

Guide to Temporary Traffic Management Part 1

Introduction



Guide to Temporary Traffic Management Part 1: Introduction



Austroads

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Guide to Temporary Traffic Management Part 1: Introduction

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Abstract

Austrroads' Guide to Temporary Traffic Management (AGTTM) details contemporary temporary traffic management practice for application in Australia and New Zealand. It provides guidance for the planning, design and implementation of safe, economical and efficient temporary traffic management designs. This Guide recognises the level of variability of the road environments for which guidance is provided. The guidance provided in AGTTM is intended to encourage a consistent level of planning that supports the streamlined safe progress of work. It applies to all works on roads and near roads, in addition to off road development and other activities that interact with and impact on the road environment.

AGTTM has been developed based on best practice temporary traffic management practice in Australia and New Zealand, to assist road authorities to meet their existing legislative responsibilities for workplace and public safety.

Part 1 provides an introduction to the topic of Temporary Traffic Management and describes the structure to the 10 Parts of the AGTTM, the key principles of Temporary Traffic Management and the ongoing governances of the AGTTM and training by Austrroads. This part also contains a list of definitions of terms used in the AGTTM.

Keywords

Temporary traffic management, worksite traffic control, risk assessment, road safety

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Edition 1.1 contains an additional definition for "shuttle lane".

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Austrroads

About Austrroads

Austrroads is the peak organisation of Australasian road transport and traffic agencies.

Austrroads' purpose is to support our member organisations to deliver an improved Australasian road transport network. To succeed in this task, we undertake leading-edge road and transport research which underpins our input to policy development and published guidance on the design, construction and management of the road network and its associated infrastructure.

Austrroads provides a collective approach that delivers value for money, encourages shared knowledge and drives consistency for road users.

Austrroads is governed by a Board consisting of senior executive representatives from each of its eleven member organisations:

- Transport for NSW
- Department of Transport Victoria
- Queensland Department of Transport and Main Roads
- Main Roads Western Australia
- Department for Infrastructure and Transport South Australia
- Department of State Growth Tasmania
- Department of Infrastructure, Planning and Logistics Northern Territory
- Transport Canberra and City Services Directorate, Australian Capital Territory
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- Australian Local Government Association
- New Zealand Transport Agency.

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1. Scope of the Guide to Temporary Traffic Management

1.1 Status

The *Guide to Temporary Traffic Management (AGTTM)* is a set of comprehensive Austroads publications developed to provide a best practice reference for the development of safe, cost effective and efficient Temporary Traffic Management (TTM) solutions for Australia and New Zealand. Comprised of 10 parts, practitioners are advised to visit the Austroads website (<https://austroads.com.au>) to view the latest versions of the parts as well as other Guide series available.

1.2 Background of AGTTM

Why is safety at road worksites a significant issue?

Managing the risks associated with providing the optimal level of safety for employees and contractors working in or near traffic, combined with the need to provide a safe road environment for all road users is a significant issue for road agencies in Australia and New Zealand.

It is recognised that activities associated with TTM represent a high-risk works activity that requires a suitable level of response. These risks have been realised with serious incidents at road worksites across Australia and New Zealand having resulted in injuries and deaths of road workers, traffic management personnel and the public.

The Australian Commonwealth Work Health and Safety Act 2011 (2012) and the New Zealand Health and Safety at Work Act 2015 (2016) provide balanced and consistent frameworks to secure the health and safety of workers and workplaces. This then creates a number of policy responses that enable them to manage the risks associated with traffic control at road worksites:

- Legislation

Road agencies and industry have legislative responsibility under the Australian Commonwealth Work Health and Safety Act and the New Zealand Health and Safety at Work Act and jurisdictionally based legislation to eliminate a reasonably foreseeable risk, to the extent reasonably practicable.

As an employer and procurer of construction, operational and maintenance services, road agencies must provide a safe work environment for workers, contractors and the travelling public. Only where elimination of foreseeable risk is not reasonably practical is it acceptable to minimise the risk. Minimising the risk is generally the approach currently adopted by road agencies and industry in the provision of traffic control at road worksites.

- Regulation

Road agencies have a number of regulatory roles in the management of work health and safety risk related to traffic control at road worksites that include:

- training and certification
- access and road occupancy
- auditing.

- Road agency service delivery and roadwork activity planning requires:

- designing for worksite safety
- planning maintenance and construction activities for worksite safety
- informing customer journeys through the provision of proactive road work advice.

The following principles therefore must influence the delivery of work health and safety practices:

- The duty of care extends to all whom an agency may influence or affect by its business or undertaking.
- Risk management is the key to road agency safety performance.
- Road agencies and industry will consult, cooperate and coordinate to ensure all safety risks are managed while conducting their business.

Legislative requirements and codes of practice

The Australian Commonwealth Work Health and Safety Act and the New Zealand Health and Safety at Work Act provides the legislative framework that enables and supports traffic control at road worksites activities across jurisdictions. Commonly, Australian States and Territories rely on respective Roads Acts to provide a general framework and then policy referencing delegations, manuals and codes of practice for specific issues relating to approval, training and implementation. In Victoria, the Road Management Act (2004) goes further and provides a detailed structure for traffic control at worksites and identifies processes, such as risk management and auditing, that must be followed for works on all roads across the state.

Australian Standard AS 1742.3 *Manual of uniform traffic control devices Part 3: Traffic control* for works on roads, and the New Zealand Code of Practice for Temporary Traffic Management (NZ CoPTTM) specify the traffic control measures and devices to be used to warn, instruct and guide road users in the safe negotiation of worksites on roads including unsealed roads, footpaths, shared paths and bicycle paths adjacent to the roadway. They apply to traffic management for road and bridge construction and maintenance sites, works associated with other public utilities and services, or any other works which cause interference or obstruction to the normal use of a road by any road user. This includes works off the road, but which have an impact on the flow of any road or path user.

The previous edition of AS 1742.3¹, and the NZ CoPTTM (2018) also provide guidance for the planning, design, installation and operation of such traffic management together with requirements for maintaining a safe workplace for workers on site. The objective of these documents is to provide organisations carrying out works on roads with a set of uniform practices for the signing and delineation of construction and maintenance works which will promote the safety of both workers and road users at the worksite.

Training

In 2012, Austroads published *Traffic Control at Worksites – Training and Accreditation* (AP-R404-12) that developed a framework for a nationally (Australian) accredited traffic control at worksites training course. The framework included six functional areas of training with associated functional competencies that would meet the needs of all jurisdictions.

In 2013-14 Austroads developed mapping assessment materials for the nationally (Australian) accredited traffic control at worksites training courses with a goal to have these materials endorsed by jurisdictions and delivered by Registered Training Organisations nationally.

While these training materials have led to improvements in the competencies of TTM individuals, there remains inconsistencies in training for each of the TTM roles between jurisdictions. This requires individuals to often need to be retrained in each state where they are working for substantially the same role.

1 The guidance in AS 1742.3 (2009) relating to planning, design, installation and operation of such traffic management together with requirements for maintaining a safe workplace for workers on site has been omitted from the 2019 version of AS 1742.3 in recognition of its adoption within this AGTMM.

Access and road occupancy

Road agencies are the legislated authority to provide access to the road network. This authority provides road agencies and their delegates, with the ability to manage the operational network impact of providing access to the road network. Authorities (national, state and local government) provide access to the road network through the issue of Road Occupancy permits or similar arrangements that allow the proponent to use a specified road space at approved times, provided certain conditions are met.

Risk assessment and inspection

The operational process of risk management assessment for road worksites is another area of inconsistency across jurisdictions with practitioners typically referred to Risk Management Standards for guidance on adopting a risk management approach.

Inspections can apply at two distinct phases – the selection/design of a traffic management plan (TMP) or traffic guidance scheme (TGS) and after a plan is implemented, to ensure ongoing compliance and appropriate application.

Where inspections are referenced in manuals/codes, it generally applies to the implementation phase and not the selection/design of TMP/TGSs. Inspections should primarily relate to the implementation phase to ensure that on-ground implementation aligns with the approved plan and is appropriate for the site operations as works progress.

Road agency service delivery and roadwork activity planning

Through effective planning and design of infrastructure projects and maintenance effort, road agencies have the opportunity to optimise the safety of employees and contractors working in or near traffic.

WHS and HSW legislation and strategy emphasises that the greatest opportunity to eliminate risk throughout an asset or workplace lifecycle is at the planning and design phase. A Safety by Design approach is recommended, introducing hazard identification and risk assessment early in the design process to eliminate or minimise the risks of injury throughout the life of an asset. The Australian Federal Safety Commissioners (2008) Safety Principles and Guidance recognises the importance of safe design and encourages industry partners to commit to safety beyond complying with the legislation.

In 2015, the Austroads Board, representing the New Zealand Transport Agency, the Australian Government Department of Infrastructure, Regional Development and Cities, the eight Australian State and Territory road authorities and the Australian Local Government Association initiated a Strategic Priority Project focused on improving safety at road worksites. The key outcome of this project was a report on best practice for TTM in Australia / New Zealand and internationally (Austroads 2017).

An analysis of the various best practice options revealed that New Zealand had a structured national approach to TTM built on the NZ CoPTTM as the body of knowledge, a centrally controlled training system and an active audit program.

1.3 Safety at Road Worksites Project Framework

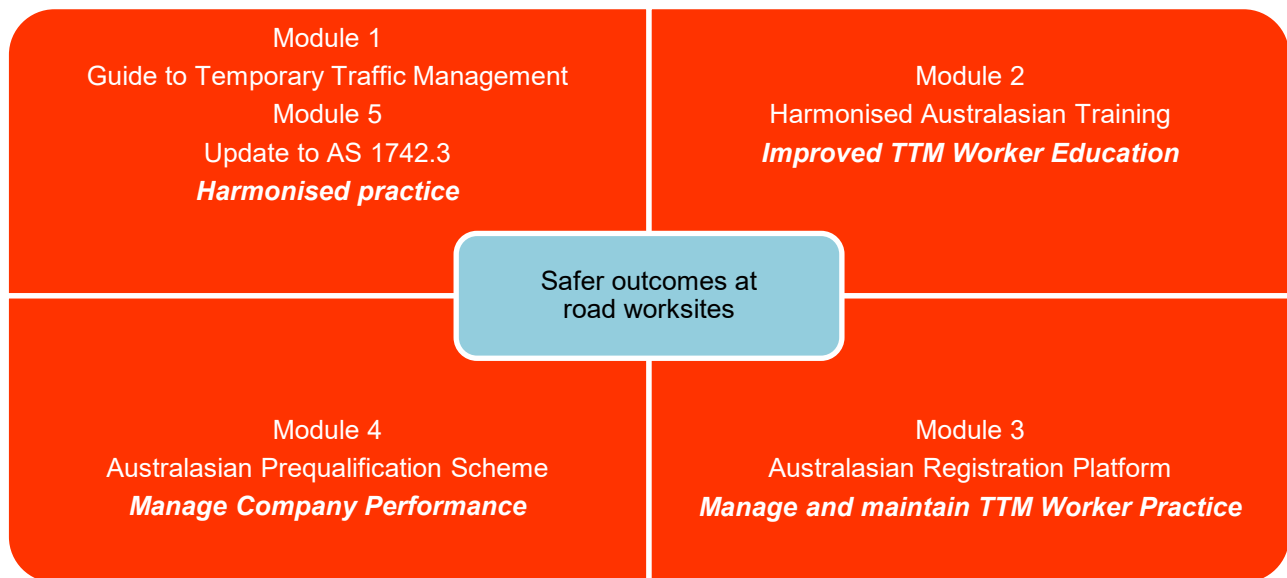
The purpose of the Austroads Safety at Road Worksites project was therefore structured to provide a comprehensive framework to support the ability of road agencies and industry to meet their WHS requirements and aimed to lead to improved safety outcomes at road worksites. The project identified and is delivering the following package of measures of which this Guide is just the first element:

1. **Module 1) Improving Harmonised Australasian Best Practice Guidance** – A new Austroads Guide to Temporary Traffic Management, providing comprehensive coverage of all matters relating to the planning, design and implementation processes associated with TTM on roads.

2. **Module 2) Improving Industry Practitioner Skills** – expansion to harmonised training material previously developed by Austroads. The new material and modules will be based on the adoption of practices similar to that already in place in New Zealand and partially adopted in some Australian States.
3. **Module 3) Improving transportability and management of Industry Practitioners** – Industry Registration - Project BN2019 is limited to investigation and exploration of suitable systems and preparation of a business case for future consideration of a registration scheme. The anticipated benefit of such a scheme would be improved portability of qualifications between jurisdictions and improved performance management of individuals working in the industry.
4. **Module 4) Improving Coordination and Management of Companies operating in Temporary Traffic Management – Company Prequalification** – Project BN2019 is limited to investigation and exploration of suitable systems and preparation of a business case for future consideration of a company prequalification scheme. The anticipated benefit of such a scheme will allow improved portability of company prequalification's between jurisdictions and allow improved performance management of companies working in the industry.

These Modules are as depicted in Figure 1.1 with the overall objective of improving safety at road worksites

Figure 1.1: Safety at road worksites framework



1.4 Purpose

The AGTTM seeks to capture the contemporary practice of member organisations in TTM. The purpose of the AGTTM is to provide guidance and supporting material that:

- supports the ability of road agencies and industry to meet their WHS requirements and lead to improved safety outcomes at road worksites
- improves the standard of TTM in Australia and New Zealand through consistency of application which assists road users to recognise and understand TTM, thereby improving their behaviour and safety
- aims to reduce the rate of incidents occurring at worksites
- improves the ability of road authorities and industry to manage the increasing frequency and variety of activities that are being undertaken on and near the road
- allows continuous industry review to maintain best practice.

This purpose is achieved through:

- providing direction for all matters relating to the planning, design and implementation of TTM
- facilitating improved adaptation to changes in technology and practices through being reactive to changes and being able to readily include new innovations
- providing guidance focused on the users of this Guide
- providing road agencies and industry with uniform practices whilst carrying out works on or near roads.

The benefits associated with uniform guidance broadly accepted by jurisdictions and industry include:

- guidance and training that appropriately develop designers with the skills necessary to develop and deliver safe traffic management at road worksites leading to better traffic management outcomes
- reduced impost and 'red tape' for industry working across jurisdictional borders
- improved workforce flexibility and ability of traffic management practitioners and trainers to be mobile across jurisdictional boundaries
- improved career path options for practitioners working in industry
- improved harmonisation of road worksites across jurisdictions providing improved consistency for road users, including vulnerable road users such as pedestrians and cyclists. This is targeted at improving road user behaviour, safety of road worksites and reducing impact on road congestion and the general community.

Although local conditions and circumstances may sometimes require unique or innovative approaches to TTM design, the bulk of works can be well accommodated by the approaches outlined in the AGTTM.

However, it is recognised that situations may arise where member organisations are required to develop and publish supplementary guidance. For legislative reasons, it is anticipated that jurisdictional documents will need to be maintained in order to call the AGTTM into practice within that jurisdiction.

The order of precedence of any other documents and the AGTTM will be determined by each jurisdiction.

1.5 Application

The AGTTM addresses TTM planning, design, installation and operational practice across all types of roads. It also recognises that the design of TTM should be based on the capabilities and behaviour of all road users, including pedestrians and cyclists, and on the performance and characteristics of vehicles. The different traffic mix and volumes, access requirements, functions and abutting developments that are typical of local roads create a different set of challenges that must be addressed in their own right.

The AGTTM is aimed at practitioners with responsibilities for the planning, design, installation, and operation of TTM and anyone working in traffic. The documentation is presented as a number of parts covering specific aspects of the entire process, with each part providing guidance underpinned by resource materials.

It is expected that, for the experienced engineer or practitioner, the AGTTM will provide the necessary key information to adequately undertake all aspects for TTM. Less experienced practitioners should note the required training competencies and qualifications required to undertake the various TTM roles and ensure that they are adequately qualified to undertake any role they are performing (refer to AGTTM Part 8).

2. Structure and Use of AGTTM

2.1 Structure of AGTTM

The AGTTM is a 10-part series published in coordination with Australian Standard AS 1742.3 and the New Zealand Code of Practice for Temporary Traffic Management (NZ CoPTTM). It will provide practitioners in all roles across the TTM industry with comprehensive guidance on all aspects for the planning, design, installation, operation and management of TTM sites. The AGTTM links closely with the Nationally Harmonised Training for TTM.

Within the Guide, the terminology that applies is detailed in Table 2.1

Table 2.1: Guide terminology

Guide	The description for the complete Austroads Guide for Temporary Traffic Management (AGTTM) including all 10 Parts.
Part	The description for the individual documents within the Guide. This document is Part 1 of the Austroads Guide to Temporary Traffic Management.
Section	The description for a numbered section within each Part of the Guide. This is Table 2.1 placed within Section 2.1 of Part 1 of the Austroads Guide to Temporary Traffic Management.

Within this Guide, reference is made to other parts of the Austroads range of publications such as the Guide to Road Design and the Guide to Traffic Management.

In the context of the other guides within the Austroads range of publications, this Guide is restricted to guidance relating to TTM practice and refers only briefly to issues more appropriately addressed in other Austroads Guides. It is recognised it is difficult, if not impossible, to discuss many aspects of TTM practice without reference to traffic management, road design and/or safety issues. The view is taken that within the AGTTM, any such advice should be brief and be supported by references to other Guides for the appropriate guidance as required.

The scope of the AGTTM is broad, addressing requirements and recommendations for protecting road workers and all road users, including vulnerable road users, from hazards, road traffic and other impacts of roadworks across a range of situations that may include:

- urban and rural environments
- motorways, major arterial roads, local roads, roads in built-up areas, roads in open road areas and unsealed roads
- all variations of road use by cars, heavy vehicles, public transport, motorcycles, cyclists and pedestrians
- day and night works
- changing road and weather conditions.

The structure of the AGTTM is described in Figure 2.1 and in Table 2.2.

Figure 2.1: Structure of the Austroads Guide to Temporary Traffic Management

Overview	Part 1: Introduction		
Planning	Part 2: Traffic Management Planning		
Design	Part 3: Static Worksites	Part 4: Mobile Works	Part 5: Short Term Low Impact Worksites
Field	Part 6: Field Staff – Implementation and Operation		Part 7: Traffic Controllers
Support	Part 8: Processes and Procedures	Part 9: Sample Layouts	Part 10: Supporting Guidance

Table 2.2: Austroads Guide to Temporary Traffic Management (detailed)

Part	Title	Content
Part 1	Introduction	<ul style="list-style-type: none"> • Introduction to the discipline of temporary traffic management practices • Breadth of the subject and the relationship between the Parts of the Guide • Legislative relationships • Links to related jurisdictional documentation • Definitions
Part 2	Traffic Management Planning	<ul style="list-style-type: none"> • Broad strategies and objectives to provide effective temporary traffic management to ensure the safety for all road users is maintained • Guidance on the safety of workers and other road users • Examples and key considerations for planning of temporary traffic management at road worksites • Process for planning and documenting temporary traffic management
Part 3	Static Worksites	<ul style="list-style-type: none"> • Guidance on the design of temporary traffic guidance schemes at static worksites • Process to decide what static worksite set up is appropriate to implement (including devices used)
Part 4	Mobile Works	<ul style="list-style-type: none"> • Guidance on the design of temporary traffic guidance schemes at mobile works • Process to decide what mobile works set up is appropriate to implement (including devices used)
Part 5	Short Term Low Impact Worksites	<ul style="list-style-type: none"> • Guidance on the design of temporary traffic guidance schemes at short term low impact worksites • Process to decide what short term low impact worksite set up is appropriate to implement (including devices used)
Part 6	Field Staff – Implementation and Operation	<ul style="list-style-type: none"> • On-site risk assessment • Installation and removal of temporary traffic management schemes • Operation and monitoring of temporary traffic management schemes • Record keeping
Part 7	Traffic Controllers	<ul style="list-style-type: none"> • Training competencies • Instructions on practices • Control devices that can be used
Part 8	Processes and Procedures	<ul style="list-style-type: none"> • Road network classification • Powers, roles and responsibilities • Training competencies • Forms and procedures • Model contract specification
Part 9	Sample Layouts	<ul style="list-style-type: none"> • Example layouts of static worksite conditions • Example layouts of mobile works conditions • Example layouts of short term, low impact conditions • Example layouts for staging plans • Worked example for a multi-stage project
Part 10	Supporting Guidance	<ul style="list-style-type: none"> • Risk management processes • Review, inspection and road safety audit of worksites • Events • Emergency works

2.2 Who Should Read Each Part of AGTTM?

The road controlling authority, who is responsible for roads within its jurisdiction, is defined as the Road Infrastructure Manager (RIM). The leadership roles identified by each RIM for TTM activities need to be understood by all persons involved in planning, designing, implementing, managing and completing TTM works. The different parts of the AGTTM forms a collective guide to achieve this objective. Table 2.3 summarises the knowledge requirements for each role for each of the AGTTM Parts.

Table 2.3: Level of knowledge of AGTTM required by each role in TTM

AGTTM Part	TTM Roles				
	Traffic management worker	Traffic controller	Traffic management implementer	Traffic management designer	RIM / project manager / contractor / TM company
Part 1	General knowledge	General knowledge	General knowledge	General knowledge	General knowledge
Part 2	General knowledge	General knowledge	Intermediate knowledge	Lead role	Supporting role
Part 3	General knowledge	Intermediate knowledge	Intermediate knowledge	Lead role	Supporting role
Part 4	General knowledge	General knowledge	Intermediate knowledge	Lead role	Supporting role
Part 5	Intermediate knowledge	Supporting role	Supporting role	Lead role	Supporting role
Part 6	Intermediate knowledge	Intermediate knowledge	Lead role	Supporting role	Supporting role
Part 7	General knowledge	Lead role	Supporting role	Supporting role	Supporting role
Part 8	General knowledge	General knowledge	Supporting role	Supporting role	Lead role
Part 9	General knowledge	General knowledge	Intermediate knowledge	Lead role	Supporting role
Part 10	General knowledge	General knowledge	Supporting role	Lead role	Supporting role

The descriptions for these roles in understanding the level of knowledge of the Parts of AGTTM as described in Table 2.3 are as follows;

Lead role: Practitioners require a comprehensive understanding of the content of the Part and will understand and apply all aspects regarding the application of the guidance.

Supporting role: Practitioners require a good understanding of the content of that Part and in their role will be required to interact regularly with those who have the lead role in application of the guidance.

Intermediate knowledge: Some aspects of the Part remain relevant to the role and practitioners are required to have an understanding of the content and its interaction with their role.

General knowledge: All practitioners should have at least a basic understanding of the content within all Parts of the Guide and how they interact with their role.

3. Definitions / Glossary of Terms

The following definitions are to be used in the context of this Guide. Further description of all definitions relating to traffic management can be found in Austroads (2015) Glossary of Terms.

Table 3.1: Definitions

85th percentile	The speed at or below which 85% of vehicles are observed to travel under free-flowing conditions past a nominated point.
AADT	<i>see annual average daily traffic</i>
AGTTM	Austroads Guide to Temporary Traffic Management
adjacent clearance area	The area immediately adjacent to the traffic lane, and typically between the traffic lane and the worksite that should be kept free from features that would be potentially hazardous to errant vehicles.
advance warning area	Area in advance of the worksite where advance warning traffic control devices are erected to warn and inform of changes to traffic conditions ahead and to give road users time to adjust their driving behaviour.
advance warning distance	Distance measured between successive signs in the advance warning area and the distance from the beginning of the taper or closure or work area to the first advance sign.
annual average daily traffic	The total volume of traffic passing a roadside observation point over the period of a calendar year, divided by the number of days in that year (365 or 366 days).
around the worksite	Methods of hazard elimination, when the entire work area (including all vehicles and plant) is located 6 m or more clear from the nearest edge of a traffic lane.
arterial road	A road that predominantly carries through traffic from one region to another, forming principal avenues of travel for traffic movements. Sub-definitions as follows: <ul style="list-style-type: none"> • Rural - A general term for the main road carrying mostly long-distance traffic, as distinct from local traffic. • Urban - A general term for a main traffic route, but specifically referring to certain streets so designated in a local authority's district scheme.
AS	Australian Standard
AS/NZS	Australian / New Zealand Standard
auxiliary lane	A portion of the roadway adjoining the through traffic lanes, used for speed change or for other purposes supplementary to through traffic movement.
B-double	A combination consisting of a prime mover towing two semitrailers, with the first semitrailer being attached directly to the prime mover by a fifth wheel coupling and the second semitrailer being mounted on the rear of the first semitrailer by a fifth wheel coupling on the first semitrailer.
B-triple	A prime mover towing three semitrailers. The first and second semitrailers are connected to the following semitrailer by a fifth wheel permanently located toward the rear of the semitrailer. Under the Heavy Vehicle National Law, a B-triple is categorised as a road train.
barricade	Barricades comprise either barrier boards or stand-alone non-interconnected lightweight modules. They must be used to inhibit access to a work area.
barrier board	Boards 150 mm to 200 mm in height and not more than 4 m in length. They are mounted on trestles or fixed posts at about 1 m above the pavement. The colour combination used for barrier boards must be alternate diagonal stripes of black and retroreflective yellow, terminating in yellow at each end.
barrier line	A pair of longitudinal lines marked on the roadway to prohibit overtaking movement in one or both directions.

buffer zone	An advance warning area if speed on the approach to a temporary speed zone is more than 30 km/h higher than the temporary speed limit and needs to be reduced in stages.
built-up area	In relation to a length of road, means an area in which either of the following is present for a distance of at least 500 metres, for the whole of the road: buildings, not over 100 metres apart on land next to the road and/or street lights not over 100 metres apart (see <i>urban road</i>) or, if the length of road is shorter than 500 metres.
centreline	The line which defines the axis or alignment of the centre of a road or other work. <ul style="list-style-type: none"> • In relation to any portion of a roadway not marked with a flush median –a dotted or solid line or lines of paint or raised studs (or any combination of those lines or studs) intended to separate opposing traffic. • In relation to any portion of a roadway marked with a flush median –the longitudinal white line that forms the left side of the median as viewed by a driver facing forward. • In relation to an unmarked roadway – the inferred line down the longitudinal centre of the roadway.
chicane	The lateral movement of traffic from one or more lanes onto another alignment before a shift back toward the original road alignment but not necessarily into the original lane or lanes. Typically applied to reduce the speed of traffic.
closure	The physical area from which the road users are to be excluded. This includes but is not limited to shoulder closures, lane closures and road closures.
competent person	A person who has, through a combination of training, qualification and experience, acquired knowledge and skills enabling that person to correctly perform a specified task.
containment fence	Physical barrier sufficient to provide separation between the travelled path, or paths used by cyclists and pedestrians, from the work area, but not as rigid as to become a hazard if struck by vehicles, or to act as a safety barrier.
contractor	A person, organisation or company responsible for implementation of an activity on or affecting a road. Examples include but are not limited to construction and maintenance crews, utility companies, surveyors, filming crews and event management.
contraflow	Traffic flow in a direction opposite to the normal flow, where two-way flow is maintained at all times. Contraflow divided by permanent rigid safety barriers or with median widths of 6 m or more use around the worksite methods. Contraflow divided by a double barrier line or with median widths of less than 6 m use past the worksite methods.
detour	A temporary, alternative route to guide road users around a worksite operation, most commonly during temporary closure of a road or path.
divided road	A road with separate roadways for traffic travelling in opposite directions.
dividing line	A road marking formed by a line, or two parallel lines, whether broken or continuous, designed to indicate the parts of the road to be used by vehicles travelling in opposite directions.
double barrier line	see <i>barrier line</i>
dynamic deflection	The largest transverse deflection of a road safety barrier system during an actual crash or during a full-scale impact test (i.e. the amount the road safety barrier deflects from its initial position during impact).
emergency services	An entity that has a statutory responsibility to respond to an emergency and includes the following: <ul style="list-style-type: none"> • an ambulance service • a fire brigade, including a volunteer fire brigade • a police force or police service • a disaster or emergency organisation of the Commonwealth or a State or Territory.
flare (road safety barrier)	The change in the offset of a road safety barrier to move it further from the travelled way or closer to the travelled way.

gore	A triangular area where two roads either meet or split.
hazard (roadside)	Any object or feature located between the edge of a traffic lane and the road reserve boundary, or within a median, that could cause significant personal injury (including fatal injury) to road users when impacted by an errant vehicle.
intersection	The place at which two or more roads meet or cross.
lane line	A line (usually painted), other than the centreline, that divides adjacent traffic lanes travelling in the same direction. This line is usually painted but may be raised delineating devices.
long term	The description which applies when a traffic guidance scheme is required to operate both day and night and may be left unattended.
may	Indicates the existence of an option
median	A strip of road, not normally intended for use by traffic, which separates carriageways for traffic in opposite directions. Usually formed by painted lines, kerbed and paved areas, grassed areas, etc.
mobile work	Work that entails vehicles moving progressively along the roadway at speeds significantly lower than other traffic, with all traffic control devices being either vehicle mounted or regularly moved along the road.
motorway	A divided highway, freeway, expressway, controlled access highway etc. for through traffic with no access for traffic between interchanges and with grade separation at some interchanges. Certain activities or uses may be restricted or prohibited by legislative provision.
multilane	Two or more running lanes in one direction.
must	Indicates that a statement is mandatory
off-peak period	The periods that have low demand volumes of traffic during the day (see <i>peak period</i>).
offset speed zone	Temporary speed zones which result in speed limits which are different for each direction of travel at a particular location.
open road area	Roadside development less frequent than that specified for a built-up area (see <i>built-up area</i>).
past the worksite	Methods of hazard control, when the entire work area (including all vehicles and plant) is located within 6 m from the nearest edge of a traffic lane.
peak period	The period that has the highest demand volume of traffic and/or number of passengers during the day (peak hour, peak half hour, etc.) (see <i>off-peak period</i>).
permanent speed limit	The maximum legal speed limit for a specific section of road indicated by permanent speed limit signs. These signs are in place 24 hours a day, seven days a week and have been implemented after a speed limit review has been carried out.
portable traffic control device	An approved portable device used to control traffic to enhance the safety and protection of road users and road workers at the worksite, specifically an option to improve safety for traffic controllers. Portable traffic controller devices may include PTSS or boom barriers.
portable traffic signal systems	An approved portable traffic signal device allowing traffic controllers to perform their roles at a safe distance from traffic in high risk environments.
primary sign	The first sign closest to the worksite, work area or hazard. This sign is followed by repeater signs placed further from the worksite, work area or hazard.
PTCD	see <i>portable traffic control device</i>
PTSS	see <i>portable traffic signal systems</i>
road reserve	An area of land between the legal road boundaries, usually a fence line to fence line. This typically includes the roadway, footpaths, other access ways and unpaved areas, which are dedicated to allow the passage of road users. The road reserve also includes an airspace of six metre directly above the road surface.

road safety barrier system	A physical barrier separating the work area and the travelled path, designed to resist penetration by an errant vehicle and as far as reasonably practicable, to redirect errant vehicles back into the travelled path.
road train	A combination, other than a B-double, consisting of a motor vehicle towing at least two trailers, excluding any converter dolly supporting a semitrailer.
road user	Any driver, rider, passenger or pedestrian using the road.
roadway	Any one part of the width of a road devoted particularly to the use of vehicles, inclusive of shoulders and auxiliary lanes.
running lane	The portion of the roadway allotted for the use of a single line of vehicles. Cyclists operating in these lanes are considered vehicles.
rural road	A general term for the road carrying mostly long-distance traffic, as distinct from local traffic and located in open road areas.
safety buffer	The unoccupied space between the additional warning area and work area which allows for an errant vehicle to pull up before reaching the work area.
safe work method statement	A document which identifies the type of work being undertaken, the risks, the hazards and controls to be implemented to eliminate the risk.
short term (traffic control)	Description that applies when a traffic guidance scheme is required only while work personnel are in attendance, and is generally limited to the duration of a single work shift.
should	Indicates a recommendation
shoulder	A sealed or unsealed part of the road outside the edge line, or inferred edge line, which is trafficable, adjacent to the traffic lane and flush with the surface of the pavement.
shuttle flow	Where a portion of the roadway is closed so that a single lane is used alternately by traffic from opposite directions. It is one-way flow with one direction first, then the other. This is used where insufficient width is available for maintaining two-way flow at all times.
shuttle lane	The lane that is open to traffic in a shuttle flow temporary traffic management arrangement
sight distance	The distance, measured along the road over which visibility occurs between a driver or rider and an object or between two drivers at specific heights above the roadway in their lane of travel.
speed	Distance travelled per unit of time (km per hour).
speed of traffic (traffic speed)	The posted speed limit at a location when being adhered to by the majority of road users (see <i>85th percentile</i>). This can be checked by travelling in the stream of vehicles and comparing to the posted speed limit. If the speed of the majority of vehicles are travelling significantly slower or faster than the posted speed limit (± 10 km/h), apply this speed limit when making any decisions regarding design.
static works	All works which are greater in scope and duration than can be handled by short term, low impact methods or mobile works and are contained within a fixed area.
swept path	The area bounded by lines traced by the extremities of the bodywork of a vehicle while turning.
SWMS	see <i>safe work method statement</i>
taper	A straight or smoothly curved row of delineation devices used to shift traffic laterally, e.g. from a lane to the shoulder.
temporary speed limit	A speed limit that is applied on some sections of road as a result of roadworks, school zones or other variable speed limits which are in place to suit driving and travel conditions. These are not permanent speed limits.
termination area	Where road users have passed the work area and normal traffic conditions resume.
TGS	see <i>traffic guidance schemes</i>
through the worksite	Methods of hazard separation by stopping all road user's movement for short periods when workers need to occupy the roadway.

TMA	see <i>truck mounted attenuator</i>
TMP	see <i>traffic management plan</i>
traffic	All vehicles or persons travelling on a road unless the context indicates otherwise.
traffic controller	A competent person whose duty it is to control traffic at a worksite.
traffic control device	Any traffic sign, road marking, traffic signal, or other device, placed or erected under public authority for the purpose of regulating, directing, warning or guiding traffic.
traffic guidance schemes	An arrangement of temporary traffic control devices to warn traffic and guide it around, through or past a worksite or temporary hazard.
traffic management plan	A document describing all essential traffic management matters associated with roadworks or works on roads. This includes risk assessment, traffic demand and accommodation, traffic routing and control and provision for vulnerable road users and special vehicles such as buses, trams or over-dimensional vehicles.
traffic speed	see <i>speed of traffic</i>
travelled path	That part of the roadway which is made available to vehicles and which may consist of one of more running lanes.
truck mounted attenuator	A safety device designed to reduce the severity of collision that should be 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 running lanes allotted for use by traffic in opposing directions.
undivided road	A road without a median (see <i>divided road</i>).
unsealed road	A road that does not have a hard or smooth surface. Unsealed road surfaces include gravel, sand or dirt.
variable message sign	Variable message signs can be changed to display information messages to alert drivers of on-road incidents on the road ahead. They are also used to warn road users about weather conditions and other important information.
vehicles per day	The number of vehicles observed passing a point in both directions on a road for 24 hours.
vehicles per hour	The number of vehicles observed passing a point in both directions on a road for one hour.
VMS	see <i>variable message sign</i>
vpd	see <i>vehicles per day</i>
vph	see <i>vehicles per hour</i>
vulnerable road user	Pedestrians, cyclists, motorcyclists.
work area	Area where maintenance or construction work is being done.
worksite	An area which includes the work area(s) and any additional length of road required for advance signing, tapers, sidetracks or other areas needed for associated purposes.

4. Purpose of TTM

The purpose of TTM is the creation of a safe work area to facilitate construction, maintenance and other activities which occur on or near a road.

TTM is most commonly achieved through use of traffic control devices which include signs, traffic signals, pavement markings, traffic islands, or other devices installed with the approval of a road agency having the necessary jurisdiction to regulate and guide traffic.

The function of a traffic control device is to:

- regulate traffic (i.e. to assign priority and to indicate regulations in force)
- warn and inform motorists of hazards or regulatory controls ahead. They may also warn of temporary hazards that could endanger motorists or workers and plant engaged in work on the road
- guide traffic (e.g. via pavement markings to channel motorists into the correct lane, via signs to indicate the direction and/or distance to destinations, and via route markers to identify a travel route).

A traffic control device fulfils its function by:

- commanding the attention of drivers through the use of standard shapes, colours, sizes, and retroreflective properties, if applicable
- making its meaning clear at a glance through the use of standard shapes, colours, symbols and layouts
- allowing adequate response times through suitable sizing of the device and associated symbols and legends
- commanding respect through appropriate use and installation (e.g. a 60 km/h speed limit should not be used where a 80km/h limit is appropriate) and being maintained in good repair.

Communication devices in the context of traffic control are those that convey information or guidance to road users for the purposes of traffic management. In addition to the basic devices of signs, signals, markings and delineators, communications which may be considered under this definition include those by radio and telephone, and digital transmissions via mobile phone, Internet and global positioning technologies. The criteria for inclusion in this Guide are either:

- the device or transmission is visible or audible to road users while they are actively involved in traffic
- the information conveyed is directly related to the management of traffic for efficiency and safety.

5. Philosophy and Principles

5.1 Philosophy

The planning and design of TTM is targeted at:

- ensuring so far as is reasonably practicable the safety of:
 - workers
 - the travelling public.
- creating efficient TTM that is suitable for the nature and duration of the work including the risks associated with set-up, operation and removal
- maintaining the customer experience:
 - encouraging compliance with TTM
 - minimising disruption and frustration for traffic.

5.2 Principles

The AGTTM processes and documentation for TTM is based on a set of fundamental principles:

- Signs and devices must be:
 - installed by a competent person
 - appropriate to the conditions at the worksite and must be used in accordance with AGTTM unless risk assessment by a competent person indicates that an alternative arrangement is satisfactory
 - erected and displayed before work commences at a worksite
 - regularly checked and maintained in a satisfactory condition
 - removed from a worksite as soon as practicable, however appropriate devices should remain in place until all work has been completed.
- Competent, trained and experienced traffic management personnel must undertake all aspects of the traffic management planning, design, implementation and operation.
- Records must be kept of all elements of the TTM.
- Where works require the relocation of regulatory traffic control items, they must be relocated or reinstalled promptly in positions where they are visible and can perform their regulatory function.

Other principles are described in further detail as follows.

5.2.1 Uniformity

Uniformity means treating similar TTM situations in the same way. The standard use of temporary traffic control devices helps drivers assess an unfamiliar situation. The uniform design and application of TTM reduces the time a motorist needs to recognise and understand the message and to choose an appropriate course of action. Ideally, the meaning of the message or symbol should be immediately apparent to drivers so that their attention will be distracted for as little time as possible from other necessary decision-making.

Uniformity is essential to law enforcement and for traffic safety. Non-uniformity causes disrespect for the law and can often create potentially dangerous traffic situations.

The use of standard TTM does not in itself constitute uniformity. To use a standard traffic control device contrary to the intended application is equally as wrong as using a non-standard device where a standard device is applicable. Inappropriate use of TTM signs and devices, including the use of non-standard devices, can lead to disrespect and lack of observance by road users. Incorrect placement of standard devices (e.g. too close to hazards or other traffic control devices or too remote to be effective) can lead to the devices being missed or ignored.

For example, the inappropriate use of low speed limits can lead to drivers not believing that the speed limit is really required and therefore does not need to be complied with. Research undertaken for Queensland Transport and Main Roads by MCR (2015) revealed that a large proportion of drivers believed that roadwork speed limits were advisory only and did not need to be complied with. Seventy percent of drivers admitted to having sped through roadworks which compares unfavourably with the much better compliance to permanent speed limits.

Areas of desirable uniformity include:

- Design: Uniformity in design includes the selection of the appropriate TTM signs and devices.
- Application: It is essential that devices are located in a uniform fashion to allow road users to react at different locations in a timely and similar manner to the same device or group of devices. To use a device in a manner inconsistent with its use elsewhere is confusing and creates a potentially hazardous situation.
- Location: Uniform location helps drivers to notice the device and interpret the situation appropriately.

5.2.2 Fit for purpose

TTM must be fit for purpose, suitable for the nature and duration of the work, installed, set up and used correctly.

Within this AGTTM, there are many options that may apply for a particular work task. For example, minor pavement patching may require a static worksite in many busier locations while on a remote road with little traffic, working in gaps in traffic may be more appropriate. Even for short term activities, there may be a tendency to implement what is seen to be the safest form of TTM with a static worksite to fully protect workers. However, in some cases, the risks created by exposing TTM staff to traffic while setting up, operating and removing the signs and devices, may be greater than the risk of using a lower level of protection in a controlled manner.

Conversely, using gaps in traffic may be completely inappropriate on higher volume roads despite a task being relatively short in duration.

The length, width and duration of TTM should be restricted to the minimum necessary for the safe operation of the works.

The cumulative impacts of multiple worksites need to be considered. While a particular TTM plan may be appropriate in isolation, it can be rendered less effective when it is located in proximity to other roadworks sites. Issues that should be considered include:

- driver awareness of a new worksite if they have just exited a previous worksite with signs for “End Roadworks”
- the cumulative delay / frustration that drivers may experience when travelling through a long sequence of worksites in close proximity.

5.2.3 Design principles for traffic management devices

The following principles provide for the proper and efficient use of TTM devices:

- External pressures for installation of a particular device should not absolve designer from determining and recommending a more effective solution to a problem.
- TTM signs and devices can seldom be used to solve problems caused by poor and confusing temporary road geometry.
- All devices should be properly maintained and replaced when worn out, particularly retro-reflective devices.
- Devices should be installed according to the jurisdiction guides and AGTTM. However, a device should not necessarily be installed simply because a guide or warrant is met.
- Excessive use of signs should be avoided as this can cause visual clutter, and driver confusion or information overload. The following questions should always be asked:
 - Are certain signs really needed?
 - Do they serve any practical function?
 - Can they be read and acted upon by a driver?
 - Can an excessive number of signs be replaced by a smaller number of larger signs that are more rationally designed and located?
 - Is a particular type of sign being used so often for purposes of lesser importance that its value in solving more serious problems is degraded?
- Signs need to be of an adequate size and properly located so that drivers can read and act the message.
- Signs and devices should provide for adequate advance warning of hazards or decision points, not forgetting that the hazard or decision point itself needs to be adequately delineated.
- Complexity in the design of word messages and symbols should be avoided. New symbols that have not been tested in accordance with Australian / New Zealand standards should not be used. Symbols should not have excessive detail, as this will often operate against their effectiveness.
- The limitations on a driver's ability to see and/or read messages conveyed by pavement markings under certain geometric road conditions (e.g. around curves, on crest vertical curves) should be recognised.
- Total reliance on pavement markings to guide or control drivers at locations of special hazard should be avoided (e.g. hazard markers may also be required to delineate an obstruction or road narrowing).
- Structures supporting signs should not be potential roadside hazards in themselves. Frangible supports should be provided, or the structure shielded using an approved safety barrier.

5.2.4 The Safe System

The Safe System is an approach to road safety that is the basis of strategies and action plans to reduce road trauma in Australia and New Zealand. Ultimately, the aim is to eliminate deaths and serious injuries resulting from crashes on the road network.

The Safe System approach is based on the following principles:

- People make mistakes – some crashes are unavoidable despite a focus on preventative measures.
- Our bodies are vulnerable – there are limits to the amount of force our bodies can tolerate before we are injured. In a Safe System, when a crash occurs the forces are managed so that they do not lead to death or serious injury.
- Road safety is a shared responsibility – this includes those involved in the planning, design and management of the road system, in addition to all road users.

As the name suggests, the Safe System is a systems approach which recognises that the components are interrelated and must work together to achieve the desired goals. The four elements or pillars of a Safe System are:

- **Safe roads and roadsides:** Roads and TTM should be designed, operated and maintained so that they are predictable, self-explaining and encourage safe travel speeds. When a crash occurs, they should be forgiving to ensure that the likelihood of death or serious injury to road users or workers is minimised.
- **Safe speeds:** Operating speeds should be managed so that crash likelihood is low and, in the event of a crash, the impact forces are within human tolerances.
- **Safe vehicles:** Vehicles should incorporate design features and technology that minimise the likelihood of crashes and protect road users (including pedestrians and cyclists) when crashes do occur. In the past, this technology has generally focused on minimising injury to vehicle occupants (seat belts, air bags, etc) but in the future is likely to encompass more driver assistance features that help to prevent crashes from occurring.
- **Safe road users:** All users should be alert, comply with road rules and engage in safe behaviour. They are supported through education, information, enforcement of road rules, training and licensing.

TTM is an essential element of a safe road environment. It creates a system for the regulation of traffic (including pedestrian and bicycle traffic) and warning, informing and guiding road users. It also plays a significant role in promoting safe speeds through physical measures (e.g. raised pavements, including speed humps), speed limit signage and advisory speed signs.

All TTM has a critical role in relation to road user behaviour and the safety of road users. To this end, it is essential that the design and use of TTM takes into consideration road user factors to ensure that road users are able to correctly interpret the information that is being presented and respond in an appropriate and timely manner.

5.2.5 Designing for the driver

When designing, implementing and inspecting TTM, it is critical that the traffic management practitioners consider the needs and perspectives of the public, not the perspective of an experienced traffic management operator. In particular, it needs to be recognised that problems with public awareness or understanding of the TTM at a worksite can occur because:

- road users do not understand the devices, particularly newer devices
- drivers do not appreciate the dangers to workers and other road users if traffic control devices are not given adequate respect, attention and appropriate response
- drivers lose respect for signs which are used incorrectly or unnecessarily
- drivers can be confused by the number of signs and devices
- drivers can be distracted by other things (e.g. navigation systems, radio, mobile phones) or other vehicle occupants
- drivers can be fatigued.

When designing, implementing and inspecting TTM, it is therefore recommended that the traffic management practitioner attempts to consider the effectiveness of the layout to a learner driver, to an overseas traveller or to an elderly person. Consideration should also be given to how various road users will respond to changed traffic conditions at night, in lower visibility or adverse weather conditions.

The road design and traffic management needs of older drivers using Australian roads have been the subject of research (Fildes et al. 2001). As people age, they experience decreasing physical and mental capabilities and become more susceptible to injury and shock. Human functions subject to deterioration due to ageing include:

- visual acuity
- attention capacity
- reaction time
- contrast sensitivity
- lack of head/neck mobility.

In relation to traffic management, people with disabilities must have equitable access to all transport services and therefore be considered in the development of all transport and traffic management proposals and treatments. Guidance devices serve to warn people with limited or no sight, and those with other disabilities, of obstacles, and to direct their movements accordingly through various audible, visual and physical cues.

Information relating to the design of facilities for persons with a disability is contained in the Austroads Guide to Road Design and the Guide to Traffic Management.

5.2.6 Working in accordance with an approved TMP and TGS

All on-road activities must be carried out in accordance with approvals from the relevant employer, contractor or road infrastructure manager.

TTM generally requires proponents to provide a Traffic Management Plan (TMP) that integrates an activity into the operation of the road network. The plan assesses an activity's impact on traffic flow and describes the activities being proposed, their impact on the general area (including public transport passengers, cyclists, pedestrians, motorists and commercial operations), and how these impacts are being addressed.

A Traffic Guidance Scheme (TGS) is a document that shows how traffic, pedestrians and vulnerable road users are to be separated from a worksite or work route. It is intended as an instruction from the Traffic management designer and the Principal contractor to the traffic management workers and is usually in the form of a diagram showing the road conditions (lanes, pedestrian routes, signs etc.) and how all road users are to be managed around the site /activities (temporary signs, posting of traffic control staff, etc.). A TGS is a work health and safety requirement of a worksite (i.e. should be held on site) and should comply with this AGTTM to comply with the relevant acts and codes of practice.

5.2.7 Road categories and training

A road categorisation system has been adopted in this AGTTM. While all works on roads are considered high risk, the categorisation into three categories allows design practices and training to be tailored to the different risk levels at each category.

Further details on the road categories and the associated training is contained in AGTTM Part 8.

6. Governance

6.1 General

Practices in TTM continue to evolve rapidly. Innovations are being developed and presented regularly, with new devices and equipment providing improved levels of safety for traffic management and construction workers as well as the public. New practices for the planning, design, and implementation of traffic management at road worksites are also developed as devices and technology evolve.

To remain relevant in this environment, the Austroads Guide to Temporary Traffic Management is maintained as a live document. The parts of the Guide, and the associated training materials, are subject to ongoing reviews and updates as practices, devices and management methods evolve and new innovations are introduced into the industry. The implications of each update will be assessed prior to publication including the impacts on Austroads members, industry, training materials, and registration/prequalification requirements so that an implementation strategy and impact assessment is developed.

6.2 Guide consultation

The annual consultation process allows any person within the industry to make submissions at any time. Submissions for a correction or change are to be made using the processes detailed in Appendix A.

Austroads member authorities are encouraged to maintain a jurisdictional based consultation processes to assist in the consideration, filtering and resolution of recommendations prior to submission to Austroads.

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Appendix A AGTTM Feedback Forms

A.1 Introduction

The Austroads Guide to Temporary Traffic Management have been thoroughly reviewed by lead bodies for contractors, consultants and road controlling authorities. Readers wishing to propose any further changes should use the attached forms.

Proposed changes fall into the following categories which will determine the process to be followed in actioning any change:

- Minor Editorial – corrections of fact which include formatting, spelling, grammar and other typographical errors.
- Minor Technical – corrections of a technical nature which are minor in nature and impact, or technical clarifications which do not propose a change in guidance or processes.
- Significant Change – where the reader proposes a variation in guidance or processes. These will be considered in batches and where appropriate, included in the next update of the AGTTM.

A.2 Submission Process

Readers can submit feedback by using the Word version of the feedback form which should be forwarded by email to austroads@austrroads.com.au. Forms are to be submitted by email in a Microsoft Word format to allow ready transfer into Austroads feedback system.

A.3 Feedback on Submissions

Each submitter receives an initial notification confirming receipt of the submission. Each submission is reviewed by the Temporary Traffic Management Technical Reference Group (TTMTRG) which includes representation from all Austroads members. The TTMTRG will decide on the action(s) to be taken, e.g. amend AGTTM, undertake further consultation/research, or no further action. The list of submissions and decisions are placed online under the AGTTM page of the Austroads website. Contact details are removed from submissions prior to being posted to the website.

A.4 Minor Editorial and Minor Technical Correction Form

Use this minor correction form if:

- you see a spelling, grammar or typographical error, or
- a minor correction of fact (eg 50 metres when it should be 30 metres), or
- a clarification which does not propose a change in guidance or processes.

Name & business	Click or tap here to enter your name and business name.		Email & phone number	Click or tap here to enter email and phone.
AGTTM reference	Error	Correction		Austrroads Decision
Part: Section: Page number:				
Part: Section: Page number:				
Part: Section: Page number:				

A.5 Significant Change Form

Use this significant change form if you wish to propose a change from the current standards or processes eg a change in sight distance at a given approach speed. Please note, on this form, you need to provide your justification for the change plus the proposed wording.

Name & business	Click or tap here to enter your name and business name.	Email & phone number	Click or tap here to enter email and phone.
AGTTM reference	Justification for guidance change	Proposed wording	Austrroads Decision
Part: Section: Page number:			
Part: Section: Page number:			
Part: Section: Page number:			

Austrroads' Guide to Temporary Traffic Management (AGTTM) details contemporary temporary traffic management practice for application in Australia and New Zealand. It provides guidance for the planning, design and implementation of safe, economical and efficient temporary traffic management designs.

Guide to Temporary Traffic Management Part 1: Introduction provides an introduction to the topic of Temporary Traffic Management and describes the structure to the 10 Parts of the AGTTM, the key principles of Temporary Traffic Management and the ongoing governances of the AGTTM and training by Austrroads.

Guide to Temporary Traffic Management Part 1



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