

8.1 Traffic Controllers

8.1.1 General (AS 4.10.2)

(a) Equipment

Traffic controllers shall wear approved high visibility clothing and shall control traffic using a **STOP/SLOW** bat (**AS 3.5.2 (c)**) or the **STOP** sign mounted on a boom. The traffic controller (symbolic) (T1-34 or T1-200-2/3 on RTA works) sign shall be used to give advance warning of the presence of a traffic controller and the **PREPARE TO STOP** (T1-18) sign shall be used if traffic may be required to stop at the traffic controller location. Traffic controllers are responsible for setting up and removing or covering these two signs and relieving traffic controllers are to check to ensure that the signs are installed correctly.

(b) Training

Traffic Controllers shall be appropriately trained in their duties and certified as competent. The minimum requirement is to have satisfactorily completed RTA's training course – *Traffic Controllers*.

(c) Authorisation

RTA Traffic Controllers, or Traffic Controllers working for RTA contractors, shall wear approved yellow high visibility safety clothing displaying either the RTA logo or the letters "RTA" and the words "Authorised Traffic Controller". Local Government Traffic Controllers or Traffic Controllers working for Local Government contractors shall wear high visibility clothing meeting the requirements of AS4602, displaying the logo or name of the Local Government organisation and the words "Authorised Traffic Controller".

(d) Approach speed (AS 4.10.4)

Where Traffic Controllers are used, approach speeds of traffic shall be restricted to 60 km/h or less through the use of appropriate devices and signs including, as necessary, a roadwork speed limit.

(e) Visibility (AS 4.10.3)

Traffic Controllers shall **not** be located in positions where the sight distance between them and oncoming traffic is less than 1.5D.

(f) Positioning

A Traffic Controller's normal duty is to remain at the head of the traffic queue while traffic is stopped. If there is a possibility of vehicles colliding with the end of the queue because of restricted sight distance, or of drivers queue jumping because they cannot see the Traffic Controller at the head of the queue, then an additional Traffic Controller and/or additional

warning signs shall be placed at the end of the queue or other appropriate location. (See Section 3.5.7, *Avoiding end of queue collisions*.)

(g) Communication

Where Traffic Controllers cannot see or hear each other, additional Traffic Controllers, placed within sight of the original Traffic Controllers, or portable two-way radios shall be used for communication between them. Additional radios in the middle of the work or with the site workers may be useful to ensure that the control is suitable for the work situation.

(h) Period of duty (AS 4.10.5)

Traffic Controllers shall be relieved after two hours work and may be either rested or placed on other duties for a period of at least 15 minutes before being returned to traffic control duties.

8.1.2 Where are Traffic Controllers required

Traffic Controllers are required on both short- and long-term work where traffic needs to be periodically stopped in approach to the work site.

Traffic Controllers may also be necessary in some circumstances on mobile work on single carriageway roads (2 lane/2 way and 3 lane/2 way), particularly for mobile work with a slow rate of progression along the road. Refer to Standard TCP 71

A Traffic Controller can control traffic in only one lane and, usually (see Section 8.1.3, *How many traffic controllers*) in only one direction at a time. When manual traffic control is required on multi-lane carriageways, a merge or merges shall be introduced upstream of the Traffic Controller so that the Traffic Controller is managing one lane.

8.1.3 How many traffic controllers

For manual traffic control using **STOP/SLOW** signs with traffic flow in opposite directions, either one Traffic Controller shall assess gaps in oncoming traffic or two Traffic Controllers are required – one on each approach to the work area.

Suitable gaps are likely to be too infrequent where the ADT exceeds 1,500 vehicles per day. To assess gaps in oncoming traffic, a Traffic Controller shall be able to see at least 300 m (400 m where pre-existing approach speeds exceed 100 km/h) or, for long work areas, 250 m (350 m where pre-existing approach speeds exceed 100 km/h) plus the length of the work area. This is illustrated in Figure 8.1. **Traffic speeds shall be reduced to comply with the clearance to workers requirements of Section 3.6, *Safe clearances between workers and through traffic at static work sites.***

Clear sight distance for a Traffic Controller may be restricted by road curvature, crests, roadside vegetation, road plant etc. Sight distance may also be restricted by conditions such as fog, rain, or mirages in hot weather on even grades.

For work at night see Sections 8.1.5, *Night work* and 9.2, *Working at night*.

A Traffic Controller shall also be required on the other approach if:-

- the Traffic Controller shown in Figure 8.1 cannot see clearly the minimum distance shown to oncoming traffic, or
- length of work area L (Figure 8.1 and Table 8.1) is greater than 250 m, or
- ADT exceeds 1,500 vehicles per day.

2 lane/2 way roads

One Traffic Controller is required where it is necessary to periodically stop traffic in one direction provided traffic in the opposing direction is not affected. **Traffic speeds shall be reduced to comply with the clearance to workers requirements of Section 3.6, *Safe clearances between workers and through traffic at static work sites*.**

Where the work closes or restricts one travel lane, and both directions of traffic use the other travel lane which remains unobstructed:

- No Traffic Controllers are required where:
 - ◆ ADT is less than 100 vehicles per day, and
 - ◆ each entry to the work site is visible from the other end, and
 - ◆ the work area is shorter than 100 m.
- One Traffic Controller is required where:
 - ◆ ADT is 1,500 vehicles or less, and
 - ◆ sight distance from the Traffic Controller exceeds the minimum in Table 8.1.

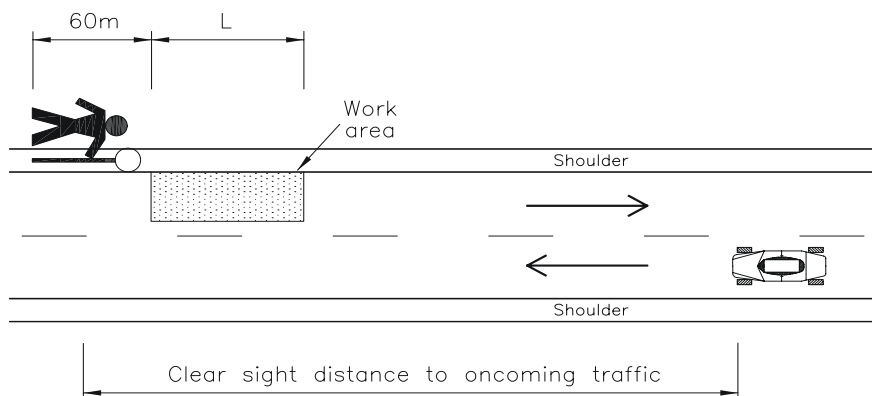


Figure 8.1 Traffic Controller minimum sight distance

Approach Speed (prior to 60 km/h zone)	Length of Work Area (L)	Minimum clear sight distance to oncoming traffic
Up to 100 km/h	Less than 60 m	300 m
	60 m to 250 m	L + 250 m
More than 100 km/h	Less than 60 m	400 m
	60 m to 250 m	L + 350 m

Table 8.1 Traffic Controller minimum sight distance

- Two Traffic Controllers are required where:
 - ◆ ADT is greater than 1,500 vehicles per day, or
 - ◆ the work area is longer than 250 m, or
 - ◆ sight distance from the Traffic Controller in the obstructed lane to the other approach is less than the minimum in Table 8.1.

3 lane/2 way roads

Where the work closes or restricts one of the lanes in the direction with two lanes, a choice is available depending on the circumstances of the site and the work. Either all traffic in that direction can be channelled to the unaffected lane or both lanes can be closed. See TCP 80.

Where the work closes or restricts both lanes in the direction with two lanes, so that both directions of traffic use the single lane, the requirements are the same as for a 2 lane/2 way road. See TCP 90.

Where traffic is stopped intermittently in the single lane and allowed to proceed in the same lane, and the opposing 2 lane flow is not affected, one Traffic Controller is required. See TCP 71.

Where the work closes or restricts the single travel lane, and the centre lane remains unobstructed and available to both directions of traffic, the requirements are:

- One Traffic Controller is required where:
 - ◆ ADT is less than 1,500 vehicles per day, and
 - ◆ sight distance from the Traffic Controller exceeds the minimum in Table 8.1.

- Two Traffic Controllers are required and the slow lane closed where:
 - ◆ ADT is greater than 1,500 vehicles per day, or
 - ◆ the work area is longer than 250 m, or
 - ◆ sight distance from the Traffic Controller in the obstructed lane to the other approach is less than the minimum in Table 8.1.

This arrangement is shown in TCP 91.

Roads with 4 or more lanes

On single carriageway roads with 4 or more lanes and on divided roads, lane closures can usually be set up so that Traffic Controllers are not required during the work. However a Traffic Controller will be required where intermittent closure of a lane is necessary, for example to allow plant to manoeuvre or to enable trucks to deliver materials. See Section 7, *Providing for works traffic*. Remember that a Traffic Controller shall control only one lane, and merges upstream of the work area may be necessary.

A typical situation with a Traffic Controllers on a divided road is shown in standard TCP 82.

8.1.4 Instructions for traffic controllers

A Traffic Controller shall:-

- wear the approved high visibility external clothing at all times
- ensure that **PREPARE TO STOP** (T1-18) and traffic controller symbolic (T1-34 or T1 -200-2 and T1-200-3 signs on RTA work) signs are in place and located in accordance with the TCP
- stand, if possible, where he or she can see the end of the work and any other Traffic Controller and where the sight distance to oncoming traffic is at least 1.5D. Traffic Controllers shall ensure that they are able to signal each other either directly or by using two way radios, an intermediate person or other means. All radios shall be confirmed to be in working order before going to the work site. **Radios shall not be used at blasting works.**
- stand facing the traffic, but just outside the travel path so that he or she can be seen for a minimum of 1.5D in advance by oncoming traffic
- not obstruct the motorists view of other signs and devices or be hidden by them
- **always stand so that a clear escape path is available**
- once the first vehicle has stopped, change position if necessary, in order to be clearly visible to following traffic. The Traffic Controller shall stay at the head of the traffic queue and stand alone, never permitting people to group around.

- give definite and clear signals to:-
 - stop traffic** – turn the **STOP/SLOW** bat (R6-8/T7-1) to **STOP** and raise the free arm into the stop signal position with the palm of the hand towards the traffic
 - allow traffic to proceed** – check that all traffic from the other end of the work site has passed, then turn the **STOP/SLOW** bat to **SLOW** and with the other hand give the **GO** signal
 - slow traffic** – show the **SLOW** side of the **STOP/SLOW** bat, extend the free arm and wave arm up and down.
- stand clear of traffic when allowing it to proceed
- not leave his or her post until directed by the Works Supervisor or Team Leader, or relieved by another Traffic Controller
- be courteous at all times in dealing with the public. If requested, inform the driver of the reason for, and possible length of the delay, but be brief. If provoked by unreasonable behaviour, exercise restraint.
- remove or cover the **PREPARE TO STOP** (T1-18) and traffic controller symbolic (T1-34, T1-200-2 or T1-200-3) signs when traffic control is discontinued or during brief breaks such as lunch
- report irresponsible motorists immediately. The Police will deal with them if you can report quickly.

NOTE:

There are three types of traffic controller ahead signs, namely:

- **day use only** (T1-34) – black symbol on fluorescent/retroreflective red background
- **day and night use** (T1-200-2) – black symbol and border on Class I reflectorised yellow background for works which continue day and night
- **night use only** (T1-200-3) – Class I reflectorised yellow symbol and border on black background.

8.1.5 Night work

See Section 9.2, *Working at night*. Be sure to:-

- wear approved, high visibility garments such as white overalls with reflective tapes
- consider use of an illuminated wand to supplement the **STOP/SLOW** bat
- try to position the traffic controller at a location on the road that is lit. For planned night work there should be good light on the traffic controllers.
- use two way radio control. It is desirable in most cases and essential if clear sight between operators is not available.

8.2 Roadwork (temporary) speed zones (AS 4.9)

It is essential that:-

- the procedures outlined in this Section are followed to provide consistency of roadwork speed zone operations in NSW
- all speed zone signs are adequately covered or removed from site when not required
- pre-existing speed zones are reinstated as soon as possible after passing the work site.

Failure to follow these three basic principles will lessen the credibility of roadwork speed zones and may lead to motorists not obeying signs correctly displayed. This will increase the risks to both workers and road users.

Consideration may also be given on the approach to a roadwork speed zone to providing additional advance warning of the zone by using the techniques mentioned in Section 3.5.7, *Avoiding end of queue collisions*.

8.2.1 General

Temporary speed zones may be implemented to assist in controlling the speed of traffic through roadwork sites. In general, the installation of temporary warning signs, lights and other devices have been more effective than speed limit signs in drawing attention to the need for caution at work sites. Furthermore, experience has shown that temporary speed zones at work sites will be significantly more effective if they appear reasonable to drivers.

Roadwork speed zones:-

- (i) shall only be used where they are self-enforcing or will be enforced
- (ii) shall not be used alone but used with other signs or devices required by the site specific conditions
- (iii) are not to be used in the place of more effective means of traffic control, but to compliment such controls
- (iv) shall only be used while work is being undertaken or temporary road conditions exist which are prejudicial to safety.

8.2.2 Location

Roadwork speed zones may be used where:-

- (i) there is an accident or an emergency
- (ii) traffic travels through the work site

- (iii) workers are endangered by high speed traffic
- (iv) dust or smoke reduces visibility
- (v) loose material or stones are on the road surface (i.e. during spray sealing works)
- (vi) there is a reduction at the work site in road surface condition or vertical or horizontal alignment which is inconsistent with the adjacent length of road
- (vii) detours or sidetracks are of a lower standard than the approaches
- (viii) excavations are adjacent to the travel path of vehicles
- (ix) bridges, which for reasons of structural safety, require a reduction in the impact loading caused by traffic
- (x) traffic is diverted onto the opposing travel lanes or carriageway.

8.2.3 Speed limit selection

The speed limit selected shall not exceed the maximum safe speed of travel for that work area. This safe speed is dependent on the degree of vehicular and pedestrian conflicts, the type and extent of the work in progress, the characteristics of the road and the proximity of workers to passing traffic. The speed of passing traffic shall be reduced to the following speeds, using appropriate signs and devices together with, if considered necessary, an authorised roadwork speed limit :-

a) 80km/h:

- (i) where workers on foot or operating plant are between 3 and 6 metres of traffic with no intervening physical barrier and traffic volumes exceed 10,000 vpd
- (ii) where there are changed traffic conditions on the site such as high speed, high standard detours, reduction in the number of lanes, varying surfaces
- (iii) where there are work vehicles entering or leaving the carriageway
- (iv) as a transition zone in 110km/h zones where a 60 or a 40km/h roadwork speed zone is required at the site of the work and the use of a 60 or 40km/h ahead sign is considered inadequate

b) 60 km/h:

- (i) where workers on foot or operating plant are within 1.2 to 3 metres of traffic with no intervening physical barrier
- (ii) on approach to a traffic controller
- (iii) on approaches to temporary or portable traffic signals
- (iv) there is significant interaction between work vehicles and through traffic

- (v) there is a reduced standard of alignment due to the works
- (vi) there is a loose surface such as gravel or a newly sprayed bitumen seal
- (vii) plant is operating near through traffic
- (viii) dust or smoke may reduce visibility
- (ix) traffic is adjacent to an excavation.

c) 40 km/h:

- (i) where workers on foot or operating plant are within 1.2 metres of traffic with no intervening physical barrier or are working within the trafficked area
- (ii) there is a severe change in the alignment considering the surrounding speed environment
- (iii) on bridges where the deck has an inconsistent surface or there might be structural damage to the bridge by vehicles travelling at higher speeds.

NOTE: for bridges where the impact loading caused by traffic threatens the structural safety of the bridge the temporary speed limit, as determined by the project manager, may be set lower than 40 km/h. Consideration should also be given to erecting bridge load limit signs (R6-3).

d) Less than 40 km/h (AS 4.2(e))

Refer to Section 3.6.6, *Speed control at hazardous sites*.

8.2.4 Procedures

(a) Duration

Signs showing roadwork speed limits (R4-212) shall be displayed only while the restriction applies and for the duration of the need. Hence the signs may be displayed on a:-

- (i) full-time basis for the duration of the roadworks or;
- (ii) part-time basis only while workers and plant are working, and a higher speed limit is more suitable between work shifts. The higher limit may be the normal speed limit or a different roadwork speed limit.

(b) Minimum length of zones

Roadwork speed zones shall be the minimum length required for the protection of workers and the travelling public. **Drivers will not adhere to limits where there are no obvious roadworks or bridgework activity.**

40km/h and 60km/h roadwork speed zones shall be located so that the zone commences no closer than 100m before the start of the work, which is the start of transition area or traffic diversion or the traffic control position. In general 40km/h zones are only to be erected over the length where people are working or the other conditions listed in 8.2.3(c) exist. The roadwork speed zone shall end at least 50m past the site where people are working.

The desirable lengths of roadworks speed zones are:-

	minimum	maximum
40km/h	not specified	500m
60km/h	150m	not specified
80km/h	500m	not specified
80km/h transition zones	300m	not specified

(The maximum length of 500m above is for worker safety but the actual length shall be restricted to areas adjacent to where people are actually working and **visible to road users.**)

(For traffic safety there is no maximum length specified above (ie for long lengths of reseals etc) but physical restraint to traffic speed shall be considered (ie pilot vehicles etc.) for longer lengths.)

Roadworks speed zones may be staggered so that there is a different speed restriction for opposing directions of traffic. Staggering may be applicable:-

- (i) to reduce the length of speed restriction to traffic leaving the work site
- (ii) where a speed zone is extended to protect the end of a queue
- (iii) on a divided road where roadworks affect traffic conditions on one side of the median only
- (iv) where a roadworks speed zone is used in a transition zone to reduce traffic speeds in approach to a traffic controller but is not required for traffic flow in the opposite direction
- (v) where work is underway on the shoulder and does not affect traffic in the opposing traffic lane.

8.2.5 Signposting

(a) Speed restriction ahead signs

Speed Restriction Ahead signs (G9-79) shall be erected where the speed of traffic on the approach to the temporary speed zone is 30 km/h or more higher than the temporary limit. They shall **also** be considered for use:-

- where there is insufficient sight distance
- on downhill approaches
- where, under normal driving expectations, the change in speed zone may not be apparent to road users.

The Speed Restriction Ahead (G9-79) signs shall be located 2D in advance of the roadworks speed zone.

At the start of zones

At the start of a roadworks speed zone the Roadwork Speed Limit (R4-212) signs shall be erected on both sides of the carriageway. Where this is not possible a second sign is to be erected 0.5 D from the start of the zone.

Repeater signs

Repeater signs (R4-212) shall be erected on the left side of the carriageway at a maximum spacing of 500 m. They are also required where traffic enters from a side road within a roadworks speed zone.

End of Zone

At the end of the roadworks speed zone, a speed restriction sign shall be erected showing the speed limit applying beyond the roadworks zone.

Conflict with other signs

When a roadworks speed zone is introduced, speed restriction signs or markings and advisory speed signs in the zone which show conflicting speeds shall be covered or removed.

(b) Sign Size

Speed restriction signs used on all roads where the existing limit is 60km/h or more are to be at least "B" size. On freeways and other higher speed roads "C" size signs may be erected.

(c) Erection of signs

Roadwork speed restriction signs shall be erected:-

- (i) within 5m of the edge of the outer travel lane
- (ii) a minimum of 600mm above the ground to the underside of the sign
- (iii) to be clearly visible to traffic. In urban areas the location of the zone may be adjusted so that signs can be erected clear of parked vehicles, other signs or obstructions.

(d) Multiple work crews

Where there are multiple work crews within a job site or over a length of road, separate zones may be required for each work area in order to avoid an excessively long and restrictive speed zone. The minimum lengths stated in 8.2.4(b) may be used as a guide when designing the TCP in this instance.

(e) Speed Restriction Road Pavement Markings

For long-term work the existing speed limit pavement numerals shall be obliterated or ground off i.e. usually removing the first numeral will suffice '1' for 100 km/h, '8' for 80 km/h. It is not normally necessary to provide pavement markings for roadworks speed zones.

(f) ROADWORK SPEED LIMITS ENFORCED signs

On long-term roadwork sites where a speed restriction is to be used for an extended period (in excess of 4 weeks) and compliance with the roadwork speed restriction is expected to be a problem, **ROADWORK SPEED LIMITS ENFORCED (T4-216)** signs shall be erected.

If used, these signs shall be located:-

- 100m after each roadwork speed limit sign for speed limits of 60km/h or less
- 125m for speed limits greater than 60km/h.

These signs may also be used if compliance becomes a problem during shorter periods of work.

(g) Seeking Police co-operation

It is desirable to advise local police of the installation of any temporary speed zones and to seek police co-operation to enforce those zones. In this regard consideration shall be given to the use of police speed enforcement/presence as part of the risk management process during the development, construction and maintenance stages of projects.

Potential projects requiring police involvement include:-

- (i) long term works on high volume and/or high speed roads
- (ii) short term work where traffic barriers cannot be employed to protect workers.

Procedures for involving police in enforcement or presence on roadworks are contained in RTA Technical Direction, TDT 2009/07, *Police Speed Enforcement or Presence on RTA Work Sites*.

8.2.6 Delegations and documentation

(a) RTA works on Classified Roads

Authorisation by a Unit Manager (RTA Delegation Level 5 Officer) who holds a current Design and Inspect Traffic Control Plans card (orange card) is required before a roadwork speed limit sign can be installed, displayed, altered or removed on any Classified Road.

Completion is required of an appropriate form (see end of this Section) to cover a roadwork speed restriction that may be applied for any section of any Classified Road. Copies of the forms shall be forwarded to the police station nearest to the appropriate sections of road.

A copy of this authorisation shall be kept on site and will enable the erection of roadwork speed limit signs (R4-212) at the specified location(s).

Records shall be kept detailing the date and time, the speed displayed and the location of speed zone signs, repeater signs, advanced warning signs and any other relevant information. Such information shall be kept for at least seven years, as it may be required as evidence for litigation purposes including speeding prosecutions or accident compensation claims.

For work undertaken on Classified Roads, councils (whether Single Invitee Contactors (SIC) or not) and private contractors shall seek the authorisation of the RTA to erect roadwork speed limit (R4-212) signs.

(b) Works on Unclassified roads

Authorisation shall be carried out in accordance with Item 13 of the RTA's *Delegation to Councils – Regulation of Traffic* (dated 23 February 2009).

“When the installation period for a ‘Roadwork Speed Limit’ (R4-212) sign is to be for 6 working days or less:-

- (i) authorisation of the use of the ‘Roadwork Speed Limit’ (R4-212) sign must be carried out by council or a sub-delegate who holds a current Select/Modify Traffic Control Plans certificate issued by the Authority ; and
- (ii) the nearest office of the Authority is to be notified in writing of council’s intention to implement a roadwork speed limit prior to works commencing; and
- (iii) the nearest Police Station is to be notified in writing of Council’s intention to implement a roadwork speed limit prior to works commencing.”

“When the installation period for a ‘Roadwork Speed Limit’ (R4-212) sign is to be for more than 6 working days:-

- (i) authorisation of the use of the ‘Roadwork Speed Limit’ (R4-212) sign must be carried out by council or a sub-delegate who holds a current Select/Modify Traffic Control plans Certificate issued by the Authority ; and
- (ii) the nearest office of the Authority is to be notified in writing of council’s intention to implement a roadwork speed limit 7 days prior to works commencing; and
- (iii) the nearest Police Station is to be notified in writing of Council’s intention to implement a roadwork speed limit 7 days prior to works commencing.”

8.2.7 Records

Records shall be maintained of all roadwork speed zones. Records shall include:-

- (i) RTA's or council's (or its sub-delegate's) written authorisation of the installation. [The sub-delegate's Select/Modify Traffic Control Plans Certificate number shall be shown.]
- (ii) the location
- (iii) the installation time and date, and
- (iv) the removal time and date

The 'Roadwork Speed Limit' (R4-212) sign is to be removed as soon as practicable after the roadworks have been completed.

Roadwork speed limit Authorisation and Notification forms are included at the end of this Section.

All records shall be kept for a minimum of 7 years.

8.2.8 Inspection

The team leader or appropriate person is to ensure that speed restriction signs are properly erected, conflicting signs are covered and advance signs are in place when inspecting the traffic control on the site. Consideration should also be given to keeping photographic records of signs and their locations.

Roadwork speed zones are to be inspected and associated documentation examined on a regular basis.

8.2.9 Mobile speed zones

The issue of the legality of mobile speed zones in New South Wales is one that has yet to be resolved. In the meantime it is acceptable to display non-regulatory (black on white) speed restriction signs on mobile works vehicles.

ROADWORKS SPEED ZONE SIGN AUTHORISATION FORM

RTA/Council Ref No _____

Authorisation is given in accordance with the RTA Delegation Manual to install, display, alter or remove a _____ km/h roadworks speed limit sign as described below.

Location

Road No & Name _____

Town/Suburb
(where applicable) _____

Start Point _____

End Point _____

Commencement

Date _____ Time _____

Signed _____ Date _____

Name _____

Designation _____

Traffic Control at
Work Sites Certificate No _____

Councils

This form should be faxed to the nearest Regional Office of the RTA and the nearest Police Station as required under clause 13 of the *Delegations to Councils Regulation of Traffic* document.

ROADWORKS SPEED ZONE SIGN NOTIFICATION FORM

Council Ref No _____

_____ Council intends to install a _____ km/h
roadworks speed limit sign as described below.

Location

Road No & Name _____

Town/Suburb
(where applicable) _____

Start Point _____

End Point _____

Proposed Commencement **Date** _____ **Time** _____

Proposed Completion **Date** _____ **Time** _____

Daily Operating Times **Date** _____ **Time** _____
(where applicable)

Signed _____ Date _____

Name _____

Designation _____

Traffic Control at
Work Sites Certificate No _____

This form should be faxed to the nearest Regional Office of the RTA and the nearest Police Station as required under clause 13 of the *Delegations to Councils Regulation of Traffic* document.
