RIIWHS302D

Implement traffic management plan

THIS UNIT FORMS PART OF THE

RIISS00041 Work Zone Traffic Control
Implement Traffic Control Guidance Plan Skills Set

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Application	This unit develops a participant's skills and knowledge required to implement a traffic management plan in Civil construction. This unit is appropriate for those working in supervisory roles. Licensing, legislative, regulatory and certification requirements that apply to this unit can vary between states, territories, and Industry sectors. Relevant information must be sourced prior to application of the unit.
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Topics

The main topics covered in this section are:

- Access, interpret and apply traffic management documentation
- Work requirement compliance
- Risk identification and management
- Personal protective equipment
- Traffic control signage and device
- Tool selection
- Environmental protection requirements
- Traffic controllers training and qualification
- Traffic flow requirements
- Traffic guidance schemes
- Work schedules
- Signage and device positioning
- Traffic control safety
- Traffic flow
- Work activities
- Procedure management
- Post work traffic control
- Signage removal
- Guidance scheme and incidents recorded and reported
- Work area clearance
- Tool maintenance and storage

Introduction

Traffic control at worksites is provided to ensure a safe workplace for workers and to safely guide road users, through and around worksites. Work needs to be arranged so that workers are able to work safely and are separated from the road users where possible. Traffic control at worksites shall only be undertaken by persons who are qualified, authorised and have passed approved training courses.

Controlling traffic can be achieved by ensuring that the correct arrangements are in place, such as the selection or design of Traffic Control Plans (TCP)/Traffic Control Guidance Schemes (TCGS) that devices and signage are installed correctly and significant measures are in place to minimise risk. TCP/TCGS are part of an overarching Traffic Management Plan (TMP) although form the main component of the TMP.

Other documentation that may be included in a TMP may include;

- Legislative requirements
- Regulations
- Codes of practice
- Industry standards
- Company policy and procedures
- Manufacturer's guidelines and specifications

Preparation of a detail Traffic Management Plan and proper implementation of measures identified in the approved plan is essential to ensure the safety of all road users as well as the workers at site. It would also assure the smooth operation of the road network as well as the work site

Whilst this unit describes the process of 'Implementing a Traffic Management Plan', this may not reflect the activities that can be conducted as part of your jurisdiction qualifications level.
Generally workers at this level predominantly implement Traffic Control Guidance Schemes (TCGS) also known as Traffic Controls Plans (TCP)

Please ensure that you check and confirm the duties, responsibilities and authority for your jurisdiction.

1. Plan and prepare to implement Traffic Management Plan

A traffic management plan is a plan detailing work to be undertaken and describing its impact on the general area, especially its impact on public transport and passengers, cyclists, pedestrians, motorists and commercial operations. It also describes how these impacts are being addressed.

It will also include details on Traffic control Guidance Schemes, and vehicle movement plans.
Traffic control guidance schemes also known as Traffic Control Plans are a major component of a TMP Traffic management plans are designed to make sure that work zone traffic control is carried out in accordance with the relevant standards for traffic control for the jurisdiction in which the work is to be carried out.

The work of setting up a traffic control work area starts with, and is determined by, a set of documents known as a ***traffic management plan (TMP)***.

A Traffic Management Plan provides the details of proposals to safely manage traffic during the conduct of works on roads and normally includes:

- **A traffic control guidance scheme (diagrams)** – An arrangement of temporary signs and devices to warn traffic and guide it through or past a work area or temporary hazard.
- Worksite hazard assessment, such as a Safe Work Method Statement
- Details of the location, nature and duration of the works.

For long-term work, the plan should also include details of the requirements to manage traffic through the worksite outside normal working hours or when workers are not present at the site (after-care).

Primary aims of Traffic Management

A Traffic Management Plan is a key workplace document that has legal standing. As such it is critical that the structure and content of the Plan is sufficient to explain the potential hazards, the assessed risks and the proposed treatments for the proposed work activities and work site. The TMP should include all of the following.

The TMP must clearly state the objectives of the plan. Primary objectives will include requirements to ensure the safety and health of work personnel, the public and those who will be impacted by the work and to ensure that road users are not inconvenienced and the road network be kept at a satisfactory level of performance.

Traffic Management around work zones strives to achieve two different goals:

1. the safety of workers in the work zone
2. the safety and convenience of road users

1.1 Access, interpret and apply traffic management documentation

A traffic management plan is a plan detailing work to be undertaken and describing its impact on the general area, especially its impact on public transport and passengers, cyclists, pedestrians, motorists and commercial operations. It also describes how these impacts are being addressed.

TMP components may include:

Introduction
Purpose and scope
Objectives and strategies
Project overview
Project location
Site constraints
Project representatives and stakeholders
Traffic management representatives
Safety plan
Communication strategies
Impact on adjoining road network
Hazard arrangements
Approval
Traffic assessment
Temporary barriers
Cultural and Heritage constraints
Staging of work
TCPs
Work sequence
Reporting
After hours
Public feedback
Variations
Incident procedures
Environmental conditions
Work access
Cyclist and pedestrians
The vulnerable and people with disabilities
Emergency vehicles
Public transport
Existing Parking
Special events
School crossing
Heavy vehicles
Contingencies
Public notification
Existing speed zones
Geological, Hydrological and survey data
Standards
Night work provisions
Signage and devices
Monitoring
Site inspections
Auditing
Project review
Submissions

Obtain a copy of a completed TMP from you trainer and see if you can identify the section as listed above. The TMP will also include details on Traffic Control Guidance Schemes, and vehicle movement plans. Traffic Control Guidance schemes also known as Traffic Control plans are a major component of a TMP.

Traffic management plans are designed to make sure that work zone traffic control is carried out in accordance with the relevant standards for traffic control for the jurisdiction in which the work is to be carried out. For long-term work, the plan should also include details of the requirements to manage traffic through the worksite outside normal working hours or when workers are not present at the site (after-care).

A Traffic Control Plan (TCP) should be available & followed on all sites. The traffic controller shall direct traffic at and/or through a work site or other event in a manner specified in the approved operating procedure for the safety of all road users and road workers.

Documentation is essential to planning all aspects of the worksite, setting out the what, when how and who of everything that needs to be done. These are documents that require you to undertake tasks in a particular way or to meet a given standard.

Worksites need to meet the requirements of a range of compliance documents, which may include:

- Legislative, organisation and site requirements and procedures for Work Health & Safety (WHS), environment, duty of care.
- Licensing requirements.
- Employment and workplace relations legislation.
- Equal Employment Opportunity and Disability Discrimination legislation.
- Australian standards.
- Codes of practice.
- Emergency and evacuation procedures.
- Safe Work Method Statements (SWMS) and Job Safety Analysis (JSA).
- Plant and equipment manufacturer's guidelines and specifications.
- Material Safety Data Sheets (SDS).

The most important compliance documents that relate to Traffic Management Plans are:

- State and territory traffic management legislation, regulations and codes of practice.
- Australian Standard AS1742.3 – 2009: Manual of Uniform Traffic Control Devices (MUTCD) – Part 3: Traffic Control Devices for Works on Roads.

1.2 Obtain, read, interpret, clarity and confirm work requirements

The Traffic Management Plan will provide specification about which signs and devices will be required and where they will need to be placed on the worksite (usually in the Traffic Control Plan/Diagram), information about the impact of the works on all road users, including public transport, pedestrians, cyclists and local residents/businesses.

It should also include information about traffic flow requirements and information about the environmental requirements for works at the site. In short, it should provide all of the information that you need to set up a work area for the management of traffic and to protect workers in the work area.

Work instructions can take many other forms, either verbally or in writing, including, but not limited to:

- verbal or written and graphical instructions
- Signage
- Work schedules/plans/specifications
- Work bulletins
- Charts and hand drawings
- Memos
- Maps
- Safety Data Sheets
- Diagrams or sketches

Instructions will provide details such as:

- Specifications for the site, equipment and materials to be used.
- Quality requirements for the standard of work and documentation produced.
- Operational details such as site layout, local traffic characteristics, weather conditions.
- Safe work procedures or equivalent.
- Regulatory/legislative requirements.
- Plant and equipment manufacturers' specifications and instructions.
- Organisation work specifications and requirements such as timeframes, personnel/workers and equipment availability, costs.
- Instructions issued by authorised organisational or external personnel/workers.
- Relevant Australian Standards

It is essential that your work requirements are clarified, interpreted and confirmed correctly.

1.3 Identify, address and report potential risks, hazards and environmental issues and implement control measures

'Risk management entails the identification and analysis of all hazards likely to arise during works on roads including the setting up, operating, changing and ultimate dismantling of a traffic guidance scheme, followed by the determination of appropriate measures to mitigate those risks.' (AS1742.3, 2009)

The process appropriate at all levels of planning and operations including the following:

- When preparing standardised plans and safe work method statements for the conduct of minor routine and mobile works.
- When preparing traffic guidance schemes for more extensive or complex works where site specific risks will assume importance.

Evaluating Hazards as Sources of Risk

Every work site has hazards, but if we avoided carrying out work because of hazards, no work would ever be done. Risk management is about identifying all of the potential sources of risk and controlling those sources, or hazards, that produce unacceptable risks.

The **Four Step Approach** when identifying Risks and Hazards:

1. List the hazards to health and safety
2. Assess the risks arising from the hazards
3. Work out what to do about the risks
4. Make sure it works

Hazard – Anything (including work practices and procedures) that has the potential to harm the health or safety of a person.

Risk – The combination of the *likelihood* of injury or illness occurring (whether the *hazard* can actually do some harm) and the *consequence* of it occurring (how 'serious' the harmful effects would be). When discussing *risk management* it is important to remember that employers are responsible for all people at *work sites*. This applies to the employer's staff, as well as contractors, agents and members of the public.

There are many common *risks* at road *work sites.* Refer the participants to the Participant reference book, and ask them to list some examples. Discuss and list their suggestions on the whiteboard/flipchart. Responses may include, but are not limited to:

Moving Vehicles	Exposure to fumes	Uneven surfaces	Adverse weather conditions
Poor Visibility	Exposure to power lines	Faulty equipment	Poor manual handling
Driver fatigue	Exposure to Chemicals	High noise levels	Unsupervised visitors

It is important to manage the ***risks*** and ***hazards*** to ensure the safety of everyone at the worksite.

Assess the risk means decide how big the risk might be. There are two aspects to this:

- likelihood (what are the chances of it actually happening)
- severity (how bad could it be)

Likelihood

1. Very likely – could happen at any time
2. Likely – could happen sometime
3. Unlikely – could happen but very rarely
4. Very unlikely – could happen but probably never will

Likelihood can be ranked from 1 to 4 with 1 the most likely to happen

Severity

1. Death or permanent disability or ill health
2. Long term illness or serious injury
3. Medical treatment and several days off work
4. First aid needed

Severity can also be ranked from 1 to 4 with 1 the most severe outcome.

Calculate the Risk

Severity	Likelihood			
	VL Very Likely	**L** Likely	**U** Unlikely	**VU** Very Unlikely
K - Death/permanent disability	1	1	2	3
S - Long term illness or serious injury	1	2	3	4
M - Medical attention/time off	2	3	4	5
F - First aid	3	4	5	6

The table shows how severity and likelihood can be combined to give us a priority ranking from 1 to 6.

Rank 1 is given to the event that is both most likely and has the greatest severity of outcome.
Rank 6 is given to the event which is both least likely and has the least has severe outcome.
1 is top priority – something must be done immediately.
6 is low priority – something should be done when possible.
We can use the table to work out the risk priority for any scenario.
What is it? *(Severity will depend on the selected likelihood)*

What can be done about the risks?

Eliminate the hazard

- Minimise the risk
- Other measures

The third step is to work out what to do. In other words what "control measures" can be implemented?

The options available include:

- Cutting out the hazard (= eliminate)
- Cutting down the risk (= minimise)
- Other ways to control risk

An example of eliminating the hazard could be the use of portable traffic signals instead of Traffic Controllers; this eliminates the risk of injury to persons.

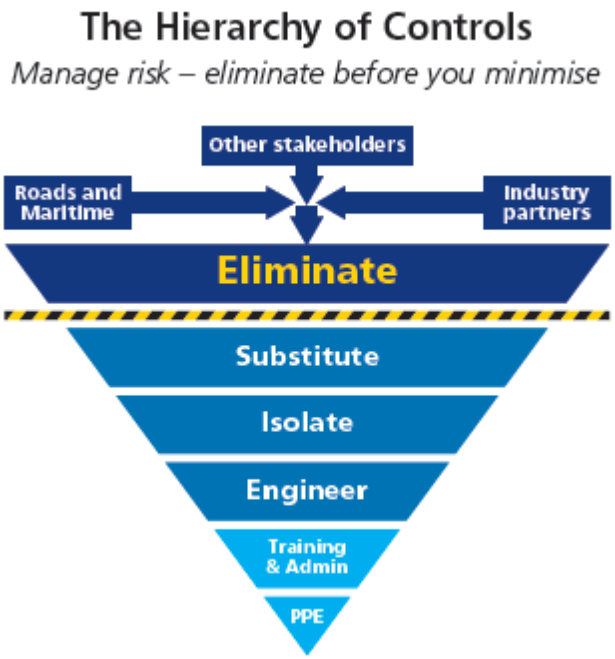
Minimising the risk includes:

- Substituting the system of work with something safer e.g. working at night when there is less traffic.
- Modifying the system of work to make it safer e.g. using reflective clothing instead of non-reflective.
- Isolating the hazard e.g. barriers between traffic and worksite.
- Engineering e.g. installing "crash cushions" on work vehicles

In instances where the Traffic Guidance Scheme is found to be inadequate, it will need to be referred to an authorised Guidance Plan Developer for alteration or complete re-design *prior to* any works commencing on the site. The alterations to the Guidance Scheme will need to be recorded and made available at the work site.

We make our workplaces healthier and safer by:

- Executives and managers committing to active leadership and sound safety governance
- Maintaining a contemporary safety management system that takes account of people's capabilities
- Managing risk - elimination before minimisation through early intervention in planning and design
- Creating a just and fair culture that encourages the reporting of hazards and occurrences –near-misses, incidents and accidents – to enable organisational learning
- Empowering workers to participate in creating and maintaining a safe and healthy workplace
- Consulting with workers on health and safety matters
- Consulting, cooperating and coordinating with our industry partners and others to achieve our common health and safety goals
- Committing to continuous improvement and assurance processes



1.4 Select and wear personal protective equipment appropriate for the work activity

There are requirements for Traffic Controllers to wear appropriate clothing and Personal Protective Equipment (PPE) to ensure their safety while conducting their specific duties. PPE includes a variety of devices and garments to protect workers from injuries.

These requirements are not restricted just to traffic controllers, they extend to all those who are involved at the worksite.

High Visibility Clothing

Traffic Controllers and those involved with traffic management functions are required to wear approved high visibility clothing (outer garments):

- at all worksites affected by traffic
- while outside a vehicle within the bounds of the road reserve

There are different types of approved high visibility clothing that workers must wear at the appropriate times. Workers must wear Approved Safety Clothing which may include:

For day time work:

- Approved High Visibility vest.
- Approved High Visibility shirt.

For night time work:

- High Visibility overalls with reflective tape

Because of the potential hazards associated with working on, or adjacent to, road worksites, all persons working on or authorised to enter such worksites, shall be supplied by their employer/Person Conducting Business or Undertaking (PCBU) with the relevant high visibility PPE and shall be instructed to wear it at all times when required.

This equipment and clothing should comprise of the following items (but may not be limited to):

- High visibility garments:
  - Fluorescent high visibility vest, shirt, jacket or overalls (day use only)
  - Retro-reflective outer garment (night use only)
- Safety footwear

Work Clothes

In order to protect the worker from exposure to UV radiation and to ensure that they are visible they should wear:

- broad brimmed hats
- broad brimmed safety attachments to safety helmet (if appropriate)
- long sleeved collared shirt
- long pants or overalls (especially when working near bitumen)
- tinted safety glasses (recommendation AS 1337.1: Safety Glasses and Spectacles)
- safety footwear
- broad spectrum SPF +30 sun screen and lip creams

Other requirements for personal protection equipment such as hearing protectors (earmuffs, ear plugs) may be applied where needed.

1.5 Identify, Obtain and Implement Traffic control signage and devices

Traffic control signs and devices are used to warn and inform road users, and guide them safely around, past or through *work areas*. Signs and devices must be:

- In place before work begins.
- Clearly visible to road users and not obscured by vegetation, parked vehicles, plant or other signs and devices.
- Displayed in the correct sequence.
- Removed on completion of the work.

As the person responsible for implementing the Traffic Management Plan it is your job to identify, obtain and implement signage and devices requirements for the project.

AS1742.3-2009: Manual of Uniform Traffic Control Devices is the accepted reference for the selection and use of any traffic control signs and devices on civil construction worksites. State and Territory Codes of Practice or Manuals based on the MUTCD may also provide jurisdictionally-specific requirements around some signs and devices, so you will need to become accustomed to referring to both of these documents when identifying and selecting signs and devices.

The Traffic Management Plan or the Traffic Guidance Scheme should state the types, sizes and numbers of signs and devices required for the project. You will need to ensure you have sufficient supplies available for each stage of the work.

You will also need to check that the signs and devices comply with the specifications set out in *AS1742.3-2009*. This means that signs and devices should meet the following criteria:

- Mechanical Condition
- Cleanliness
- Colour of fluorescent signs
- Night time visibility

Signage and devices required at all construction and maintenance sites may include (but not limited to):

- Temporary Warning Signs
- Temporary warning signs are used to alert the public of changed conditions ahead, for example: Roadwork ahead; Prepare to stop; Workers (symbolic).
- Regulatory and Traffic Cones
- Traffic cones are generally used on short-term works to define the traffic path past or around the work area. Various sizes are available for different situations such as footpaths or freeways.

Types of Road Signs

- Work site approaches and departures
- Regulatory control of traffic
- Detours
- Road condition
- Lane and road closures
- Pedestrian control signs
- Other signs

Please refer to your jurisdiction work sites manual to identify the sign reference number and the image representation of each sign.

There are a number of sign types that may be used at road works:

Work site approaches and departure signs - used to warn road users of temporary hazardous conditions that could be encountered, for example:

- ROADWORK AHEAD
- END ROADWORK

Regulatory control of traffic signs - indicating the laws that shall be obeyed for example:

- speed restriction signs
- STOP /SLOW bats

Detour signs - indicating the way road users should proceed within the work site, for example:

- DETOUR (left or right)
- Two way traffic

Road condition signs - indicating to road users the road conditions that will be encountered. for example:

- ROUGH SURFACE
- GRAVEL ROAD

Lane and road closures - indicating to road users the lane configuration that will be encountered, for example:

- Lane status
- ROAD CLOSED

Pedestrian control signs – indicating the paths pedestrians are required to take, for example:

- PEDESTRIANS
- USE OTHER FOOTPATH

Other signs – for example:

Sign sizes (AS 3.2.3)

Standard signs shall be used wherever one suitable for the purpose exists. Individual signs may be available in 2 different sizes described as (A) or (B).

Each category of sign shall be used under the following conditions:

- A size
  - at traffic speeds up to 90km/h where lateral offset of the sign from the travel path is not more than 8 metres; or
  - at traffic speeds up to 110km/h where the offset is not more than 4.5 metres; or
  - signs directed at pedestrians.

- B size
  - where the conditions for A size signs are exceeded; or

  - on expressway type roads for added emphasis of the onset of works, detours or closures; or
  - other critical safety messages; or
  - where traffic speeds exceed 70 km/h and the relevant A size sign is less than 1 m2 in area.

- C and D size
  - Larger signs may be used where there is considered to be a need to emphasise the message or there is excessive lateral offset of the sign.
  - The works supervisor is responsible for selecting sign sizes and for ensuring that they are shown on the TCP.

Example table for Traffic Control Devices

Barrier Boards	Used to prohibit vehicles from entering a work area or using a traffic lane.
Plastic containment fencing	Used to isolate the work area and inhibit pedestrian access in situations where a safety barrier is not required.
Cones	Use on short term works to define the traffic path. Cones come in two sizes, 450mm where traffic speeds do not exceed 70 km/h, and 700mm where traffic speeds exceed 70 km/h.
Bollards	May be used on short term or long term works to define the traffic path past or through the works area. They are at least 750 mm high. If used when the site is unattended they shall be securely fixed or weighted to the pavement.
Delineators	May be used on short or long-term works where something more "permanent" than bollards would be beneficial.
Longitudinal Cannulising Barricades	Are used to provide better separation and a greater degree of protection than plastic mesh.
2	How many types of these are there?
Concrete Barriers	(Called "Type F") are used to give protection by deflecting out of control or colliding vehicles.
1. Unidirectional flashing yellow lamps 2. Rotating yellow lamps	Traffic Warning Lamps Two types of traffic warning lamp are in use: - Mounted above a particular sign to draw attention to it. - Used to draw attention to work vehicles and plant to which they are attached or to draw attention to signs in difficult light conditions or in high volume locations.
Flashing Arrow Signs	Are mounted on a vehicle or trailer and used to direct traffic to the right or left, or to give warning.
Variable Message Signs	Are used to deliver a specific message and can be programmed to show the message progressively.
Portable Traffic Signals are used to:	Portable traffic signals are used to control traffic.

Tapers

Tapers are used to move traffic out of or into the normal path, or to slow traffic by creating lateral friction. They are created by using a series of devices and/or pavement markings to channel traffic. There are five types of tapers. Diagrams for each of these tapers can be seen on pages 89 and 90 of AS1742.3:

Two-Lane, Two-Way Taper. Used in advance of a work area that occupies part of a two-way road in a way that the rest of the road is used alternately by traffic in either direction. It requires a flagging operation.

Shoulder Closure Taper. No buffer space is required.

Merging Taper. Closes lanes to move traffic on a multi-lane highway using channelising devices.

Shifting Taper. Shifts traffic from one lane to another but does not require traffic in that lane to merge with traffic in another lane.

Downstream Taper. Used at the end of the work area to direct drivers to move back into the lane that was closed.

The Traffic Management Plan and Traffic Guidance Scheme will outline the length of tapers to be used and the spacing of devices. Diagrams, technical specifications and instructions for the use or restriction of each traffic sign and device can be found in *AS1742.3-2009* and the relevant state or territory Code of Practice.

1.6 Select, and check for faults, tools and equipment to carry out tasks

In addition to the traffic signs and devices, various tools and equipment will need to be obtained to carry out tasks that are consistent with the requirements of the job.
Tools and equipment will include:

- High visibility vests.
- Radios.
- Notebooks and pens.
- Cones.
- Sign mountings.
- Stop-slow bats.
- Signage.
- Delineators.
- Barricades and barriers.
- Bollards.
- Warning lights and beacons.
- Arrow boards.
- Signalling devices.

You will also need to check that the signs and devices comply with the specifications set out in *AS1742.3-2009*.

This means that signs and devices should meet the following criteria:

- Mechanical Condition
- Cleanliness
- Colour of fluorescent signs
- Night time visibility

Two-way radios are required at worksites where communication is required over long work distances or sight distances are limited, particularly for traffic controllers. Characteristics, technical capabilities, uses and limitations of the regulatory equipment listed above can be found in *AS1742.3-2009* and the relevant state or territory Code of Practice.

Any defective equipment needs to be dealt with in accordance with site procedures. Commonly this would include isolating or tagging out the equipment and reporting the fault to a supervisor for corrective action, replacement or repair.

1.7 Identify, confirm and apply environmental protection requirements

In addition to managing the risk of harm or loss to humans and equipment, you will need to ensure that any risks of damage to the environment from the work area are managed. Environmental protection requirements are part of every worksite. You must be familiar with the site *environmental management plans*, requirements and constraints, and apply these to all the tasks you carry out on the site.

Environmental protection requirements include:

- Waste/clean up management.
- Water quality protection.
- Noise and vibration control.
- Dust management.

Environmental Management Plan (EMP)

What is an EMP?

An EMP is a site or project specific plan developed to ensure that appropriate environmental management practices are followed during a projects construction and/or operation.

An effective EMP should ensure:

- Application of best practice environmental management to a project
- The implementation of a projects environmental impact assessment (EIA) including its conditions of approval or consent
- Compliance with environmental legislation
- Environmental risks associated with a project are properly managed

All personnel/workers must have a good understanding of the environmental management processes that must be used onsite. If you have concerns, questions or queries about the exact requirements you must meet, you should speak with the environmental manager.
Where aspects of traffic management may have an environmental impact, procedures should be applied in accordance with the project environmental management plan to minimise any impact

Waste/Clean-Up Management

Waste management may include taking steps to use environmentally friendly materials (including recycled materials) and implementing methods of sorting waste into categories for recycling and correct disposal.

Water Quality Protection

Water quality protection measures may require runoff to be directed to areas where it will not escape into the stormwater system or other waterways. This plan will detail items like silt fences, diversion drains and sediment ponds. The water quality protection plan can have a sub-plan for any traffic diversions or detours planned.

Dust Management

Dust control techniques may include:

- All vehicles transporting soil to/from the worksites will have their loads covered to minimise spillage and fugitive dust.
- Dust screens will be used as feasible.
- Water or a dust/erosion control agent applied as necessary by truck to unpaved surfaces used for trucking during dry weather conditions, with adequate frequency to limit the generation of dust from vehicle traffic.
- All stockpiles of soils designated for reuse will be placed on, and covered with, waterproof material until removed for placement elsewhere.
- All piles of soil and aggregate that could cause dust generation through wind erosion will be covered with a tarp or watered-down regularly.

The procedures to be followed on-site will be based on the requirements outlined in the environmental plans and specifications.

1.8 Traffic controllers training and qualification

In most states of Australia, traffic management regulations require that anyone working in traffic control must have the appropriate current traffic control training. There are various levels of traffic control training.

For Work Zone Traffic Control – Traffic Controller Skill Set, the minimum national competencies are:

- RIIWHS201D Work safely and follow WHS policies and procedures
- RIICOM201D Communicate in the workplace
- RIIWHS205D Control traffic with stop-slow bat

Each state *may* identify the various levels differently whilst still using the national competency skill sets. In addition, it is a requirement that all personnel/workers involved in traffic management and traffic control attend an appropriate refresher training course following receipt of an initial certificate, as set out by state requirements. Normally three (3) year, but ensure you check the state requirements. Personnel/Workers involved in traffic management and traffic control should only perform those tasks for which they have the appropriate training.

Verifying Competency

It is not enough to take a worker's word that they are competent – you will need to see evidence of their competency. This means:

- Ensuring that someone in your organisation (if it is not you personally) has sighted the Statements of Attainment for the relevant Units of Competency required

That you ensure the worker has currency of competency

1.9 Advise Traffic Controllers of the traffic flow requirements

Where the Traffic Management Plan calls for the use of traffic controllers, you must ensure they clearly understand their role before starting any work. They must also be aware of the traffic flow requirements for the site. It is also important to remember that traffic controllers can only be used in work areas that have an approach speed of 60km/h or less. Where speeds exceed this, alternate means of traffic control must be used, or temporary speed zoning will be required in the work area.

2. Set out the Traffic Guidance Scheme

2.1 Select Traffic Guidance Schemes to suit the site condition, traffic volumes and work activities

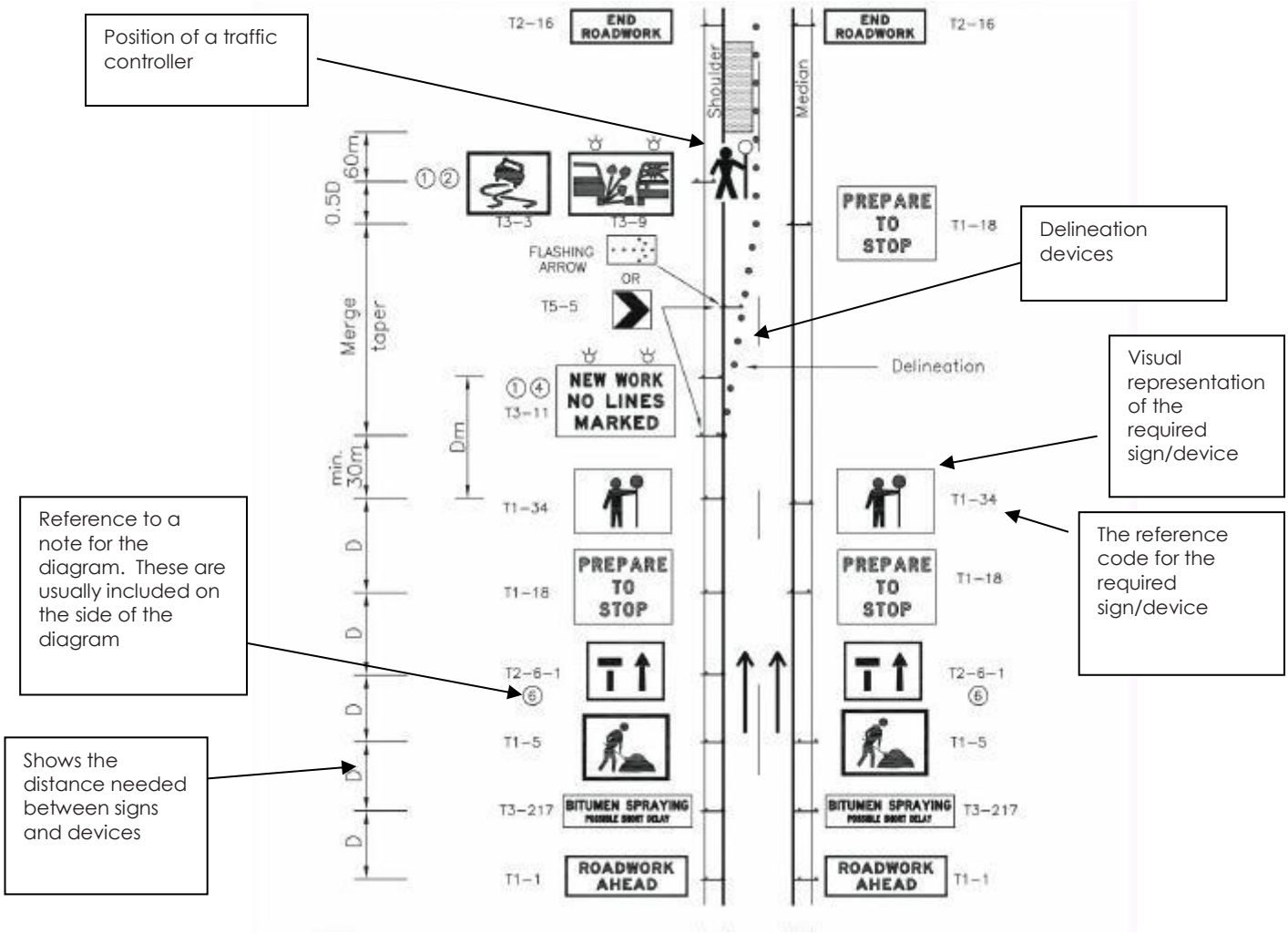
Whilst this unit describes the process of selecting a suitable TCGS/TCP to suit site conditions and volume of traffic, this may not reflect the activities that can be conducted as part of your jurisdiction qualifications level.

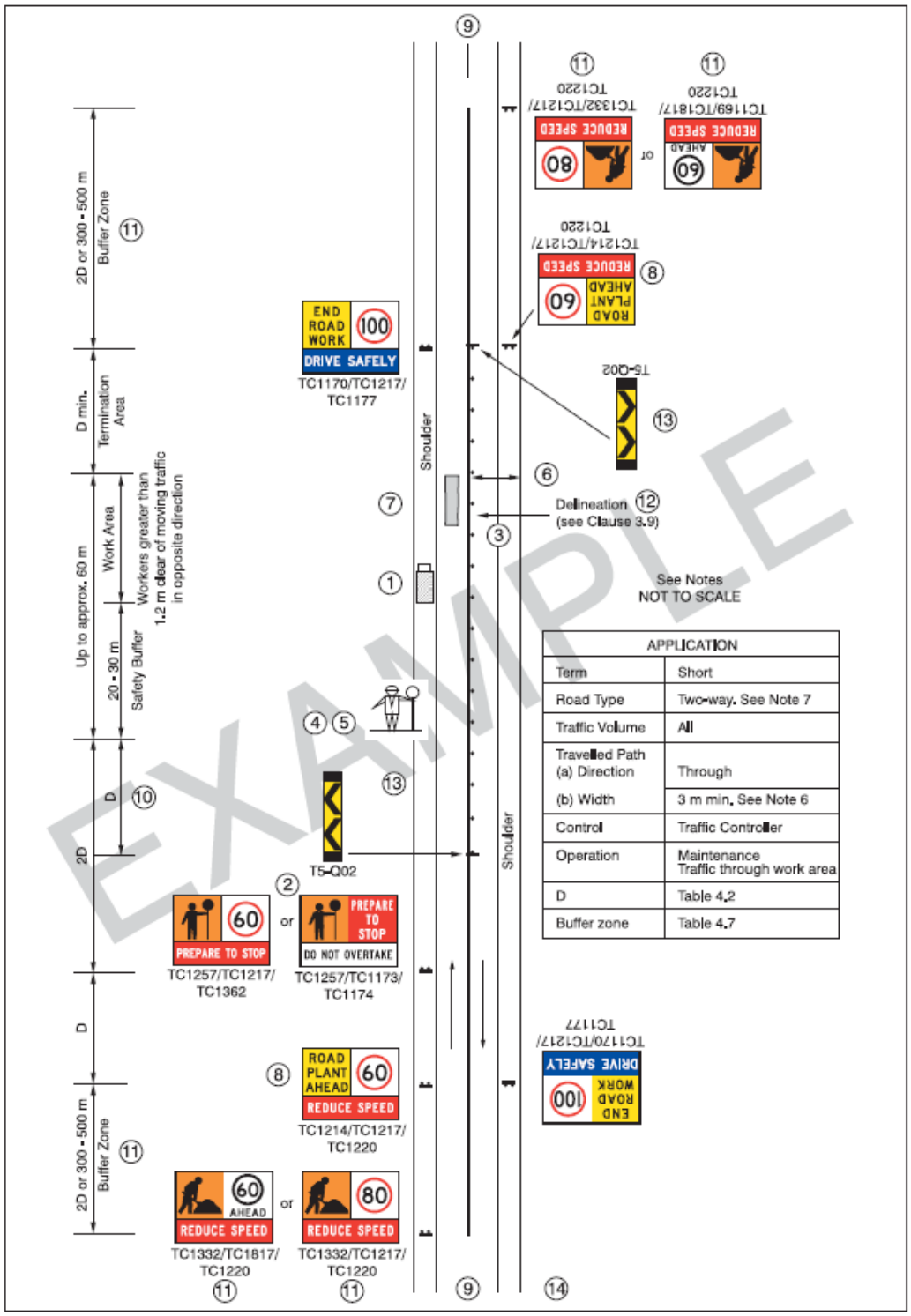
Please ensure that you check and confirm the duties, responsibilities and authority for your jurisdiction. A Traffic Guidance Scheme shows, on a diagram or sketch, the physical arrangement of temporary traffic control signs and devices, to warn traffic and guide it through, past or around a work area or temporary hazard.

This may include:

- Warning signs, lights, markers.
- Cones, bollards, barriers.
- Road and footpath closures.
- Detours or side tracks.
- Traffic controllers.

Example of a Traffic Guidance Scheme





APPLICATION	
Term	Short
Road Type	Two-way. See Note 7
Traffic Volume	All
Travelled Path (a) Direction	Through
(b) Width	3 m min. See Note 6
Control	Traffic Controller
Operation	Maintenance Traffic through work area
D	Table 4.2
Buffer zone	Table 4.7

A variety of standard plans or diagrams may be found in your State or Territory's Traffic Control Code of Practice or Traffic Control Manual.

The nature of the work

Short-term and mobile work
Planning in these cases should comprise the development of procedures and the provision of appropriate sets of signs and devices to cover all of the routine tasks the workers will encounter.

Work involving relatively simple part-roadway closures
Planning in these cases should comprise a minimum requirement to sketch the protective devices and delineation required on a road construction, or similar plan, and to prepare a list of devices required for the job.

Complex traffic arrangements
Planning in these cases should comprise:

- plans showing temporary traffic paths, their delineation and the position of traffic control or warning devices, or on multi-stage works, a separate set of plans for each stage
- details of after-hours traffic arrangements, on separate plans, if required
- all necessary instructions for the installation, operation, between-stage rearrangement and ultimate removal of devices at the conclusion of the job, planned well before the job starts, or before the start of the stage to which they apply, so that there is enough time to obtain any special devices or approvals needed.

All essential aspects of traffic plans are to be considered in the following order, and incorporated into the plan, if relevant.

The nature of the roadway

Traffic demand
Determine the capacity required to accommodate traffic demand at an acceptable level of service and convenience to road users and to decide on the amount of road space which must remain open, and where applicable, the times of day when greater amounts of road space are needed to handle higher traffic volumes (e.g. urban peak periods).

Traffic routing
Select the appropriate means of routing traffic at the site, i.e. through, around, or past the site, or a combination of these, ensuring that all required traffic movements are provided for.

Traffic control
Determine the need for traffic control by:

- traffic controller
- traffic signals (portable or permanent)
- police
- other means.

Other road users
Determine the need to make provisions for road users, other than vehicular traffic, including:

- pedestrians, including people with disabilities, where appropriate
- bicycles
- school children
- local residents
- emergency vehicles.

Special vehicle requirements
Determine the need to provide for vehicles, such as:

- buses, including stops and terminals
- over-dimensional vehicles (e.g. vehicles which, together with their load, are
- wider or longer than standard)
- restricted vehicles (e.g. vehicles which, although within legal limits, are
- permitted to use only specified routes).

Depending on circumstances, movement of traffic may be achieved in one of the

- following ways:
- through the work area, by intermingling with workers or plant
- past the work area by means of a delineated path alongside, but clear of the work area
- around the work area by a detour, which may be via a side track, or an existing road.

2.2 Determine and ensure adherence to work schedule, maximum traffic delays, signals and site communications

The work schedule should detail the following, but not limited to:

- Tasks / responsibilities
- Hours of operation of the worksite
- Duties of and hours for personnel
- Minimum numbers of personnel required on the worksite to undertake the tasks
- Maximum permissible traffic delays
- Site signals
- Site communications
- Emergencies / contingencies

Work schedules may be subject to change as work progresses on the worksite. The plan will '*evolve*'. Each worksite is subject to the relevant state and federal regulations/Australian standards.

Traffic control safety

Traffic control safety encompasses the safety of all personnel on, transiting through or around a worksite.

This may include, but not limited to:

- Ensuring signs and devices are positioned and displayed on each approach
- Ensure signs and devices are positioned and displayed laterally
- Ensure traffic is controlled effective to protect the work crew

Safety should always be the first priority and is the responsibility of all personnel on a worksite.

2.3 Ensure signs and devices are correctly positioned on the approaches to the work area

Sequence of erection

Before work commences, signs and devices at approaches to the work site shall be erected in accordance with the adopted Traffic Control Guidance Scheme, in the following order:

- advance warning and regulatory signs
- all intermediate advance warning and regulatory signs and devices required in advance of the taper or start of the work area
- all delineating devices required to form a taper including flashing arrow signs or temporary hazard markers where required
- delineation past the work area or into a side track
- all other warning signs or regulatory signs including termination and end of temporary speed zone signs.

Delineation devices such as cones and bollards shall be placed in the same sequence i.e. those furthest in advance of the work place first

When erecting signs an devices

- Always travel in the direction of normal traffic flow
- A work vehicle with flashing arrow or rotating or flashing lights shall be positioned between the workers and approaching traffic during the placement of traffic control devices
- Worker shall not cross roads or carriageways on foot when erecting or removing signs

Signs and devices should be positioned and erected so that:

- They are placed in the specified position on the Traffic Guidance Scheme;
- They are properly displayed and securely mounted;
- They are within line of sight of the intended road user;
- They cannot be obscured from view (e.g. by vegetation or parked cars);
- They do not obscure other devices from the line of sight of the intended road user;
- They do not become a possible hazard to workers, pedestrians or vehicles;
- They do not deflect traffic into an undesirable path;
- They do not restrict sight distance for drivers entering from side roads or streets, or private driveways; and
- They are not installed using supports that could be a hazard if struck by a vehicle.

Dimension D

Dimension D is a measure of distance that is dependent on the approach speed of traffic toward a work zone and is usually included on Traffic Guidance Schemes to allow for them to be used across contexts. An example of the value of D, in metres, is as follows:

Speed of traffic (km/h)	**Dimension D (metres)**
45 or less	0-5
46-55	15
56-65	45
>65	Equal to the speed of traffic (in Km/h) E.g. if traffic is travelling at 80km/h, Distance D will be 80m

Some jurisdictions may disregard the 0-5m specification for speeds lesser than 45km/h in preference for 15m in all instances where the approach speed to a work area is less than 55km/h. Ensure that you refer to the specifications of the State or Territory in which you are working.

Delineating devices (e.g. traffic ones, bollards, post mounted delineators) should generally be placed 1 m clear of the travelled path where practicable. However, traffic cones and bollards may also be used to define the edge of the travelled path or to separate opposing traffic.

2.4 Ensure that signs and devices are positioned and displayed on each approach

Ensure that you follow the TCGS/TCP and this will ensure that signs and devices will be displayed on each approach. This will be identified upon briefing and acceptance of the plan. If the TCGS/TCP does not indicate this, then you must contact your supervisor or the authorised person who designed the plan.

2.5 Ensure signs and devices are positioned and displayed laterally

All devices and signs should be placed laterally to the travelled path on the roadway. In other words, they should be off to the side of where traffic will move through the work area. In open road areas and on un-kerbed roads in built-up areas where signs are to be mounted on posts, they should normally be placed clear of the outer edge of shoulders and at least 1m clear of the travelled path, whichever is the greater clearance.

They should be erected 1 to 1.5m above the level of the nearest edge of the travelled path to the underside of the sign. Signs should generally be positioned 1 metre clear of the travelled path (i.e. the edge line or "fog line" as it is sometimes called).

For works lasting longer than 2 weeks –

- they should be mounted on poles sunk into the ground and duplicated on the right hand side of the road if physically possible.

In open road areas where signs are to be mounted on posts –

- they should be erected a minimum of 1 to 1.5 metres above the level of the nearest edge of the travelled path to the underside of the sign
- placed clear of the outer edge of the shoulder and at least 2m clear of the travelled way.

In urban areas adjacent to footpaths or where vehicles may be parked –

- signs should be erected a minimum of 2.2 metres above the level of the kerb or footpath to the underside of the sign
- be placed 300mm behind the kerb.

Mountings for short-term work shall be arranged so -

- that the signs are prominently displayed to traffic and can be clearly noticed.
- Ideally the minimum height to the lower edge of the sign should be 200mm
- signs may be positioned on the ground subject to them being clearly visible to traffic

Orientation of sign

Signs should face towards approaching traffic approaching traffic approximately at right angles to the line of sight from the driver to the sign.

Note: In some cases there is an option to make adjustments or tolerances for the location of signs and devices where distances are specified (e.g. taper lengths).

The tolerances are:

- Minimum 10% less than the length or distance given
- Maximum 25% more than the length or distance given

It should be noted that these tolerances only refer to prescribe lengths and distances not to distances specified in a TCP; they can be used as prescribed but should not be offered as a general rule

Please see below a sample of a checklist

Traffic control at worksites location checklist			
Road No.		Location	
Type of work			
Date/Time		Completed by	
The following checklist shall be completed on site with the approved TCP for the work being undertaken, prior to TCP implementation.			

1. Has provision been made for any intersections, on-loading or off-loading ramps within the worksite?	Yes/No/NA
2. Will vehicles be entering or leaving the worksite from private or commercial driveways?	Yes/No
Has provision been made for those vehicles?	Yes/No/NA
3. Is there adequate sight distance for road users to signs and traffic controllers?	Yes/No
4. Will control measures be safe for the approach speeds of traffic?	Yes/No
5. Has consideration been given to traffic volumes expected?	Yes/No
6. Has provision been made for bus stops (including school)?	Yes/No/NA
7. Has provision been made for pedestrians including those with impairments?	Yes/No/NA
8. Has provision been made for cyclists?	Yes/No/NA
9. Are there any overhead power lines that might be a risk to construction vehicles and plant?	Yes/No
10. Has the time of day been adequately considered (i.e. night work, low setting sun)?	Yes/No

Item No	**Action Taken**

2.6 Ensure traffic is controlled effectively to protect the work crew

Generally you will be working from a truck carrying the signs and devices that will be used.

There are some safe and practical ways to set up your signs and devices.

- Always wear high-visibility clothing.
- Always travel in the direction of normal traffic flow.
- Work from the nearside of the truck to avoid exposure to traffic on the road.
- Ensure there is an adequate escape route in case of emergency.
- A work vehicle with a flashing arrow or flashing lights should be positioned between the workers and approaching traffic when cones or barriers or other devices are being positioned on the roadway itself. Don't walk out onto the roadway without the truck to act as a protective barrier.

For long-term or recurring short term sites, consider marking the location of each sign or device on the road pavement for easy future placement

3 Monitor Traffic Guidance Scheme

3.1 Ensure traffic flow is monitored and effectiveness of guidance scheme determined

When the TCGS/TCP has been implemented, i.e. the erection of the signs and devices is completed and the condition of devices has been checked, a functional inspection should be carried out before and after opening to traffic.

This inspection should be conducted in a vehicle at the normal traffic speed, along the travelled path, and past all of the signs and devices. As the works progress and the requirements of the TCGS/TCP change, further monitoring should be undertaken to ensure that the plan is operating as effectively as possible.

An operational inspection may be undertaken at the following stages of the works:

- At each major change to the traffic management plan.
- During both day and night operation for long term works.
- Whenever the operation of a traffic management plan results in unexpected significant disruptions to traffic.

When carrying out an operational inspection, consideration should be given to the following:

- Public transport operation through the worksite.
- Safety of workers on the worksite, road users and the public.
- Signs, road markings, temporary safety barriers, lighting and facilities for pedestrians, cyclists and people with disabilities.
- Traffic compliance with the implemented traffic management plan.
- Effect of the works on surrounding land use (e.g. Residential, commercial/industrial, car parking).
- Differences in weather conditions.
- After-hours conditions.
- Traffic volumes (e.g. peak periods).

3.2 Monitor work activities and provide guidance to adjust scheme

As the person responsible for implementing the Traffic Management Plan, you will be required to work with the team to monitor the TCGS/TCP.

During work hours:

- Follow a routine of periodically driving through the worksite to check that all signs, markings and delineating devices as seen by other road users are satisfactory and in their correct position.
- Monitor queue length and conduct continual assessments
- Attend to minor problems as they occur.
- Monitor road user behaviour in regard to approach speeds, if vehicles are approach to fast, you may need to check the position of signage
- During work breaks, move personnel/workers clear of the work area; park plant clear of traffic lanes and remove from view or cover inappropriate signs such as Traffic Controller Ahead/PREPARE TO STOP or Workers (symbolic) if workers leave the site or cannot be seen.
- 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.
- Reposition barriers, signs and tapers as necessary, e.g. adjust the length of single lane traffic operation as necessary to keep it to a minimum, and keep records of changes made and the time these occurred.
- Coordinate maintenance of the travelled path with other job operations.

After hours:

- Confirm any special provisions that are required after working hours, during weekends or holidays, and make sure these are actioned. This could include illumination of the site or the installation of portable or temporary traffic signals.
- Arrange for personnel/workers to carry out after dark checks to ensure lamps and other traffic devices are functioning.

3.3 Apply process for dealing with traffic controllers who fail to adhere to approved procedures

Accredited traffic controllers are required to operate at the highest standards and to comply with the statutory conditions of their appointment.

Traffic controller need to be;

- Correctly certified (having a valid and current Traffic Controller qualification gained by successful completion of relevant training) and authorised by the appropriate road authority.
- Correctly dressed i.e. reflective jackets for clear visibility, protective clothing for worksite (headwear and footwear etc.) weather protection (e.g. sunhats), and displaying "Authorised Traffic Controller" on the garment.
- Correctly equipped i.e. Stop/Slow bats, radios.
- Correctly positioned i.e. clearly visible to road users, having good view of the queue, in line of sight with other controllers if required, and with clear escape route in case of emergency

The following actions are **NOT** acceptable by traffic controllers:

- Using a mobile phone while directing traffic.
- Not adhering to approved procedures for controlling traffic.
- Unprofessional behaviour towards the public.
- Inappropriate dress or equipment.
- Working while affected by drugs or alcohol.

3.4 Apply procedures to deal with offending motorists

Be aware that traffic controllers have no power at law. The legal authority rests with the STOP sign, not with the person. You will be required to warn the workers ahead, using your two-way radio, mobile phone, hand signals or other approved communication method.

You should then record the following details:

- Type and colour of vehicle (or other distinguishing features).
- Date and time of the traffic offence.
- Location (including street or road names if applicable, or other landmarks).
- Nature of the offence.

The police or relevant authority should then be notified.

4 Close down traffic guidance scheme

4.1 Ensure traffic is controlled to protect work crew removing traffic control devices

As soon as any activity is completed or a hazard ceases to exist in the work area, the Traffic Guidance Scheme needs to be closed down. Generally you will be working from a truck carrying the signs and devices that will be used.

There are some safe and practical ways to set up your signs and devices:

- Always wear high-visibility clothing.
- Always travel in the direction of normal traffic flow.
- Work from the nearside of the truck to avoid exposure to traffic on the road.
- Ensure there is an adequate escape route in case of emergency.
- A work vehicle with a flashing arrow or flashing lights should be positioned between the workers and approaching traffic when cones or barriers or other devices are being positioned on the roadway itself. Don't walk out onto the roadway without the truck to act as a protective barrier.

It is most important to remove the relevant signs and devices or at least conceal them from view so that traffic flow is no longer disrupted and road users do not become confused by conflicting instructions.

4.2 Ensure signs are removed in sequence to provide maximum warning during removal

In accordance with the Traffic Management Plan, traffic control signs and devices used for the Traffic Guidance Scheme must be removed in reverse order progressing from the work area out toward the approaches.

The signs and devices should be removed in the reverse of the positioning sequence as follows:

- Other warning signs or regulatory signs including termination and end of temporary speed zone signs.
- Delineation past the *Work Area* or into a side-track.
- All delineating devices required to form a *Taper*, including flashing arrow signs and temporary hazard markers.
- All intermediate advance warning and regulatory signs and devices required in advance of the taper or start of the work area.
- Advance warning and regulatory signs

On completion of a traffic control operation, the first step is to remove the signs and devices.

- They should be removed in the reverse of the positioning sequence, starting at the *Work Area* and moving out to the approaches, as listed above.

Other considerations

- When removing lane or road closure traffic control devices, a work vehicle should be positioned between the workers and the approaching traffic.
- Delineated by cones and bollards, and should slowly reverse along the closed roadway, while the workers remove the signs and devices.
- Subject to the approval of the Works Supervisor, the work vehicle may also proceed towards approaching traffic in a forward direction along the closed roadway.
- After the lane or road closure traffic control devices have been removed, the work vehicle should return to the *Work Area*.
- When the vehicle is able to move clear of the travel lane, workers may remove all other signs in the reverse of the positioning sequence or as they are placed as long safety requirements have been met.
- Removing signs on central medians, or barriers on multi-lane divided carriage-ways, require detailed safety considerations

Note: The vehicle removing the signs and devices must be either totally on, or totally off, the road. It can be difficult to remove traffic control signs and devices at some sites because of traffic conditions or volume, shoulder width, or road alignment.

In such cases, it may be necessary to vary the removal sequence, as long as a site-specific TCP and appropriate safety measures are provided to maintain worker safety. **For example:**

- The signs and devices may have to be removed in the same order that they were positioned
- This could allow the work vehicle to move in the direction of normal traffic flow, when use of the travel lane is the only alternative.

Condition of Devices

On completion of a traffic control operation signs and devices are removed.

Count – refer back to Understanding TCPs – at the close of the operation":

- Look again at the plan
- List the devices and signs that were required
- Note the number of devices that were used e.g. cones
- Count what you have done

Check - the signs and devices for:

- Damage
  - Repair minor damage
- Dirt - Clean
  - Hose them off
  - Polish them
  - Wipe over with a wet rag

Communicate – i.e. report to the relevant person:

- Loss or irreparable damage to devices or signs requiring replacement.
- Damage to devices or signs requiring repair

Complete – any required documentation:

- Who is the relevant person in your organisation?
- What is the reporting procedure – is there a form?

Before signs are returned and placed in storage for future use. The additional checks must be performed on completion of the traffic control operation when the signs and devices have been removed, and before they are placed in storage for future use. The site should then be inspected for any *hazards* or *risks*, to ensure it has been restored to a safe standard and can be re-opened

4.3 Ensure guidance scheme details are recorded and reported as required

When undertaking works on a road, records of the traffic management plan and any written authorisation for the erection of certain traffic control devices must be kept by the person responsible for the works (e.g. the contractor or works manager).
These records must then be submitted to the works manager or other relevant personnel/workers in charge of the site.

- In accordance with organisational and Road Authority requirements, these records should include:
- The installation, alteration and removal of all regulatory signs and devices, including speed restriction signs.
- The hours of operation
- The surface condition of the road.
- Any significant departures from, or additions to, the signs and devices included in the relevant diagram(s).
- The details of any changes to the Traffic Management Plan or Traffic Guidance System made during the conduct of the works.

Records should also be kept of any traffic-related incident or accident that occurred during the works, and of any audit and surveillance activities undertaken. Any incidents involving workers or members of the public must be reported as required by your organisation and/or the relevant Road Authority.

4.4 Ensure incidents are recorded and reported as required

Incident reports may contain the following information:

- time, date and location of incident;
- type of incident (for example, a motorist fails to stop; accident; abusive/insulting/threatening language; assault; breach of these Approved Procedures by another person);
- incident identification, including:
  - vehicle type and colour
  - registration number including registered state or territory
  - direction of travel
  - description of driver/other road user and occupants
  - full and accurate description of the incident
  - witness details.

In an emergency situation, Traffic Controllers must:

- never leave their post (unless their own safety is threatened or a competent person takes over the job of traffic controlling)
- never risk their personal safety when trying to get a vehicle to stop
- secure traffic behind the incident to prevent additional collisions
- always warn co-workers, other Traffic Controllers and supervisor (if time permits) of the situation

5 Clean Up

5.1 Ensure work area is appropriately cleared

The work area should be cleared in accordance with the project environmental management plan. Good housekeeping to keep the work area clear is necessary to control hazards and risks on the worksite.

As part of your duties, you may be required to assist with packing up and clearing.

- Remember your manual handling practices
- Always consider the environment when cleaning up a site
- Dispose of rubbish correctly wet and dry waste
- If one of your duties is the clean and maintain signs
- Consider the environment when using cleaning chemicals

5.2 Ensure tools and equipment are cleaned, checked, maintained and stored

All tools and equipment should be cleaned, checked, maintained and stored in accordance with manufacturers' recommendations and standard work practices. If anything is defective, damaged or faulty it should be reported and tagged for repair or replacement. It is important to maintain tools and equipment properly to prolong their working life, and so they operate safely and effectively.

Ensure the items are stored correctly to protect them from the weather and from theft.

Additional Information

Log Books

For Traffic Controllers and those associated with traffic management, logbooks are a way of tracking your duties and may assist with achieving further qualifications, logbooks provide:

- Checklist for workers on a new site Risk Assessment for SWMS
- Record of worker hours on duty
- Portability of experience for the worker when travelling interstate

The completed logbook can be used as evidence of industry experience when attending training for other Traffic Control qualifications

Fatigue management

It is important that you manage fatigue effectively. You may be out in the elements for long periods, in differing conditions.

You will be required to be on your feet standing for long periods so:

- Carry water and food
- Wear comfortable footwear and appropriate clothing
- Always take breaks and adhere to task rotation

Rotation of Duties

An industry practice is to rotate assignments during the day.

This assists with:

- Fatigue management
- Dealing with the elements
- And it assists in ensuring that staff takes essential breaks

PCBUs need to ensure that the physical welfare and safety of staff is managed. Always check your SWMS and policy and procedures.

Manual Handling

At all times ensure that you follow appropriate manual handling practices and procedures when handling equipment and signage. Refer to your workplace WHS procedures and guidelines.

Consider warming up and stretching prior to conducting any activity on the worksite.

Summary

Working near traffic has been identified as high-risk construction work. In order to ensure the safety of yourself, workers, pedestrians and the motorists it is important that you:

- Be properly dressed
- Understand your authority
- Recognise the importance of correct procedures
- Be properly located
- Communicate effectively
- Assess changes in traffic patterns
- Know what to do in an emergency

It is only when all these requirements are followed that risks associated with the hazard of traffic controlling can be effectively controlled/managed

- How to communicate information about traffic flow to traffic controllers
- The correct order that signs and devices should be installed
- The standards for the correct positioning of signs and devices
- How to ensure that traffic is controlled to protect the work crew
- How to determine work schedules, maximum traffic delays, signals and methods of communication on site, and how to make sure that these are followed on site
- How to, if necessary, select traffic guidance schemes to suit particular site conditions
- How to ensure that workers are protected as they remove signs and devices
- The correct order and procedures for removing signs and devices
- How to correctly report site information at the end of a shift/end of the works
- How and when to report incidents and near-misses at the site
- Some strategies for making sure the site is cleared at the end of a shift or at the end of a works project
- The activities that you should conduct at the end of each shift to ensure that your tools and equipment are maintained