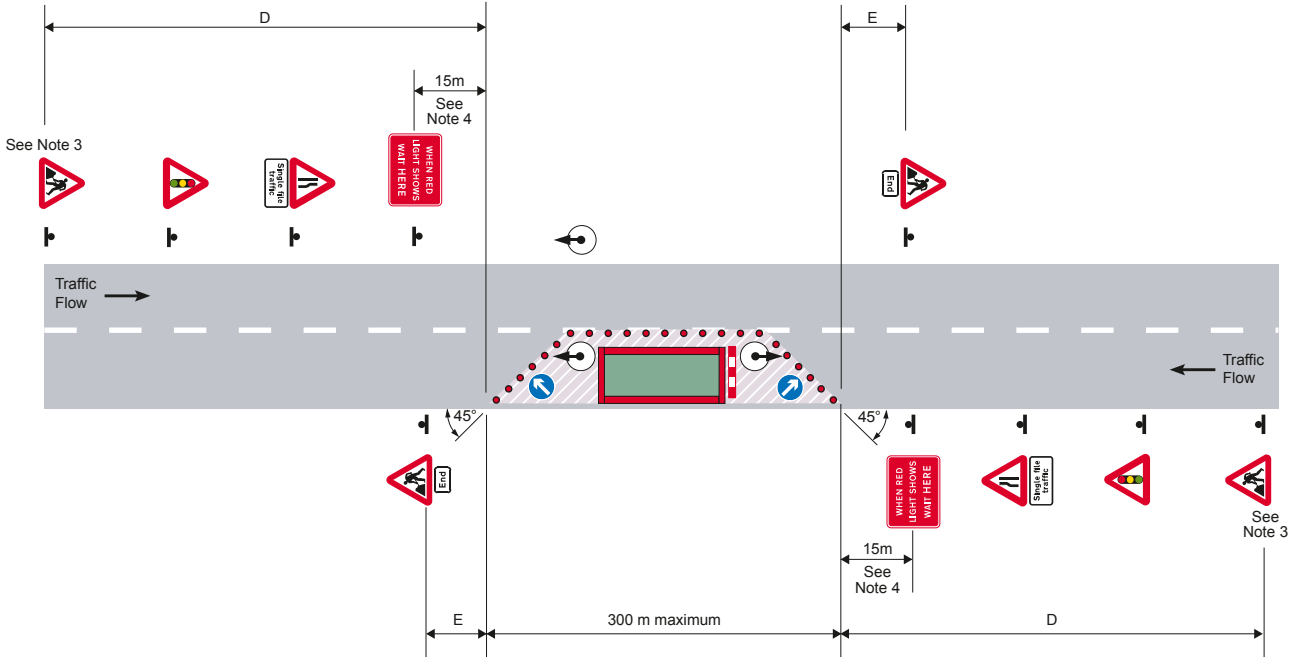
Three-way and four-way traffic control (multi-phase)

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 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:

- site length (first cone to last cone) does not exceed 300 metres;
- they are vehicle-actuated (unless otherwise instructed by the highway authority); and
- the equipment is type-approved for use on the highway.

Traffic control by portable traffic signals



Notes

1 For numbers and minimum size of cones, and dimensions D and E, see table inside back cover.

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

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

4 This distance may have to be increased in some cases to allow larger vehicles to pass the works.

When using three-way and four-way portable signals to control traffic, you **must** consider:

- the speed of the traffic. If these signals are to be used on roads where the 85th percentile speed is 35 mph or more, speed-reducing measures should be considered on the approach;
- the potential for the exit from the shuttle section to become blocked by stationary traffic;
- the position of bus stops and parking bays;
- the position of pedestrian crossings, either signal-controlled or Zebra;
- the location of existing traffic control, junctions and roundabouts that could affect traffic flow beyond the works;
- the needs of cyclists and other vulnerable road users; and
- the potential for waiting traffic to block any level crossing (see page 79).

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 might require the use of more than one signal head on each approach.

Installation and commissioning

For advice on setting up and adjusting the timings of portable traffic lights, see *An Introduction to the Use of Portable Vehicular Signals* (the 'Pink Book').

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.

In most cases, portable signals should be vehicle-actuated. Manual control of the signals should only be used to stop traffic if the shuttle lane has to be occupied for short periods (e.g. for unloading), or in other permitted circumstances.

Many 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.

You must have Stop/Go boards available on site in case the portable traffic signals break down. An emergency contact telephone number for the traffic signal provider should be displayed on site.

The signing you will need is shown on page 65.

Traffic control and 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.

Reduction of speed limit

Any reduction in speed limit must be supported by a Temporary Traffic Regulation Order.

Caution: To proceed with this option, your supervisor, manager or other competent person must consult the highway authority at the earliest opportunity. Where a temporary Traffic Regulation Order is required, sufficient advance notice must be given to the highway authority to enable proper application. 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.

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. At least one chicane in each direction is required. The chicanes should be just large enough to allow a large vehicle to pass through slowly. Traffic must first be brought to a halt by positive traffic control and then released in small batches by careful use of Stop/Go boards or manually controlled portable traffic signals. Where it is not practical to provide a chicane in one direction, for example because there is a junction, an alternative traffic management arrangement should be used in that direction to ensure that traffic speeds are reduced to less than 10 mph, for example convoy working.

Warning: The planning, installation and operation of a chicane system must be undertaken by appropriately competent personnel.

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 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 must 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 highway users must be conducted in order to determine whether this system is appropriate for the particular task and location.

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 is considered necessary to ensure traffic speeds are low.

Planning for convoy working

The planning should include:

- early liaison with the highway authority. If the speed limit is to be reduced, a Temporary Traffic Regulation Order will be required;
- 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 authority.

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 can only be considered 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.

A risk assessment must be carried out on any diversion route to ensure it is suitable and safe for the diverted traffic or pedestrians.

Temporary closure of a carriageway to traffic

If it is necessary to close a road to vehicular traffic, the approval of the highway authority must be obtained. A Temporary Traffic Regulation Order or Notice will be required, and sufficient notice must be given to the highway 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.

Every effort should be made to maintain pedestrian access past the works and to maintain vehicular access to all properties and premises within the closure area. 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 width of the cycle track is 2.5 metres but 3 metres is preferable.

Where cycle flow is light, and/or give-and-take working operates, it might be acceptable to reduce the width to 1.2 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, so you will need to discuss this in advance with the highway authority.

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 considered 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 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: A risk assessment must be carried out on the diversion route to ensure it is suitable and safe for the diverted traffic.

Planning for a road closure

The planning should include:

- co-ordination with highway 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, manager, or other competent person should consult the highway authority at the earliest opportunity.

Temporary closure of a 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 will be required. Refer to page 28 for further guidance. A traffic regulation order is not normally required to temporarily close a footway.

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.

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 must only be used at sites where the risk is assessed as being low.

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 page 93). 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.

Only use the 'Stop – works' sign when **all** the following apply:

- the road is single carriageway;
- the stoppage is for a maximum period of 2 minutes;
- its use is restricted to once in any 15 minutes; 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 must 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 inside back cover for the siting distances for these signs.

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;
- the highway 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, and there is at least one hour between such delays;
- the 'Temporary obstruction' sign is placed within sight of the obstruction; and
- the 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, manager or other competent person and an on-site risk assessment has been undertaken. It is an offence under section 137 Highways Act 1980 to obstruct the highway without lawful excuse.

The use of the 'Temporary obstruction' sign requires authorisation for use in Scotland and Wales. In addition, temporary traffic regulation orders, temporary traffic regulation notices or temporary traffic regulations (as appropriate) are required to temporarily obstruct roads in Scotland, Wales and Northern Ireland.

Tramways and railways

Working near tramways

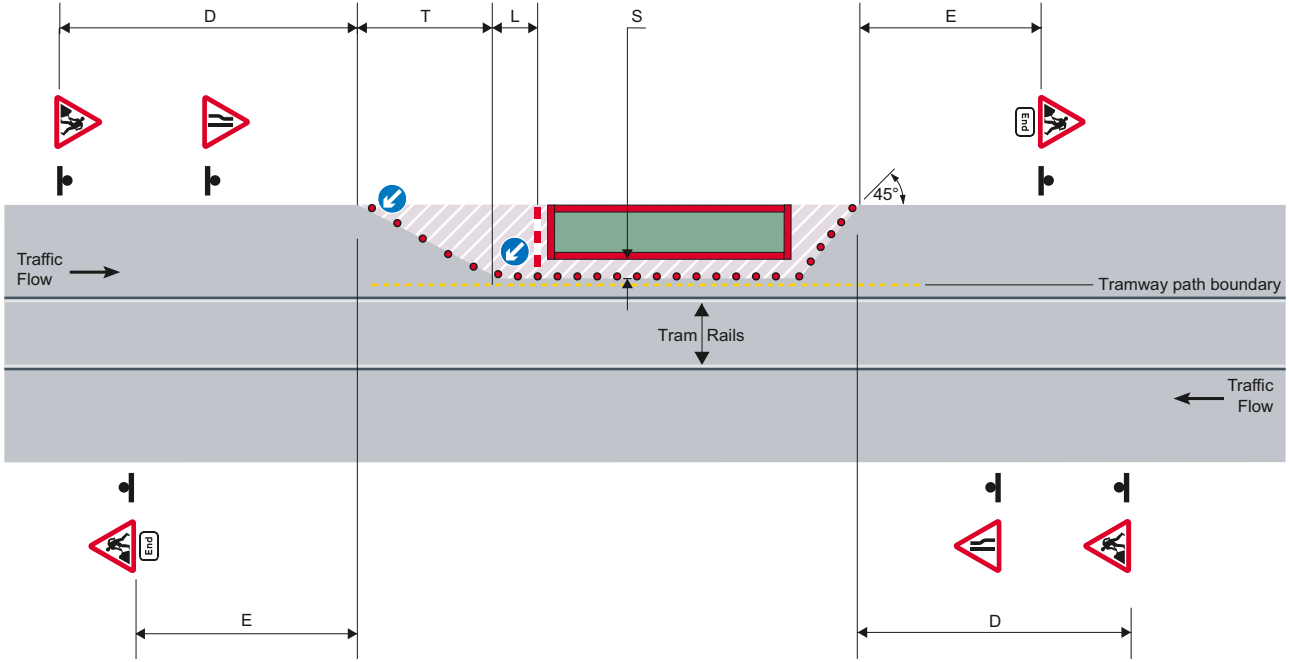
Streets with tramways should be identified before works begin, and the job instructions must contain the special safety precautions to be taken when works are to be carried out near a tramway.

Warning: Before carrying out works in a street with a tramway, the tramway operator and highway authority must be consulted. The tramway operator will set out safety requirements to ensure safe working and to minimise the impact of works on operation of the tramway. These requirements must be followed.

Those planning the works should ensure that:

- the method of carrying out works in the part of the street containing the tramway is acceptable to the tramway operator;
- the works plan and sections have been approved by the tramway operator, if appropriate; and
- the supervisor, manager or other competent person arranges for the works to be carried out in accordance with the approved plan and sections. These drawings should be available on site while work is in progress.

Works next to tramways



Notes

1 For numbers and minimum size of cones, and dimensions D, T, L, S and E, see table inside back cover.

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

Some tramway operators have developed standard conditions for work being carried out close to a tramway. These may include a requirement to obtain a permit to work from them that will set out the times when work close to the tramway may be undertaken, and the safety precautions that need to be followed.

If the works are emergency works and police are in attendance, you should take your instructions from the police. They will liaise with the tramway operator and advise you when it is safe to start the works. Otherwise you **must** contact the tramway control centre to notify them of the need for the works. They will then advise you when it is safe to begin working.

Risk of collision with the tramcar

Unlike other traffic, a tramcar cannot swerve to avoid a person or obstruction. Tramcars are wider than the tracks on which they run. The path of a tramcar and the area adjacent to it, known as the tramway path, contains its own safety zone and must be kept clear of any obstructions. The area may be marked, for example by a line of round yellow stud markings, a painted line or a raised kerb.

It is essential that no one enters the tramway path and that nothing (for example signing and guarding equipment, vehicles, or materials) is placed there. Equally, the moving parts of plant (for example buckets or counterweights) must not swing around into this obstruction-free zone. Where the works cause the footway to be diverted into the carriageway, cones marking the traffic side of the safety zone must not be closer to the trams than the edge of the tramway path.

Where the road layout means the normal sideways clearance would intrude into the tramway path, those planning the works should discuss the possibility of reducing the safety zone with the tramway operator. Such a reduction, subject to an absolute minimum of 0.3 metres to allow for the tram's swept path, is permissible with the agreement of the tramway operator. The tramway operator may impose a speed restriction on tramcars and/or provide a lookout. The highway authority should also be consulted to see if a temporary speed restriction is needed. If this is only realised on site, then the supervisor, manager or other competent person must consult the tramway operator straight away.

Risk of electrocution

Tramway electrical supplies, consisting of overhead lines or underground cables, may be located outside the obstruction-free zone. The tramway operator's requirements will state whether the electricity needs to be disconnected before work can be carried out. Work must not begin within 3 metres of overhead lines until a certificate has been received from the tramway operator stating that the electricity has been disconnected and made safe. Similarly, the electricity cannot be reconnected until your organisation has certified that the site is clear of men and machinery (including moving parts of machinery, for example the bucket on an excavator) within 3 metres of the overhead line. Your supervisor, manager or other competent person, will find out how close to the tramway you can safely work while the electricity is still connected.

No equipment, plant, vehicles, etc. should be brought within 3 metres of the overhead lines, unless specifically permitted by the tramway operator.

Underground cables should be dealt with using standard safe digging practices.

Tramway crossings

Where works are to be carried out close to where a tramway crosses the street, traffic must not be caused to stop on the tramway. The advice given in relation to railway level crossings (below) should be adopted where appropriate.

The tramway operator must be consulted prior to works on or near the tramway that require altering the phases, timings or switching off road traffic signals that are connected to tramway signals.

Works at or near railway level crossings

Network Rail and Northern Ireland Railways Co. Ltd are transport 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.

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 approximately 3 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 that are usually found on private roads such as through farmland or industrial estates. They have barriers and miniature red and green lights, and the red light is activated by approaching trains. Users open the barrier themselves, following instructions on the signs.
- Open level crossings that have neither gates nor barriers. They rely on traffic signs to warn drivers of the crossing. Some open level crossings have wig-wag signals, like automatic crossings.

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 200m or less.

This information is provided by Network Rail for inclusion in either the National Street Gazetteer or the Scottish Road Works register. Works planned by any promoter within the precautionary area of a level crossing must be advised to either Network Rail's Asset Protection Engineer or Northern Ireland Railway's Third Party Works Engineer at least one month in advance (further in advance if possible) of serving the initial notice, permit application or provisional advance authorisation where a permit scheme is in force. The supervisor, manager or other competent person should check with the the works promoter that this has taken place and obtain details of the result of the consultation.

Extreme care must be taken to avoid stationary traffic tailing back across a railway level crossing when street works or road works are being carried out at or near a crossing. Particular attention must be paid to situations where works might cause traffic to tail back over the crossing as a result of long traffic delays, even though they could be a considerable distance from the crossing.

If it is necessary to carry out emergency works near a level crossing, the following must be done before works begin:

- at automatic half-barrier level crossings and most automatic open crossings, use the emergency telephones to inform the railway employee monitoring the crossing; and
- at manually-operated or CCTV controlled level crossings the railway employee controlling the crossing is to be informed directly or by telephone as appropriate.

In either case works **must not begin** until the railway authority advises it is safe to do so.

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

Detailed advice on carrying out works on or near railway level crossings is given in the *Code of Practice for the Co-ordination of Street Works and Works for Road Purposes* that applies in each part of the UK. An example layout for works is shown on page 80.

Works over and under railways

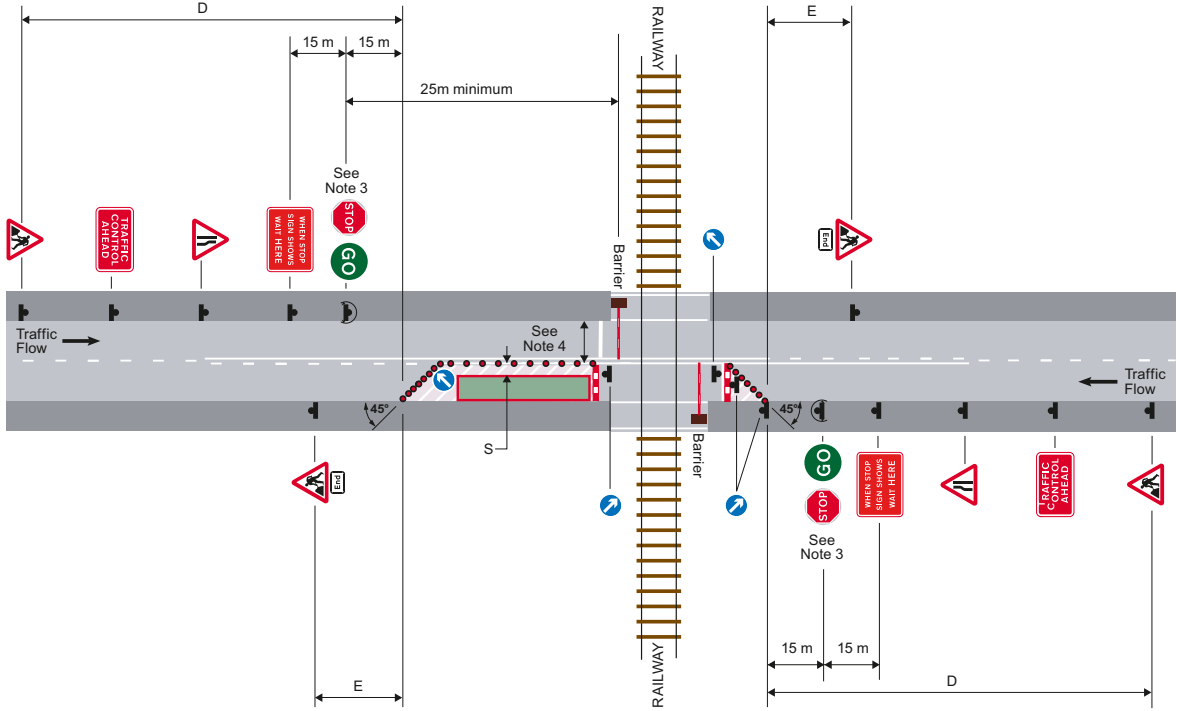
Works planned by any promoter on a road over rail, or under a rail over road bridge must be advised to Network Rail's Outside Party Engineer no later than one month in advance of serving the initial notice. The supervisor, manager or other competent person should check with the works promoter that this has taken place and obtain details of the results of the consultation.

Works adjacent to railways

Care must be taken when positioning portable traffic signals near railways because they could be mistaken for railway signals. Where works require portable signals, the highway authority must give prior approval.

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

Works at a level crossing using Stop/Go boards



Notes

1 For numbers and minimum size of cones, and dimensions D, T, C, S and E, see table inside back cover.

2 An information board (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 page 52 for guidance on unobstructed width past the works.

Checking and maintaining sites

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 dirty:

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

Unattended sites (England, Wales and Northern Ireland)

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, manager or other competent person to discuss when the site should next be visited.

The level of risk may be affected by the following:

- how busy the road and/or footway is during the hours the site is unattended, e.g. consider whether the site is near:
  - high-volume pedestrian areas;
  - pubs and clubs;
  - 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.

Unattended sites (Scotland)

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

Sites meeting the following criteria must be checked at least once every 24 hour period:

- traffic-sensitive roads;
- sites where the carriageway or footway is likely to be busy, including:
  - high-volume pedestrian areas;
  - pubs and clubs;
  - schools and colleges;
  - commuter routes and traffic-sensitive areas;
  - sports grounds and concert venues;
- sites where vandalism is found to be a problem;
- when adverse weather conditions, particularly high winds, are forecast;
- sites containing risks, including:
  - deep excavations;
  - exposed services;
  - trench crossings;

  - plant and machinery;
  - portable traffic signals;
- when pedestrian crossing, footway or road closures are present; and
- when results of previous checks indicate problems

This minimum level of checking must be increased if required by the level of assessed risk.

Any problems must be dealt with immediately upon discovery.

Removing the works

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 must 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 may form a trip hazard, and members of the public may pick them up again, thinking they have been knocked over.

Mobile works and short-duration works

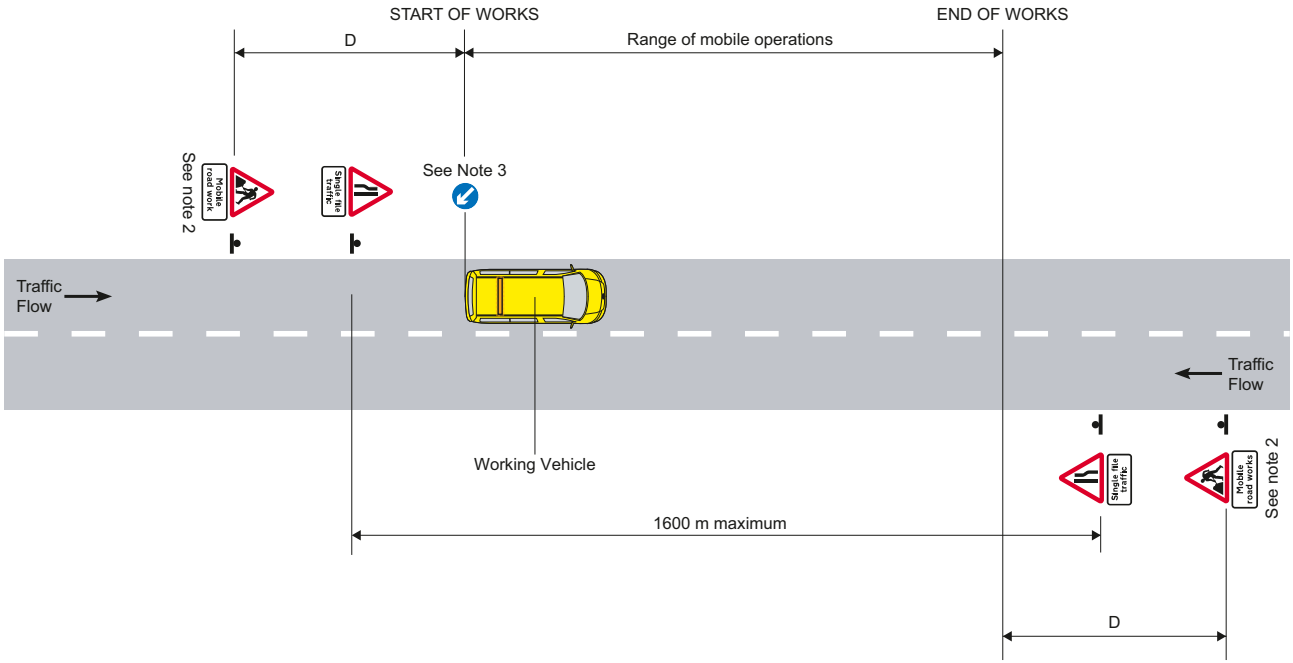
Mobile works

Mobile works are carried out 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.

Short-duration works

Short-duration works involve a single vehicle or a small number of vehicles undertaking one or more intermittent stops of:

Mobile works on a single carriageway road



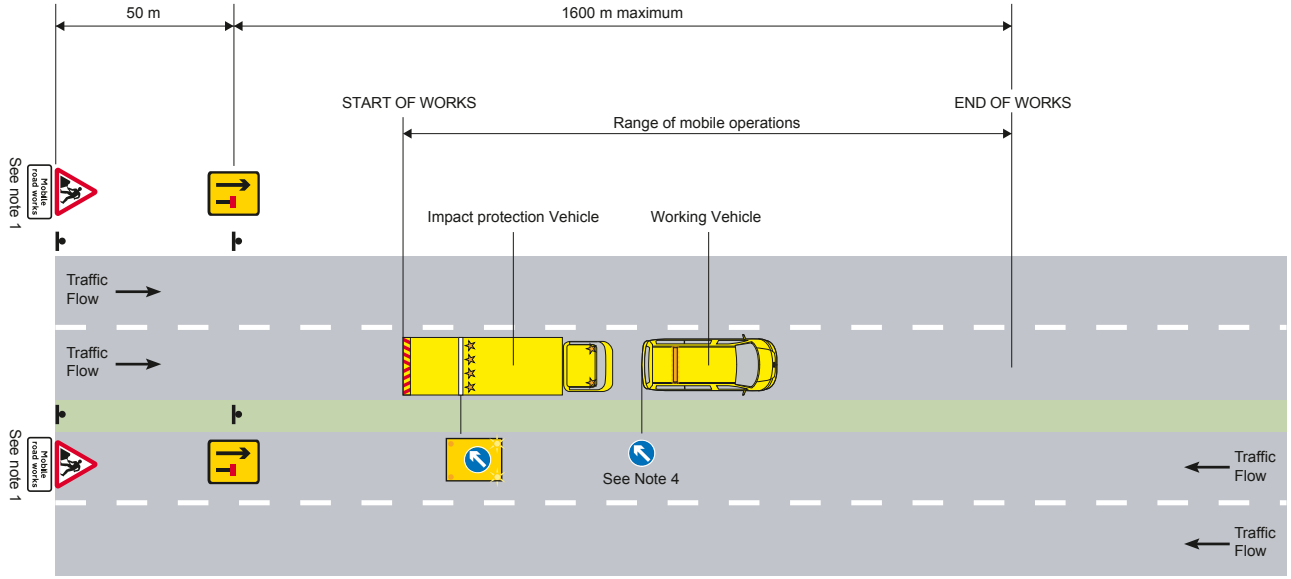
Notes

1 For dimension D see table inside back cover.

2 Or permitted variants.

3 The keep right arrow shown on the rear of the vehicle is only appropriate for a speed limit of 30 mph or less. For higher speed limits, a diagram 7403 sign or a light arrow is required.

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



Notes

1 Or permitted variants.

2 The need to place signs in the central reservation must be assessed before you proceed and you should consult your supervisor, manager 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 If the speed limit is 40 mph and an impact protection vehicle is not used, a diagram 7403 sign or a light arrow is required on the working vehicle.

- up to 15 minutes – could be used for activities such as street light maintenance, pole testing, road markings, compliance testing, jetting of sewers, jet or velocity patching, etc; or
- between 15 and 60 minutes (**between 15 and 30 minutes in Scotland**) – could be used for activities such as pothole repairs, leak detection, fault finding, tree cutting or felling, installation of traffic loops, coring. This time period must include all time needed to set up and dismantle signing, lighting and guarding.

For signing of short-duration works, see pages 87 to 90.

Works involving stops that are expected to last more than 60 minutes (30 minutes in Scotland) must 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.

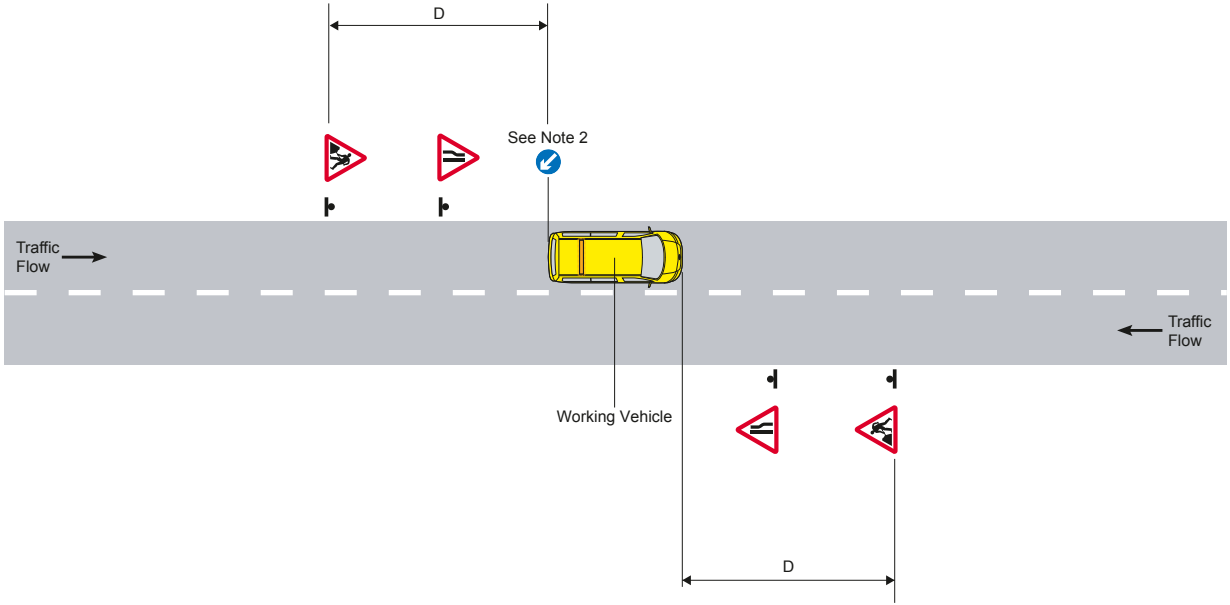
Caution: Mobile and short-duration static works should only be carried out when there is good visibility and during periods of low risk. Consult your supervisor, manager or other competent person if work is to take place in the centre of the carriageway with traffic passing on both sides.

Risk assessment

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

Operatives carrying out the works should 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.

Short duration stops less than 15 minutes on a single carriageway road

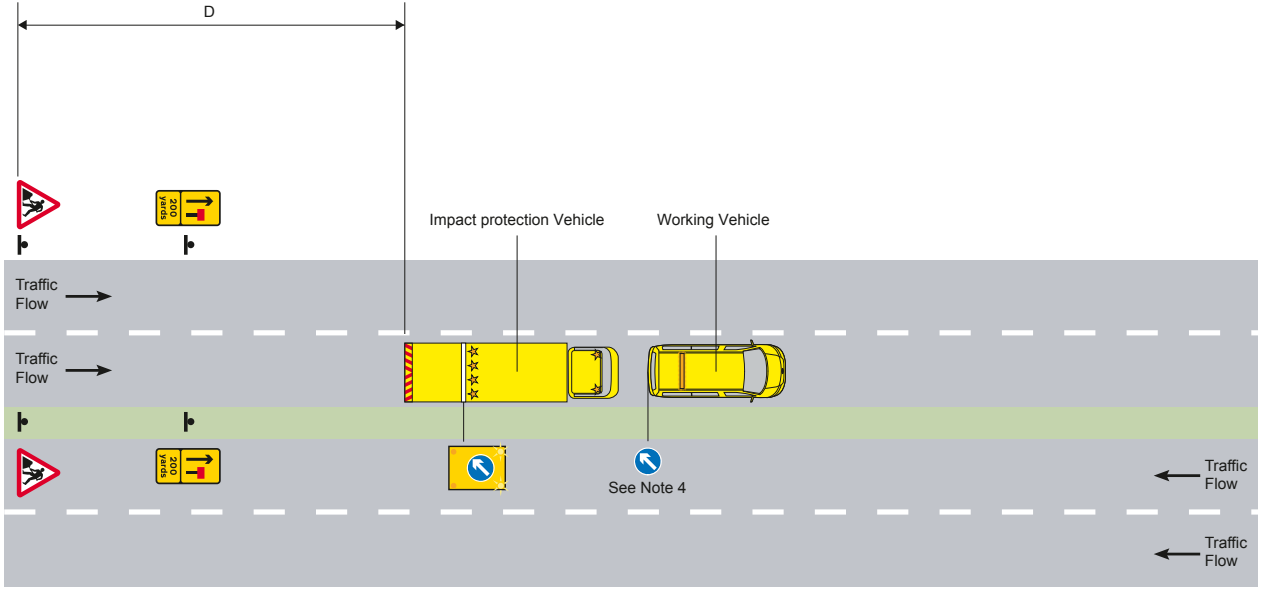


Notes

1 For dimension D, see table inside back cover.

2 The keep right arrow shown on the rear of the vehicle is only appropriate for a speed limit of 30 mph or less. For higher speed limits, a diagram 7403 sign or a light arrow is required.

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



Notes

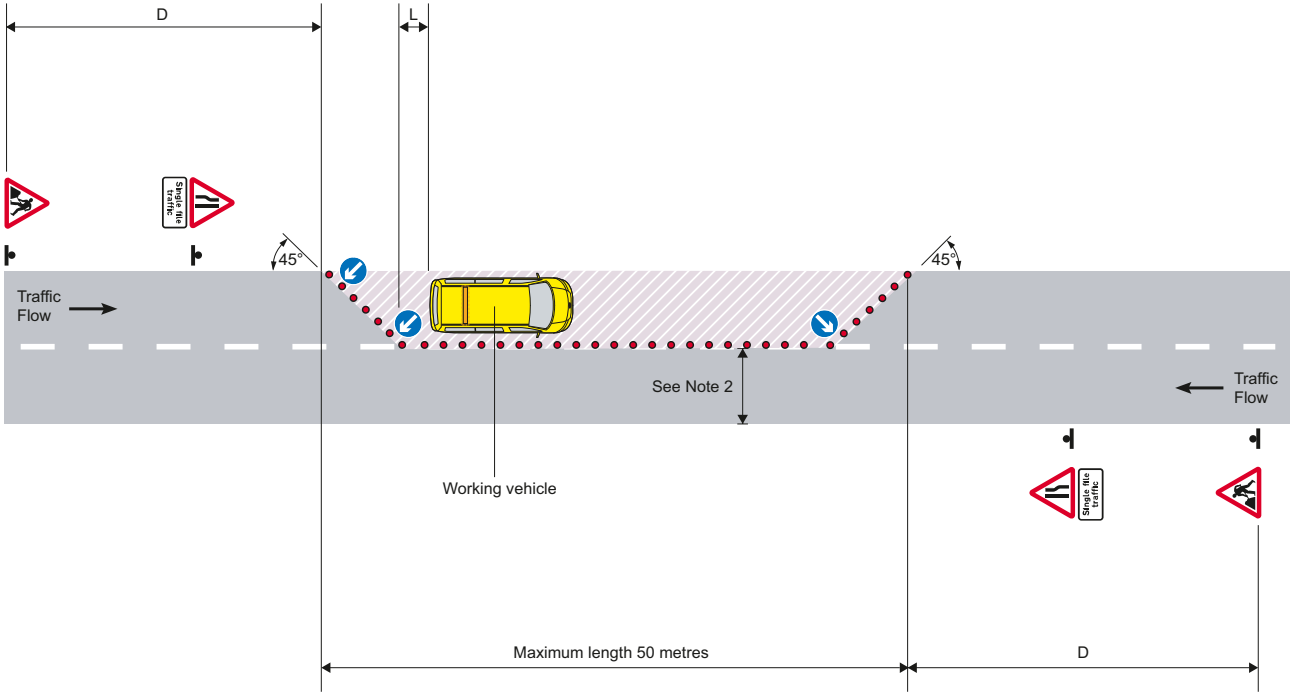
1 For dimension D, see table inside back cover – dimension D = 275 m (300 yds) in this example.

2 The need to place signs in the central reservation must be assessed before you proceed and you should consult your supervisor, manager 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 If the speed limit is 40 mph and an impact protection vehicle is not used, a diagram 7403 sign or a light arrow is required on the working vehicle.

Short duration stops more than 15 minutes on a single carriageway road

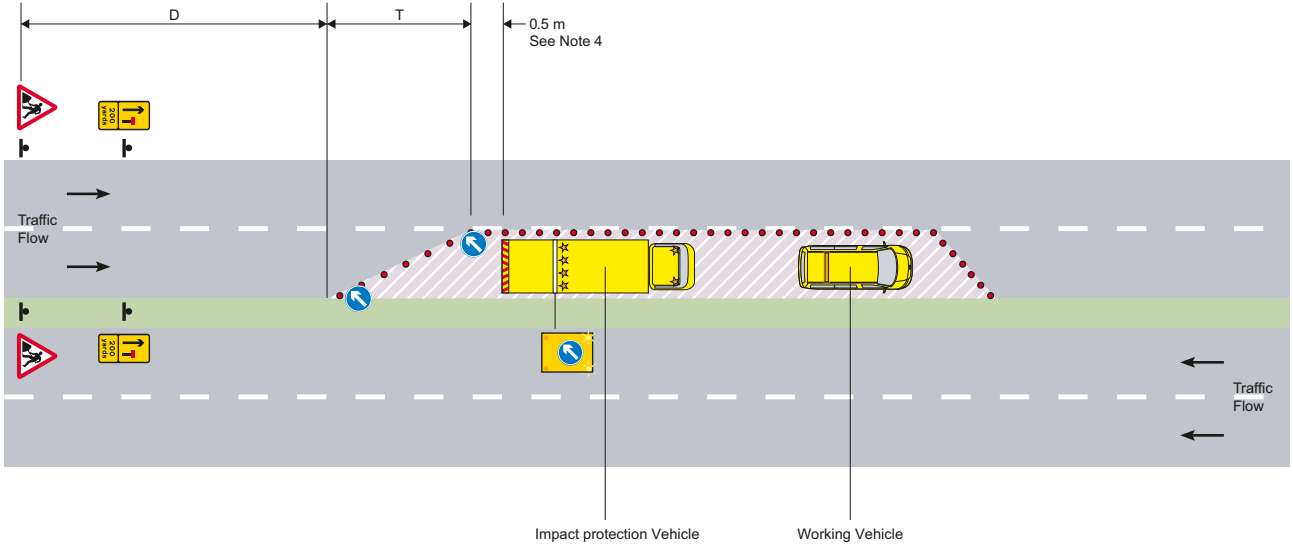


Notes

1 For dimensions D and L see table inside back cover.

2 See page 52 for guidance on unobstructed width past the works.

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



Notes

1 For dimensions D, T and L, see table inside back cover – dimension D = 275 m (300 yds) in this example.

2 The need to place signs in the central reservation must be assessed before you proceed and you should consult your supervisor, manager 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 m 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.

Some very short duration works may be undertaken without the use of static signs and cones provided that a site specific risk assessment demonstrates minimal obstruction to traffic flows and a low risk to operatives and road users. An example might be the use of a gully emptying lorry on a single carriageway road where traffic can pass safely and without difficulty, and where operatives tend to work off the carriageway.

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 pages 85, 88 and 90). The risk assessment might identify the need for an impact protection vehicle on other, single carriageway roads.

The risk assessment might identify that full traffic management and a Temporary Traffic Regulation Order reducing the speed limit is 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.

Vehicle requirements

When you are carrying out mobile or short-duration works, the vehicle **must be conspicuous**: high visibility rear chevron markings are strongly recommended in England, Scotland and NI, and compulsory in Wales (see page 100).

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

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.

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.

Signing

Warning: If the requirements for mobile or short-duration works are not met, you must use full standard signing, lighting and guarding.

Signing requirements: Mobile works
As shown on pages 84 and 85, and 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); • 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.

Signing requirements: Short-duration works	
Stop less than 15 mins	As shown on pages 87 and 88.
15 to 60 mins (15 to 30 mins in Scotland)	As shown on pages 89 and 90.
Over 60 mins (over 30 mins in Scotland)	**WARNING:** This is not short-duration work, and signing, lighting and guarding for a fixed site must be provided.

High visibility clothing

High visibility clothing must conform to BS EN 471:2003 and A1:2007. 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.

High visibility clothing (England, Scotland and Northern Ireland)

The standard of high visibility clothing required should be determined by a risk assessment. In most circumstances, an adequate assessment is likely to indicate a requirement for:

- a jacket with a minimum amount of visible material complying with Class 3 (Table 1, BS EN 471) for work outside the working space; and
- retroreflective material with performance at least complying with Level 2 (Table 4, BS EN 471) for work during the hours of darkness.

High visibility clothing (Wales)

The standard of high visibility clothing must comply with Class 3 (Table1, BS EN 471). High visibility clothing must have full length sleeves meeting the requirements of paragraph 4.2.4, BS EN 471, combined with retroreflective material with performance at least complying with Level 2 (Table 4, BS EN 471).

This requirement may be varied to three-quarter-length sleeves where a risk assessment shows full-length sleeves would present increased risk due to the activity being undertaken.

Signs and cones

The size shape and style of all signs, including traffic cones, must comply with Traffic Signs Regulations and General Directions or, in Northern Ireland, the Traffic Signs Regulations (NI). In Wales and some areas of Scotland the signs should be bilingual. The standard of reflectorisation

must be in accordance with BS EN 12899 and be of the correct class for the speed of road on which it is to be used. The retroreflective sleeves of cones must be kept clean. Damaged sleeves or cones must not be used.

In Wales, 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 may 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, manager or other competent person first.

Regularly check that all signs, cones and barriers are clearly visible and kept clean. Where site or traffic conditions change, appropriate adjustments should be made to signing, lighting and guarding.

Caution: Consult your supervisor, manager 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.

The lighting of signs and any supplementary plates used with them must comply with the requirements of the Traffic Signs Regulations and General Directions 2002 or, in Northern Ireland, the Traffic Signs Regulations (NI).

Road danger lamps

Road danger lamps must be no higher than 1.5 metres above the road (or 1.2 metres where the speed limit is 50 mph or more). They shall comply with National Annex to BS EN 12352. In addition, the external surface of the light body visible to road users shall be coloured lemon (colour ref. 335) or golden yellow (colour ref. 356) of BS381C:1996.

Basic signs and equipment you will need

Road works ahead

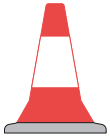
Road narrows on left-hand side ahead

Road narrows on right-hand side ahead

Keep right

Keep left

End of road works



Traffic cone

Road danger lamp

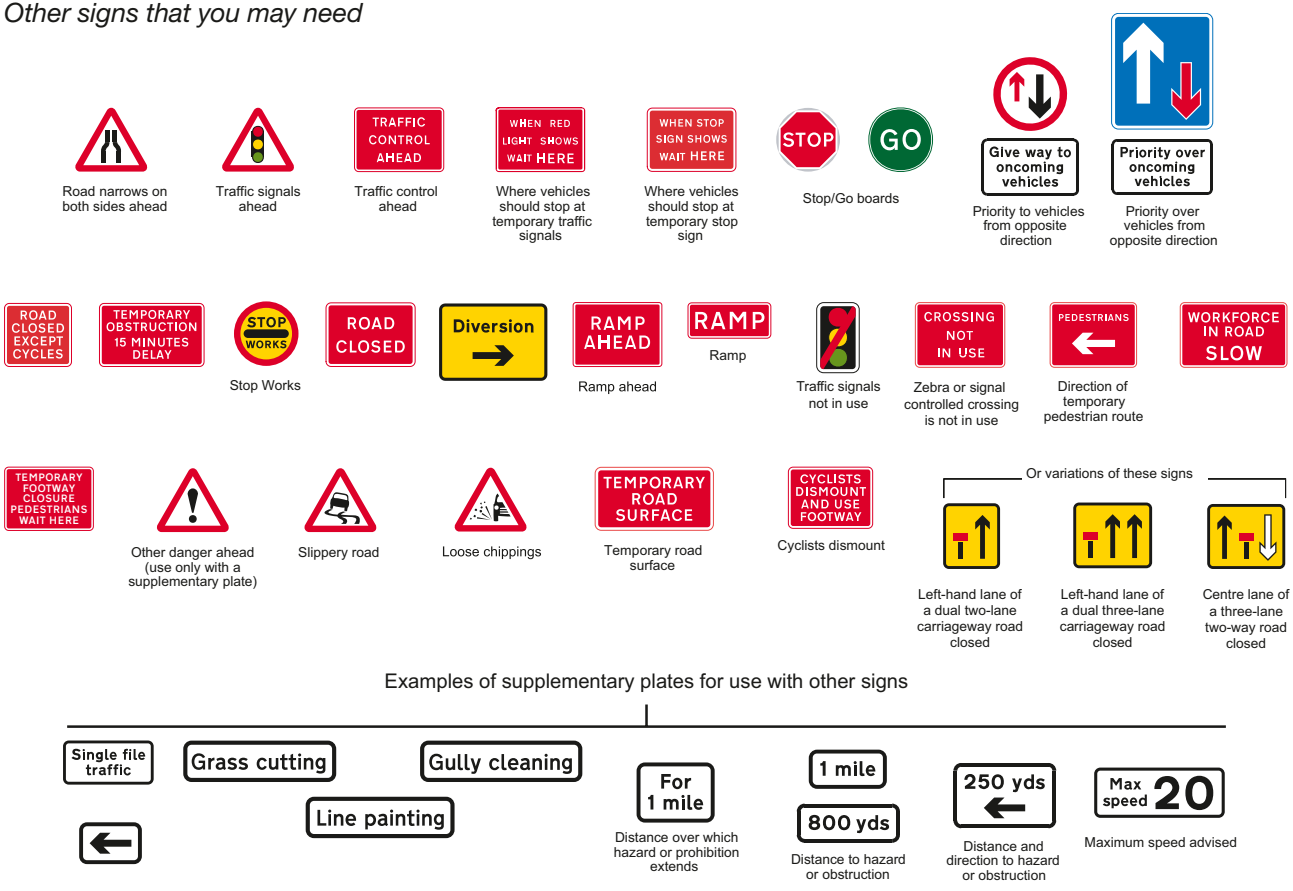
Typical pedestrian barrier with tapping rail

Typical traffic barrier

Information board

High visibility clothing

Other signs that you may need



Note

1 This figure shows some of the more common signs in use. It does not show every sign that might be required.

Type of road danger lamp	Conditions of use
Flashing light (55 to 150 flashes per minute)	Only when ALL of the following conditions apply: • the speed limit is 40 mph or less; • the road danger lamps are within 50 metres of a street light; and • the street light is illuminated.
Steady light	On any road with or without street lighting.

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, must 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 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 must take additional measures to secure the barriers, for example by the use of clamps or ties that require a tool for removal.

Wind classes are given in Table 2 of BS 8442 (2006) *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. Individual barriers or groups of barriers need to be capable of withstanding winds of Class C (8.7 m/s) blowing from any direction. This can be achieved through the use of ballast or cross-bracing if necessary.

In some circumstances, your risk assessment may determine that enhanced guarding is required – for example if the site is to be left unattended, if it is next to a busy pedestrian thoroughfare, if there are pubs, clubs, football grounds or schools nearby, or if a deep excavation is present.

Pedestrian barriers (Scotland)

From 1 April 2015 in Scotland, there is an additional requirement – where a site is unattended for a period of 24 hours or more (including weekends), individual barriers or groups of barriers need to be capable of withstanding winds of Class B (17.6 m/s) blowing from any direction.

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 scooter users to enter and exit a temporary walkway safely.

Ramps must:

- be fixed in position and at least 1 metre wide (1.2 metre wide if possible);
- be constructed from materials strong enough to support pedestrians and mobility scooter users;
- have a slip-resistant surface and edging to prevent wheelchairs etc. slipping over the edge;
- slope gently enough 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); and
- allow for rain water to run along the gutter.

Footway boards

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

Footway boards used for bridging excavations:

- must extend the full width of any temporary footway;
- must be strong enough to support pedestrians and mobility scooters and, where light vehicle access is needed, the weight of those vehicles;
- must be made from material that is unlikely to become distorted;
- must cover the whole width of any vehicle crossover;
- must have chamfered edges to prevent tripping;
- should have a slip-resistant surface;
- must be rigidly fixed with sufficient length on either side of the excavation to provide the necessary support. On non-bitumastic surfaces, the use of bitumastic material should be avoided, as the surfacing will be affected after works are completed;
- must only be used where the sides of the excavation under the boards are stable or suitably supported; and
- must be fenced to prevent falls where the edges of the boards are adjacent to an excavation.

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 might require ballasting or some other method for fixing them in place.

Road plates

Road plates may 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. Consideration may also be given to the plating of open excavations within the works area.

Road plates must 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 must be suitably supported beneath the road plates, which must be rigidly secured to the road surface. Road plates must have chamfered edges, integral ramps, be sunk into the surface or have a suitable bitumastic material to provide a ramp to the plate level. Where ramps exceed 15 mm in height, appropriate ramp warning signs should be used.

As an alternative to plating, interim reinstatement should be considered. 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, manager 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.

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.

Vehicles (England and Northern Ireland)

It is strongly recommended that any vehicle stopping on the highway for works purposes is equipped with either a roof-mounted flashing amber warning light bar (comprising at least two independent light sources) or two independent vehicle roof-mounted flashing amber warning beacons, visible through 360°.

In addition, it is strongly recommended that all vehicles stopping on the highway for works purposes or being used for mobile works are 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.

Vehicles (Scotland and Wales)

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

In addition, all vehicles stopping on the highway for works purposes or being used for mobile works shall 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

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

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.

Minor works – works with a planned duration of three days of 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 crossing for a distance of 200 m or less.

Safety zone – additional space around the working space to ensure the safety of the workforce and highway users.

Short-duration static works – works carried out at one or more intermittent stops, each lasting less than 60 minutes (30 minutes in Scotland).

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

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

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

Wig-wag signals – light signals (to diagram 3014) used to control traffic at level crossings, swing bridges, etc.

Index

List of figures

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 lamps	3	3	5	6	8	9	11			
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 lamps	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 lamps	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 lamps	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 or more
C Clearance to works vehicle	2	5

Notes

1 The minimum height of cones is 450 mm for roads covered by this Code.

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

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

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 19).

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.

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