

SA Standards

for Workzone Traffic Management

Version 7.2 - 2023



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Section 1: Introduction

This document has been produced by the Department for Infrastructure and Transport (DIT) and complies with the South Australian *Road Traffic Act, 1961*, Australian Standard *AS 1742.3 Part 3: Traffic Control for Works on Roads*. It is the standard for the workzone traffic management industry for works on or near a road in South Australia. It is also a reference document for the workzone traffic management industry participants attending the Workzone Traffic Management training course.

Please note, this document may not cover all instances and therefore you will need to refer to *AS 1742.3* and Austroads *Guide to Temporary Traffic Management*, subject to any provision of the South Australian *Road Traffic Act, 1961* and Regulations.

Pursuant to the *Road Traffic Act 1961(SA)* the Minister's approval is required to install, maintain, alter, operate or remove traffic control devices on, above or near a road. The Minister has issued approval to authorities, subject to varying conditions (refer to Section 2.4). Note that one of these conditions is the successful completion of a DIT approved Workzone Traffic Management training course (refer to Section 2.6).

1.1 References

The following documents have been used to develop the *SA Standards for Workzone Traffic Management*:

- a) *Road Traffic Act 1961, (SA)* ("the Act") and Regulations
- b) Work Health Safety Act 2012 and Regulations ("WHS")
- c) DIT's Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices ("the Manual"):
 - Part 1 – Legal Responsibilities ("the Instruments")
 - Part 2 – Code of Technical Requirements ("the Code")
- d) Austroads Guide to Temporary Traffic Management ("AGTTM")
 - Part 1: Introduction
 - Part 2: Traffic Management Planning
 - Part 3: Static Worksites
 - Part 4: Mobile Works
 - Part 5: Short Term Low Impact Worksites
 - Part 6: Field Staff – Implementation and Operation
 - Part 7: Traffic Controllers

- Part 8: Processes and Procedures
 - Part 9: Sample Layouts
 - Part 10: Supporting Guidance
- e) Australian Standard AS 1742.3: Manual of Uniform Traffic Control Devices, Part 3 – Traffic Control Devices for Works on Roads
- f) DIT's Field Guide – Traffic Control Devices for Workzone Traffic Management (Field Guide)

1.2 Definitions

For the purpose of this document the following terms are used:

- Authorised officer** a) a person, or class of persons, appointed as an Authorised Officer under Section 35 of the Act; or
b) a South Australian Police Officer.
- Built-up area** Roadside development comprising property accesses at spacings averaging less than 100 m over distances of at least 500 m.
- Competent person** A person who has:
a) authority delegated by Commissioner of Highways to place, move and remove traffic control devices on or above roads in South Australia; and
b) through a combination of training, qualification and experience, acquired knowledge and skills enabling them to correctly perform a specified task.
- Day time** The daylight hours between the official times of sunrise and sunset. Refer to <https://www.sa.gov.au/topics/driving-and-transport/roads-and-traffic/sunrise-and-sunset-times>.
During these hours conditions may be so poor that there is not enough natural light for the daytime rules to apply. In such circumstances, it is recommended that traffic controls meet night time requirements.
- Delineate** To mark out temporary pathways for traffic to follow through a worksite.
- Dimension D** A distance expressed in metres, used for the positioning of advance signs and related purposes.
See Section 5.5.1 for the calculation of D.

DIT	South Australian Department for Infrastructure and Transport (“the Department”).
Expressway	A divided road for through traffic with full or partial control of access and generally with grade separation at intersections. The term includes expressways, freeways, tollways and motorways (as defined in AS 1348).
Frangible	Capable of being broken; frangible materials shall be used for posts or other supports for signs and devices which could otherwise injure road users.
Hazard Category 1	For the purposes of Section 20 of the Act, a work area that involves a hazard to workers or a <u>greater than normal level of hazard</u> for the person using the road is referred to a Category 1 hazard (40 km/h speed limit). Refer to Section 6.2 of this Standard for further detail.
Hazard Category 2	For the purposes of Section 20 of the Act, a work area that involves an <u>unusually high level of hazard</u> to workers or persons using the road is referred to as a Category 2 hazard (25 km/h speed limit). <u>Refer to Section 6.2 of this Standard for further detail.</u>
Long-term	A description which applies when a traffic guidance scheme must operate both day and night and may be left unattended.
May	Indicates the existence of an option.
Median	The portion of a divided road separating carriageways transporting traffic travelling in opposite directions.
Multi-lane	Two or more traffic lanes in one direction.
Night time	The night hours between the official times of sunset and sunrise. Refer to Day time definition.
Open road area	Roadside development less frequent than that specified for a built-up area.
Prescribed Road	A road that is under the care, control and management of the Commissioner of Highways; or A road, or road class, prescribed by the regulations for the purposes of this definition. <u>Note:</u> there are currently no roads under the care, control and management of council that have been prescribed by the Regulation for the purposes of section 20 of the Act.

Public Authority	Is a Minister of the Crown; or The Commissioner of Highways; or A council; or Any other authority, body or person authorized by statute to carry out works on roads; or An authority, body or person prescribed by regulations.
Risk management	Process for managing risks by identifying, analysing, evaluating, recording, monitoring, mitigating, treating and reporting risks according to ISO 31000.
Road	An area that is open to or used by the public and it is developed for, or has as one of its main uses, the driving of motor vehicles and includes road related areas.
Road safety barrier	A physical barrier separating the work area and the travelled path, designed to resist penetration by an out-of-control vehicle and as far as practicable, to redirect vehicles back into the travelled path.
Road user	Any driver, rider, passenger or pedestrian using the road, including people with disabilities.
Road related area	Any of the following: a) an area that divides a road; b) a footpath or nature strip adjacent to a road; c) an area that is not a road and that is open to the public and designated for use by cyclists or animals; d) an area that is not a road and that is open to or used by the public for driving or parking vehicles; or e) any other area that is open to or used by the public and that has been declared by regulation to be a road-related area.
Roadway	Portion of the road devoted particularly to the use of vehicles, including shoulders and auxiliary lanes.
Roadwork	As defined by section 7 of the <i>Highways Act 1926</i> , namely: (a) the construction of a road; or (b) the maintenance or repair of a road; or (c) the alteration of a road; or (d) the construction of drains and other structures for the drainage of water from a road; or

- (e) the installation of fences, railings, barriers or gates; or
- (f) the installation of traffic control devices, traffic islands or parking bays; or
- (g) the improvement of a road including (for example) —
 - (i) landscaping and beautification; or
 - (ii) installation of road lighting; or
- (h) the installation of amenities or equipment on or adjacent to a road for the use, enjoyment or protection of the public; or
- (ha) the construction of buildings or facilities relating to public transport or parking for users of public transport; or
- (i) the installation of signs on or adjacent to a road for the use or benefit of the public; or
- (j) any work in connection with a road.

A reference to roadwork in this document also includes a temporary work activity on or near a road.

Roadwork speed limit	A speed limit indicated for a work site and where work is being carried out or along a work area.
Shall	Indicates that a statement is mandatory.
Short-term	A work site where a traffic guidance scheme is required only while work personnel are in attendance and is generally limited to a single work shift where road conditions are returned to normal when the shift ends.
Should	Indicates a recommendation.
Sight distance	The distance measured along the carriageway over which objects of a defined height are visible to a driver. <u>Refer <i>AGTTM Pt 3: Static Worksites Section 2.5.4</i></u>
Speed of traffic	The speed limit applying at a location or an estimate of the speed of the majority of vehicles in the stream if considered to be significantly different (a variation of 10 km/h) from the speed limit either above or below.
Static work site	All works which are greater in scope and duration than can be handled by short-term, low impact provisions or by mobile works.
Traffic	All vehicles, persons or animals travelling on a road unless the context indicates otherwise.

Traffic control device	Any sign, signal, pavement marking, structure or other device or thing, used to direct or warn traffic on, entering or leaving a road, which may be installed, placed or erected on the road (note: this includes traffic cones, temporary bollards, any barrier, structure or other device or thing to wholly or partially close a road or part of a road).
Traffic controller	A trained person whose duty it is to control traffic at a work site. This control is normally exercised by the use of a Stop/Slow Bat.
Traffic guidance scheme (TGS)	An arrangement of temporary signs and devices to warn road users and guide them through or past a work site or temporary hazard.
Traffic management plan (TMP)	A document describing all essential traffic management matters associated with roadworks. This includes risk assessments, traffic demand and accommodation, traffic routing and control and provision for vulnerable users and special vehicles such as buses, trams or over-dimensional vehicles.
Travelled path	That part of the roadway which is made available to vehicles and which may comprise one or more trafficable lanes.
Truck Mounted Attenuator (TMA)	A safety device designed to reduce severity of collision, fitted to slow moving or stationary work vehicles which are exposed to potential impact from behind by approaching traffic.
Two-way roadway	A roadway having traffic lanes allotted for use by traffic in opposing directions with or without either physical separation or a painted median between them.
Urgent Works	Urgent Works - For the purpose of Section 20 of the Act, Urgent works are unplanned works that are required to be performed as a matter of "urgency" to minimise the risk to road users and or the public when the supply of essential services may be affected and or the potential threat to life or property. This may include but is not limited to a burst water main or a gas leak, fallen tree etc.
Unsealed road	A road surface that is not sealed i.e. with asphalt, bitumen or concrete.
Windrow	A row of built-up earthwork materials which occurs along unsealed roads.

Work area

For the purposes of Section 20 of the Act, a portion of road:

- (a) on which workers are, or may be, engaged; or
- (b) on which vehicles or equipment relating to any works are placed; or
- (c) that is otherwise affected by works in progress (whether those works are occurring on the road or elsewhere).

Refer to Section 8 of this Standard for further detail.

Work site

For the purposes of Section 20 of the Act, a portion of road affected by works in progress, together with any additional portion of road used to regulate traffic in relation to those works or for associated purpose.

Refer to Section 8 of this Standard for further detail.

Section 2: South Australian legal requirements

2.1 Legislation

The conditions under which people are permitted to work on roads are governed by legislation and associated standards and codes of practice. This section deals with the legal requirements at work sites.

It is important to assess every work site to determine the traffic control devices needed and be sure that the minimum requirements are met. There are strict requirements covering approval for placing traffic control devices.

The following Acts, Regulations, Codes and Standards relate to works on roads. It is the responsibility of all organisations to ensure they have the latest version of these documents.

2.2 Work Health Safety Act 2012 and Regulations

Every worker and every workplace on or near a road are covered under the *Work Health Safety Act 2012* (“WHS”) and Regulations. The WHS Act and Regulations requires both persons conducting businesses or undertakings, and workers, to undertake certain duties to ensure that all workplaces are safe.

Under the WHS Act, SafeWork SA inspectors have the power to impose heavy fines on both employers and employees found in breach of the WHS Act. Where an inspector considers that an immediate danger exists to the health or safety of a worker, other workers or the public, then an order can be given to stop work immediately, or stop all works on site until the problems are corrected. Inspectors are active throughout South Australia.

2.3 Road Traffic Act 1961 (SA) and Regulations

Section 17 of the Road Traffic Act 1961 provides that Traffic Control Devices may only be installed, maintained, altered, operated and removed with the Minister’s approval. Use of any Traffic Control Device without this approval the person is guilty of an offence under Section 21 of the Act, which carries a maximum penalty of \$5,000 or imprisonment for one year.

Under Section 17 (1) and (2) of the Act, a road authority requires approval from the Minister for Transport to install, maintain, alter, operate or remove a traffic control device on, above or near a road.

Under Section 17 (3) of the Act, any authority, body or person requires approval from the Minister for Transport to install, display, alter, operate or remove traffic

control devices in relation to works on a road, temporary road closures, or for any temporary purposes.

Under Section 20 of the Act a public authority must, with a relevant authorisation, place signs on a road for the purpose of indicating a maximum speed at a work site or work area that is accordance with this Standard.

Approval by the Minister for Transport for the Sections above is issued through the Instruments of General Approval and Delegation or via a permit under section 20 of the Act.

2.4 Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices

There are two parts to the *Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices* ('the Manual'); firstly *Part 1: Legal Responsibilities* ('the Instruments') which set out the legal requirements for the variations from the Act for the use of traffic control devices in South Australia. Please note, the Instruments shall be read in conjunction with the other documents it references.

If the conditions in the Instrument cannot be met then a separate approval shall be sought from the Commissioner of Highways or his/her delegate. For example, if any part of the workzone traffic management standards and/or supporting documentation is not adhered to, a TMP shall be submitted providing justification to why the standards for WZTM cannot be met.

The second part of the Manual is *Part 2: Code of Technical Requirements* ('the Code') which amends some aspects of the Australian Standards and Austroads Guides where South Australia's practices differ. Authorities and authorised persons shall comply with all relevant standards and guides, as varied by the Code.

It is the responsibility of the organisation to ensure they have the latest version of the Manual as amendments occur from time to time.

This publication is issued by the Traffic Services Section of the Department, and can be accessed at www.dit.sa.gov.au/standards/tass.

2.5 Instruments of General Approval and Delegation ('the Instruments')

The Minister has delegated powers and granted approvals through the Instruments to the:

- a) Commissioner of Highways;
- b) Commissioner of Police;
- c) Adelaide Airport Limited;

- d) Accredited railway owners;
- e) Board of the Botanic Gardens and Herbarium; and
- f) Councils.

The above authorities can delegate functions from the Minister subject to conditions contained in the specific 'Instruments' to authorised positions within the individual organisations. These Instruments are included as the first part of the *Manual of Legal Responsibilities and Technical Requirements for Traffic Control Devices*.

Persons or bodies who are not a road authority (i.e. statutory bodies like SA Water and SA Power Networks) who undertake temporary work activities on or near a road, are authorised by the Commissioner of Highways to use traffic control devices temporarily, subject to the conditions stated Section 20 of the Act and in the *Instrument from the Commissioner of Highways to grant general approval for the temporary use of traffic control devices by persons other than road authorities*.

2.6 Training and accreditation

The Department has developed the South Australian 'Workzone Traffic Management' training course to ensure that personnel who are required to work on roads are aware of their responsibilities and legal obligations. The training course will also ensure that these personnel are aware of the traffic control devices that are available for use and how to use them to provide a safe working environment for their own benefit and that of the general public.

The course carries a formal three year accreditation period. To maintain accreditation, retraining in the DIT Workzone Traffic Management training course must be undertaken every three years.

At all times that workers are present at a work site, at least one worker must:

- a) Have attained accreditation in the DIT Workzone Traffic Management training course; and
- b) Carry evidence certifying accreditation in this course when engaged at a work area or work site.

It is an offence under the Act not to carry evidence certifying current accreditation.

It is through this accreditation that a worker is declared a competent person and has the authority to place, move and remove traffic control devices when required. These tasks may be delegated by a competent person to another person under supervision.

NOTE All Traffic Controllers must be accredited and carry evidence of their accreditation on them.

NOTE When non-roadworks are carried out adjacent to a roadway, AND the work does not obstruct or interfere with any road users (including cyclists and/or

pedestrians), AND the work does not require works protection measures as detailed in Section 8 of this Standard, accreditation in workzone traffic management is not required. Devices such as traffic cones, vehicle mounted warning devices, high visibility clothing and/or description of works signs may be used to make the workers more conspicuous, and provide information and awareness to the general public about the presence of workers and reason for works.

2.7 Working on prescribed roads or roads under the care, control and management of the Commissioner of Highways

When working on or adjacent to a roadway, the appropriate road authority must be notified before any roadworks commence. Prescribed roads and roads under the care, control and management of the Commissioner of Highways require an **Approval** to be obtained from the Department's Traffic Management Centre (TMC) office prior to starting any works.

NOTE Short-term low-impact works on prescribed roads do not require permit from the Department if the criteria in Section 8.2 of this document are met.

2.7.1 Notification of Works Approval

Notification to the Department's TMC is required when roadwork is undertaken on, along, adjacent or across any road pavement or shoulder which is maintained by the Commissioner of Highways or prescribed by regulations. An approval giving you authority to work on these roads must be obtained before any work is carried out. If a work zone speed limit or lane change is required then a permit for that speed limit and/or lane change will be issued as part of this approval.

A list of roads under the department's control is available at <https://www.sa.gov.au/topics/driving-and-transport/roads-and-traffic/road-responsibilities>

A copy of the permit, TMP and/or the TGS must be available for viewing on site.

When working on or adjacent to a road under the care, control or management of the Commissioner of Highways, refer to the 'Specification for Works on Roads by Other Organisations'.

Refer to: <https://www.dit.sa.gov.au/contract-or-documents/works-on-roads-by-other-organisations>

Such notification shall include submitting an application via the Department's roadworks portal (www.roadworks.sa.gov.au) and TGS that shows the location of all traffic control devices and proposed times of traffic restrictions. Access to the portal can be made via the New User Application Form (Appendix A).

Large project work impacting the Department's assets, involving drawings, specifications and work methods should have prior agreement by the Department. A reference number will be supplied. This number should be included upon the Notification of works approval to assist the approval process.

Notification of works approvals shall be at least three working days before the commencement of the works.

The TMC shall be notified via the Roadworks Application by a representative of the organisation undertaking the works:

- a) prior to commencing all works; and
- b) immediately after the works are completed.

OR

The TMC shall be notified on 1800 018 313 by a representative of the organisation undertaking the works:

- a) 15 minutes prior to commencing all works; and
- b) immediately after the works are completed.
- c) Access to the Roadworks Application can be made via the New User Application Form (Appendix A).

NOTE A copy of the permit, TMP and/or the TGS must be available for viewing at the site on request by an Authorised Officer.

2.7.2 Notification of urgent works

For the purposes of Section 20(4)(b) of the Act when work by a Public Authority is required to be undertaken as a matter of urgency, verbal notification to the TMC must be given within 2 hours of speed signs being placed on the road on (1800 018 313). This will automatically generate a permit for a 24 hour work period. If an extension of the 24 hour work period is required then an application for an extension is required and must be made at least 3 hours before the end of that 24 hour period.

2.8 Working on roads under control of local government

For roadworks undertaken on roads under the care, control and management of council, contact the appropriate Council in whose area the road is situated.

2.9 Closing roads for roadwork purposes

There are legal procedures to follow when a road needs to be closed to traffic. Check with the organisation controlling the road (the Department or the local council) at least two weeks prior to the work. Early notice enables all emergency services to be advised before the work begins.

When an emergency arises and a road must be closed for safety purposes or to carry out emergency repairs, close the road and advise the following organisations of the action and the expected time of completion of the closure:

- a) Traffic Management Centre on 1800 018 313;
- b) Public transport operators (for bus and train movements); and
- c) Emergency services (police, ambulance and fire).

2.9.1 Roadworks vs events on roads

On many occasions events are declared under section 33 of the Act on roads under the care, control and maintenance of either the Commissioner of Highways and local council. These events may require either total road closure or traffic restrictions. Ensure that any proposed roadworks do not conflict with these events.

For further information on events on roads refer to:

<http://www.dit.sa.gov.au/standards/tass>

2.10 Safe working zone at train level crossings

A nominal rail corridor shall be established at all level crossings that will act as a safe working zone. The safe working zone shall extend out to 3 m from the nearest rail on each approach. Maintenance activities shall not be undertaken within the safe working zone without first notifying the rail owner and having undertaken 'Rail Safety Awareness' training.

The Public Transport Services Division (formerly TransAdelaide) requires notification of ten working days prior to the proposed works to allow Infrastructure Services officers to issue the relevant Train Notice and to arrange for a track protection/qualified employee to be on site.

In order to satisfy the notification requirements of the Australian Rail Track Corporation (ARTC), Genesee and Wyoming Australia (GWA), the relevant train control office shall be advised a minimum of five working days prior to the start of works, and once again immediately before the start of works, in order to gain clearance to operate at that location at a certain time so that the roadwork does not conflict with train running schedules.

All enquiries shall be directed to the train control for the relevant rail authority.

2.11 Work zones around tram lines

Irrespective of the employer, Rail Safety Workers who manage or operate tram services, or manage or perform maintenance and construction work on the tram network, or access the tram network other than as a passenger on public services, must comply with DIT's Tram Rules & Procedure Guidelines when work zones are on or near tram lines. These guidelines can be obtained from the Department's Rail Technical & Operational Assurance Section.

Section 3: Safety and record keeping responsibilities

3.1 Maintaining a safe workplace

This document along with *AS 1742.3* and *AGTTM Part 6: Field Staff – Implementation and Operation Section 2.1* set out the procedures for installing and operating traffic control devices to ensure that they are used consistently to provide the highest practicable level of protection to roadwork personnel and road users. The following sections address matters which shall be taken into account when working on or above roads.

3.1.1 Fire prevention

Organisations and/or individuals undertaking roadworks or temporary work activities on or near a road must comply with South Australia's *Fire and Emergency Services Act, 2005*, if works are undertaken during the Fire Danger Season. The risk assessment plan shall include liaising with the Country Fire Service or the Metropolitan Fire Service.

3.2 Responsibility for safety at work sites

Organisations and/or individuals undertaking roadworks or whose workplace is on a road need to be aware of their responsibilities for any injury to the road user or damage to property as a result of such operations. There is an equally important obligation to provide a safe workplace environment that minimises, as far as practicable, the likelihood of injury to workers by traffic within or adjacent to the work area. Principals and contractors need to be aware of their WHS legislative requirements and implement these as they apply to this obligation.

Steps should be taken to warn the public of existing conditions and to guard, delineate and where necessary, illuminate work which may be a hazard to the road user. Care should be taken to avoid long delays or detours which may cause unnecessary inconvenience to road users.

3.2.1 Responsibilities of supervisory personnel

Supervisory personnel carrying out construction, maintenance or other works that require the use of a traffic guidance scheme should give attention to:

- a) being mindful of their responsibilities to provide a safe workplace for personnel and plant under their control, and safe and convenient travelling conditions for road users;

- b) ensuring that personnel under their control are at all times courteous to road users. Personnel should not allow themselves to become distracted by provocation from members of the public;
- c) ensuring that all personnel at a work site are aware of their responsibilities and that traffic controllers are appropriately trained and informed of their duties; and
- d) being familiar with and act, as far as practicable, in accordance with the provisions of these Standards and where applicable AS 1742.3 and AGTTM.

3.2.2 Hierarchy of control to assess level of protection

When planning and undertaking work there is a hierarchy of control which can be used to assess whether the highest level of protection or separation from traffic is being applied. It has the following elements, in descending order of safety reliability:

- a) hazard elimination from the immediate location of the work area by relocating traffic via a detour of side track;
- b) hazard elimination by stopping traffic movement for short periods when workers occupy the roadway;
- c) separation of the work area from moving traffic by means of engineering controls or isolation i.e. by placing a substantially impenetrable barrier at the boundary of the work area or maintaining a level of lateral separation designed to provide adequate protection; and
- d) management of the risk using administrative and behavioural controls in cases where:
 - the work area is close to but not within the travelled path – by controlling the behaviour of traffic (e.g. speed of traffic) according to the lateral separation; or
 - the work area is within the traffic stream – by training in appropriate work methods and safety requirements and strictly following them.

Requirements in this Standard have been developed to meet the minimum requirements to maintain a safe work site.

3.3 Record keeping

In South Australia it is mandatory to keep records of every traffic guidance scheme used. When undertaking works on a road, the person or body responsible for the works shall keep records of the traffic guidance scheme along with any written authorisation for erecting other types of traffic control devices. These records may be required as evidence in legal proceedings and will greatly assist in establishing pre-existing work site conditions where claims for damages are made. These Standards show details for keeping records of signs and other traffic control devices used on roads. Records including any approvals or permits issued shall be kept on site to be viewed by an authorised officer if required at any time.

Records obtained by the Department's personnel shall be kept in accordance with DP009 (Record Keeping Policy).

For non-Departmental personnel, records should be kept in accordance with their own record keeping policy.

For further information refer to AGTTM Part 2: Traffic Management Planning, Part 6: Field Staff – Implementation and Operation, Part 9: Sample Layouts, and Part 10: Supporting Guidance

Record keeping shall begin before any signs or devices are placed. This indicates the site has been inspected and an appropriate traffic guidance scheme has been selected. On-going record keeping shall occur immediately after any changes to the placement, type or number of devices used on the job.

A satisfactory record may be provided by referring to an example diagram selected from the *AGTTM Part 9: Sample Layouts*, the Department's *Field Guide* or other source based on current requirements e.g. a diagram provided by an employer.

If none of the diagrams suit a particular work site then a specific traffic guidance scheme shall be drawn up for that site.

As a minimum the records shall include:

- a) date;
- b) location of the work site;
- c) identification of the job (permit number);
- d) adequate reference to a pre-prepared figure, sketch or plan of the traffic guidance scheme for the job;
- e) times when the scheme is in place, including the times of any changes;
- f) times when the installation, changes and removal of speed restriction signs occurred;
- g) condition of the road surface, weather conditions or other features or matter of note;
- h) name of person(s) responsible for setting up, changing or removing the scheme;
- i) name of person authorising the setting up, changing and/or removal of the scheme;
- j) any adjustments made to barriers, signs and tapers as necessary e.g. to keep the length of single lane traffic operation to a minimum, including records of the type of changes made and the times that these changes occurred; and
- k) any adjustments made to coordinate maintaining the travelled path with other job operations in the vicinity.

Whilst work is being undertaken there must be at least one accredited person on site.

3.4 Accident and incident records

When there is an accident or incident at a work site (either witnessed by or reported to a worker on site). It is mandatory to report accidents to the Police when anyone is injured or the total value of damage to vehicles and equipment exceeds \$3,000. It is also necessary to make a record if there is an accident or incident where legal action may arise.

The following information shall be recorded (as a minimum):

- a) names and addresses of those involved;
- b) names and addresses of any witnesses;
- c) actual type, size and location of signs and devices in use at the time of the accident or incident. Do not rely solely on the records made to date, instead, check and add details as necessary;
- d) photographs of sign and device arrangements in place at the time;
- e) details of the surface conditions and width of the travelled path;
- f) details of any hazards at the site; and
- g) details of prevailing weather conditions.

All of this information should relate to what was in place at the time of the accident or incident.

Make sure that any internal reporting system for accidents or incidents within your organisation are followed.

In South Australia:

- a) WHS Act require a report to be made to SafeWork SA when a person requires immediate treatment as an in-patient in a hospital as a result of an accident or incident at work. Report the event by phoning SafeWork SA on 1800 777 209.
- b) South Australian Police (SAPOL) requires a report to be made within 90 minutes when a person is injured in an accident involving a motor vehicle.

*Report to SafeWork SA all accidents that result in a person requiring immediate treatment as an in-patient in a hospital.
Phone: 1800 777 209*

Report to the police at the scene of the crash or at a police station within 90 minutes when someone is injured or killed due to a motor vehicle accident.

3.5 Traffic guidance schemes

Traffic guidance schemes may be in either hardcopy or electronic format. Regardless of the format chosen, they shall be made available to view at the work site.

Refer to AGTTM Part 2: Traffic Management Planning

Careful consideration should be given to the signing of the work site, no matter how brief the occupation of the site may be. This should include:

- a) protection of workers;
- b) adequate warning provision for changes in surface conditions and presence of personnel or plant engaged in works on roads; and
- c) adequate instruction of road users and their guidance safely through, around or past the work site.

Planning for all roadwork requires the preparation of traffic guidance schemes by a competent person. It normally takes place at one of the following levels.

3.5.1 Short-term and mobile works not involving full or part road closure

This traffic guidance scheme shall include procedures together with details of signs and devices needed to cover all of the routine tasks the workers will encounter. Procedures should be documented by means of work methods statements supported if necessary by standard plans e.g. showing the processional order and the separation distances of items in a mobile works gang.

3.5.2 Works involving relatively simple part-roadway closures

As a minimum, the traffic guidance scheme shall include:

- a) a sketch of the protective devices and delineation required on a plan; and
- b) a list of devices required for the job.

Reference to *AGTTM Part 9: Sample Layouts*, the Department's *Field Guide* or a similar standardised illustration may be used as the sketch or plan, provided it is adequate for the situation.

3.5.3 Works involving complex traffic arrangements or staged works

A fully documented traffic management plan which provides the following:

- a) TGS's showing temporary traffic paths, their delineation and the position of traffic control or warning devices;
- b) a separate set of plans for each stage, if undertaking multi-stage works;
- c) details of after hours traffic arrangements, on separate plans if they cannot be adequately incorporated into the above;

- d) all necessary instructions for the installation, operation, between stage rearrangement and ultimate removal of devices at the conclusion of the job; and
- e) TGS's must show that all existing permanent speed signing is completely covered up when not required.

It is essential to prepare traffic management plans before the job starts and before the start of each stage, so that there is enough time to obtain any special devices or approvals as required.

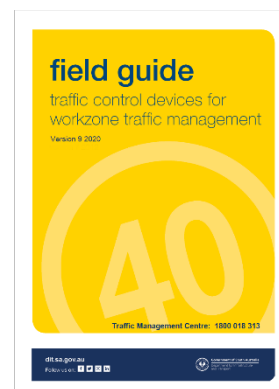
3.6 Sample traffic guidance scheme layouts

The *AGTTM Part 9: Sample Layouts* provides example layouts of the application of the guidance provided in other parts on the AGTTM series.

In addition to this, the Department has issued a supplementary guide to assist with planning works on roads entitled *Field Guide – Traffic Control Devices for Workzone Traffic Management* ('Field Guide'). The *Field Guide* also provides examples of traffic guidance schemes in accordance with Section 20 of the Act, *AS 1742.3, AGTTM Part 3: Static Worksites, Part 4: Mobile Works, and Part 5: Short Term Low Impact Worksites* and this Standard.

The *Field Guide* can be used as a guide to prepare a traffic guidance scheme intended for use anywhere in South Australia.

However, please note that the *Field Guide* does not include a scenario of all situations and should only be used as a guide when planning TGSs.



Section 4: Developing traffic management plans and managing risks

4.1 Traffic management plans

Traffic management plans are prepared by following a risk based procedure considering all essential traffic management matters in an ordered way. The following matters shall be considered in turn and incorporated into the plan if relevant.

4.2 Safety and convenience

4.2.1 Safety of workers

Workers are protected from traffic by either:

- a) providing a road safety barrier system between the work area and moving traffic at a static work site;
- b) providing increased separation between the edge of the work area and the nearest traffic path or lane at a static work site;
- c) providing a temporary speed zone appropriate for the work area location at a static work site; and/or
- d) where appropriate, using the work methods for short-term low impact works and mobile works set out in this document.

4.2.2 Safety and convenience of road users

The safety of road users is increased by:

- a) providing traffic control and guidance at a static work site; and
- b) managing the work site in a way that causes the minimum amount of inconvenience to traffic movement.

Works should be arranged to minimise:

- a) disruption of established traffic movements and patterns;
- b) interference with traffic at peak movement periods;
- c) interference with public transport services; and
- d) the amount of road closed to traffic at any one time.

If the path of traffic infringes on regulatory requirements of pavement markings, use traffic control measures to direct traffic along the path or remove the conflicting regulatory pavement markings entirely.

Any regulatory or warning signs (e.g. advisory speed signs for curves) that do not apply to the works shall be completely covered or removed.

4.2.3 Maintaining traffic flow

Determine the traffic flow required to accommodate an acceptable level of service and convenience to road users. This determines the amount of road space which should remain open and, where applicable, the times of day during which greater amounts of road space are needed to handle higher traffic volumes e.g. peak periods in built-up areas (see Appendix B). On two-way roads, two-way traffic flow should be maintained wherever possible. When this is not possible, travel over one lane is acceptable for short periods of time in certain conditions (see Appendix B).

4.2.4 Lane widths

Table 4.1 illustrates the minimum lane widths which shall be provided through or past work sites. Refer to Table 9.1 for edge clearances to these requirements.

Table 4.1:
Desirable lane widths for works on roads

Road environment	Lane width
60 km/h or less	3.0 m
> 60 km/h	3.5 m
Two-way roadway on residential streets	5.5 m (total width of roadway)

Reference: AGTTM Part 3 Static Worksites Section 2.5.8

Temporary lane widths are not to be greater than existing lane widths.

4.3 Traffic management

Select the appropriate means of routing traffic past, around or through, the site ensuring that all required traffic movements are provided for. Depending on the circumstances, the hierarchy of control for managing traffic should be managed by either:

Refer to AGTTM Part 2: Traffic Management Planning and Part 3: Static Worksites

- a) closure of the road for short periods while work is carried out.
- b) movement around the work area by a detour, which may be via a side track or an existing road; or

- c) movement past the work area by means of a delineated path alongside but clear of the work area;
- d) movement through work area under closely controlled conditions;

4.3.1 Closures

Where applicable complete road closure should be undertaken for the safety of roadworkers and/or road users. Delays to traffic should be minimised. If delays are expected to be longer than can be tolerated by traffic due to volumes, build-up of queues and expectation of road users, works methods should be altered or a detour/ side track provided.

4.3.2 Traffic around work area (side-tracks, detours and cross-overs)

When it is not practical to allow traffic through or past the work area, it may be catered for by means of either a detour using existing roads or a specially constructed side-track.

For further information on side-tracks, detours and cross-overs refer to AS 1742.3 Section 3.8 and AGTTM Part 3: Static Worksites

Pavement, surfaces and conditions shall be appropriate to the type and volume of traffic using the facility and its location. Temporary pavements shall have sufficient structural strength to carry the anticipated heavy vehicle traffic. Recommendations for pedestrian, cyclist, wheelchair and public transport provisions at detours are provided in *AGTTM Part 3: Static Worksites*. Requirements and recommendations for delineation at side-track and detours are provided in *AGTTM Part 3: Static Worksites* Section 3.8.2.

The following forms of **detours** should be considered:

a) Side tracks

A temporary roadway may be constructed beside or near the existing roadway, usually within the same road reserve. It may cater for one or both directions of travel.

b) Detours via existing roads

Consult with the National Heavy Vehicle Regulator on 1300 696 487 when detouring Heavy Vehicles

Traffic in one or both directions may be detoured via existing roads suitably located to carry traffic around the work area. Pavements shall be checked to ensure that they are structurally adequate to carry the increased volumes and loads. For detours which will be in use for periods in excess of 14 days, the lane width and design speed should match, as nearly as practicable, those of the approach road. Where a detour via existing roads is provided, signing of the detour at all changes of direction and at other locations where reassurance is needed shall be applied consistently throughout for each direction of travel.

c) Detours for heavy or over-dimensional vehicles

Heavy or over-dimensional vehicles may be detoured via existing roads suitably located and designed to carry them. This is usually required if:

- works have temporarily reduced the height clearance or load carrying capacity of the original road; or

- the route is designated an over-dimensional load route and works have temporarily reduced over-dimensional clearances.

d) Crossovers

Part of a divided road is converted to a two-way roadway by closing one roadway and constructing temporary crossovers to transfer traffic in that direction to the other roadway. Where traffic is required to travel temporarily in the wrong direction, the following safety measures should be considered:

- Intersections should be checked and temporarily modified as necessary to ensure that crossing and turning movements can be made safely. Any movements that are temporarily banned should be adequately catered for elsewhere.
- Potential hazards resulting from the reversal of direction such as fixed roadside objects protected in one direction only, and safety barrier and bridge parapet trailing ends which will become leading ends, should be risk assessed and remedial action taken accordingly.
- Consideration of appropriate treatment options where it is necessary to cater for pedestrians crossing a temporary two-way roadway at zebra crossings, uncontrolled mid-block points or at intersections where there is traffic turning through a pedestrian control point. Signs related to these options are shown in Section 7.3 of these Standards.

4.3.3 Traffic past work area

Where the complete elimination of traffic from a site is not required, the normal method of traffic management is for traffic to travel past the work area. These paths shall be clearly delineated. At long-term works, if the original pre-works delineation (including pavement markings and raised pavement markers) are likely to misdirect drivers negotiating the site, then conflicting delineation shall be removed completely. Single shuttle line working may be required if the available trafficable roadway width is restricted.

4.3.4 Traffic through work area

Traffic is only permitted to travel through a work area if both the traffic and the work can be adequately controlled by using:

- a) traffic controllers or traffic signals as necessary to slow traffic on the immediate approach to an active work area, stopping traffic for short periods when required for:
 - controlling the movement of plant or other operations in the trafficable area; or
 - controlling single line shuttle working;
- b) a pilot vehicle to lead traffic along the desired path and to control its speed, where appropriate; and/or
- c) using the work methods for short-term low impact works and mobile works set out in this document, where appropriate.

4.4 Traffic control

Except for some exemptions for short-term and low-impact works as outlined in *AGTTM Part 5: Short Term Low Impact Worksites*, traffic shall only be permitted through a work area where both traffic and the work can be adequately controlled. Traffic controllers and temporary traffic signals shall be employed as necessary to stop and / or direct traffic at roadwork sites. In limited circumstances a temporary 'Give Way' and 'One Lane' sign assembly may be used instead of traffic controllers. Refer to *AGTTM Part 3: Static Worksites* and the following to determine the appropriate means of traffic control:

For further information refer to AGTTM Part 3: Static Worksites, Part 6: Field Staff – Implementation and Operation and Part 7: Traffic Controllers.

4.4.1 Where to use traffic controllers

- a) Bitumen surfacing works under traffic.
- b) Single lane operation e.g. a lane closure on a two lane, two-way road or bridge.
- c) Where there is limited sight distance within a work site.
- d) Where construction traffic is crossing or entering a roadway.
- e) Temporary total road closures e.g. blasting works.
- f) Emergency situations.

4.4.2 Where to use a single traffic controller

Traffic control may be performed by a single traffic controller for short-term partial road closures on unsealed roads under the following conditions:

- a) the single lane section does not exceed 50 m in length;
- b) the volume of passing traffic is not more than 20 vph; or
- c) the traffic controller has a good view of traffic approaching from both directions when stationed at one end of the job.

4.4.3 Where to use temporary traffic signals

- a) For single lane operation i.e. a lane closure on a two lane, two-way road or bridge.
- b) Construction traffic is crossing or entering a roadway.
- c) Limited sight distance within a work site.

Portable traffic signals are intended for traffic control applications of a relatively short duration only (Refer to Section 9.8 of this document). For longer periods consider using temporary fixed traffic signals (This may require traffic modelling). Temporary signals will require a power supply for continuous use.

See [Appendix B](#) to determine the desirable maximum length of single lane operation under reversible flow.

4.4.4 When to use a temporary 'Give Way', 'One Lane' sign assembly

When **all** of the following conditions apply:

- a) the work area is less than 100 m in length;
- b) each entry to the work area is visible from the other;
- c) a sight distance to opposing traffic of at least 200 m beyond the far end of the work area for the traffic facing the 'Give Way' sign;
- d) the traffic volume is 150 vpd or less; and
- e) the traffic speed is 70 km/h or less.

4.5 Other road users

Determine the need to provide for road users other than vehicle traffic including:

- a) pedestrians (including people with disabilities);
- b) bicycles, motorcycles;
- c) school children; and
- d) emergency vehicles.

4.5.1 Pedestrians and cyclists

Where pedestrians (including people with disabilities or visual impairment) have to move through, past or around a work site or to cross the road within a work site, they shall be provided with and directed to either of the following:

- a) temporary or alternative footpaths and crossing points;
- b) formal pedestrian crossings; or
- c) refuges (if warranted).

Pedestrians, including those with mobility and visual impairment require special consideration. Those in wheelchairs require smooth, direct and continuous access while those with vision impairment require an easy-to-navigate alternative.

When appropriate, bicycle lanes should continue as temporary lanes through a work zone. Where this is not possible, consider providing off-road temporary bicycle paths. It may be possible to safely integrate cyclists and motor vehicles where a work zone is governed by reduced traffic speed.

Pedestrian and cyclists paths should be provided on the same scale and to the same width as the facilities that existed prior to the works.

For further information refer to the department's Guidelines for Disability Access in the Pedestrian Environment available at:

<http://www.dit.sa.gov.au/standards/tass>

For additional information regarding temporary footpaths and pedestrian crossing provisions refer to AGTTM Part 3: Static Worksites Sections 3.10, 4.10, 5.13, Part 4: Mobile Works Section 3.8.9 and Part 5: Short Term Low Impact Worksites Section 3.3

4.6 Special vehicle requirements

Determine the need to provide for vehicles such as:

- a) buses and trams, including stops and terminals;
- b) over-dimensional vehicles; and
- c) restricted vehicles.

4.6.1 Vehicle size and load restrictions

Where the width, height or load carrying capacity of the roadway or structure is to be temporarily reduced during works, the appropriate authority should be informed in advance of the works. They should also be advised once the restriction is removed. Designers of a TGS need take into consideration Special Vehicle requirements.

For further information about works impacting vehicle size and load restrictions including signs available refer to AGTTM Part 3: Static Worksites Fig 3.5 & AS 1742.3 Section 4.2.8

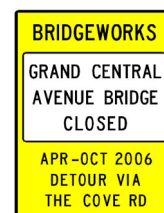
4.7 Night works

If applicable, determine if any special requirements for overnight traffic operations are required.

For further information refer to AGTTM Part 2: Traffic Management Planning Section 4.7.2, Part 3: Static Worksites Section 6.7, Part 6: Field Staff – Implementation and Operation Section 9, Part 7: Traffic Controllers Section 2.6.5 & AS 1742.3 Section 4.2.4

4.8 Advance notice of works

Depending on the complexity of the traffic management plan and the length of time it is expected to operate, it may be necessary to erect special signs to inform the public of the works. It may also be advisable to implement a publicity campaign using printed material and local media, particularly the radio.



In addition, when applying for a roadworks permit from the Traffic Management Centre, the location of the works will be printed in 'The Advertiser' newspaper Daily Roadworks Report and made available online at www.dit.sa.gov.au or www.traffic.sa.gov.au

Portable variable message signs (VMS) are used to give advance notice of works to road users. VMS should only be used to supplement existing roadside infrastructure and should not be used as a substitute for conventional signs and pavement markings.

For further information on the use of variable message signs refer to:

<http://www.dit.sa.gov.au/standards/tass>

Roadwork messages on portable VMS must be approved by the Department's Traffic Management Centre or Council or their respective representative.

4.9 Risk management

Risk management involves the identification and analysis of all hazards likely to arise during works on roads including the set up, operation, change and removal of a traffic guidance scheme, followed by the determination of appropriate measures to mitigate those risks. This process is appropriate at all levels of planning and operation when preparing traffic guidance schemes for:

- a) minor routine and mobile works (i.e. procedures, work method statements and standardised plans);
- b) works involving relatively simple part-roadway closures (i.e. sketches, plans and references to the Field Guide or similar standardised illustrations); and
- c) works involving complex traffic arrangements or staged works (i.e. traffic management plans).

This Standard and AGTTM *Part 2: Traffic Management Planning Section 4.5 and Part 10: Supporting Guidance Section 2* provide guidance and the minimum requirements for works. Variations below these requirements shall only be made on the basis of a documented risk assessment prepared by a competent person in consultation with affected parties. Where superior hazard controls are identified through this process they should be adopted in preference to minimum requirements.

4.9.1 Risk assessment

A risk assessment should be carried out that:

- a) identifies all the hazards likely to arise;
- b) results in the development of a traffic guidance scheme or procedural statement that controls or reduces any significant risks;
- c) checks the proposed traffic guidance scheme or procedural statement in detail to ensure that the means of controlling or reducing any significant risks are adequate; and
- d) uses historical data, experience or other means, to evaluate the hazards in terms of:
 - likelihood of occurrence; and
 - adverse consequences.

For speed limit assessment refer to Section 6 of this document

Assessments should consider the following for workers and other road users:

- a) details of work to be undertaken e.g. duration and location on road;
- b) traffic volumes and traffic speeds through the work site;

- c) road geometry including road and carriageway widths;
- d) sight distances; and
- e) history of WHS accident/incident records relating to these types of activities, the work location and work units.

The risk assessment should be reviewed on site. The following points should be checked to ensure that risks are reduced:

- a) ensure all workers are briefed on safety requirements;
- b) ensure all workers wear high visibility clothing;
- c) minimise obstructions to traffic, pedestrians and other road users;
- d) allow safe access to neighbouring properties and side streets;
- e) erect the correct speed signs to suit the work site;
- f) ensure all signs and devices are correct and clear to road users;
- g) ensure all existing permanent signs are completely covered up;
- h) check for glare and other distractions to road users; and
- i) regularly review the traffic guidance scheme during installation and operation as the risks may have changed.

In Fire Danger Season the risk assessment shall include liaising with Country Fire Service and/or Metropolitan Fire Service.

NOTE Risk assessments shall only be conducted by a 'competent person'.

4.9.2 End of day risk assessment

In addition to the information above, an end of day risk assessment **shall** be carried out at the end of the day when a worksite is to be left unattended overnight. This assessment shall be documented and signed off by a competent person.

NOTE An unattended work site shall be setup for the *road user* and not for the road worker.

In accordance with Section 20(11) of the Act, ensure that the roadwork speed limits are correct for the conditions of use and that temporary speed limits are **not** left in place when there are no workers engaged at the work area or the area of road affected by the works, or by vehicles or equipment relating to the works, does not involve a greater than normal level of hazard for persons using the road. If a temporary lower speed limit has been left in place, the rationale for it being left out must be documented and made available on request.

Refer to the record keeping requirements included in this Standard (Section 3.3) for further information.

All symbolic worker or Traffic Controller signs shall be removed or covered over when not required. If applicable, the return to speed limit signs shall be correctly placed.

Section 5: Devices used at typical work sites

5.1 Functions of signs and devices

The functions of the various traffic control devices are to:




- warn, guide and instruct drivers, pedestrians or other road users;
- draw attention to the work area, personnel and equipment;
- control speed or traffic within and adjacent to work area;
- indicate the direction and width of the available travelled path;
- discourage access to the whole of, or a portion of, the work area; and
- provide physical protection for the work area and its occupants.

5.2 Format of signs

The format of signs used at works on roads is shown in Table 5.1.

Refer AS 1742.3 Section 4.4.1

Table 5.1:
Format of signs

Sign type	Sign format	Sign example
Signs warning of workers on foot	Rectangular with a black legend on retroreflective fluorescent orange background	 Workers (symbolic) [T1-5]
PREPARE TO STOP signs and signs associated with blasting operations	White legend on red background, both retroreflective	 Prepare to Stop [T1-18]
Direction and other roadwork signs	Rectangular with a black legend on retroreflective yellow background	 Detour [T5-1(L)]

Regulatory, warning and traffic instruction signs used for roadworks (i.e. R, W and G Series signs)

Same as permanent counterpart – substrates and sign mountings may need to be altered



Speed Restriction [R4-1]

5.2.1 Retroreflective material

Retroreflective material used on signs for work on roads shall as a minimum meet the requirements for Class 400T material as specified in AS/NZS 1906.1. Substrate material for the message panels shall comply with the manufacturer's requirements for reflective sheeting.

Refer AS 1742.3 Section 4.4.2

5.2.2 Size of signs

Sign sizes are split into T Series, and a Multi-message Series for use in multi-message sign frames. Multi-message sign frames cater for four possible sign panel sizes.

Refer AS 1742.3 Section 4.4.3 & 4.4.4

- a) A size is applicable to all signs in the T Series and suitable for:
 - traffic speeds up to 90 km/h (with a lateral offset between the sign and travel path of no more than 8 m);
 - traffic speeds up to 110 km/h (with a lateral offset between the sign and travel path of no more than 4.5 m);
 - signs directed at pedestrians;
 - Stop/Slow Bats used by controllers; and
 - repeater speed signs (R4-1).

- b) B size applies where an oversize sign may be required:
 - where recommendations for the A size sign are exceeded;
 - on expressway and freeway type roads for added emphasis of the onset of works, detours or closures;
 - for other critical safety messages; and
 - where traffic speeds exceed 70 km/h and the A size signboard is less than 1 m² in area.

NOTE C size signs to enhance a situation may be used.

- c) Multi-message size signs are an alternative to standards signs as above providing:
 - They shall only be used in temporary or permanent 80 km/h or less speed zones (this includes buffer zones).

- Individual panels shall comply with the requirements for the related standalone sign in *AS 1742.3 Section 4: Function, Description and Use of Signs and Devices*.
- Sign assemblies containing regulatory speed limit sign panels shall be provided on each side of the roadway, or carriageway of the road for that direction of travel in accordance with Austroads AGTTM Part 3 Section 2.5.3.
- When used, regulatory speed limit sign plates must be placed in the side of the multi-message frame closest to the traffic
- Where possible, other non-regulatory sign assemblies should be duplicated.
- Multi-message sign panels are not designed to be used in A-frames.
- Multi-message sign panels approved for use in South Australia are shown in Appendix B and on the Department's Sign Index at <http://www.dteiapps.com.au/signindx/>. No other multi-message sign panels shall be used without approval.
- Frames shall meet the requirements of *AS 1742.3 Section 4.5.2*.

5.3 Signs used in South Australia

Only signs defined in AS 1742.3, this Standard or specified indicated for use for temporary work activity on the Department's Sign Index shall be used when working on the road.

Refer AS 1742.3 Section 4,
Appendix A and B;
DIT Sign Index
<http://www.dteiapps.com.au/signindx/>

In special circumstances, signs that do not appear in the above documents may be used with the approval of the Department. Special signs must be designed in accordance with the requirements of AS 1742.3, for example, a sign advising of future roadworks would need to:

- a) be rectangular;
- b) have a yellow retroreflective background and a black border;
- c) have a black legend; and/or
- d) letters of such a size that they can be read by drivers at the prevailing traffic speed.

Additionally, temporary use of standard (non-roadwork) signs on the sign index may be permitted provided their use is in accordance with the requirements of the relevant standard and documented within the Traffic Guidance Scheme (TGS).

All Australian Standard signs have a unique alpha-numeric identification code to assist in placing orders for signs.

5.3.1 Standard sign list

The Department's Standard Sign Index defines signs available for use in South Australia. Signs with "SA" in the alpha-numeric code are for use in South Australia only e.g. T1-SA2.

Refer to the department's Standard Sign Index
<http://www.dteapps.com.au/si/gnindx/>

5.4 Multiple sign displays

In cases where AGTTM requires two signs to be displayed together at the one position e.g. Workers (symbolic) and Speed Restriction signs, they may be displayed on the same mounting side by side. Multi-message signs that combine up to three signs in one frame may also be used in South Australia subject to the requirements of Section 5.2.2(c).

Any unused modules within the multi-message sign frame are filled with yellow or white retro-reflective panels without messages. Refer to the examples in Appendix B of this Standard and AS 1742.3 Appendix B.

5.5 Components of a work site

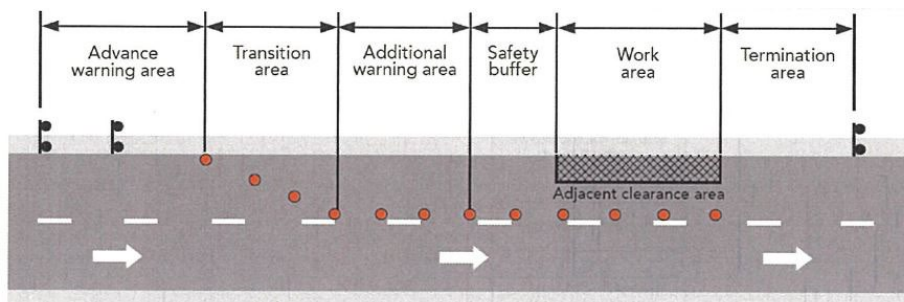
The components of a typical work site are:

- Advance warning area;
- Transition area (or taper area);
- Additional Warning Area
- Safety buffer;
- Work area; and
- Termination area.

Refer AGTTM Part 3: Static Worksites Sections 3.2, 4.2 and 5.2

These components are illustrated in Figure 5.1.

Figure 5.1: Typical Components of a work site



5.5.1 Sign spacing (Old Dimension ‘D’)

Dimension D is a distance expressed in metres, used for the positioning of advance signs and related purposes.

Refer AGTTM Part 3: Static Worksites Section 2.5.3

For the purpose of calculating D , the speed of traffic shall be taken as either:

- a) the speed of traffic in the speed zone immediately preceding the zone in which the advance sign occurs, see *AGTTM Part 3: Static Worksites Section 2.5.3*; or
- b) the speed of traffic at the advance sign if there has been no zone change for the preceding 200 m or greater, see *AGTTM Part 3: Static Worksites Section 2.5.3*.

The value of D should be determined as shown in Table 5.2.

NOTE This table varies from *AGTTM Part 3: Static Worksites Table 2.2* to cater for the use of 25 km/h speed limits in South Australia.

Table 5.2:
Value of Dimension D

Speed of traffic (km/h)	Dimension D (m)
45 or less	5
46 - 55	15
56 - 65	45
Greater than 65	Equal to speed of traffic, in km/h

Reference: *AGTTM Part 3: Static Worksites Table 2.2 (modified)*

5.6 Advance warning area

Advance warning signs and devices are used within the advance warning area. Place these signs and devices so that they allow adequate time for the correct response from drivers under the worst anticipated conditions. These signs shall be displayed as prominently as possible taking into account the best sight distance for approaching traffic. Provide them on all approaches to the work area, including any side roads. Flashing lamps may be used to draw attention to advance signs.

Refer AGTTM Part 3: Static Worksites Section 2.5.3

Advance warning signs shall be placed on both sides where possible of the roadway in advance of the beginning of the taper. Signs should be placed:

- a) $2 D$ back from the first sign;
- b) D back from the first sign for approach speeds less than 65 km/h; or
- c) 100 m back from the first sign if a buffer zone is installed.

Advance warning signs for works exceeding a continuous two week period should be erected in a permanent manner e.g. on posts sunk into the ground.

5.6.1 Advance warning signs

Signs that are placed in advance of work areas are shown in Table 5.3.

Table 5.3:
Examples of advance warning signs

Workers (symbolic) [T1-5]

Shall be used to warn of personnel at short or long-term works, at locations and times where workers are on or adjacent to, or visible to, oncoming traffic.



Roadwork Ahead [T1-1] or [T1-31]

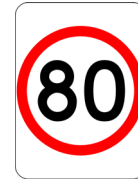
Shall be used to give advance warning of all long-term work sites other than bridgeworks. May also be used at short-term works if additional advance warning is needed. Use [T1-1] if there is the space.



[T1-1]

Speed Restriction [R4-1]

Shall be used to start a temporary speed zone and indicate the speed limit which applies beyond the speed control sign.



Advance Speed Zones [G9-79]

Should be used to notify in advance for a single change in limit speed. Refer to Section 6.2.3.



Roadwork X km Ahead [T1-16]

Should be used X km in advance of arterial road sites if extra advance warning is needed (traffic speed over 80 km/h and sight distance less than 150 m).



Bridgework Ahead [T1-2]

Shall be used at long-term bridgeworks involving a closure, part closure or diversion of traffic.



Road Plant Ahead [T1-3-1] or [T1-3-2]

Shall be used at work sites where machinery is working on the roadway and no form of traffic control, barrier or delineation is present.



[T1-3-1]

Grader Ahead [T1-4]

May be used instead of Road Plant Ahead where a grader alone is engaged in pavement, shoulder or roadside maintenance.



Refer AS 1742.3 Section 4.6.2 and AGTTM Part 3: Static Worksites, Part 4: Mobile Works and Part 5: Short Term Low Impact Worksites

5.6.2 Additional advance warning signs

Additional advance warning signs shall be used where additional warning is needed to advise of an action that may be required, or road conditions. These signs should be erected at least *D* metres before the start of the hazard or greater distance if warranted. If hazardous conditions extend over considerable lengths signs may need to be repeated at regular intervals of up to 500 m. Road condition signs outside an active work area may not require additional advance warning provided the normal running lanes are not obstructed.

Road condition signs are shown in Table 5.4. Other additional advance warning signs that are often used include:

- a) Prepare to Stop [T1-18]; and
- b) Signals Ahead [T1-30].

Table 5.4:
Examples of Road Condition Signs

Slippery [T3-3]

Should be used to warn of conditions which render roadway surfaces or edges temporarily hazardous. May be used to warn of water or ice. May be used with Loose Surface to warn of loose material.

**New Surface [T3-SA105B]**

Should be used to warn of conditions where the new pavement makes the roadway surface temporarily hazardous.



SOFT EDGES [T3-6]

Should be used to warn of conditions which make roadway surfaces or edges temporarily hazardous.



ROUGH SURFACE [T3-7]

Should be used to warn of conditions which make roadway surfaces or edges temporarily hazardous.



Loose Stones [T3-9]

Shall be used if flying stones may be a hazard. May be used to: protect surfaces against aggregate loss; warn stones may fly at fresh bituminous surfacing.



GRAVEL ROAD [T3-13]

Should be used to warn of conditions which make roadway surfaces or edges temporarily hazardous.



LOOSE SURFACE [T3-14]

Should be used to warn of conditions which make roadway surfaces or edges temporarily hazardous.



Reference: AS 1742.3 Section 4.9

5.6.3 Advance warning distances

Refer AGTTM Part 3: Static Worksites Section 2.5.3

Table 5.5:
Advance warning sign distances

Number of advance sign positions	Approach speed km/h	Distance m
One	less than 65 km/h	<i>D</i>
One	65 km/h or more	<i>2D</i>
More than one	all approach speeds	<i>D</i>

This distance shall be measured from the sign to the beginning of the transition (taper) area or the beginning of a diversion associated with the work site. Where there are more than one advance sign position, the advance signs nearest the work area shall be placed *D* from the beginning of the taper area or diversion and other advance sign positions at successive spacing's of *D* further in advance of the work area.

5.6.4 Advance warning sign exceptions

Examples of special cases that are exceptions to the normal use of advance warning signs are provided in Table 5.6.

Table 5.6
Exceptions to advance warning sign usages

Long distance signs

On freeways and other roads where traffic speed is 90 km/h or greater, additional Roadwork X km Ahead [T1-6] type signs may be required.

Refer AGTTM Part 3: Static Worksites Sections 3.7 and 5.11

Frequently changing work areas

Under appropriate conditions advance signs may be displayed up to 2 km in advance of the work vehicle.

Refer AGTTM Part 5: Short Term Low Impact Worksites Section 4.4

Mobile works

Advance signs for mobile works activities are carried on vehicles.

Refer AGTTM Part 4: Mobile Works Section 3

Temporary traffic signals

Long distance warning of unexpected temporary traffic signals may be required e.g. open road areas.

Refer AS 1742.3 Section 4.7.4

The sign assembly Signals Ahead [W3-3] and 1 km [W8-5] should be used in this case.

Refer AGTTM Part 3: Static Worksites, Part 4: Mobile Works and Part 5: Short Term Low Impact Worksites

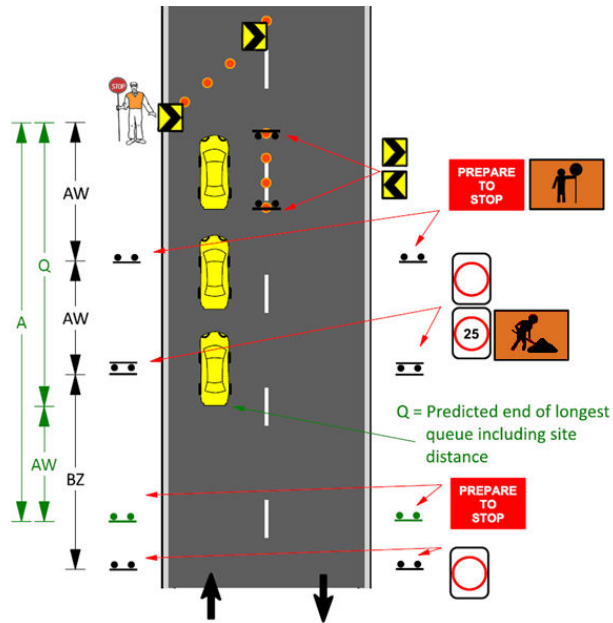
5.6.5 Avoiding end of queue collisions

Under heavy traffic conditions long queues may form at a work site. Depending on the speed of traffic and sight distance to the end of the queue, additional advance warning may be required to avoid end of queue collisions. End of queue protection shall be provided whenever a stationary queue is likely to extend to a point more than D beyond the 'Prepare to Stop' sign.

If queuing is likely then evenly spaced 'Prepare To Stop' repeater signs are required as in figure 5.2.

For further information refer to: AGTTM Part 3: Static Worksites Section 4.8

Figure 5.2: Avoiding end of queue collisions



5.7 Transition area

If a roadway has to be partially closed, an appropriate taper should be formed by setting temporary bollards or traffic cones so that they direct traffic past the work area. Wherever possible, the full length of the taper should be visible to approaching traffic.

The travelled path on the approaches and past the work area shall be delineated so as to properly define which part of the roadway is available to road users, or the path that the traffic is required to follow.

Consideration should be given to delineation in all reasonably expected weather and atmospheric conditions, day or night.

Refer to the Department's *Field Guide* and *AGTTM Part 9: Sample Layouts* for typical taper applications.

5.7.1 Lane closures using tapers

The following types of tapers are used:

- traffic control at the beginning of a taper where there is a traffic controller or temporary traffic signals just prior to a single lane;
- lateral shift taper where traffic is required to shift laterally without conflict with another traffic stream; and
- merge taper where one lane of traffic is required to merge into another.

When closing more than one lane on multi-lane roadways, one lane should be merged at a time, with the distance between the end of the first merge and the start of the second taper being at least $1.5D$.

For further information regarding tapers including recommended lengths of tapers refer to AGTTM Part 3: Static Worksites Section 5.9

Lane Status signs shall be used where one or more lanes of a multi-lane roadway are closed. These signs indicate the lanes that are closed to traffic by 'bars' whilst arrows indicate the lanes that are available to traffic.

Refer AS 1742.3 Section 4.10.1(b)

Different versions of Lane Status signs that show more than three lanes may be used. In addition, Lane Status signs made with removable and reversible symbols may also be used as this type of sign has a number of different options that can be selected to suit the particular lane closure that is currently in operation.

For lane closures which require complex driving manoeuvres, the production of special signs incorporating curved arrows which better depict the travelled path alignment should be considered.

Table 5.7:
Examples of signs and devices for lane closures

Lane Status [T2-6-1] or [T2-6-2]

Shall be used where one or more lanes of a multi-lane roadway are closed. Shall only be used to give advance warning of lane closures and not in lieu of adequate signing and delineation of the closure. This sign shall be placed on both sides of the road where possible.



[T2-6-2]

Barrier board

A type of barricade used to inhibit access to a work area. Shall not be used for delineation. Shall not be placed parallel to the direction of traffic flow as they can become a spearing hazard if struck end on by an out of control vehicle.



Reference: AS 1742.3 Section 4.10

5.7.2 Devices for delineating and indicating the travelled path

Devices used to form tapers may comprise of one or more of the following:

- a) traffic cones;
- b) temporary bollards;
- c) temporary hazard markers (T5-4);
- d) roadworks delineators; and/or
- e) vehicle or trailer-mounted illuminated flashing arrow signs.

Traffic cones or temporary bollards may be used to form a taper for a short-term day time work site.

Devices used to form tapers should be spaced so that traffic is discouraged from weaving through them.

For periods of a longer duration, it is recommended substituting roadworks delineators to form the taper. They should be spaced so that they appear as a continuous line to an approaching driver.

Temporary line marking may be used to define the delineated pathway more clearly. Raised pavement markers may be used in conjunction with line marking.

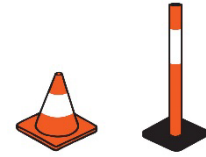
For further information refer to AGTTM Part 3: Static Worksites Sections 4.4, 5.4 and AS/NZS 1906.1.

Devices for delineating and indicating the travelled path are shown in Table 5.8.

Table 5.8:
Examples of devices for delineating and indicating the travelled path

Traffic cones or temporary bollards

Refer to AS 1742.3 Section 4.11.1



Roadworks delineators

Refer AS 1742.3 Section 4.11.2

Temporary hazard markers [T5-4] or [T5-5]

Should be used to show any lateral change of direction of the travelled path through a work site and to delineate hazards and non-trafficable work areas adjacent to the travelled way. They should be erected with their edge about 1 m from the edge of the travelled path. Chevrons should always point to the side where traffic shall pass.



[T5-4]



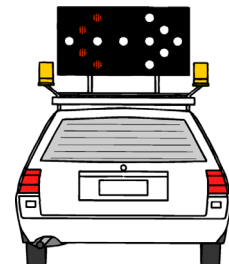
[T5-5]

Refer AS 1742.3 Section 4.11.3

Vehicle or trailer mounted illuminating flashing arrow

This sign shall be used to assist traffic in negotiating the taper where the traffic volume is 1500 vpd or greater.

Refer AS 1742.3 Section 4.14.2



5.7.3 Traffic cones and temporary bollards

Traffic cones and temporary bollards may be displaced by passing traffic. Unless workers are present to replace them they should not be used unless they are securely fixed to the pavement or weighted to provide adequate stability from passing traffic when unattended.

For night time use, traffic cones and temporary bollards shall be fitted with a white horizontal retro reflective band in accordance with AS 1742.3 Section 4.11.1.

Table 5.9 gives the recommended maximum spacing of traffic cones and temporary bollards.

Table 5.9:
Recommended maximum spacing of traffic cones and temporary bollards

Purpose and usage	Traffic speed (km/h)	Recommended maximum spacing (m)
All purpose	< 50	4
Centre-line on approach to a traffic controller position	All cases	4
Outer edge of traffic lanes e.g. works on shoulder or parking lane	51 to 70 >70	18 24*
Separating opposing traffic on a two lane, two way road e.g. partial or complete lane closure	51 to 70 >70	12 18
Separating opposing traffic on a multi-lane undivided road e.g. as part of a lane closure	51 to 70 >70	12 18
Adjacent to a closed lane on a multi-lane undivided road	51 to 70 >70	18 24
Merge tapers (see AGTTM Part 3: Static Worksites Section 5.9)	51 to 70 >70	9 12
Lateral shift tapers (see AGTTM Part 3: Static Worksites Section 5.9)	51 to 70 >70	12 18
Protecting freshly painted lines	51 to 70 >70	24 60 [†]

* This spacing may be extended to 60 m where the length of the line of traffic cones or temporary bollards exceeds 1 km but not adjacent to locations where there are workers on foot.

† This spacing may need to be reduced on curves or crests or if the row of traffic cones is not clearly defined at night.

Reference: AS 1742.3 Section 4.11 & AGTTM Part 3: Static Worksites Table 5.3 (modified)

For further information about the edge clearances for delineating devices and safety barrier systems refer to: Table 9.1.

5.7.4 Roadworks delineators

Roadwork delineators that are used at or near works on roads shall meet the requirements of AS 1742.3 Section 4.11.2 and AS/NZS 1906.2.

For further information refer to AS 1742.3 Section 4.11.2 and AS/NZS 1906.2.

They should be used for delineation as follows:

- a) for delineation of the travel path through or past the work site as an alternative to traffic cones or temporary bollards – yellow delineators on both sides of the roadway; and
- b) for delineation of the roadway on detours and side-tracks – red delineators on the left side and white on the right side (two way roadway) or yellow on the right side (one way roadway).

They should be erected 1 m minimum from the edge of the travelled path and at a uniform height of approximately 1 m above the road surface. Delineator posts should be frangible or otherwise non-hazardous. Delineators should be installed so as to provide a single continuous line defining the travelled path.

The spacing of delineators shall be as follows:

- a) 24 m maximum at traffic speed up to 70 km/h; and
- b) 60 m maximum at higher traffic speeds.

5.7.5 Temporary hazard markers

Temporary hazard markers should be used to show any lateral change of direction of the travelled path through a work site and to delineate hazards and non-trafficable work areas adjacent to the travelled path. They should be erected allowing a clearance of about 1 m from the edge of the travelled path. Chevrons should always point to the side which the traffic is required to pass.

Refer AS 1742.3
Section 4.11.3

The T5-5 sign should be used on short-term day time work sites to indicate the start of a line of traffic cones or temporary bollards where the devices themselves may not be sufficiently visible to approaching traffic.

5.7.6 Pavement markings

Pavement markings should be provided on roads where pavement markings existed prior to works.

Refer AS 1742.3 Section 4.11.4

For further information refer to the department's Pavement Marking Manual available online at:

<http://www.dit.sa.gov.au/standards/tass>

Yellow marking may be used at road work site but must be in accordance with Vicroads *Supplement to AS 1742.2:2009* (2017) Clause 5.2.2(c):

<https://www.vicroads.vic.gov.au/-/media/files/technical-documents-new/traffic-engineering-manual-v2/tem-vol-2-part-2-as17422-traffic-control-devices-for-general-use-dec-2017.ashx>

5.7.7 Pavement markers (RRPMs)

Raised retroreflective pavement markers (RRPMs) may be used in conjunction with temporary pavement markings at long-term sites.

Refer AS 1742.3
Section 4.11.5

5.7.8 Temporary kerbing

Temporary kerbing may be used to form temporary medians, traffic islands or pavement edges at long-term works.

Refer AS 1742.3
Section 4.11.6

5.8 Safety buffer

An area immediately ahead of a work area shall be provided as a safety buffer wherever the speed of traffic is 60 km/h or more. An area 20 to 30 metres in length is normally sufficient. However, the area must be adequately seen by approaching traffic. A safety buffer shall be kept free of plant, materials and work activity. It may be used for vehicular access. When using devices such as a vehicle mounted illuminated flashing arrow sign, they should be mounted and displayed at the beginning of the area.

Refer AGTTM Part 3: Static
Worksites Section 3.6

5.9 Work area

The work area is the part of the road where works, including all vehicles and plant, are physically being carried out and workers may be working.

5.9.1 Work area edge clearances

When measuring distances for the purpose of determining an appropriate treatment for a static work site, measure from the edge of the traffic lane to the devices using the edge of the devices that are closest to the traffic.

5.10 Termination area

Signs placed at the end of the termination area indicate the end of works and that normal traffic conditions and/or speed limits resume.

For further information refer to
AGTTM Part 3: Static
Worksites Sections 3.9, 4.9 &
5.12

Termination signs shall be placed a distance of D further away from the last point on the roadway or verge affected by the works.

Table 5.10 shows the termination sign options

Table 5.10:
Termination signs

End Roadwork [T2-16] or [T2-17]

'End Roadwork' shall be used at the departure end of long-term work sites.



[T2-16]

Speed Restriction [R4-1]

Shall be used to terminate a temporary speed zone and indicate the speed limit which applies beyond the sign. Speed restrictions are regulatory signs and are discussed further in the next section.



End Speed limit [R4-12]

Shall be used to terminate a temporary speed zone on unsealed roads.



Reference: AS 1742.3 Sections 4.6.10 and 4.7.6

Section 6: Using regulatory signs and devices

6.1 Regulatory traffic control devices

Regulatory signs are signs that must be obeyed by law. They are used to indicate and reinforce traffic regulations, rules and restrictions. Some examples of these include speed limit, give way and stop signs. The following signs are often used at work sites to regulate road users or complement regulatory signs.

6.2 Roadwork speed limits

Section 20 of the Act prescribes the speed limits to be set at works on roads for work sites, work areas and Category 1 and Category 2 hazardous work areas.

Section 20 also prescribes that a roadworks permit is required when placing a speed limit or closing a portion of a prescribed road (road under the care, control and management of the Commissioner of Highways or otherwise prescribed by the Regulations).

A temporary speed zone established at works on roads will only apply for the duration of the permit. Section 20(11)(b) of the Act provides that temporary speed limit signs must be removed from the road during any period which:

- (i) workers are not engaged at the work area; and
- (ii) the area of road affected by the works, or by vehicles or equipment relating to the works, does not involve a greater than normal level of hazard for persons using the road.

Speed zones for traffic safety purposes should not be used where alternative means of traffic control would be adequate, nor should they be used to avoid the necessity for some other more appropriate action, such as the use of a barrier system, TMA or a traffic controller.

The speed limits shall be displayed for the following parts in a workzone:

- Work site – Maximum of 80 km/h;
- Category 1 Hazardous Work area – 40 km/h; and
- Category 2 Unusually High Hazardous work area – Maximum of 25 km/h.

The maximum speed limit for a work site is 80 km/h. Note that if speeds higher than 80 km/h are required (e.g. excessive lengths of safe work sites or use of TMAs or barriers) then a separate approval in accordance with Section 20(10)(c)(ii) of Road Traffic Act 1961 can be obtained at the discretion of the Commissioner of Highways or delegate.

Where the work area has been determined that it is not Category 1 or 2 and the posted speed limit under normal conditions applying to the road is greater than 80 km/h, then a roadwork speed limit of 60 km/h **may** be used under the following conditions where:

- a) plant only is operating;
- b) the road surface has been degraded;
- c) a fresh bituminous seal has just been laid; and/or
- d) traffic is subject to a reduced standard alignment e.g. an uneven road surface due to roadworks.

Refer to Table 6.1 for safety controls to reduce the level of risk associated with Category 2 work areas and eliminate the need for a 25 km/h speed limit. Traffic speed may be increased to a maximum of 60 km/h where work is carried out on plant exclusively.

6.2.1 Speed limit assessment for Category 2 unusually hazardous work areas

Category 1 hazardous work areas have a default speed limit of 40 km/h. The conditions for Category 1 hazardous work areas are explained in Section 8 of this document.

The use of a 25 km/h speed limits is reserved for Category 2 hazardous work areas (unusually high level of hazard to workers or persons using the road). See Table 6.1 below.

Note that a permit for the use of a 25 km/h speed limit will only be issued once a documented risk assessment has been undertaken to show that controls such as the following cannot be implemented so as to obtain a higher speed limit.

Table 6.1:
Category 2 Hazardous Control selection table

Category 2 Hazards	Hierarchy of Safety Controls		
	Elimination/Substitution	Engineering	Administrative
Edge drop of more than 200 mm	Road closure Detour onto other roads Side track past the works	Safety barriers Lateral clearance	Speed reduction
Unprotected worker on foot within 1.2 m of moving traffic	Road closure Detour onto other roads Side track past the works	Safety barriers Lateral clearance	Speed reduction
Controller using a manual Stop/Slow	Road closure	Safety barriers	Speed reduction

Using regulatory signs and devices

bat (unprotected) stepping into a lane	Detour onto other roads Side track past the works Use of electronic/remote signing	Lateral clearance	
If stopping sight distance cannot be met for other higher road work speed limits	Road closure Detour onto other roads Side track past the works		Speed reduction
Uneven road surface	Road closure Detour onto other roads Side track past the works		Speed reduction
Unfinished pavements	Road closure Detour onto other roads Side track past the works		Speed reduction
Poor visibility	Road closure Detour onto other roads Side track past the works		Speed reduction
Narrowed lane widths (below minimum requirements of Austroads)		Safety barriers Lateral clearance	Speed reduction
Major events with high pedestrian volumes	Road closure Detour onto other roads Side track past the works	Safety barriers Lateral clearance	Speed reduction
Where the existing permanent speed limit is greater than 25 km/h and less than 40 km/h. Note that if the permanent speed limit is less than 25 km/h the existing speed limit shall be displayed.	Road closure Detour onto other roads Side track past the works	Safety barriers Lateral clearance	Speed reduction
It is impracticable to separate pedestrians and cyclist from vehicular traffic through (not past) the work area.	Detour onto other roads Side track past the works	Safety barriers Lateral clearance	Speed reduction

6.2.2 Start of speed zone

Roadwork speed restriction signs shall not be used alone but in addition to other signs and devices required at the work site. Speed restriction signs shall be placed on both sides of the roadway where possible at the start of the speed zone, unless the normal speed limit is 40 km/h, in which case a speed restriction sign is required on the left-hand side only.

6.2.3 Buffer zone

Advance warning of a temporary speed zone shall be provided by means of a buffer zone, comprising a speed zone of intermediate value (buffer zone speed limit), or “Speed Limit AHEAD” type signs according to the following table. The buffer zone speed limits are 80 and 60 km/h.

Refer AS 1742.3 Section 3.4.4 and AGTTM Part 3: Static Worksites Section 5.5.1

A speed reduction of greater than 39 km/h shall have a buffer zone.

NOTE This varies from AS 1742.3 and AGTTM Part 3 to allow for the use of a temporary 25 km/h speed zone within a 60 km/h speed zone in South Australia without the use of a buffer zone.

A reduction in speed of 60 km/h or more should be phased in through two steps for safety or other reasons. A single step buffer may be used where a risk assessment determines that this is adequate.

NOTE The length of a buffer zone speed limit (BZ) is determined by the preceding speed limit. Refer to the DIT *Field Guide: Traffic Control Devices for Workzone Traffic Management* for dimension BZ.

Refer to ¹ below Table 6.2 for locating the “Speed Limit AHEAD” (G9-79) sign where this type of buffer is used.

Table 6.2:
Type of buffer zone

Preceding speed limit (km/h)	Work area speed limit (km/h)		
	25	40	60
60 or less	n/a	n/a	n/a
70	25 Ahead ¹	n/a	n/a
80	60	40 Ahead ¹	n/a
90	60	40 Ahead ¹ or 60	n/a
100	60 Ahead ¹ and 60	40 Ahead ¹ or 80 and 40 Ahead	60 Ahead ¹ or 80
110	60 Ahead ¹ and 60	40 Ahead ¹ or 80 and 40 Ahead	60 Ahead ¹ or 80

¹ Where the “Speed Limit AHEAD” type buffer zone is used, the “Speed Limit AHEAD” (G9-79) sign is located a distance equal to double the value of the preceding speed limit, in advance of the Speed Restriction (R4-1) sign.

For example, if the preceding speed limit is 110 km/h, a “60 AHEAD” (G9-79) sign would be located 2 x 110 = 220 m in advance of the “60” Speed Restriction (R4-1) sign.

Reference: *AGTTM Part 3: Static Worksites* Section 5.5.1 in relation to the locating of “Speed Limit AHEAD” signs

A buffer zone speed limit is not required for traffic leaving a lower speed zone.

6.2.4 Return to speed signs

The Speed Restriction sign [R4-1] is used to display the appropriate speed limit on sealed roads as soon as possible at the end of the work site. The sign shall display the appropriate speed for the road following the roadwork.



[R4-1]

Where the sealed road has a default speed limit of 50 km/h or 100 km/h the R4-12 can be used.

Refer AS 1742.3
Section 4.7.6(c)

On unsealed roads the End Speed Limit sign [R4-12] must be displayed at the start point of a section of road covered by the rural default speed limit.

Signs shall be placed on both sides of the road where possible.

Where a permanent speed limit sign is located within the vicinity of the end of the work site (ie within 15 metres), this sign may be utilised as the return to speed sign.

6.2.5 Length of work area

To encourage drivers to obey the signs the speed limit zone should not be greater than the length of the work area which should be kept as short as possible. Workers should, wherever possible, avoid setting up or working in an area defined as a hazardous work area.

Table 6.3:
Recommended maximum work area lengths

Max Speed Limit (km/h)	Work Area Lengths (m)
25	100 – 200 *
40	500 *
60	150 min
80	500 – 5000 *

* Note: for traffic management purposes, if a longer length work area is required, it should be highlighted in the submission for approval to the Road Authority.

6.2.6 Repeater signs

Repeater signs are used to confirm or remind road users of the speed limit where the zone is long and there are locations where it could seem like the temporary speed limit no longer applies. (i.e. between work areas in an extended worksite). Repeater signs are also used at locations where traffic enters from side streets and it is necessary to advise them of the speed limit.

Refer AGTTM Part 3: Static Worksites Section 5.5.1

The sign size use for the repeater Speed Limit sign is generally an “A” size (450 mm x 600 mm).

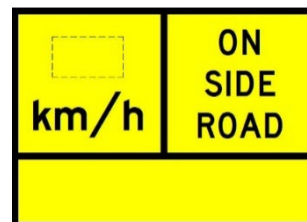
6.2.7 Offset speed zones

Temporary speed zoning which results in speed limits which are different for each direction of travel at a particular location (offset speed zones) may be used when the conditions specified in *AGTTM Part 3: Static Worksites* Section 5.5.1 for offset speed zones are met.

6.2.8 Speed limits on side roads

When works are being carried out on a side road and works are not within 1.2 m of moving traffic on the main road or the work does not interfere with traffic flow on the main road, displaying a lower speed on the main road is not warranted.

However, to notify road users of a lower speed for roadworks being carried out on a side road, the Advisory Speed “x km/h” (TM3-16-1A) with “On Side Road” (TM5-9A) sign shall be used (also refer example Figure 1.2.2.5 in the *DIT Field Guide*). As this type of sign is advisory only, regulatory Speed Restriction signs (R4-1) are still required on the side road.



[TM3-16-1A / TM5-9A]

The Workers (symbolic) and “On Side Road” signs may be used on the main road to provide advance warning to drivers of works on the side road, where any regulatory signs on the side road are clearly visible to drivers after completing their turn from the main road.



[TM1-5A / TM5-9A]

Signs above are not required to be duplicated but where possible, installed on the side of the road in which the road is closed. An alternative is to install an L or R arrow in the bottom panel.

6.2.9 Speed Limits for New Surfaces

Where speed needs to be temporarily reduced to provide safer conditions until the newly constructed surface has time to achieve adequate skid resistance. This is only applicable to Stone Mastic Asphalt (SMA) or Open Graded (OG) surfacings, not dense mixes.



Subject to an adequate risk assessment, possible speed restrictions that may be used in conjunction with this sign combination are:

- 40 km/h where the permanent posted speed for the relevant section of road will be 60 km/h,
- 60 km/h where the permanent posted speed for the relevant section of road will be 80 km/h, or
- 80 km/h where the permanent posted speed for the relevant section of road will be 100 km/h or greater.

6.2.10 Non Complying Speed limits

If Section 20(11)(b) of the Act is not complied with in relation to any speed limit signs then an authorised officer may alter or remove the speed limit signs.

6.3 Traffic control

6.3.1 Manual traffic control

Signs and devices that are used for manual traffic control are shown in Table 6.4. The 'Stop' face of the 'Stop/Slow Bat' is a regulatory sign.

Refer AS 1742.3
Section 4.7.2

Table 6.4:
Examples of signs and devices for manual traffic control

STOP/ SLOW Bat [R6-8, T7-1]

Shall be used by a traffic controller to control traffic at any temporary obstruction or hazard.

Refer to *AGTTM Part 7: Traffic Controllers* for the model instructions for the establishment of manual traffic control and for the training of a traffic controller.

An alternative to the use of a 'Stop/Slow Bat' is to use a 'Stop' sign mounted on a boom barrier that is operated by a traffic controller (also known as a boom barrier).

Other alternatives to the manual control of a 'Stop/Slow Bat' such as remote operation may also be used to control traffic at a temporary obstruction or hazard. This is provided that a traffic controller is seen to be in control of the remote operation of the 'Stop/Slow Bat' from the perspective of a road user, and that the correct sign faces are used.



[R6-8]



[T7-1]

Prepare to stop [T1-18]

Shall be used with the Traffic Controller (symbolic) sign to give advance warning where traffic may be required to stop in compliance with the directions of a traffic controller.



Traffic Controller (symbolic) [T1-34]

Shall be used to give advance warning of the presence of a traffic controller. Shall only be used with 'Prepare to Stop' sign if traffic is required to stop at traffic controller position.



Portable two-way radios

Portable two-way radios or similar means shall be used for communication between traffic controllers (except near blasting works) if unable to communicate by sight.



Reference: AS 1742.3 Section 4.7.2

6.3.2 Sign control, single lane operation

The 'Give Way', 'One Lane' sign assembly is to control traffic by signs only. It is appropriate for road and bridgeworks when:

Refer AS 1742.3
Section 4.7.3

- traffic volume is 150 vpd or less and speed is 70 km/h or less;
- each work area entry is visible from the other;
- the work area is less than 100 m in length; and
- sight distance to opposing traffic is at least 200 m beyond the far end of the work area for traffic facing the 'Give Way', 'One Lane' signs.

Traffic may be controlled by signs only using the devices shown in Table 6.5. The 'Give Way' and 'No Overtaking or Passing' signs are both regulatory signs.

Table 6.5:

Examples of signs for sign control, single lane operation

GIVE WAY, ONE LANE sign assembly [R1-2, R9-9]

May be used to assign priority to one direction of travel past a work area when reduced to less than that for two lanes of traffic.



[R1-2]



[R9-9]

NO OVERTAKING OR PASSING [R6-1]

Where traffic at a single lane section is controlled by a 'Give Way', 'One Lane' sign assembly at one end, the 'No Overtaking or Passing' sign shall be erected at the start of the single lane for traffic in the opposite direction.



Give Way Ahead sign [W3-2]

If advance warning of this assembly is required, the 'Give Way Ahead' sign may be used.



[W3-2]

Reference: AS 1742.3 Section 4.7.3

6.4 Portable traffic control devices

6.4.1 Traffic signal control

Signs and devices that are used to control traffic by traffic signals are shown in Table 6.6. 'Stop Here on Red Signal' is a regulatory sign.

Refer AS 1742.3
Section 4.7.4

Table 6.6:
Examples of signals and signs to control traffic

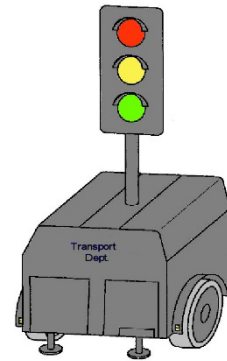
STOP HERE ON RED SIGNAL [R6-6]

Shall be used to indicate where traffic must stop when there is no stop line on the pavement. It is recommended to supplement the stop line where one is provided.



Portable traffic signal

Usually consists of two signal heads each comprising a three-aspect signal face (red, yellow and green), two vehicle detectors, a signal control unit and power source.



Prepare to stop [T1-18]

Shall be used with the 'Signals Ahead' sign to give advance warning if portable or temporary fixed traffic signals are used to control traffic.



Signals Ahead [T1-30] & [W3-3]

If portable or temporary fixed traffic signals are used to control traffic, the 'Signals Ahead' sign shall be used to give advance warning along with the 'Prepare to Stop' sign.



[T1-30]



[W3-3]

For long-term use with temporary fixed signals the diamond version of this sign [W3-3] may be substituted.

Reference: AS 1742.3 Section 4.7.4

6.4.2 Portable boom barriers

For signs that are used in association with portable boom barriers, refer to AS 1742.3 Section 4.7.5.

Refer AS 1742.3
Section 4.7.5

6.5 Road closures

Signs and devices that are used at road closures are shown in Table 6.7. 'No Entry', 'No Right Turn' and 'No Left Turn' are regulatory signs.

Refer AS 1742.3
Section 4.10

Table 6.7:
Examples of signs and devices for road closures

NO ENTRY [R2-4]

Should be used to complement the 'Road Closed' sign so that the road closure is enforceable.



No Right Turn [R2-6(R)]

Should be used to complement the 'Road Closed' sign so that the road closure is enforceable.



No Left Turn [R2-6(L)]

Should be used to complement the 'Road Closed' sign so that the road closure is enforceable.



ROAD CLOSED [T2-4]

Shall be used where a roadway is closed to traffic in conjunction with barrier boards completely barring access to the roadway. Consideration should be given to traffic detours. The 'Road Closed' sign by itself is only a warning sign and is not enforceable.

ROAD CLOSED

Barrier boards

Should be mounted on trestles of fixed posts 1 m above the pavement. These shall not be placed parallel to direction of traffic flow as it may become a spearing hazard if struck end on by an out of control vehicle.



Reference: AS 1742.3 Section 4.10.

6.6 Detour signs

Signing arrangements at detours should be checked to ensure that all detour signs are prominently displayed. Detour and side-track pavements shall be monitored to ensure any indications of impending pavement failure are dealt with promptly.

Refer AS 1742.3
Section 4.8

Signs used for detours are shown in Table 6.8 below.

Table 6.8:
Examples of detour signs

NO ENTRY [R2-4]

Should be used to complement the 'Road Closed' sign so that the road closure is enforceable.



No Right Turn [R2-6(R)]

Should be used to complement the 'Road Closed' sign so that the road closure is enforceable.



No Left Turn [R2-6(L)]

Should be used to complement the 'Road Closed' sign so that the road closure is enforceable.



DETOUR AHEAD [T1-6]

Shall be used to give advance warning of a detour (via roads or streets, or side track for this purpose).



END DETOUR [T2-23]

Should be used to indicate a detour end if road users need advice they have returned to their original route.



DETOUR [T5-1(L)] or [T5-1(R)]

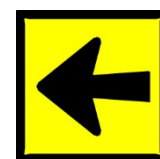
Shall be used to indicate the direction and location for traffic to detour from the road. It is often necessary to use 'Detour Ahead' signs as well. Other signs should be used as required to reassure or guide traffic.



[T5-1(L)]

Detour marker

Used to guide users along the detour route if the detour sign is likely to misdirect road users other than those following the detour. Typically used in built-up areas where traffic is detoured via side streets. The arrow may be displayed vertically upwards or to the left or right.



[T5-6]

Reference: AS 1742.3 Section 4.8.

Section 7: Additional signs and devices

7.1 Signs and devices on vehicles

Warning devices such as rotating flashing lamps, illuminated flashing arrow signs or variable message signs (VMS) may be used to warn road users.

Refer AS 1742.3
Section 4.14

7.1.1 Vehicle-mounted warning device

A vehicle-mounted warning device shall comprise of one of the following:

Refer AS 1742.3
Section 4.14.1

- a) a single rotating flashing yellow lamp for emergency or other infrequent use on a vehicle not normally used for roadwork purposes. Also for use on a plant item working within a static work area or an inspection vehicle operating under mobile inspections;
- b) a pair of rotating flashing yellow lamps for use on vehicles working on roads with a traffic volume up to 1500 vpd and positioned on the vehicle so that at least one lamp is visible from any direction; or
- c) an illuminated flashing arrow sign (see below for details) for any work including that described in the previous two dot-points, and for mobile works where indicated in *AS 1742.3 Section 4.14.2*.

The vehicle-mounted warning device shall be mounted as high as practicable on the vehicle for best visibility to traffic e.g. on the roof of the truck. Supplementary signs such as 'Line Marking' may be mounted in conjunction with the illuminated flashing arrow or elsewhere in a prominent position on the body of the vehicle.

If signs are mounted on a device or elsewhere on a vehicle they shall be capable of being removed from view if not required (i.e. able to cover, fold, turn off).

7.1.2 Illuminated flashing arrow sign

This sign comprises a matrix of lamps or light emitting elements in the form of an arrow that is flashed in a cyclic manner to provide advance warning of a temporary diversion. It includes a backing board for the lamps or light-emitting devices together with additional equipment for mounting and operating the sign.

Refer AS 1742.3
Section 4.14.2

Flashing arrow boards shall be used where the traffic volume is greater than 1500 vpd.

For additional information refer
to AS/NZS 4192.

Rotating flashing lamps may be used in conjunction with this sign, provided the lamps are either appropriately shielded or laterally or vertically displaced from the edge of the sign to avoid corrupting the arrow shape or its directional effect.

7.1.3 Supplementary vehicle-mounted signs

The following signs are used with the illuminated flashing arrow sign:

Refer AS 1742.3
Section 4.14.3

- a) 'Workers (symbolic)' (T1-5) shall be used on all vehicles in a mobile works convoy whenever workers on foot are part of the operation; and
- b) 'Line Marking' should be used on advance warning vehicles and on the work vehicle.

These signs shall be mounted either on the vehicle along with the flashing arrow sign or elsewhere in a prominent position on the body of the vehicle. They shall be removed from view when they do not apply.

7.2 Safety barriers

Safety barriers are intended to separate moving traffic from the work area, while providing a safe work area for workers.

Refer AS 1742.3 Section
4.12 and AGTTM Part 3:
Static Worksites Section 5.3

Safety barriers may be required for situations where any of the following are cause for concern:

- a) inadequate safe clearance between moving traffic and workers and plant on site;
- b) hazardous traffic conflicts;
- c) collisions with hazardous fixed objects, construction works or falls into excavations close to the travelled path; or
- d) inadequate separation of temporary footpaths, shared paths or bicycle paths from vehicular traffic paths.

The requirements and recommendations for the selection, positioning and end treatment of safety barriers are given in *Austrroads Guide to Road Design Part 6*.

7.2.1 Containment fences

Containment fences (tapes, plastic mesh fencing or longitudinal channelizing barricades) may be used to provide visible containment and in situations where physical protection by use of a road safety barrier system is not warranted. Containment fences shall have sufficient stability to resist displacement, fracture or deflection of more than 0.5 m resulting from all expected wind conditions, air turbulence from passing traffic and minor vehicular impacts.

Refer AS 1742.3 Section
4.12.1 and AGTTM Part 3:
Static Worksites Section 5.3.2

7.2.2 Tapes and bunting

Containment tapes may be used to contain workers on foot and plant within the safe work area at a work site. The tape should be a minimum 100 mm wide with alternate stripes of contrasting colour and should be supported approximately

Refer AS 1742.3 Section
4.12.1 and AGTTM Part 3:
Static Worksites Section 5.3.2

1 m above ground level with supports spaced so that the minimum height of the tape above the ground is 800 mm. The maximum breaking strength of the tape should be low enough not to cause a hazard to any vehicle or motor cycle which may run into it. Tapes and bunting shall not be used for pedestrian containment adjacent to traffic.

7.2.3 Plastic mesh fencing

Plastic mesh fencing may be used for pedestrian containment as well as for the containment of workers on foot and plant as above. It comprises a flexible orange mesh approximately 1 m high. It shall be supported so that the top of the fence is at least 800 mm above ground level at all times.

Refer AS 1742.3 Section 4.12.1 and AGTTM Part 3: Static Worksites Section 5.3.2

7.2.4 Longitudinal channelizing barricades

Longitudinal channelizing barricades shall comprise of interconnected light-weight modules such as plastic water-ballasted modules. They may be used either as containment fences for workers or pedestrians or as delineation devices in situations where a road safety barrier system is not required.

Refer AS 1742.3 Section 4.12.2 and AGTTM Part 3: Static Worksites Section 5.3.1

7.2.5 Temporary road safety barrier systems

Temporary road safety barrier systems are designed to provide a physical barrier between the travelled path and the work area which will inhibit penetration by an out of control vehicle and will have redirecting properties. They are typically used between traffic and a severe hazard e.g. a deep excavation, a bridge pier or a hazardous stockpile; and for the protection of workers and non-vehicular road users in vulnerable situations where lateral clearance to moving traffic would otherwise be insufficient for safety. They may also be used to separate opposing traffic.

Refer AS 1742.3 Section 4.12.3 and AGTTM Part 3: Static Worksites Section 5.3.1

The type selection and installation of a temporary road safety barrier system including positioning and end treatments shall be in accordance with AS/NZS 3845.

For a list of approved products for use on the roads under the care, control and management of the Commissioner of Highways, refer to *GD 300 Accepted Safety Barrier Products* (<http://www.dit.sa.gov.au/?a=626296>).

7.2.6 Temporary crash attenuators

Temporary crash attenuators are purposely designed with energy absorbing terminal devices to reduce the severity of a collision by an out of control vehicle with hazardous fixed objects e.g. bridge piers or safety barrier ends.

Refer AS 1742.3 Section 4.12.4

The need for temporary crash attenuators should be determined through a risk assessment.

For attenuator use in SA refer to the Department's *GD 300 Accepted Safety Barrier Products* (<http://www.dit.sa.gov.au/?a=626296>).

7.2.7 Truck Mounted Attenuators (TMAs)

In the absence of any South Australian documentation for the use of TMAs, refer to the VicRoads Guidelines for the use of TMAs.

Refer AS 1742.3 Section 4.14.5, AGTTM Part 3: Static Worksites Section 5.8.1, and AGTTM Part 4: Mobile Worksites Section 3.5.3

<https://www.vicroads.vic.gov.au/-/media/files/documents/utilities/about-vr/ohs/guidelines-for-the-use-of-truck-mounted>

7.3 Pedestrian control

Signs often used for pedestrian control are shown in Table 7.1.

Refer AS 1742.3 Section 4.17

Table 7.1
Examples of pedestrian control signs

PEDESTRIANS WATCH YOUR STEP [T8-1]

Should be used if pedestrian routes across works may be hazardous due to roughness, level differences, or loose or other surface material.



PEDESTRIANS (arrow) [T8-2(L)] or [T8-2(R)]

Shall be used at a work site where it is necessary to direct pedestrians via a particular path.



[T8-2(L)]



[T8-2(R)]

USE OTHER FOOTPATH [T8-3]

Shall be used where works make it necessary to deny footpath use on one side of a road. 'Pedestrian (arrow)' signs shall be used as necessary in conjunction with this.



FOOTPATH CLOSED [T8-4]

Shall be used if the footpath is not in use. The footpath should be closed with a barrier.



LOOK BOTH WAYS, TWO-WAY TRAFFIC [T8-5]

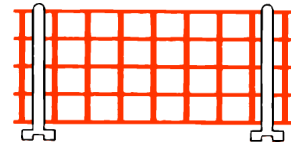
Shall be used at non-signalised pedestrian crossings on both sides of the open roadway facing pedestrians about to cross if one roadway of a divided road is temporarily



closed and there is a risk that pedestrians might not notice it is temporarily two-way.

Mesh fencing

Used to control pedestrian movements at a work site. A safety barrier may be required instead if pedestrians are diverted onto roadway.



Reference: AS 1742.3 Section 4.17.

7.4 Other signs and devices

Other signs and devices that do not fall into other categories are in Table 7.2.

Refer AS 1742.3 Sections 4.20, 4.21 and 4.22

**Table 7.2
Other signs and devices**

Trucks [T2-25] or [W5-22]

Should be used where trucks may cross, enter or leave the road from an adjoining property at a frequency and in circumstances which create a hazard. Should only be displayed when the need exists and removed or covered when truck activity ceases. Should be placed on the side of road where trucks will be crossing or entering from.



[T2-25]

High visibility clothing

High visibility clothing meeting the requirements of AS/NZS 4602 (Types D, N or D/N) shall be worn by all visitors and personnel working in or adjacent to traffic (including at work sites, in quarries and on construction haul roads). It is designed to make personnel more conspicuous and warn road users of their presence. Further reading see AS 1742.3 Section 4.21, *AGTTM Part 6: Field Staff – Implementation and Operation Section 3.3.3 and Part 7: Traffic Controllers Section 2.5.*



TRAFFIC HAZARD [T1-10]

May be used for emergency use only, whenever any unexpected event causes a traffic hazard. Should be



replaced as soon as possible (generally within 24 hours) by signs more appropriate to the conditions.

Lamps

If road lighting is poor or absent at work sites flashing yellow lamps may be used to draw attention to advance warning signs e.g. 'Roadwork Ahead' or 'Bridgework Ahead'. Lamps shall not be used for delineation.

NOTE:

The use of steady or ripple lamps is no longer permitted in AS1742.3.

Portable VMS

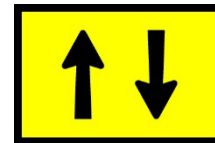
VMSs are used as a supplementary sign only and must not replace standard signs.

Refer to Department's *Operational Instruction 2.36 - Variable Message Signs* and *AS 1742.3 Section 4.22*



Two-way Traffic [W4-11] & [T2-24]

Shall be used to warn road users that the roadway carries two way traffic. Should be used where a roadway designed and normally used for one way traffic is temporarily being used for two way traffic and to warn traffic entering from a side road of this condition.



[T2-24]

Temporary Road Humps / Speed Humps

Portable road humps may be used to assist in achieving greater speed compliance within an established 25 km/h worksite. Refer Appendix D and *AGTTM Part 3: Static Worksites Section 5.5.2*.



[TM1-38A]

Reference: AS 1742.3 Sections 4.20, 4.21 and 4.22.

Section 8:

Works protection methods

A summary of works protection methods is given in Table 8.1.

Table 8.1: Works protection methods

Works method	Applicable tasks	Further reading
Static work site	All works which are greater in scope and duration than can be handled by the short-term low-impact provisions below or mobile works.	Section 8.1 AGTTM Part 3
Short-term low-impact works - open road areas	Isolated work on pavements of up to 20 minutes in duration, traffic volume permitting. Shoulder grading and verge mowing.	Section 8.2 AGTTM Part 5
Short-term low-impact works - built-up areas	Work adjacent to or in a traffic lane for up to 20 minutes duration depending on traffic volume. Median and verge mowing or footpath works.	Section 8.2.5 AGTTM Part 5
Mobile works	Line marking, laying or removing pavement markers and pavement testing where all signs and other protective devices are on vehicles.	Section 8.3 AGTTM Part 4
Works on unsealed roads	Maintenance grading on unsealed roads. Short-term partial road closures on unsealed roads.	Section 8.4

8.1 Static work sites

Note: The clearance to edge of the work area in the following shall be measured from the traffic side edge of the line of delineating devices or barriers.

8.1.1 Work area or work site is 6 m or more clear of traffic

If the entire work area including all vehicles and plant is located a minimum of 6 m from the nearest edge of a lane carrying traffic, no traffic delineation of the work area or temporary speed limit will be required. Refer to *AGTTM Part 3: Static Worksites Section 3.1*.

8.1.2 Work area 3 m to 6 m clear of traffic

If the entire work area including all vehicles and plant is located a minimum of 3 m from the nearest edge of a lane carrying traffic, no traffic delineation of the work area will be required but the following shall be provided:

- A Worker (symbolic) T1-5 sign in advance of the work area when workers of small items of plant are present on the site.
- A vehicle-mounted warning device (see Section 7.1.1).
- A containment fence can be used to delineate the clearance line for workers if the work area clearance is close to the 3 m minimum.
- **A maximum roadwork speed limit not exceeding 80 km/h shall be used.**

8.1.3 Work area clearance to traffic between 1.2 m & 3 m (Category 1)

If there is no road safety barrier between the edge of the work area and the nearest edge of a lane carrying traffic, but the clearance between the two is from 1.2 m to less than 3 m, the following are required when workers or small items of plant are on site, in addition to the requirements for other work site management devices specified in the Standard:

- A Workers (symbolic) T1-5 sign in advance of the work area.
- Delineation of the edge of the traffic lane by cones, bollards or similar means (see Table 9.1).
- Separate delineation of the edge of the work area by means of a containment fence (see Section 7.2.1) if there is a risk of workers or small items of plant infringing the clearance area.
- Vehicle mounted warning devices
- **A roadwork speed limit of 40 km/h shall be used**

8.1.4 Hazardous work area – when clearance to traffic is less than 1.2 m and not protected by a road safety barrier system (Category 2)

If a clearance of 1.2 m cannot be achieved then the following minimum requirements apply:

- 'Workers (symbolic)' signs in advance of the work area.
- Delineation of the edge of the traffic lane by traffic cones, temporary bollards or similar means.
- Separate delineation of the edge of the work area by means of a containment fence if there is a risk of workers or small items of plant infringing the clearance area. The containment fence may be omitted if there is insufficient space to place it.
- **A roadwork speed limit of 40 km/h or less shall be used.**

Refer to Table 6.1 for safety controls to reduce the level of risk associated with Category 2 work areas and eliminate the need for a 25 km/h speed limit. Traffic speed should be increased to a maximum of 60 km/h where work is carried out on plant exclusively.

8.1.5 Work area protected by a road safety barrier system

If the work area is protected by a road safety barrier system there will be no requirement to reduce traffic speeds for the protection of workers but the following apply:

- Advance signing and delineation, including Worker (symbolic) T1-5 signs when workers are on site, are required.
- Temporary speed zoning below 80 km/h may be required for the safety of traffic negotiating the site outside the barrier.
- Clearance to edge of barriers:
 - 0.3 m – 40 km/h
 - 0.5 m – 60 km/h
 - 1.0 m – 80 km/h
 - 2.0 m - > 80 km/h – Requires separate approval
- Steps should be taken to ensure that workers and plant will remain within the protection of the barrier.
- A containment fence behind the barrier (see Section 7.2.1) and temporary crash attenuators (see Section 7.2.4) should also be used.
- **A maximum roadwork speed limit not exceeding 80 km/h must be used.**

8.2 Short term low impact works

In accordance with Regulation 4A of the *Road Traffic (Miscellaneous) Regulations 2014*, short term low impact works cannot be carried out on prescribed roads without a permit in the following situations:

- between the hours of 7am to 9am, Monday to Friday (inclusive), or
- between the hours of 4pm to 6pm, Monday to Friday (inclusive), or
- if the work area or work site includes a length of road to which a clearway sign applies—during a period referred to above or during any additional period for which the clearway sign applies to that length of road.

A permit is required for works within both the times specified above and those displayed on a clearway sign. Approval must be sought from the TMC for any Short-Term Low impact works on Motorways.

Note **short term low impact works** means works that involve the occupation of a road for not more than 20 minutes as defined in Regulation 4A(2) of the *Road Traffic (Miscellaneous) Regulations 2014* and not the definition which has been defined in the *Austrroads Guides to Temporary Traffic Management*.

NOTE Short term low impact works undertaken on prescribed roads in accordance with this clause do not require a roadworks permit outside the above times.

The following works are permitted to be carried out as short term low impact works without the use of fully protected static work sites or mobile works convoys. A risk assessment shall be made of these treatments in environments where this type of work is proposed. If the risks cannot be tolerated, a fully protected static work site or mobile works convoy will be required.

A built-up area is defined as: “roadside development comprising property accesses at spacings averaging less than 100 m over distances of at least 500 m”.

An open road area is defined as: “roadside development less frequent than that specified for a built-up area”.

8.2.1 Frequently changing work area – open road areas (rural areas)

For activities such as minor maintenance on the pavement or shoulder, including road furniture maintenance and longitudinal survey work at successive locations less than 2 km apart, the frequently changing work area treatment may be applied.

The following requirements shall be observed:

- workers may work on the roadway or within 1.2 m of moving traffic provided the roadway at any one work site is not occupied for more than 20 minutes;
- display a vehicle mounted warning device (which shall not be obscured);
- sight distance to the vehicle mounted warning device for approaching traffic shall be greater than 150 m in a 60 km/h or lower speed limit zone; or greater than 250 m for speed limits greater than 60 km/h; and
- a lookout person is posted to warn workers on foot on the roadway of approaching traffic (see *AGTTM Part 5: Short Term Low Impact Worksites*)

Advance signs up to 2 km in advance of each work position or item of moving plant shall be displayed. The distance between these advance signs for opposing directions of travel shall not exceed 2 km at any time.

At each advance sign location the following signs shall be used:

- ‘Workers (symbolic)’ – where there are workers on foot;
- ‘Road Plant Ahead’ – where moving road plant only will be encountered; and
- ‘Next 2 km’ sign shall be placed with whichever of the above signs is used.

If any of the above requirements cannot be met at a particular location e.g. sight distance is substandard then that site shall be set up as a fully protected short-term work site with advance signs at the standard distances.

8.2.2 Frequently changing work area – built-up areas (urban areas)

Work *not* within traffic lane

The work shall be carried out with a vehicle equipped with a vehicle mounted warning device parked on a shoulder, parking lane or elsewhere where parking is permitted adjacent to moving traffic.

The vehicle shall shadow the work area at all times, either to the front or behind it. The limitations that shall apply are:

- speed limit – 70 km/h or less;
- minimum sight distance to oncoming traffic – 50 m;
- maximum work period at any one location of 20 minutes;
- a static work site is required if these conditions cannot be met; and
- the work area may move frequently between successive locations.

The following are examples of short-term low-impact works appropriate for this treatment when they do not encroach onto a moving traffic lane:

- pit cleaning or repair;
- litter collection;
- tree pruning or planting;
- road signs or street furniture maintenance; and
- street light maintenance.

Work within a traffic lane

The work shall be carried out using a work vehicle or large plant item and a shadow vehicle, both equipped with a vehicle mounted warning device. A large plant item should generally be considered to be the equivalent of a medium size farm or industrial tractor or larger.

If work is being carried out by a large plant item and there are no workers on foot or small plant items present, the shadow vehicle shall follow the plant item 15 m to 30 m behind it, either in the lane or shoulder to the left of the work lane if free, or otherwise, within the work lane.

If the work is being carried out by workers on foot or small items of plant, even though large plant items may also be present, the shadow vehicle shall travel in the same lane as the work area, 20 m to 40 m behind the work vehicle.

The following limitations apply:

- speed limit – 60 km/h or less;
- **maximum work period at any one location - 20 minutes at any traffic volume;**

- the shadow vehicle may be dispensed with at traffic volumes less than 60 vph provided sight distance to oncoming traffic is at least 50 m or 2 D, whichever is the greater; and
- the work may be moved between successive locations.

A static work site is required if these conditions cannot be met.

The following are examples of short-term low-impact works appropriate for this treatment:

- pavement marker laying (other than on dividing lines).
- Accessing water castings/valves
- Crack sealing
- pavement testing.

8.2.3 Works on medians, verges and footpaths – built-up areas (urban areas)

The following works may be undertaken without any support vehicle on the roadway:

- median and verge mowing and relating activities such as tilling, seeding and weed spraying;
- works on a footpath; and
- garden maintenance.

subject to the conditions listed below that shall be met:

- Maximum work period at any one location of 20 minutes;
- Where there are plant items only and no workers on foot, the relationship between speed limit and clearance to edge of traffic lane shall be as follows:
 - A maximum speed limit of 80 km/h – clearance shall be greater than 1.2 m; and
 - A speed limit 60 km/h or less – clearance may be 1.2 m or less but plant items shall not encroach onto the traffic lane.
- Where there are workers on foot or small items of plant, or both, the work method shall be restricted to one of the following:
 - the speed limit is 60 km/h or less and the work area does not encroach onto a moving traffic lane;
 - the speed limit is 80 km/h or less and the clearance to edge of traffic lane is at least 1.2 m; or
- The 'Workers (symbolic)' sign or 'Road Plant Ahead' sign shall be displayed respectively, when either workers on foot or plant items alone are present and working closer than 1.2 m to a moving traffic lane.
- Wherever there are workers on foot or small items of plant working 1.2 m or less clear of a moving traffic lane, traffic cones or temporary bollards to the

required spacing shall be placed along the kerb line or edge of traffic lane if no kerb.

A static or mobile work site is required if these conditions cannot be met. If work duration is longer than 20 minutes but limited to a single shift, refer to *AGTTM Part 5: Short Term Low Impact Worksites* Section 5.1 and 5.2

8.2.4 Shoulder grading and mowing on sealed roads – open road areas (rural areas)

Shoulder grading and mowing on sealed roads with traffic volumes less than 1500 vpd may be undertaken in bounds of up to 10 km in length under the following conditions:

- If sight distance to the vehicle mounted warning sign on the grader or mower is at least 250 m throughout the section of road being worked on, advance signs 'Road Work Next 10 km' shall be placed at each end of the section. 'Loose Stones (symbolic)' or similar signs may be needed at the beginning and along the section.
- If the sight distance falls to less than 250 m at some locations, 'Grader Ahead' or 'Road Plant Ahead' together with 'Next 2 km' shall be used on each approach to the section covering the location of diminished sight distance. A 60 km/h temporary speed zone will be required if the speed of traffic is 80 km/h or more.
- Subsections of 2 km or less in length created as described in the bullet point above shall be used. All signs, including speed zone signs if used, shall be relocated before proceeding with the next section. If there is difficulty turning a grader around at the end of a 2 km section it may be extended to the next available turning point provided it is not more than 6 km in total length.

Where traffic volumes are greater than 1500 vpd the works shall be undertaken either as a mobile works or as static work site.

8.2.5 Work between gaps in traffic – open road (rural areas) and built-up areas (urban areas)

Work that is of short duration that can be carried out within gaps in traffic may be done without advance signs or delineation provided that:

- a lookout person who can see approaching traffic in time to warn workers to vacate the work area before its arrival, is posted;
- work vehicles and items of plant are parked clear of a moving traffic lane;
- a vehicle mounted warning device is displayed on the work vehicle; and
- the maximum work period at any one location is 20 minutes.

The lookout person may be dispensed with if the work will not take longer than 10 seconds and approach traffic can be seen for a distance of at least 20 seconds of travel time.

NOTE In urban areas, this method is not recommended where traffic lane volume exceeds 100 vph unless significant gaps are being created by upstream traffic control such as intersection traffic signals.

8.2.6 Short-term work in traffic – open road areas (rural areas)

Workers with a vehicle or item of plant equipped with a vehicle mounted warning device may work on the roadway or within 1.2 m of moving traffic without the use of advance signs provided the roadway at any one work site is not occupied for more than 20 minutes, and the conditions below are met.

Sight distance to the vehicle mounted warning device for approaching drivers shall be:

- speed limits 60 km/h or less – greater than 150 m; and
- speed limits 61 km/h or more – greater than 250 m.

The vehicle mounted warning device shall not be obscured e.g. overhanging vegetation or a raised truck body.

The work shall not reduce the:

- overall width to less than that required for safe passage for two way traffic (or one way traffic if volume is less than 50 vpd); or
- running lane width adjacent to a barrier line to less than that needed to allow vehicles to proceed without crossing the line.

A lookout person shall be posted to warn workers on foot on the roadway of the approach of any vehicles whose speed or size may constitute a safety threat. If two or more work areas within a space of 2 km are to be worked on, the site shall be treated as a frequently changing work area. The lookout person may be dispensed with if the:

- work area is more than 1.2 m clear of moving traffic; or
- work will not take longer than 10 seconds and approaching traffic can be seen for a distance away equal to 20 seconds of travel time.

8.2.7 Mobile inspections – open road areas (rural areas)

Mobile inspections are carried out in one of the following ways:

- If the inspection vehicle maintains speed that is less than 20 km/h below the speed limit it may travel in the traffic stream.
- If the inspection vehicle maintains speed that is at least 25 km/h on a road with less than 200 vpd it may travel in the traffic stream but shall display at least one flashing yellow light.
- If the inspection vehicle is able to operate by travelling along a shoulder or verge clear of moving traffic, using gaps in traffic to pass any obstructions in the shoulder or verge, it may operate as a single vehicle but shall display at least one flashing yellow light.

- If the inspection vehicle is required to occupy or partially block a traffic lane continuously at speed slower than 20 km/h below the speed limit or less than 25 km/h on a road with less than 200 vpd, it shall operate within a mobile works convoy.

8.2.8 Low Volume Unsealed Road Grading

Grading of low volume unsealed roads may be undertaken as Short Term Low Impact works without the use of speed limit signs where traffic volumes are < 20 vehicles per day and a detailed risk assessment is undertaken.

For further information refer to AGTTM Part 4: Mobile Works Section 3.8.13.

Advance warning signs may also be omitted where:

- the grader is able to operate while leaving room for opposing traffic to pass it without driving off the roadway, and
- the sight distance of the grader's vehicle mounted warning device is 250 m through the entire section of roadworks.

Low Volume Unsealed Road Grading shall be undertaken as follows:

- No advance warning signs are required for either travel direction if there is sufficient room for opposing traffic to pass the grader without it driving off the roadway and the sight distance to the grader's vehicle mounted warning device is at least 250 m throughout the whole section of road being worked on.

If the conditions above cannot be met, then work shall be carried out as follows:

- Work shall not be undertaken in lengths of more than 10 km. The sign 'Roadwork Next 10 km' shall be placed at each end.
- For site distances less than 250 m the sign 'Grader Ahead' or 'Road Plant Ahead' together with 'Next 2 km' shall be used at each end of each subsection with a reduction of sight distance of up to 2 km in length. These signs shall be placed at least 100 m in advance of the start of any windrow.
- Freshly graded surfaces with loose materials that may become a hazard shall have road condition signs erected. Depending on the type of hazard one or more of the following signs are required:
 - 'Slippery (symbolic)';
 - 'Loose Stones (symbolic)'; and/or
 - 'Loose Surface'.

8.3 Mobile works

Mobile works involve vehicles moving along the roadway continually at a speed significantly lower than other traffic and obstructing traffic lanes. All

For further information refer to AGTTM Part 4: Mobile Works Section 3.8.4, and Part 9: Sample Layouts.

signs and warning devices shall be displayed on moving vehicles in the convoy.

Where mobile works involves the following:

- Line marking using ride-on plant, self propelled, towed or pushed, or
- Pedestrian type line marking or pavement maker laying or removal where a shadow vehicle is used,

a maximum speed limit of 40 km/h shall apply.

8.4 Works on unsealed roads

The following treatments are permitted on unsealed roads in recognition of the generally lower volumes and traffic speeds encountered on those roads than on sealed roads.

For further information refer to AGTTM Part 4: Mobile Works Section 3.8.13.

A risk assessment shall be made of these treatments in environments where this type of work is proposed. If risks cannot be tolerated, a fully protected static work site or mobile works convoy will be required.

These treatments shall not be applied to any road which would normally be sealed but has been left unsealed in the process of construction or reconstruction as a sealed road either temporarily or permanently (e.g. due to economic or climatic factors).

Maintenance grading and resheeting may be carried out either with or without leaving a windrow. Where graded or resheeting material cannot be traversed by traffic, in order to allow traffic to overtake the grader, the grader driver should be instructed to raise the blade from time to time and move forward a short distance to allow the traffic to pass.

Grading on the right side of a road against oncoming traffic should be avoided.

8.4.1 Maintenance grading

Maintenance grading shall be undertaken as follows:

- the grader must always operate while leaving room for opposing traffic to pass it without driving off the roadway
- the sight distance of the grader's vehicle mounted warning device must be 250 m through the entire section of roadworks
- no advance warning signs for either direction of travel is required.
- Maintenance grading may be undertaken as short term low impact works, see Section 8.2.8.

If the conditions above cannot be met, then work shall be carried out as follows:

- Work shall not be undertaken in lengths of more than 10 km. The sign 'Roadwork Next 10 km' shall be placed at each end.
- For site distances less than 250 m the sign 'Grader Ahead' or 'Road Plant Ahead' together with 'Next 2 km' shall be used at each end of each subsection with a reduction of sight distance of up to 2 km in length. These signs shall be placed at least 100 m in advance of the start of any windrow.
 - Subsections of 2 km or less in length shall be completed and signs such as Speed Zone and End of Zone (if used) shall be removed or relocated prior to starting the next section.
- Freshly graded surfaces with loose materials that may become a hazard shall have road condition signs erected. Depending on the type of hazard one or more of the following signs are required:
 - 'Slippery (symbolic)';
 - 'Loose Stones (symbolic)'; and/or
 - 'Loose Surface'.

8.4.2 Maintenance resheeting

Maintenance resheeting shall be undertaken as follows:

- The work shall not be undertaken in lengths of more than 10 km. The sign 'Roadwork Next 10 km' shall be placed at each end of the section being worked on.
- For site distances less than 250 m the sign 'Grader Ahead' or 'Road Plant Ahead' together with 'Next 2 km' shall be used at each end of each subsection with a reduction of sight distance of up to 2 km in length. These signs shall be placed at least 100 m in advance of the start of any windrow.
 - Subsections of 2 km or less in length shall be completed and signs such as Speed Zone and End of Zone (shall be removed or relocated prior to starting the next section.
- Freshly graded surfaces with loose materials that may become a hazard shall have road condition signs erected. Depending on the type of hazard one or more of the following signs are required:
 - 'Slippery (symbolic)';
 - 'Loose Stones (symbolic)'; and/or
 - 'Loose Surface'.

8.4.3 Short-term partial road closures

Advance warning signs may be omitted from short-term partial road closures at works on unsealed roads under the following conditions:

- approaching traffic can see the vehicle mounted warning device from at least 250 m;
- no traffic controller is required;

- and either:
 - traffic volume is less than 20 vpd; and/ or
 - there is sufficient room for two way traffic past the work area.

A single traffic controller may be used at works on unsealed roads under the following conditions:

- traffic volume is less than 20 vph;
- the single traffic lane section does not exceed 50 m in length; and/or
- the traffic controller has sufficient sight distance of traffic approaching from both directions when situated at one end of the job.

If the above conditions cannot be met the works shall be treated in the same way as sealed roads.

8.5 Night works

Work carried out at night presents higher risks than day light work so extra care is required.

Refer AGTTM Part 3: Static Worksites and AS 1742.3 Section 4.2.4

The following requirements apply to works at night or work that extends to more than a single day, i.e. long-term works.

8.5.1 Night conditions

The following requirements apply whether or not workers or plant are on site:

- Wherever practicable, light the entire work area and the immediate approach. Footpaths, hazards or barriers may need to be lit.
- All signs and devices shall be retroreflective. Signs required to be fluorescent by day shall have a sign face background that is also fluorescent. Signs outside of headlight beams shall be floodlit.
- Flashing lamps may be used to draw attention to advance signs.
- Flashing lamps shall not be used for delineation.
- Temporary bollards and traffic cones shall have a retroreflective band for night use.
- On works extending overnight or being conducted at night where an obstruction encroaches onto the roadway, a series of T5-4 Temporary Hazard markers shall be used in lieu of traffic cones or temporary bollards to form the taper guiding traffic away from the obstruction. The markers should be spaced so that as the taper is approached they appear as a continuous line.
- The T5-5 Temporary Hazard markers may be used on works extending overnight, instead of the T5-4 marker, in confined areas where there is not enough space to use the wider marker.

8.5.2 Work in progress at night

In addition to the requirements above the following apply when works are being carried out at night:

- Lighting at a work site shall, as a minimum, illuminate the following:
 - locations where workers or plant may encroach traffic lanes;
 - intersections in which works are taking place; and
 - any traffic controller positions.
- Workers shall wear high visibility clothing.
- Check that signs and devices can be seen by drivers when affected by the glare of site lighting and approaching vehicles. This may involve adjusting the illuminated flashing arrow signs and matrix type variable message signs when in use at night.

Section 9: Installing, operating and removing traffic guidance schemes

9.1 Installing traffic guidance schemes

Refer AS 1742.3 Section 4.3, AGTTM Part 3: Static Worksites Sections 7.3 and 7.4, AGTTM Part 6: Field Staff – Implementation and Operation Section 6, 7 and 8.

9.1.1 Condition of devices

Before installing signs and devices, they shall be checked to ensure they are in good condition and their performance is not impaired, in particular:

- Physical condition – items that are bent, broken or have surface damage shall not be used.
- Cleanliness – items shall be free from accumulated dirt, road grime or other contamination.
- Colour of fluorescent signs – fluorescent signs that have become faded to a point where they have lost their impact shall be replaced.
- Night-time visibility – signs required to be effective at night shall be checked for retro reflectivity as soon as possible after installation. If retro reflectivity is degraded, either from long use or surface damage, they shall be replaced. Night-time effectiveness is best checked by viewing the signs by vehicle headlights set on low beam in dark conditions.

Important basic principles to be observed are as follows:

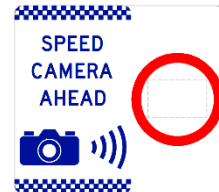
- signs and devices shall be installed by a 'competent person';
- signs and devices shall be appropriate to the conditions at the work site and shall be used in accordance with this Standard unless a risk assessment undertaken by a competent person indicates that an alternative arrangement is satisfactory;
- signs and devices shall be erected and displayed before work commences at a work site;
- signs and devices shall be regularly checked and maintained in a satisfactory condition;
- signs and devices shall be removed from a work site as soon as practicable with only appropriate signs remaining in place until all work has been completed; and
- where works require the relocation of regulatory traffic control items, they shall be relocated or reinstalled promptly in positions where they are visible and can perform their regulatory function.

9.1.2 Adjustment to existing devices

Any signs and traffic control devices, including regulatory, warning, guide signs and pavement markings, which are inappropriate to, or conflict with the temporary work site situation shall be covered, obliterated or removed (see AS 1742.3 Section 4.2.6). This shall be indicated in the traffic guidance scheme.

Refer AS 1742.3
Section 4.2.5

Where safety camera signs are present within the temporary work site, only the speed limit portion of the sign shall be covered.



9.2 Sign mountings

Refer AS 1742.3
Section 4.5

Mountings for signs are required to suit a wide variety of situations.

For short-term operations, signs and mountings should be:

- quick and easy to install;
- provide a secure sign attachment;
- stable in windy conditions and from the effects of moving traffic;
- suitable to instal on all types of road, shoulder or verge surfaces;
- able to handle the sizes of signs involved;
- easily handled, transported and stored;
- not hazardous to road users if struck; and
- prominently displayed (see below for heights and locations).

Signs for long-term work should be mounted on regular fixed supports so that they are not likely to be disturbed by weather, vandals or traffic.

Multi-message sign panels (TM, RM, WM, GM Series) shall only be used in multi message frames

9.2.1 Portable supports

Signs mounted on portable supports used for short-term operation should generally be located as follows:

- Open road areas – on the road shoulder a minimum of 1 m clear of the travelled way.
- Built-up areas – behind the kerb if visible to oncoming traffic and not obstructing pedestrians, otherwise on the pavement as near as practicable to the kerb without obstructing the sign or traffic.

9.2.2 Post mounting

Signs mounted on posts should be located:

- Open road areas – clear of the shoulder's outer edge and at least 2 m clear of the travelled way (whichever is greater) and minimum of 1.2 m between the travelled path and sign's underside.
- Built-up areas on unkerbed roads – clear of the shoulder's outer edge and at least 2 m clear of the travelled way (whichever is greater) and minimum of 1.2 m between the travelled path and sign's underside.
- Built-up areas adjacent to a footpath or where vehicle parking may occur – a minimum of 300 mm behind the kerb and a minimum of 2.2 m between the kerb or footpath and the underside of the sign.
- Built-up areas without pedestrian or parking considerations e.g. median – minimum of 1.2 m between kerb and sign's underside.

9.3 Positioning of signs and devices

Signs and devices shall be positioned and erected so that they:

*Refer AS 1742.3
Section 4.3.*

- are properly displayed and securely mounted;
- are within the line of sight of the road user;
- cannot be obscured from view, e.g. by vegetation or parked cars;
- do not obscure other devices from the line of sight of road users;
- do not become a potential hazard to workers, pedestrians or vehicles;
- do not deflect traffic into an undesirable path;
- do not restrict sight distance for drivers entering from side roads, streets or private driveways; and
- are not installed using supports that could be a hazard if struck by vehicles, i.e. supports shall be constructed using frangible materials.

Where an instruction sign and a road condition sign are required in the same place; install the instruction sign first and then find the most effective place to install the road condition sign.

The visibility of a sign can be affected by deep shade, the direction of sunlight, background conditions (including lighting) and headlights. These factors should be considered when signs and devices are erected to ensure that they can be clearly seen at all times.

9.3.1 Edge clearances

The clearance between the edge of the traffic lane to delineating devices or road safety barrier systems shall be determined as shown in Table 9.1. This clearance shall be measured to the edge of the delineating device or barrier closest to traffic.

*Refer AGTTM Part 3: Static
Worksites Section 4.4 and 5.4*

9.4 Setting out devices

Before work commences, signs and devices shall be installed in accordance with the principles set out in *AGTTM Part 6: Field Staff – Implementation and Operation Section 6*.

Refer AGTTM Part 6: Field Staff – Implementation and Operation Section 6

Signs and devices that are erected before they are required shall be covered by a suitable opaque material. Open weave materials such as hessian or dark coloured plastic materials are not suitable. Best results are obtained by using a dense fabric that allows entrapped moisture such as condensation, to dissipate in a natural manner.

The cover shall be removed immediately prior to the commencement of work.

Signs should also be checked in unusual weather conditions including high winds for loss or disturbance of the covering.

Table 9.1:
Edge clearances for delineating devices and road safety barrier systems

Device	Traffic speed	Edge clearance *
Traffic cones, bollards or longitudinal channelizing barricades	60 km/h or less	0.5 m
	Greater than 60 km/h	1.0 m
Roadworks delineators or temporary hazard markers	All	1.0 m
Road safety barrier systems	40 km/h or less	0.3 m
	41 to 60 km/h	0.5 m
	61 to 80 km/h	1.0 m
	Greater than 80 km/h	2.0 m

Note (*): In the absence of marked lines these clearances shall be added to the nominal lane widths specified in *AGTTM Part 2: Traffic Management Planning Section 3.3.4* and *Part 3: Static Worksites Section 2.5.8*.

For the recommended spacing of traffic cones and temporary bollards refer to:

Table 5.9 of this document

Reference: *AGTTM Part 3: Static Worksites Tables 4.1, 5.1 and 5.2 (modified)*

9.4.1 Placement of signs for detours

Installation for the 'uncovered process' should be undertaken as follows:

- Install the last sign that vehicles will see, i.e. the sign at the end of detour.
- Then, working back towards the start of the detour, install the remaining signs. Vehicles are able to detour only when all signs are present.

Another option is the 'covered process' where signs are covered until required.

A 'competent person' shall drive the detour path to verify the signs are clear and that the vehicle types and volume of traffic are able to travel the detoured path.

Removal of the detour signs should be undertaken as follows:

- Signs from the beginning of the detour route.
- Other signs along the route.

9.4.2 Orientation of signs

Signs should face towards oncoming traffic, approximately at right angles in line with the sight of the driver. On curved alignments, the correct angle should be considered from the point 50 m in advance of the sign.

9.4.3 Inspection

Once the signs and devices have been erected at a static work site, a 'competent person' shall carry out a functional inspection on site. The inspection should be carried out from within the traffic stream travelling at the posted speed limits. If unsatisfactory, it should be adjusted and reinspected.

Night inspections should be carried out with vehicle headlights set on low beam.

9.5 Operation

9.5.1 Work site records

A daily routine for the operation of a work site shall be implemented and maintained, including the keeping of daily records of:

- the sign and delineation arrangements or traffic guidance scheme;
- any changes to signs and devices as work circumstances or road conditions dictate; and
- any incidents which might have ongoing consequences.

9.5.2 Layout variation

Cover or remove any signs or devices that are no longer needed. Add signs and devices as work circumstances or road conditions dictate. When all workers leave

at a site the 'Workers (symbolic)' sign shall be removed. Keep a record of any such changes on daily work sheets or in a diary.

9.5.3 Maintenance of signs and devices

Signs and devices shall be kept clean.

Damaged or ineffective signs and devices shall be refurbished to new condition or replaced. Non repairable signs should be destroyed to avoid reuse.

Required water levels shall be maintained in water-filled safety barrier elements.

9.5.4 High visibility clothing

High visibility clothing shall comprise of at least the following:

- For day time use – type D or D/N jacket or vest in fluorescent red, orange or yellow. Care should be taken to select the appropriate colour in order to obtain the best visual contrast particularly for vulnerable workers, e.g. traffic controllers.
- For night time use – type N jacket or vest with a minimum area of 450 cm² of white or yellow retroreflective material visible on the upper torso to front and to rear. Fluorescent material, which is not also retroreflective, does not give adequate conspicuity at night.

Combination fluorescent and retroreflective material may be used for dual purpose garments provided the above requirements are met.

In wet weather conditions, conspicuous wet weather clothing that meets the same colour requirements as above shall be used.

High visibility clothing shall be worn over other clothing and shall be fully fastened to display the entire available area of high visibility material for each direction of observation.

For additional information refer to AS/NZS 4602.1-2011 clause C4: Safe Use of Garment (a) (i).

9.5.5 Hazard avoidance

Machinery should not be parked, materials stored or buildings erected in positions where they may create a hazard, obscure signs or block approaching drivers' lines of sight.

9.5.6 Delays

If an excessively long delay is caused by an unexpected event e.g. plant breakdown, the supervisor should inform the traffic controllers of the delay and give an estimated time to be relayed to the public. Advice should also be given to emergency services. If traffic queues become too long, consideration should be given to either finding a suitable detour or otherwise re-routing traffic.

9.5.7 Safety audit

Periodic safety audits of roadworks treatments should be undertaken to ensure compliance to documented requirements. See [Appendix C](#) for an example of a safety audit form.

Refer to AGTMM Pt 10:
Supporting Guidance Section 3

Consider a construction phase road safety audit for complex traffic arrangements or staged works.

9.6 Daily routine tasks

Supervisory personnel should establish a daily routine that allocates specific tasks to personnel and supervisors working on roads. This is to make sure that:

- signs and devices are adequate for the safety of personnel and traffic at all times;
- travelling surfaces are maintained in a satisfactory condition;
- plant operations are not disrupted; and
- loss of production time is minimised.

The supervisor's role in this routine is coordination, inspection and correction.

The following daily routine is an example of the activities that should be undertaken.

9.6.1 Before work starts

- Inspect all traffic signs and devices and make a note of signs out of place or damaged during the night for subsequent rectification.
- Check all lamps and if necessary clean them.
- Inspect all water ballasted safety barriers or containment fence modules and make a note on any out of position modules, low water levels and damaged modules for subsequent rectification.
- Check for safety and effectiveness of any adjustments made by an inspection drive through of the site and make a record of the signs erected and their locations.

9.6.2 During hours of work

- Periodically drive through the work site to check that all signs, markings and delineating devices seen by other road users are satisfactory and in their correct position.
- Attend to minor problems as they occur.
- During work breaks e.g. tea breaks:
 - move personnel clear of the work area;
 - park plant clear of traffic lanes; and

- if workers leave the site or cannot be seen, remove from view any inappropriate signs such as 'Prepare to Stop' or 'Workers (symbolic)'.
 - Where there are traffic hazards or where only one lane is open to traffic, instruct traffic controllers to remain on the job and relieve them as necessary.

9.6.3 Closing down at the end of the day

- Carry out a pre-closedown inspection, allowing time for urgent maintenance to the travelled path.
- Remove 'Prepare to Stop', 'Workers (symbolic)' and other inappropriate signs.
- Drive through the work site to confirm signs, devices and delineators are in position and operating before leaving the site.
- Record any changes.
- Special provisions such as traffic controllers working in shifts, illumination of the site or traffic signals installation are required if:
 - less than one lane in each direction is available after working hours, during weekends or holidays; or
 - the traffic flow in one direction on a multi-lane highway exceeds the figures shown in Appendix B for the number of lanes available.
- Also refer to Section 4.9.1 & 4.9.2 (Risk Assessment).

9.6.4 After hours (when work is suspended)

- Carry out periodic after dark inspections on low headlight beam to ensure that all signs and devices are visible and performing their correct function.
- Provide an after hours contact so that arrangements can be made to replace damaged signs, delineators or barriers.
- Ensure that a record is kept of signs found damaged, missing or out of place (and their location) at night, on weekends or during holiday inspections.
- Ensure appropriate speed limit is in place for the road user
- Also refer to Section 4.9.1 & 4.9.2 (Risk Assessment).

9.7 Performing traffic control

Refer to AGTTM Part 7:
Traffic Controllers

9.7.1 Duties of traffic controller

The duties of a traffic controller shall include the following:

- be an 'competent person' i.e. have attained accreditation in a DIT approved Workzone Traffic Management training course;
- wear high visibility clothing;
- set up and remove 'Prepare to Stop' signs;
- be located where sight distance is no less than 1.5 *D* to traffic;

- not obstruct or be obstructed by other signs and devices;
- to stand alone;
- have a clear escape path i.e. work out what you would do if a vehicle came towards you and appeared not to be stopping;
- if working with another controller and you are next to stop traffic, fulfill your responsibility to change the direction of traffic;
- use an 'A' size Stop/Slow Bat' (unless a boom barrier is used);
- use portable two-way radios or other suitable equipment to communicate between controllers if unable to do this by sight;
- give definite and clear hand signals (see figures in *AGTTM Part 5*);
- make sure you stand clear of traffic before allowing it to proceed;
- take care you do not display a 'Stop' sign to traffic by mistake;
- take at least a 15 minutes break after no more than 2 hours duty;
- not leave the position unless relieved by another 'accredited person' or directed by the supervisor; and
- be courteous at all times in dealing with the public, never let yourself be provoked.

9.7.2 Control of approach speed

In the first instance an appropriate roadwork speed limit zone shall be established to protect traffic controllers. In most situations the positions where a traffic controller will be required to operate will create a hazardous work area.

9.8 Operating portable traffic signals

The following guidelines apply to the operation of portable traffic signals:

Refer AS 1742.3 Section 4.7.4
& AGTTM Part 3: Static
Worksites Section 5.10

- vehicle-actuated operation allows the signals to operate automatically in response to vehicle demands. This is the preferred mode;
- fixed-time operation does not respond to vehicle demand. Cycle times are a fixed length; or
- manual operation allows operation of signals by a traffic controller.

Irrespective of the form of operation, signals shall be monitored to ensure they are operating safely and effectively and don't cause unnecessary traffic delays.

9.8.1 Approach conditions and speed

Sight distances for portable traffic signals shall be a minimum of 150 m to the primary signal face. A roadworks speed limit no higher than 60 km/h shall be imposed if the signals would otherwise be in a higher speed limit zone.

9.9 Removal of devices

It is important that all signs and devices which are no longer relevant are removed or concealed from view as soon as the activity is completed or the hazard ceases to exist. Refer to Section 4.9.2 (End of Day Risk Assessment)

Refer AGTTM Part 6: Field Staff – Implementation and Operation Section 8

AGTTM Part 6: Field Staff – Implementation and Operation Section 8 provides guidance on the removal of devices.

Any permanent traffic control devices that were altered or covered during the work program shall be reinstated.

Section 10: Appendices

Appendix A Notification of Works Impacting Roads under the care, control and management of the Commissioner of Highways



Government of South Australia
Department for Infrastructure and Transport

TRAFFIC SA - Roadworks Portal – New User Application

All fields must be completed

Please circle the access required:

Portal and App

App only

First name:

Surname:

Organisation & Position:

Workzone Ticket # & Expiry Date *(Mandatory for App users)*

.....

Phone/Mobile #:

Fax #:

Email:

Address:

.....

.....

.....

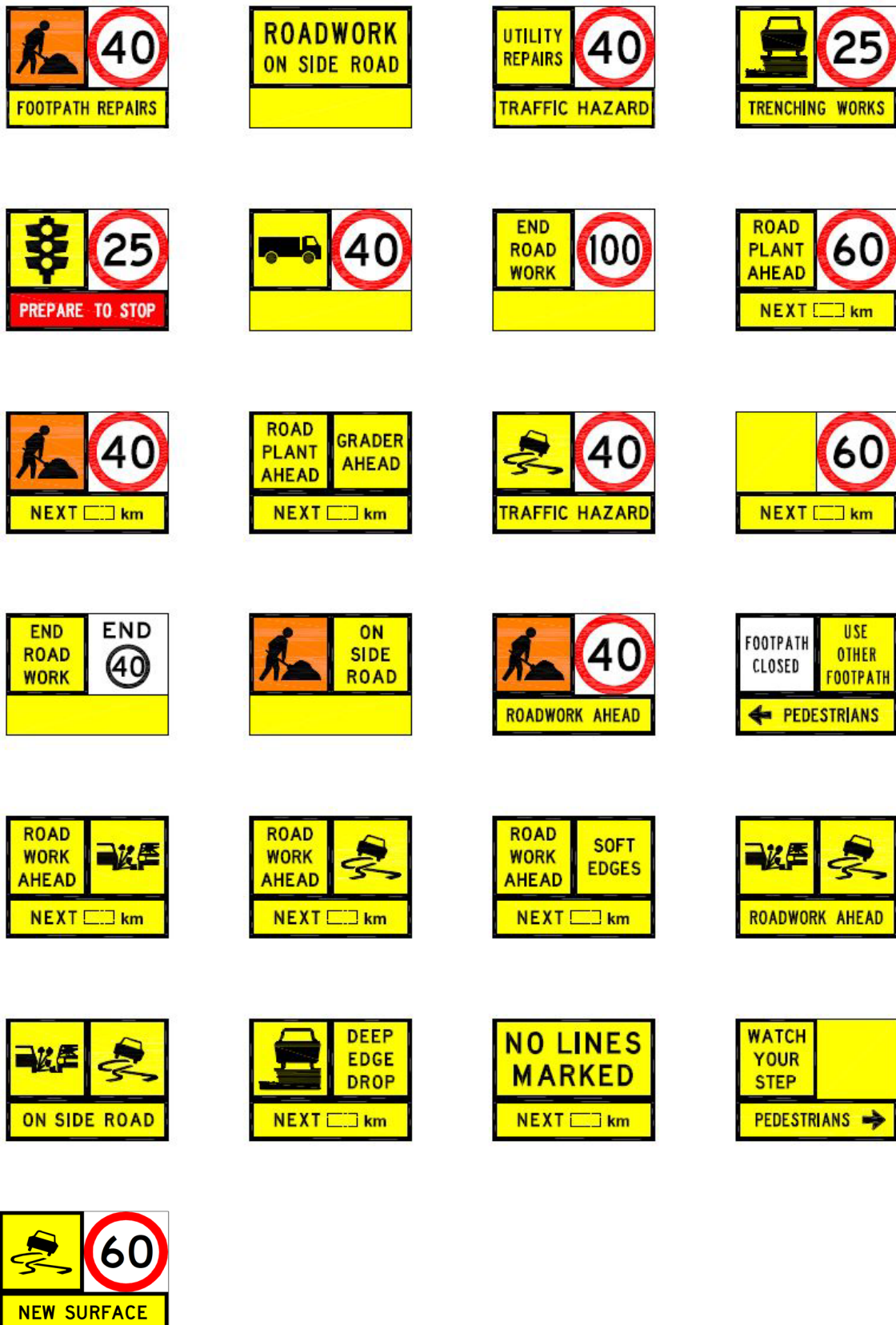
Signature:

Date:

Appendix B Multi-message Sign Combination Examples

Also refer AS 1742.3 Appendix B and DIT Sign Index (<http://dteapps.com.au/signindx/>) by searching "TM, RM, WM or GM" for multi-message signs





NOTE: Speed restriction and end of speed limit signs shown in here are interchangeable with those listed in the Department’s Sign Index at <http://www.dtejapps.com.au/signindx/>.

Appendix C Desirable numbers and lengths of lanes

Table C.1
Desirable maximum length of single-lane operation under reversible flow

Traffic volume (vph)	Length of single lane section (m)
> 701	70
601 to 700	100
501 to 600	150
301 to 500	250
< 300	600

Reference: AGTTM Part 3: Static Worksites Table 5.4 (modified)

NOTE This length is to be taken as the distance between the traffic controller or traffic signal positions, for each traffic direction.

Table C.2
Desirable number of lanes for each direction

Mid-block (vph, one direction)	Within 200 m of an intersection (upstream or downstream) (vph, one direction)	Desirable number of lanes for direction considered
Up to 1000	Up to 500*	1
1001 to 2000	501 to 1000	2
2001 to 3000	1001 to 1500	3
3001 to 4000	1501 to 2000	4

* Right turns out of the single lane may need to be prohibited depending on the proportion of heavy vehicles and the volume of opposing traffic.

Reference: AGTTM Part 3: Static Worksites Table 2.4

NOTE Volumes shown in the Tables may need to be reduced by the amount shown if the following apply:

- a) Pavement surface is rough or unsealed – reduce volume by 30%.
- b) Horizontal geometry is reduced to speeds below 40 km/h – reduce volume by 50%.
- c) Volume of heavy vehicles exceeds 10%:
 - downward, level or easy upgrade – reduce traffic volume by 20%; and
 - sustained upgrades greater than 5% – reduce traffic volume by 40%.

Appendix D Temporary Speed Humps At Work Sites

D1. Background

Excessive speed of passing motorists at roadworks has been identified as a major safety issue for workers on site. Speed control of vehicles at roadwork sites has traditionally been primarily managed by the use of speed restriction signing and traffic controllers.

It is recognised that a proportion of road users do not strictly observe roadwork speed limit signs, and in some cases don't respond to the directions given by traffic controllers to slow down through roadwork sites.

Greater speed compliance can be achieved through an established 25 km/h worksite by the application of strategically placed temporary speed humps laid out in conjunction with accompanying warning signs.

Temporary speed hump devices that meet the specification requirement (see Section D6) may be considered for use at roadwork sites to assist in reducing speeds and therefore creating a safer work environment for road workers through these 25 km/h worksites.

D2. Application of a Speed Hump Device

Prior to the use of any temporary speed hump device on a 25 km/h worksite, a Traffic Management Plan (TMP) shall be developed for the particular worksite. Due consideration needs to be given to the most appropriate course of action to protect workers during the development of the TMP (refer to Table 6.1 of this Standard).

If higher order devices (such as safety barriers) are considered to be inappropriate or unmanageable, temporary speed humps can be considered subject to a risk assessment being undertaken. Temporary speed humps shall only be utilised as follows:

- On a worksite that is already under 25 km/h speed control, which has been installed as part of a TMP developed in accordance with this Standard.
- In conjunction with appropriate training for installers.
- In daylight hours or under floodlighting at each temporary speed hump location point.
- Within the confines of the area defined by the workzone.
- In conjunction with appropriate warning signs.
- Temporary speed humps shall be removed when workers are present at the worksite but no roadworks are being carried out. They must also be removed whilst the work site is unattended to maintain the credibility of the device.

When temporary speed humps are considered at roadworks, it is essential that they only be incorporated within a TMP which genuinely warrants the use of 25 km/h speed limits.

The TMP may either be specifically developed or selected from one of the various diagrams outlined in the Department's *Field Guide: Traffic Control Devices for Workzone Traffic Management*. There are a number of points that should be considered when installing temporary speed humps as part of a TMP. They include:

- Determining the most appropriate installation procedure to be used at the site.
- Establishing the number of temporary speed humps to be used at the site.
- Establishing if there is actually a requirement to install temporary speed humps in traffic lanes not immediately adjacent to the work area.
- Determining the number, type and position of speed hump warning signs required for the site.
- The layout of delineation and other traffic control devices which are used in conjunction with the temporary speed humps.
- Whether the road surface is sealed or unsealed, and its condition (which influences the effectiveness of affixing the humps to the surface and their ability to stay in position).

Speed humps, used to manage vehicle speeds, are considered to be traffic control devices.

D3. Setting up of Temporary Speed Humps

D3.1 Speed Control Signing

Temporary Speed Humps shall only be used in conjunction with appropriate 25 km/h speed restriction signing installed in accordance with this Standard.

D3.2 Number of Temporary Speed Humps at a Work Site

A minimum of one temporary speed hump shall be utilised at a worksite, at the beginning of the roadwork area. However, it is recommended that at least two temporary speed humps, one located at each end of the roadwork area, are installed.

If the length of the workzone is greater than 200 metres, or there is an interrupted line of sight between each end of the workzone, then an intermediate temporary speed hump and its associated signing should be installed. A trial undertaken by the Department showed that the use of an intermediate hump successfully resulted in vehicle speeds being restrained for the full length of the worksite.

In two directional arrangements, it may only be necessary to install temporary speed humps in the lane closest to the work site.

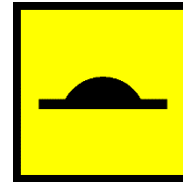
D3.3 Speed Hump Warning Signs

A temporary multi-message warning sign, utilising Road Hump Ahead (TM1-38A), shall be located in the transition area in advance of the work areas containing temporary speed humps. The Road Hump warning sign

(TM2-51A) shall be located at each of the temporary speed hump locations, including any intermediate temporary speed humps. These warning signs shall only be visible in the direction in which the hump is traversed (in the case of humps only being installed in the lane closest to the worksite).



[TM1-38A]



[TM2-51A]



Figure D1 Example of Temporary Speed Hump use

D4. Speed Hump Installation Requirements

All temporary speed humps shall be installed, maintained and removed in accordance with a TMP developed in accordance with this document. The manufacturer's installation instructions are to be strictly complied with. Traffic shall be controlled by traffic controllers during installation, maintenance or removal of humps.

Any speed hump shall be positioned to allow a minimum cyclist operating space of 1.0 metre.

D5. Delineation

Where two-way traffic passes through the work site, there will be a need to ensure traffic does not attempt to bypass the temporary speed humps. Delineation may be required between each of the lanes to guide vehicles over the temporary

speed humps. Traffic cones and bollards should be considered for this purpose, with procedures in place to keep them intact.

D6. Product Specifications

The following requirements apply to the use of temporary speed humps on road in SA.

- Shall be suitable for slowing vehicle speeds without posing a risk to a drivers ability to control their vehicles
- Shall not be used in a manner which may promote unacceptable driver behaviour
- Does not move from its original position when hit or run over by a vehicle
- Should be reflective yellow in colour
- Shall meet the dimensions below:



A device which is to be used as a temporary speed hump shall not be used if it were, in itself, to present an unacceptable increased risk of causing an incident.

D6.1 List of Temporary Speed Hump products

Refer to the Approved Products list at:

http://www.dit.sa.gov.au/contractor_documents/specifications for products that are used by the Department.

Appendix E Traffic Management Audit Report (example)

TRAFFIC MANAGEMENT – AUDIT REPORT

Road number: _____ **Road name:** _____

Road segment / maintenance marker peg **Start:** _____ **Finish:** _____

On site contact: _____ **Organisation name:** _____

Auditor's name: _____ **Date:** _____ **Time:** _____

#	TRAFFIC CONTROL REQUIREMENTS AT WORKSITE	Y	N	n/a
1.	High visibility clothing correctly worn by all workers, including plant operators.			
2.	Daily records of traffic controls are kept and filled in correctly.			
3.	Person responsible for signing has current Workzone Traffic Management Card and is present at manned site.			
4.	The overall layout of signs and devices for this worksite is in accordance with a traffic management plan: Field Guide Fig. #: _____ (plus additional signs/ devices used if required)			
5.	In particular, there is conformance for the following:			
5.1	Correct advance warning signs in place			
5.2	Correct buffer zone signs in place for the work site speed limit			
5.3	Correct distances between signs			
5.4	Correct return to speed limits signs in place			
5.5	Signs and devices not in use are covered up/removed			
5.6	Signs and devices are visible i.e. clean, undamaged and not obscured by parked vehicles, vegetation or other signs			
5.7	Sign mountings are secure, stable and not a hazard to road users if struck			
5.8	Vehicle mounted warning signs are operating effectively			
5.9	Adequate controls for pedestrians and cyclists in place			
5.10	Correct use of containment fences, e.g. mesh fencing, tapes & light weight safety modules			
5.11	All signs conform to AS 1742.3 and AS 1742.2 (i.e. for material, size and construction)			
5.12	Traffic controllers used are operating effectively and possess a current Workzone Traffic Management Card			