



NSW Centre for
Road Safety



New South Wales Government



NSW speed zoning guidelines



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www.rta.nsw.gov.au/roadsafety/roadenvironmentsafety/index.html

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SECTION I:

Introduction

Scope, references and definitions

1.1 General

The Roads and Traffic Authority (RTA) is legislated under the *Transport Administration Act 1988* and is identified as the lead agency for delivery of road safety in New South Wales. The NSW Centre for Road Safety (Centre) is the road safety research, policy and technology directorate of the RTA and is committed to being at the forefront of road safety engineering, technological and behavioural research to significantly reduce the number of deaths and with serious injuries on NSW roads.

The Centre's Safe System Partnership approach is RTA's initiative to road safety and effective speed management is a key component of that approach (*refer to Section 1.8 for definition*).

The *NSW Speed Zoning Guidelines* have been developed to make the roads and the roadside environment safer for all road users.

1.2 Scope of the document

This document contains guidelines for use by contractors, councils and RTA staff who are experienced in assessing speed zones. It provides extensive technical information needed to understand the principles of speed zoning and procedures in determining, reviewing and signposting of speed zones.

These guidelines should be used in determining the permanent speed limits. They shall not be used in determining variable speed limits (VSL), speed zones at work sites, school zones or 40 km/h speed limits in high volume pedestrian areas. Although principles are the same but separate documents are available to cover these situations (*refer to Section 1.6.3*).

This document is to be used in conjunction with relevant Australian Standards and Austroads documents. It conforms with the specific interpretation of Australian Standards and Austroads guides.

This document contains material, which may constitute mandatory guidelines. If the word 'must' or 'shall' is used, then the matter forms part of mandatory guidelines. Where other terms such as 'may', 'should' or 'desirable' are used, then they do not form part of the mandatory guidelines (*refer to Section 1.8 for definitions*).

1.3 Aim

The purpose of this document is to provide guidance in reviewing and installing speed limits, to provide an appropriate balance between safety and mobility, and amenity on public roads. It describes the principles and procedures to be applied in determining appropriate speed limits on NSW roads. By providing a state-wide point of reference, it ensures a credible and consistent application of speed limits throughout NSW.

1.4 Approvals

Road Transport (Safety and Traffic Management) Act 1999 enables the RTA to set the speed limit for vehicles through traffic regulations. The speed zones are administered on NSW roads by the Roads and Traffic Authority, however, there is scope for relevant stakeholders (eg local council, members of public and road safety experts) to make requests to the RTA for change in speed zones.

The installation of traffic control devices (eg speed restriction signs) or interference with existing ones without the prior approval of the RTA is an offence as detailed in Part 4, Division 1 of the *Road Transport (Safety and Traffic Management) Act 1999*.

Special approval is required from the Director, NSW Centre for Road Safety for any departure from the guidelines contained in this document.

1.5 Application

These guidelines have been developed to provide consistency with the application of speed zoning in NSW and are generally in accordance with *Australian Standard 1742 Part 4*.

The practices and policies described in these guidelines comply with *Austrroads Guide to Road Safety – Part 3: Speed Limits and Speed Management*, and *Austrroads Guide to Traffic Management – Part 5: Road Management, as applied to New South Wales practice*.

This document sets out factors that need to be considered in setting speed limits and for signposting those limits. It supersedes *Speed Zoning Guidelines, version 2.3 April 2004*.

The section on 'trucks and bus speed limits' has not been included in these guidelines as the section is currently under review. Guidelines on 'trucks and bus speed limits' contained in version 2.3 shall continue to be used until the review is completed.

1.6 Reference documents

1.6.1 Government Plans

- *Australian Transport Council, National Road Safety Action Plan 2009-2010* (www.atcouncil.gov.au/documents/Pubs/ATC_actionplan0910.pdf).
- *NSW Government, Premiers Department State Plan – A new direction for NSW, 2006*. ISBN: 07313 32512 (www.nsw.gov.au/stateplan).

1.6.2 Acts and Regulations

- *NSW Road Rules 2008*.
- *Road Transport (Safety and Traffic Management) (Road Rules) Regulation 1999*.

1.6.3 RTA documents

- 40 km/h speed limits in high volume pedestrian areas: a guide to identifying and implementing 40 km/h speed limits in high volume pedestrian areas.
- 50 km/h Urban Speed Limit Evaluation Summary Report.
- *Delineation Guidelines Version 1.0*.
- *QA specification R141 Pavement Marking*.
- *QA specification R143 Signposting*.
- *Regulatory Signs Version 1.2*.
- *Road Design Guide*.
- *Traffic Control at Work Sites, Version 3.0*.
- *TD 2000/6 Shared Zone Signs*.
- *TD 2002/11 Use of VMS signs*.

These documents are accessible through the RTA website (www.rta.nsw.gov.au).

1.6.4 Australian Standards

- *Australian Standard 1742.1, Manual of uniform traffic control devices, Part 1: General introduction and index of signs*.
- *Australian Standard 1742.2, Manual of uniform traffic control devices, Part 2: Traffic control devices for general use*.
- *Australian Standard 1742.4, Manual of uniform traffic control devices – Speed controls*.
- *Australian / New Zealand Standard 2890.1, Parking facilities – Off street car parking*.

1.6.5 Austroads documents

- *Balance between Harm Reduction and Mobility in Setting Speed Limits: A Feasibility Study.*
- *Guide to Road Safety – Part 3: Speed Limits and Speed Management.*
- *Guide to Traffic Management – Part 5: Road Management.*
- *Urban Speed Management in Australia.*

1.6.6 Research reports

- ARRB Research Report 246, *Reducing Speed for Relative Effectiveness for a Variety of Sign Types.*
- ELVIK, RUNE et al, 2005, *Speed and Road Accidents: an evaluation of the Power Model, Nordic Road and Transport Research No. 1.*
- NILSSON, G, 1990, *Reduction in the speed limit from 100 km/h to 90 km/h during summer 1989: effects on personal injury accidents, injured and speeds.* Linköping, Sweden: Swedish Road and Traffic Research Institute. Report No.: 358A.
- Roads and Traffic Authority, *50 km/h Urban Speed Limit Evaluation, Summary Report, September 2000 (Version 2), RTA/Pub.00.0061 ISBN: 0 7313 0102 1.*
- SCHARPING, F K, 1994, *Experience Report. 30 km/h Speed Limit Zones in Hamburg, Speed Reduction Measures On Major Inner City Roads,* Transportation Research Institute, Technion-Israel Institute, Haifa, Israel.
- SLIOGERIS, J, 1992, *110 kilometre per hour speed limit – evaluation of road safety effects,* VicRoads Report GR 92-8.
- TZIOTIS, M, 2001, *Lower general speed limits – Learning from the NSW experience.* AITPM National Conference, Melbourne, Victoria.

1.7 Specifications

Speed management devices (eg signs and markings), in relation to which the methods, standards and procedures are prescribed in this document, shall meet RTA specifications. For detailed specifications for the materials and manufacture of these devices reference should be made to the relevant document listed in *Section 1.6.*

1.8 Definitions and abbreviations

AADT – Annual Average Daily Traffic is the total yearly traffic volume in both directions at a road location, divided by the number of days in the year.

In NSW, AADT is measured as either the number of vehicles or the number of axle pair passes during a 24 hour period averaged over a year.

Adjacent development – Commercial or residential development near the road, requiring regularly used driveways/access points (*also refer to Regularly used driveways/access points*).

Advisory speed signs – Advisory speed signs are used to inform motorists of changes in alignments (ie curves, bends, humps, dips) and of the appropriate speed to comfortably negotiate these road features. Advisory speed sign is used where the safe speed on the roadway may be less than the posted speed limit. Although the sign provides a warning to approaching drivers, it is not legally enforceable.

Area wide speed limit – This is the road network within a defined area on which a blanket speed limit is applied.

Arterial road – Arterial roads have the principal role of providing for traffic movement across and between regional areas.

Built-up area – 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:

- Buildings, not over 100 metres apart, on land next to the road.
- Street lights not over 100 metres apart.

Classified road – A road declared under *Roads Act 1993*, Part 5. (*also refer to State Roads*).

Clear zone – The roadside area adjacent to the road required to be clear of any non-frangible roadside hazard (ie trees, poles, drains, culverts, and steep embankments).

Default speed limit – Statutory speed limits that apply in the absence of speed limit signage. Default speed limits are 50 km/h in built-up areas and 100 km/h in non built-up areas.

Driver eye height – *RTA Road Design Guide* recommends driver eye height of 1.15 metres for passenger car and 1.8 metres for commercial vehicle. It also recommends 0.6 metres as vehicle tail-stop light.

85th percentile speed (V85 km/h) – The speed at or below which 85 percent of vehicles are observed to travel under free flowing conditions past a nominated point.

Freeway – A divided highway with no access for traffic between interchanges and with grade separation at all intersections (*also refer to Motorway and Tollway*).

Limited access – In urban areas limited access relates to sections of road where some frontage access is via side streets and traffic management is generally via front-in front-out access to and from properties.

Local road (or street) – These roads have a primary function of providing direct access to abutting properties.

Local area (or local traffic area) – Network of local and collector roads bounded by arterial roads.

Local precinct – Network of local roads bounded by collector and arterial roads.

May – Indicates the existence of an option, which is not mandatory. Mandatory requirements may, however, apply to a particular option once it is selected.

Motorway – A divided highway for through traffic with no access for traffic between interchanges and with grade separation at some interchanges. Certain activities or uses may be restricted or prohibited by legislative provision (*also refer to Freeway and Tollway*).

Must – Indicates that the statement is mandatory.

PR (Perception and Reaction) time – Time taken to detect, identify, evaluate a stimulus and react to it, eg change in signal condition, and the taking of appropriate action, eg application of vehicle brakes. *RTA Road Design Guide* recommends reaction time of 1.5 seconds for design speeds less than or equal to 100 km/h and 2.5 seconds where design speed is more than 100 km/h and access is controlled.

Prescribed traffic control device – Prescribed traffic control device means a sign, signal, marking, structure or other device to direct or warn traffic on a road or road related area (or part of a road or road related area) that is prescribed by the regulations for the purposes of this definition (*also refer to Traffic Control Device*).

Regularly used driveways – Driveways in urban areas used 2 to 3 times per week over a substantial period of time to establish a pattern.

Regularly used private accesses – Private accesses in rural areas used 2 to 3 times per week over a substantial period of time to establish a pattern.

Regularly used intersections – In semi urban/rural fringe areas regularly used intersections with a traffic generation potential of greater than 100 vehicles per day.

Road user – A driver, rider, passenger or pedestrian

Residential precinct – Same as *Local precinct*.

Safe systems approach – This approach recognises that even with a focus on prevention, road crashes will occur – therefore, the road system must be designed to be more forgiving of human error and where any crash that does occur minimises death and serious injury. It holds those who design and manage the road system to be specifically accountable for the safety performance of the network, and that the design of vehicles and road environments must be undertaken on the basis of human limitations.

Seal width – The width of sealed pavement. This includes lane widths and sealed shoulder.

Sub arterial – These roads compliment the arterial road network. They provide a traffic route onto the arterial road network, generally via collector roads. The arterial roads subsequently provide for traffic movement from one regional area to another.

Shall – Indicates that the statement is mandatory.

Should – Indicates a recommendation.

Shared zone – An area or length of road that is shared by vehicles and pedestrians, in which pedestrians have priority.

Sight distance – The distance measured along the road over which visibility occurs between a driver and an object or between two drivers at specific heights above the carriageway in their lane of travel (*also refer to stopping sight distance*).

Speed control – The practice of controlling speed by way of speed limits or speed management so that safe maximum speeds are clearly indicated. Compliance with the speed limit is promoted and uniform travel speed is encouraged and enforced.

Speed limit – This is the maximum, legally permissible driving speed along a specific section of road, as defined by the *NSW Road Rules* and the *Road Transport (Safety and Traffic Management) Act 1999*.

Speed management – Speed management is a process by which vehicle speeds are influenced in order to improve road safety and residential amenity. Speed management is generally achieved through the combination of engineering, education and enforcement strategies.

Speed zone – A speed zone is a length or an area of road along which a sign posted regulatory speed limit applies.

State Roads – Category of roads agreed with Council for administrative purposes. They form the primary arterial network of classified roads in the state and some special purpose classified roads.

Stopping sight distance – is the sight distance required by an average driver (car or truck depending on design requirements), travelling at a given speed, to react and stop before striking an object on the road (*also refer to sight distance*).

Time-based speed limit – Regulatory speed limit which applies during specified times of the day. These speed limits are applied on roads at times when the level of road and roadside activity varies markedly from other times.

Tollway – A freeway, for the use of which a toll has to be paid (*also refer to Freeway and Motorway*).

Traffic control device – Any sign, signal, pavement marking or other installation placed or erected by a public authority or official body having the necessary jurisdiction, for the purpose of regulating, warning or guiding road users (*also refer to Prescribed traffic control device*).

Traffic route – A road whose prime function is to move traffic between locations. These roads are typically primary arterials or secondary/sub-arterial roads.

Transition zone – A short length of speed zone used to provide a stepped change between adjacent sections of road that have different speed limits. Transition zones, also known as buffer zones, are not used in NSW.

Variable speed limits (VSL) – Variable speed limits are regulatory speed limits that are applied at different times of the day to reflect differing driving conditions.

Urban fringe – An area usually adjoining an urban built-up area characterised by dispersed access and lower population density.

1.9 Structure of the document

The document is structured to provide guidance in reviewing and installing speed limits. These guidelines are written in three Sections.

Section 1 gives the scope, aim, reference documents, definitions, abbreviations and structure of the document. *Section 2* describes the general framework for defining speed limits and includes the process required to review a speed zone, while *Section 3* provides detailed reference material.

A quick guide on how to use the document is given in *Table 1.1*.

TABLE 1.1 STRUCTURE OF THE DOCUMENT

SECTION	TITLE	DESCRIPTION
Section 1	Introduction	Gives the scope, aim, reference documents, definitions, abbreviations and structure of the document
Section 2	Speed zoning	Gives speed limit and speed zone principles, and speed zoning review procedures
Section 3	Reference information	Gives reference information on speed limits, speed zoning and signposting and authorisation of speed zones

SECTION 2:

Speed zoning

Principles and procedures

2.1 Speed limits – general principles

2.1.1 Introduction

These guidelines refer to speed limits and speed zones. A speed limit is the number shown within the red circle (anulus) and defines the maximum legal speed permitted (refer to Figure 2.1). A speed zone is the length of road to which a signposted speed limit applies.

FIGURE 2.1 SPEED LIMIT SIGN



The Roads and Traffic Authority (RTA) is the only agency authorised to set speed limits in NSW.

Speed zoning in NSW is based on a system of default speed limits supplemented by sign posted speed limits. Speed limits enable vehicles exceeding the limit to be identified and the drivers prosecuted, providing a measure of control over drivers who might otherwise travel at an unsafe speed.

All regulatory speed limits shall be in steps of 10 km/h always ending in 0. Advisory speed limits shall be in steps of 10 km/h, ending in 5.

Speed limits should be set to promote safety and encourage, as far as possible, a uniform travel speed. Excessive variation among vehicle speeds can indicate an inappropriately set speed limit or suggest that other measures are warranted, such as enforcement.

Speed zoning needs to reflect the use of the road and the nature of the road in the road hierarchy. Relative uses relating to local amenity, eg property access of roadside facilities such as pavement restaurants, compared with inter regional transport also need to be recognised.

A lower speed limit, that is speed limits less than 50 km/h, can improve amenity for local communities. Lower speed limits, particularly in commercial centres, will often encourage outdoor activities with local authorities providing suitable infrastructure.

2.1.2 Safe Systems Partnerships

The principle of 'Safe Systems Partnerships' as defined in *The National Road Safety Action Plan 2009 and 2010* concentrates on Safer Roads, Safer Speed and Safer Vehicles. A safe road system will assist in the delivery of the road safety targets set in The NSW State Plan.

A safe road system accepts human error as an inevitable factor in any transport system. A safe transport system makes allowance for human error, and endeavours to minimise the consequences: in particular, the risk of death or debilitating injury.

Knowledge of the forces, a human body can withstand, is key to understanding the safe road system. The force a human body can tolerate is directly proportional to speed.

These guidelines are important in determining speed limits that assist the drivers to recognise the speed limits which reflect the road environment being encountered.

Research demonstrates that speed is a significant road safety problem and the evidence is clear that lower speed limits result in irrefutable road safety benefits. (Sliogeris 1992, Nilsson 1990, Scharping 1994)

2.1.3 Improved road safety

The setting of safe speed limits is an integral part of safety on NSW roads. Almost 40% of all road related fatal crashes and 16% of injury crashes in NSW have speed as a factor.

Crashes have significant costs to individuals, families and communities:

- There were 140 fatalities and 4,129 injuries from speed related crashes in 2007.
- The cost to the community from speed related crashes in 2007 was around \$830 million (expressed in December 2007 dollars).

Lower speeds deliver significant road safety benefits, reducing both the number and severity of crashes. A major study (Tziotis, 2001) that evaluated the introduction of the 50 km/h urban speed limit, in NSW, has found that 23% reduction in road crashes was achieved on residential streets, where the lower speed limit was introduced. The study also found that the proportion of motorists travelling at excessive speed also fell dramatically on streets re-zoned to 50 km/h.

The monitoring of community attitudes revealed strong and growing support for 50 km/h urban speed limit.

As well as the benefits for safer speeds, appropriately set speed limits may provide a more uniform speed environment where drivers can more easily synchronise manoeuvres with other vehicles.

2.1.4 Engineering measures

If safety issues are identified along a particular length of road, engineering measures should initially be considered. These may include realignment, delineation or local-area traffic management schemes.

When long-term engineering measures are implemented, the speed limit should be re-evaluated.

Due to site consideration and financial constraints, engineering measures may not be feasible. Therefore, speed zoning may also be considered a long-term solution.

2.1.5 Economic development

Speed zoning needs to be considered in the context of economic activity. There is a cost to the community associated with increased travel time when setting a lower speed limit. Speed limits usually have only a small effect on overall travel times for an individual vehicle, but the economic cost can be very large when applied to significant traffic flow particularly when high volumes of freight vehicles are involved. This needs to be considered in setting speed limits.

For example, a 3 kilometre trip with no interruptions will take only 36 seconds longer if the speed limit is reduced from 60 km/h to 50 km/h. In most urban environments, with high volumes of traffic and frequent intersections, the change in travel time is even less.

Depending on the traffic volumes the potential reduction in costs associated with crashes will outweigh the penalty in travel times.

Benefits for the community arise from lower speed limits when the severity and number of crashes are reduced as lower speed limits are introduced. Research has shown that there is a causal relationship between speed and road safety outcomes. If mean speeds are reduced by 10%, fatalities can reduce by approximately 38% (Elvik, 2005).

Furthermore, lower speed limits contribute to improved network efficiency on key travel routes by reducing the number of crashes and associated delays. This is to be balanced against reduced network efficiency from slower mean speeds.

2.1.6 Public expectations

A recent attitudinal survey of metropolitan drivers showed that:

- The majority of Sydney's drivers thought speed limits were 'set about right'.
- Many reported being unsure of the speed limit: with 15% reporting being 'often unsure'.
- A substantial majority supported altered speed limits for changes in traffic conditions for roadworks (86%) or wet weather (79%).

The results show that the majority of drivers support the application of speed limits, but require speed limits to be clearly signposted.

Drivers expect that speed limits will be consistently applied and recognisable. The speed limit for some roads will, however, be set lower than similar roads for reasons such as an adverse crash history, which may not necessarily be apparent to motorists. Where this is the case, extra effort should be put into signposting the speed limit and to signposting or otherwise managing the factors underlying the crash history.

2.2 Speed limits in NSW – a quick guide

2.2.1 Introduction

Speed limits indicate the maximum safe and therefore legal speed for vehicles under ideal conditions. Drivers should reduce their speed as road and weather conditions dictate.

There are three types of speed limits used in NSW:

- Default speed limits.
- Signposted speed limits.
- Special speed limits based on vehicle and licence class.

Default speed limits are 50 km/h in built-up areas and 100 km/h in non built-up areas. These speed limits apply on roads in the absence of signposted speed limits.

2.2.2 Typical speed limits

Table 2.1 and *Table 2.2* show the ranges and types of speed limits used in NSW. In addition to crash history, cross sections, alignment, roadside development and traffic volume will influence the selection of a posted speed limit. This table must be used in conjunction with detailed descriptions found in *Section 3.2*.

Speed limits may also be applied for specific on-road or roadside conditions, or for particular classes of vehicles. Typical special speed limits are shown in *Table 2.3*.

TABLE 2.1 OVERVIEW OF SPEED LIMITS IN NSW

SPEED LIMIT	TYPE OF SPEED LIMIT	TYPICAL APPLICATION <i>(refer to Section 3.2.2 for more details)</i>
50 km/h	Default urban speed limit	<ul style="list-style-type: none"> Default urban speed limit in built up areas
60 km/h	Length	<ul style="list-style-type: none"> Significant urban undivided arterial roads (with direct driveway accesses)
70 km/h	Length	<ul style="list-style-type: none"> Significant urban divided arterial roads (with limited direct driveway accesses) Urban fringe undivided roads
80 km/h	Length	<ul style="list-style-type: none"> Urban high standard divided roads (without driveway access) Undivided arterial and sub-arterial roads on the fringes of urban areas Lower quality rural roads Undivided rural roads with less than 5.6 metres wide sealed pavement or no marked dividing line <i>(refer to Note below)</i>
90 km/h	Length	<ul style="list-style-type: none"> High volume urban motorways (freeways/tollways) Lower quality rural roads
100 km/h	Default rural speed limit Length	Default state speed limits for non-built up areas: <ul style="list-style-type: none"> Urban motorways (freeways/tollways) Rural undivided road with sealed pavement greater than 5.6 metres Rural divided roads
110 km/h	Length	Maximum allowable speed limit in NSW <ul style="list-style-type: none"> Motorways (freeways/tollways) in non-built up areas High quality rural divided roads Undivided rural road with low traffic volume in western part of NSW

NOTE:

Excluding some higher quality arterial roads in remote areas which are constructed in a geo-textile base and may have edge lines without a corresponding dividing line.

TABLE 2.2 SPEED LIMIT BY VEHICLE/LICENCE CLASS

VEHICLE/LICENCE CLASS	Learner	P1	P2	Provisional rider	Road trains	Heavy vehicles
SPEED LIMIT	80	90	100	90	90	100

NOTE:

- For further details refer to *Section 3.2: Types of speed limits*.
- Lower speed limits are to be used on lengths with adverse crash history or geometric limitations, such as steep, and/or winding roads.

TABLE 2.3 SPECIAL SPEED LIMITS AND APPLICABILITY IN NSW

OTHER SPEED LIMIT	TYPE OF SPEED LIMIT	TYPICAL APPLICATION
10 km/h	Length or area	Shared zones including: <ul style="list-style-type: none"> • Carparks • Reserves <i>Refer to Section 3.2.3 for more details</i>
40 km/h	Length or area	<ul style="list-style-type: none"> • High pedestrian activity areas • Local traffic areas • School zones (prescribed times) • School bus blackspot zones <i>Refer to Section 3.2.3 for more details</i>
40, 60 and 80 km/h	Length	<ul style="list-style-type: none"> • Roadwork speed limits <i>Refer to Section 3.2.4 for more details</i>

2.2.3 Zone length

To provide reasonable consistency while avoiding excessive variations in speed limits, a balance needs to be achieved between:

- Roadside development.
- Road environment.
- The number of changes of speed limit.

The desirable minimum typical lengths, shown in *Table 2.4*, have been developed with these needs in mind.

TABLE 2.4 MINIMUM LENGTH OF SPEED ZONES

SPEED LIMIT (KM/H)	DESIRABLE MINIMUM TYPICAL LENGTH OF ZONE (KM)
40	0.2
50 Default urban limit	Not applicable
50, 60	0.5
70, 80, 90	2.0
100	3.0
110	10.0

2.2.4 Unsealed roads

The default state speed limit is often inappropriate for unsealed roads. Allowances have been made to reduce speed limits on rural undivided roads with sealed pavement less than 5.6 metres and, unsealed roads may be considered in a similar manner.

Unsealed roads in a rural environment can be speed limited to 80 km/h. Unsealed roads passing through urban areas or areas with poor alignment should be speed zoned in accordance with the principles described in these guidelines.

Nevertheless, in some locations the default speed limit may be the preferred option, and in such cases, the *State Limit 100 Guidance sign (G9-318)* can be used to remind drivers to drive to conditions on unsealed roads.

2.2.5 Seasonal

Seasonal speed zones may be used at some locations where the traffic and/or road conditions vary significantly between seasons. These may occur at:

- Coastal or alpine holiday locations where pedestrian and parking and traffic activity increases significantly during holiday seasons.
- Locations where seasonal weather conditions require a lower than usual speed limit for safe driving (eg prevalent snow/wet weather and ice).

Seasonal speed limits should only be implemented where other means of addressing a road safety problem are not possible.

2.2.6 Offset speed zones

An offset speed zone means that there are different speed limits in each direction of a road. Offset speed limits are often difficult to enforce and confusing to some motorists.

They are not recommended and should only be adopted after careful consideration of road safety and enforcement implications. It may be appropriate to use offset speed zones in the following situations:

- On divided roads where one direction of a road produces a greater risk to that of the opposing direction (steep downgrades in combination with poor alignment).
- An opposing carriageway or divided road where the roadside development or road geometry on the two sides is markedly different.
- Construction sites.

At steep descents/ascents with unbroken dividing lines and climbing lanes for buses and trucks, it may also be desirable for a lower speed limit for descending heavy vehicles.

2.2.7 Delineation of curves

Guide posts are used to delineate alignment over the road length, however, abrupt changes in horizontal alignment require additional delineation treatments to assist drivers in approaching and negotiating the road safely.

Curve warning signs together with an advisory speed sign should be installed on all curves that have a recommended advisory speed at 15 km/h or less than the posted speed limit. Curves with a recommended advisory speed within 14 km/h below the posted speed limit should have curve warning signs installed without an advisory speed.

Ball-bank indicator should be used to determine the recommended safe speed of the curves (*refer to Section 3.5 for use of a ball-bank indicator to assess safe curve advisory speeds*).

Chevron Alignment Markers (CAM) should also be considered to better delineate the curve. Section 17 of RTA's *Delineation Guidelines* gives detailed information on delineating curves (*refer to Sections 2.3.4.1 and 3.3.5 for more information*).

2.3 Speed zones

2.3.1 Introduction

The following principles shall be followed when reviewing speed limits:

- The speed limit must not exceed the maximum assessed speed for the road, taking into account the amount and nature of adjacent activity, as well as the characteristics of the road itself.
- Speed limits should not be determined/ reduced for isolated geometric deficiencies.
- Speed limits should encourage a uniform speed of travel by vehicles.
- The need for a non-default speed limit should be obvious to drivers.
- Speed zone changes should be kept to a minimum, balancing the need for a new speed zone with the possible confusion caused by frequent changes.

2.3.2 Road function

The road network spans a wide range of road types with different transport functions and mixtures of traffic. Roads also have widely differing crash patterns and speed behaviour. Roads often have more than one function and it is important to identify the key function of the length of road under review.

2.3.3 Roadside development

The level of roadside development can influence the speed at which drivers travel. Driver acceptance of reduced speed limits is usually higher when the speed limit is appropriate for the level and nature of adjacent roadside development.

2.3.4 Road characteristics

A variety of road characteristics, such as horizontal and vertical alignment, clear zones, medians, lane widths etc, are able to influence the choice of a safe speed limit for a length of road. These factors need to be considered when reviewing the speed limit:

2.3.4.1 Alignment

The geometric features of a road may influence the speed at which motorists choose to travel. Speed zoning should consider the overall standard of road alignment (refer to Section 2.2.7 for delineation of curves).

Isolated sections of road with adverse alignments should be treated with advisory warning signs. The use of advisory signs is covered in Section 3.3.5. In critical locations, such as approaches to tunnels or bridges, it may be necessary to reduce speed limits and use enforcement measures to get the desired results.

The speed limit for a section of road that is characterised by closely spaced curves should be set according to the recommended safe speed of the curves rather than straight sections of road. This guideline applies if the section of winding road is more than 2 kilometres.

2.3.4.2 Road access

Consider the number and type of access points along a length of road and the adequacy of the sight distance (as described in AS/NZ 2890.1 – Section 3.2.4: *Sight distance at access driveway exits*).

2.3.4.3 Road hazards

Speed limits should generally not be reduced for isolated road hazards, however, where a number of hazards occur in proximity to each other over a 2 kilometres or more length of road, a reduction of speed limit may be warranted.

Where motorists would not have time to adjust their speed for a hazard, suitable advance warning signs should be considered.

A reduction in the speed limit may also be appropriate when there is a more generalised hazard such as a steep gradient.

2.3.4.4 Lane width

Lane width and the road surface condition have a substantial influence on the safety and comfort of road users. Depending on lane configuration and road alignment, a reduction in lane width reduces the lateral clearance between vehicles, which will reduce the traffic travel speed and lane capacity. A reduction of lane width requires consideration of speed limits.

2.3.4.5 Adjacent speed zones

Take into account the limits on adjacent sections of road and the length of the road section that is to be zoned. Speed limit changes should meet the minimum length criterion shown in Table 2.4. Excessive fluctuations in speed limits are confusing for drivers and create enforcement difficulties.

2.3.5 Intersections including merging, diverging and lane changes

Isolated intersections do not themselves justify a lowering of the speed limits. Improving sight distance, design layout and warning signs should all be considered to improve safety at the site. The effects of cross traffic, including pedestrians, are generally reflected in the crash rate, which is discussed in Section 3.1.

2.3.6 Traffic characteristics

The following traffic characteristics need to be considered before introducing a speed limit.

2.3.6.1 Traffic patterns

Lower speed limits should not normally be applied solely in response to conditions that arise for short periods each day. This includes in peak traffic activity, outside a factory or near a sports ground.

Exceptions can be made for specific Traffic Management Plans, including temporary speed limits (eg community bike rides). Other exceptions are school zones, work sites and variable speed limits (eg M5 East Motorway).

2.3.6.2 Pedestrians and cyclists

The presence of vulnerable road users, such as pedestrians and cyclists, should be taken into consideration when determining the speed limit for a length of road. The speed limit shall be compatible with the pedestrian and cyclist activity and facilities on that length of road. When assessing the speed limit for a length of road, factors such as roadside development and road environment should be considered in terms of pedestrians and cyclists.

Factors to consider include:

- Nearby pedestrian attractors and generators.
- Pedestrian characteristics (eg young children, elderly, mobility and vision impaired).
- Pedestrian crossing facilities.
- On-road bicycle facilities.
- Bicycle crossing facilities.
- Public transport links.

The amount of pedestrian and cyclist activity is related to the level of roadside development and type of road environment. If these factors are considered, the speed limit and pedestrian/cyclist activity will likely be compatible.

Reduced speed limits should be considered where certain selection criteria are met. This includes 40 km/h high pedestrian activity areas, shared zones and school zones (*refer to Section 3.2.2 for more information*).

2.3.6.3 85th percentile speed of vehicles

Speed surveys are used to determine overall traffic speed and volume on a road. This speed is usually determined by a survey of vehicles travelling under free-flow conditions. One of the measures used is the 85th percentile speed, which is the speed at or below which 85% of drivers travel.

This measure is useful for designing, implementing and evaluating speed management initiatives to address a speeding problem on a length of road. It does not indicate the safe speed limit.

If the 85th percentile is higher than the speed limit of a road it may be necessary to implement a broad speed management program in order to reduce speeding. Typical measures may include a combination of the elements shown below, noting that a reduction in speed limit should be undertaken after a speed zone review, considering all relevant factors:

- Speed signs.
- Enforcement.
- Public education.
- Reduced speed limit.

2.4 Speed review procedures

2.4.1 Introduction

The RTA has responsibility for reviewing and setting speed limits on all roads in NSW. All requests for assessment or review of a speed limit must be directed to the relevant RTA Regional Office.

A review of the speed limit seeks to enhance road safety by applying speed management policies and practices to:

- Evaluate the appropriateness of current speed limits.
- Determine the need for a change in the current speed limit taking into account:
 - Objectively respond to community views and concerns related to speed zoning policies and practices.
 - Identify and correct speed zoning anomalies.
 - Ensure that speed limits keep pace with changes in road use and level of roadside activity.
 - Keep the number of speed zone changes along a section of road to a practical minimum.

The use of a standard procedure to determine speed limits is necessary to provide the following:

- Consistent methodologies between Regions and practitioners.
- Guidance for data collection and analysis, and the relative importance of the various criteria used in determining speed limits.
- Consistent correlation of road environments with speed limits.
- Preservation of the integrity and credibility of speed limits.
- Standardised documentation, which assists in satisfying accountability and quality management requirements.

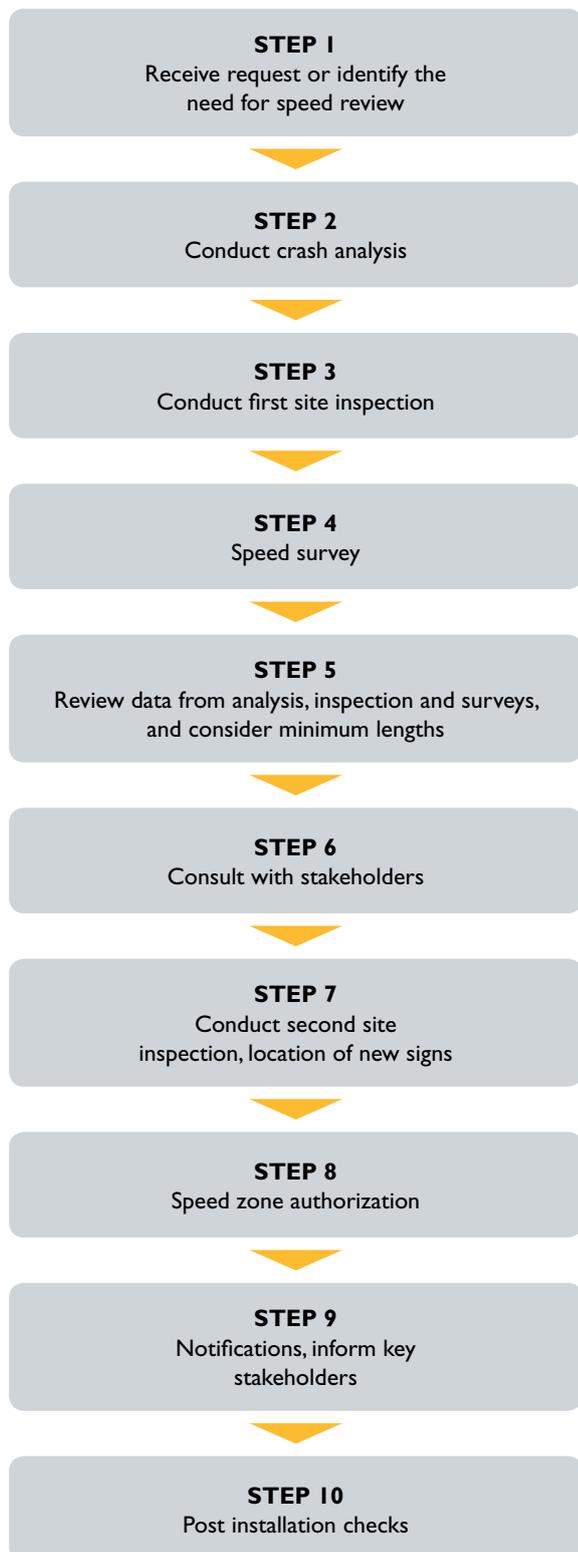
2.4.2 Main procedures for installing speed zones

A ten-step process has been created to enable practitioners to assess all issues related to reviewing and setting speed limits. The implementation process for each step is described in *Section 2.5*.

2.5 Ten-step process: speed zone review

The key 10 steps to be considered when reviewing and setting a speed limit are outlined in *Figure 2.2*.

FIGURE 2.2 SPEED ZONE REVIEW PROCEDURE



Step 1: Receive request or identify the need for speed review

Typical circumstances that lead to a review of speed limits include:

- A default speed limit is thought to no longer be applicable to a particular road.
- The speed limit no longer aligns with the speed environment (changes in conditions or need for rationalisation).
- Community requests or other inquiries have prompted a review of a particular speed limit.
- Existing speed zone lengths are less than the minimum length specified in *Table 2.4*.

Typically requests to review the speed limit come from:

- Police.
- Members of the public.
- RTA.
- Politicians.
- Local councils.
- Advocacy groups.

Step 2: Conduct crash analysis

Conduct a statistical crash analysis of the length of the road under review, as follows:

- Assemble a minimum 3 years of crash data for the selected road, plot data if required.
- Establish whether physical works have been undertaken that could render crash data as unreliable.
- Identify key crash types and clusters (such as day, time of day, conditions, pedestrian and alcohol involvement, heavy vehicle, single or multiple vehicle crashes).
- Determine the scale of the problem – prepare crash rate calculations and compare with established benchmark rates (*refer to Section 3.1 for further details*).
- Speed can be a determinant in the severity or outcome of all crash types.

Step 3: Conduct first site inspection

Information about the roadway and its characteristics needs to be collected by inspecting the road. Define the length of road under consideration, drive or walk the route and prepare a site sketch using running chainage to describe features. Use this technique to collect the following information about the relevant elements along the route including:

- Signage (GPS locations of regulatory, advisory, warning and guide).
- Adjoining speed limits.
- Vertical and horizontal alignment, delineation, curve speeds (other geometric constraints).
- Number and type of intersections (number and type of intersection noting Traffic Control Signal (TCS) number and configuration).
- Number of driveways, type and utilisation.
- Pedestrian facilities and controls such as fences.
- On-street parking.
- Cyclists' facilities.
- Roadside hazards and clear zones.
- Road cross section (shoulders, number of lanes including turning lanes, medians, merges, lane widths, transit lanes, bus lanes and pedestrians).
- Adjoining developments including pedestrian and traffic generators (such as fast food outlets, stations, bus stops, shopping centre car parks).
- Traffic mix (estimate percentage of heavy vehicle and vulnerable road users).

From the above information identify uniform lengths along the road that would be suitable for a single speed limit, taking into account minimum lengths of speed limit zones.

Step 4: Speed survey

Consider conducting speed surveys using one of the following three methods.

- (i) Limited speed surveys. For minor roads, conduct limited sample speed checks (typically a sample of 100 cars) using a speed detection device, such as radar or laser.
- (ii) Floating car surveys. Use 'floating car' speed checks by following another vehicle to determine travelling speed (typically 10 cars in each direction).
- (iii) Seven-day, 24 hour speed survey (amphometer).

Data must be collected over seven days, 24 hours per day speed survey. Data must be collected from free-flowing traffic and be capable of isolating speed profiles based on direction and lane choice. Review mean speed, 85th percentile speed, and percentage exceeding speed limit (by both 10 and 20 km/h exceedances).

Measurements (except floating car surveys) should be taken:

- No closer than 80 metres and preferably 100 metres from the start of a curve that would require a heavy vehicle to slow down, or at the mid-point between curves after the fastest curve in the section.
- Where possible, record light and heavy vehicle classifications.
- On longer lengths of road speed surveys should be conducted at approximately 3 kilometres intervals.
- Surveys should be undertaken on typical days (non public holidays/school holidays).

Traffic patterns on new constructed or reconstructed roads do not stabilise for 6-12 months. This should be taken into consideration when planning a survey.

Step 5: Review data from analysis, inspection and surveys, and consider minimum lengths

Develop a preferred speed limit considering Steps 1 through to 4 and referring to *Section 3.2*.

Define end and start points as well as any other changes (such as advisory speed signs) that need to be implemented if the speed limit is changed. Consider also the minimum zone lengths as shown in *Table 2.4* (refer to *Section 2.2.3*).

Step 6: Consult with stakeholders

Consultation with stakeholders should focus on the following aspects of the speed limit review process:

- Knowledge of crashes or other road safety issues.
- Reporting the outcome of the review process.

It may be appropriate to discuss the proposed speed zoning with all or some of the following stakeholders:

- Network Management, including where appropriate:
 - Traffic Management.
 - Network Operations (SCATS).
 - Infrastructure Maintenance.
- Centre for Road Safety and seek comment.

Make a decision giving consideration to comments received.

Step 7: Conduct second site inspection, location of new signs

Review information gathered from the initial inspection detailed in Step 3:

- Review proposed sign locations by standing on the spot where the sign is to be installed, check sight distances and ensure that there are no conflicting signs or obstacles.
- Consider future vegetation growth.
- Mark all new sign locations on the road with paint and record GPS location of new signs as well as reference to running chainage and to fixed objects in field notes.
- Note exact locations of all signs to be removed with running chainage and reference to fixed objects.
- Request maintenance work such as trimming foliage, if necessary.
- Check all curves and existing curve advisory signs using the ball-bank indicator (*refer to Section 3.5*).
- Identify the need to install new Curve Alignment Markers (CAMS) as required. The speed reviewer should advise council regarding the appropriate curve warning signs on council, local and regional roads.

NOTE For types and placement of signs *refer to Section 3.3*.

Step 8: Speed zone authorisation

Under current legislation, the installation or removal of every speed limit sign must be authorised. A Speed Zoning Authorisation (SZA) must be used to authorise the installation and removal of the main speed limit signs. A SZA only authorises signs that define speed zones and is not used for replacement signs or repeater signs. Repeater signs are authorised by the completion of a 'Works Instruction'. Records of these authorisations must be retained by the relevant RTA office (*refer to Section 3.4 for an example of a SZA*).

Separate records shall also be retained showing details of the actual installation and removal of the sign. Details shall include authorisation, exact sign location, date, and time.

A database incorporating a Geographical Information System (GIS) output shall be maintained indicating the location of all authorised speed limit signs and the zones that these signs create. Also, a record system must be maintained to retain SZA information. A unique numerical identifier shall be assigned to each SZA to assist with filing and identification of records in the relevant Regional Office.

Step 9: Notifications, inform key stakeholders

It may be necessary to inform the public and key RTA stakeholders of any proposed change to speed zoning.

The following levels of notification can be used as a guide:

- Key RTA Stakeholders:
 - Network Operation Section.
 - RTA Traffic Asset Management Section (update TAIMS database)-state roads only.
- For State-managed roads:
 - Advise the Police.
 - Organise Variable Message or 'Changed Traffic Conditions' Signs where appropriate to inform passing motorists of changed speed limit (RTA policy for VMS signs is covered in TD2002/11, *refer to Section 1.6.3 for reference details*).
 - Prepare a minute to the Regional Manager and send a copy to the Director, NSW Centre for Road Safety.
 - Prepare press release or advertising for local newspapers through the RTA media unit.
- For Council managed roads:
 - Inform council of proposed changes (including sign types and locations for maintenance).
 - Advise the Police.

Step 10: Post installation check

Conduct a post-installation check to ensure all signs were installed and removed as per work instruction. Document any additional work required.

All new sign locations shall have GPS coordinates taken at this time and dates of installation shall be recorded.

SECTION 3:

Reference information

Types and signposting of speed limits

3.1 Crash concentrations and rates

A thorough crash analysis must be undertaken before adjusting the speed limit for any road length, including examination of possible factors associated with road crashes. High crash rates or concentrations of crashes along a length of road are indicators of safety deficiencies. Speed limits that are too high may exacerbate crash rates and injury severity.

By examining the causes of crashes, it is possible to decide the relative importance of causes, including speeding. Speed is also a predictor of the severity of the outcome of all crashes regardless of identified contributing factors.

When conducting a statistical crash analysis, it is important to note clusters of crashes which may affect the crash rate. Clusters of crashes may indicate localised problems that are best addressed through engineering treatments. A crash rate can be determined for a section of road as follows:

$$\text{Crash Rate} = \frac{\text{No. Crashes} \times 10^8}{[\text{Length (km)} \times \text{AADT (total number)} \times 365 \times \text{No. Years (of crash data)}]}$$

NOTE: Locations of crashes along lengths of road.

The crash rate for a section of road should be reviewed and compared to the values in Table 3.1. If this calculated rate is greater than average for that type of road, a lower speed zone may be warranted.

TABLE 3.1 CRASH RATES AND ROAD ENVIRONMENT

DEVELOPMENT/ ROAD CATEGORY	TYPICAL CRASH RATE (total crashes per 100 MVK)*
Urban Freeway	50
Urban divided road (4 lanes or more)	165
Urban undivided road (4 lanes or more)	225
Urban undivided road (less than 4 lanes)	110
Rural Freeway	20
Rural divided road (4 lanes or more)	33
Rural undivided road	35

* Million Vehicle Kilometres

NOTE:

- Discretion is needed in comparing these rates to the rate on a particular section of road. A specific road section may not fall comfortably into any single category.
- Rates shown are typical crash rates based on the rural crash rates database and typical urban values. The values do not suggest an acceptable level.
- If the calculated crash rate for a length of road is greater than the average for that type of road, a lower speed zone may be warranted.

3.2 Types of speed limits

Three types of speed limits are used in NSW:

- (i) Default speed limits.
- (ii) Signposted speed limits.
- (iii) Speed limits based on vehicle and licence class.

Signposted speed limits take precedence over the default speed limit that would otherwise apply but not over special speed limits that apply to certain classes of vehicles and licences.

A speed zone is the length of road where a sign-posted speed limit applies.

3.2.1 Definitions of types of speed zoning

(a) Sign posted limits

A speed limit is the number of kilometres per hour indicated within the red annulus on the roadside sign. Signposted speed limits override the default limits that would otherwise apply to the length of road when they are displayed. However, neither speed zones nor default speed limits take precedence over any special limits for particular groups of vehicles (ie trucks and buses) or drivers (ie learner and provisional drivers).

(b) Default speed limits

Default speed limits are statutory limits imposed by NSW Government Road Transport law, specifically the *NSW Road Rules and Road Transport (Safety and Traffic Management) (Road Rules) Regulation 1999 – Schedule Clause 19*.

In NSW two default speed limits apply – a default speed limit for built-up areas and a default speed limit for non built-up areas. Both limits are set by regulations under the *Road Transport (Safety and Traffic Management) Act 1999*. The default limit for a built-up area is 50 km/h while the default limit for non built-up areas is 100 km/h.

Default speed limits are legally enforceable even though there may be no speed limit signs. That is, motorists are required to know that in the absence of signs, the default limit applies.

(c) Areas

A speed-limited area is the network of roads in an area with:

- An area speed-limit sign on each road into the area, indicating the same speed, and
- An end area speed-limit sign on each road out of the area.

Areas include 40 km/h high-pedestrian activity areas and local traffic areas.

(d) Lengths

A speed-limited length of road begins at a speed limit sign and ends at the nearest of the following:

- A speed-limit sign on the road showing a different speed limit.
- An end speed-limit sign on the road.
- The end of the road if the road ends at a T-intersection or terminates such as in a cul-de-sac.

3.2.2 Typical types of speed zones, areas and lengths

(a) 50 km/h (default urban speed limit)

A default urban speed limit of 50 km/h applies in all built-up areas.

In the context of speed limits, 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 metres or, if the length of road is shorter than 500 metres, for the whole road:

- Buildings, not over 100 metres apart, on land next to the road.
- Street lights not over 100 metres apart.

The 50 km/h area sign (R4-10(50)) and end 50 km/h area (R4-11(50)) are no longer to be installed.

FIGURE 3.1 50 KM/H DEFAULT URBAN SPEED LIMIT



(b) 60 km/h

This speed limit applies to roads in built-up areas. These roads are generally major arterial roads that are designed for travel between localities. Roads can be divided or undivided having closely spaced access to abutting development and, in larger areas, are usually multi-lane roads.

FIGURE 3.2 SIGNIFICANT URBAN DIVIDED ARTERIAL ROAD (WITH DIRECT DRIVEWAY ACCESS)



FIGURE 3.3 SIGNIFICANT URBAN UNDIVIDED ARTERIAL ROAD (WITH DIRECT DRIVEWAY ACCESS)



(c) 70 km/h

Urban 70 km/h speed limits may be applied to divided arterial roads with full or partial urban development with limited access to the main carriageway. Roads zoned 70 km/h in urban areas should also have a high standard of alignment, signalised intersections.

A 70 km/h speed limit should not be applied where there are high levels of traffic conflict, or side friction resulting from adjacent pedestrian activity and vehicle parking.

Typically 70 km/h speed limits include:

- Significant urban divided roads with limited driveway access (typically six to 15 regularly used driveways per kilometre).
- Significant two lane state roads with limited driveway access (typically six to 15 regularly used driveways per kilometre) and low pedestrian activity.

FIGURE 3.4 URBAN 70 KM/H DIVIDED ROAD WITH LIMITED ACCESS



(d) 80 km/h

This speed limit is applied to divided carriageway urban arterial roads with little or no direct abutting access.

These speed limits are also applied to undivided roads in rural areas where a lower standard of vertical and horizontal alignment exists or; the sealed pavement width less than 5.6 metres or no dividing line exists.

The 80 km/h speed limit also applies to rural roads in semi urban/rural fringe areas (with pavement width greater than 5.6 metres) with limited adjacent development or undivided arterial roads passing through fringe urban areas. Semi urban/rural fringe areas can be defined as having one to two intersections per kilometre and five to six regularly used driveways or private accesses per kilometre.

80 km/h speed limit roads typically include:

- Urban high standard divided arterial roads (without driveway access).
- Undivided arterial and sub-arterial roads on the fringes of urban areas.
- Undivided rural roads with less than 5.6 metres sealed pavement or no dividing line.

FIGURE 3.5 URBAN HIGH STANDARD DIVIDED ROAD (WITHOUT DRIVEWAY ACCESS)



FIGURE 3.6 URBAN FRINGE UNDIVIDED ROAD



FIGURE 3.7 UNDIVIDED RURAL ROAD WITH LESS THAN 5.6 METRES SEALED PAVEMENT



(e) 90 km/h

This speed limit is suitable for busy urban freeways or motorways and some rural roads.

Roads with traffic lights are not suitable for 90 km/h speed limits.

90 km/h speed limit roads typically include:

- High-volume urban freeways/motorways.
- Rural roads not suitable for 100 km/h.

FIGURE 3.8 HIGH VOLUME URBAN FREEWAY



(f) 100 km/h (default rural speed limit)

All rural roads in NSW are 100 km/h unless signposted with another speed limit. It is also appropriate to install 100 km/h speed limits on urban freeways and motorways and rural divided roads, as well as rural roads with sealed pavement widths greater than 5.6 metres and a marked dividing line (refer to Section 3.2.2 (d) for semi urban/rural fringe areas).

Default state speed limits apply in non-built up areas, including:

- freeways/motorways.
- Rural divided roads.
- Rural undivided road with at least 5.6 metres sealed pavement and rural roads with a marked centreline.

FIGURE 3.9 RURAL DIVIDED ROAD



FIGURE 3.10 RURAL UNDIVIDED ROAD WITH SEALED PAVEMENT GREATER THAN 5.6 METRES



(g) 110 km/h – divided roads

Speed zones of 110 km/h may be appropriate for routes that are key transport routes. This speed limit is often appropriate for freeways and the continuation of divided carriageways beyond freeway sections.

Consider the following aspects when implementing 110 km/h zoning:

- Access is restricted to no more than two regularly used private accesses per kilometre on each side of the carriageway.
- Interchanges and intersections to be well spaced to allow safe operational movements, with a typical length between important intersections of 10 kilometres.
- Low-volume side road intersections to be more than 1 kilometre apart.
- The general nature of the roadside is conducive to safe recovery of errant vehicles with sealed shoulders provided.

Typically 110 km/h speed limit roads include:

- Freeways/motorways in non-built up areas.
- High quality divided rural roads.

FIGURE 3.11 FREEWAY IN NON-BUILT UP AREA



(h) 110 km/h – undivided roads

On undivided roads in rural NSW, a speed zone of 110 km/h may be suitable if the following conditions are met:

- Rural route used mainly for interstate and inter-regional transport with relatively longer trip lengths (these will generally be highways).
- Roadways of higher alignment standard (generally high design speeds, with adequate sight distance available).
- Undeveloped roadside or isolated dwellings are set well back from the road and not overly affected by noise.
- Less than two regularly used accesses per kilometre on both sides of carriageway, all with adequate sight distance.
- Interchanges and intersections are well spaced to allow safe operational movements with a typical length between important intersections of 10 kilometres.

Crash rate not to exceed 25 crashes/100 MVKT, generally calculated over a period of at least three years.

Roadside terrain provides good opportunity for drivers to regain control of vehicles and sealed shoulders are provided. A clear zone of between 5 metres and 15 metres is required depending on a grade of batter or embankment (refer to Section 3.74 of the RTA's Road Design Guide).

Appropriate sealed width of roadway is available as are shown in Table 3.2.

TABLE 3.2 MINIMUM SEAL WIDTH

AADT	MINIMUM SEAL WIDTH (M)
0 to 300	6.2
301 to 1000	6.8
1001 to 4000	7.4

3.2.3 Other speed limits

(a) 10 km/h shared zones

10 km/h urban shared zones including:

- Carparks.
- Reserves/parks.

A shared zone is a network of roads in an area where pedestrians and motor vehicles share the road space. Drivers must not exceed 10 km/h and must give way to pedestrians at all times.

The most common uses of shared zones are in commercial, tourist and heritage areas. However, this facility may also be used in other appropriate situations such as some shopping malls.

Shared traffic zones must:

- Clearly indicate pedestrian priority.
- Be a self-enforcing speed environment.
- Have low traffic volumes.

For detailed guidelines for implementation of shared traffic zones, refer to TD 2000/6 *Shared Zone Signs*.

(b) 40 km/h speed limits

The 40 km/h speed limits are used in areas where vulnerable road users are present and include:

- School zones (prescribed times).
- High pedestrian activity areas.
- Local traffic areas.
- Toll plazas in pedestrian access areas.
- School bus blackspot zones.

(c) School zones speed limits

School zones are implemented outside schools to reduce vehicle speeds, where there is an increased potential for conflict between vehicles and school children. School zones operate on government gazetted school days.

School zones are described by the following documents:

- *Technical direction (Under revision), Installation of 40 km/h School Zones on multilane roads and High Speed Roads (TD 2003/RS02)*.

(d) High pedestrian activity areas

Vehicle speed is a key factor in pedestrian injuries and fatalities, especially in areas with high pedestrian activity.

The 40 km/h high pedestrian activity speed limits are installed where there are relatively large numbers of pedestrians and/or other vulnerable road users.

These areas should be established in conjunction with a suitable Local Area Traffic Management (LATM) Scheme. The area will need to contain physical devices or treatments to create a self-enforcing 40 km/h speed environment.

For further details on how to identify and install 40 km/h high pedestrian speed limits in high volume pedestrian areas refer to the Roads and Traffic Authority's 40 km/h speed limits in high volume pedestrian areas (*refer to Section 1.6 for reference details*).

(e) Local traffic areas

Local traffic areas that are primarily self-contained, residential precincts with networks of local streets used mainly for local access may be suitable for 40 km/h speed limits.

Typically, these areas have physical devices or treatments to create a 'self-enforcing' 40 km/h speed environment.

(f) Toll plazas

In toll plazas where toll operators require pedestrian access, a 40 km/h speed limit is to be applied as there will be staff working in this area. The speed limit is reduced on approach to the cash toll booths with the appropriate speed restriction ahead speed sign (R4-225) as an advance warning. At electronic toll collection points the speed limit is to be set out to suit the prevailing configuration.

3.2.4 40, 60 and 80 km/h road work speed limit

Reduced speed limits are implemented when road works are on or adjacent to the road.

Speed limits must be authorised by the delegated authorising officer and a temporary Speed Zone Authorisation (SZA) issued. In addition, a seven-year record must be kept of the locations, dates and times road work speed limits are in operation. Records must be supplied to the Regional RTA office by the construction authority. The construction authority should also notify Police of roadworks speed limits.

All non-applicable speed limits signs must be securely covered or removed (not turned around) during which the road work speed limit applies. At the end of road work speed limit zones the regular speed limit must be clearly signposted and should be established as close to the worksite as is reasonable. Roadwork speed limits should not be implemented during period where the lack of activity or the available road condition does not justify the request.

Section 8 of the RTA's *Traffic Control at Work Sites Guidelines* details the procedure for speed zoning a work site. All speed zoning at work sites must be carried out using these guidelines.

3.2.5 Variable Speed Limits (VSL)

Electronic VSL are currently used in NSW for any of the following reasons:

- Traffic management and incident responses.
- Changes in weather conditions that physically affect the safe speeds at which all vehicles can be driven on a particular length of road.
- To ease traffic congestion as part of an adaptive speed control system.
- Roadworks.

The SZA for variable speed limits is to be approved by the Director, Centre for Road Safety and the General Manager, Transport Management Centre (TMC) (refer to Section 3.3.10 for details).

The design and use of variable speed limits should be assessed using the RTA's *Policy on Use of Variable Speed Limit Signs* (refer to Section 1.6 for reference details).

3.2.6 Truck and bus speed limits

The section on 'trucks and bus speed limits' has not been included in these guidelines as the section is currently under review. Guidelines on 'trucks and bus speed limits' contained in version 2.3 of *Speed Zoning Guidelines* shall continue to be used till the time review is completed (refer to Section 1.5).

3.2.7 Speed limits on structures

In some circumstances it is necessary to limit speed on structures such as bridges to avoid damage. This may be temporary or semi-permanent. The actual speed limit needs to be set after consultation with relevant structural engineering staff. Consideration should also be given to supplementary signposting and transitioning speed zones, especially on higher speed roads.

3.3 Signposting of speed zones

3.3.1 Sign type

Signs used to prescribe a speed limit are defined in the *NSW Road Rules Part 3 Section 20-21*.

Signs used in this guide comply with the design practice of *Australian Standard AS 1742.4: Speed controls, and associated standards* (refer to Section 1.6 for reference details).

Electronic signs are to be used in tunnels.

A complete list of signs is given in the RTA Traffic Signs Register on the RTA website.

3.3.2 Determining sign sizes

Speed limit signs R4-1 come in four sizes ranging from A (the smallest, which is rarely used) to D size signs which are typically seen in high speed environments such as freeways and motorways.

The approach speed is the main determinant of sign size. The size of signs should also take into account the road type, surrounding road environments and the distraction from other signs and advertising.

Table 3.3 should be used to determine appropriate sign size.

TABLE 3.3 SIGNAGE SIZES FOR VARIOUS ENVIRONMENTS

ROAD TYPE	A SIZE	B SIZE	C SIZE	D SIZE
Local, low speed environments < 50 km/h	Repeater signs	Change of speed limit		
Local road environment (50 km/h)		Change of speed limit & repeater signs		
Arterial urban		Repeater signs	Change of speed limit	
Non-arterial urban		Change of speed limit and repeater signs		
Arterial rural <100 km/h		Repeater signs	Change of speed limit	
Non-arterial Rural		Change of speed limit & repeater signs		
Freeway/motorway on and off ramps and freeway/motorways <100 km/h			Change of speed limits and repeater signs	
High speed roads \geq 100 km/h freeway/motorways			Repeater signs	Change of speed limit
Variable Speed Limit (VSL) zones				All
Tunnels (backlit or VSL signs)		Repeater signs	Change of speed limit	

NOTES:

- Pavement markers (numerical display of speed limit painted onto each lane) are generally installed with changes of speed limit on roads that carry substantial volumes of traffic (refer to Section 3.3.6).
- Where the lateral placement of these signs exceeds 4 metres from edgeline of a travelled lane, increase by one size.
- If there are competing signs, the size may be increased one size.

(a) Location of signs

At each change of speed limit, two speed restriction signs (R4-1) are to be provided. A sign is positioned on each side of the carriageway in a symmetrical position (refer to Figure 3.13 – Typical signs and markings at change of speed limits).

The signs should be positioned so drivers have a timely view of them and should not be distracted by other signs or roadside development.

Minimum clearances of vertical and horizontal offsets from the ground and carriageway are to be observed. All speed limit signs are to be placed as close to these minimum clearances as possible to give motorists a clear and timely view of the signs. If signs are to be located closer than the minimum or further than the maximum distances, approval must be sought from the Regional Road Safety Manager.

The minimum clearance between the ground and base of any signs are:

- Urban (where there are pedestrians and cyclists) = 2.2 m
- Rural (no pedestrians and cyclists) = 1.5 m

The minimum and maximum distance between the sign and passing traffic is shown below.

- The minimum lateral clearance between the edgeline of travel lane and edge of the sign is 0.6 metres.
- The maximum lateral clearance from the centre of the left travel lane and the edge of the sign must not exceed 6.6 metres.

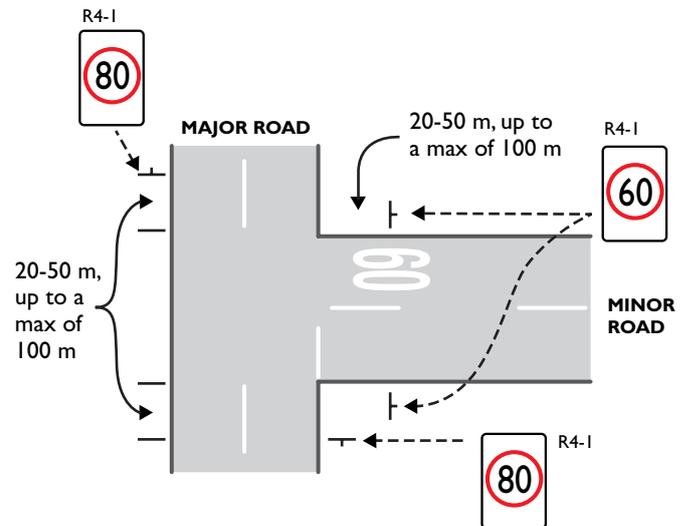
Speed limit signs should be installed at locations that provide for sight distances shown in Table 3.4.

TABLE 3.4 SIGHT DISTANCE TO SPEED RESTRICTION SIGNS

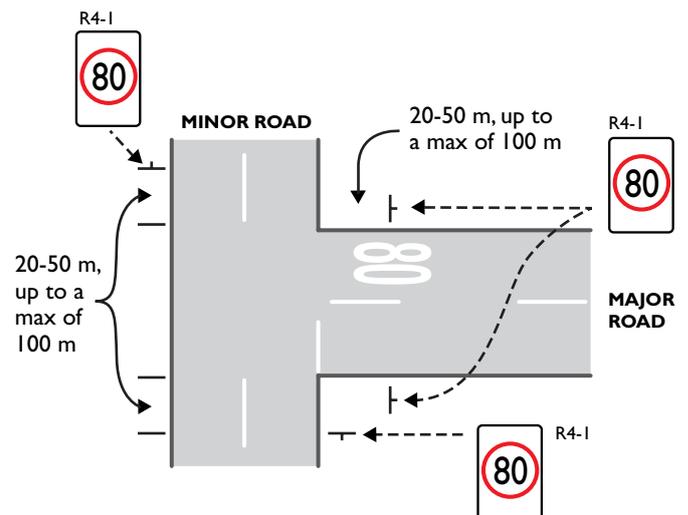
SPEED RESTRICTION (R4-1) SIZE	SIGHT DISTANCE (M)
B	150
C	240
D	300

FIGURE 3.12 TYPICAL SPEED LIMIT SIGNS AT A JUNCTION

Different speed limit on major and minor roads



Same speed limit on major and minor roads



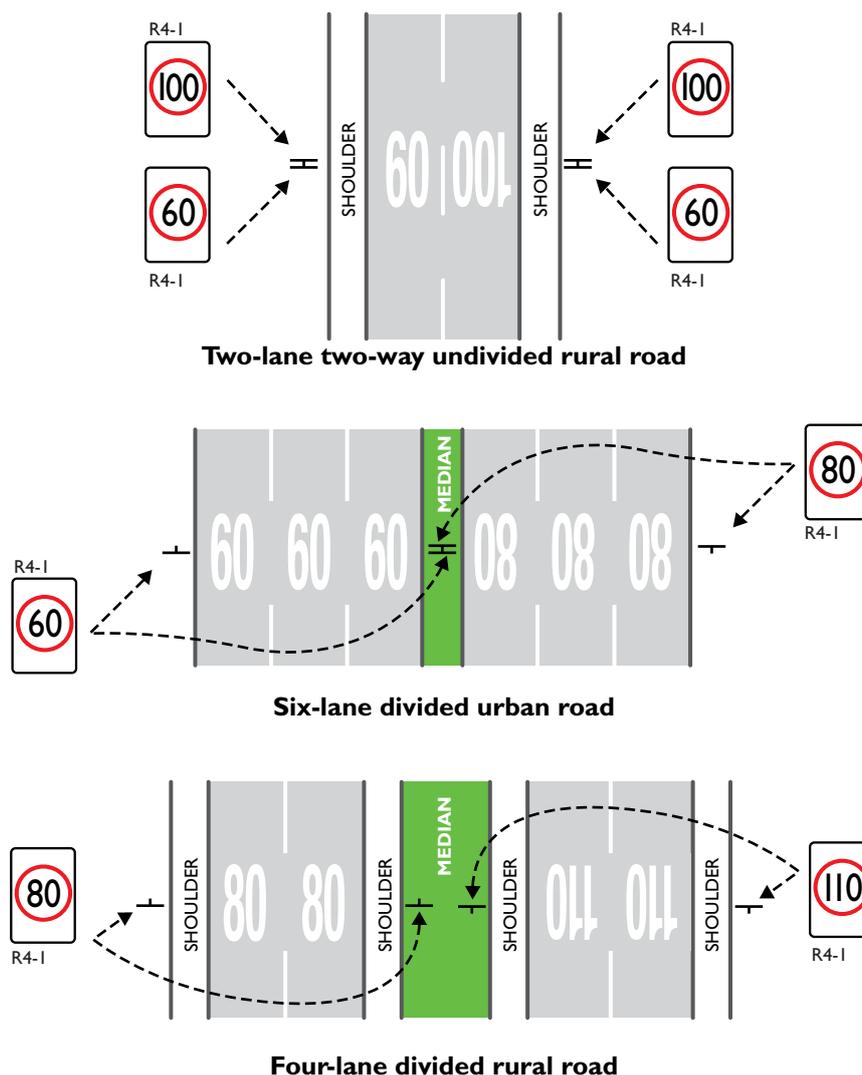
NOTE:

- Signs located up to 100 m from junction.
- Speed limits are generally not to be reduced on approach to a T-junction. If necessary warning signs should be installed alerting motorists of the junction or intersection.

(b) Supplementary plates

Supplementary plates can be used to explain speed limits where the reason for the limit it is not apparent, such as road works, school zones or high pedestrian areas.

FIGURE 3.13 TYPICAL SIGNS AND MARKINGS AT CHANGE OF SPEED LIMIT



NOTE:

- Speed signs are usually centred on the pavement markings.
- Signs must be placed on either side of the carriageway on divided carriageway roads.

3.3.3 Repeater signs

Repeater signs R4-1 are typically positioned on the left-hand side of the road on the departure side of the intersection on:

- Classified roads.
- Other roads with a substantial volume of traffic.
- Any location where there is confusion over speed limits.
- Roads with three or more lanes (repeater signs should be on both sides of the road).

Repeater signs must be used to reinforce speed limits when the speed limit may not be obvious. If repeater signs are considered necessary, subsequent spacings throughout the zone are suggested in *Table 3.5*.

The distance between repeater signs shown in *Table 3.5* are maximum distances which may be reduced according to site conditions. Repeater signs should be placed where the road is straight, or where gradual curves have advisory speed rating above the speed limit.

Many speed zones will involve curves with advisory speed signs, and in some cases, curves with advisory speeds will be very near the start of the speed zone. The minimum separation distances between speed limit signs and other road signs must be considered (*refer to Table 3.6*).

TABLE 3.5 SUGGESTED SPACING OF SPEED REPEATER SIGNS

SPEED ZONE (KM/H)	DISTANCE OF FIRST REPEATER SIGN FROM START OF ZONE	SPACING OF SUBSEQUENT REPEATER SIGNS
40	Appropriate intervals (300 m) ¹	Maximum of 500 m
50	300 m	Generally not needed
60	300 m	1 km
70	300 m	1 km
80	300 m	1 km
90	400 m	3 km
100, 110	500 m	5 km – 10 km
100, 110 (far west of State) ²	1 km	10 – 20 km

NOTES:

1. Length of zone is usually too short (eg school zones).

2. Repeater signs may be used less frequently in far-western areas of the State, where the terrain is mostly flat and highways are typified by long straight sections with few intersecting main roads.

(a) Conflict with other signs

Speed limit signs should not generally be placed closer to another road sign than indicated in *Table 3.6*.

TABLE 3.6 SEPARATION BETWEEN SPEED LIMIT SIGNS AND OTHER SIGNS

SPEED LIMIT (KM/H)	MINIMUM SEPARATION DISTANCE (M)
40	50
50	80
60	80
70	90
80	100
90	110
100	120
110	130

(b) Speed Restriction Ahead signs (SRA)

Advance warning of changes in speed limits should be provided in the following situations by installing a speed restriction ahead sign (R4-225) (which incorporates a black anulus):

- Insufficient sight distance.
- A downhill approach.
- Where there is a speed reduction of 30 km/h or more.
- Where under normal driving expectations, the change in speed zone may not be apparent to the motorist.

NOTE: On roads with three or more lanes, speed restriction ahead signs must be on both sides of the road.

Speed restriction ahead signs should generally only be used when it is essential to provide motorists with information not otherwise evident, or where the reduction in speed is significant. *Table 3.7* provides recommended sign spacing of Speed restriction ahead signs in relation to the speed zone change. This table can also be applied to the distance between a curve advisory sign and the curve.

TABLE 3.7 DISTANCE FOR PLACEMENT OF SPEED RESTRICTION AHEAD SIGNS

85TH % SPEED (KM/H)	DISTANCE TO SPEED ZONE CHANGE (M)
50	60 to 80
60	80 to 100
80	120 to 140
90	140 to 170
100	170 to 210
110	210 to 260

NOTE: This table also applies to the distance between a curve advisory sign and the start of the curve.

3.3.4 Buffer zones (transitional zones)

Buffer zones should not be installed in NSW. The speed restriction ahead sign – discussed in *Section 3.3.3 (b)*, is the preferred method of signposting.

A buffer zone is a gradual reduction in speed limits, eg an 80 km/h speed limit between a 100 km/h rural limit and a 50 km/h urban limit. Buffer zones are described in Australian Standards but they are not recommended in NSW as they would increase the number of speed zones across the road network. The speed restriction ahead sign (R4-225) is the adopted practice in NSW to provide advance warning of changes in speed limits.

Speed limits should be compatible with the adjacent roadside development. This ensures that motorists are provided with a speed environment that is appropriate and enforceable. The use of an intermediate speed limit may be considered where adjacent roadside development supports such action.

ARRB Research Report 246 (*Reducing Speed for Relative Effectiveness for a Variety of Sign Types*) supports the use of speed restriction ahead signs as the preferred option to limit the number of speed zone changes.

3.3.5 Advisory speed signs

The advisory speed sign (W8-2) is used to recommend the speed for comfortable and safe travel through a curve. The typical curve should be indicated by an accompanying warning sign. This speed is a maximum based on good weather, traffic and road conditions. If the measured advisory is within 14 km/h below the posted speed limit, no advisory speed sign is used. However the appropriate curve or warning sign should be displayed. All advisory speed signs should end in 5 km/h and be multiples of 10 km/h, such as 75 km/h or 85 km/h.

Guidelines for determining advisory speeds and the application (*refer to Table 3.7 for sign placement in advance of corners*) of advisory speed signs are provided in *Section 3.5*.

NOTE: Additional Curve Alignment Markers (CAMs) can be located around the curve to further delineate the alignment of the curve (*refer to Section 17 of the RTA Delineation Guidelines*).

Reference to advisory speeds and the application of advisory speed signs is also provided in *Section 9* and in *RTA Delineation Guidelines*.

When speed zones are introduced or reviewed, a survey should be made of all advisory speed signs within the zone to ensure they are correct and they do not indicate a speed above the posted speed limit.

Speed limit signs and advisory speed signs showing different speed values from one another should not be placed where drivers can read both at the one time.

(a) Sign types

For horizontal curves use W8-2 (advisory speed sign) in conjunction with W1-1, 2, 3, 4, 5 or 7 (curve warning) symbol sign where the advisory speed has been determined from a properly conducted speed investigation.

For vertical curves use the following signs:

- **Dip** – Use the W5-9 sign in advance of a dip where the advisory speed is less than the speed limit.
- **Hump** – Use the W5-10 sign in advance of a hump where the advisory speed is less than the speed limit.
- **Crest** – Use the W5-11 sign in advance of a crest where a no overtaking zone would be appropriate, but it is not practical to mark a dividing line, or where the stopping sight distance is substandard. Use only on unsurfaced roads or surfaced roads with no separation lines.
- **Advisory speeds** – Use the W8-2 sign in conjunction with W5-9 or W5-10 signs where the advisory speed has been determined by a properly conducted investigation.

3.3.6 Road pavement markings

At the point of change in speed zoned areas, the speed limit should be indicated on the road surface.

This is applicable to all sealed roads that carry substantial traffic volumes.

Each marking should be located centrally in each lane carrying moving traffic, and adjacent to the speed limit signs. *RTA Delineation Guidelines (refer to Section 1.6 for reference details)* give details for general use and size of pavement markings.

Pavement markings may also be introduced in conjunction with repeater signs in exceptional circumstances. This includes roads that have a history of poor compliance with the posted speed limit, multi lane roads, and those with a high incidence of speed-related crashes or enforced speed camera locations.

Pavement markings are used as supporting information to enhance speed limit signs. When pavement markings are removed, they should be completely removed so that outlines of numbers are not visible.

3.3.7 Entering New South Wales

The State Limit 100 regulatory sign R4-205, indicates to drivers entering New South Wales that a rural default speed limit of 100 km/h applies in the State unless signposted otherwise.

The State Limit 100 km/h regulatory sign R4-205 should be placed at the earliest appropriate location on a road entering New South Wales:

- Where a speed zone of 100 km/h is signposted or the default limit of 100 km/h applies on crossing the border, the State Limit 100 R4-205 sign should be erected immediately beneath the State border sign, G6-3; or
- Where a speed zone other than 100 km/h has been signposted on crossing the border, the State Limit 100 R4-205 sign should be located at the commencement of whichever of the following comes first – the start of a 100 km/h default speed limit or the start of a 100 km/h speed zone.

3.3.8 Default 100 km/h speed limit signs

Reversion to the state 100 km/h default limit at the end of a speed zone is signed with a 100 km/h R4-1 Speed limit sign.

Where road conditions are unsuitable for the use of the 100 km/h R4-1 sign, install the R4-12 'End Speed Limit' sign. This sign should be supplemented with the G9-318 'State Limit 100 Applies, Drive to Conditions' sign.

NOTE: The R4-2 Speed derestriction sign is no longer to be used and all existing signs are to be removed. It has been replaced with R4-12 and G9-318 signs.

3.3.9 Signage for motorways and freeways

High-speed road environments such as freeways and motorways require larger signs than typical road environments.

The following speed signs should be used on all motorways and freeways:

- On the main carriageway all speed limit change signs must be D-sized (R4-1), with one sign placed on each side of the carriageway.
- Repeater signs on the main alignment must be C-sized (R4-1) and placed in pairs on each side of the carriageway. The maximum distance between speed signs is detailed in *Section 3.3.4*.
- All VSL signs on motorways and freeways are to be D-sized signs.
- On-ramps must be signposted well in advance of the merge with the through traffic already on the main alignment to allow motorists to reach the signposted speed. The signposted speed on the on-ramp must be the same as the signposted speed on the main alignment at the merge point.
- Off-ramps must be signposted with an Exit Speed Sign (GE9-2) on the left side of the exit lane, adjacent to the gore (or painted) area. The speed on this exit sign is to be the same as the reduced speed limit located further along the off-ramp.

Typically speed limits on off-ramps from motorways should be the same as the road they intersect. If there are isolated geometric deficiencies on the off-ramps these locations should be treated with warning signage. In some cases where there is a safety concern, a reduced speed limit may be required on off-ramps.

The speed limit reduction on the off-ramp must be clearly signposted with two C sized signs (R4-1), one on each side of the exit lanes after the ramp has diverged from the main alignment.

Any speed limit change within a motorway/freeway environment (with the exception of VSL schemes) should be enhanced by the use of pavement numerals.

3.3.10 Variable Speed Limits (VSL)

VSL signs are used where there is a need to change the speed limit on a length of road. Reasons include:

- **Traffic management** – for controlling the speed of traffic typically when there are high volumes.
- **Incident management** – for reducing the speed of traffic and therefore improving safety in the vicinity of an incident.

Reducing speed limits in adverse weather conditions such as wet weather or fog.

(a) Requirements for VSL schemes

- All VSL signs are controlled centrally by the RTA's Traffic Management Centre (TMC). The TMC is responsible for keeping a record of all speed limit changes (times, dates & locations) within VSL schemes.
- VSL signs must be D size except in tunnels (*refer to Table 3.3*).
- VSL signs must be located in pairs, symmetrically with one sign on each side of the carriageway or, if they are located on a gantry structure a sign is to be located above each lane.
- VSL schemes must have 'Start Variable Speed Limit' signs (G6-315) before the first VSL signs and at any entry point into the VSL scheme.
- VSL schemes must have 'End Variable Speed Limit' signs (G6-316) after the last VSL scheme and before any static speed limit signs (R4-1).
- At each VSL scheme motorists must be made aware of the default speed limit in the event of VSL signs failure through the use of a G6-317 sign. These signs must be displayed on all entry points to the VSL scheme and should also be used as repeater signs along the length of the VSL scheme. The spacing of these signs should be in accordance with other repeater signs (*refer to Section 3.3.3 for further guidance*).

3.3.11 50 km/h default limit

On roads covered by the 50 km/h default urban speed limit the installation of regulatory speed signage is not required. However, where there is some ambiguity regarding the speed limit on a particular road, regulatory signs (R4-1 (50)) may be installed at a suitable spacing.

New 50 km/h area signs (R4-10 and 50 km/h end area signs R4-11) must not be installed. If existing signs are no longer serviceable they should be removed.

It is not necessary to install pavement numerals on roads covered by the default urban speed limit. It is not necessary to replace or remove existing pavement numerals.

End 50 signs (R4-11) are to be progressively removed.

3.3.12 Signage for 40 km/h local traffic areas

A local traffic area is designated by an R4-240 'Local Traffic Area (40)' regulatory speed limit sign at all precinct entry points or individual streets. At the precinct exit points, the end of local traffic area is designated by an R4-241 'End Local Traffic Area' sign and a relevant speed limit sign, to indicate the speed limit that applies beyond the zone.

3.3.13 Signage for 40 km/h high pedestrian activity areas

At the entrance to a high pedestrian activity area, use:

- A sign that incorporates the standard speed sign R4-240 and the R4-236 High Pedestrian Activity 40 Area sign.
- The standard 40 km/h speed sign R4-240 with a separate High Pedestrian Activity 40 Area sign (R4-236) as a repeater at appropriate intervals.
- For details relating to reviewing and installing High Pedestrian Activity Areas refer to *40 km/h Speed Limits in High Volume Pedestrian Areas* document.

3.3.14 Signage for school zones

At the start of the school zone, a 'school zone' (R3-230) sign must be installed on each side of the road. At the end of the school zone, an 'end school zone' (R3-231) sign must be installed. For non standard school zone signs (R4-235) should be installed.

All school zone signs should be supplemented with yellow pavement patches. For more information refer to *RTA Delineation Guidelines*.

NOTE: Other speed limit signs must not be placed within this zone as they cancel the school zone speed limit.

3.3.15 Signage for heavy vehicles

The relevant signs are R4-229 (40) Truck and Bus Speed Limit at the start and R4-220 End 40 Truck and Bus Speed Limit sign at the end of the truck / bus speed limit section.

Where a speed limit other than 40 km/h is required:

- Use the R4-219 Truck and Bus Speed Limit plate with an R4-1 speed limit sign at the start of the truck/bus speed limit section.
- Use an R7-4 End plate with the R4-219 and R4-1 signs at the end of the truck/bus speed limit section.

NOTE: Other speed limit signs must not be placed within this zone as they cancel out the truck and bus speed limit.

3.3.16 Signage for shared zones

A shared traffic zone is designated by a regulatory shared zone sign at the entry to the zone. The 10 km/h speed limit applicable within the zone is shown in the R4-4 regulatory sign. Additional 10 km/h R4-4 speed limit signs within the zone may be necessary.

A R4-5 'End of shared zone' sign designates the end of the zone as well as the end of the 10 km/h speed limit. A relevant speed limit sign should also be displayed under this sign (eg 40 km/h) to indicate the speed limit that applies beyond the shared traffic zone.

Please note that a Give Way to Pedestrians (R2-10) sign must be installed in combination with (under) a Shared Zone (R4-4) sign on each entry road into the area.

3.4 Speed zoning authorisation

THE FOLLOWING IS A SAMPLE OF A SPEED ZONE AUTHORISATION FORM.



Speed Zone Authorisation

(Authorising the Installation / Removal of Speed Limit Signs)

Road Transport (Safety and Traffic Management) Act 1999

Under Part 4, Section 51 of the Road Transport (Safety and Traffic Management) Act 1999, this document (Authority) here by gives the person(s) named below the appropriate authority to:

1. Install or display (or to interfere with, alter or remove) a prescribed traffic control device at the following locations, or
2. Direct another person to install or display (or interfere with, alter or remove) a prescribed traffic control device at the following locations:

Name: _____

Organisation: _____

Contact name: _____

Road: _____ At: _____

Suburb/locality: _____ LGA: _____

Distance between signs: _____ Direction: _____

Zone type: _____

Speed limit on signs: _____

Notes:

Signed: _____ Dated: _____

Designation: Manager, Road Safety & Traffic Management

3.5 Tools to assist reviewing speed zones

3.5.1 NLIMITS assessment tool

NLIMITS is to be redeveloped and versions earlier than 2007 should no longer be used.

3.5.2 Ball-bank indicator

The advisory speed for a curve is obtained by Ball-bank indicator method.

The detailed methodology using Ball-bank indicator to determine speed values is given in *Appendix I of Australian Standard 1742.2 – Traffic Control devices for general use*.

Roads and Traffic Authority

The information in this brochure is intended as a guide only and is subject to change at any time without notice.

For further enquiries

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