

# 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



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# I. Introduction

Vehicle speed is a major factor in pedestrian injuries and fatalities, especially in areas that have a high number of pedestrians. This is despite the fact that NSW has experienced major road safety improvements in the past few years.

This document details the use of 40 km/h speed limits in areas of high pedestrian activity. The criteria for identifying 40 km/h speed limits are provided. In addition, possible treatment options and the implementation process (including engineering and public education components) are detailed.

This guide is primarily for Roads and Traffic Authority (RTA) and council officers involved in identifying areas suitable for, and implementing, 40 km/h speed limits in high volume pedestrian areas.

The use of 40 km/h speed limits at work sites, outside schools and adjacent to school buses is not addressed by this document.

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## I.1 Current position

Currently 40 km/h speed limits have been installed on roads that have traffic calming devices installed or on roads that 'naturally' restrict the vehicle speed. The 40 km/h speed limits are used on local, regional and state roads.

The current *NSW Speed Zoning Guidelines* detail the use of 40 km/h speed limits on roads that have traffic calming devices installed.

In addition the RTA authorises:

- 40 km/h speed limits at all schools (during specific hours).
- 40 km/h school bus speed limits (when the wig-wag lights flash).
- 40 km/h work zone speed limits.

## I.2 40 km/h speed limit guideline

This 40 km/h speed limit guideline is intended for use in areas with high numbers of pedestrians on local, regional and state roads.

Consideration of a 40 km/h speed limit is appropriate in:

- Central Business District (CBD) areas.
- Suburban shopping strips.
- Areas where land-use or facilities generate significant pedestrian traffic (eg. beach-side/park-side reserves).
- Business areas generating significant pedestrian traffic such as medical centres, hospitals, and Government service agencies.

## I.3 Funding

The RTA will fund appropriate installation of the 40 km/h speed limit zones on a priority basis. The level of funding is solely for traffic calming devices and is to be negotiated with the local council.

Local councils are responsible for the preparation of all civil engineering and facilities design for local and regional roads. To assist the development of an effective traffic calming scheme, the RTA may assist by providing a grant to a maximum of \$20,000 as required. This is for the engagement of a consultant to prepare a detailed traffic calming design and to liaise with stakeholders affected by the changes in road environment.

The RTA will review and comment on civil engineering designs before the installation of any additional traffic calming devices commences. This occurs through the Local Traffic Committee process and usual arrangements for the delivery of RTA funded works. The RTA must approve all speed limits on all roads.

The RTA has the responsibility for the approval of civil engineering and facilities design on state roads.

On state roads the RTA will identify the necessary traffic calming works and fully fund the initiative in accordance with funding priorities.

#### 1.4 Maintenance

On local and regional roads, the local council is to maintain facilities (engineering works, signs and road markings) associated with 40 km/h pedestrian zones.

On state roads the RTA will maintain facilities/treatments that are installed within the carriageway and the local council will maintain treatments on footways and road related areas.

#### 1.5 Initiating a 40 km/h speed limit

##### *Non-classified roads*

Requests for 40 km/h speed limits may be initiated by councils, members of the public, lobby groups, the Police, Members of Parliament and the RTA. All submissions are to be made to the RTA's Regional Road Safety Manager<sup>1</sup>. The RTA will forward all non-council submissions to the local council for consideration.

After obtaining RTA in principle agreement for funding it is important that requests for 40 km/h speed limits are then progressed through the Local Traffic Committee to obtain their technical comment on the traffic calming proposed. After consultation with local stakeholder groups, the request can then be submitted by the local council to the RTA. The RTA will review the proposal at this stage to assess the impact on adjoining classified roads. The Manager, Road User Safety (Corporate) must assess the proposal and approve the 40 km/h scheme prior to proceeding. When the proposal has been approved to proceed, funds will be made available to construct traffic calming schemes.

##### *Classified roads*

The RTA manages traffic on classified roads. However, pedestrian safety in local communities is an issue appropriately addressed by both the local council and the RTA. The RTA will consider the advice of the local council when considering appropriate speed limits for classified roads with a high pedestrian volume.



#### Steps to implement a 40 km/h speed limit:

1. Council to determine whether the type of roadside development activity generates relatively high pedestrian volumes in the area.
2. Council examines possible treatment options (see Section 2.2) and submits draft proposal with indicative costs to the RTA's Regional Road Safety Manager.
3. Stakeholder consultation. The Local Traffic Committee provides comment on the traffic calming proposed to support 40 km/h. Consultation occurs with relevant local stakeholders as necessary. The local council then submits, in writing, a proposal to the RTA's Regional Road Safety Manager<sup>1</sup>.
4. Undertake Road Safety Audit in accordance with RTA policy guidelines. Refer TD 2003/RS03.
5. RTA's Regional Road Safety Manager<sup>1</sup> in consultation with the regional Traffic Management Manager endorses proposal after assessing its impact on adjoining roads.
6. The Manager, Road User Safety (Corporate) approves the 40 km/h scheme and releases funds for implementation.
7. RTA and council develop a signage and marking plan and initiate action to install engineering works.
8. RTA and council develop an implementation timetable for the public education campaign, engineering works and signage installation.
9. Traffic calming scheme installed.
10. RTA and council implement the public education campaign (2 weeks before installation of signs).
11. Regional RTA Road Safety Manager<sup>1</sup> authorises a change to the speed limit signs.
12. Installation of signs and markings.

<sup>1</sup> In some RTA regions Manager, Road Safety and Traffic Management

## 2. Criteria for selection

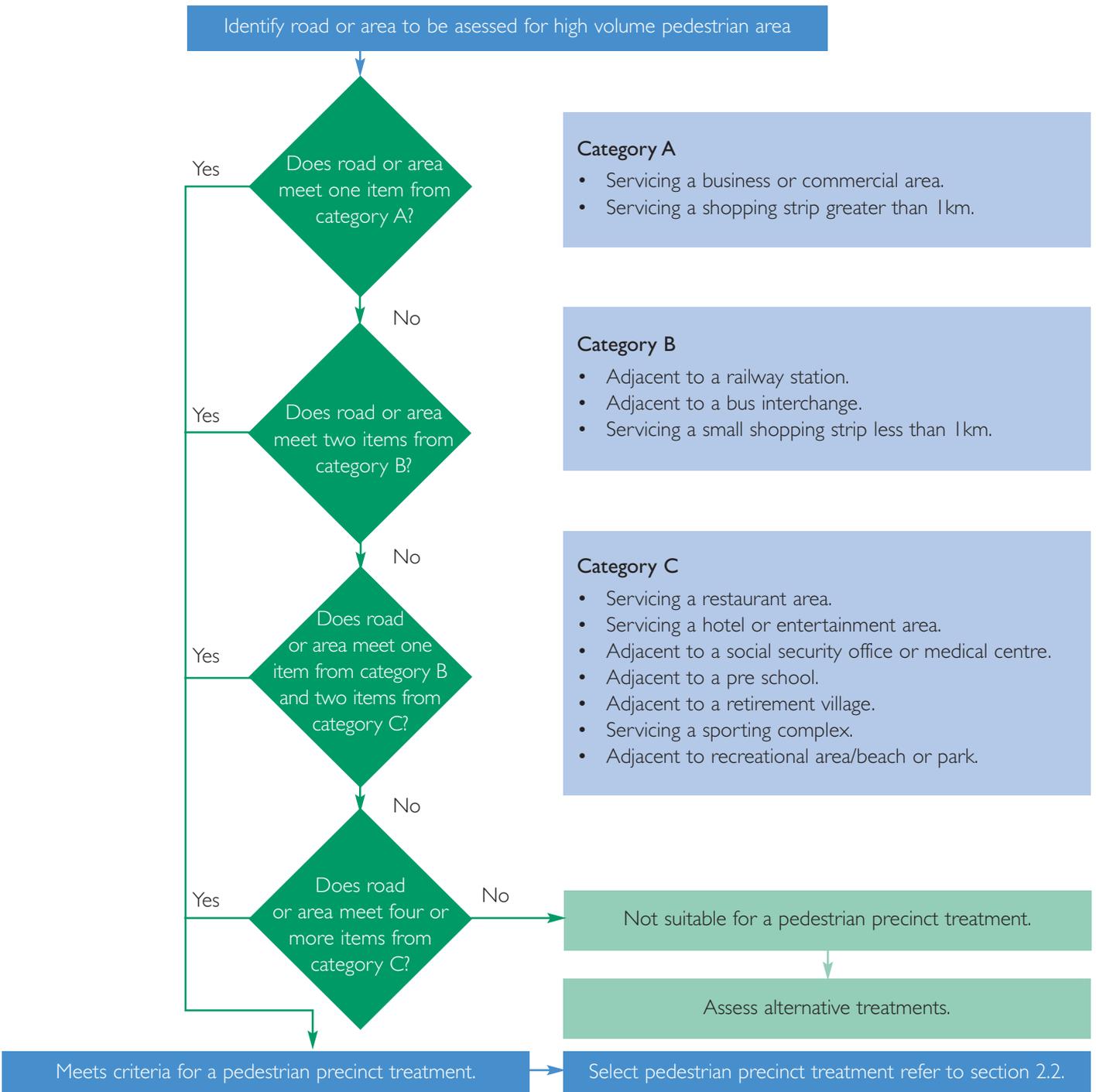
### 2.1 Step I: Identification of a high volume pedestrian road/area

The 40 km/h speed limit is appropriate in areas with relatively high volumes of pedestrians. These areas are typically characterised by commercial and recreational land-uses. Criteria have been developed for assessment of the area as 'high pedestrian volume'.

The area under consideration must meet the criteria in Figure 1 below.

These areas typically generate pedestrian traffic in addition to vehicular traffic. Developments which generate a high volume of pedestrians should only be considered if access points deliver pedestrians directly onto the road. For instance, modern style suburban shopping centres with large car parks may not generate large numbers of pedestrian movements on the road.

→ **Figure 1** Flowchart for identification of high volume pedestrian areas Criteria for identification of areas of high pedestrian activity



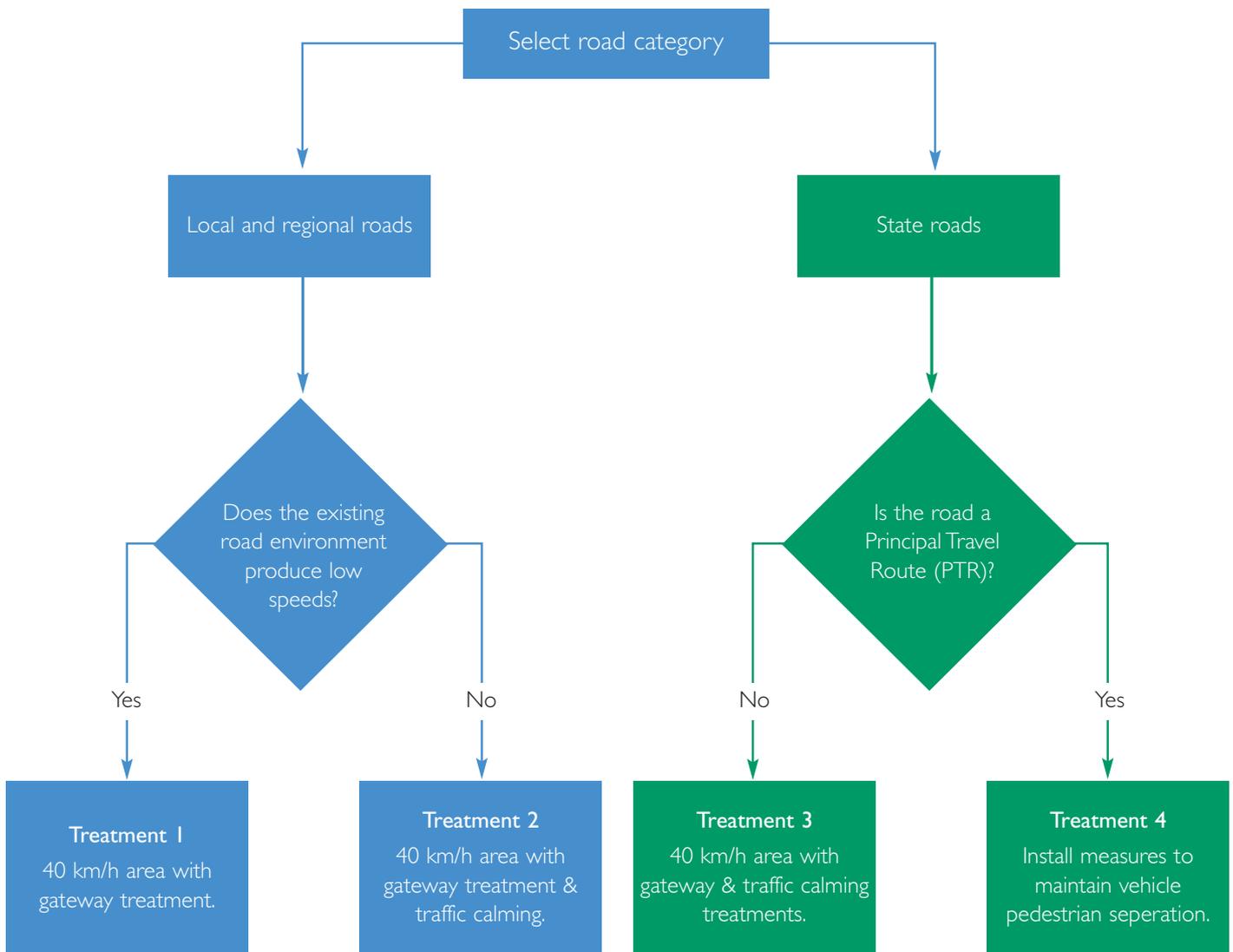
If the area under review does not satisfy the criteria of sufficiently high pedestrian traffic, the area should be monitored for any increases in pedestrian traffic. Other suitable engineering treatment options should also be considered.

## 2.2 Step 2: Selection of treatment options

If a road or area meets the above criteria of high volume pedestrian activity, then next step is to determine the most appropriate treatment options.

The flow chart below will help in selection of the best treatment option.

→ **Figure 2** Flowchart for identifying appropriate treatment options Selection of treatment options



### Treatment 1 - Gateway treatment

Local roads in an existing low travelling speed environment require only a gateway treatment prior to installation of 40 km/h speed limit signage. Typically these roads have traffic calming treatments already installed or have existing road environments that encourages low speeds such as some roads in older inner-city suburbs.

Suitable 40 km/h speed limit treatments in these areas include gateway treatments (ie. 40 km/h area signs and markings) and appropriate reminder treatments. Gateway treatments for this road type are shown in Appendix A and B.

If the road has been established as a low speed non-classified road, no further engineering treatment is required other than the reduced speed limit signs and gateway treatments.<sup>2</sup>



**Broughton Street, Paddington.**  
Early subdivision forming a 'natural' low speed environment.

### Treatment 2 - Gateway and traffic calming on local and regional roads

Prior to the implementation of 40 km/h speed limits on local and regional roads in higher speed environments, traffic calming schemes as well as gateway treatments must be installed to ensure motorists comply with lower speed limits.

The types of traffic calming measures that can be installed are set out in the *RTA (2000) Sharing the Main Street Guide* or *Austrroads (1988) Guide to Traffic Engineering Practice Part 10 - Local Area Traffic Management* as well as relevant RTA Technical Directions such as *TDT 2001/04 Use of traffic calming devices as pedestrian crossings*.

Additional information regarding traffic calming is included in Section 4.6 - Traffic calming treatments.

#### Daytime and Night-time speeds

Some CBD areas may have low travel speeds during peak travel. However travel speeds on these roads are often much higher at other times and about 90% of fatalities involving alcohol affected pedestrians happen in darkness<sup>3</sup>. The 40 km/h speed limit and traffic calming treatments can be suitable options for creating safer pedestrian environments at all times.

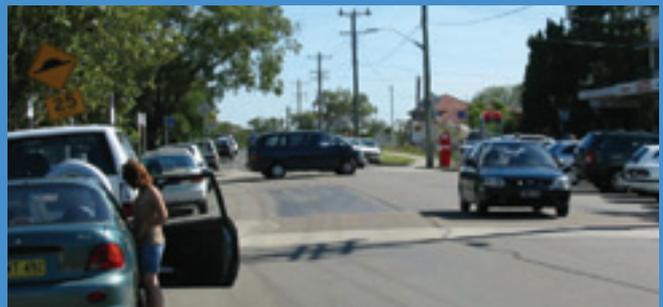
If these areas include signalised intersections, consideration should be given to creating pedestrian priority features such as:

- All pedestrian phase.
- Scramble crossing.
- Additional pedestrian phase time.
- Red arrow protection.
- Shorter cycle lengths.
- Pedestrian phase auto-introduction features.

A review of the signalised crossings should be conducted in consultation with Network Operation Section and pedestrian facilities provided on all legs of each signalised intersection in accordance with TDT 2001/08. Additional information regarding signalised intersections is included in section 4.7 - Traffic signals.

On two lane roads, priority should be given to providing pedestrian crossings (zebra) as an easily identified pedestrian road crossing facility in accordance with TDT 2001/04 and AS 1742.10. Additional traffic engineering devices should be considered that support the use of pedestrian crossings.

The entry point to these areas must consist of gateway treatments (40 km/h speed limit signage). Consideration should be given to reinforcing the gateway treatment with a section of audio tactile paving. See Appendix A and B for typical signage treatments.



**Belmore Street, Oatlands.**  
Small suburban shopping strip with traffic calming treatments and 40 km/h speed limits.



**Wharf Street, Forster.**  
Local road with 40 km/h speed limits and traffic calming treatments in regional shopping precinct.

<sup>2</sup> NOTE: A number of modern subdivision communities have narrow shared access roads that may or may not be open to the public such as in 'gated communities' and communities with common property driveways. These roads may be suitable for installation of shared zones. Refer to RTA Technical Direction 2000/6 for guidance in these matters.

<sup>3</sup> Pedestrian Safety: Problem Definition and Countermeasure Summary. RTA, May 2002.

### *Treatment 3 - Gateway and traffic calming on state roads*

Some state roads may have traffic calming treatments. It is important to work in partnership with the RTA's traffic management sections when proposing a 40 km/h pedestrian zone on a state road.

Increasingly many older style shopping strips on state roads are being by-passed and may eventually be declassified. This provides an opportunity to improve safety and amenity for the community by implementing a traffic calming scheme and 40 km/h speed limit (see Treatment 2).

Additional information regarding traffic calming is included in Section 4.6 - Traffic calming treatments.

If signalised intersections are present on these lower order roads, consideration should be given to creating pedestrian priority features such as:

- Red arrow protection.
- All pedestrian phase.
- Scramble crossing.
- Additional pedestrian phase time.
- Shorter cycle lengths.
- Pedestrian phase auto-introduction features.

A review of the signalised crossings should be conducted in consultation with Network Operation Section and pedestrian facilities provided on all legs of each signalised intersection. Additional information regarding signalised intersections is included in Section 4.7 - Traffic signals.

On two lane roads, priority should be given to providing pedestrian crossings (zebra) as an easily identified pedestrian road crossing facility in accordance with TDT 2001/04 and AS 1742.10. Additional traffic engineering devices should be considered that support the use of pedestrian crossings.

All proposed changes to state roads must be referred to the RTA's Regional Traffic Manager for concurrence prior to conducting stakeholder consultation. If a 40 km/h speed limit and traffic calming is not possible on this length of road, Treatment 4 should be considered.



#### **Victoria Road (old Pacific Highway), Taree.**

State Highway which has been by-passed as a Principal Travel Route. The opportunity has been taken to undertake pedestrian access and safety works and a 40 km/h speed limit has been introduced.

### *Treatment 4 - Separation of pedestrian and vehicular traffic on state roads*

If the location forms part of an important state road it may not be possible to restrict vehicular movements. The preferred option is to fully separate pedestrian and vehicular conflict points.

This can be achieved either by separation in space:

- Pedestrian fencing.
- Overbridges.
- Redirective kerb (eg. trief - redirective kerb).
- Creating safer lateral distances to parked cars.

Or by creating a separation in time:

- Pedestrian signals.
- All pedestrian phase.

Any proposed treatments on state roads must be referred to the RTA's Regional Traffic Manager prior to conducting stakeholder consultation who will advise on the approach to be taken.

It should be noted that pedestrian fencing impacts on kerbside parking and may have implications for the local community. Accordingly, stakeholder consultation is particularly important.



#### **Great Western Highway, Blaxland**

Kerbside fencing adjacent to parking lanes separated from travel lane.

## 3. Implementation process

### 3.1 Consultation

An overview of the consultative model involved in the implementation process is provided below<sup>4</sup>.

→ **Figure 3**  
**Consultation model**



### 3.2 Retrofitting of 40 km/h speed limits

Existing 40 km/h speed limits may either be installed in an area or linear length of road and may or may not have traffic calming treatments.

It is important that 40 km/h speed limits be installed in suitable low speed environments.

If traffic calming treatments have already been installed, there is a need to review the effectiveness of the scheme using current traffic calming guidelines. If travel speeds are restricted, the old speed limit signs can be replaced with new speed limit signs and gateway treatments. If the existing traffic calming treatments are inadequate (particularly in regards to limiting travelling speed) then the consultation model detailed in Section 3.1 needs to be followed and a suitable traffic calming scheme installed.

If there are no existing traffic calming treatments and it is not a naturally low speed environment, it is necessary to design and install appropriate traffic calming treatments. (see Figure 3 Consultation model and Section 4.5 Traffic calming treatments).

### 3.3 Safety audits

Road safety audits provide a means of managing road safety by identifying risks associated with road and traffic works. Road safety audits are a device to assist project managers to ensure improved road safety outcomes.

On regional and local roads, councils are responsible for designing and installing traffic calming schemes. The RTA may provide a grant for these works. The local council must conduct road safety audits in accordance with TD 2003/RS03 prior to the RTA's Road Safety Manager<sup>5</sup> endorsing the scheme.

On state roads, the RTA will design and install all treatments. The RTA will ensure that a Road Safety Audit is conducted in accordance with TD 2003/RS03 on all RTA works.

### 3.4 Post installation review

An RTA traffic engineering officer, in collaboration with a council traffic engineering officer, is to inspect and review the scheme within a month of installation. Elements to be inspected include:

#### 1. Signs and markings.

- Do the signs adequately inform the motorists of the speed limit?
- Are there enough signs?
- Are the signs in prominent and unobscured positions?
- Do gateway treatments require textual paving to reinforce the 40 km/h speed limit?

#### 2. Traffic calming scheme.

- Does the traffic calming scheme adequately restrict vehicle speeds throughout the area?
- Do service vehicles have satisfactory access to the area?
- Are there additional and suitable pedestrian crossings installed?
- Does the traffic calming scheme support pedestrian crossings?

<sup>4</sup> The RTA will ensure that the Police are fully informed of the proposed speed limit by:

1. Including Police in the community consultation phase, and 2. Forwarding a letter to the Regional Traffic Co-ordinator after receiving the initial submission from the Local Traffic Committee.

<sup>5</sup> or Manager, Road Safety and Traffic Management

## 4. Engineering works

To clearly define the 40 km/h pedestrian zone it is necessary to install new signage and pavement markings. These are to consist of:

- Standard 40 km/h speed sign.
- 'Pedestrian activity' plate (used with 40 km/h speed sign).
- 40 km/h pavement numerals.

All pavement numerals are to be installed using cold applied plastic according to standard RTA specifications.

Typically the life span of this product on a local road is estimated to be around seven years.

In addition, consideration should be given to installing, at some locations, a section of audio tactile paving to clearly communicate the changed environment to the motorist.

### 4.1 'Pedestrian activity' plate and 40 km/h gateway signage

A new plate that visually highlights pedestrian activity has been developed to further emphasise the reason for lower speed limits. The plate features a number of pedestrians and includes the words 'High Pedestrian Activity'. The sign is either a single plate incorporating both the speed limit sign and the Pedestrian Activity sign, R4-236 (Figure 4) or R4-237 or the Pedestrian Activity plate, R9-213 (Figure 5), is attached under the standard speed limit sign, R4-1(40) (Figure 6) or R4-10(40).



→ Figure 4 R4-236



→ Figure 5 R4-1(40) and R9-213

### 4.2 40 km/h speed limit repeater signs

The standard 40 km/h speed sign R4-1(40) (Figure 6) is to be installed at appropriate intervals as a repeater sign. The standard 40 km/h speed sign R4-1(40) is to be installed at a maximum interval of 500 metres on through roads.



→ Figure 6 R4-1(40)

The standard 'B' sized sign is to be used at all locations including as gateway and reminder signs. Gateway signs are to be installed in pairs. A smaller 'A' sized sign is available for some locations where there is limited space and no distracting background.

### Linear length of road:

- On roads with limited lateral space - use R4-1(40) with R9-213 installed below the 40 km/h sign.
- On roads with limited air space - use R4-237 sign.

### Roadwork network or area:

- In areas with limited lateral space use R4-10(40) with R9-213 installed below the 40 km/h AREA sign.
- In areas with limited air space - use R4-236.

For new sign details see:

- |                |        |
|----------------|--------|
| • Attachment C | R9-213 |
| • Attachment D | R4-237 |
| • Attachment E | R4-236 |

### 4.3 End sign posting and adjoining speed limits

Area wide speed limits must be contained and adjoining speed limits clearly sign posted. All area wide speed limits must have an 'End Area' sign R4-11(40) installed at each exit point in the area. The speed limit signs for the adjoining speed limit are to be installed at the nearest practical point.

In order to minimise the number of sign posts to be installed, one option is to install both the end area sign R4-11(40) and the next speed limit sign (R4-1) on the same post. The 'End Area' sign R4-11(40) would be placed above the speed limit sign.

### 4.4 Typical 40 km/h speed limit layout

A diagram showing a typical street layout for a 40 km/h pedestrian zone area is in Attachment A. The typical 40 km/h speed limit treatment for a linear length of road is in Attachment B.

### 4.5 Traffic calming treatments

In cases where the existing road environment does not encourage low vehicle speeds, 40 km/h speed limits and traffic calming scheme are to be installed. It is important that traffic calming schemes be designed and installed to restrict vehicle travel speeds throughout the whole speed restricted area. Accordingly individual traffic calming devices should be installed at intervals no more than 80 metres.

The minimum length of road suitable to be treated with a 40 km/h high volume pedestrian area speed zone is 200 metres.

Typical traffic calming measures include:

- Raised threshold (Wombat crossing).
- Footpath and kerb extensions.
- Channelisation.
- Staggered carriageway.
- Managed on-street parking.
- Installation of medians.
- Traffic signal timing.

Particular consideration is to be given to installing textured threshold treatments at gateways in 40 km/h speed limit zones.

Traffic calming treatment details are set out in the RTA's *Sharing the Main Street Guide, Austroads (1988) Guide to Traffic Engineering Practice part 10; Local Area Traffic Management Austroads (1988) Guide to Traffic Engineering Practice part 13; Pedestrians and various technical directions, such as TDT 2001/04 Use of traffic calming devices as pedestrian crossings*, which are available to be downloaded from the RTA website.

All traffic calming elements are to be designed for a speed of 25 km/h (without a median) and a speed of 35 km/h (with a median)<sup>6</sup> and be subject to a Road Safety Audit conducted in accordance with TD 2003/RS03. The RTA's Regional Road Safety Manager<sup>7</sup>, in consultation with the regional Traffic Management Manager, is to endorse the traffic calming scheme prior to requesting approval for the scheme from the Manager, Road User Safety (Corporate). If approved, funds will then be released for implementation.

The traffic mix must be considered when designing a traffic calming scheme. Care must be taken to ensure that buses and other service vehicles have full convenient access. Key stakeholders such as councils, bus operators, taxi representative bodies, Australia Post, emergency services and waste disposal truck operators all need to be consulted as appropriate.

It is essential that traffic calming treatments do not disadvantage pedestrians (particularly pedestrian confusion about the distinction between footpath and carriageway). Refer to *TDT 2001/04 Use of traffic calming devices as pedestrian crossings*.

Pedestrian crossings (zebra) are to be provided in 40 km/h speed limit zones. Where possible pedestrian crossings should be raised and installed in association with kerb extensions. Specific devices that emphasise the pedestrian crossing such as textured pavement treatments should be considered.

In areas that service a high number of pedestrians who are aged or disabled, extra traffic calming measures may need to be considered viz:

<sup>6</sup> NSW Roads and Traffic Authority (RTA) 2000: *Sharing the Main Street* p51

<sup>7</sup> or Manager, Road Safety and Traffic Management

- Tactile and or coloured pavement tiles.
- Hand rails.
- Lipless transitions (from footway to carriageway).

In some cases, 7-day 24-hour speed surveys can be used to identify mean and 85th percentile speeds at peak pedestrian volume times. The technical specification and reporting requirements of the speed surveys are in Appendix F.

Traffic calming schemes will be funded by the RTA and installed by council to ensure that the 40 km/h speed limit is economically sustainable and achieves speed reduction.

#### 4.6 Traffic signals

The Regional Road Safety Manager is to ensure that the Manager, Network Operations is advised of all changes in speed limits so that SCATS traffic co-ordinating algorithms are adjusted.

A review of all Traffic Controlled Sites (TCS) within the identified high volume pedestrian area needs to be conducted in regard to the following:

##### *Timing*

The time allocated to pedestrian phases for all TCS within the identified area of high pedestrian activity must be reviewed. Additional time is to be allocated to pedestrian phases if appropriate. Apart from providing additional amenity for pedestrians, the timing will help communicate to motorists the pedestrian nature of the road.

##### *Red arrow hold*

At TCS where conflict exists between turning vehicles and pedestrian movements, full red arrow hold (for green and part clearance) is to be considered.

##### *Pedestrian features*

Each TCS should provide a pedestrian feature on each leg of the intersection or junction in accordance with TDT 2001/08. Unless it can be shown that no pedestrian demand exists for a pedestrian feature or that traffic operations cannot accommodate the facility, a pedestrian crossing facility must be provided on each intersection leg.

##### *Phasing*

The phasing of the TCS should be assessed in order to determine the phasing (or phasing type) that provides superior pedestrian amenity and safety. In particular scramble (or all pedestrian) phases should be considered. Leading and trailing turn movements should be reviewed with additional attention focused on protection for adjacent pedestrian phases.

## 5. Implementation process - public education

### 5.1 Public education resources

To ensure public awareness and support for 40 km/h speed limits, it is necessary that a public education campaign be implemented at the local level.

The campaign is to be managed by the RTA and the local council using a range of resources developed by the RTA and adapted for the local community.

The RTA will manage a number of communication elements such as:

- Variable Message Signs (VMS) (where appropriate).
- Bridge banners (where appropriate).
- Letter box drops of brochures.

The local council will manage communication strategies such as:

- Advertisements in the local press.
- Poster distribution.
- Additional distribution of brochures.

Variable Message Signs (VMS) will ensure that the (non-local) through traffic are fully aware of the proposed speed limit. VMS are to be used in accordance with TDT 2002/11 in regard to on-street placement and approved messages. The Transport Management Centre must be notified. The approved message is "New 40 km/h speed limit (insert locality name) from (insert date)". VMS are to operate for a minimum of two weeks before and one week after the installation of signs.

Bridge banners with a generic message can be made in 5 metres, 7 metres and 10 metres lengths. They can be installed in prominent locations immediately before or within the 40 km/h speed limit areas. The bridge banners should be put up only after the 40 km/h speed limit signs have been unveiled.

Interested councils will receive a media information package from the RTA. The media information package contains the following:

- Media release from the Minister for Roads.
- Draft press advertisement.
- Sample of poster.
- Fact sheet containing frequently asked questions and answers.
- Order form.

A CD-Rom will also be provided which has all the public education materials in electronic form as well as slogans for VMS, design for banners and a generic powerpoint presentation.

To start the public education campaign the council is to complete an order form (provided in the information package) and provide the council logo, number of brochures required in community languages and details regarding letterbox drop of brochures.

## 5.2 Funding

The RTA will provide a \$3000 grant to each participating council to support the public education delivery of the message at the local level.

The \$3000 grant could be used for running advertisements in the local newspapers as well as other local initiatives.

The RTA will also fund the printing and letter box drop of brochures to the local community.

The brochures will also be available in a number of community languages (Chinese, Arabic, Korean and Vietnamese).

## 5.3 Timing

Councils are to run the advertisements in the local press two weeks prior to the installation of the signs.

# 6. Frequently asked questions

## Have any other jurisdictions in Australia or overseas installed 40 km/h speed limits?

### Australia

40 km/h speed limits were installed in Unley, South Australia, as part of an urban speed limit trial. Following its successful evaluation, 40 km/h speed limits have been installed in 12 Adelaide council areas.

Victoria, Queensland, South Australia and the Northern Territory have all implemented 40 km/h in areas or on lengths of road as a road safety initiative.

### International

In the United States of America, 21 of 50 states have implemented a 25 mph (40.2 km/h) speed limits in commercial and highly populated residential areas.

As an example, California traffic regulations state that 25 mph speed limit apply 'on any highway other than a State highway in any business or residence district, unless a different limit is established'.<sup>8</sup>

In most European countries lower speed limits have been extensively implemented as a key pedestrian safety initiative. Nations such as the United Kingdom and The Netherlands have installed 30 km/h speed limits in areas with high number of pedestrians. Denmark (after trialing 40 km/h suburban speed limits in 1996) has proceeded to install 40 km/h speed limit zones.

## How do I resolve issues of separating vehicle traffic and pedestrian traffic in areas where it is necessary to provide off-peak kerbside parking?

Areas that have clearways for peak-hour traffic may not be suitable for 40 km/h treatment. In these areas separation is the most appropriate means of providing for pedestrian safety.

The RTA has released a technical directive TDT 2002/12 based on the *Australian Road Rules* regarding stopping and parking restrictions at intersections and crossings. Under these directions vehicles are not permitted to stop within 20 metres either side of intersections, within 20 metres of the stop line on the approach and 10 metres from the departure of marked pedestrian crossings and within 10 metres of the stop line on the approach and 3 metres of the departure of mid-block pedestrian crossings.

In areas of high pedestrian activity where there is off-peak parking these distances should be fenced in order to maintain traffic separation.

Median fencing should be provided along the length where there is high pedestrian activity and off-peak kerbside parking where there is a median available.

While it is important to separate pedestrians and vehicle traffic for pedestrian safety it is also necessary to provide pedestrian amenity in areas of high pedestrian activity.

Added pedestrian treatments should be installed at crossings and intersections.

## How does this guideline affect Pedestrian Access and Mobility Plans (PAMP)?

The RTA currently has a policy of promoting the implementation of Pedestrian Access and Mobility Plans (PAMP). This guideline does not replace PAMP. It actually provides an opportunity to supplement the objectives of the PAMP program.

## Do all proposals for the installation of 40 km/h speed zones have to go through the Local Traffic Committee before submitting to the RTA?

The installation of 40 km/h speed limits in areas of high pedestrian activity is a community led initiative and the RTA is responsible for approving speed limits on all roads. To maintain a local focus all submissions should come to the RTA through the council. The Local Traffic Committee should provide technical advice on traffic calming devices that form part of the proposal.

## Will the 40 km/h speed limits be enforced?

The 40 km/h speed limits are legally enforceable.

Police will enforce the 40 km/h speed limit in the same way that they enforce the 50 km/h and 60 km/h speed limits. All existing speeding penalties including double demerit points on holiday long weekends will apply.

## From whom can I obtain copies of the information package?

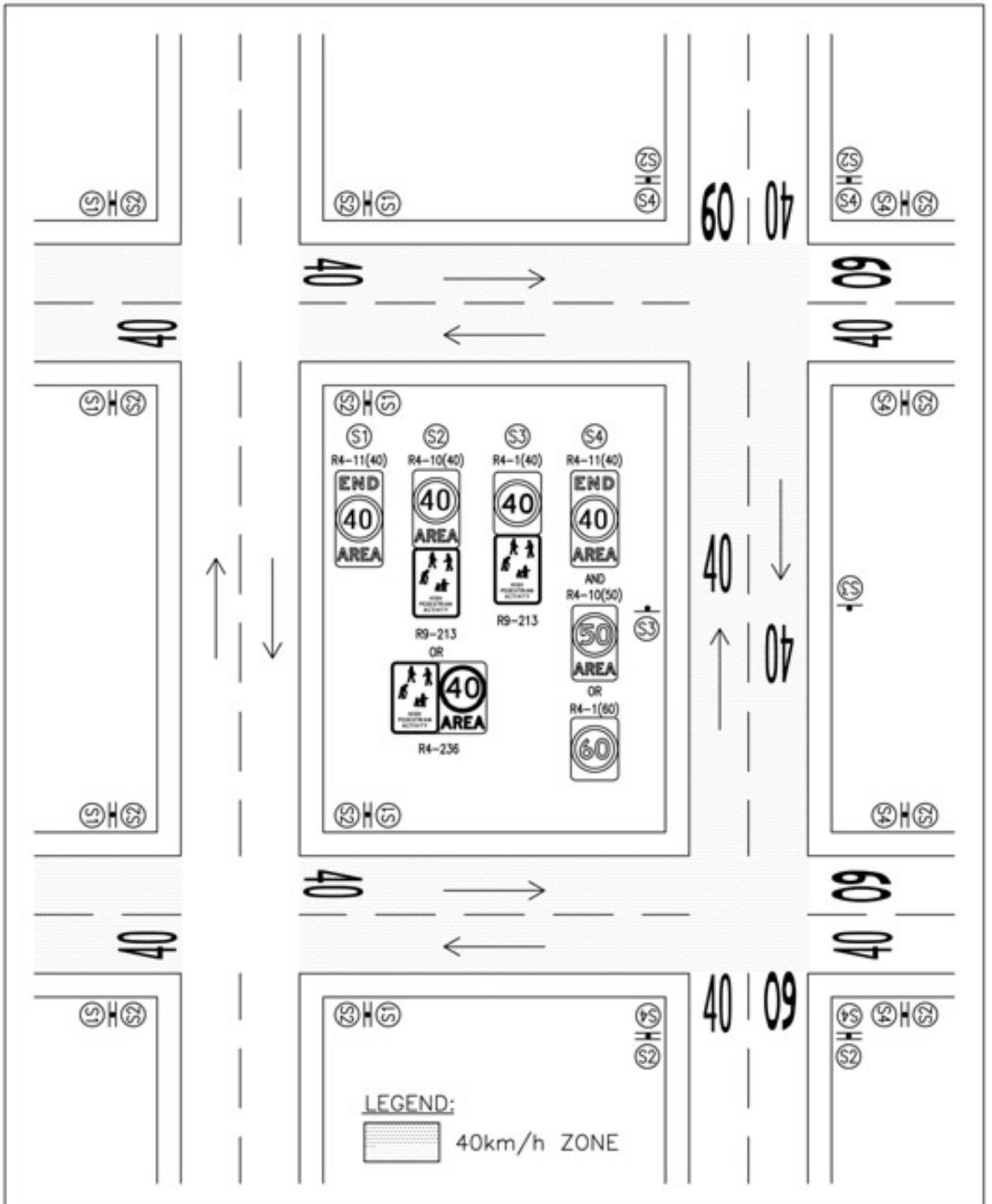
These can be obtained from the RTA's Regional Manager, Road Safety<sup>9</sup>.

<sup>8</sup> California Traffic Regulations Manual, 8-03.3 <http://www.dot.ca.gov/hq/traffops/signtech/signdel/chp8>, October 2002

<sup>9</sup> or Manager, Road Safety and Traffic Management

# Appendices

- Appendix A** Typical area gateway and signage treatment
- Appendix B** Typical linear gateway and signage treatment.
- Appendix C** Pedestrian activity plate - R9-213.
- Appendix D** Combined sign linear treatment - R4-237.
- Appendix E** Combined sign area treatment - R4-236.
- Appendix F** Speed survey - data collection and analysis specifications.



TYPICAL 40km/h PEDESTRIAN ZONE LAYOUT

T000836



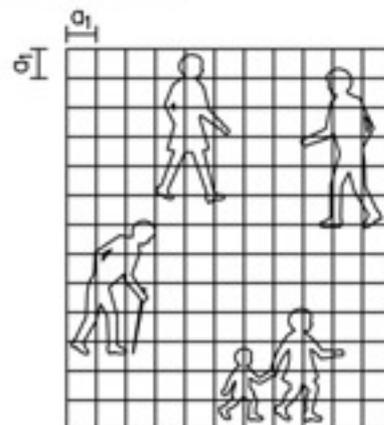
R9-213



Black legend and border on C1.1 white reflectorised ground

	a	b	c	d	e	f	g	h	j	k	m
R9-213A	450	675	68	315	375	41	18	146	122	49	317
R9-213B	600	900	90	420	500	55	24	194	163	65	423

n	p	q	r	s	w	x	y	z	a <sub>1</sub>
86	242	9	45	644	56	40DM	20	53	30
115	323	12	60	852	75	50DM	25	70	40



Scale 1:10

TITLE

REGULATORY SIGN  
R9-213

Date: 26/2/03

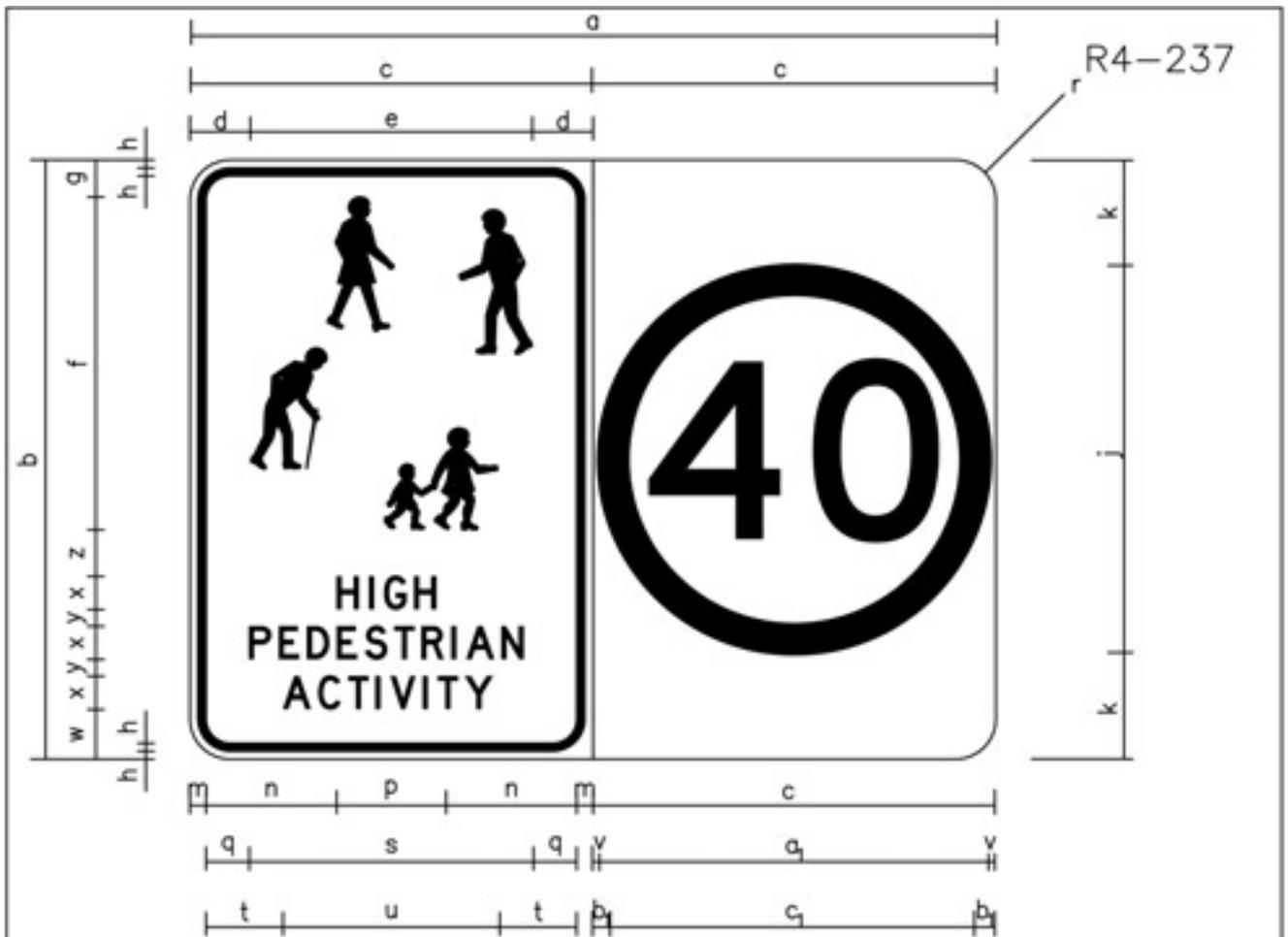
Checked: XX

Drawn: J.R.

Rev.



File (Sign) K:\TTT\DRAWINGS\REGULAT\R9-213.DWG

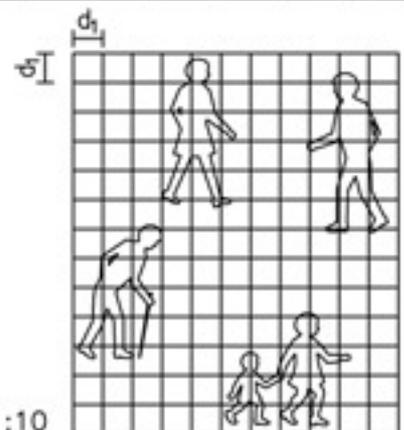


LEFT PANEL: Black legend and border on C1.1 white reflectorised ground

RIGHT PANEL: Black legend on C1.1 white reflectorised ground.  
C1.1 red reflectorised annulus.

	a	b	c	d	e	f	g	h	j	k	m	n	p	q	r	s	t
R4-237A	900	675	450	68	315	375	41	9	440	117	18	146	122	49	45	317	86
R4-237B	1200	900	600	90	420	500	55	12	586	157	24	194	163	65	60	423	115

u	v	w	x	y	z	a <sub>1</sub>	b <sub>1</sub>	c <sub>1</sub>	d <sub>1</sub>
242	5	56	40DM	20	53	440	19	412	30
323	7	75	60DM	25	70	586	25	550	40



Scale 1:10

<p><b>TITLE</b></p> <p>REGULATORY SIGN</p> <p>R4-237</p>	Date: 26/2/03	
	Checked: XX	
	Drawn: J.R.	
	Rev.	
	File (Sign) K:\TIT\DRAWINGS\REGULAT\R4-237.DWG	

R4-236

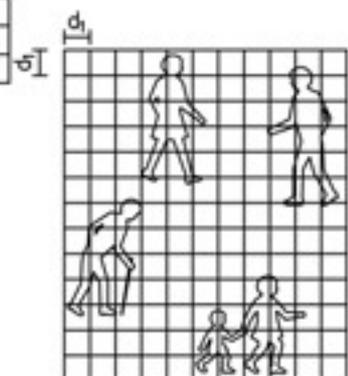


LEFT PANEL: Black legend and border on C1.1 white reflectorised ground

RIGHT PANEL: Black legend on C1.1 white reflectorised ground.  
C1.1 red reflectorised annulus.

	a	b	c	d	e	f	g	h	j	k	m	n	p	q	r	s	t
R4-236A	900	675	450	68	315	375	41	9	440	35	18	146	122	49	45	317	86
R4-236B	1200	900	600	90	420	500	55	12	586	45	24	194	163	65	60	423	115

u	v	w	w <sub>1</sub>	x	x <sub>1</sub>	y	y <sub>1</sub>	z	a <sub>1</sub>	b <sub>1</sub>	c <sub>1</sub>	d <sub>1</sub>
242	5	56	45	400M	1200M	20	35	53	440	19	412	30
323	7	75	60	600M	1600M	25	50	70	586	25	550	40



Scale 1:10

**TITLE**  
REGULATORY SIGN  
R4-236

Date: 26/2/03

Checked: XX

Drawn: J.R.

Rev.

File (Sign) K:\TTT\DRAWINGS\REGULAT\R4-236.DWG



## Speed data collection and analysis 40 km/h speed limits

### 1: Speed survey locations

Speed surveys must be conducted at points on the road where traffic is typically free flowing:

- The location should be well clear of features likely to affect the natural travelling speed of vehicles.
- The length of road should be straight.
- The road pavement should be of good quality.

Speed surveys should be conducted during normal times of travel. Accordingly speed surveys should not be conducted:

- During school holidays or long weekends or special community events.
- If a sustained period of wet weather is expected.
- If roadworks are likely to affect drivers travelling speed.

Each speed survey location should be inspected and site sketches prepared. Sketches should be kept so that post treatment surveys can be conducted at the same locations. When inspecting a speed survey location the following features should be noted on the sketch:

- Number of lanes (noting that the survey will require one pair of anemometer tubes per lane).
- Parking and turning lanes.
- Median or type of centre line.
- Anchor points such as power poles (anchor points are required to chain down the traffic counter).
- Reference anchor points by recording the distance to the nearest cross street or house number.
- Record the reference numbers of power poles identified as anchor points.
- Adjacent house numbers (if available).
- North point.

Anchor points should be identified on the road by neatly marking the speed survey location (with spray paint) adjacent to the anchor point.

Speed surveys are conducted over seven days (five work days and two weekend days) and over a 24 hour period.

Speed survey location information should be tabulated and together with sketches prepared for the contractor conducting the speed survey.

### Example:

Smith Street, Jonesville	1st SS: 200m north of Smith Rd adjacent to electricity pole T3456 (2 lanes undivided).
	2nd SS: 300m south of Brown Rd adjacent to property numbered 234 (4 lanes undivided).
	3rd SS: 500m north of Jones St (4 lanes divided).

All speed survey locations have been located to suit roadside anchor points and have been marked on site accordingly.

### 2: Speed survey data collection

The data output should consist of ASCII files with the following format (Table F1).

Table F1

No.	Field	Example
1	Date	25/11
2	Time	16:00
3	Classification	9
4	Speed	94

- Each record (vehicle) must be one line in the data set.
- Fields to be delimited by a tab, comma or they must be fixed length.
- Date stamping of each record must include the day and month. The year is optional.
- Time stamping (24 hour system) of each record must be as a minimum to the current hour; but for school zones time intervals must be to the current 0.25 hour (eg. Between 14:45 and 14:59 (say 14:52), this record may be stamped 14:45 for school zones and 14:00 for other zones).
- Each location (Survey Number) is to have a separate data file for each direction and one for both directions combined. On **multi-lane roads each lane should be separately recorded** and output files then combined by direction.
- All file names are to clearly identify the location, lane and direction(s) (see Table F2 following).

NOTE: RTA Trafficorder \*.RTC files must be converted to ASCII files.

### Output files required

Where a survey collects both traffic directions a separate ASCII file is required for each traffic direction and also a file combining both directions (ie. 3 files). Where multiple lanes are required to be surveyed separately recorded files must be combined into a single file for the appropriate direction (separate lane file headers to be retained for separation at a later date if required).

Each file is to be clearly labelled to indicate the survey number; lane number; direction and/or combined directions.

The following example naming convention should be used (Table F2):

Table F2.

Survey Number	Direction	Lane	File name
2019	N	1	2019n1.txt
2050	Combined		2050c.txt
2049	E	3	2049e3.txt

File headers generated by the recording device should be retained at the beginning of each file and contain a description of the site, location number, survey number and posted speed limit.

In addition the following electronic table must also be completed (Table F3).

Table F3.

No.	Field	Description
1	Survey No	RTA to supply for inclusion in this table where applicable
2	Road No	State Road Number where applicable
3	Location No	RTA to supply for inclusion in this table where applicable
4	Collection Method	Automatic, manual
5	Type of Equipment	Type of recorders, ie Trafficorders etc
6	Start Date	Commencement date of data collection
7	Finish Date	Completion date of data collection
8	Speed Limit	Actual posted speed limit
9	Comments	

Each record (survey) must be one line in the data set.

Fields to be delimited by a tab, comma or they must be fixed length.

### 1. Trafficorder

Example of RTA Trafficorder output consisting either of a fixed length field or delimited by a space. Each line in the data set represents one vehicle.

Table F4.

Date	Time	CI Speed	Fol
25/11	16:00	9 100	3
25/11	16:00	1 94	
25/11	16:00	1 73	1

### 2. Metrocount

Example of Metrocount output consisting either of a fixed length field. Each line in the data set represents one vehicle.

Table F5.

Axle Num	Ht	Date	Time	Dr	Speed	Wb	Hdwy	Ax	Gp	Rho	CI Nm	Vehicle
00000017	04	2003Feb24	20:11:26	AB	67.1	2.9	45.3	2 2	1.00	1	00000020	SV o o
00000033	04	2003Feb24	20:11:55	AB	58.7	2.8	10.7	2 2	1.00	1	00000010	SV o o
0000003b	04	2003Feb24	20:12:07	AB	63.1	2.8	6.9	2 2	1.00	1	00000010	SV o o

### 3. Speed survey data analysis (as required)

#### Data supplied

The electronic data files supplied will be ASCII files and have the following format or similar:

Table F6.

Date	Time	CI Speed	Fol
25/11	16:00	9 100	3
25/11	16:00	1 94	
25/11	16:00	1 73	1

Files will be either fixed length (as above), tab or comma delimited. Total number of records (one vehicle per record) will depend upon the number of surveys included in the tender and the locations surveyed but usually will be in the range of 500,000 to 1,000,000 records.

Within each data file there will be header records containing descriptive text, which will need to be filtered out during the analysis.

#### Output

The analysis is to be conducted by using the data prescribed in Table F8.

For all analysis, speeds that do not meet the following ranges must be filtered out:

- Minimum speed included in the analysis is 20 km/h.
- Maximum speed for short wheelbase vehicles is 240 km/h.
- Maximum speed for long wheelbase vehicles is 150 km/h.

Speeds outside these parameters are considered errors and would adversely affect the overall results.

The data output should consist of four ASCII tables as indicated. Specifically the following variables are to be calculated.

**Table F7.**

Number of vehicles.
Mean speed
85th percentile speed
Standard deviation
Modal speed
Minimum speed
Max speed
Percent of vehicles exceeding speed limit(SL)
% exceed SL by 10km/h or more
% exceed SL by 20km/h or more
% exceed SL by 30km/h or more

Each of the variables indicated in Table F7 must be calculated for each vehicle group by day, by time and by directional groups (81 total possible groups) as indicated in Tables F1 to 3 in Attachment F.

Electronic output tables are to be produced in accordance with the specifications. The tables need to comply exactly with the specifications indicated to enable up-loading into the main RTA database.

#### 4: Speed survey data output specifications

The analysis output is to be provided in a comma delimited ASCII.

Output is comprised of four tables consisting of one line per record with the fields indicated in Tables F7 to F11 to be comma delineated. A header (field names) is to be provided at the top of each table. Tables may be provided in Microsoft Access 2000 or Microsoft Excel. Either method must be able to print an output similar to the example provided below.

Where the data for certain fields (eg. ID No and Survey No) is supplied by the RTA the consultant must add this data to the output tables.

#### Field codes

The following table describes the codes used in the field names of the required tables.

Field Codes	Description
All	All vehicles
S	Short wheelbase - AUSTRROADS class 1-2
M	Medium wheelbase - AUSTRROADS class 3-5
L	Long wheelbase - AUSTRROADS class 6-12
WDD	Week - Day - Daytime
WDN	Week - Day - Nighttime
WED	Week - End - Daytime
WEN	Week - End - Daytime
ADD	All - Days - Daytime
ADN	All - Days -Nighttime
AD24	All - Days - 24hours
Daytime	06:00:00 - 17:59:59 hours inclusive
Nighttime	18:00:00 - 05:59:59 hours inclusive

**Table F8: All vehicles combined**

No.	Field	Description 1	Description 2
1	ID No	Same as Survey No plus 0.1-N, 0.2-S,0.3-E 0.4-W and 0.5 combined	eg. 2019.5
2	Survey No	RTA to supply. See Annexure 1	eg. 2019
3	NumDirections	1-single direction, 2-both directions	
4	Direction	N,S,E,W or NS, EW etc	
5	AllWDDNoVeh	Number of vehicles.	All vehicles, Weekday, Daytime
6	AllWDDMean	Mean speed	
7	AllWDDPer85	85th percentile speed	
8	AllWDDStdDev	Standard deviation	

No.	Field	Description 1	Description 2
9	AIIWDDMode	Modal speed	
10	AIIWDDMin	Minimum speed	
11	AIIWDDMax	Max speed	
12	AIIWDDExceedSPLMT	Percent of vehicles exceeding speed limit(SL)	
13	AIIWDDExceedSPLMT>=+10	% exceed SL by 10km/h or more	
14	AIIWDDExceedSPLMT>=+20	% exceed SL by 20km/h or more	
15	AIIWDDExceedSPLMT>=+30	% exceed SL by 30km/h or more	
16	AIIWDNNoVeh	Number of vehicles.	All vehicles, Weekday, Nighttime
17	AIIWDNMean	Mean speed	
18	AIIWDNPer85	85th percentile speed	
19	AIIWDNStdDev	Standard deviation	
20	AIIWDNMode	Modal speed	
21	AIIWDNMin	Minimum speed	
22	AIIWDNMax	Max speed	
23	AIIWDNExceedSPLMT	Percent of vehicles exceeding speed limit(SL)	
24	AIIWDNExceedSPLMT>=+10	% exceed SL by 10km/h or more	
25	AIIWDNExceedSPLMT>=+20	% exceed SL by 20km/h or more	
26	AIIWDNExceedSPLMT>=+30	% exceed SL by 30km/h or more	
27	AIIWEDNoVeh	Number of vehicles.	All vehicles, Weekend, Daytime
28	AIIWEDMean	Mean speed	
29	AIIWEDPer85	85th percentile speed	
30	AIIWEDStdDev	Standard deviation	
31	AIIWEDMode	Modal speed	
32	AIIWEDMin	Minimum speed	
33	AIIWEDMax	Max speed	
34	AIIWEDExceedSPLMT	Percent of vehicles exceeding speed limit(SL)	
35	AIIWEDExceedSPLMT>=+10	% exceed SL by 10km/h or more	
36	AIIWEDExceedSPLMT>=+20	% exceed SL by 20km/h or more	
37	AIIWEDExceedSPLMT>=+30	% exceed SL by 30km/h or more	
38	AIIWENNoVeh	Number of vehicles.	All vehicles, Weekend, Nighttime
39	AIIWENMean	Mean speed	
40	AIIWENPer85	85th percentile speed	
41	AIIWENStdDev	Standard deviation	
42	AIIWENMode	Modal speed	
43	AIIWENMin	Minimum speed	
44	AIIWENMax	Max speed	
45	AIIWENExceedSPLMT	Percent of vehicles exceeding speed limit(SL)	
46	AIIWENExceedSPLMT>=+10	% exceed SL by 10km/h or more	
47	AIIWENExceedSPLMT>=+20	% exceed SL by 20km/h or more	
48	AIIWENExceedSPLMT>=+30	% exceed SL by 30km/h or more	

No.	Field	Description 1	Description 2
49	AllADDNoVeh	Number of vehicles.	All vehicles, All days, Daytime
50	AllADDMean	Mean speed	
51	AllADDPer85	85th percentile speed	
52	AllADDStdDev	Standard deviation	
53	AllADDMode	Modal speed	
54	AllADDMin	Minimum speed	
55	AllADDMax	Max speed	
56	AllADDExceedSPLMT	Percent of vehicles exceeding speed limit(SL)	
57	AllADDExceedSPLMT>=+10	% exceed SL by 10km/h or more	
58	AllADDExceedSPLMT>=+20	% exceed SL by 20km/h or more	
59	AllADDExceedSPLMT>=+30	% exceed SL by 30km/h or more	
60	AllADNNoVeh	Number of vehicles.	
61	AllADNMean	Mean speed	All vehicles, All days, Nighttime
62	AllADNPer85	85th percentile speed	
63	AllADNStdDev	Standard deviation	
64	AllADNMode	Modal speed	
65	AllADNMin	Minimum speed	
66	AllADNMax	Max speed	
67	AllADNExceedSPLMT	Percent of vehicles exceeding speed limit(SL)	
68	AllADNExceedSPLMT>=+10	% exceed SL by 10km/h or more	
69	AllADNExceedSPLMT>=+20	% exceed SL by 20km/h or more	
70	AllADNExceedSPLMT>=+30	% exceed SL by 30km/h or more	
71	AllAD24NoVeh	Number of vehicles.	All vehicles, All days, 24 hours ie day and night combined.
72	AllAD24Mean	Mean speed	
73	AllAD24Per85	85th percentile speed	
74	AllAD24StdDev	Standard deviation	
75	AllAD24Mode	Modal speed	
76	AllAD24Min	Minimum speed	
77	AllAD24Max	Max speed	
78	AllAD24ExceedSPLMT	Percent of vehicles exceeding speed limit(SL)	
79	AllAD24ExceedSPLMT>=+10	% exceed SL by 10km/h or more	
80	AllAD24ExceedSPLMT>=+20	% exceed SL by 20km/h or more	
81	AllAD24ExceedSPLMT>=+30	% exceed SL by 30km/h or more	

Table F9: Short wheelbase

No.	Field
1	ID No
2	Survey No
3	NumDirections
4	Direction
5	SWDDNoVeh
6	SWDDMean
7	SWDDPer85
8	SWDDStdDev
9	SWDDMode
10	SWDDMin
11	SWDDMax
12	SWDDExceedSPLMT
13	SWDDExceedSPLMT>=+10
14	SWDDExceedSPLMT>=+20
15	SWDDExceedSPLMT>=+30
16	SWDNNoVeh
17	SWDNMean
18	SWDNPer85
19	SWDNStdDev
20	SWDNMode
21	SWDNMin
22	SWDNMax
23	SWDNExceedSPLMT
24	SWDNExceedSPLMT>=+10
25	SWDNExceedSPLMT>=+20
26	SWDNExceedSPLMT>=+30
27	SWEDNoVeh
28	SWEDMean
29	SWEDPer85
30	SWEDStdDev
31	SWEDMode
32	SWEDMin
33	SWEDMax
34	SWEDExceedSPLMT
35	SWEDExceedSPLMT>=+10
36	SWEDExceedSPLMT>=+20
37	SWEDExceedSPLMT>=+30
38	SWENNoVeh
39	SWENMean
40	SWENPer85

41	SWENStdDev
42	SWENMode
43	SWENMin
44	SWENMax
45	SWENExceedSPLMT
46	SWENExceedSPLMT>=+10
47	SWENExceedSPLMT>=+20
48	SWENExceedSPLMT>=+30
49	SADDNoVeh
50	SADDMean
51	SADDPer85
52	SADDStdDev
53	SADDMode
54	SADDMin
55	SADDMax
56	SADDExceedSPLMT
57	SADDExceedSPLMT>=+10
58	SADDExceedSPLMT>=+20
59	SADDExceedSPLMT>=+30
60	SADNNoVeh
61	SADNMean
62	SADNPer85
63	SADNStdDev
64	SADNMode
65	SADNMin
66	SADNMax
67	SADNExceedSPLMT
68	SADNExceedSPLMT>=+10
69	SADNExceedSPLMT>=+20
70	SADNExceedSPLMT>=+30
71	SAD24NoVeh
72	SAD24Mean
73	SAD24Per85
74	SAD24StdDev
75	SAD24Mode
76	SAD24Min
77	SAD24Max
78	SAD24ExceedSPLMT
79	SAD24ExceedSPLMT>=+10
80	SAD24ExceedSPLMT>=+20
81	SAD24ExceedSPLMT>=+30

Table F10: Medium wheelbase

No.	Field
1	ID No
2	Survey No
3	NumDirections
4	Direction
5	MWDDNoVeh
6	MWDDMean
7	MWDDPer85
8	MWDDStdDev
9	MWDDMode
10	MWDDMin
11	MWDDMax
12	MWDDExceedSPLMT
13	MWDDExceedSPLMT>=+10
14	MWDDExceedSPLMT>=+20
15	MWDDExceedSPLMT>=+30
16	MWDNNoVeh
17	MWDNMean
18	MWDNPer85
19	MWDNStdDev
20	MWDNMode
21	MWDNMin
22	MWDNMax
23	MWDNExceedSPLMT
24	MWDNExceedSPLMT>=+10
25	MWDNExceedSPLMT>=+20
26	MWDNExceedSPLMT>=+30
27	MWEDNoVeh
28	MWEDMean
29	MWEDPer85
30	MWEDStdDev
31	MWEDMode
32	MWEDMin
33	MWEDMax
34	MWEDExceedSPLMT
35	MWEDExceedSPLMT>=+10
36	MWEDExceedSPLMT>=+20
37	MWEDExceedSPLMT>=+30
38	MWENNoVeh
39	MWENMean
40	MWENPer85

41	MWENStdDev
42	MWENMode
43	MWENMin
44	MWENMax
45	MWENExceedSPLMT
46	MWENExceedSPLMT>=+10
47	MWENExceedSPLMT>=+20
48	MWENExceedSPLMT>=+30
49	MADDNoVeh
50	MADDMean
51	MADDPer85
52	MADDStdDev
53	MADDMode
54	MADDMin
55	MADDMax
56	MADDExceedSPLMT
57	MADDExceedSPLMT>=+10
58	MADDExceedSPLMT>=+20
59	MADDExceedSPLMT>=+30
60	MADNNoVeh
61	MADNMean
62	MADNPer85
63	MADNStdDev
64	MADNMode
65	MADNMin
66	MADNMax
67	MADNExceedSPLMT
68	MADNExceedSPLMT>=+10
69	MADNExceedSPLMT>=+20
70	MADNExceedSPLMT>=+30
71	MAD24NoVeh
72	MAD24Mean
73	MAD24Per85
74	MAD24StdDev
75	MAD24Mode
76	MAD24Min
77	MAD24Max
78	MAD24ExceedSPLMT
79	MAD24ExceedSPLMT>=+10
80	MAD24ExceedSPLMT>=+20
81	MAD24ExceedSPLMT>=+30

Table F11: Long wheelbase

No.	Field
1	ID No
2	Survey No
3	NumDirections
4	Direction
5	LWDDNoVeh
6	LWDDMean
7	LWDDPer85
8	LWDDStdDev
9	LWDDMode
10	LWDDMin
11	LWDDMax
12	LWDDExceedSPLMT
13	LWDDExceedSPLMT>=+10
14	LWDDExceedSPLMT>=+20
15	LWDDExceedSPLMT>=+30
16	LWDNNoVeh
17	LWDNMean
18	LWDNPer85
19	LWDNStdDev
20	LWDNMode
21	LWDNMin
22	LWDNMax
23	LWDNExceedSPLMT
24	LWDNExceedSPLMT>=+10
25	LWDNExceedSPLMT>=+20
26	LWDNExceedSPLMT>=+30
27	LWEDNoVeh
28	LWEDMean
29	LWEDPer85
30	LWEDStdDev
31	LWEDMode
32	LWEDMin
33	LWEDMax
34	LWEDExceedSPLMT
35	LWEDExceedSPLMT>=+10
36	LWEDExceedSPLMT>=+20
37	LWEDExceedSPLMT>=+30
38	LWENNoVeh
39	LWENMean
40	LWENPer85

41	LWENStdDev
42	LWENMode
43	LWENMin
44	LWENMax
45	LWENExceedSPLMT
46	LWENExceedSPLMT>=+10
47	LWENExceedSPLMT>=+20
48	LWENExceedSPLMT>=+30
49	LADDNoVeh
50	LADDMean
51	LADDPer85
52	LADDStdDev
53	LADDMode
54	LADDMin
55	LADDMax
56	LADDExceedSPLMT
57	LADDExceedSPLMT>=+10
58	LADDExceedSPLMT>=+20
59	LADDExceedSPLMT>=+30
60	LADNNoVeh
61	LADNMean
62	LADNPer85
63	LADNStdDev
64	LADNMode
65	LADNMin
66	LADNMax
67	LADNExceedSPLMT
68	LADNExceedSPLMT>=+10
69	LADNExceedSPLMT>=+20
70	LADNExceedSPLMT>=+30
71	LAD24NoVeh
72	LAD24Mean
73	LAD24Per85
74	LAD24StdDev
75	LAD24Mode
76	LAD24Min
77	LAD24Max
78	LAD24ExceedSPLMT
79	LAD24ExceedSPLMT>=+10
80	LAD24ExceedSPLMT>=+20
81	LAD24ExceedSPLMT>=+30