Traffic Engineering Manual

Volume 3 – Additional Network Standards & Guidelines

Speed Zoning Technical Guidelines

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VICTORIA State Government | Department of Transport

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1 INTRODUCTION

The Department of Transport (DoT) Speed Zoning Guidance has been separated into Speed Zoning Policy and Speed Zoning Technical Guidelines as part of the 2021 update (see Figure 1).

This document, the Speed Zoning Technical Guidelines, provides technical guidance for the application of speed zoning in Victoria. It operationalises the Speed Zoning Policy and shall be read in conjunction with that document.

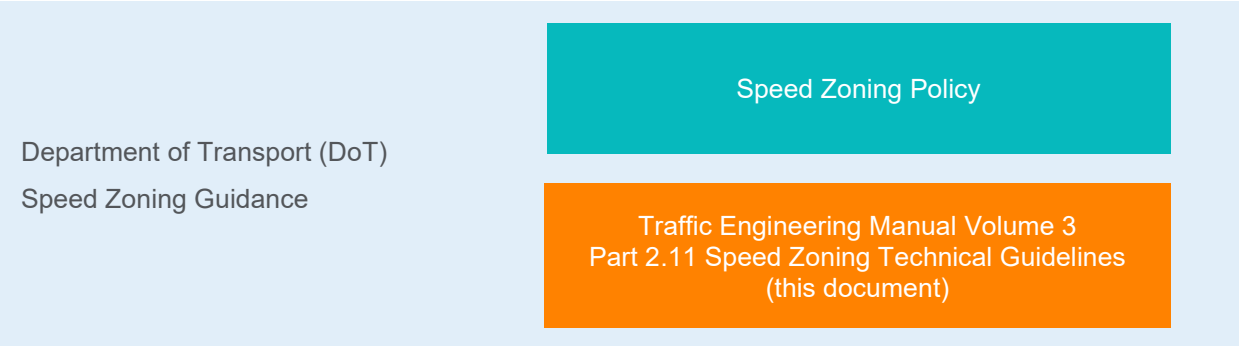


Figure 1: Update to the speed zoning guidance (2017 to 2021)

These guidelines are a DoT supplement to the Austroads Guide to Traffic Management, the Austroads Guide to Road Safety and Australian Standards. The primary source of guidance on this topic comes from the Austroads Guides. However, for the practice of traffic management in Victoria, this document takes precedence to the extent of any conflict with other documents.

The relevant sections of the Austroads Guides and Australian Standards relating to speed zoning are:

- *Austroads Guide to Road Safety Part 3: Speed Limits and Speed Management*
- *Austroads Guide to Traffic Management Part 5: Road Management* (Section 5)
- *Austroads Guide to Traffic Management Part 13: Road Environment Safety*
- *Australian Standard AS 1742.4 Speed controls*

These guidelines do not cover temporary speed limits that are applied during **road works** or special events. Requirements for these situations are covered by *Australian Standard AS 1742.3 Traffic Control for Works on Roads*, the DoT / VicRoads supplement to AS 1742.3, and the *Code of Practice for Worksite Safety - Traffic Management*, which was established under the Road Management Act 2004.

These guidelines do not cover variable speed limits on **managed motorways**. Requirements for these situations are covered by *DoT / VicRoads Traffic Engineering Manual, Volume 3, Part 2.04: Managed Freeways Handbook for Lane Use Management, Variable Speed Limits and Traveller Information* and *DoT / VicRoads Managed Motorways Framework, Network Optimisation & Operations Rationale and Technical Requirements*.

1.1 Application of these guidelines

These guidelines are based on the principles set out in the Speed Zoning Policy and have been written to cover a wide variety of situations and factors as every location has its unique characteristics. Engineering judgement, guided by these principles, must be applied to decide upon an appropriate speed limit, based on site specific, local and route factors.

It is essential that the decisions not just focus on isolated sections of the road but are made in the context of the adjoining road network to minimise the number of speed zone changes. Network based speed limit reviews within the Movement and Place framework are encouraged so that consistency of speed limits is achieved over an area where issues and the road environment are similar (e.g. within the activity centre of a regional city).

Where the operational safety or the safety outcome is unsatisfactory at the existing or the proposed speed limit, infrastructure improvements shall be considered. Guidance on road infrastructure improvements can be obtained from the Austroads Guides relating to road design and traffic management, the Australian Standards relating to traffic management, the relevant DoT / VicRoads supplements to these documents, and any other relevant DoT / VicRoads standard and/or guideline.

Road Safety Victoria (RSV) is the owner of Speed Policy within DoT and provides oversight and endorsement for the operational delivery of speed zone changes.

The power to set speed limits in Victoria is provided to the State Road Authority (Defined as Head, Transport for Victoria) through the Road Management Act 2004 (Schedule 4, Clause 13). This power has been delegated to DoT Regional Directors through an instrument of delegation.

Proposals to erect, remove or modify a permanent speed sign on any road in Victoria is provided to the Head, Transport for Victoria through the Road Safety (Traffic Management) Regulations 2019 (Regulation 9(4) on arterial roads and Regulation 11(1a) for local roads). This is through the issuance of a Memorandum of Authorisation (MoA). This power has been delegated to various DoT officers but can only be legally implemented for speed signs following approval from the Regional Director.

Whilst Regional Directors have the authority to install speed limits in Victoria, internal operational policy set by the Secretary DoT requires all speed zone changes to have the endorsement of RSV and the Deputy Secretary Policy, Precincts and Innovation before they are implemented on site. The internal DoT endorsement process also includes the development of community engagement plans and associated ministerial briefs.

Speed limit proposals that do not fall within the provisions of these guidelines and/or may be controversial or have state-wide implications shall require the approval of the relevant Regional Director prior to seeking endorsement from RSV. Where required, RSV shall consult with the Chief Engineer – Roads or their delegate regarding the application of the speed zoning principles.

2 INTRODUCTION TO SPEED LIMITS

Table 1 provides an overview of the speed limits used in Victoria. Details of how to determine the appropriate speed limit for specific locations and circumstances are set out in Section 3.

Table 1: Overview of regulatory speed limits

Speed limit	Application of speed limit
10 km/h	• Shared zones where pedestrians have priority over vehicles along the road
20 km/h	• Car parks, recreational reserves and other similar areas where vehicles and pedestrians mix
40 km/h	• Activity Centres, including shopping precincts and school zones • Local streets in built-up (urban and rural) areas
50 km/h	• Local streets in built-up (urban and rural) areas where streets are unsigned and use the State 'built-up area' default speed limit • Rural and outer metropolitan town centres with abutting development, low level pedestrian movement and kerbside parking
60 km/h	• Most undivided arterial roads in built-up (urban and rural) areas • Divided arterial roads in built-up (urban and rural) areas with a high number of access points or significant pedestrian or cyclist activity • Some higher movement classified local streets
80 km/h	• Rural roads with developed abutting land, poor geometry or a high crash rate or demonstrated high crash risk • Divided arterial roads in built-up (urban and rural) areas with a limited number of access points, exclusive turn lanes and not a significant level of pedestrian or cyclist activity • Undivided roads on the urban / rural fringe, or township / rural fringe, or in rural areas where there is an elevated risk of crashes • Roads through small rural settlements (hamlets) • Freeways / motorways / tollways where there is an elevated risk of crashes and/or high-volume complex traffic movements
100 km/h	• Rural roads where there is no elevated risk of crashes • Rural roads where roads are unsigned and use the State 'outside built-up area' default speed limit • Freeways / motorways / tollways where there is no elevated risk of crashes
110 km/h	• High standard rural freeways / motorways / tollways

There are a number of special purpose speed limits used in Victoria. The basis of these special purpose speed limits is outlined in the Speed Zoning Policy document. In noting the approval of special purpose speed limits, Road Safety Victoria will coordinate with Road and Traffic Engineering where required. These speed limits are listed in Table 2.

Table 2: Special purpose regulatory speed limits

Speed limit	Application of speed limit
30 km/h	• In special circumstances – refer to the Speed Zoning Policy document
70 km/h	• In special circumstances on undivided urban arterial roads with a limited number of access points and not a significant level of pedestrian or cyclist activity • In special circumstances on divided urban arterial roads with exclusive turn lanes and not a significant level of pedestrian or cyclist activity • In special circumstances on some municipal roads in urban / rural fringe or township / rural fringe areas
90 km/h	• In special circumstances such as on freeways / motorways / tollways where 80 km/h and 100 km/h speed limits have been considered and found to be unsuitable

2.1 Overview of the speed limit implementation process

The process of implementing a speed limit is illustrated in Figure 2.

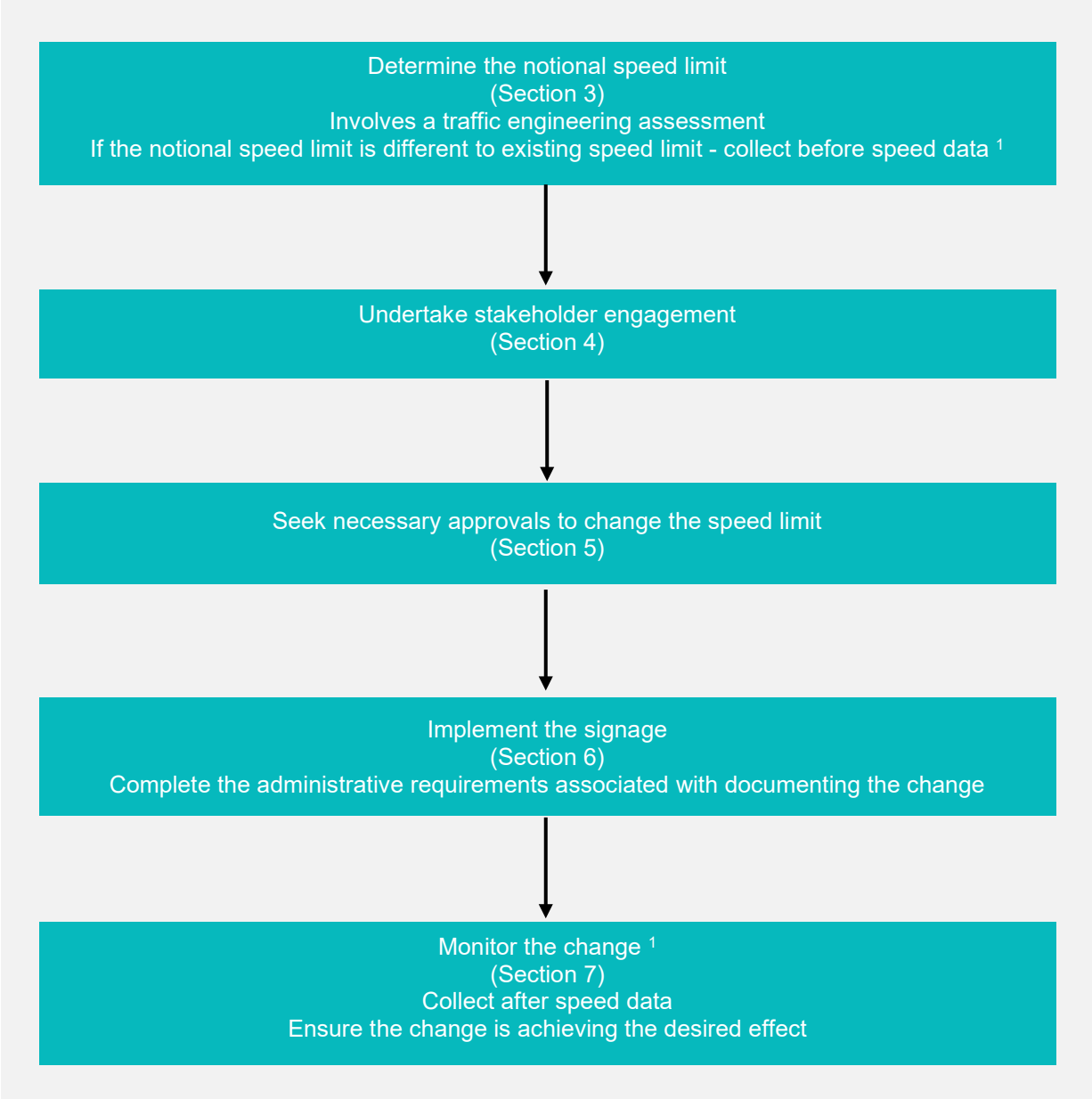


Figure 2: Speed limit change process

Notes to Figure 2:

1. ***For DoT managed roads, evaluation of the impact of the speed limit change using speed data is highly recommended (except for very minor speed limit changes such as changes in land use resulting in speed limit extensions less than approx. 200m in length). This assists in ensuring that the change is achieving the desired effect. For roads managed by local governments and other agencies, the evaluation of the impact of the speed limit change is encouraged.***

2.2 Legislation

2.2.1 Determination of speed limits

Legislation relating to the authority to determine speed limits is set out in the Road Management Act 2004 (RMA) and the Local Government Act 1989 (LGA).

Regulations relating to how and where speed limits apply and the rules to be observed by road users are specified in Road Safety Road Rules 2017 (RSRR).

Installation, operation and management of speed limit signs are covered by the Road Safety (Traffic Management) Regulations 2019 (the RS(TM)Regs).

Both RSRR and RS(TM)Regs are statutory rules established under the Road Safety Act 1986 (RSA).

The LGA also sets out powers for Councils to determine speed limits on a road. However, the Act highlights that this power is conditional on obtaining the relevant authorisation from DoT in accordance with any regulation made under the RSA (e.g. the RS(TM)Regs).

Speed limits are the maximum speed that a vehicle can be legally driven at (with the exception of vehicles specified in Rule 21(2) of the RSRR).

Other legislation relating to the speed limits in Victoria is included in the RSA as shown in Table 3.

Table 3: Speed limit related legislation in Victoria

Act of Parliament	Relevant Sections	Comments
Road Management Act 2004 (RMA)	• Schedule 4, Clause 13 - Power to determine speed limits	• RMA sets out the relevant authority to determine speed limits.
Local Government Act 1989 (LGA)	• Schedule 11, Clause 13 - Power to determine speed limits	• LGA Section 207 essentially states that with respect to major traffic control devices, any power exercised under Schedule 11 of the LGA is conditional on the Council obtaining authorisation under the RS(TM)Regs from DoT.

Road Safety Act 1986 (RSA)	• Road Safety (Traffic Management) Regulations 2019 (RS(TM)Regs)
	• Road Safety Road Rules 2017 (RSRR)
	  ○ Part 3 - Speed-limits
	  ○ Obeying the speed-limit
	  ○ Speed-limit where a speed-limit sign applies
	  ○ Speed-limit in a speed-limited area
	  ○ Speed-limit in a school zone
	  ○ Speed-limit in a shared zone
	  ○ Speed-limit elsewhere
		• The RS(TM)Regs cover installation, operation and management of speed limit signs
		• RSRR set out the rules relating to how and where speed limits apply and the rules to be observed by road users.

The RSA also states that:

- (Section 64) ‘a person must not drive a motor vehicle at a speed or in a manner which is dangerous to the public’; and

- (Section 17A) ‘a person who drives a motor vehicle on a highway must drive in a safe manner having regard to all the relevant factors, including (without limiting the generality) the:

(a) physical characteristics of the road;

(b) prevailing weather conditions;

(c) level of visibility;

(d) condition of the motor vehicle;

(e) prevailing traffic conditions;

(f) relevant road laws and advisory signs;

(g) physical and mental condition of the driver.’

2.2.2 Authorisation of speed limit signs

The RS(TM)Regs prescribe requirements for the authorisation of traffic control devices in Victoria. The RS(TM)Regs categorise traffic control devices into major and minor traffic control devices, with differing powers relating to the authorisation of each category of traffic control device.

The speed limit related major traffic control devices referred to in these guidelines are:

- speed limit / end speed limit signs
- area speed limit / end area speed limit signs
- shared zone signs / end shared zone signs

With regard to these major traffic control devices, regulation 9 of the RS(TM)Regs states that DoT:

(1) may, on a road or road related area forming part of a freeway, erect, display, place, remove or alter a traffic control device

(2) may, on a road or road related area forming part of an arterial road, erect, display, place, remove or alter a traffic control device other than—

a) a stopping or parking traffic control device; or
b) a traffic control device that is associated with a children's crossing.

(3) *~Note this clause has no relevance to speed limits~*

(4) Subject to regulation 10, may erect, display, place, remove or alter a traffic control device that is a reasonable likeness of one of the following diagrams in Schedule 2 to the RSRR, on a road or road related area, other than a road or road related area forming part of a freeway or an arterial road—

(a) a speed-limit sign;

(b) an end speed-limit sign;

(c) an area speed-limit sign;

(d) an end area speed-limit sign;

(e) a shared zone sign;

(f) an end shared zone sign.

(5) may, on a road or road related area other than a road or road related area forming part of a freeway or an arterial road, erect, display, place, remove or alter a traffic control device that provides direction to, or advance warning of, a nearby intersection with a freeway or arterial road.

(6) *~Note this clause relates to conducting works on roads. These guidelines do not cover temporary speed limits that are applied during road works~*

An Instrument of Delegation that DoT has issued, gives certain DoT officers the authority to exercise DoT’s powers under the RS(TM)Regs, in relation to major traffic control devices (other than works advisory devices). With reference to sub-regulations (1), (2), (4) and (5) listed above, these powers are generally delegated to positions within DoT at Team Leader level and above.

For DoT staff, a full list of these positions within the Instrument of Delegation relating to the above powers can be found under Delegations and Authorisations on the DoT Intranet.

Details regarding the approval process for implementing speed limits can be found in Section 5.

2.2.3 Speed limits along a road length or for an area

Rule 21(3) of the RSRR specifies that a speed limit sign on a road applies to the length of road beginning at the speed limit sign and ending at the nearest of the following:

- A speed limit sign on the road with a different number on the sign
- An end speed limit sign or speed derestriction sign on the road
- The end of the road if the road ends at a T-intersection or dead end.

The RSRR also allow for speed limited areas (Rule 22) and speed limited shared zones (Rule 24) which should only be applied to areas clearly identifiable to the road user (e.g. car parks) and signed appropriately.

2.2.4 Default speed limits

Default speed limits are imposed by Rule 25 of the RSRR and provide a legal speed limit when speed limit signage is not present. The default speed limit for built-up areas is 50 km/h and the default speed limit outside built-up areas is 100 km/h.

In Victoria, 100 km/h speed limits on rural roads and 50 km/h speed limits on urban/regional township roads are the most common speed limits in use. The main purpose of the default speed limit is to minimise the need to sign the vast extent of short and/or minor roads that exist throughout the Victorian road network.

2.3 Supporting treatments for low speed environments

Where existing road environments do not encourage vehicles to travel at low speeds, speed management treatments may be used to support the lower speed limit.

To encourage drivers to travel at safe speeds, road geometry and infrastructure treatments may be used to influence the drivers' expectation of the appropriate driver behaviour and speeds. The concept of 'self-explaining roads' involves designing a road system in which the driver's expectations created by the road environment are implicitly in line with the safe, appropriate behaviour for the road. This allows motorists to receive consistent speed information from the roadway, speed limit signs and the environment. In this way, it is often important to combine speed limit signs with road infrastructure solutions to achieve safer speeds, safer road systems and safer driver behaviours.

There are various treatment solutions that range in cost and effectiveness. The ideal treatment may vary based on each individual road environment and so, engineering judgement is required to determine if and what treatment is to be used.

More information and examples of traffic management treatments to support low speed environments can be found in:

- *Austroads Guide to Traffic Management Part 8 - Local Area Traffic Management*
- *Australian Standard AS 1742.13 Local area traffic management*
- DoT / VicRoads supplements to the above documents

2.4 Safe System approach

The Safe System approach to road safety, which is the key concept in Victoria's strategy to reduce fatalities and serious injuries from road crashes, provides the overarching principle that guides the setting of speed limits upon which these guidelines are based.

The Safe System approach is built on the premise that humans are likely to make mistakes and crashes will happen (even with continued focus on prevention). Human bodies can only withstand a limited amount of force in a crash before serious injuries or death results. Speed is a critical factor in managing the force that road users are exposed to. Accordingly, the road transport system needs to be designed, built and speeds managed so that in the event of a crash, the people involved do not receive fatal or serious injuries.

By applying the Safe System philosophy, the long-term vision is to eliminate fatal and serious injuries arising from crashes. Safer speeds, together with safer roads, safer road users and safer vehicles, are the fundamental components of the Safe System which represent the focus of efforts to achieve this vision.

Under the Safe System, the setting of speed limits takes into account the risks to road users of sustaining fatal or serious injuries. For example, at locations where there is a significant level of pedestrian or cyclist activity, lower speed limits are appropriate. Similarly, where the potential for conflicts is high (e.g. on busy arterial roads in built-up (urban and rural) areas with frequent points of access) speed limits are set at a level that will minimise the chances of fatal or serious injuries in the event of a crash. However, speed management is not just about speed limit setting. Road infrastructure standards and design that create an environment that supports safe speeds, together with education and enforcement to encourage appropriate road user behaviour are also critical elements.

Lowering of speed limits may be appropriate on roads with low-standard infrastructure. Matching travel speeds to the road and roadside environment is a focus under the Safe System approach.

Where the operational safety of a road or length of road is unsatisfactory (i.e. the crash rate or crash risk is high) the preferred response is to identify and implement infrastructure improvements that address the specific safety problem. However, where infrastructure improvement options have been exhausted or are not feasible in the short term and current risks are unacceptably high, a reduced speed limit may be appropriate.

2.5 Movement and Place and Transport Link Classification

The Victorian Movement and Place Framework developed by DoT is a system of classifying transport links and hierarchies based on the broader network outcomes we are seeking to achieve. It considers the different function of each road type within the road network and how it performs its function to meet the community's, as well as users' needs.

The Movement and Place Framework identifies the role of each road through a movement and place matrix (Figure 3). This is based on the strategic significance of the road to move people and goods and the strategic significance of the land use interacting with the road.

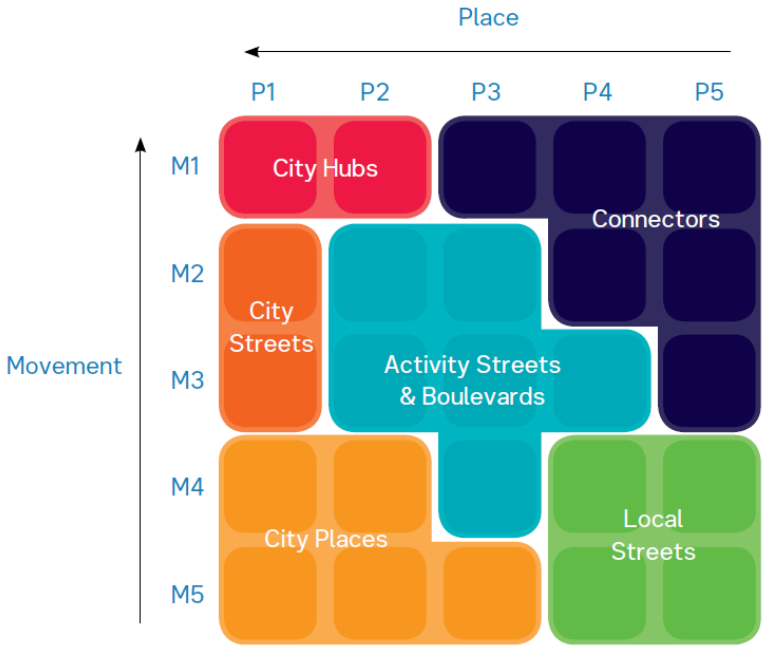


Figure 3: Movement and Place classifications

There are various terms and definitions used to describe the classification of a transport link in the transport industry. Some of these are described in relevant Victorian Acts or Regulations, while others are included in the Victorian Planning Provisions (VPP) and Austroads Guides. The purpose of this section is to assist practitioners who may be familiar with a particular classification, yet unfamiliar with others, in understanding how various terms and definitions relate to DoT's Movement and Place Framework in the context of speed zone setting.

Table 4 provides an overview of Movement and Place road and street types, other transport link terms and their broad equivalency to DoT's Speed Zoning Guidance.

Table 4: Movement and Place, 'other' and DoT Speed Zoning Guidance transport link descriptions

Movement and Place transport link description	Other transport link descriptions	Equivalent DoT Speed Zoning Technical Guidelines transport link descriptions
Connectors (M1-P5)	Freeways (Austroads) Motorways (Austroads) Tollways (Austroads)	Freeways / Motorways / Tollways
Connectors (other than M1-P5)	Arterial Roads (Austroads)	Arterial Roads
Activity Streets and Boulevards City Hubs City Streets City Places	Activity Centres (Austroads)	Activity Centres
Some Local Streets (M4-P4/P5)	Collectors (Austroads) Connector Streets (VPP)	Higher Movement Classified Local Streets
Local Streets (M5-P4/P5)	Access Streets (VPP)	Local Streets
Some City Places (P1-M5)	Shared Zones (Austroads) Access Places (VPP)	Shared Zones

The DoT Movement and Place definitions of the road and street types mentioned in this section are included in the definitions section of this document (Section 8). Further information about these can be found in DoT's document *Movement and Place in Victoria*.

Further guidance on the relationship of transport link descriptors to the Movement and Place Framework is available in the *Austroads Guide to Traffic Management Part 4: Network Management Strategies*.

Consideration of the Movement and Place framework and the relationship it has with other transport link classifications can help inform decisions that are made when practicing speed zoning.

2.6 Types of speed signs

There are three main types of signs on the road network that display a speed related message. These are shown in Table 5 below.

Table 5: Types of speed signs

Regulatory speed signs	
   	These signs are used to indicate the speed limit which applies to a length of road. These signs indicate the maximum, legally permissible speed and provide legal effect in accordance with the RSRR. Regulatory signs are used on roads to set a legal speed limit, advise road users of a change in speed limit, or as a repeater sign to remind road users of the applicable speed limit.
Advance speed signs	
  	These signs are typically used to provide advance warning of an upcoming significant speed limit reduction. Typically, these signs are considered where there is a speed reduction of 30 km/h or greater or prior to a low speed variable speed limit such as a school speed zone or a variable 40 km/h speed limit for activity centres. These types of signs do not have any legal effect under RSRR but are provided to assist road users in complying with regulatory speed limits.
Advisory speed signs	
 	These types of signs are typically used to recommend the speed for a location or a very short section of road. Typically, these types of signs are used for a tight curve, a crest in the road or a short section of road in poor condition. These types of signs do not have any legal effect under RSRR but are provided to assist road users to travel at a safe and appropriate speed for the section of road. For horizontal and vertical curves, guidance in determining the appropriate advisory speed can be found in AS 1742.2 (2009) Appendix F and G respectively. For roads in poor condition, advisory speed signs shall only be used in conjunction with another warning sign to indicate the desirable speed in good weather, traffic and road conditions for comfortable travel through the hazard referred to on the warning sign.

3 DETERMINATION OF NOTIONAL SPEED LIMIT

The notional speed limit refers to the speed limit that has been determined using Figure 4 and has been found to be consistent within the road context.

Different speed limits may be adopted under certain circumstances to achieve safer travel speeds that align with the function of a road.

If the notional speed limit differs from the current speed limit, this signifies an opportunity to revise the speed zone.

The determination of a maximum safe speed limit for a set of circumstances is an evidence-based process which takes into account a multitude of factors. Some of the key factors are:

- Road safety
    - crash risk / crashes along the road or in the area being considered
    - human tolerance to physical force in different crash types.
- Road classification and its function within the network
- Road characteristics
    - divided/undivided, number of lanes and lane widths, intersection spacing
    - presence of service roads
    - pavement condition and width
    - shoulder type and width
    - presence of footpaths
    - clearance to obstacles
    - vertical and horizontal alignment
    - speed limits on similar roads in the area
- Extent and nature of abutting development
    - number and density of abutting developments
    - type and extent of trips generated
    - type of developments such as houses, shops, hospitals and schools
- Road users, their movements and the number of potential conflicts between road users
    - cars
    - trucks
    - bicycles
    - motorcycles
    - buses and trams
    - pedestrians
    - parked vehicles
    - peak traffic flow
    - recreational traffic
- Seasonal issues
    - holiday traffic
    - harvest traffic
    - presence or risk of ice and snow

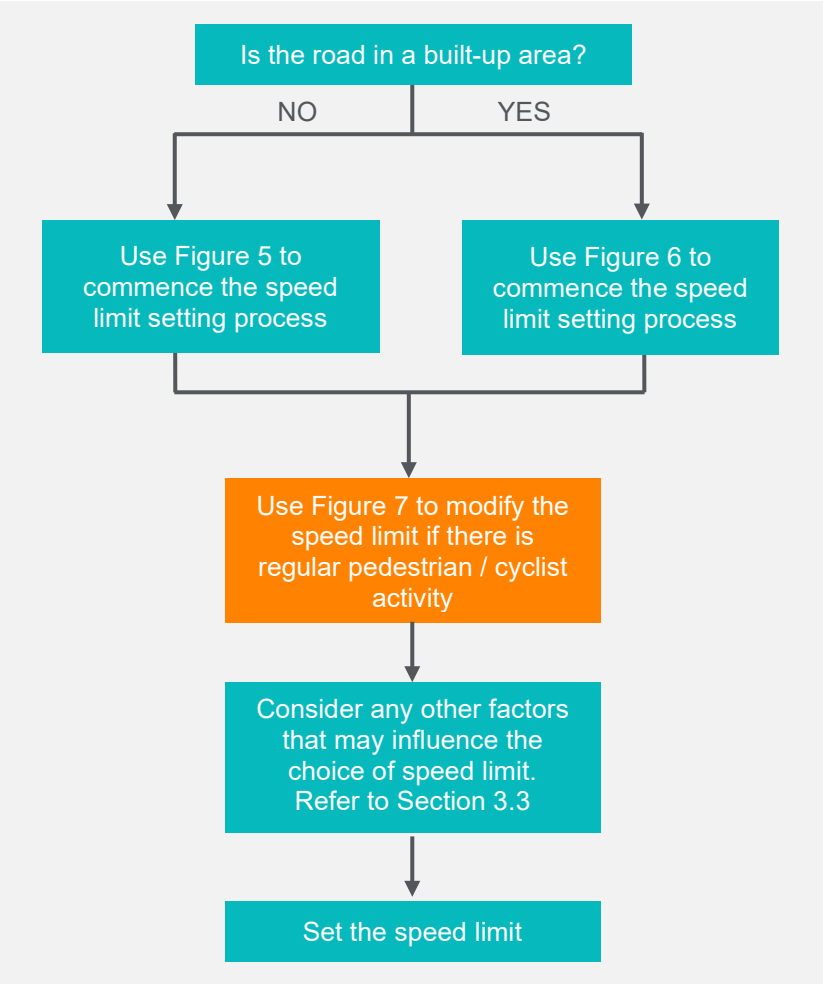


Figure 4: Process for determining speed limits

Notes to Figure 4:

1. ***In RSRR, a 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 m or, if the length of road is shorter than 500 m, for the whole road –***
    a. ***buildings, not over 100 m apart, on land next to the road;***
    b. ***street lights not over 100 m apart.***
2. ***For rural local streets that are classified as being 'outside built-up areas', engineering judgement may be applied as to whether the process for determining speed limits for roads 'in built-up areas' is more appropriate.***
3. ***In most cases, a speed zone should be applied to a particular length of roadway for both directions of travel. However, offset speed zones (speed zones that that have different speed limits for each direction of travel) may be permitted on divided roads where carriageways operate independently of each other, or on roads where the speed limit is reduced due to isolated traffic signals or railway level crossings in high speed environments.***
4. ***Temporary lowering of the speed limit may be appropriate when the condition of the road pavement becomes hazardous to an extent that is unable to be managed by regular routine maintenance. On roads managed by DoT, signing advice is set out in the 'Guidelines for Signing Roads in Poor Condition' document (located in SmartDocs).***
5. ***Decisions made in determining the speed limit should be documented and filed for future reference.***

VLimits is a software package to assist practitioners to determine appropriate speed limits. Online access to VLimits is available at www.vlimits.com.au.

VLimits is to be used as a secondary tool (the Speed Zoning Technical Guidelines being the primary) in the determination of speed limits. It is only a tool to facilitate the implementation of the principles and general rules outlined in this document. The output from VLimits is an initial or suggested speed limit based on a range of inputs. Adjustments to the suggested speed limit will generally need to be made to reflect local issues and conditions, including consideration of lower speed limits in activity centre areas.

3.1 Speed limits for roads outside built-up areas

The process for commencing speed limit setting outside built-up areas is illustrated in Figure 5 (notes apply).

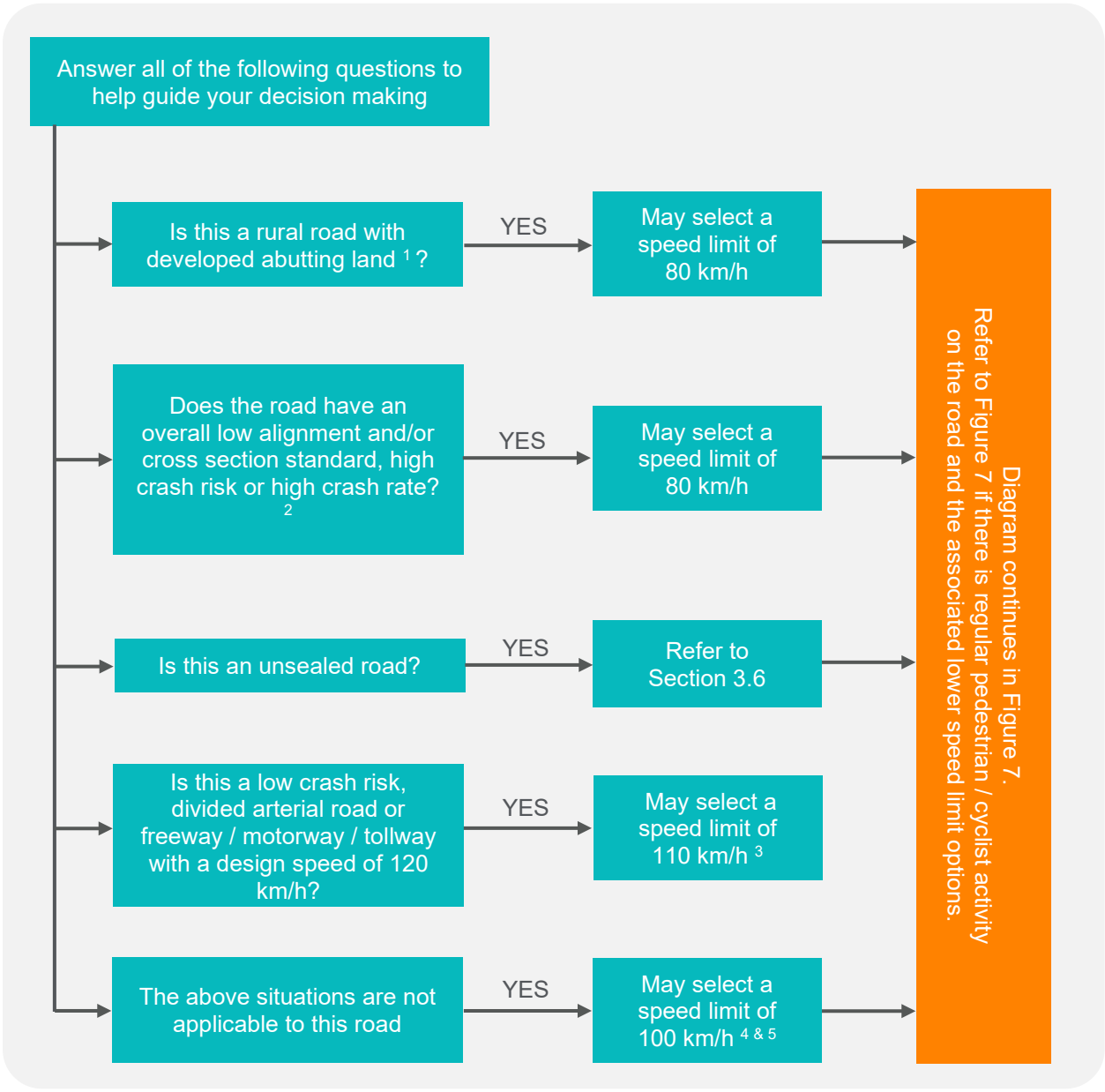


Figure 5: Process for commencing speed limit setting for outside built-up areas

Notes to Figure 5:

1. ***Includes roads that pass through a hamlet – a small rural settlement with sparsely built-up development.***
2. ***Speed limit reductions are an effective measure to address roads with high road safety risk for lower-order rural roads (i.e. roads with a M3-M5 classification in Victorian Movement and Place Framework). The preferred approach for higher volume and higher productivity routes (i.e. M1-M2 roads in Victorian Movement and Place Framework) is to upgrade the infrastructure to a suitable standard to support higher speed limits.***

   The Austroads Infrastructure Risk Rating (IRR) tool should be used to assist with making speed zoning assessments on high risk rural roads (https://austroads.com.au/publications/road-safety/ap-r587a-19). This tool uses 9 inputs that cover cross-section, alignment, roadside hazards and head-on risk to provide an objective assessment of the inherent risk of the road environment. It is intended to be used alongside the practitioner's judgement of other relevant factors such as road users, crash history, high-risk intersections and community feedback in making a decision.

   The outputs of the IRR assessment should be interpreted in the following way when making a speed zoning decision:

a. *'HIGH' and 'MEDIUM-HIGH' risk: these roads will have both low standard cross-section and severe roadside hazards. Consider a speed limit of 80 km/h.*

b. *'MEDIUM' risk: these roads will typically have either severe roadside hazards or a poor alignment and cross section, but not both. Consider an 80 km/h speed limit. In making a decision consider if the road has other factors such as vulnerable road users (e.g. motorcyclists, cyclists, pedestrians, equestrians), high-risk intersections or a demonstrated crash history.*

c. *'MEDIUM-LOW' or 'LOW' risk: these roads will generally be straight or mildly curved and of reasonable cross-section with lower severity roadside hazards. In most cases a 100 km/h speed limit should be appropriate.*

Indication of a high demonstrated crash rate would be evidence of more than 0.2 road safety related casualty crashes per kilometre over 5 years.

3. *A speed limit of 110 km/h can generally only be applied to the highest standard rural roads. To be eligible, a road shall satisfy ALL of the following criteria:*

   a. *Perform an interstate or inter-regional transport function AND*

   b. *Be a divided arterial road or freeway / motorway / tollway with a design speed of 120 km/h AND*

   c. *Have full access control AND*

   d. *Have sealed shoulders and appropriate roadside AND*

   e. *Have a low crash risk determined by a formal road safety risk assessment utilising risk assessment tools such as IRR.*

   Some permitted points of access may exist (generally not more than two per km per carriageway). In general, entry and exit shall be by well-spaced interchanges, and ramps signposted to interchange standards in the case of service centres and rest areas. However, some well-spaced, low volume (< 100 vpd) at-grade intersections should not exclude the section if the crash risk is satisfactory.

   Any hazard (including rigid objects) within the roadside recovery area must be frangible or be shielded by crash barriers.

   A 110 km/h speed limit is not appropriate for sections of freeways in or around the general built-up areas of Melbourne or provincial cities where there are high volumes (> approx. 25,000 vpd (two-way)), complex traffic manoeuvres, high amounts of lane changing and/or relatively closely spaced interchanges (typically < 3km) leading to increased risk associated with potential conflict points.

4. *A 100 km/h speed limit outside built-up areas on non-state managed roads can be implemented as a default speed limit (unsigned) – refer to Section 6.2.2.*

5. *The following situations require a localised speed reduction:*

   a. *At railway level crossings – a speed limit of 80 km/h shall apply – refer to Section 6.2.10 for further details.*

   b. *At isolated traffic signals – a speed limit of 80 km/h shall apply – refer to Section 6.2.11 for further details.*

   Note that for the two above items, offset speed zones are permitted in these instances (i.e. the start and finish of the 80 km/h speed zone do not coincide for each direction of traffic). See DoT / VicRoads Supplement to AS 1742.7 for speed signing details around railway level crossings.

3.2 Speed limits for roads in built-up areas

The process for commencing speed limit setting in built-up areas is illustrated in Figure 6 (notes apply).

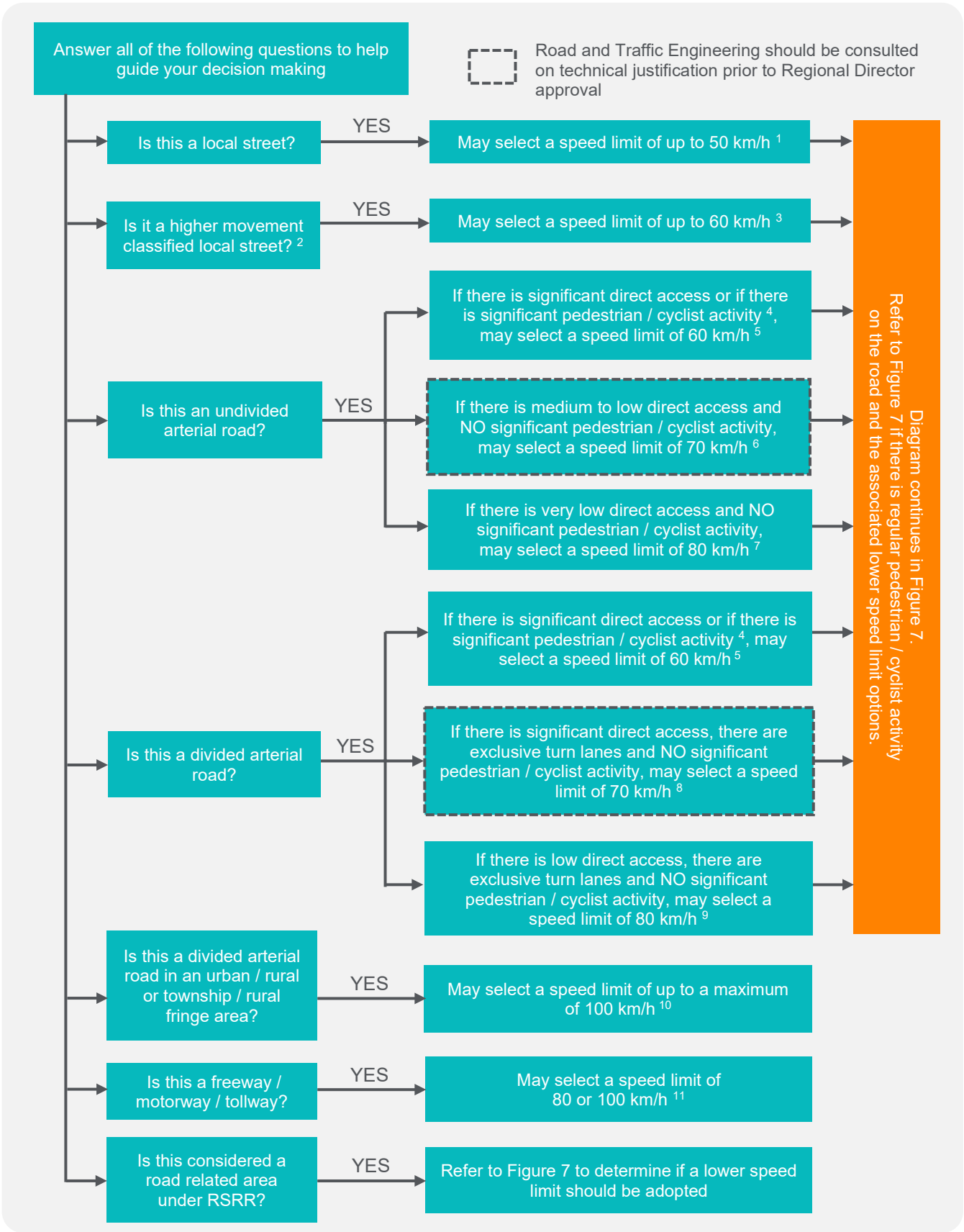


Figure 6: Process for commencing speed limit setting in built-up areas

Notes to Figure 6:

1. *A 50 km/h speed limit in built-up areas can be implemented as either a default speed limit (unsigned) or signposted speed limit.*
2. *For the purpose of determining speed limits in built-up areas, a higher movement classified local street that is designated by the relevant municipal council as a road that performs a traffic function similar to an arterial road may be categorised as an arterial road when using Figure 6.*
3. *A speed limit of 60 km/h may be appropriate on a higher movement classified local street in a built-up area where ALL of the following apply:*
    a. *Appropriate standard of road design and visibility AND*
    b. *Low level of pedestrian and / or cyclist activity AND*
    c. *Insignificant crash history and crash risk, especially related to pedestrians and cyclists AND*
    d. *Support of the local community and council.*

    It is also desirable that the frequency of direct access to properties is less than is generally the case for local streets.
4. *A significant level of pedestrian activity means that there are regular movements of pedestrians across the road such that on most trips a driver expects to see pedestrians crossing the road. Examples include roads with abutting land uses that generate significant pedestrian movements but are not continuous or at a density that would justify a 40 km/h zone, those with closely spaced, well patronised bus stops and along tram routes with kerbside stops.*

    A significant level of cyclist activity means that on most trips along the road a driver encounters cyclists that share the road space and includes locations where there is an on-road bicycle lane. Generally, a road that is designated as a strategically important cycling corridor is considered to have a significant level of cyclist activity, although the actual level should be confirmed. Cycling activity for off road facilities is considered where at grade road crossings occur.

    A 'significant' level of pedestrian / cyclist activity is not to be confused with 'regular' / 'high' levels of pedestrian activity covered in Section 3.4.
5. *A speed limit of 60 km/h may be appropriate for undivided and divided arterial roads:*
    a. *Where there is a significant level of direct access to the road from abutting properties OR*
    b. *Where there is a significant level of pedestrian and/or cyclist activity (refer to note 4) or if there is a history of crashes or identified crash risk involving pedestrians and/or cyclists.*
6. *A speed limit of 70 km/h may be appropriate for undivided arterial roads:*
    a. *Where there is medium to low direct access to the road from abutting properties AND*
    b. *Where there is NOT a significant level of pedestrian and/or cyclist activity (refer to note 4)*

    Installation of a new 70 km/h speed zone should be consulted with Road and Traffic Engineering on its technical justification prior to Regional Director approval.
7. *A speed limit of 80 km/h may be appropriate for undivided arterial roads:*
    a. *Where there is very low direct access to the road from abutting properties AND*
    b. *Where there is NOT a significant level of pedestrian and/or cyclist activity (refer to note 4).*
8. *A speed limit of 70 km/h is appropriate for divided arterial roads:*
    a. *Where there is significant direct access to the main carriageway via driveways and local streets AND*
    b. *Where there are exclusive right turn lanes at median openings AND*
    c. *Where there is NOT a significant level of pedestrian and/or cyclist activity (refer to note 4).*

    Installation of a new 70 km/h speed zone should be consulted with Road and Traffic Engineering on its technical justification prior to Regional Director approval.
9. *A speed limit of 80 km/h may be appropriate for divided arterial roads:*
    a. *Where there are a low number of direct access points to the main carriageway (service roads are present) or controlled access on one or both sides AND*
    b. *Where there are exclusive right turn lanes at median openings AND*
    c. *Where there is NOT a significant level of pedestrian and/or cyclist activity (refer to note 4).*
10. *A speed limit of 100 km/h will generally apply to a divided arterial road with low direct access in the outer urban / rural fringe, subject to a satisfactory safety record and a determination of low risk using a risk assessment methodology that makes reference to IRR or other similar road safety risk assessment tools.*

    Where traffic signals have been installed, a speed limit of 80 km/h shall apply – refer to Section 6.2.11 for further details.
11. *A speed limit of 100 km/h applies to freeways / motorways / tollways with full access control, well-spaced interchanges and high design standards. A lower 80 km/h speed limit may be appropriate on a permanent or variable basis to address geometric and operational concerns on specific sections such as:*

a. *Alignment standard or sight distance issues that are likely to impact the safety and operation of the section of freeway OR*

b. *Closely spaced interchanges and complex weaving manoeuvres OR*

c. *High levels of congestion OR*

d. *Turning roadways or ramps at interchanges OR*

e. *Tunnels with confined cross sections OR*

f. *At freeway terminals OR*

g. *A poor crash history or high crash risk which cannot be addressed through improvements to the road infrastructure in the short-term OR*

h. *Sections that are subject to severe levels of wind or adverse weather, such as elevated roadways (generally variable speed limits would apply, dependent on the conditions) OR*

i. *High traffic volumes where a lower speed limit would optimise traffic flow*

Indication of a poor crash history would be evidence of more than 0.2 road safety related casualty crashes per kilometre over 5 years.

3.3 Consideration of other factors that may influence the speed limit

Further to the notional speed limit determined using Figures 5 and 6, consideration should be given to other factors that may influence the speed limit. A different speed limit may be adopted under certain circumstances to achieve safer travel speeds that align with the function of the road. For example, lower speed limits may be appropriate along roads and in areas where there are high numbers of vulnerable road users or where the crash risk is high because of sub-standard infrastructure. Speed limits that are higher may be appropriate on higher standard roads on which the crash risk is low - for example, divided arterial roads with service roads.

Consideration of other factors that may influence the speed limit should be documented such that decisions can be understood into the future

3.4 Speed limits for school zones and activity centres

The link between impact speed and the risk of death or serious injury when a pedestrian or cyclist is involved in a crash is well established. In areas where there are high levels of pedestrian activity or the risk to pedestrians is high, the speed limit based on either Figure 5 or Figure 6 should be reviewed and a lower speed limit adopted where appropriate in accordance with Figure 7 (notes apply).

All Victorian school speed zones are made under Rule 21 of RSRR. They are provided on school boundary roads that have gates used for student access. They may also be installed at high risk remote crossings that are used by school children in accordance with Section 3.5.

Activity centres include locations where pedestrians and vehicles mix (e.g. shared zones and car parks), road crossings used by school children, shopping precincts, town centres and locations where there is a concentration of land uses that generate a high level of pedestrian movements across roads (not including pedestrian movements along roads) at either controlled or uncontrolled pedestrian infrastructure.

While the focus of this section is primarily on pedestrian safety, the principles apply equally to cyclists. The presence of cyclists on the road (not including cyclists using off-road facilities) is an additional factor that should be considered when deciding on whether a lower speed limit is justified in an activity area.

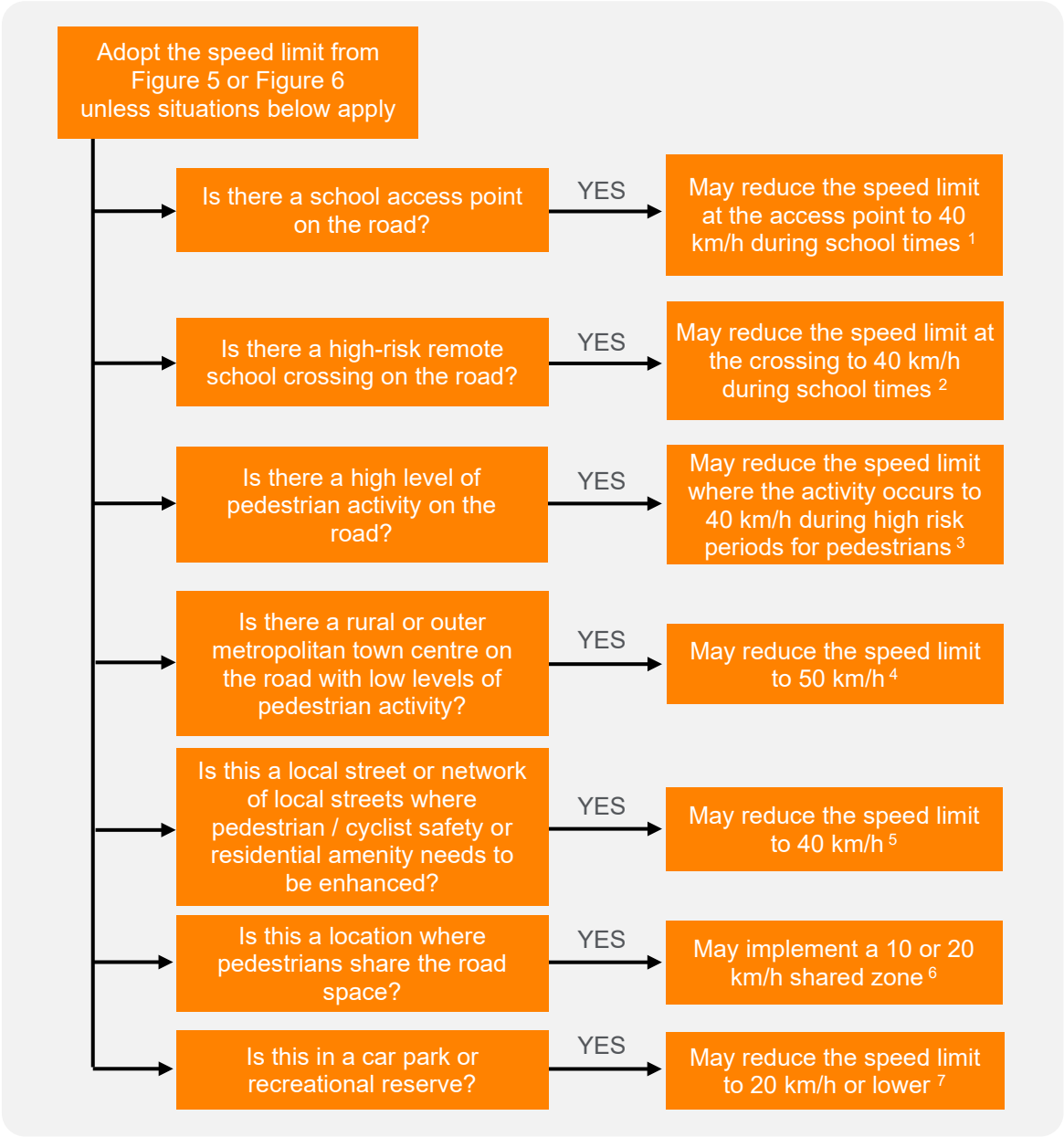


Figure 7: Process for determining speed limits in school zones and activity centres

Notes to Figure 7:

1. *SCHOOL SPEED ZONES*

   Applies at all primary and secondary schools on roads that have boundary gates used for student access. The following limits are to be used:

   a. *Roads with a speed limit of 50 km/h – either a permanent or time-based 40 km/h speed zone*

   b. *Roads with a speed limit of 60 km/h or 70 km/h – a time-based 40 km/h school speed zone*

   c. *Roads with a speed limit of 80 km/h or greater –*

      i. *Where a flagged school crossing is provided, a 40 km/h time-based school speed zone shall be used.*

      ii. *Where a formal pedestrian crossing facility (e.g. pedestrian operated signals) is provided, a 40 km/h time-based school speed zone should be used.*

      iii. *Where no formal pedestrian crossing is provided, a 60 km/h time-based school speed zone is used. Where circumstances do not permit the installation of a formal pedestrian crossing (Note 1 c. ii above) and there is a desire to implement a time-based 40 km/h school speed zone, justification for this preference must be provided and will be assessed on a case-by-case basis.*

   The times of operation of time-based school speed zones are 8:00 am to 9:30 am and 2:30 pm to 4:00 pm on school days (school days are defined in RSRR (2017) (Rule 317A (3)). As these times of operation are well understood by the Victorian community, and in general are observed to lead to a high level of compliance, it is important that these times are not modified. This approach is also consistent with the Road User Expectation Principle which states that speed limits should be set in a consistent manner and that combinations of similar environments and factors should have the same speed limit.

   At locations where significant pedestrian activity occurs outside of the standard school hours, the following options should be investigated:

   a. *The implementation of a time-based activity centre speed zone (note: where the activity centre speed zones are less than 400m long the Chief Engineer – Roads or delegate shall be consulted prior to Regional Director approval).*

   b. *If the school is on a local street, consider installing a full time 40 km/h speed zone.*

   c. *At locations where a school is in close proximity to an activity centre, consider combining the school speed zone with the activity centre speed zone by implementing a single, time-based 40 km/h speed zone.*

   The times of operation of such speed zones shall cover the generated pedestrian activity from both the school and the activity centre.

   At locations where there are adjacent schools up to 500 m apart, the school speed zones should be merged into one.

2. *REMOTE SCHOOL CROSSINGS*

   A remote school crossing is defined as a formal pedestrian crossing (e.g. flagged school crossings, zebra crossings, pedestrian operated signals and marked pedestrian crossings at signalised intersections) that is used by school children and is located on a section of road that does not have a gate that is used by students to access a school.

   Time-based school speed zones may be applied at remote school crossings. As funding can be limited, the priority for individual sites is in accordance with the criteria and assessment process detailed in Section 3.5.

   High-risk remote school crossings should be 40 km/h (refer Section 3.5).

   The times of operation of high-risk remote school crossings shall be in accordance with Note 1 above.

   The Department of Education and Training may have student access plans for schools in Victoria to assist with determining student catchments and directions of approach.

3. *ACTIVITY CENTRES / AREAS*

   A speed limit of 40 km/h may apply on roads where there is a high level of pedestrian activity and a lower speed limit is desirable to reduce the risk to pedestrians and cyclists. Activity centres include strip shopping centres, some rural and outer metropolitan town centres as well as other locations where the land uses abutting the road generate high levels of pedestrian activity. In principle, if there are frequent pedestrian movements across the road, a significant proportion of which are not at controlled crossing points (e.g. a strip shopping centre on an undivided road), a 40 km/h speed limit may be appropriate. Eligible sites must meet the following criteria:

   - *Continuous and directly abutting retail development and/or other types of land uses, for not less than 400 m, that generate frequent pedestrian movements across the road AND*
   - *The abutting development that generates the pedestrian movements should preferably be on both sides of the road but may be predominantly on one side provided that there are frequent movements of pedestrians across the road (e.g. to access car parking) AND*
   - *A high level of pedestrian activity for a minimum of four hours per day, and preferably five days a week.*

   In addition to shopping precincts, land uses that may generate high levels of pedestrian movements (as well as trips by bicycle) include public transport interchanges, offices, hospitals, restaurants, pre-schools and child minding

centres. Lowering of speed limits is not appropriate for isolated facilities but may be considered where there is a combination of these types of land uses.

Locations with seasonal high pedestrian activity (e.g. only during summer months) may be considered for lower speed limits for that part of the year. Similarly, locations with regular, major event-based high pedestrian activity (e.g. around sports arenas) may be considered for time based lower speed limits.

The main carriageways of a divided road with service roads will generally not be suitable for a reduced speed limit, unless there is a history of crashes involving pedestrians or a high risk identified using an established road safety risk assessment methodology, that cannot be addressed by other measures (such as pedestrian operated signals).

The times of operation of time-based 40 km/h speed zones are to be tailored to match the times of high pedestrian activity. Permanent 40 km/h zones may be permitted where activity is high for the majority of each day, seven days a week.

4. *RURAL AND OUTER METROPOLITAN TOWN CENTRES*

Permanent 50 km/h speed zones may be applicable in rural and outer metropolitan (generally more than 30 km from the Melbourne CBD) town centres where there is:

- *Continuous and directly abutting, predominantly retail development on both sides of the road for not less than 200 m, or most of the development on one side of the road with the majority of parking on the opposite side of the road AND*
- *Low level, frequent movement of pedestrians across the road AND*
- *Kerbside parking which results in frequent parking manoeuvres AND*
- *Support from the local community and the municipal council.*

The main carriageways of a divided road with service roads will generally not be suitable for a reduced speed limit, unless there is a history of crashes involving pedestrians or a high risk identified using an established road safety risk assessment methodology, that cannot be addressed by other measures (such as pedestrian operated signals).

5. *LOCAL STREETS*

A 40 km/h speed limit may be applied to a local street or network of local streets that are identified as having a significant level of pedestrian and/or bicycle activity or high residential amenity. If the road environment does not support a 40 km/h speed limit, then consideration should also be given to local area traffic management (LATM) treatments.

Where a 40 km/h speed limit is applied to a network of local streets, the area should be bounded by arterial roads and/or higher movement classified local streets and/or a physical barrier such as a railway line or river. LATM devices or other road design measures should be used to support the 40 km/h speed limit.

A 40 km/h speed limit may also be applied to local streets where residential amenity is to be prioritised by a plan that is formally adopted by a council (e.g. a Principal Pedestrian Network, Walking and Cycling Plan or Integrated Transport Strategy).

6. *SHARED ZONES*

A speed limit of 10 km/h or 20 km/h may be applied by creating a shared zone in streets where pedestrians are given priority over vehicles while maintaining basic access for motor vehicles. The speed limit in a shared zone is covered by Rule 24 of the RSRR. This type of speed limit requires road engineering that is integrated with the surrounding built environment.

7. *CAR PARKS AND RECREATIONAL RESERVES*

All roads and aisles within a car park and recreational reserves that are open to or used by the public are 'road related areas' as defined in RSRR. Accordingly, the Road Rules apply in car parks and recreational reserves. A speed limit of 20 km/h may be applied in car parks and recreational reserves where motor vehicles mix with pedestrians and/or cyclists. The major access and circulatory roads in large shopping centre car parks or recreation reserves may be signed at 40 km/h.

The speed limit may be signed using area speed limit signs or signed as a shared zone.

Speed limit signs will generally not be required where the geometry or other factors will limit vehicles to 20 km/h or lower.

3.5 Assessment of remote school crossings

A remote school crossing is defined as a formal pedestrian crossing (including flagged school crossings, zebra crossings, pedestrian operated signals and marked pedestrian crossings at signalised intersections) that is used by school children and is located on a section of road that does not have a gate that is used by students to access a school.

As discussed in the previous section, a school speed zone may be established at a remote school crossing at which the safety risk for students using the crossing is high and/or funding permits.

The risk at remote school crossings shall generally be determined based on consideration of the following factors which are representative of the likelihood and potential severity of a crash involving a school student:

- traffic speed
- number of school children using the crossing
- traffic volume
- proportion of heavy vehicles
- the type of crossing
- number of traffic lanes to be crossed
- number of conflicting traffic movements
- sight distance limitations.

The level of risk is determined by calculating a risk score for a remote school crossing. The score is indicative of the relative risk based on consideration of the factors listed above. The *Remote School Crossing Risk Assessment Tool* has been developed for this purpose. An online version of the tool is available on the VicRoads website (https://www.vicroads.vic.gov.au/business-and-industry/technical-publications/traffic-engineering) or by contacting a DoT regional office.

The level of risk is then used to prioritise any such sites. A threshold is included to assist with understanding whether a site may be a high priority. Sites generating lower risk scores should still be prioritised and considered.

3.6 Speed limits on unsealed roads

It is common to adopt the default speed limit for unsealed roads where it is considered safe and appropriate.

If the default speed limit is not considered safe and appropriate for an unsealed road, an appropriate signposted speed limit should be adopted. The adopted speed limit should be determined after a thorough assessment of the road environment is conducted. Given the variability that can exist from one unsealed road to another, such assessments should be undertaken on a case-by-case basis and any speed limit mentioned in Table 1 (excluding 110 km/h) can be adopted. Such assessments shall be documented with consideration of the key factors mentioned in Section 3.

Roads with narrow road seals may be considered the same as an unsealed road.

3.7 Length of speed zones

Minimum speed zone lengths are used to restrict the frequency of changes to speed limits along a given route. Frequent changes to speed limits is a common theme of road user concerns regarding speed zone setting. The minimum lengths are shown in Table 6. Where a speed limit is to apply to an isolated short section of road, such as through a small town on a rural road, the minimum length may need to be reduced. In such cases, approval of the Chief Engineer – Roads or their delegate is required following consultation with Victoria Police.

Table 6: Minimum length of speed zones

Speed limit (km/h)	Minimum length of speed zone [1 & 2]
<40	Site specific
40	400 m (except below) 500 m (shopping strips and other pedestrian activity precincts) [3] 200 m (school speed zones) [4]
50	500 m (except below) 300 m (rural and outer metropolitan town centres) [5]
60	600 m (except below) 300 m (school speed zones) [4]
70	700 m
80	800 m (except below) 500 m (at railway level crossings in rural areas) 500 m (at isolated traffic signals in urban / rural fringe areas)
90	900 m
100	2 km
110	10 km (on a freeway that is predominantly 100 km/h) 5 km (on a freeway that is predominantly 110 km/h)

Notes to Table 6:

1. ***The minimum length of speed zones in this table do not apply where a default speed limit or area speed limit is in place.***
2. ***The minimum length of speed zones in this table do not apply to variable speed limits or dynamic variable speed limits on managed motorways.***
3. ***Minimum length of appropriate abutting development is 400 m.***
4. ***School speed zones are generally measured from either side of a school crossing or school boundary gate if there is no marked crossing.***

   The measured distance is either:

   a. ***200 m to 300 m for a prevailing speed limit of 100 km/h.***
   b. ***200 m to 300 m where the school speed zone is 40 km/h and the prevailing speed limit is 70 km/h or greater.***
   c. ***150 m to 200 m for all other situations.***
5. ***Minimum length of appropriate abutting development is 200 m.***

3.8 Speed limit rationalisation

When reviewing and implementing speed limits, consideration must be given to adjacent speed limits so that the number of speed limit changes is minimised, short speed zones do not result, and route consistency is achieved. Generally, any rationalisation of adjacent speed limits should aim to adopt the lower speed limit. However, in circumstances where an increase in the speed limit is considered necessary to achieve the best overall outcome, a thorough analysis of the road safety risk shall be undertaken including the crash history of the relevant section.

3.9 Speed limit consistency

After having determined the most appropriate speed limit using Figures 4, 5, 6 and/or 7, a review should be conducted to check for consistency of speed limits along each length of road, and across a network of roads. It is important to provide road users with consistent and predictable speed limits to minimise potential confusion and unintended outcomes.

For example: An arterial road speed limit is reduced. The reduction results in an abutting local street with a higher speed limit than the arterial road. The arterial road reduction leads to unintended outcomes for the local street. Suggested practice for this example would be to consider reducing the local street speed limit as well as the arterial road speed limit.

3.10 Collecting speed data

When considering altering a speed zone or changing the speed limit, it is necessary to obtain the current speeds vehicles are travelling through that particular section of the network. This speed data provides additional context and allows for a greater understanding of how this subject road is currently operating. In addition, analysing the speed data may support the proposal of changing the speed and may be particularly influential in obtaining support during the stakeholder and community engagement phase for speed changes.

For more information about how to collect and interpret speed data on the network, refer to Section 7.

4 UNDERTAKE STAKEHOLDER ENGAGEMENT

Prior to commencing external engagement regarding alterations to the existing speed limits, it is crucial to consider how this intervention will likely be perceived by the wider community.

4.1 Linking evidence to engagement response

A challenge for speed limit change related community engagement is obtaining feedback from a high portion of road users and understanding the community engagement response.

A study undertaken by ARRB on behalf of DoT identified a concept developed by New Zealand Transport Agency (NZTA) that links engineering data collection to community engagement response. The concept centres around community engagement resistance to a speed limit change being stronger the greater observed speeds are from the proposed speed limit. The New Zealand concept has been simplified in some ways as a means of introducing it into Victorian practice.

The concept relies on engineering 'before data' being translated into 3 simple categories to assist engineers and community engagement personnel in understanding the potential level of engagement response.

The following applies:

Table 7: Linking engineering 'before' data to community engagement response

Category	Engineering 'before' data	Community engagement resistance to speed limit change
Self-explaining	Existing average speeds are below or within 0 km/h to 5 km/h above the proposed new speed limit	LOW
Diverse opinions	Existing average speeds are between 5 km/h to 15 km/h above the proposed new speed limit	MEDIUM
Challenging conversations	Existing average speeds are higher than 15 km/h above the proposed new speed limit	HIGH

Self-explaining – Travel speeds are already close to the new proposed speed limit. The change of speed limit is likely to be consistent and credible with typical road user expectations.

Diverse Opinions – Travel speeds will tend to be close the existing speed limit, or possibly higher. There is likely a strong case for investment however mixed opinions are likely as to how improvements should be made.

Challenging Conversations – Travel speeds are much faster than the proposed new limit. Intervention may require a lowering of the current speed limit, either permanently or for an extended basis until more significant investment can be justified. Discussions around lowering limits can often be challenging, and road authorities need to be prepared for careful and perhaps extended community engagement and consultation.

Before engaging with external agencies or the community, it is useful to identify how the proposed speed limit change aligns with the above three categories to gauge the level of potential community resistance. This can be done by collecting 'before' speed data.

For example, a 'before' speed data collection identifies current travel speeds to be lower or approximately equivalent to the proposed speed limit. Community engagement resistance is considered in this situation to be low. Community engagement is classified as 'self-explaining'. An appropriate community engagement plan for the low resistance to the speed limit change is developed.

Another example, if 'before' speed data collection identifies current travel speeds to be significantly higher than the proposed speed limit, community engagement resistance would be considered high. In this situation, the engagement category is classified as 'challenging conversations' and an appropriate community engagement plan for the higher resistance to the speed limit change should be developed.

This process allows practitioners to adequately prepare for the likely level of engagement for the proposed speed limit change. A speed limit change that has community support is more likely to be successful than a speed limit change that doesn't have community support.

4.2 Stakeholder engagement

Prior to seeking approval for implementation of a speed limit or speed limit change, regardless of the road classification and responsible authority, engagement should occur with:

- Victoria Police
- Department of Transport
- Department of Justice and Community Safety where road safety cameras exist (refer to Section 5.2)
- The relevant municipal council or road authority (e.g. Parks Victoria, Department of Environment, Land Water & Planning)
- In appropriate circumstances, other stakeholders such as public transport operators.

The views of other stakeholders should be taken into account in the decisions made. Engagement with the community and road users is also necessary as is detailed in Section 4.3.

The consultation process and management of stakeholder feedback is typically undertaken by the responsible road authority for the road in question (e.g. for a municipal road, the relevant municipal council would be responsible for this process).

4.3 Community engagement

In accordance with the Speed Zoning Policy all speed limit changes require a level of community consultation in the decision making and implementation.

The community engagement process and management of community feedback is typically undertaken by the responsible road authority for the road in question (e.g. for a municipal road, the relevant municipal council would be responsible for this process). It is expected that the responsible road authority liaises with the relevant DoT regional office at the earliest stage of the project (i.e. during the defining stage of the speed limit investigation).

For DoT managed roads, contact should be made with the relevant DoT regional Strategic Communications and Engagement team to determine the appropriate engagement approach for a proposed speed limit change.

For roads managed by other responsible road authorities (e.g. Council), its own communications/ engagement expertise should be utilised and the process undertaken in consultation with DoT.

5 SEEK NECESSARY APPROVALS TO CHANGE THE SPEED LIMIT

Refer to Section 2.2.1 for legislation relating to the authority to determine speed limits.

Speed limit signs are described in the RS(TM)Regs as major TCDs.

Major TCDs place a significant and legally enforceable condition on what road users may do and/or can have a significant impact on the use of a road.

The power of road authorities to erect, display, place, remove or alter speed zone-related major TCDs is regulated by Part 2, Division 2, regulations 9, 10 and 11 of the RS(TM)Regs and summarised in Table 8.

Table 8: Road authority power to erect speed zone-related Major Traffic Control Devices

Road or Road Related Area is part of:	Power to erect, display, place, remove or alter TCDs	Conditions
Regulation 9 – DoT		
A freeway	All TCDs	None
An arterial road	All TCDs	None relating to speed zoning
Other than part of a freeway or arterial road	Speed-limit devices (road lengths and areas)	Under reg. 9(4) and 10 – DoT must consult with relevant councils
	Shared zone devices	
Regulation 11(1) – Responsible road authorities (other than Councils)		
An area under road authority's care and management	All Major TCDs other than a temporary works speed limit sign	With the authority of DoT
Regulation 11(2) – Councils		
An arterial road	A Major TCD	With the authority of DoT

An application for a Memorandum of Authorisation (MOA) must be made to DoT when the responsible road authority / Council does not have the power to use a major TCD or requires the authority of DoT to use a major TCD. Applications should include all the information required by DoT to determine that the need for a major TCD is valid and justified and conforms to appropriate technical references and practice. It may be appropriate for applications to be accompanied by a covering report, site plan, sight distance diagrams, traffic and/or pedestrians counts, crash data/diagrams and/or details regarding stakeholder and community engagement.

For DoT delegation and authorisation of powers under the RS(TM)Regs, refer to Section 2.2.

5.1 Administrative process

Speed limits on the road network should be reviewed where there are road safety concerns and when there are changes in the level of abutting land use or changes to the road itself. In areas of high population growth, factors affecting speed limits should be monitored and speed limits changed, as necessary, in accordance with these guidelines.

Applications for a new speed limit or alterations to an existing speed limit must be submitted to the relevant DoT region. This can be initiated by the local council, DoT, Major Transport Infrastructure Authority (MTIA), Victoria Police or other road authorities (e.g. Parks Victoria, shopping centre operators). Proposals initiated by municipal councils are to be submitted using the Speed Sign Management System (SSMS). Proposals shall be based on consideration of all relevant information including the extent of abutting development, the locations of existing speed limit signs, the proposed location of the new signs, the crash history, crash risk and any available information about road user movements, particularly in relation to pedestrians and cyclists.

Access to SSMS is available at the following website address: www.openofficeonline.com.au/SSMS. Users are required to have a registered username and password.

All documentation in relation to a speed limit change shall be retained by DoT as the Coordinating Road Authority in an accessible form for possible future legal purposes, particularly the document of written consent and the date of installation, modification or relocation of speed limit signs. This requirement also applies to temporary roadwork speed limits.

Where a speed limit change is on a municipal road, any queries or concerns raised by stakeholders regarding its installation shall be resolved by the relevant municipal council.

These guidelines are intended to clearly define the appropriate speed limit for a set of circumstances. Consultation with stakeholders including Victoria Police, Department of Justice and Community Safety, local government and the community shall be undertaken as required, in accordance with these guidelines, prior to the implementation of speed limit changes.

5.2 Impact on traffic signals and fixed safety camera operation

Where a speed limit is to be changed, the need to change traffic signal timings (e.g. intergreen times) shall be assessed at any directly affected traffic signal sites. Traffic signal phasing may also need to be assessed as part of this process. Proposed speed limit changes in the vicinity of traffic signals shall be referred to DoT Signal Services for these purposes.

A check shall be undertaken to determine whether the operation of any fixed safety camera is impacted by a proposed speed limit change. The following protocols are to be applied where a change in speed limit is being considered at a location covered by an existing road safety camera (fixed) or in close proximity to one:

1. DoT's Infrastructure Liaison Officer should be utilised as a central point of contact to the Department of Justice and Community Safety (DJCS).
2. For lower speed limits, such as 40 km/h zones, consider whether infrastructure may be included to make the site 'look and feel' like its new speed limit.
3. Conduct and report on an onsite signage audit to ensure signage is installed in accordance with current best practice as outlined in these guidelines.
4. Consider the potential road user behaviour risks associated with higher speed limit signs visible to road users from the road safety camera site.
5. Consider the need for any traffic signal changes such as 'yellow time' amendments as a result of the proposed speed limit change. The DoT point of contact for such liaison is the Manager - Signal Services (East or West).
6. Refer details of the proposed changes, including the signage audit and (where relevant) traffic signal changes to the Fixed Camera Site Selection Committee for endorsement that road safety camera risks have been adequately considered prior to approval.
7. Obtain approval from an authorised officer to the speed limit change in accordance with RMA, Schedule 4 (13) – Power to Determine Speed Limits.
8. Obtain approval from an authorised officer to the location of speed signs in accordance with the RS(TM)Regs, Division 2 – Road authority power to erect traffic control devices.

5.3 Additional measures

The implementation of new speed limits, particularly lower speed limits, require specific actions to maximise effectiveness and ensure fairness to road users. Some measures that should be considered include:

- temporary installation of ‘NEW SPEED LIMIT AHEAD’ signs (refer to Table 9) in advance of the start of the new speed limit in each direction, generally for a period of one to four months
- temporary installation of 'NEW LIMIT' supplementary signs (refer to Table 12) at the start of the new limit and, as necessary, under all other speed limit signs in the newly created zone, generally for a period of one to four months
- local media / social media campaigns
- speed advisory trailers for a short time period.

6 IMPLEMENT THE SIGNAGE

Any speed zone signing scheme needs to provide legal functionality for enforcement purposes and fairness to ensure that compliance is maximised. The legalities relating to speed limit signs are covered by the RSRR, Rules 21 to 25, 315, 316, 317, Part 20 and Schedules 2 and 3.

A speed zone signing scheme generally comprises of the following types of speed signs:

- Advance speed signs advising motorists of the speed limit ahead (where required)
- Regulatory speed limit signs to introduce the new speed limit
- Repeater speed limit signs to ensure motorists are always aware of the speed limit

Section 6.1 contains guidance on general signing requirements that apply to all speed zones.

Section 6.2 contains guidance on signing arrangements that apply to specific types of speed zones.

6.1 General signing requirements

Guidance on general requirements applicable to speed signing is contained in this section.

Speed limit signs are generally placed on the left side of the road where motorists can see them. Speed limit signs should be duplicated on the right side of the road where there is a reduction in the speed limit, on multi-lane roads or where the additional sign would be beneficial.

Where a speed sign is to be placed near an intersection, the sign should be 20 – 50 m from the intersecting road to ensure that motorists who have turned from the intersecting road have adequate opportunity to read the sign. This distance may be increased in rural, high speed areas.

No other sign shall be erected on any post carrying a speed limit sign unless it is a sign specified for supplementary use with a speed limit sign. Where it becomes necessary to convey two or more different messages at the one location, signs at separate locations should be used.

Care should be taken to ensure that any speed limit signs are not placed in locations where they can be misleading. Speed limit signs and advisory speed signs (used with warning signs) showing different values shall not be placed where drivers can read both signs at the same time.

The use of electronic speed limit signs is primarily a measure to improve conspicuity on busy roads where time-based variable speed limits are implemented.

By following these guidelines, both the legal and fairness objectives will be achieved for typical situations.
Speed sign schedule

Table 9 provides an overview of regulatory, advance and advisory speed signs used on the Victorian road network. Details including the relevant sign code and available sign sizes for each sign type is also provided.

Detailed drawings for Australian Standard signs can be found in *Australian Standard AS 1743 Road Signs - Specifications*; Victorian specific signs can be found in the DoT / VicRoads supplement to AS 1743.

Signs shall be manufactured in accordance with DoT / VicRoads Specification Standard *Section 860* and installed in accordance with *Australian Standard AS 1742.2 Traffic Control Devices for General Use* and the DoT / VicRoads supplement to AS 1742.2.

All non-electronic signs shall be retroreflective in accordance with *Australian Standard AS 1742.1 General Introduction and Index of Signs*, the DoT / VicRoads supplement to AS 1742.1 and the requirements of *Australian Standard AS 1906.1 Retroreflective Sheeting*.

For supplementary signs not shown in Table 9, refer to Section 6.1.4.

Figure 8 provides an illustration of how different types of speed signs are typically used on the Victorian road network.

Table 9: Speed sign schedule

Regulatory signs			
Standard speed limit signs			
Name	Diagram	Sign No.	Size (mm)
Speed Limit		R4-1A R4-1B R4-1C R4-1D	450 × 600 600 × 800 900 × 1200 1200 × 1600
School zone signs			
Name	Diagram	Sign No.	Size (mm)
School zone speed limit sign (wide format)		R4-V105B R4-V105C	1200 x 1150 1800 x 1725
School zone speed limit sign (narrow format)		R4-V106B R4-V106C	600 x 1684 900 x 2511
Pedestrian activity areas			
Name	Diagram	Sign No.	Size (mm)
Speed Limit sign (single time of operation)		R4-V114-1B R4-V114-1C	600 x 1000 900 x 1500
Speed Limit sign (multiple times of operation)		R4-V114-2B R4-V114-2C	600 x 1460 900 x 2200

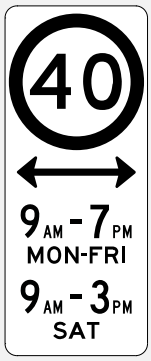
Area speed zones			
Name	Diagram	Sign No.	Size (mm)
Speed Limit AREA		R4-10A R4-10B	450 x 750 600 x 1000
END Speed Limit AREA		R4-11A R4-11B	450 x 750 600 x 1000
END Speed Limit AREA (at linear speed zone transition)		R4-13A R4-13B	450 x 150 600 x 200
Speed Limit AREA reminder		R4-14A R4-14B	450 x 750 600 x 1000
Area speed zones			
Name	Diagram	Sign No.	Size (mm)
Shared zone		R4-4	450 x 750
END shared zone		R4-5	450 x 750

Electronic signs			
Name	Diagram	Sign No.	Size (mm)
Electronic speed limit sign		Refer to DoT / VicRoads Specification *TCS 037* Main sizes used: equivalent to B and C Note: When displaying the prevailing speed limit, all pixel rings of the annulus shall be static. When displaying the reduced speed limit, there shall be a combination of static and flashing pixel rings to satisfy the regulatory status of the sign.	

Advance speed signs

Speed limit ahead signs

Name	Diagram	Sign No.	Size (mm)
Speed limit AHEAD		G9-79B G9-79C G9-79D	600 x 1000 800 x 1350 1200 x 2025
Speed limit AHEAD sign (single time of operation)		G9-V79-1B G9-V79-1C G9-V79-1D	600 x 1200 900 x 1800 1200 x 2400
Speed limit AHEAD sign (multiple times of operation)		G9-V79-2B G9-V79-2C G9-V79-2D	600 x 1600 900 x 2400 1200 x 3200
Speed limit AHEAD on side road sign		G9-V79-3A G9-V79-3B G9-V79-3C G9-V79-3D	450 x 750 600 x 1000 900 x 1500 1200 x 2000

Speed limit AHEAD on side road sign (with operating times)		G9-V79-4B G9-V79-4C G9-V79-4D	600 x 1650 900 x 2500 1200 x 3350
		Note: arrow may be single headed (left or right direction)	
New speed limit ahead sign		G9-V201B G9-V201C	600 x 910 900 x 1365
Advisory signs			
Name	Diagram	Sign No.	Size (mm)
Drive to conditions supplementary sign		W8-V129	600 x 305

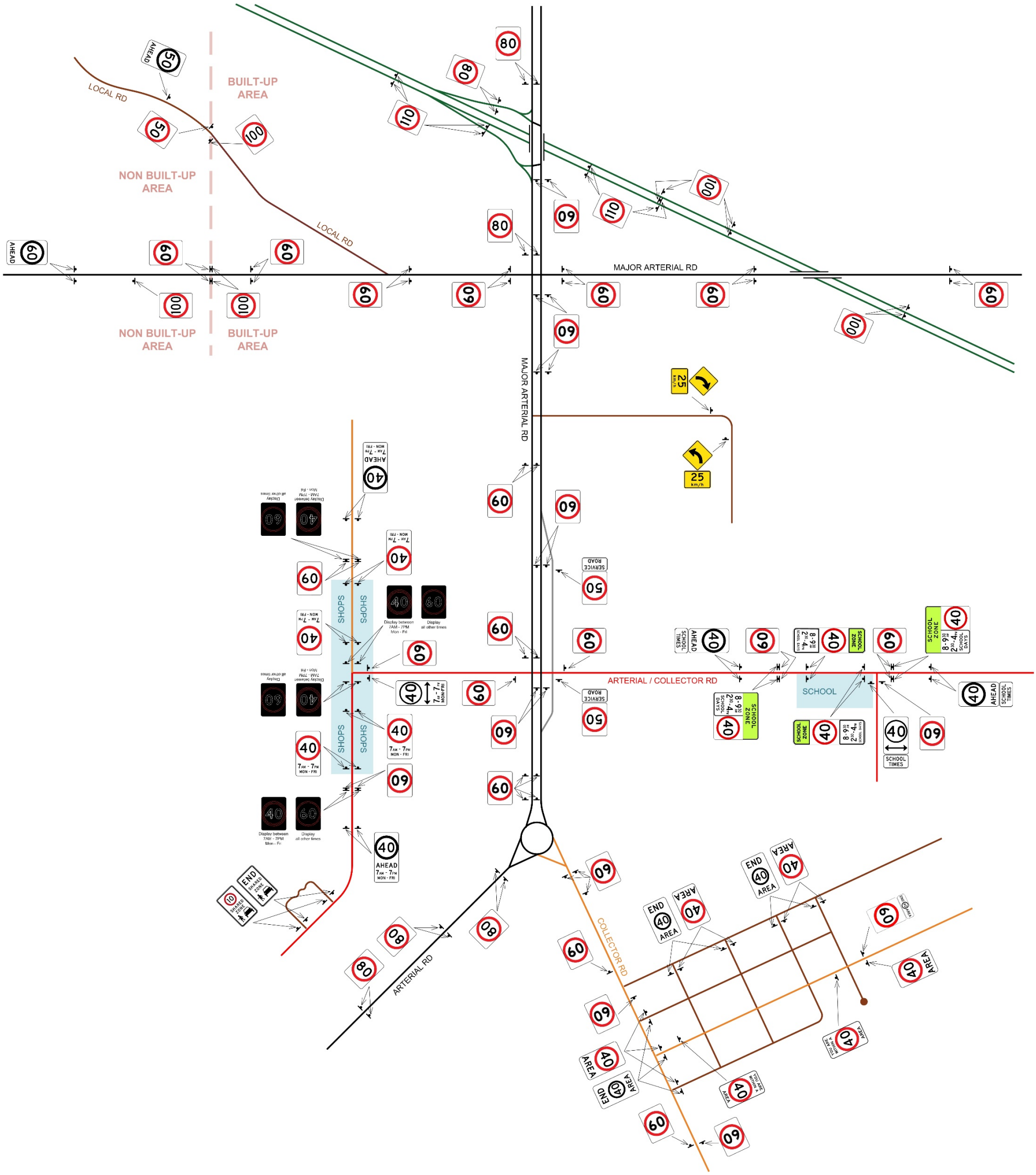


Figure 8: Example layout of speed signs on a road network.

6.1.1 Speed sign sizes

A range of sizes is available for regulatory, advance and advisory speed signs depending on the circumstances outlined in the table below. The sizes available for a particular sign type is shown in Table 9.

Table 10: Overview of speed sign sizes

Road type	Situation	Minimum sign size [1 & 2]
Municipal road (local street) (including other responsible road authority road)	All speed limit and related signs (except below)	B [3]
	Speed limit change on the same road where reduction is 30 km/h or greater (speed limit AHEAD and first regulatory speed sign only)	C [3 & 4]
	Repeater sign with no times of operation information	A
	Shared zone signs	A
Arterial road Higher movement classified local streets	All speed limit and related signs (except below)	B [3]
	Speed limit change on the same road where reduction is 30 km/h or greater (speed limit AHEAD and first regulatory speed sign only)	C [3 & 4]
Freeway / Motorway / Tollway (including ramps and collector-distributors)	All speed limit and related signs (except below)	C
	Start of new speed limit at the end of a 110 km/h speed zone (speed limit ahead and first regulatory speed sign only)	D

Notes to Table 10:

1. ***The above guidance should be considered as the minimum standard of speed sign sizes. Larger sign sizes may be used without further approvals with appropriate judgement (e.g. where additional emphasis or greater conspicuity is required).***
2. ***Use of speed limit signs below the minimum sign size requires consultation with the Chief Engineer – Roads or delegate to seek support and justification of the proposed size.***
3. ***Larger speed limit signs are used for certain school zone scenarios – refer to Section 6.2.3 for further guidance.***
4. ***Electronic speed limit signs are generally B size.***

6.1.2 Speed limit transitions

At a speed limit transition, the following signs are required:

- A speed limit AHEAD sign (G9-79), where the conditions in Section 6.1.2.1 are met.
- A regulatory speed limit sign at the location of the speed limit change.

6.1.2.1 Speed limit AHEAD sign

At locations where there is a reduction in the speed limit of 30 km/h or greater, a speed limit AHEAD sign (G9-79) shall be installed to inform drivers on the approach to the lower speed limit. The speed limit AHEAD sign should be installed approximately 300 to 400 m in advance of the posted change in speed limit.

The speed limit AHEAD sign is also used in advance of:

- time-based school speed zones (with the G9-V202 'school times' supplementary sign)
- activity centres where the prevailing speed limit is 60 km/h or greater
- 50 km/h rural and outer metropolitan town centre speed zones, irrespective of the adjacent speed zone.

In these situations, the speed limit AHEAD sign should be installed approximately:

- 100 to 200 m in advance of the speed zone where the change in speed limit is 20 km/h or less
- 300 to 400 m in advance of the speed zone where the change in speed limit is 30 km/h or greater.

G9-79 speed limit AHEAD sign

6.1.2.2 At speed change location

At the location of the speed limit change, a regulatory speed limit sign (R4-1) showing the new speed limit shall be provided.

Where the transition is to a default speed limit (i.e. to a 50 km/h or 100 km/h default speed limit), a 'courtesy' regulatory speed limit sign (R4-1) should be provided at the transition point. It should be noted that the provision of the 'courtesy' regulatory speed limit sign does not constitute the implementation of a signposted speed zone, and the requirements for signing default speed limits still apply.

END speed limit signs (R4-12) are generally not used in Victoria as it is considered they do not provide drivers with a clear understanding of the applicable speed limit.

6.1.3 Repeater speed limit signs

Repeater speed limit signs are used to ensure that motorists are always aware of the correct speed limit by reminding them at frequent intervals.

Repeater speed limit signs are used to:

- Remind road users of the applicable speed limit, particularly just beyond the beginning of a zone where the speed limit is reduced.

- Reassure road users of the speed limit in situations where the speed limit might appear to be inconsistent with the surrounding development (e.g. where there is a short length of relatively open country between two built-up areas which is too short to be signposted with a higher speed limit).
- Advise drivers turning into the road at a busy intersection of the speed limit that applies to that road.

Repeater speed limit signs should be installed in accordance with Table 11.

Repeater speed limit signs should also be placed on the departure from all important intersections at a distance of approximately 20 – 50 m from the intersection. “Important” should generally be interpreted as meaning arterial road intersections, intersections with higher movement classified local streets that are signposted at 60 km/h or above and other roads where there are traffic signals at the intersection.

Engineering judgement should be applied to adjust the spacing of repeater signs as required to ensure that the use of repeater signs is not excessive. Examples include:

- Adjusting the spacing of the repeater sign so that it is located after an intersection, rather than before.
- Where there are closely spaced intersections, placing a repeater sign after the last intersection, rather than after each one.

Repeater signs in school speed zones, 40 km/h shopping strips and other pedestrian activity zones and in 50 km/h rural and outer metropolitan town centres are outlined in Sections 6.2.3, 6.2.4 and 6.2.9 respectively.

Repeater signs on freeways / motorways / tollways, particularly urban freeways / motorways / tollways, may need to be located at intervals closer than specified in the above table to suit freeway traffic management systems and / or closely spaced interchanges. Typical locations of repeater signs on freeways at interchanges are shown in the DoT / VicRoads supplement to AS 1742.2. Also, further guidance on electronic repeater signs on managed freeways can be found in the *DoT / VicRoads Managed Freeways Handbook for Lane Use Management, Variable Speed Limits and Traveller Information*.

Repeater signs are not required on roads where the default speed limit has been adopted.

Table 11: Spacing of repeater signs

Speed limit (km/h)	Approximate spacing of repeater signs [1 & 2]		
	First repeater sign	Second repeater sign [3]	Subsequent repeater signs
<40	Site specific	Site specific	Site specific
40	50 m	300 m	300 m
40 (school speed zone and pedestrian activity areas)	50 m	100 – 150 m [4]	100 – 150 m [4]
40 AREA	50 m [5]	Not required	Not required
50	50 m	300 m	300 m
60	100 m	300 m [4]	500 m [4]
60 (school speed zone)	50 m	100 – 150 m [4]	100 – 150 m [4]
70	100 m	300 m	500 m
80 (built up areas)	100 m	300 m	500 m
80 (rural areas)	200 m	500 m	2 km
90	100 m	500 m	1 km
100 / 110	200 m	500 m	5 km

Notes to Table 11:

1. ***Distances are measured from the previous speed limit / repeater sign.***
2. ***Repeater signs are not required on roads where the default speed limit has been adopted.***
3. ***The second repeater sign is generally only required where there is a speed limit reduction.***
4. ***Additional guidance for repeater signs in school zones and pedestrian activity areas can be found in Sections 6.2.3 and 6.2.4 respectively.***
5. ***40 AREA repeater signs are generally only required on more significant roads within the area speed zone.***

6.1.4 Supplementary signs

Supplementary signs may be installed with speed signs to indicate a condition that applies to the speed limit. Common examples of supplementary signs are shown below.

The sign size of the supplementary sign shall be the same as the parent sign (e.g. a B size supplementary sign would be used with a B size speed limit sign).

Table 12 lists some of the more commonly used supplementary signs.

Table 12: Commonly used supplementary signs

Commonly used supplementary signs	
	SERVICE ROAD supplementary sign (G9-V81) may be placed underneath a speed limit sign on a service road to clarify that the speed limit sign applies to the service road and not the main carriageway.
	ON RAMP supplementary sign (G9-90) may be placed underneath a speed limit sign on a ramp to clarify that the speed limit sign only applies to the ramp.
	ON BRIDGE supplementary sign (G9-49) may be placed underneath a speed limit sign on a bridge to clarify that the speed limit sign applies to the bridge.
	SCHOOL TIMES supplementary sign (G9-V202) is placed underneath a school speed zone speed limit AHEAD sign.
	NEW LIMIT supplementary sign (R9-V112) may be placed underneath a regulatory speed limit sign in accordance with Section 5.3.

Other supplementary signs may be considered for use with speed limit signs where further clarification is required regarding location, day and/or time of operation. However, care shall be required to ensure that the supplementary message does not contravene the road rules and/or cause driver confusion regarding the applicable speed limit.

Supplementary signs may be used to indicate a special hazard where it is necessary to inform drivers of the reason for a lower speed limit than might be expected (e.g. “ROAD WORK” or “NO SHOULDER”).

6.1.5 Speed limit pavement markings

Speed limit pavement markings are advisory only – they have no legal effect and should only be used where it is necessary to provide additional advice to drivers of a change in the speed limit.

DoT usual practice is to avoid the use of speed limit pavement markings on arterial roads.

When the use of pavement markings is being considered, the following principles and guidance should be applied:

Pavement markings principle 1: Pavement markings should have a practical function that cannot be provided adequately by regulatory speed limit signs.

The primary purpose of pavement markings is to provide enhanced information to drivers to support regulatory speed limit signs. Generally, they should only be used at the start of a speed zone where there is a reduction in the speed limit and the effectiveness of the regulatory signs is compromised (e.g. the signs may be offset further from the traffic stream than desired). Pavement markings should not be relied upon to reduce vehicle speeds. Research relating to the effect of speed limit pavement markings on the behaviour of drivers is inconclusive.

Pavement markings principle 2: Pavement markings should not cause confusion.

Pavement marking should only be used at locations where there is little or no chance of confusion regarding the applicable speed limit. Situations may arise where there is a conflict between the pavement markings and the speed limit e.g. if a temporary lower speed limit is in force during road works or an event. The implications of possible confusion should be considered before installing speed limit pavement markings. Practitioners should note that the risk of possible confusion resulting from temporary lower speeds such as during road works is increased where the permanent speed on the roads is greater than 40 km/h. Pavement markings shall not be used in conjunction with variable speed limits.

Pavement markings principle 3: Pavement markings must be clear and comprehensible.

Where pavement markings are used to provide supplementary speed limit advice to drivers they should comply with AS 1742.2.

The responsible road authority shall be prepared to maintain the pavement markings. Pavement markings should be maintained or remarked if the condition of the markings shows signs of deterioration.

6.2 Signing arrangements for specific scenarios

Guidance on the signing arrangements for specific speed limits and situations is contained in this section.

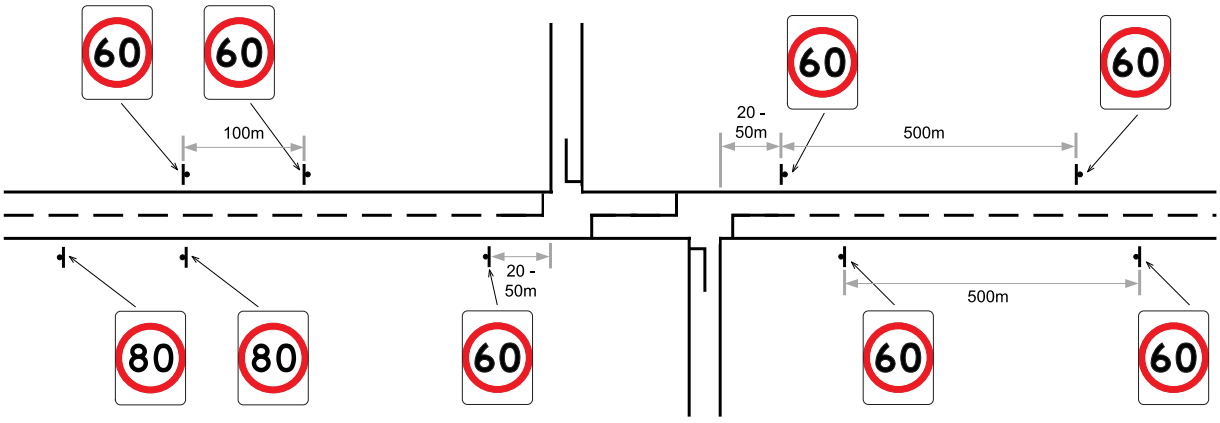
6.2.1 General signposted speed limit

For guidance on the provision of a general signposted speed limit sign, the requirements contained in Section 6.1 apply.

A general signposted speed zone comprises of the following:

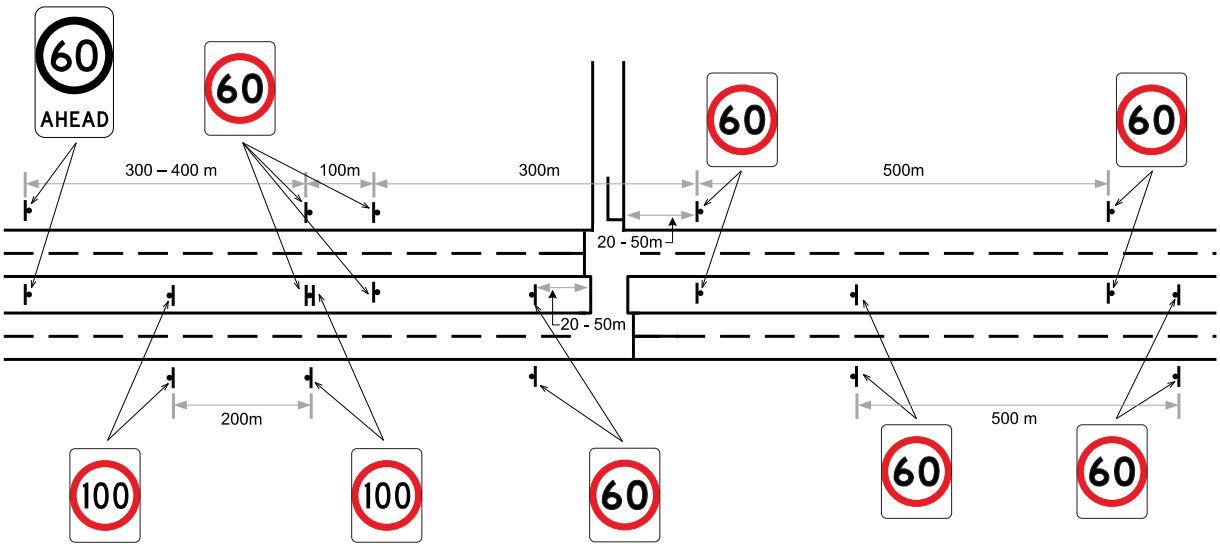
- Advance speed signs advising motorists of the speed limit ahead where the decrease in posted speed limit is 30 km/h or greater (refer to Section 6.1.2).
- Regulatory speed limit sign(s) to introduce the new speed limit at the commencement of the new speed zone.
- Repeater speed limit signs place strategically along the road to ensure motorists are always aware of the speed limit (refer to Section 6.1.3).

Figure 9 below shows a typical arrangement of speed signs for a general signposted speed limit.



Undivided road

(transition between 80 km/h and 60 km/h speed limits shown)



Divided road

(transition between 100 km/h and 60 km/h speed limits shown)

Figure 9: Typical arrangement of speed signs for a general signposted speed limit

6.2.2 Default speed limits

Where a decision has been made to apply the default speed limit along a road, speed limit signs are not required except for a 'courtesy' speed limit sign at the transition to the default speed limit (refer to Section 6.1.2.2).

6.2.3 School speed zones

There are three types of signing arrangements for school speed zones in Victoria:

- Type 1 arrangement may be used on 50 km/h local streets and includes the use of permanent standard 40 km/h speed limit signs.
- Type 2 arrangement may be used on 50 km/h, 60 km/h and some higher speed roads and includes the use static time-based school speed zone signs.
- Type 3 arrangement includes the use of electronic time-based signs to improve the conspicuity of the zone to drivers where speed limits or traffic volumes are relatively high.

Details regarding the first regulatory speed limit sign used in each of these types of school speed zones is detailed in Table 13. Further requirements regarding associated advance speed signs, repeater signs, side road signs and signs at speed limit transitions are illustrated in the figures that follow Table 13.

There may be situations where enhancements to the signing arrangements are required to make the signs more conspicuous to approaching drivers (e.g. distracting information in the background of the signs). Possible conspicuity upgrades are included in Table 13.

The signing arrangements described in Table 13 are considered to be best practice to ensure drivers are made aware of the school speed zone. These signing arrangements take into account the level of pedestrian activity, traffic volumes and maximising the level of driver compliance. It should be noted the signs outlined in Table 13 are the minimum standard and practitioners are able to use a higher level of signage without further approvals. However, any proposals to use a lower standard of signing will require the support of the Chief Engineer – Roads or delegate following a safety assessment of the proposal.

Where electronic time-based speed signs are provided for school speed zones, the electronic sign shall display the school speed zone speed limit during school times only (the sign shall be blank at all other times). However, there may be situations where it is necessary to display the prevailing speed limit outside of school times as well (e.g. where a Type 3 school speed zone is introduced shortly after an important intersection and there are no signs to advise drivers who have just turned into the road of the applicable speed limit outside of school times).

Table 13 show typical signing layouts for a range of common situations. Where the actual site conditions are different, the signing layout should be modified to suit.

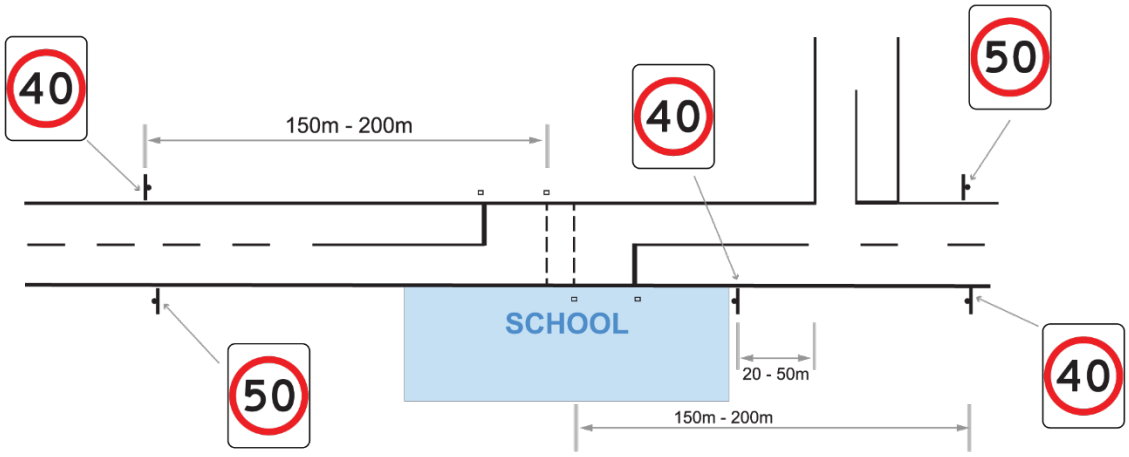
Table 13: Signing arrangements for first regulatory speed limit sign at school speed zones

50 km/h roads [1]			
School speed zone type	First regulatory speed limit sign	Minimum standard sign size [4 & 5]	Suggested conspicuity upgrade
Type 1 - Figure 10	Static 40 km/h speed limit sign (R4-1)	B [2]	Duplicate sign
Type 2 - Figure 11	Static time based 40 km/h school zone speed limit sign (R4-V105)	B [2]	Duplicate sign
60 km/h roads [1]			
Traffic volume / school speed zone type	First regulatory speed limit sign	Minimum standard sign size [4 & 5]	Suggested conspicuity upgrade
< 5,000 vpd Type 2 - Figure 11	Static time based 40 km/h school zone speed limit sign (R4-V105)	B [2]	C size or duplicate B size sign
5,000 ≤ 10,000 vpd Type 2 - Figure 12	Duplicate static time based 40 km/h school zone speed limit sign (R4-V105)	B [2]	C size signs
> 10,000 and ≤ 20,000 vpd Type 2 - Figure 12	Duplicate static time based 40 km/h school zone speed limit sign (R4-V105)	C [2]	Duplicate electronic B size signs with Regional Director approval
> 20,000 vpd Type 3 - Figure 13	Duplicate electronic time based 40 km/h speed limit sign	B (electronic)	Larger electronic signs with Regional Director approval
70 km/h roads [1]			
Traffic volume / school speed zone type	First regulatory speed limit sign	Minimum standard sign size [4 & 5]	Suggested conspicuity upgrade
< 500 vpd Type 2 - Figure 12	Duplicate static time based 40 km/h school zone speed limit sign (R4-V105)	C	Duplicate electronic B size signs with Regional Director approval
> 500 vpd Type 3 - Figure 13	Duplicate electronic time based 40 km/h speed limit signs	B (electronic)	Larger electronic signs with Regional Director approval
Flagged school crossing [3] Type 3 - Figure 16	Duplicate electronic time based 40 km/h speed limit signs	B (electronic)	Larger electronic signs with Regional Director approval

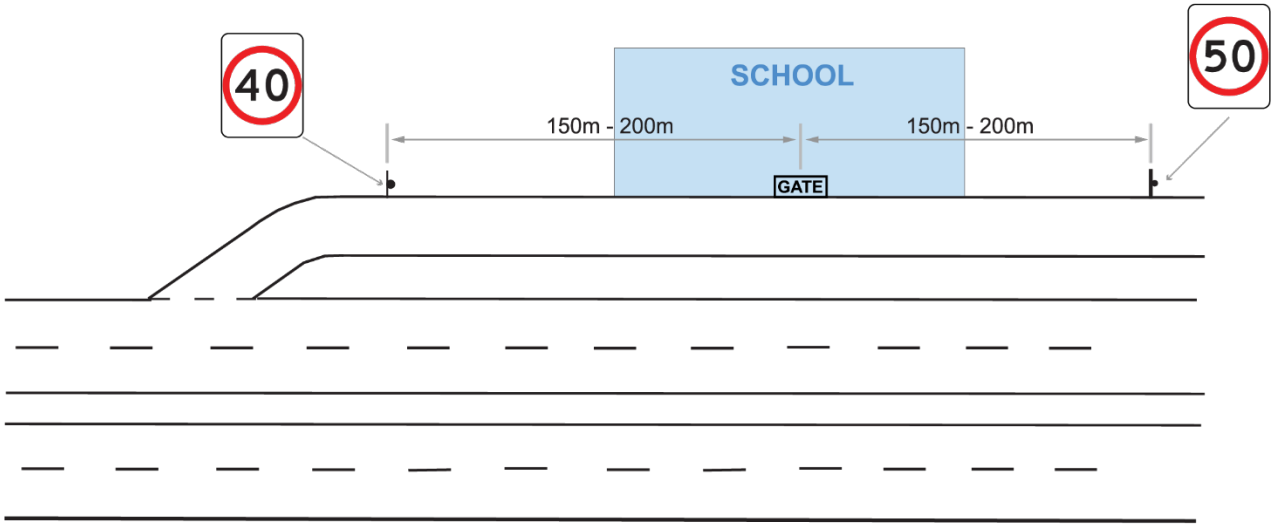
≥ 80 km/h roads with 60 km/h school speed zone *(no school / formal pedestrian crossing)* [1]			
Traffic volume / school speed zone type	First regulatory speed limit sign	Minimum standard sign size [4 & 5]	Suggested conspicuity upgrade
< 500 vpd and 80 km/h speed limit Type 2 - Figure 14	Duplicate static time based 60 km/h school zone speed limit sign (R4-V105)	B [2]	C size signs
< 500 vpd and 90 or 100 km/h speed limit Type 2 – Figure 14	Duplicate static time based 60 km/h school zone speed limit sign (R4-V105)	C [2]	Larger advance speed signs (G9-79 with G9-V202)
> 500 vpd and ≥ 80 km/h speed limit Type 3 - Figure 15	Electronic time based 60 km/h speed limit signs	B (80 km/h road) or C (90 or 100 km/h road) electronic	Larger electronic signs with Regional Director approval
≥ 80 km/h roads with 40 km/h school speed zone *(with school / formal pedestrian crossing)* [1]			
Traffic volume / school speed zone type	First regulatory speed limit sign	Minimum standard sign size [4 & 5]	Suggested conspicuity upgrade
< 500 vpd [3] Type 3 - Figure 16	Duplicate electronic time based 40 km/h speed limit signs	B (electronic)	Larger electronic signs with Regional Director approval
> 500 vpd [3] Type 3 - Figure 16	Duplicate electronic time based 40 km/h speed limit signs	C (electronic)	Larger advance speed signs (G9-79 with G9-V202)

Notes to Table 13:

1. ***Where a single combined school zone is to be implemented to cover several closely spaced schools along the same stretch of road, refer to Figure 18 for guidance.***
2. ***Narrow format signs may be used where there are physical constraints in positioning larger signs.***
3. ***Where there is a pre-existing time based 40 km/h school speed zone on a road on which the prevailing speed limit is to be increased from 60 or 70 km/h to 80 km/h, the 40 km/h school speed limit shall be retained.***
4. ***Use of speed limit signs below the minimum sign size requires consultation with the Chief Engineer – Roads or delegate to seek support and justification of the proposed size.***
5. ***Larger sign sizes and/or higher standard of signs may be used without further approvals if funding permits with appropriate judgement (e.g. where additional emphasis or greater conspicuity is required).***



50 km/h roads



Service road

Figure 10: Type 1 layout - school speed zones on roads with 50 km/h default or signposted speed limit

Notes to Figure 10:

1. ***Where pedestrians cross the main carriageway(s) of the major road in the vicinity of the school that abuts a service road, a school zone speed limit is also required on the major road carriageway(s) – refer to Figure 19.***
2. ***If a speed limit sign on a service road is likely to cause confusion on the main carriageway, a 'SERVICE ROAD' supplementary sign (G9-V81) should be added below the service road speed limit sign.***
3. ***School speed zones are generally located 150 – 200 m either side of a school crossing or school boundary gate if there is no marked crossing.***
4. ***A repeater sign should be installed 20 – 50 m on the departures from any intersecting side road and in accordance with Table 11.***
5. ***Advance speed signs are not required for Type 1 signing arrangements where the prevailing speed limit is less than 60 km/h.***

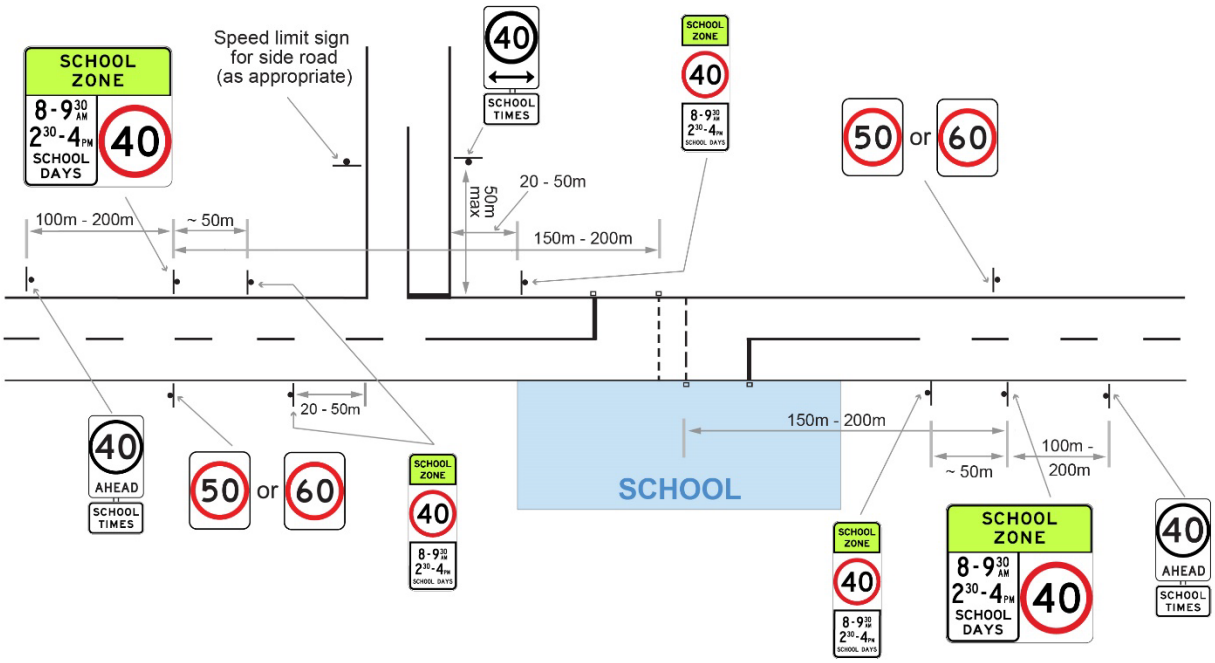
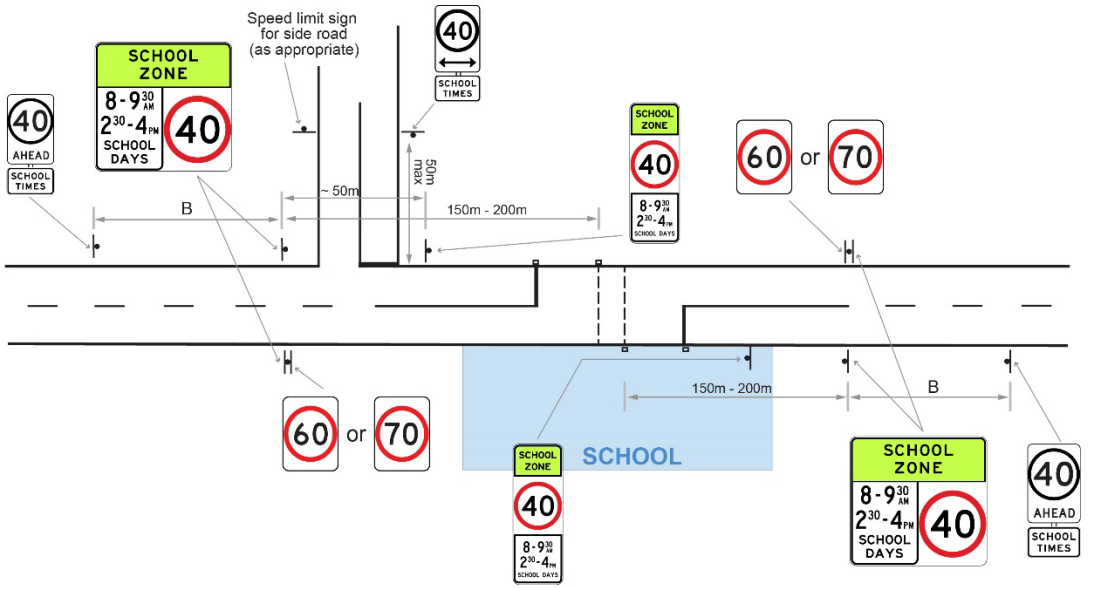


Figure 11: Type 2 layout - school speed zones on 50 km/h roads (default limit or signposted) or 60 km/h roads with less than 5,000 vpd

Notes to Figure 11:

1. *School speed zones are generally located 150 – 200 m either side of a school crossing or school boundary gate if there is no marked crossing.*
2. *A repeater sign should be installed 20 – 50 m on the departures from any intersecting side road and in accordance with Table 11.*
3. *Advance speed signs with a SCHOOL TIMES supplementary sign shall be installed on all intersecting side roads leading to the school speed zone. The arrow used on the sign shall indicate which departure(s) from the intersection are under a school speed zone.*



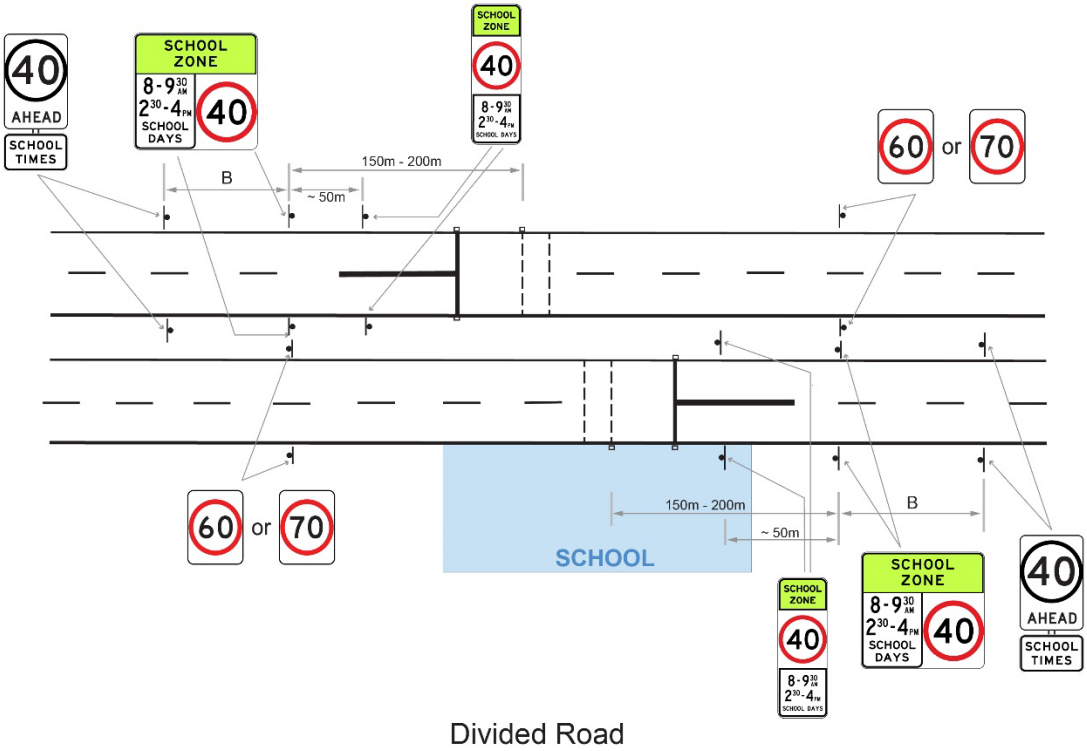
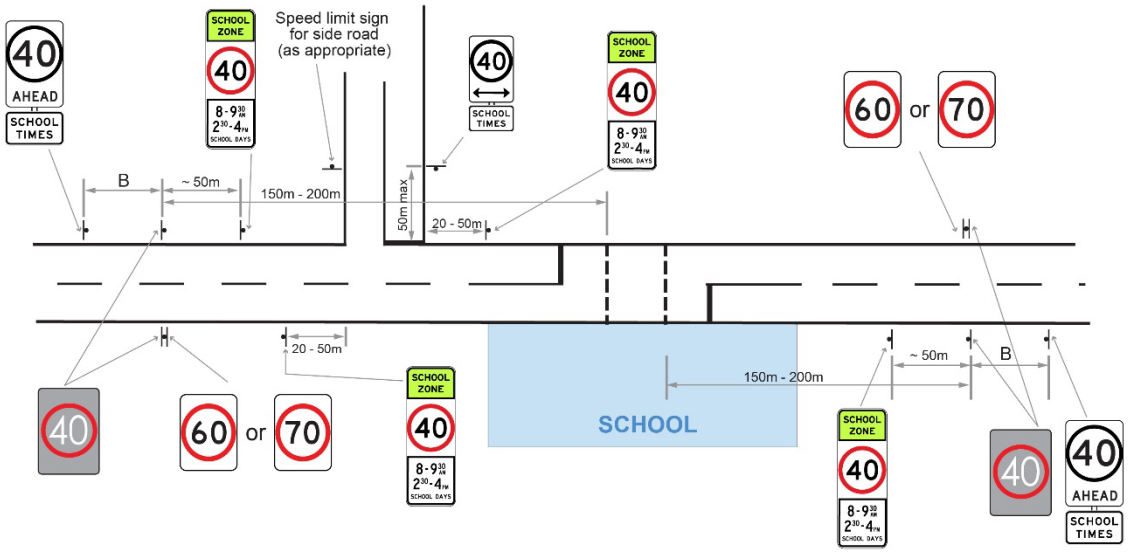


Figure 12: Type 2 layout - school speed zones on 60 km/h roads with 5,000 vpd to 20,000 vpd or 70 km/h roads less than 500 vpd

Notes to Figure 12:

1. *School speed zones are generally located 150 – 200 m either side of a school crossing or school boundary gate if there is no marked crossing.*
2. *A repeater sign should be installed 20 – 50 m on the departures from any intersecting side road and in accordance with Table 11.*
3. *Distance 'B' is approximately 100 – 200 m where the prevailing speed limit is 60 km/h; or approximately 300 – 400 m where the prevailing speed limit is 70 km/h.*
4. *Advance speed signs with a SCHOOL TIMES supplementary sign shall be installed on all intersecting side roads leading to the school speed zone. The arrow used on the sign shall indicate which departure(s) from the intersection are under a school speed zone.*



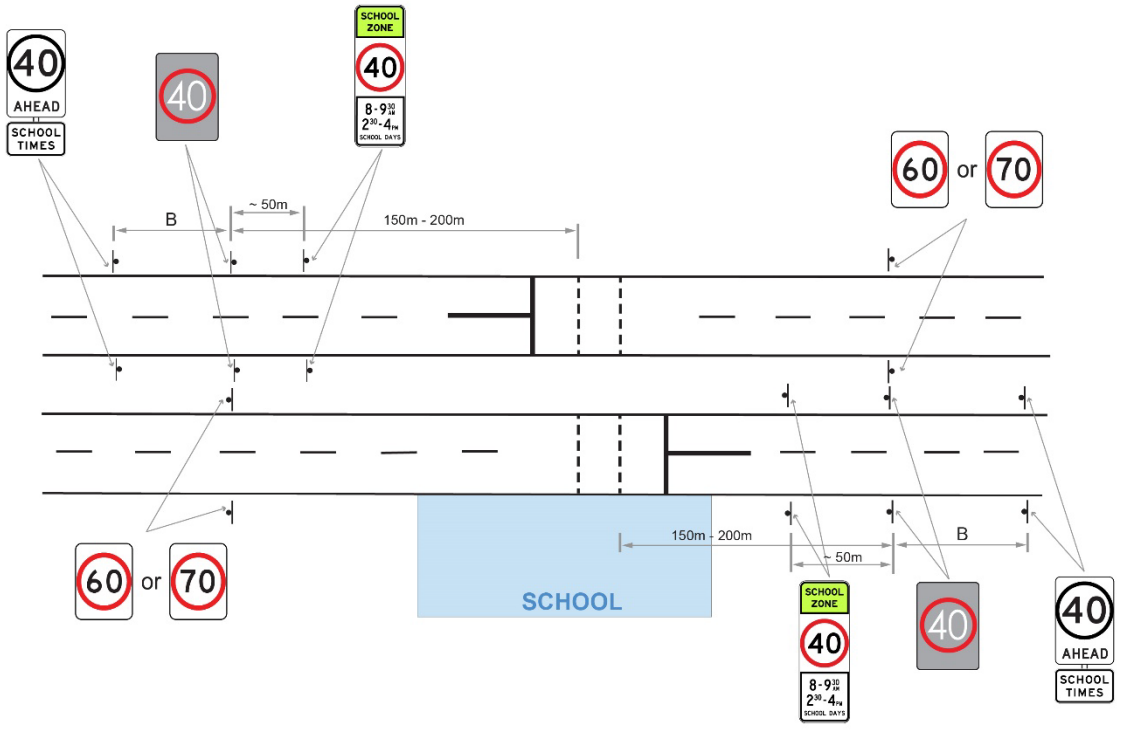


Figure 13: Type 3 layout - school speed zones on 60 km/h roads with more than 20,000 vpd or 70 km/h roads greater than 500 vpd

Notes to Figure 13:

1. *School speed zones are generally located 150 – 200 m either side of a school crossing or school boundary gate if there is no marked crossing.*
2. *A repeater sign should be installed 20 – 50 m on the departures from any intersecting side road and in accordance with Table 11.*
3. *Distance 'B' is approximately 100 – 200 m where the prevailing speed limit is 60 km/h; or approximately 300 – 400 m where the prevailing speed limit is 70 km/h.*
4. *Advance speed signs with a SCHOOL TIMES supplementary sign shall be installed on all intersecting side roads leading to the school speed zone. The arrow used on the sign shall indicate which departure(s) from the intersection are under a school speed zone.*

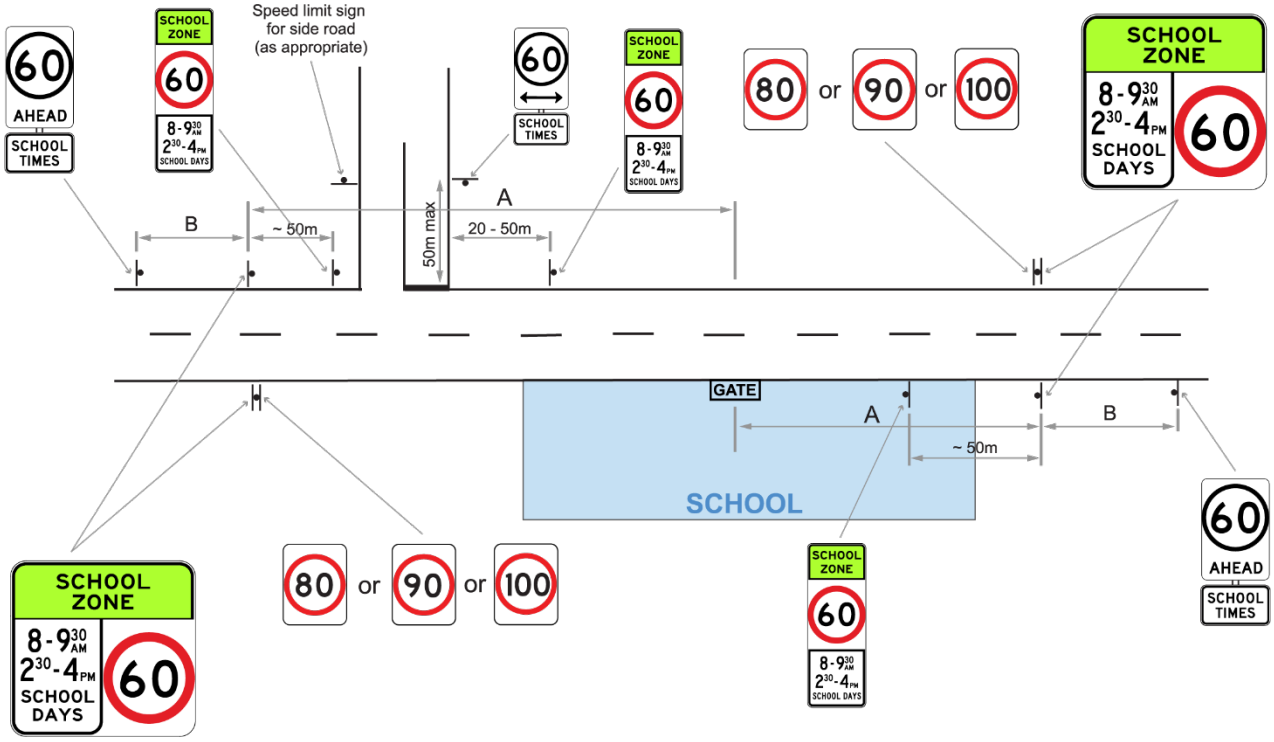


Figure 14: Type 2 layout – 60 km/h school speed zones on 80 km/h, 90 km/h or 100 km/h roads with less than 500 vpd

Notes to Figure 14:

1. *School speed zones are generally measured from either side of a school crossing or school boundary gate if there is no marked crossing.*
2. *Distance 'A' is either:*
    a. *Approximately 150 – 200 m where the prevailing speed limit is 80 km/h or 90 km/h.*
    b. *Approximately 200 – 300 m where the prevailing speed limit is 100 km/h.*
3. *Distance 'B' is either:*
    a. *Approximately 100 – 200 m where the prevailing speed limit is 80 km/h.*
    b. *Approximately 300 – 400 m where the prevailing speed limit is 90 km/h or 100 km/h.*
4. *A repeater sign should be installed 20 – 50 m on the departures from any intersecting side road and in accordance with Table 11.*
5. *Advance speed signs with a SCHOOL TIMES supplementary sign shall be installed on all intersecting side roads leading to the school speed zone. The arrow used on the sign shall indicate which departure(s) from the intersection are under a school speed zone.*

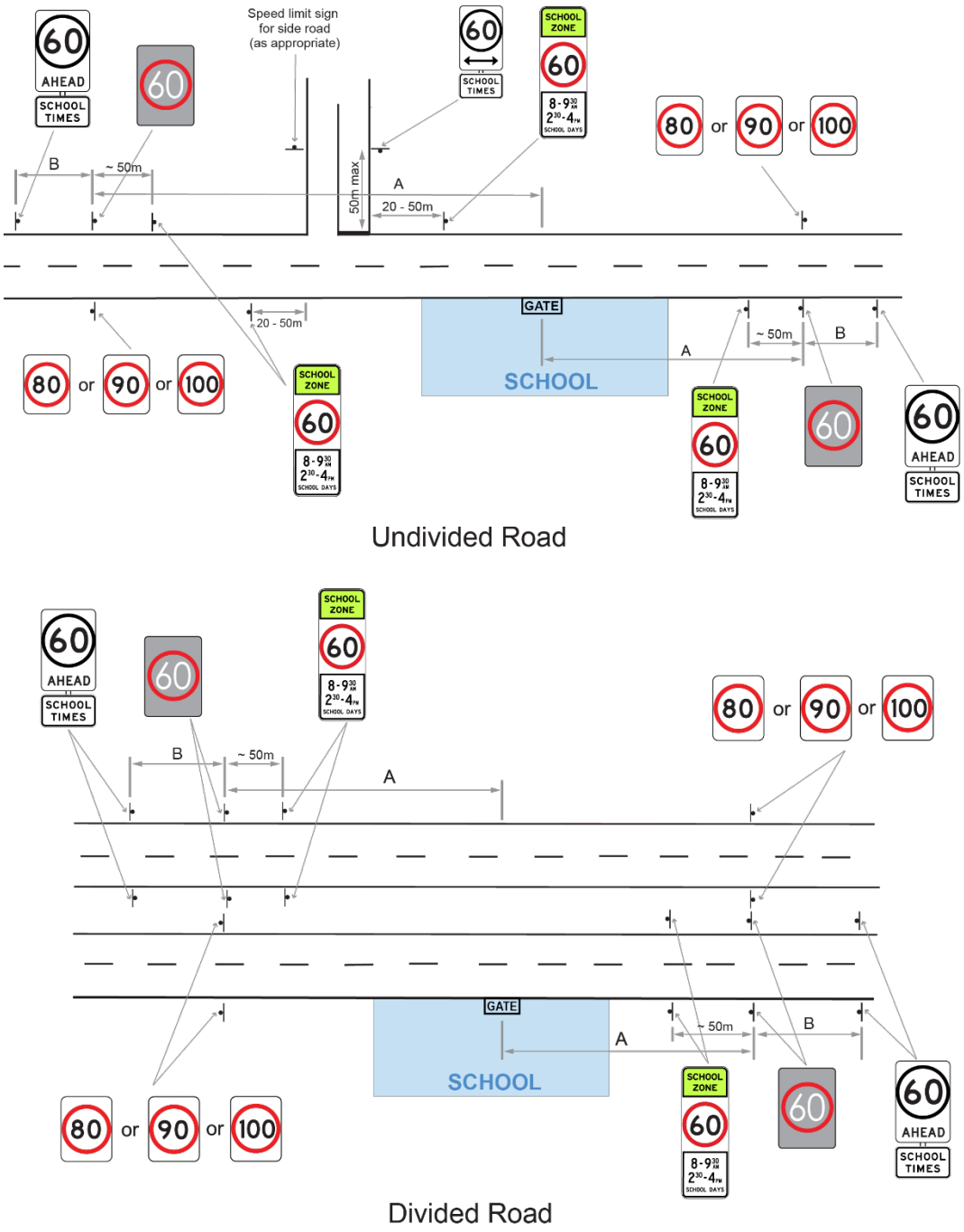
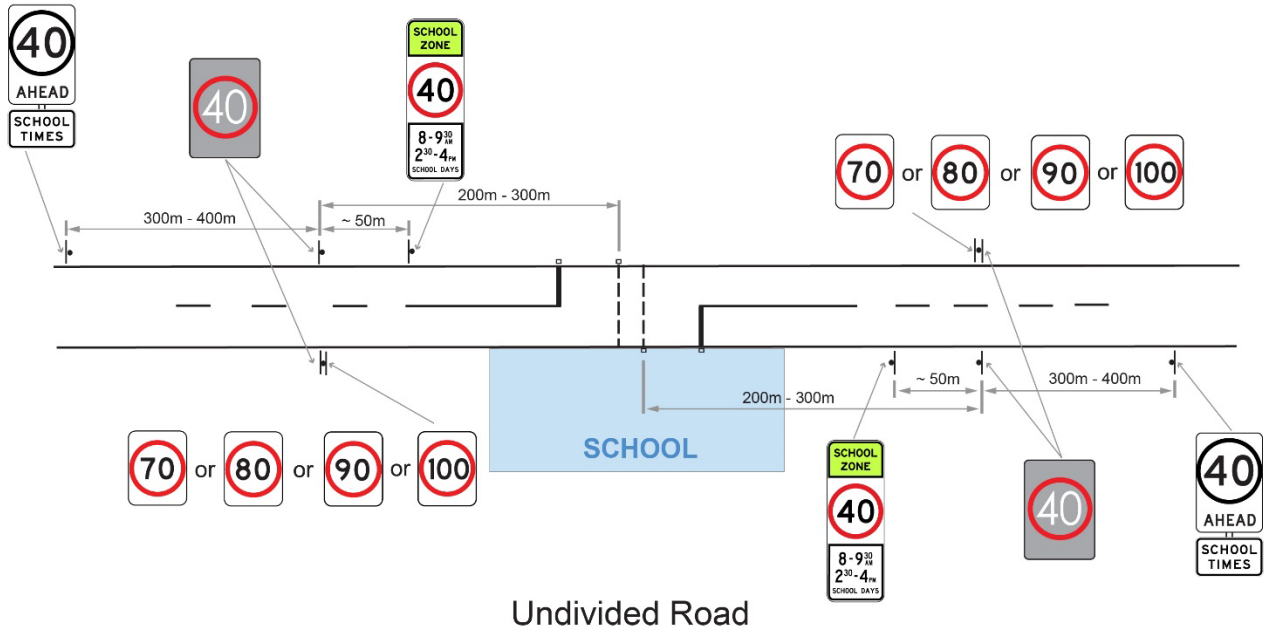


Figure 15: Type 3 layout – 60 km/h school speed zones on 80 km/h, 90 km/h or 100 km/h roads with more than 500 vpd

Notes to Figure 15:

1. *School speed zones are generally measured from either side of a school crossing or school boundary gate if there is no marked crossing.*
2. *Distance 'A' is approximately 150 – 200 m where the prevailing speed limit is 80 km/h or 90 km/h; or approximately 200 – 300 m where the prevailing speed limit is 100 km/h.*
3. *Distance 'B' is approximately 100 – 200 m where the prevailing speed limit is 80 km/h; or approximately 300 – 400 m where the prevailing speed limit is 90 km/h or 100 km/h.*
4. *A repeater sign should be installed 20 – 50 m on the departures from any intersecting side road and in accordance with Table 11.*
5. *Advance speed signs with a SCHOOL TIMES supplementary sign shall be installed on all intersecting side roads leading to the school speed zone. The arrow used on the sign shall indicate which departure(s) from the intersection are under a school speed zone.*



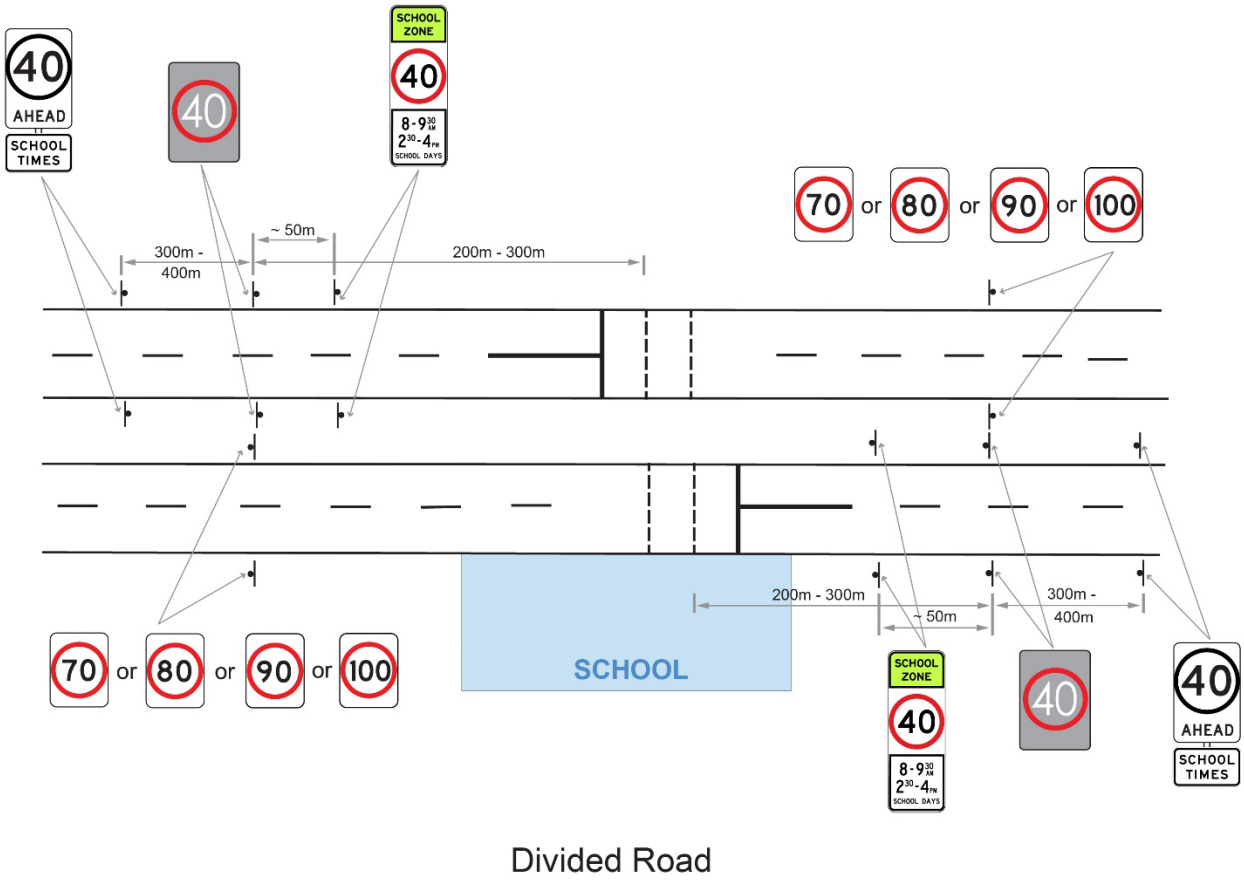
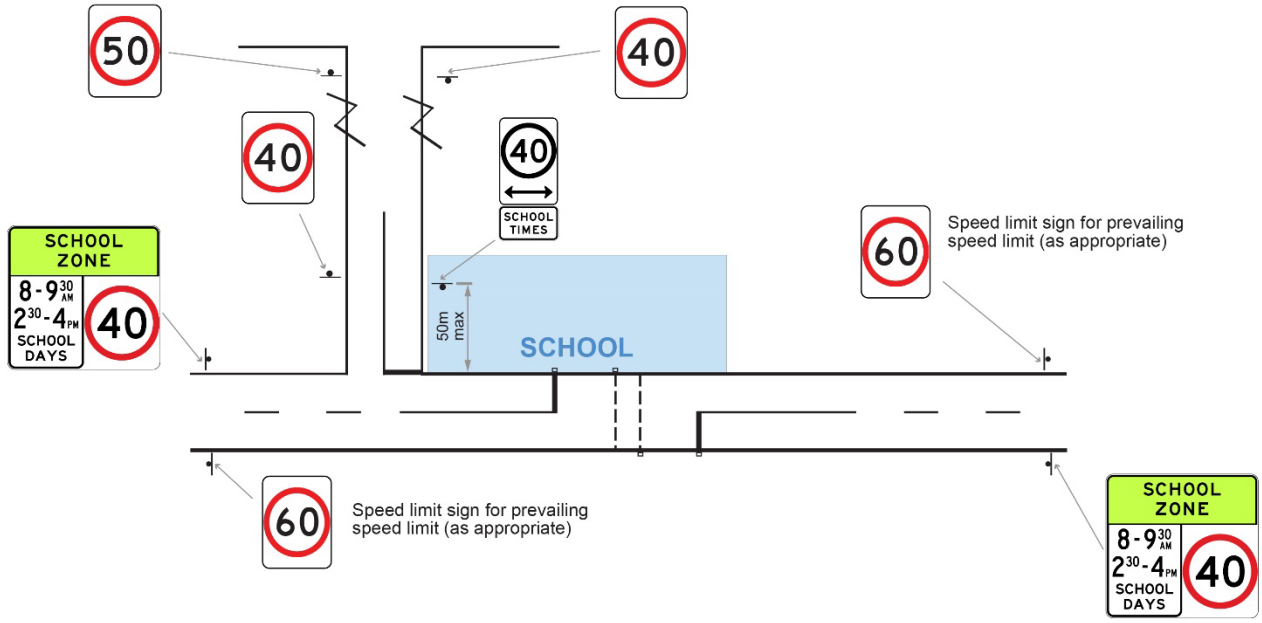


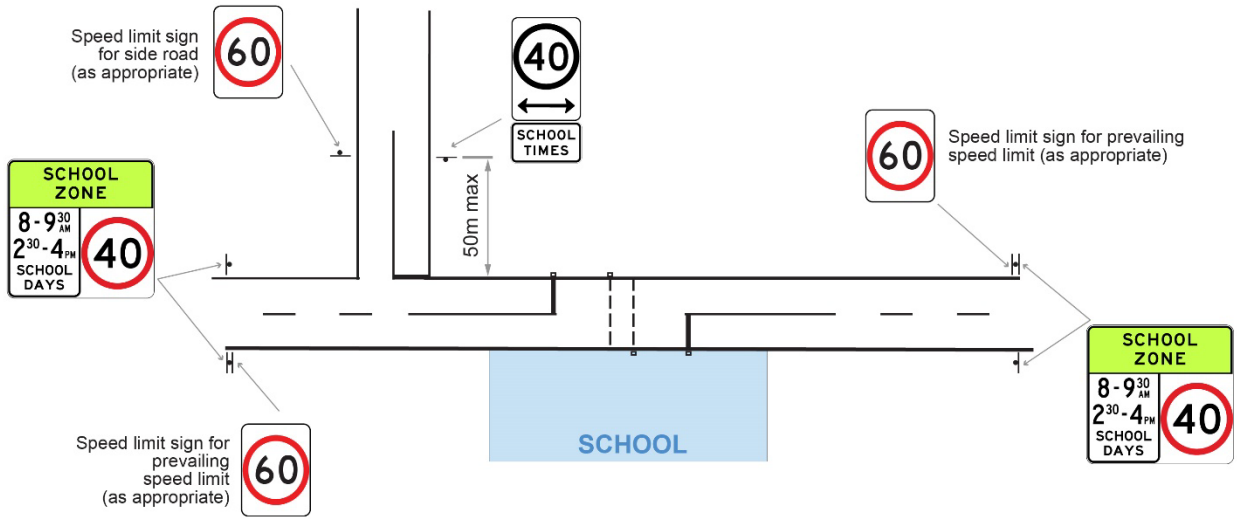
Figure 16: Type 3 layout – 40 km/h school speed zones on 70 km/h or greater roads

Notes to Figure 16:

1. *A repeater sign should be installed 20 – 50 m on the departures from any intersecting side road and in accordance with Table 11.*
2. *Advance speed signs with a SCHOOL TIMES supplementary sign shall be installed on all intersecting side roads leading to the school speed zone. The arrow used on the sign shall indicate which departure(s) from the intersection are under a school speed zone.*



Permanent 40 km/h in an intersecting street



Speed limit other than 40 km/h in an intersecting street

Figure 17: School speed zones – examples of sign layouts in intersecting streets

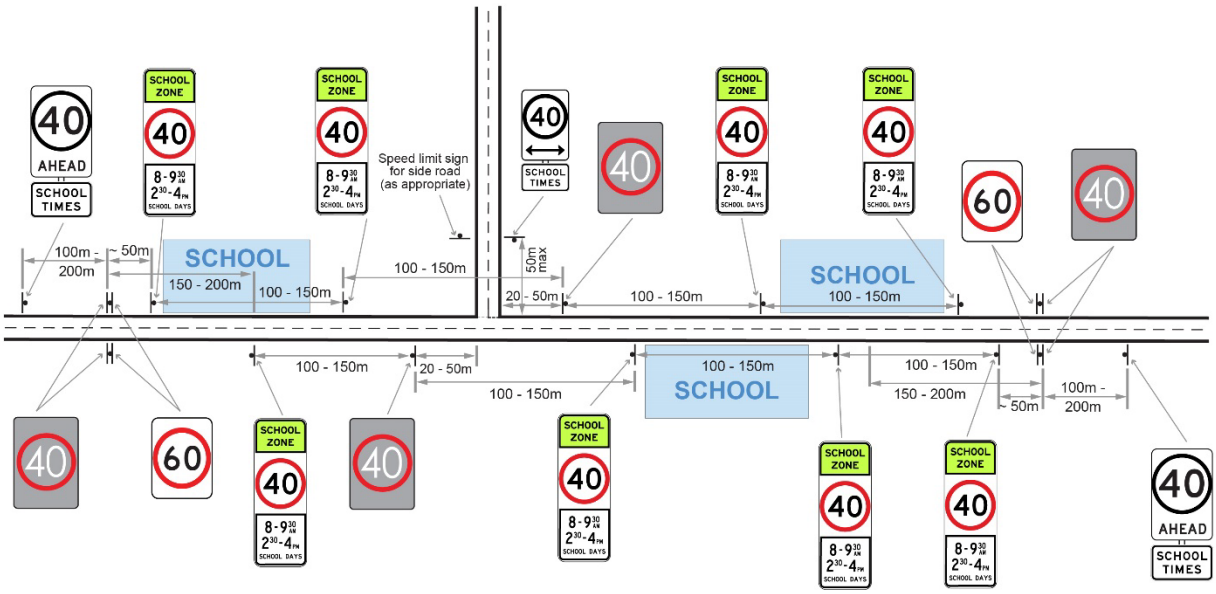


Figure 18: Adjacent and closely spaced schools along the same stretch of road (40 km/h school speed zone shown)

Notes to Figure 18:

1. *The speed limit for the school speed zone to be set in accordance with Section 3.4.*
2. *The overall length of the school speed zone should be appropriate for the type of school speed zone.*
3. *Refer to Table 13 for guidance on the provision of static and electronic speed limit signs.*
4. *Given the length of the school speed zone, an appropriate number of repeater signs should be provided to ensure motorists are aware of the speed limit throughout the school speed zone.*
5. *Advance speed signs with a SCHOOL TIMES supplementary sign shall be installed on all intersecting side roads leading to the school speed zone. The arrow used on the sign shall indicate which departure(s) from the intersection are under a school speed zone.*

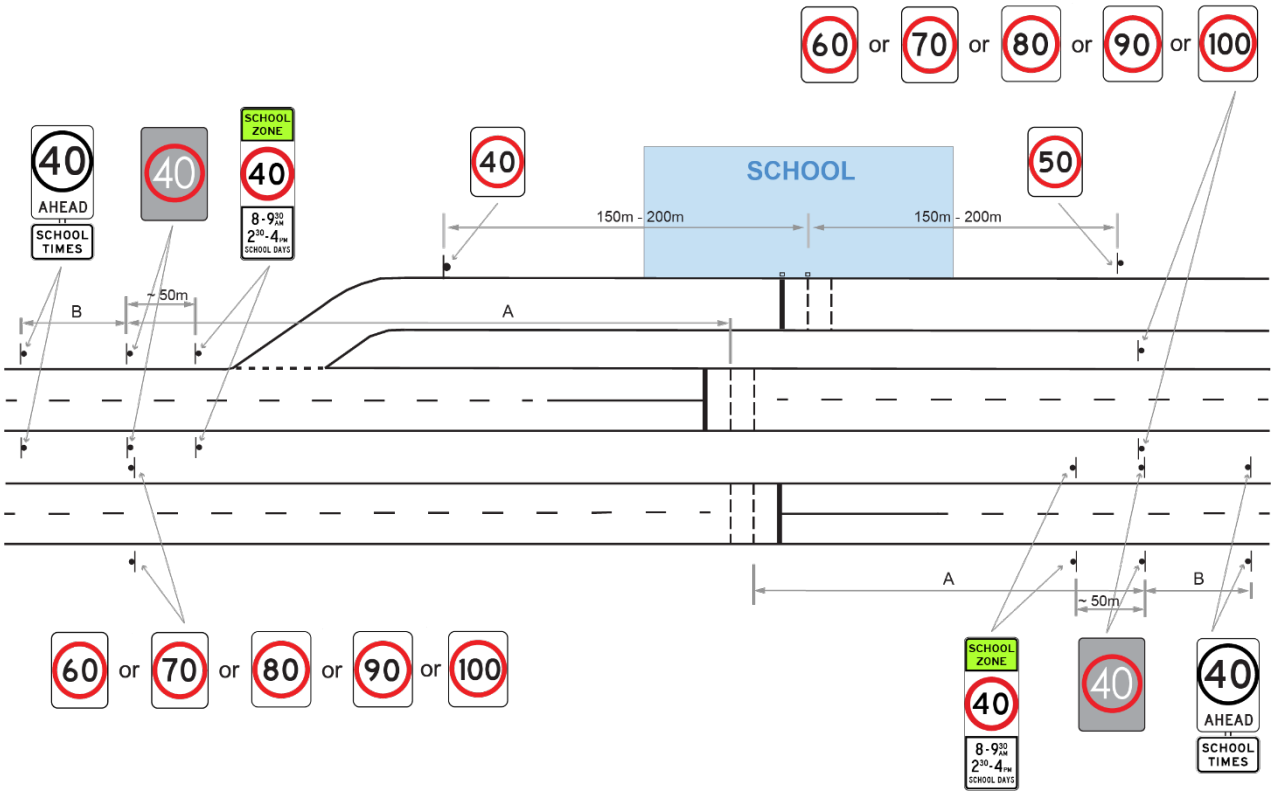


Figure 19: 40 km/h school speed zones on service road and main carriageways where formal pedestrian crossing facilities have been provided

Notes to Figure 19:

1. *The speed limit for the school speed zones to be set in accordance with Section 3.4.*
2. *If a speed limit sign on a service road is likely to cause confusion on the main carriageway, a 'SERVICE ROAD' supplementary sign (G9-V81) should be added below the service road speed limit sign.*
3. *Refer to Table 13 for guidance on the provision of static and electronic speed limit signs.*
4. *Distance 'A' is either:*
    a. *Approximately 150 – 200 m where the prevailing speed limit is 60 km/h, 70 km/h, 80 km/h or 90 km/h.*
    b. *Approximately 200 – 300 m where the prevailing speed limit is 100 km/h.*
5. *Distance 'B' is either:*
    a. *Approximately 100 – 200 m where the prevailing speed limit is 60 km/h*
    b. *Approximately 300 – 400 m where the prevailing speed limit is 70 km/h, 80 km/h, 90 km/h or 100 km/h.*
6. *A repeater sign should be installed 20 – 50 m on the departures from any intersecting side road and in accordance with Table 11.*
7. *Advance speed signs with a SCHOOL TIMES supplementary sign shall be installed on all intersecting side roads leading to the time-based school speed zone. The arrow used on the sign shall indicate which departure(s) from the intersection are under a school speed zone.*

6.2.4 Activity centre speed zones

The signing arrangements for activity centre speed zones are described in this section.

It should be noted that the level of signing described in this section is the minimum level required for activity centre speed zones. Any proposals to use a lower standard of signing will require the support of the Chief Engineer – Roads or delegate.

- Prior to the activity centre speed zone:
    - A '40 AHEAD' sign (G9-79 series) installed before the change in speed limit to provide advance warning on roads with a prevailing speed limit of 60 km/h or greater.
    - All roads that intersect the road with the activity centre speed zone shall require side road advance speed signs (G9-V79 series) to be installed a maximum of 50 m in advance of the intersection.

  Advance speed signs do not have any legal effect under the road rules but provide an important fairness function to ensure road users are aware of the speed zone that they are about to enter.

- At the start of the activity centre speed zone:
    - Two electronic speed signs at each end of the activity centre speed zone to introduce the zone.

  Electronic signs have legal effect in accordance with the road rules. They also serve a safety and fairness function on busy roads where time-based variable speed limits are implemented by providing a higher level of conspicuity. These electronic signs are installed on both sides of the road, which also serves to enhance conspicuity (especially in busy environments).

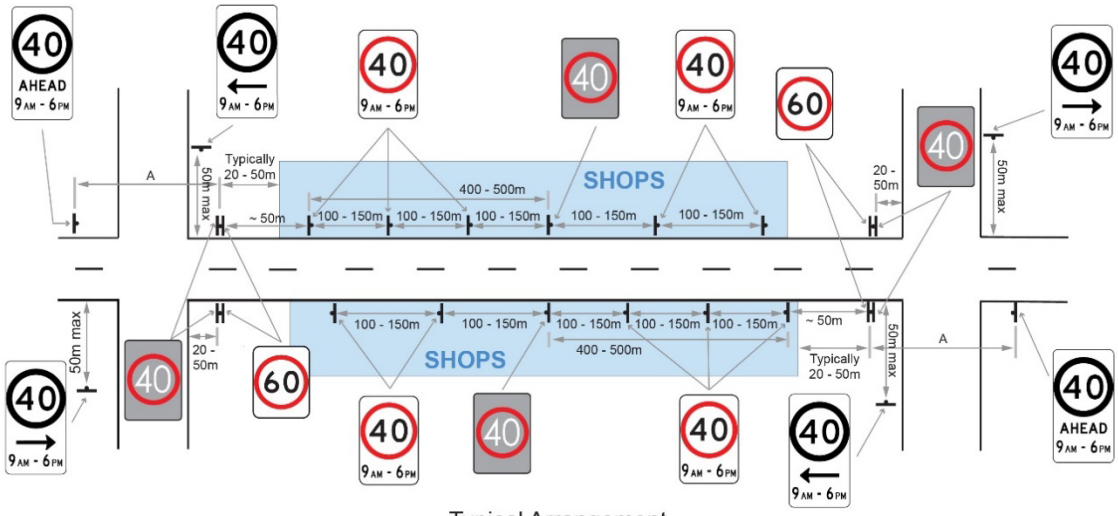
- Repeater signs within the activity centre speed zone:
    - The first static repeater speed limit sign should be placed 50 m after the start of the activity centre speed zone. Additional static repeater speed limit signs should then be placed at spacings no greater than 150 m.
    - For longer activity centre speed zones, a single repeater electronic speed sign should be located at 400 m – 500 m from the start of the zone, and every 400 – 500 m after that.
    - A static repeater sign should be installed 20 – 50 m on the departures from any intersecting side road. Where the intersecting road is an arterial road (or a road of similar significance), electronic repeater signs should be used instead.

  Repeater signs serve an important fairness function by reminding drivers (especially those who have just entered the road) of the speed limit through the activity centre.

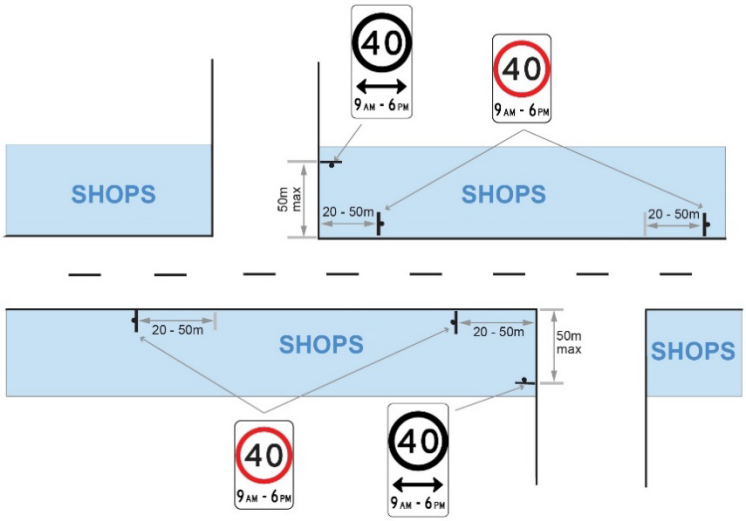
- At the end of the activity centre speed zone:
    - Two permanent speed signs are required at each end of the activity centre speed zone to reinstate the prevailing speed limit for the road.

- Further to the above requirements:
    - Where the activity centre speed zone is a time based 40 km/h speed zone:
        - The electronic speed limit signs shall display the reduced speed limit during high pedestrian activity times and the prevailing speed limit at all other times.
        - All static speed signs shall show the times of operation.
    - Where the activity centre speed zone is a permanent 40 km/h speed zone:
        - The electronic signs shall show the 40 km/h speed limit.
        - No times of operation shall be shown on the static speed signs.

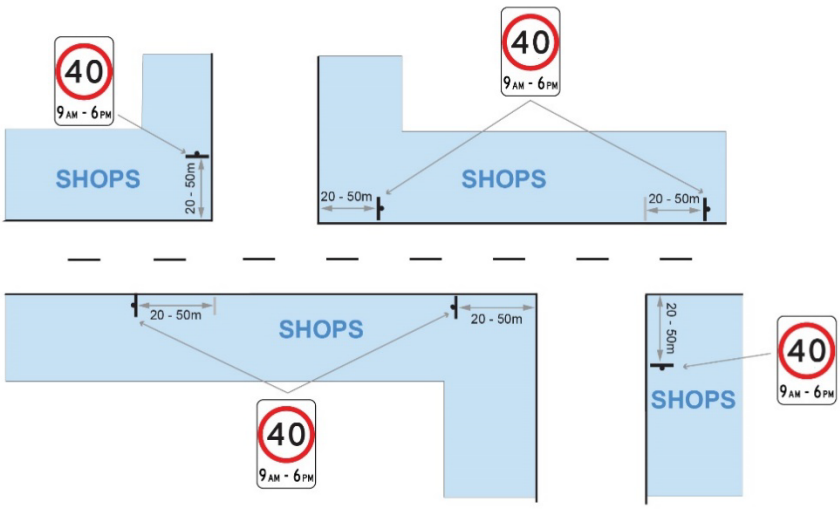
Figure 20 shows typical speed sign layouts for an activity centre speed zone.



Typical Arrangement



Detail of intersecting roads with pedestrian activity zones along a single road



Detail of intersecting roads with pedestrian activity zones along multiple connecting roads

Figure 20: Typical sign layout for 40 km/h activity centre speed zones

Notes to Figure 20:

1. ***Distance 'A' is either:***
    a. ***Approximately 100 – 200 m where the prior speed limit is 60 km/h.***
    b. ***Approximately 300 – 400 m where the prior speed limit is 70 km/h or 80 km/h.***

6.2.5 Variable speed zones

Variable speed zones are typically used on freeways / motorways / tollways or implemented as part of a school speed zone or pedestrian activity area speed zone.

- Guidance on signing for variable speed limits on freeways is provided in the *DoT / VicRoads Managed Freeways Handbook for Lane Use Management, Variable Speed Limits and Traveller Information* and *DoT / VicRoads Managed Motorways Framework, Network Optimisation & Operations Rationale and Technical Requirements*.
- Guidance on signing school speed zones is provided in Section 6.2.3.
- Guidance on pedestrian activity area speed zones is provided in 6.2.4.

For any other types of variable speed zones, consultation with the DoT Traffic Engineering team should take place.

6.2.6 Area speed zones

An area speed zone is a speed zone within a defined area in which a blanket speed limit is applied.

An area speed zone may be applied to a confined network of roads within an area by erecting appropriate signage at each entry to and exit from the area. The network may be comprised of:

- local streets
- access roads and aisles within a car park
- access and internal roads within a recreational park or reserve.

The area speed zone should generally only be applied to roads which have been designed to support the lower speed limit, or where appropriate traffic calming devices have been installed in accordance with *Austroads Guide to Traffic Management Part 8, Australian Standard AS 1742.13 Local Area Traffic Management* and DoT / VicRoads supplements to these documents.

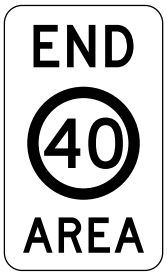
In Victoria, area speed limits in local streets should be 40 km/h whereas those in car parks or recreation reserves may be 20 km/h (or 40 km/h for major access and circulatory roads in large car parks or recreation reserves).

Speed limit AREA signs (R4-10) shall be erected at each entry to the zone and END speed limit AREA signs (R4-11) should be erected at each exit from the zone. At a linear transition from an area speed zone to a different speed limit on the same road, a supplementary END speed limit AREA midblock sign (R4-13) shall be mounted above the regulatory speed limit sign to denote the end of the area speed zone.

A speed limit AREA reminder sign (R4-14) may be provided beyond the initial speed limit AREA sign on more significant roads and/or at locations where it may be beneficial (e.g. near schools).

Where an area speed zone is introduced, any existing speed limit signs within the zone shall be removed.

R4-10
Speed limit
AREA sign



R4-11
END speed limit
AREA sign

R4-13
Supplementary END speed limit AREA midblock sign (above R4-1 sign)

R4-14
Speed limit
AREA reminder sign

Figure 21 shows a typical layout of an area speed zone on a confined road network.

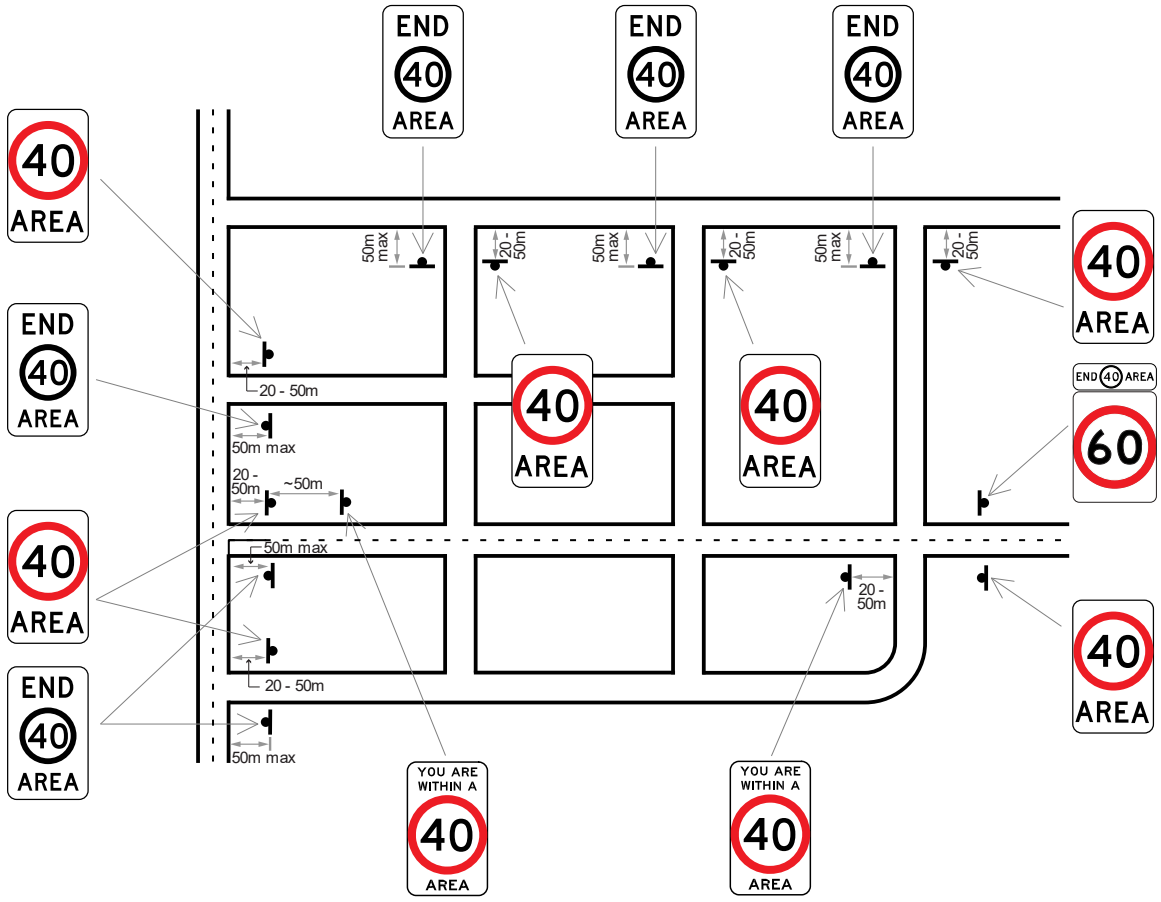


Figure 21: Typical layout of an area speed zone on a confined road network

Notes to Figure 21:

1. ***Speed limit signs should be installed 20 – 50 m from the intersection.***
2. ***On more significant roads within the area speed zone, a speed limit AREA reminder sign (R4-14) may be installed 50 m from the first speed limit AREA sign.***

6.2.7 Service roads

Service roads are generally unsigned (i.e. the default speed limit applies).

Where clarification of the speed limit of the service road is considered necessary (e.g. to distinguish the service road speed limit from the main carriageway), speed limit signs may be installed along the service road.

Service road speed limit signs should generally be placed at the left edge of the service road to avoid any impression that the speed limit may apply to the main carriageway. However, if signing on a service road is likely to cause confusion on the main carriageway, a 'SERVICE ROAD' supplementary sign (G9-V81) should be added below the service road speed limit sign(s).

Figure 22 shows speed limit signs on a service road.

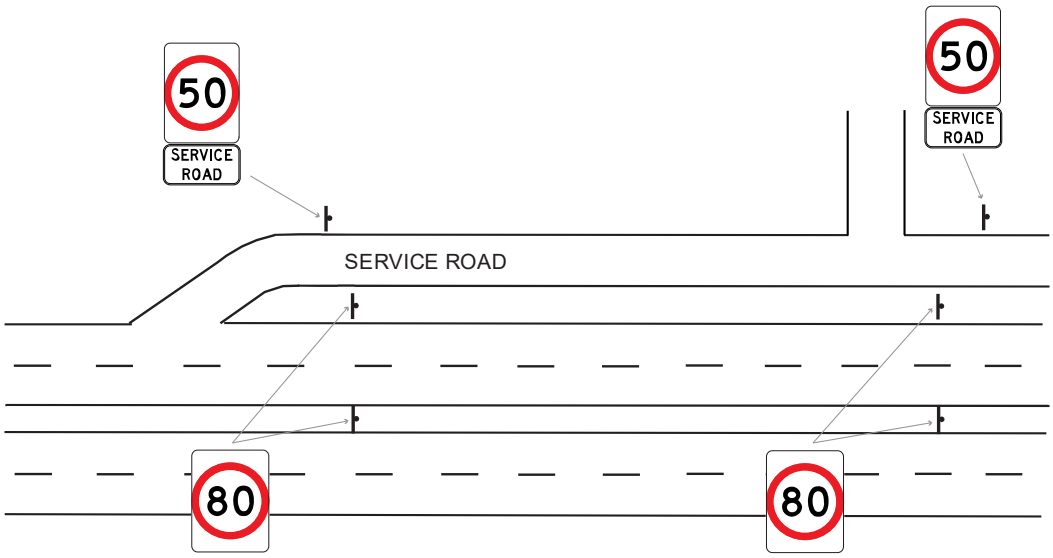


Figure 22: Service road with signposted speed limit

6.2.8 Local streets

Where a 40km/h speed limit is to be implemented on a local street:

- Apply a 40 km/h speed limit to the street using R4-1 regulatory speed limit signs (refer to Section 6.2.1).
- Apply a 40 km/h area speed zone to the surrounding network of local streets using area speed limit signs (refer to Section 6.2.6).

Where a 50 km/h speed limit is to apply to a local street they are generally unsigned (i.e. the default speed limit for built-up areas of 50 km/h applies).

Where a 60 km/h speed limit is to apply to a higher movement classified local street, the signing should be in accordance with Section 6.2.1.

6.2.9 Rural and outer metropolitan town centres

Where a 50 km/h speed limit is to be implemented through a rural or outer metropolitan town centre:

- A '50 AHEAD' sign (G9-79 series) installed before the change in speed limit to provide advance warning on roads where the prior speed limit is 60 km/h or greater.
- Duplicated permanent 50 km/h R4-1 signs to introduce the reduced speed limit.
- Repeater signs on the left, 50 m after the start of the speed limit and then on both sides at maximum intervals of 300 m.
- Additional repeater signs may be required within the 50 km/h speed zone, 20 – 50 m from any intersection with a major side road.

Two permanent speed limit signs are required at each end of the zone to reinstate the general speed limit for the road.

The level of signing described above is the minimum level required for a rural or outer metropolitan town centre. Any proposals to use a lower standard of signing will require the support of the Chief Engineer – Roads or delegate.

Figure 23 shows a typical layout of speed signs for 50 km/h rural and outer metropolitan town centres.

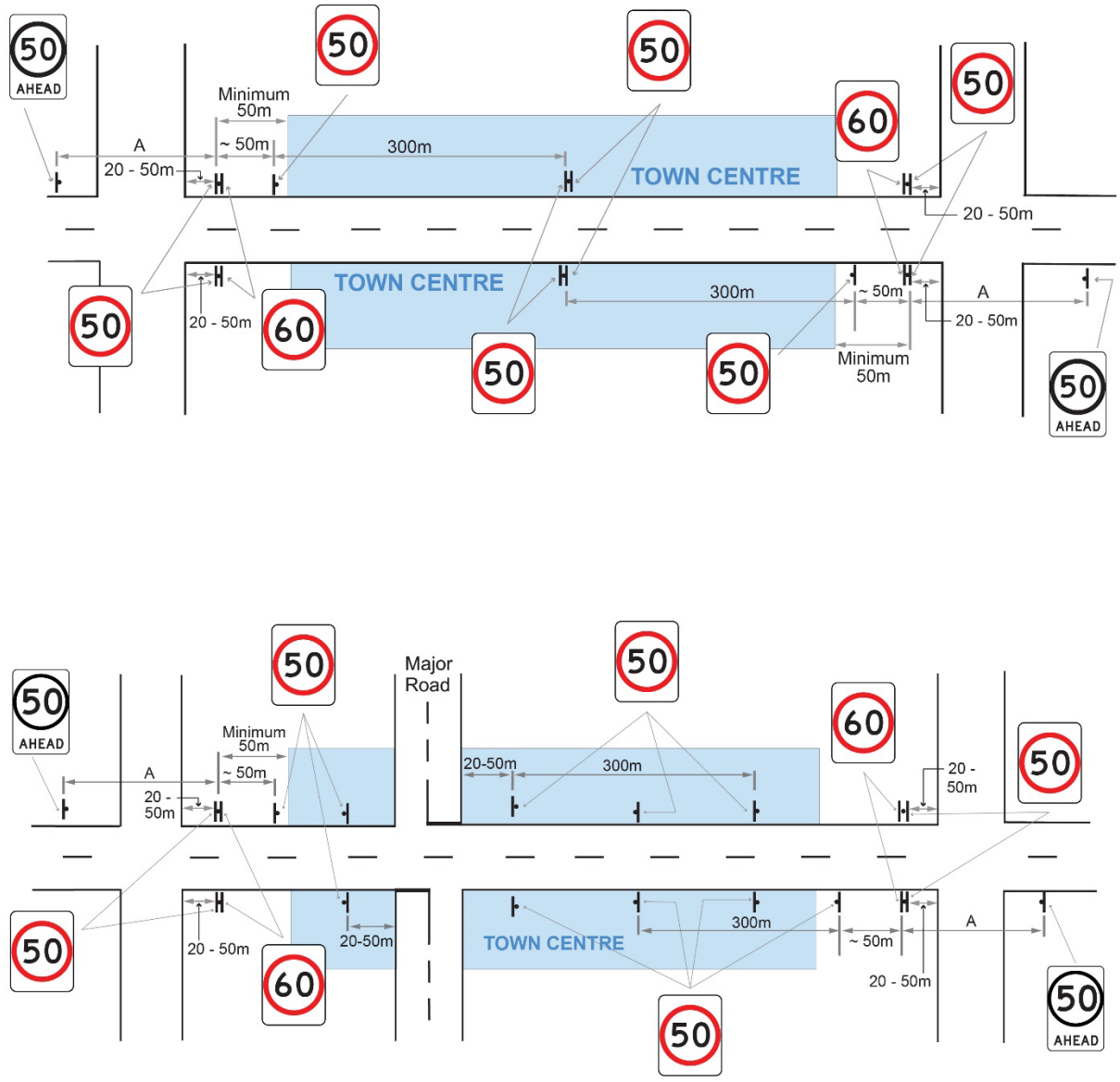


Figure 23: Typical signing layouts for 50 km/h rural and outer metropolitan town centres

Notes to Figure 23:

1. ***Distance 'A' is either:***
    a. ***Approximately 100 – 200 m where the prior speed limit is 60 or 70 km/h.***
    b. ***Approximately 300 – 400 m where the prior speed limit is 80 km/h.***

6.2.10 Railway level crossings in rural areas

At railway level crossings on rural roads, a maximum speed limit of 80 km/h shall be applied for a minimum distance of 400 m on the approach to the level crossing and 100 m on the departure. For further guidance on signing railway level crossings in rural areas, refer to *Australian Standard AS 1742.7 Railway Crossings* and DoT / VicRoads supplement to AS 1742.7.

6.2.11 Traffic signals in high-speed environments

Where traffic signals exist, the maximum speed limit through the site shall be 80 km/h.

Where traffic signals have been installed on a road with a prevailing speed limit of 90 km/h or greater, the speed limit shall be reduced to the lower limit, generally applied for a minimum distance of 400 m on the approach to the traffic signals and 100 to 200 m on the departure.

Duplicate speed limit signs should be provided at the start of the speed zone followed by a set of repeater signs.

Note that offset speed zones are permitted in these instances (i.e. the start and finish of the 80 km/h speed zone do not coincide for each direction of traffic).

6.2.12 Unsealed roads

If the default speed limit is applied to an unsealed road, signing is generally not required.

If a regulatory speed limit is to be adopted on an unsealed road, the first regulatory speed sign may include the W8-V129 drive to conditions supplementary sign underneath it. All subsequent speed limit signs (e.g. repeater signs) do not require the W8-V129 sign underneath unless considered beneficial (e.g. after an intersection with a significant road).

W8-V129

The W8-V129 drive to conditions supplementary sign has been developed as an optional sign for use on unsealed roads. The sign highlights that drivers are required to drive to the conditions due to the variable conditions of the unsealed road.

6.2.13 Shared zones

The signing arrangements for shared zones is as follows:

- A ‘SHARED ZONE’ sign (R4-4) at each entry to the shared zone.
- ‘END SHARED ZONE’ sign (R4-5) at each exit of the shared zone.

Where a shared zone is introduced, any existing speed limit signs within the zone shall be removed.

R4-4

R4-5

Figure 24 show an example of a shared zone.

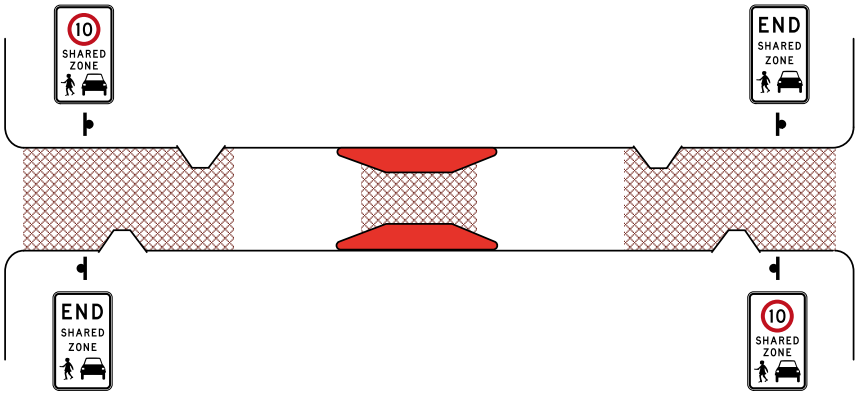


Figure 24: Signing of a shared zone

6.2.14 Car parks and recreation reserves

Car parks and recreation reserves may be signed via one of the following ways:

- a general signposted speed limit
- an area speed zone
- a shared zone.

If geometry or other factors limit speeds to 20 km/h or less, signing may not be necessary.

6.2.15 Side road activated speeds (SRAS)

Side road activated speeds (SRAS) is an innovative road safety treatment which aims to reduce the risk of serious injury or death in intersection related crashes. SRAS is also known as STARS (Side traffic activated rural speeds) and RIAWS (Rural intersection activated warning signs).

The SRAS treatment uses detectors (usually radar or in-pavement loops) to detect a vehicle on a side road that is approaching an intersection. When this side road vehicle is detected, it activates a temporary reduction of speed for vehicles on the main road travelling towards the intersection by using Electronic Speed Limit Signs (ESLS).

SRAS is currently being trialled and evaluated in Victoria.

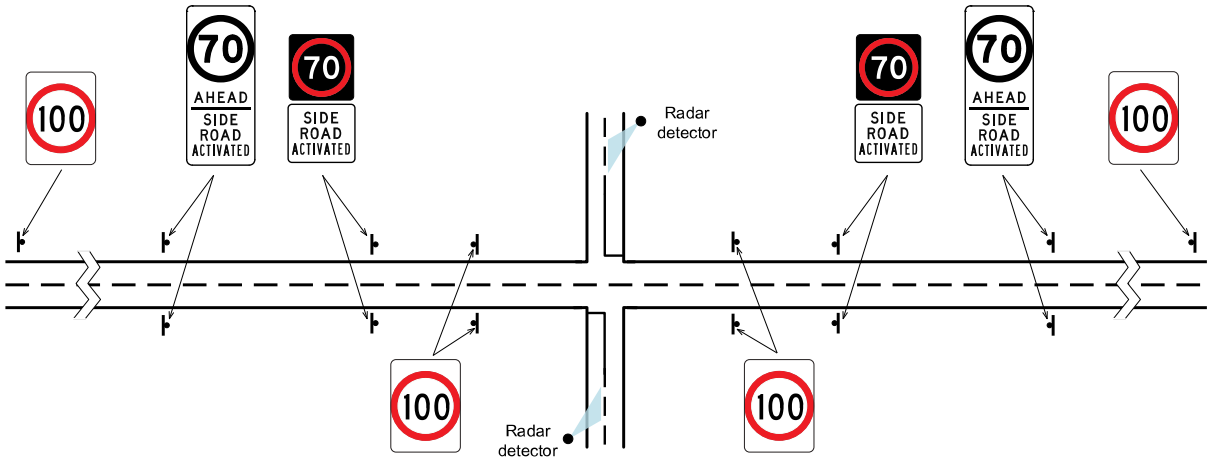


Figure 25: Example of side road activated speeds layout

For detailed guidance on the implementation of SRAS, please refer to DoT's document *Guidance for the Design and Operation of SRAS Systems*.

6.2.16 Community gateway treatments

The Community gateway treatment is an innovative road safety treatment which aims to improve safety for people living in and travelling through regional communities.

A Community gateway treatment generally includes:

- A large green sign displaying the applicable speed limit and town name.
- Some form of traffic calming pavement marking treatment (e.g. lane narrowing).

Community gateway sign

Community gateway treatments are currently being trialled and evaluated in Victoria.

For detailed guidance on the implementation of a community gateway treatment, please refer to DoT's (Safer Roads') document *Gateway Design Note*.

6.2.17 Road safety camera sites

"ROAD SAFETY CAMERAS OPERATE IN THIS AREA" signs (P2-V111 series) may be installed at locations at which there is a fixed road safety camera.

A sign may be located as follows:

- For fixed road safety cameras at intersections – on each approach road, approximately 150 metres in advance of the intersection.
- At other locations – to be determined in consultation with Department of Justice and Community Safety (DJCS) and DoT based on site conditions.

Approval of DJCS and DoT should be sought prior to the use of these signs.

P2-V111 series

7 MONITORING SPEED ZONE CHANGES

After implementing a speed zone change, it is important to observe how road users respond to and adhere to the change. Monitoring the change is required to determine whether the treatment has had the desired effect and compliance is being achieved. Such an approach forms part of a human centred design approach.

For DoT managed roads, evaluation of the impact of the speed limit change is highly recommended for all speed limit changes (except for very minor speed limit changes such as changes in land use resulting in speed limit extensions less than approx. 200m in length). For roads managed by local governments and other agencies, the evaluation of the impact of the speed limit change is encouraged.

7.1 Key metrics

The following key metrics are considered to be important for the evaluation of speed zone changes over a short term:

Casualty crashes: the measure of the number of road crashes in which somebody is injured or killed. Casualty crashes are a primary indicator of road safety.

Traffic speed: a measure of the speed of individual vehicles. Road safety research indicates that the risk of a casualty crash is a relationship between the actual vehicle speed at the time of the crash and the type of crash that occurs. Therefore, changes in traffic speed give an indication of road safety risk.

Compliance: a measure of how many vehicles are exceeding the speed limit. Setting a speed limit that is easily understood and complied with by road users is an important element to good speed zoning practice.

Other metrics such as Fatal and Serious Injuries (FSIs) should be monitored over longer term periods.

7.2 Collecting data

Data collection is the process of gathering information on targeted variables. It is through data collection where quality information needed to make informed decisions can be obtained. It can be particularly useful to compare data collected prior to any speed change against the post-installation data to add context and demonstrate the effect of a treatment.

As data capturing sources will continue to develop over time the following requirements shall be met for any chosen form of data collection:

- The data capturing source must have the capability of recording the individual speed and time of close to 100% of vehicles travelling past a point and/or along a length of road.
- The data capturing source must have the ability to provide an entire one week worth of data.
- The data be presented in a manner that enables the following information to be obtained:
    - average speed of vehicles
    - 85th percentile speed of vehicles
    - total number of vehicles counts
    - % and total number of vehicles complying with the speed limit
    - % and total number of vehicles 0-5 km/h above the speed limit
    - % and total number of vehicles 5-10 km/h above the speed limit
    - % and total number of vehicles 10-15 km/h above the speed limit
    - % and total number of vehicles 15 km/h or more above the speed limit.

7.2.1 Casualty crash data

Casualty crash data can be obtained from the Road Crash Information System (RCIS). The RCIS is an online database providing crash data from Victorian road incidents dating back to 1987. The information contained in the RCIS is sourced from Victoria Police. Casualty crash data is typically collected and assessed over a 5-year period due to the variability in when casualty crashes occur.

7.2.2 Traffic speed and compliance data

There are several types of speed. The most commonly referred to types are ‘design speed’, ‘posted speed’, ‘operating speed’ (or 85th percentile speed) and ‘advisory speed’. The definition of the different types of speed are defined below.

Design speed: A speed fixed for the design and correlation of those geometric features of a carriageway that influence vehicle operation. Design speed should not be less than the intended 85th percentile speed (in Victoria, the design speed is generally the same as the posted speed in urban areas and 10 km/h higher on rural high-speed roads).

Posted speed: the speed limit signposted on a road.

Operating speed: The 85th percentile speed of cars at a time when traffic volumes are low, and which allows a free choice of speed within the road alignment.

85th percentile speed: The speed at or below which 85% of vehicles are observed to travel under free-flowing conditions past a nominated point.

Advisory speed: The recommended maximum speed at which a section of roadway should be negotiated for comfort and safety.

The operating speed (or 85th percentile speed) is the only speed type above that can be physically measured. The operating speed is often measured to assess whether motorists are complying with the posted speed limit or to check and see whether the posted speed limit is appropriate.

While other methods are available and can be used where it meets the requirements of Section 7.2, vehicle speed data is commonly measured using the following devices:

- pneumatic road tubes
- infra-red radar

(a) Pneumatic road tubes

Pneumatic tubes are often used to measure traffic speed during a short period of time (typically 1 week). The method utilises two tubes laid across a traffic lane at a set spacing (typically 1 m). When a vehicle travels over the tubes, a machine connected to the tubes located on the side of the road will detect when the first and second tube is driven on. By knowing the distance between the two tubes, the speed can then be calculated. Pneumatic tubes can also be used to count and classify vehicular traffic.

Example of pneumatic road tubes

When using pneumatic tubes, the following is considered good practice:

- Installing pneumatic road tubes across the entire width of the road to capture speeds in both directions.
- Ensuring the pneumatic road tubes are located well within the speed zone (beyond the second repeater sign) and not adjacent to any speed limit signs to give representative readings of vehicles travelling through the speed zone.
- Ensuring the pneumatic road tubes are located away from driveways, side road intersections, curves, turning lanes or any other location that may not give representative speed readings.
- Recording the exact location of the road tubes so that 'after' data can be collected from the same locations.

(b) Infra-red radar

In recent years, at more permanent traffic count stations, infra-red radar is often used. One method of using infra-red radar is called The Infra-Red Traffic Logger, more commonly known simply by the acronym TIRTL. Similar to the pneumatic tubes, the TIRTL is a multi-purpose traffic sensor that can be used not only to measure traffic speed but also to count and classify vehicular traffic.

Example of TIRTL installed on the Princes Freeway

7.2.3 Control data

As the data collected when evaluating a speed zone change can be variable, it is good practice to also collect some control data to understand how any trends associated with the speed zone change compare with broader trends in the operation of the road network.

For example, actual traffic speed can be influenced by factors such as wet weather. Therefore it is good practice to collect data of similar roads nearby that are not undergoing a speed limit change to understand how any trends associated with the speed zone change compare.

7.3 Evaluation of data

Once data has been collected and analysed, it can be used to evaluate the effectiveness of the speed limit change and/or understand more about the operation of the road.

Some examples include:

- To determine whether the speed limit change has resulted in a reduction in casualty crashes, reductions in traffic speed and/or increase in speed limit compliance.
- To assess whether the posted speed limit is appropriate and suitable for the road condition. For example, a road with a posted speed limit of 80 km/h may need to be reduced if the measured operating speed is 60 km/h.
- To determine whether motorists are still exceeding the posted speed limit after the installation of traffic calming measures.

- To compare the performance of the road network over time. For example, it may be useful for road authorities to understand whether the operating speed on a section of road has increased, decreased or has stayed the same over a period of time as a result of changes in land use.
- To assess whether there is a compliance issue with the posted speed limit on a section of road. If the operating speed is significantly higher than the posted speed limit, measures such as local area traffic management (LATM) (for local streets) or enforcement (e.g. the installation/placement of fixed or mobile safety cameras) may be considered to address the issue.

If a speed zone is found to be unsatisfactory (i.e. the crash risk is high), and other measures such as advisory speed signs on curves fail to correct the problem, sections of the road may be:

- Investigated for permanent infrastructure improvements such as curve realignment, cross-section changes, additional delineation and/or shoulder sealing.
- Speed limited to a lower value if infrastructure improvements are not possible or practical in the short term.

8 DEFINITIONS

Activity Centre	An urban planning term for those places that are 'vibrant hubs where people shop, work, meet, relax and often live' (Department of Planning and Community Development 2012). The essential feature of activity centres, as understood in contemporary planning usage, is the concentration of people-activity.
Activity streets and boulevards	Streets with a high demand for movement as well as place with a need to balance different demands within the available road space. Successful activity streets and boulevards provide access to shops and services by all modes.
Arterial road	A road which is declared by the Department of Transport to be an arterial road under section 14 of the Road Management Act 2004. Generally, it is a road that predominantly carries through traffic from one region to another, forming principal avenues of travel for traffic movements.
Authorised officer	A person who has been delegated powers under the Road Safety (Traffic Management) Regulation 2019 in relation to major traffic control devices (other than works advisory devices). Authorised officers in DoT are listed in an Instrument of Delegation issued by the Head, Transport for Victoria.
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 or, if the length of road is shorter than 500 metres, for the whole road - (a) buildings, not over 100 metres apart, on land next to the road; (b) street lights not over 100 metres apart.
City hubs	Dense and vibrant places that have high demand for movement and provide focal points for businesses and culture.
City places	Roads and streets with high demand for pedestrian activities and lower levels of vehicle movement.
City streets	Streets that support businesses, on-street activity and public life while ensuring excellent connections with the wider transport network.
Collectors	A non-arterial road that collects and distributes traffic in an area as well as serving abutting property.
Connectors	Roads that provide safe, reliable and efficient movement of people and goods between regions and strategic centres and mitigate the impact on adjacent communities.
Freeway	A road which is declared by the Department of Transport to be a freeway under section 14 of the Road Management Act 2004. Generally, these are high standard divided roads with no or limited access for traffic between interchanges.
Local street	A road primarily used for local access to abutting residential properties within built-up areas.

Local streets (M&P)	Streets that provide quiet, safe and desirable residential access for all ages and abilities that foster community spirit and local pride.
Major traffic control device	A traffic control device specified in Schedule 1 of the Road Safety (Traffic Management) Regulations 2019.
May	Indicates the existence of an option for the practitioner to consider.
Municipal road	A road which has the meaning as defined in section 3(1) of the Road Management Act 2004. These roads / streets fall under the responsibility of the municipal council. Generally, these are roads / streets that are primarily used for access to abutting properties.
Rural	An area outside an urban area.
Shall	Indicates that the statement is mandatory.
Should	Indicates a recommendation.
Traffic control device	A traffic sign, road marking, or another device, to direct or warn traffic on, entering or leaving a road.
Unsealed road	A road that has been formed and constructed but has not been sealed with a surface treatment such as bitumen, asphalt or concrete.
Urban	Refer to 'built-up area'.
Urban / rural fringe or township / rural fringe	An area usually adjoining a built-up area characterised by dispersed access and lower population density.

9 DOCUMENT INFORMATION

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This document is also available in an accessible format at transport.vic.gov.au