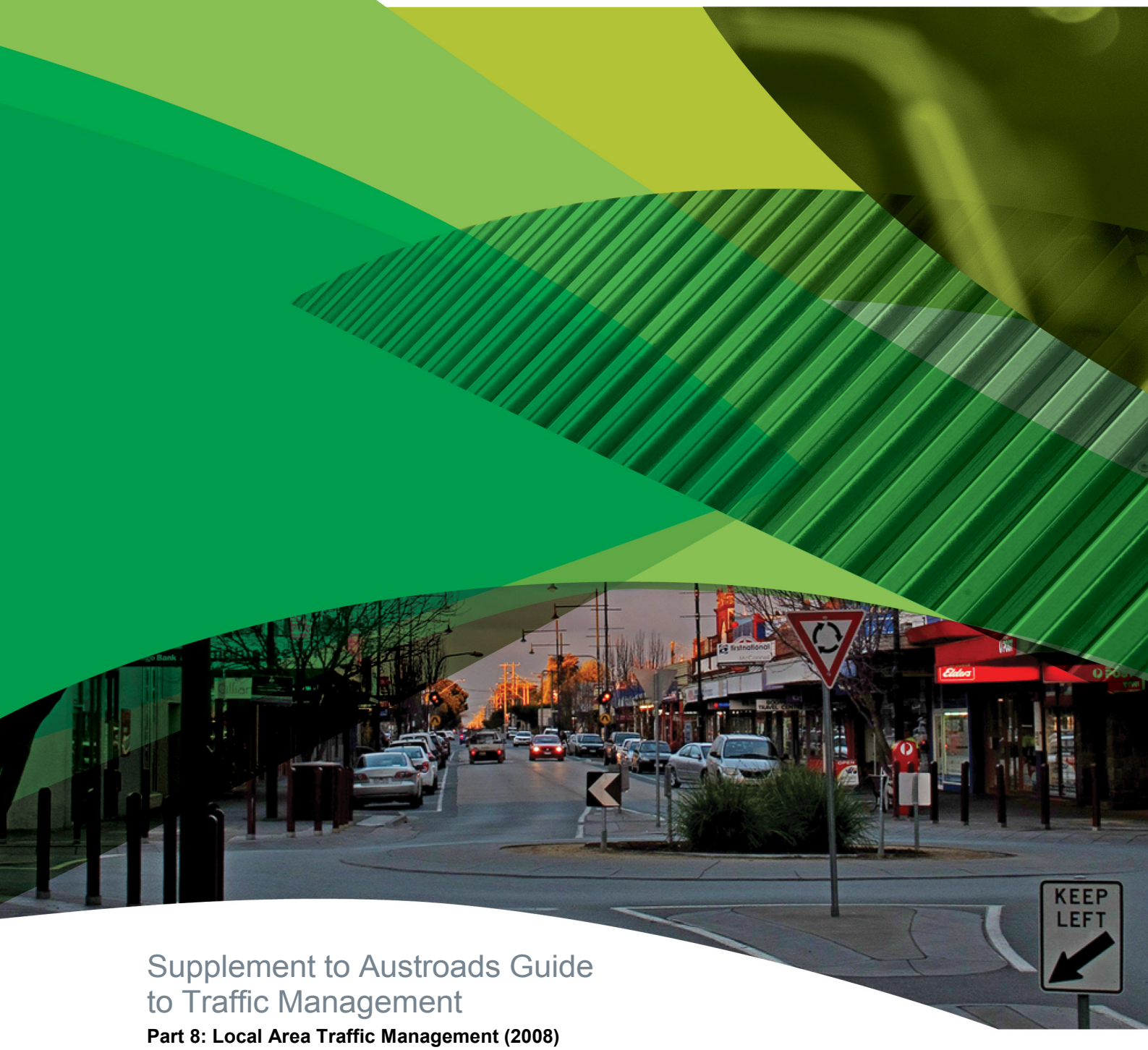

Supplement to Austroads Guide to Traffic Management

Part 8: Local Area Traffic Management (2008)

OCTOBER 2015

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1. Introduction

1.1 General

All road agencies across Australia are working towards greater consistency between States/Territories in how road networks are managed. In order to achieve this, the Austroads Guide to Traffic Management and Australian Standards relating to traffic management have been adopted to assist in providing that level of consistency and harmonisation across all jurisdictions. This agreement means that these Austroads Guides and the Australian Standards are the primary technical references.

Austroads Guide to Traffic Management – Part 8: Local Area Traffic Management (AGTM Part 8) is a nationally agreed guideline document outlining the use of traffic control devices on the road network and has been adopted by all jurisdictions, including VicRoads.

All jurisdictions will be developing their own supplement to clearly identify where its practices currently differ and to provide additional guidance to that contained within AGTM Part 8. This document is the VicRoads supplement and shall be read in conjunction with AGTM Part 8.

1.2 How to Use this Supplement

There are two key parts to this document:

- **Classification of Supplement Information:** this table classifies supplement information as a Departure, Additional Information or both. This information assists with identifying its hierarchy in relation to the Austroads Guide.

- **Details of Supplement Information:** this section provides the details of the supplement information.

  - **Departures:** where VicRoads practices differ from the guidance in the Austroads Guide. Where this occurs, these differences or 'Departures' will be highlighted in a box. The information inside the box **takes precedence** over the Austroads Guide clause. The Austroads Guide clause is not applicable in these instances.

  - **Additional Information:** all information not identified as a departure provides further guidance to the Austroads Guide and is read and applied **in conjunction** with the Austroads Guide clause.

Where a clause does not appear in the body of this supplement, the Austroads Guide requirements are followed.

2. Classification of Supplement Information

The classification of each clause as a Departure, Additional Information or both is shown in the table below.

Section	Classification
2.4	Additional Information
3.3.2	Additional Information
7.2.1	Additional Information
7.5.1	Additional Information
7.5.7	Additional Information
7.5.9	Additional Information
8.13	Additional Information
8.13.1	Additional Information
8.13.2	Additional Information
Attachment A	Additional Information

Austroads Guide requirements are followed for clauses not shown in this table.

3. Details of Supplement Information

Section 2.4 – Network Considerations

Victoria Planning Provisions

Clause 56.06 of the *Victoria Planning Provisions* (2010) deals with 'Access and Mobility Management', which is primarily the road system. It applies to the planning and design of new urban areas and new developments within existing urban areas and sets out objectives and standards to be achieved. These include traffic volume and speed management targets in the design of local street networks and individual streets. The requirement to provide 'larger roads and traffic routes' at intervals of approximately 1.6 km should be regarded as the maximum spacing to avoid high traffic volumes on some internal local streets. A closer spacing of traffic routes is desirable (refer to VicRoads document *Guidance and principles for planning road networks in Growth Areas*. To obtain a copy of this document, please contact, Manager Operations Policy, Network Policy & Standards, on 03 9854 2440).

Designing the Treatment

- Consider all likely road users in the design
- Use the correct design vehicle and checking vehicle (refer to Table 5.1 'Selection of design and checking vehicles and typical turning radii in Australia' of *Austroads Guide to Road Design Part 4: Intersections and Crossings - General*).
- Consider how the type of device and its design may impact on any adjacent traffic routes.

Referral and Obtaining Authorisation

- Major Traffic Control Device (MTCD) authorisation (refer to Traffic Engineering Manual Vol 3, Part 2.7 – Road Management Definitions, Administration and Responsibilities (2015)).
- Comply with the Local Government Act (1989) requirements (refer to Traffic Engineering Manual Vol 3, Part 2.2: Authorisation of Major Traffic Control Devices (2015) (TEM Vol 3, Part 2.2:2015).

Section 3.3.2 – Device Spacing and 'Speed Based Design'

The location of existing services, drainage pits, poles, driveways, pram crossings and street lighting must be considered when selecting sites for Local Area Traffic Management (LATM) devices.

Table 1 provides advice on the spacing of devices - or bends in the road - to achieve particular target street speeds.

Table 1: Slow Point Speed and Length of Street Between Slow Points

Speed at the Slow Point or Bend	Maximum length of street between slow points or bends to limit the target street speed to:		
	30 km/h	**40 km/h**	**50 km/h**
20 km/h	75 - 100 m	100 - 140 m	120 - 155 m
25 km/h	45 m	80 m	135 m
30 km/h		65 m	115 m
35 km/h		50 m	100 m
40 km/h			80 m
45 km/h			60 m

Note: a bend needs to be at least 60 degrees.

LATM devices may be used in combination for increased effectiveness or to reinforce their function e.g. the combination of a slow point and a road hump. But road humps should not be located where pedestrians may mistake them for pedestrian crossings. In such situations the hump should be separated from the pedestrian route or a signed pedestrian crossing on the hump should be created (subject to authorisation to install, modify or remove these MTCDs in accordance with TEM Vol 3, Part 2.2:2015). A non linear street alignment may be created by locating offset slow points at intervals along alternate sides of a wide street.

Section 7.2.1 – Road Humps

Road humps, including those in off-street areas subject to an Order under Section 98 of the *Road Safety Act 1986*, are MTCDs that require authorisation in accordance with TEM Vol 3, Part 2.2:2015.

The design and use of, and the signs and pavement markings for road humps are described in *AS 1742.13:2009 Local Area Traffic Management* at Clauses 2.4, 3.5, 4.3.3, 4.3.4 and 4.6.6 and Appendix C.

Off-Road Humps

Off-road humps are considered appropriate only for locations such as carparks, private access roads and caravan parks where vehicle speeds are very low. The road hump shape should conform generally to the cross-section detailed in Figure 1. The standard hump warning sign (W5-10) may be used at each hump with an advisory speed sign (W8-2) although their use may be waived if a sign is provided at the entry. Pavement markings should be as illustrated in Figure 1 unless different light coloured paving material is used to distinguish the hump.

Care should be exercised when proposing use of these humps in areas where prams and shopping trolleys travel or where low clearance ground equipment operates (e.g. forklifts). Off-road humps should be located so that they will not inhibit drainage and should not be within vehicle manoeuvring areas.

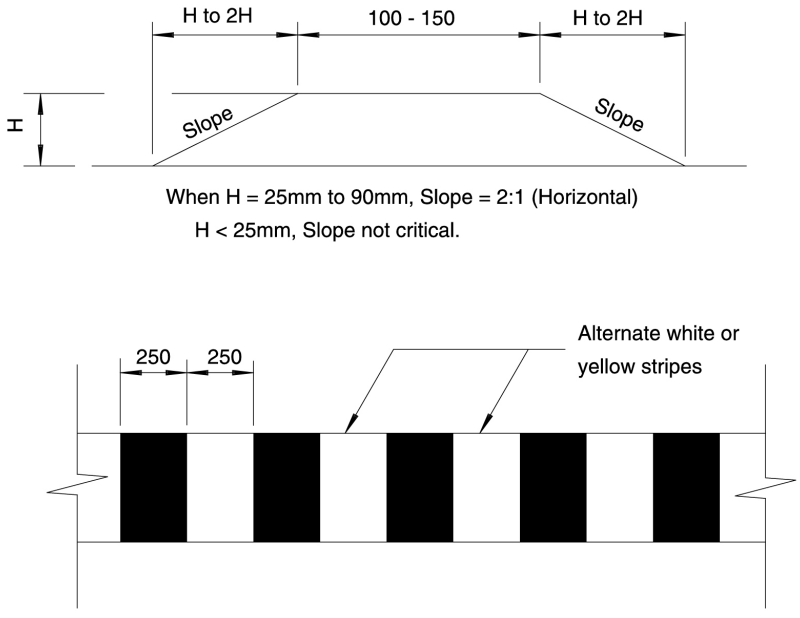

Figure 1: Off-Road Hump

Section 7.5.1 – Signs, Linemarking and Other Treatments: Speed Limit Signs

In Victoria, the general urban speed limit of 50 km/h applies to most streets in a local traffic area. Unless a local street is a direct continuation of a road with a higher speed limit, speed limit signs will generally not be required in a local area to create the 50 km/h limit. On some collector roads or major access roads a 60 km/h speed limit may be appropriate. If so, it will need to be signed.

It may be appropriate to introduce a 40 km/h speed limit throughout a local traffic area or precinct. The area-wide application of a 40 km/h local speed limit will often require local area traffic management works to have been undertaken to limit speeds across the area to about 40 km/h. An area speed limit is signed by installing a 'Speed Limit AREA' sign (R4-10) facing each entry into the area and an 'END Speed Limit AREA' sign (R4-11) facing each exit.

Signed 40 km/h speed limits may also be applied in local streets near schools (may be time based or permanent) and on streets which are designated as pedestrian or bicycle priority routes.

Speed limit signs are MTCDs that require authorisation in accordance with TEM Vol 3, Part 2.2:2015.

The consultation process and management of stakeholder feedback with the alteration of a speed zone is undertaken by the responsible road authority (which is Council in the case of local roads).

Further information on speed zoning is in Traffic Engineering Manual Vol 3, Part 2.9 – Speed Zoning Guidelines.

Section 7.5.7 – Signs, Linemarking and Other Treatments: Shared Zones

A Shared Zone is a road or network of roads where pedestrians, cyclists and vehicles share the roadway.

Appropriate locations:

- low volume streets where pedestrians outnumber motor vehicles and where the pedestrian needs are best met by walking on the roadway, and
- where the street has been constructed or reconstructed to a sufficient degree to ensure significant visual interruption and where speed is physically restrained, and
- where there is no cross motor traffic.

A shared zone provides improved amenity for pedestrians and an improved streetscape. Locations for shared zones may include lanes and streets in central business districts, selected residential streets, shopping centres and caravan parks.

The speed limit shown on the shared zone sign should be 10 km/h or 20 km/h. No other speed limit values should be used unless there are exceptional circumstances.

Inappropriate locations:

Shared zones are not suitable in the following locations:

- on streets that carry over 200 vehicles per hour in peak periods, or over 1000 vehicles between 7.00 am and 7.00 pm
- on streets with a history of vehicle speed problems
- on unprotected locations where approach speeds exceed 40-50 km/h.

Design guidelines for shared zones:

- The road should be discontinuous and any kerb should be removed to enhance the sense of equality between pedestrians and vehicles

- Speed reduction devices should be installed at a spacing of approximately 40 m and these devices should be staggered on opposite sides of the reserve to require a weaving alignment through the shared zone
- A maximum design speed should be 20 km/h
- All entry and exit points to shared zones should be clearly signed
- A minimum trafficable width of 2.8 m should be maintained throughout the zone
- Straight lengths of roadway without speed reduction devices should not exceed 50 m
- Parking spaces should be provided adjacent to the trafficable path
- There should be no provision for traffic to flow across the zone
- Devices should include planting areas to contain the area visually
- It is desirable to create a surface texture difference between the shared zone and the surrounding road network
- Bollards with reflectors may be used to delineate the shape of the roadway from the approach side and to shield landscaping.

An example of a Shared Zone is provided in Figure 2.

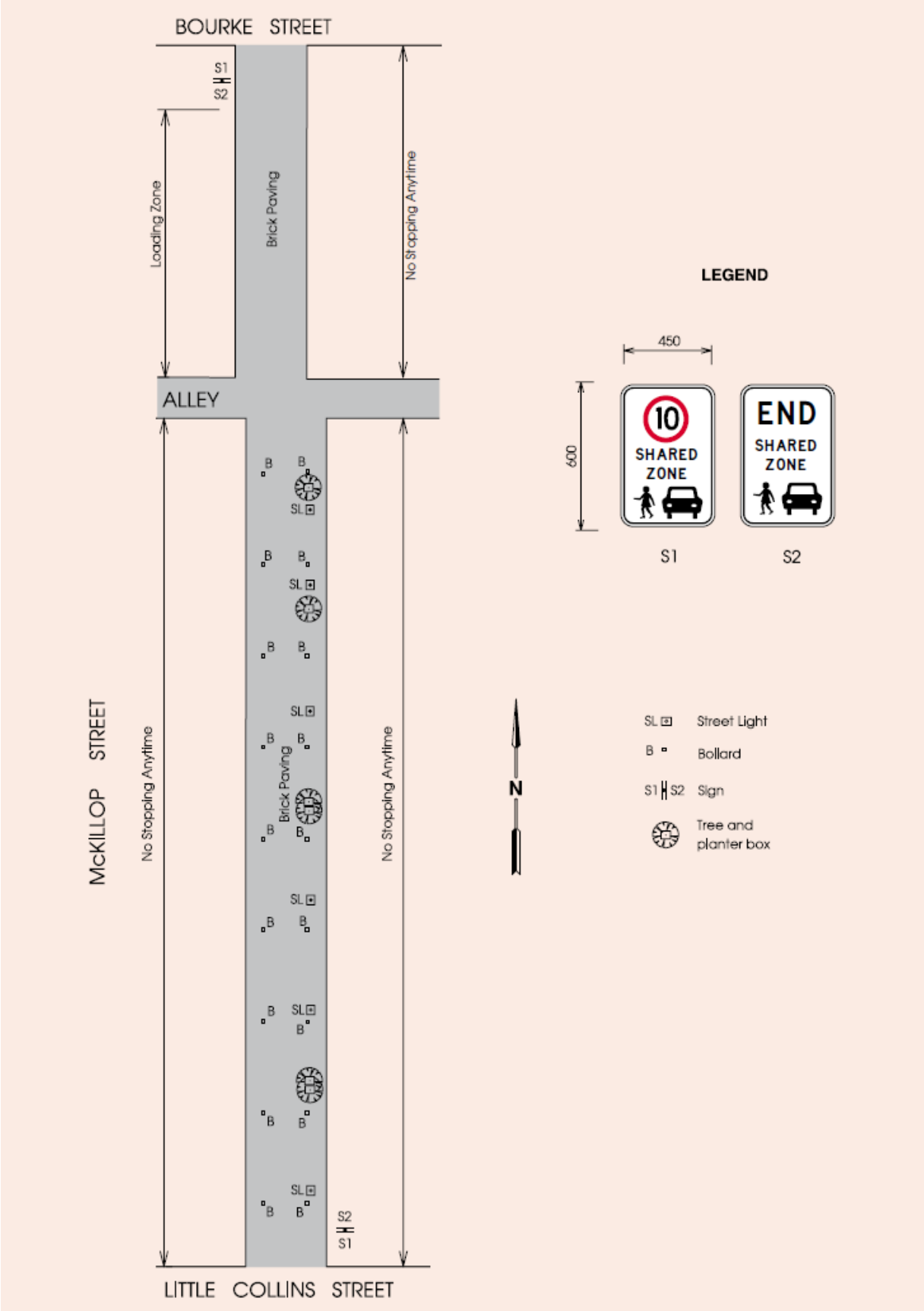

Figure 2: Shared Zone Treatment

Section 7.5.9 – Signs, Linemarking and Other Treatments: Threshold Treatments

Splitter Islands

Splitter islands can be used at threshold treatments as a means of improving safety by channelising traffic, improving intersection conspicuity and providing pedestrian refuges at an intersection (see Figure 3). They may be used to reduce the volume of through traffic by limiting the capacity of traffic leaving the local street. They also provide motorists with a clear indication they are entering a local street.

APPROPRIATE LOCATIONS

- Where there is a need to reduce the capacity of an intersection as part of a LATM scheme
- At all points of transition between boundary roads and local streets, i.e. at gateways to residential areas
- Residential streets with high volumes of through traffic
- Where there is a need to reduce entry speed of vehicles to a short residential street, (i.e. less than 500 m long)
- Where there is a need to provide a pedestrian refuge at an intersection
- To control turning traffic and prevent corner cutting
- At the entrances to a local traffic area

ADVANTAGES

- May discourage through traffic by reducing intersection capacity, for instance, reducing a two lane exit of a local street to one lane may divert drivers to other routes
- Reduces entry speeds at the intersection.
- Reduces the carriageway width to be crossed by pedestrians
- Increases vehicular and pedestrian safety at an intersection
- Provides physical separation of traffic.
- Can improve intersection definition

DISADVANTAGES

- Splitter islands have little effect on mid-block vehicle speeds in long streets
- May be restrictive for emergency and service vehicles
- May increase traffic volumes in other nearby streets
- Effectiveness limited unless complemented by other devices in the street
- Can create a squeeze point for cyclists

DESIGN PRINCIPLES

- Lane widths and the set back of the island at the intersecting street should be adequate to provide for the turning requirements of service vehicles
- The overhang of a turning truck should be checked to ensure the safety of a pedestrian sheltering in the splitter island
- The width of a splitter island should not be less than 1.2 m for sheltering a sign. If the island is intended to be used as a pedestrian refuge, a desirable minimum island width of 2 m should be provided. If fully mountable kerbs are used and the splitter island is free of signs the width may be reduced below 1.2 m
- Requires good illumination
- Install a centre line over the last 30 m of the street and take it past the island on the left hand side and install white raised reflective pavement markers at 6 m spacing
- A “Keep Left” sign is desirable to provide conspicuity at each end of the island
- An opening in the island should be provided for pedestrians, wheelchairs and prams, preferably at road pavement level
- Pram crossings should be provided on both sides of the intersection
- Minimum length of splitter island should be 8.0 m for adequate visual effect (May be reduced to cater for driveways.)
- Visual effect may be enhanced by the use of contrasting pavement materials with adequate skid resistance at the threshold
- Ensure parking restrictions are adequate to allow safe approach to and departure from the device

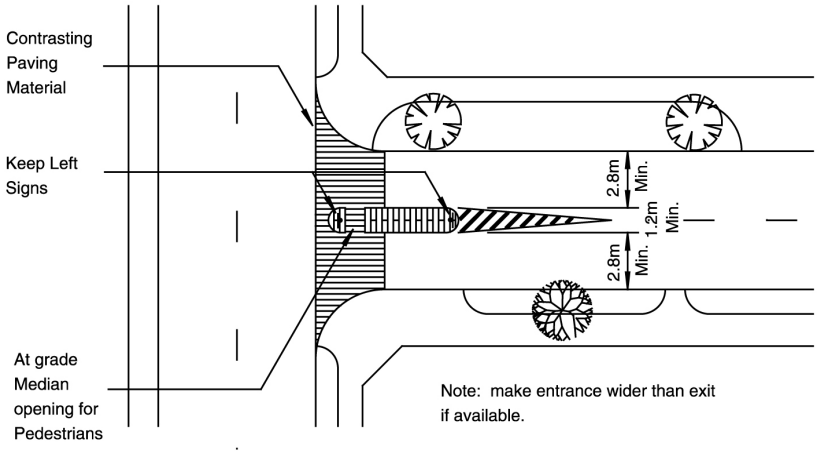

Figure 3: Splitter Island

Section 8.13 – Catering for Emergency Vehicles, Buses and Trucks

Where a dispute exists between a council and another party regarding issues of trucks, buses or emergency vehicles, the matter should be referred to the relevant VicRoads' Regional Director for resolution.

VicRoads *Supplement to AS1742.12 Part 12: Bus, transit, tram and truck lanes* provides further information about design for trucks, buses and emergency vehicles.

Section 8.13.1 – Providing for Emergency Service Vehicles in LATM

All streets and all properties must be accessible for emergency vehicles. LATM plans should be discussed with emergency service providers to ensure they allow appropriate access. In planning, the Freightliner Pumper Tanker is the current MFB design vehicle. The properties of this vehicle are:

- Height 3.26 m
- Width 2.5 m
- Length 8.75 m
- Weight (GVW) 15.3 t
- Turn radius 9.9 m

Section 8.13.2 – Providing for Buses in LATM

Designing Local Roads for Ultra Low Floor Buses

Victoria's passenger bus fleet is to be progressively replaced with Ultra Low Floor (ULF) buses over the next 20 years to meet the requirements of the Commonwealth Disability Discrimination Act 1992.

The Austroads design vehicles (19m semi trailer and longer vehicles) are to be used for designs on arterial roads. The physical dimensions of the ULF bus means that it has become an important design vehicle for use when developing proposals for local roads serving as bus routes.

This information aims to assist in the design of traffic management treatments on local roads to ensure safe and convenient passage for ULF buses.

ULF bus characteristics differ from the traditional bus in that they are lower to the ground, have a longer front overhang and a shorter turning radius and swept path.

Vehicle Swept Path

Traffic management treatments on bus routes along local roads should be designed to accommodate the design vehicle shown in Figure 4.

Whilst ULF buses have the same length and similar operating characteristics as the standard Austroads design bus, the more modern ULF buses have a greater steering angle, which provides increased manoeuvrability in negotiating local road traffic management treatments.

However ULF buses also have a lower and longer front overhang which must also be taken into account in designing traffic management treatments.

These conflicting requirements are demonstrated in Figure 4 where the higher steering angle has been used to allow the ULF bus to turn on a radius of 10.8 m to the outside front wheel, compared with the 12.5 m radius standard adopted for the Austroads single unit truck/bus design vehicle. Nevertheless, in spite of the smaller turning radius, the overall swept path of the ULF bus through the turn is similar to the Austroads vehicle because of the longer front overhang.

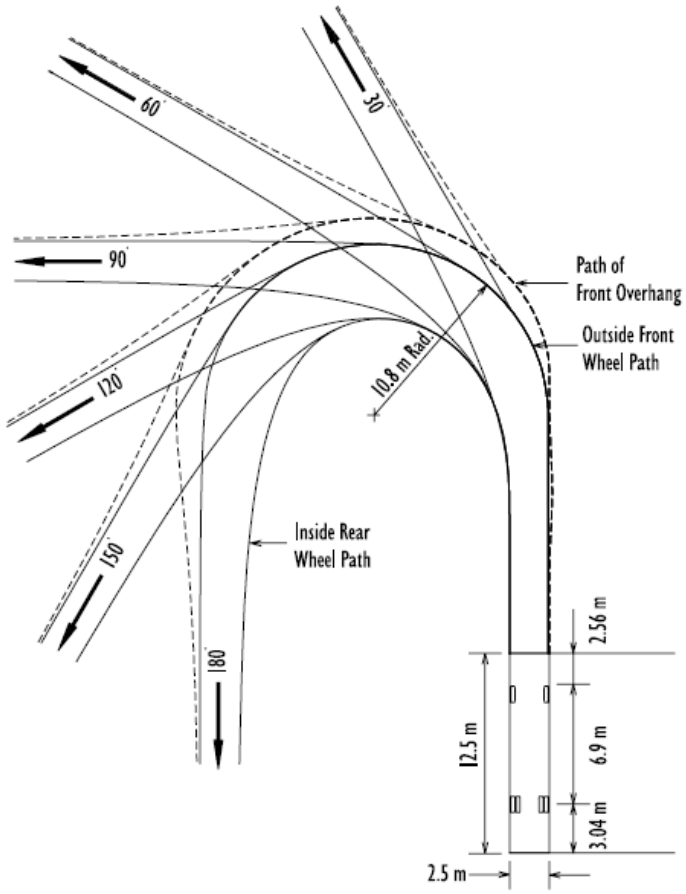

Figure 4: Design ULF Vehicle for Bus Routes on Local Roads

Designs should also be checked to ensure that they can accommodate other design vehicles that are likely to use the route, such as service vehicles.

Important Factors to Consider

A number of features on existing roads are known to cause operational and potential safety problems for ULF buses using local roads and at their intersections with arterial roads. In particular, improvements should be considered to the design of the following aspects:

- Kerb returns at intersections where buses mount barrier kerbs while turning into or out of local streets
- Intersections where buses turning left from local roads have to encroach over the centreline of arterial roads to complete the turn
- Verges where buses turning right into local streets overhang the verge and impact it because of the surface profile behind the kerb
- Inappropriate changes in pavement profile across median openings, within intersections, at the crown of a road pavement, or at entrances (to schools, shopping centres, bus terminals) may cause the front or rear of ULF buses to contact the pavement. Open drainage inverts provided across intersections can cause the same problem
- Devices such as road humps which may not be constructed strictly in accordance with VicRoads guidelines. These devices may have obstacles or other features which unduly restrict the passage of buses or, if mounted by buses, cause discomfort to passengers
- Roundabouts which are constructed to make roads safer but which may unreasonably inconvenience large vehicles such as ULF buses
- Power reticulation and lighting poles which are often located on the corners of intersections and impede the passage of buses
- Road furniture on the islands of traffic management treatments which should not be located within areas likely to be used by ULF bus
- Guard fences and barriers which should not be placed where they unduly restrict ULF buses
- Trees and vegetation which should be locatedand maintained to ensure that the necessary sight lines are not impeded.

Intersections

All intersection movements forming part of a bus route must be designed to safely accommodate the movement of ULF buses.

This can be achieved by designers checking the design using the turning template in Figure 4 and checking the vertical profile along the length of the bus at points where vertical clearance is likely to be critical.

The principles described below for the design of a typical urban local road roundabout should be applied to other types of existing and proposed intersections and traffic management treatments along bus routes.

Roundabouts

Austroads Guide to Road Design Part 4B - Roundabouts is the primary reference for the design of roundabouts in Victoria. All roundabouts, including those on local roads, should be designed in accordance with the principles outlined in this guide. The principles described should also be applied to other types of intersections along bus routes where this is applicable.

As a general rule, all kerbing used at roundabouts and other local traffic management treatments should desirably have a semi-mountable profile so that vehicles, particularly trucks and buses, are not unduly affected should they mount the kerb. Wherever possible, barrier kerb and bluestone kerbs should be avoided.

Power and street lighting poles should not be located or retained within the area likely to be traversed by buses.

The following additional information describes aspects of design which must be taken into account to adequately provide for ULF buses at local road roundabouts.

Through Movement

Whilst this is the easiest movement for buses, a design that provides the appropriate entry and exit widths for buses could compromise the vehicle path deflection required to ensure the safety of smaller vehicles (Figure 5). A fully mountable paved annulus should be provided to reduce the speeds of smaller vehicles, its outer edge being bounded by a suitably profiled mountable kerb such as VicRoads M1 profile. This profile should not cause undue inconvenience or tyre damage to larger vehicles because they approach it at an acute angle and the kerb is not very high (50 mm).

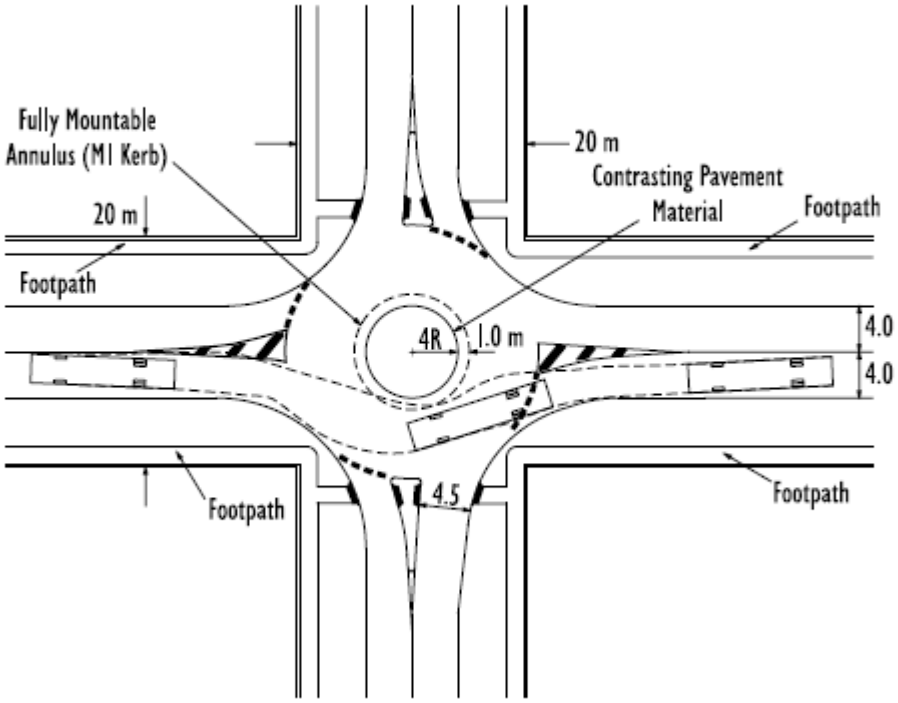

Figure 5: Swept Path for Through Movement

The apron behind the annulus should not be superelevated to the extent that the front of a ULF bus would strike it or the kerb of the central island. If raised islands are located on the roundabout approach and departures, areas overswept by the front and rear overhangs should be kept clear of road furniture and landscaping. The finished paved surface of traffic islands should not be higher than the surrounding kerb.

Left Turn Movement

In order to undertake this manoeuvre, the approaching bus may need to either encroach on the splitter island (painted or kerbed) or mount the inside kerb return (Figure 6). This can be eased by providing a fully mountable apron on the inside of the turn. However, drainage lines, pit lids and services (overhead service poles are frequently encountered in these locations) need to be considered. Further, pedestrian standing areas need to be defined and located so that they are not overswept by buses.

On the departure, the vehicle could also be required to encroach upon splitter islands or into the opposing direction traffic lanes for a short distance. Road furniture should not be located in areas which are likely to be traversed by buses, such as the splitter islands and the kerb on the inside of the left turn.

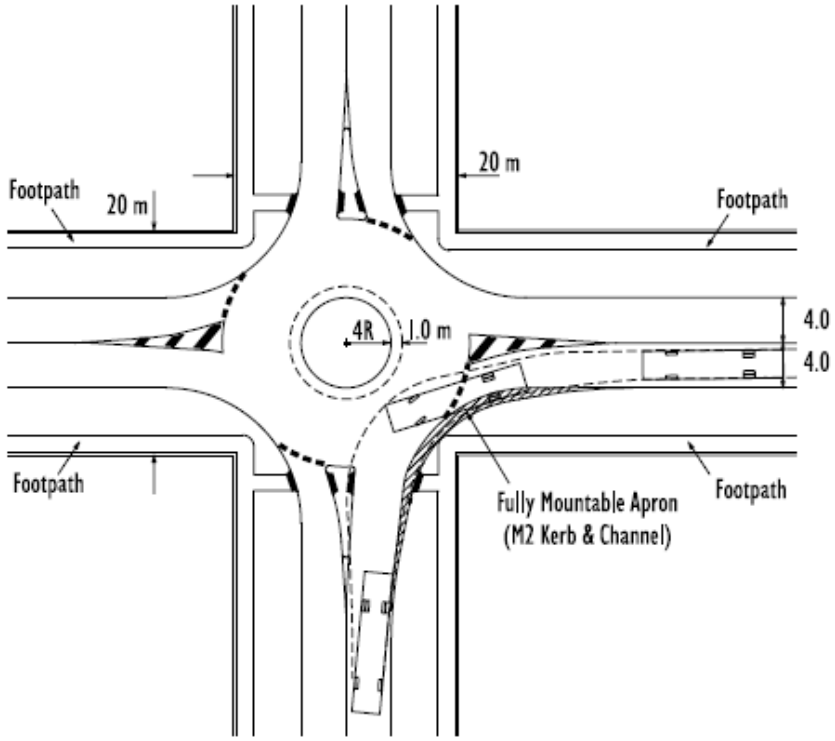

Figure 6: Swept Path for Left Turn Movement

Right Turn Movement

The swept path of the vehicle throughout this movement is the controlling factor in determining the overall size of the roundabout. Similar to other movements, a mountable annulus and encroachment upon splitter islands must be considered (Figure 7). The position of holding lines on approaches should also be checked to ensure that they are located clear of the front overhang of a circulating bus.

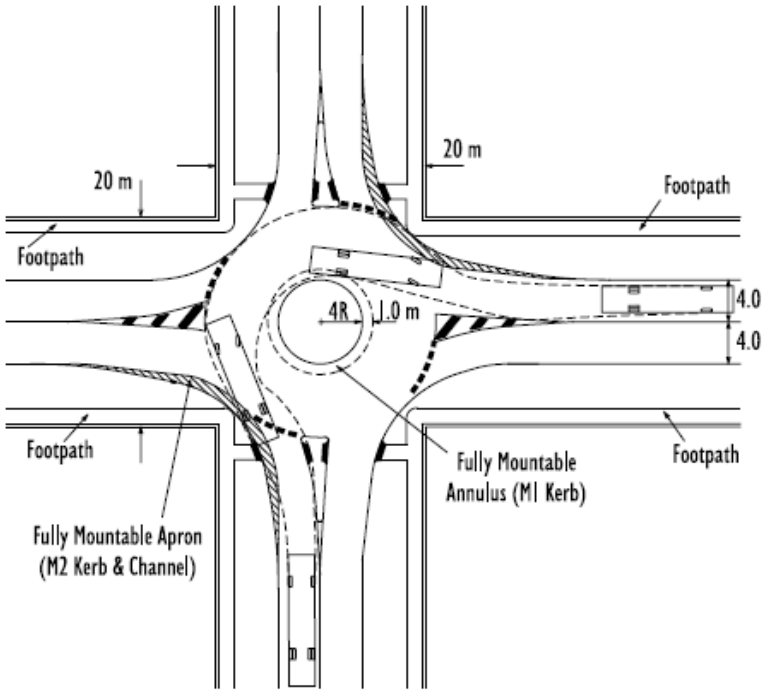

Figure 7: Swept Path for Right Turn Movement

Front Overhang

Where the front overhang of an ULF bus sweeps beyond the pavement, designers should make provision for the front overhang to clear the area beyond the kerb. An area for a distance of 2.0 m behind the back of kerb should not exceed 150 mm above the projected pavement level or have any road furniture, utility poles or landscaping on it (Figure 8).

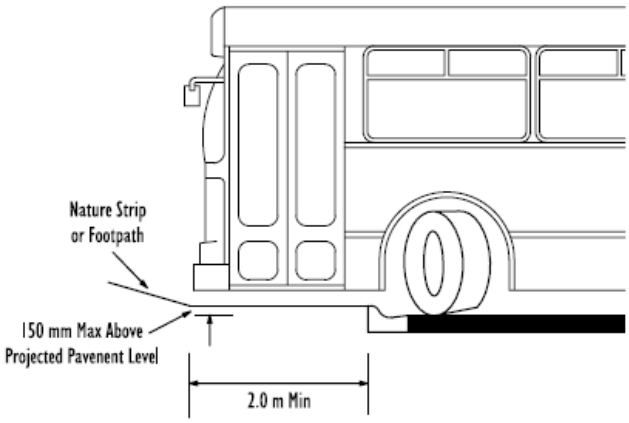

Figure 8: Front Overhang Requirements for Turning ULF Bus

Road Humps

On routes used by ULF buses it is desirable that flat top humps be used, in order to minimise twisting of the chassis of the bus. The flat top hump should be long enough to ensure that the front and rear axles of the bus are raised at the same time, and the ramps should have the most gentle slope permitted by the guidelines. It is noted that humps should be no higher than 100 mm above the surrounding road surface. It is important that the clearance of the vehicle is not reduced due to irregularities in the road surface adjacent to the hump, or the hump height is not increased by potential obstacles such as narrow raised concrete dividing strips.

Bus Stops

Bus stops should be easily accessed by persons with disabilities and elderly pedestrians, by the provision of smooth, well designed and well maintained footpaths.

Consultation

It is essential that councils or consultants initiate discussions with bus operators at an early stage in the development of intersection or traffic management treatments along local roads so that they are designed to accommodate the buses which are intended to use the route.

Bus operators or ULF bus manufacturers will make available to councils or consultants precise details of the bus characteristics, such as under body clearances, so that inconvenient and costly changes to designs and/or traffic management treatments are avoided.

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Directorate:	Policy and Programs
Approved by:	Jeremy Burdan Manager – Network Standards
Date of Approval:	October 2015

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Previous versions of this document are available on request by contacting the VicRoads – Network Standards team.

For enquiries regarding this supplement, please contact the VicRoads – Network Standards team via tem@roads.vic.gov.au or 9854 2417.