mainroads WESTERN AUSTRALIA

We're working for Western Australia.

Main Roads Supplement to the Austroads Guide to Traffic Management

Part 6: Intersections, Interchanges and Crossing Management

D23#926118
June 2023

Contents

Document Control

Owner	Manager Road & Traffic Engineering
Custodian	Senior Traffic Engineer (Raj Shah)
Document Number	D23#926118 (Master: D19#957054)
Issue Date	June 2023
Review Frequency	5 years

Amendments

Revision Number	Revision Date	Description of Key Changes	Section / Page No.
1	06/11/2024	Text related to Offset Left Turn modified. Intersection warrants equation updated. Road trains included in the updated Intersection Warrants Tool	Pgs 8, 9, 11-13
2	07/04/2025	Text for SL & SR treatments updated	Pg 6
3	01/09/2025	Update to reference guidelines and links to drawings	Entire document

PURPOSE

The purpose of this document is to detail Main Roads' standards for traffic management at all type of road intersections, including grade-separated interchanges, as well as rail crossings and pedestrian and cyclist crossings of roads, and bicycle paths and shared paths.

This Supplement has been developed to be read in conjunction with the Austroads Guide to Traffic Management (AGTM) Part 6: Intersections, Interchanges and Crossings Management (2020), a copy of which can be obtained via the Austroads website.

In Western Australia, Main Roads' policies, guidelines and standards take precedence over Austroads Guides and Standards Australia Standards. National Guides and Standards take precedence over International Guides and Standards, unless specifically stated otherwise.

This Supplement has the same structure as the equivalent Austroads Guide and only additional requirements, clarifications, or practices different from Austroads appear. Where appropriate, this Supplement may also contain additional sections and figures not covered by Austroads, but the numbering sequence found in the Austroads Guide remains. Figures and tables in this Supplement replace those with the same figure or table number in the equivalent Austroads Guide.

Where a reference has been made to a particular Main Roads WA document or drawing within this supplement, the reference provided can be used in the search facility on the Main Roads WA website to locate the current version.

1 INTRODUCTION

Main Roads has no supplementary comments for this section.

2 SAFETY AND TRANSPORT MANAGEMENT OBJECTIVES

2.1 Safety Objectives

Main Roads has implemented the Road Safety Management System (ROSMA) based on Safe System principles.

2.2 Traffic Management Objectives

The Department of Transport and Major Infrastructure provides advice on the application of Inter-Modal Hierarchical Prioritisation (I'M-HiP for short) to active transport infrastructure, such as footpaths, shared paths, and bicycle paths where these intersect with minor roads.

3 SELECTION OF INTERSECTION TYPE

3.1 General

Main Roads WA has Supplements to the Austroads Guide to Road Design Parts 4, 4A, 4B and 4C.

3.2 Types of Intersections

3.2.2 Simple and Basic Turn Treatments (Type S / BA)

3.2.2.1 Simple Turn Treatments – Rural Roads (Type S)

The Simple Left (SL) and Simple Right (SR) turn treatments are applicable to rural roads and in situations where the turning traffic is less than or equal to 5 vehicles per hour. This treatment differs from Type BA in that there is no widening of the pavement at the turning point at the intersection.

SL and SR treatments are not suitable for intersections where heavy vehicles are the predominant vehicle type.

Refer to Main Roads WA Intersections at Grade Guideline drawing 202231-0008 and Pavement Marking Standard drawing 200331-0182.

3.2.2.2 Basic Turn Treatments (Type BA)

Refer to Main Roads WA Intersections at Grade Guideline drawing 200131-0081 and Pavement Marking Standard drawing 200331-0182.

3.2.3 Auxiliary Lane Turn Treatments (Type AU)

Refer to Main Roads WA Intersections at Grade Guideline drawing 200131-0083 and Pavement Marking Standard drawing 200331-0182.

Main Roads does not support the use of lane marking at a rural AUR right turn treatment shown in Figures 3.5 and 3.6. Further details on this type of treatment can be found in Appendix A of Main Roads WA "Supplement to Austroads Guide to Road Design Part 4".

3.2.4 Channelised Turn Treatments (Type CH)

Refer to Main Roads WA Intersections at Grade Guideline drawings 200131-0084, 200131-0085, Kerbing Guideline drawing 200231-0053 and Pavement Marking Standard drawing 200331-0183. For road trains, refer to Main Roads WA Intersection at Grade Guideline drawings 201431-0001 and 201431-0002.

Main Roads prefers to use the AUR treatment instead of the type CHR(S) on two-lane roads. A type CHR(S) treatment may only be considered on dual carriageways to provide access to minor local roads and driveways. A typical type AUR treatment is shown in Appendix A of Main Roads WA "Supplement to Austroads Guide to Road Design Part 4".

In certain instances, an 'Offset Left Turn Treatment' would be warranted for type CHL treatments. See section 3.3.6.1 *Warrants for Offset Left Turn Treatments on Rural Roads* in this supplement. Refer to Main Roads Standard Drawing 201931-0044 for design guidance for Offset Left Turn Treatments.

3.2.5 Intersection Treatments – Rural Divided Roads

Refer to Main Roads WA Standard drawing 201131-0072 for signs and pavement marking details of a minor intersection in a rural area on a dual carriageway with a wide median.

3.2.7 Staggered T-intersections

Main Roads does not support the use of the two-lane two-way road right-left staggered treatment shown in Figure 3.16(a).

For signs and pavement markings at staggered T-intersections, refer to Main Roads WA Guideline drawings 201631-0001 and 201631-0002.

3.2.8 Seagull Treatments

Refer to Main Roads WA Intersections at Grade Guideline drawings 200131-0085, kerb treatments Guideline drawing 200231-0053 and Pavement Marking Standard drawings 201031-0022 and 201031-0023.

3.2.9 Wide Median Treatments

Refer to Main Roads WA Pavement Marking Standard Drawing 201031-0021.

3.2.10 Channelised Intersections with Right-turn Restrictions

Refer to Main Roads WA Signs and Pavement Marking Local Area Traffic Management Guideline drawings 200331-0142, 200331-0136, 200331-0137 and 200631-0002.

3.3 Intersection Selection

3.3.2 Selection Process

Road Safety Management System (ROSMA) system based on Safe System principles can be used for intersection selection.

Main Roads WA "Supplement to Austroads Guide to Traffic Management Part 3" describes Main Roads approach to modelling and intersection analysis.

3.3.3 Assessment of Intersection Control Options

Main Roads is committed to providing the safest practical intersection control treatment that also provides an acceptable level of mobility, i.e. seeking to maximise safe mobility.

Main Roads' process to determine the most suitable intersection treatment on major roads is described in Main Roads WA "Towards a Safe System Approach – Selection of Intersection Control".

The Main Roads WA "Traffic Signals Approval Policy – Network Operations Directorate" outlines the factors that Main Roads takes into account when considering approval of modifications to existing traffic signals and the provision of new traffic signals.

3.3.6 Warrants for S, BA, AU and CH Turn Treatments

This section replaces Section 3.3.6 from the Austroads Guide to Traffic Management Part 6.

The type CHR(S) treatment is not a preferred Main Roads treatment. Main Roads prefers to use the AUR treatment as an alternative to the type CHR(S). For dual carriageways a CHR treatment should be adopted in place of an AUR treatment.

Due to the high percentage of heavy vehicles and road trains on Western Australian roads, Main Roads uses the equation below for warrants for turn treatment in place of Austroads Guide to Traffic Management, Part 6 (2020), Figure 3.25. Note that this equation will match the warrants in Austroads graphs when the %HV equals 7.725% and %RT equals 0%.

The following equation is used to determine the turning treatment warranted.

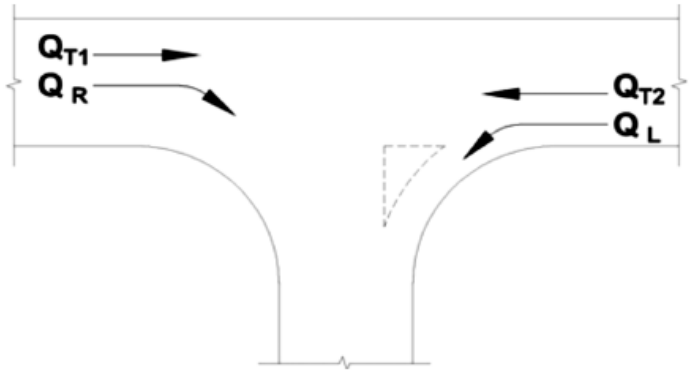
$$x = \frac{1}{471.5} \times Q_M^{0.912} \times Q_i^{1/2.46} \times \left(1 + 0.75 \times \frac{(\%HV + 2.5 \times \%RT)}{100}\right)$$

To use the above equation, substitute in values for Q_M , Q_i , %HV and %RT

Notes

1. Q_M is calculated based on Austroads Guide to Traffic Management Part 6 (2020), Figure 3.26 shown below.
2. %HV, calculated as the weighted average % heavy vehicles for Q_M.
3. %RT, calculated as the weighted average % road trains for Q_M.
4. Q_i is either Q_R or Q_L.
5. If Q_i is less than or equal to 5, only a Simple Left (SL) or Simple Right (SR) is warranted.
6. For four lane and six lane single carriageways refer to Austroads Guide to Traffic Management Part 6 (2020), Figure 3.26, for adjustments to Q_M.
7. If the treatment is found to be of type CHL, perform an additional check to determine if an offset turn is required. See section 3.3.6.1 *Warrants for Offset Turn Treatments on Rural Roads* in this supplement for guidance on performing this check.

Figure 3.26: Calculation of the major road traffic volume Q_M



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	= $Q_{T1} + Q_{T2} + Q_L$
		Yes	= $Q_{T1} + Q_{T2}$
	Left	Yes or no	= Q_{T2}
Four-lane two-way	Right	No	= 50% x $Q_{T1} + Q_{T2} + Q_L$
		Yes	= 50% x $Q_{T1} + Q_{T2}$
	Left	Yes or no	= 50% x Q_{T2}
Six-lane two-way	Right	No	= 33% x $Q_{T1} + Q_{T2} + Q_L$
		Yes	= 33% x $Q_{T1} + Q_{T2}$
	Left	Yes or no	= 33% x Q_{T2}

Source: TMR (2016a).

For Design Speeds ≥ 100 km/h and $Q_i > 5$

If x < 1, only a BAR / BAL treatment is warranted
If 1 ≤ x < 2.1 , an AUR / AUL treatment is warranted
If x ≥ 2.1 , a CHR / CHL treatment is warranted

For 70 km/h ≤ Design Speeds < 100 km/h and $Q_i > 5$

If x < 1.5, only a BAR / BAL treatment is warranted
If 1.5 ≤ x < 3.3, an AUR / AUL treatment is warranted
If x ≥ 3.3, a CHR / CHL treatment is warranted

For Design Speeds < 70 km/h and $Q_i > 5$

If x < 2.3, only a BAR / BAL treatment is warranted
If 2.3 ≤ x < 5, an AUR / AUL treatment is warranted
If x ≥ 5, a CHR / CHL treatment is warranted

Example:

Major Road: Two lane single carriageway with a design speed of 80 km/h
Minor Road: Splitter Island included.

Q_{T1} = 250 (HV 10%, RT 4%)
Q_R = 35 (HV 20%, RT 0%)

Q_{T2} = 300 (HV 11%, RT 4%)
Q_L = 155 (HV 12%, RT 0%)

Note above values are peak hour flows with % heavy vehicles.

$$x = \frac{1}{471.5} \times Q_M^{0.912} \times Q_i^{1/2.46} \times \left(1 + 0.75 \times \frac{(\%HV + 2.5 \times \%RT)}{100}\right)$$

Right Turn Assessment:
Q_M = 550
x = 3.28
Treatment = AUR

Left Turn Assessment:
Q_M = 300
x = 3.46
Treatment = CHL

3.3.6.1 Warrants for Offset Left Turn Treatments on Rural Roads

Refer to Main Roads Standard Drawing 201931-0044 for Offset Left Turn Treatments.

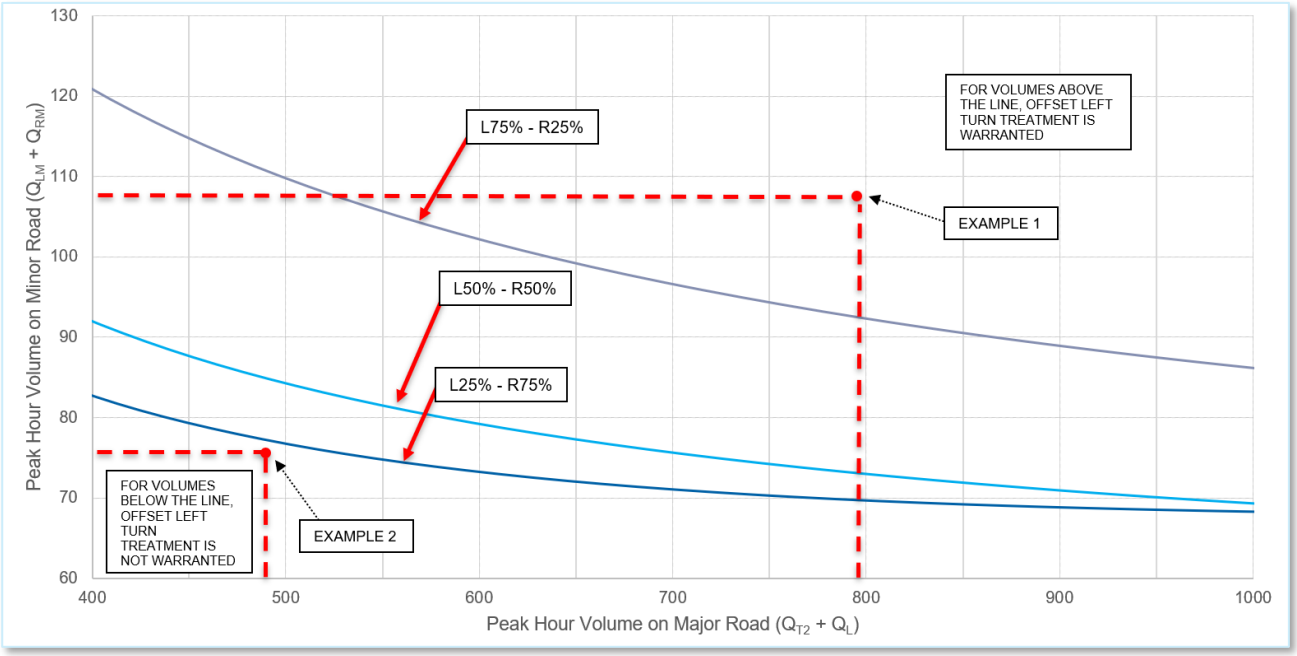
Offset turn treatments are proposed to eliminate the masking of through-movement vehicles at intersections by left turning vehicles in the left turn pocket. The warrants for offset left turns are based on the probability of one crash occurring every 50 years as a result of the offset left turn treatment not being installed.

The graph in Figure 3.26A below was produced using a frequency of one KSI crash (KSI = Killed or Seriously Injured) in 50 years, for a range of traffic flow split on the minor road and the corresponding allowable major road traffic volumes. The following two examples have been plotted onto the graph in Figure 3.26A as an illustration.

Example 1: The peak hourly traffic volume on the major road is 795 veh/hr. The peak hourly traffic volume on the minor road is 108 veh/hr. The right and left turn out from the minor road is split evenly – 50% right and 50% left. Since the plotted point is above the L50%-R50% curve, an offset left-turn pocket is required.

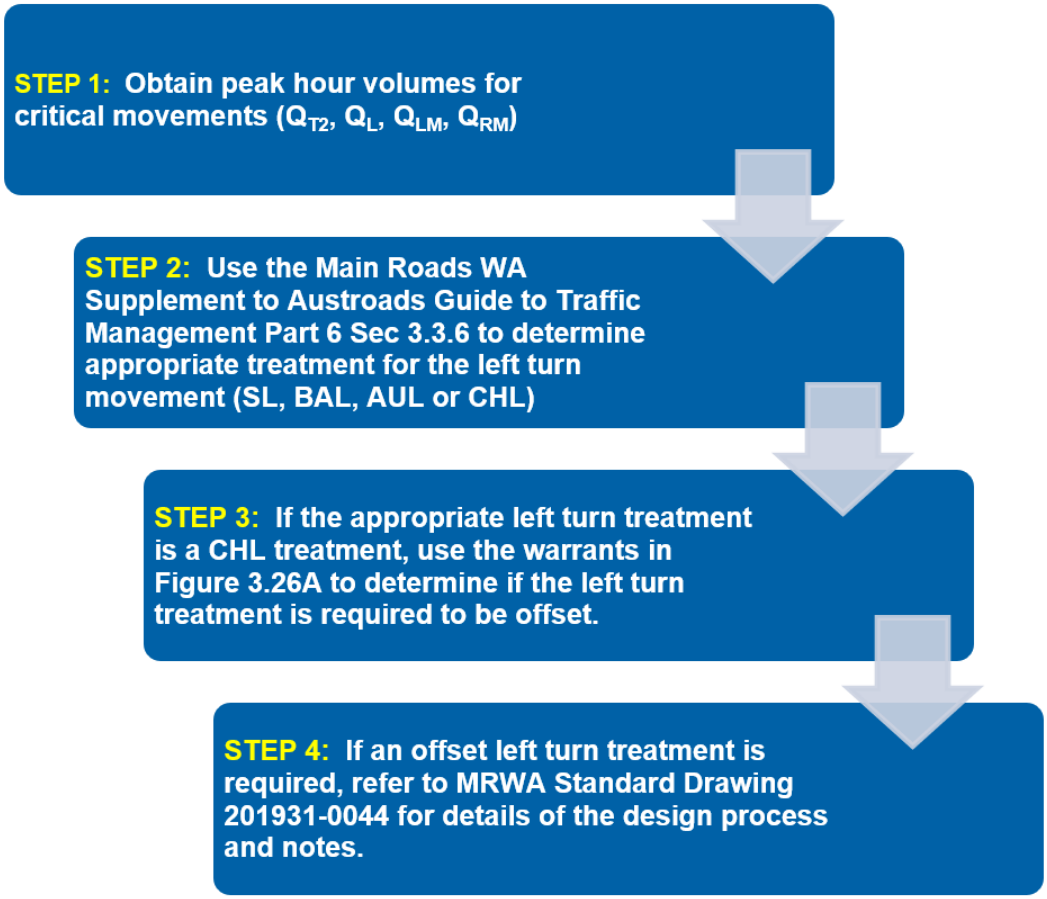
Example 2: The peak hourly traffic volume on the major road is 490 veh/hr. The peak hourly traffic volume on the minor road is 76 veh/hr. 25% of vehicles from the minor road turn left, and 75% turn right. Since the plotted point is below the L25%-R75% curve, an offset left-turn pocket is not warranted.

Figure 3.26A: Warrants for Offset Left Turn Treatments at Rural Intersections



A step-by-step process to determine whether an offset left turn is warranted is shown in Figure 3.26B.

Figure 3.26B: Flow Chart to Determine Offset Left Turn Treatment at Rural Intersections



A spreadsheet using the equation and conditions in the supplementary section 3.3.6, and offset warrants in supplementary section 3.3.6.1 is available from the following link:
MRWA Intersection Warrants Spreadsheet

If the above link doesn't work, please search for "*MRWA Intersection Warrants*" in the Technical Library on the Main Roads website (*www.mainroads.wa.gov.au/technical-commercial/technical-library*).

Note: The spreadsheet has an additional column for road trains. For the purpose of assessing intersection warrants, heavy vehicles that are Austroads Class 10 and above are categorised as road trains, and are considered 2.5 times the length of a standard heavy vehicle. The separate input for road trains provides more appropriate evaluation of intersection requirements in regions where there is a high proportion of larger heavy vehicles or road trains.

Spreadsheet Example 1:

Major Road: Two lane single carriageway with a design speed of 80 km/h
Minor Road: Splitter Island included.

Q_{T1} = 182 (HV 8%, RT 6%)
Q_R = 12 (HV 8%, RT 3%)
Q_{T2} = 750 (HV 9%, RT 6%)
Q_L = 45 (HV 7%, RT 4%)
Q_{LM} = 54 (HV 8%, RT 2%)
Q_{RM} = 54 (HV 7%, RT 3%)

Note: above values are peak hour flows with % heavy vehicles and road trains.

Spreadsheet output:

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	80km/h
SPLITTER ISLAND YES / NO =	Yes
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	182	8	6
Q_R =	12	8	3
Q_{T2} =	750	9	6
Q_L =	45	7	4
Q_{LM} =	54	8	2
Q_{RM} =	54	7	3

RIGHT TURN ASSESSMENT

Q_M =	932
% HV =	14.805
x =	3.50
TREATMENT =	CHR

LEFT TURN ASSESSMENT

Q_M =	750
% HV =	15.00
x =	4.93
TREATMENT =	CHL
OFFSET?	YES

Spreadsheet Example 2:

Major Road: Two lane single carriageway with a design speed of 80 km/h
Minor Road: Splitter Island included.

Q_{T1} = 170 (HV 10%, RT 2%)
Q_R = 22 (HV 10%, RT 0%)
Q_{T2} = 460 (HV 14%, RT 1%)
Q_L = 30 (HV 9%, RT 0%)
Q_{LM} = 19 (HV 10%, RT 0%)
Q_{RM} = 57 (HV 10%, RT 0%)

Note: above values are peak hour flows with % heavy vehicles and road trains.

Spreadsheet output:

INTERSECTION WARRANTS

Main Roads WA Supplement to Austroads Guide to Traffc Management - Part 6, Sec 3.3.6

Version: 2.01

DESIGN SPEED =	80km/h
SPLITTER ISLAND YES / NO =	Yes
DUAL CARRIAGEWAY YES / NO =	No

MOVEMENT	COUNT (v/h)	Std HV (Class 2-9) (%)	Road Trains (Class 10+) (%)
Q_{T1} =	170	10	2
Q_R =	22	10	0
Q_{T2} =	460	14	1
Q_L =	30	9	0
Q_{LM} =	19	10	0
Q_{RM} =	57	10	0

RIGHT TURN ASSESSMENT

Q_M =	630
% HV =	14.190
x =	2.98
TREATMENT =	AUR

LEFT TURN ASSESSMENT

Q_M =	460
% HV =	15.00
x =	2.55
TREATMENT =	AUL
OFFSET?	NO

MRWA Guideline drawings for the different turn treatments are listed under the relevant sections in this supplement (Sections 3.2.2 – 3.2.4).

3.5 Intersection Performance

3.5.1 Safety

Ensuring adequate visibility

For Main Roads' variations to the Austroads Guideline requirements for Approach Sight Distance (ASD), Safe Intersection Sight Distance (SISD) and Minimum Gap Sight Distance (MGSD), refer to Main Roads WA "Supplement to Austroads Guide to Road Design Part 4A".

3.5.4 Road Lighting

For Main Roads variations to Australian Standards and Austroads Guidelines, refer to "Lighting Design Guideline for Roadway and Public Space" and Main Roads WA "Supplement to Austroads Guide to Road Design Part 6B".

4 ROUNDABOUTS

4.1 General

Refer to Main Roads WA "Supplement to Austroads Guide to Road Design Part 4B: Roundabouts" for the preferred practice for the design of roundabouts in Western Australia.

4.4 Road Space Allocation and Lane Management

4.4.2 Cyclists

Main Roads' practice is to provide an off-road bicycle path at multi-lane roundabouts. The preferred practice is to allow for cyclists to exit the roadway prior to entering the roundabout using off-road cycle paths located outside the circulating carriageway as shown in Main Roads WA Guideline drawings 200331-0196 and 200331-0202.

4.5 Functional Design

4.5.4 Entry Curvature and Deflection

Refer to Section 4.5.2 of the Main Roads WA "Supplement to Austroads Guide to Road Design Part 4B: Roundabouts".

4.5.7 Signs and Line Marking

For roundabout pavement marking and signing refer to the following Main Roads WA drawings:

Single Lane Roundabouts	200331-0197
Dual lane Roundabouts – Single lane approach	200331-0198
Dual lane Roundabouts	200331-0202
Single Lane Roundabout – On low speed roads (Posted speed limit < 60 km/h)	200831-0016
Roundabout metering	201031-0171
Roundabouts - Multi combination vehicles	201231-0014
Dual lane Roundabouts – With single lane exits – Spiral Line Marking	201831-0002
Three lane roundabout with double right turn - Spiral line marking	201831-0031

4.5.9 Lighting

For Main Roads variations to Australian Standards and Austroads Guidelines, refer to "Lighting Design Guideline for Roadway and Public Spaces" and Main Roads WA "Supplement to Austroads Guide to Road Design Part 6B".

4.6 Signalised Roundabouts

4.6.1 General

Main Roads WA "Guidelines for the Analysis of Roundabout Metering Signals" have been developed by Main Roads to assess whether an existing roundabout is suitable for the installation of traffic signals on any particular leg (or legs) of a roundabout in order to increase overall capacity.

Main Roads WA "Signalised Roundabouts Guidelines" has been developed to provide guidance on assessing whether existing priority-controlled or metered roundabouts are suitable for conversion to a signalised roundabout.

4.6.2 Metering in Advance of Roundabouts

Refer to Main Roads WA Standard drawing 201131-0048 for more detailed information on the traffic signal layout and Standard drawing 201031-0171 for the signs and pavement markings used at metered roundabouts in Western Australia.

5 SIGNALISED INTERSECTIONS

5.1 Introduction

Main Roads WA "Traffic Signals Approval Policy – Network Operations Directorate" sets out the circumstances under which Main Roads will consider approving the modifications of existing traffic signals and the providing new traffic signals.

5.3 Road Space Allocation

A typical arrangement for a signalised Intersection with double left turn lanes and a right turn acceleration lane on a divided road is given in Main Roads WA Guideline drawing 200431-0065.

Swept path clearances at a signalised intersection with double and single right turn lanes on a divided road are given in Main Roads WA Guideline drawing 200431-0066.

Main Roads WA Standard drawings 200531-0006 and 200531-0007 provide advance stop line details on the approaches to traffic signals.

5.6 Signs and Road Markings

Main Roads may install U-turn permitted signs on an approach to intersection traffic control signals where U-turning will not compromise safety or interfere with the efficiency of the traffic signal operations in accordance with the Main Roads WA "Policy and Application for U-turn Permitted Signs at Traffic Signal Controlled Intersections".

Advance signs with flashing signals and the message "Prepare To Stop" may be used to warn motorists that they will be required to stop at a signalised intersection. The appropriate locations and types of signs are described in Main Roads WA "Policy, Application, and Technical Guidelines for Warning Flashing Signals".

5.7 Road Lighting

For Main Roads variations to Australian Standards and Austroads Guidelines, refer to "Lighting Design Guideline for Roadway and Public Space" and Main Roads WA "Supplement to Austroads Guide to Road Design Part 6B".

6 UNSIGNALISED INTERSECTIONS

6.2 Traffic Controls

6.2.2 Stop Signs and Give Way Signs

Further information on the application of Stop and Give Way controls is described in the Main Roads document "Keep left, Keep right, Stop, Give Way and Divisional Marker Signs in WA".

7 ROAD INTERCHANGES

7.3 Route Considerations

7.3.1 Spacing of Interchanges

For closely spaced interchanges on urban freeways, the distance between consecutive decision-making points (eg. merge from two lanes to one after an intersection, lane changes after an intersection, a merge followed by a diverge) is to be at least equivalent to 4 seconds of travel time at the respective design speed. Refer to Main Roads WA "Supplement to Austroads Guide to Road Design Part 4C".

7.4 Road Space Allocation and Lane Management

7.4.4 Pedestrians and Cyclists

Pedestrians and cyclists are prohibited from travelling along freeways in Western Australia.
The Department of Transport and Major Infrastructure "Cycling Infrastructure Policy" requires a Principal Shared Path to be provided adjacent to one side of a freeway and allowance made in land and structural designs for the future installation of a shared path along the other side of a freeway. At interchanges, Main Roads will provide grade separation for Principal Shared Paths.

7.6 Ramp Layouts

7.6.4 Access Control

On freeways and major roads planned to be upgraded to a freeway standard, control of access shall be enforced over the full length of the road including the interchange ramps. Special cases for direct access may exist to accommodate Freeway Service Centres, public transport facilities, enforcement sites or in extenuating circumstances where alternative access is unavailable. Refer to Main Roads WA "Supplement to Austroads Guide to Road Design Part 4C".

7.9 Ramp Metering

In Western Australia Managed Motorways are identified as Smart Freeways and reference should be made to Main Roads WA "Smart Freeways Policy & Guidelines Overview". Guidance on ramp storage requirements, number of lanes at the stop line and the ramp merge treatments can be found in Main Roads WA "Supplement to Victoria's Managed Motorway Design Guide, Volume 2: Design Practice, Parts 2 and 3".

8 RAIL CROSSINGS

Main Roads WA "Railway Crossing Control in Western Australia Policy and Guidelines" provides direction and guidance on the management, design and operation of railway crossings in Western Australia.

9 PEDESTRIAN AND CYCLIST CROSSINGS

9.1 Introduction

The criteria for different types of parallel pedestrian crossings and exclusive pedestrian phase crossings at signalised crossings are outlined in Main Roads WA guidelines for "Pedestrian Crossing Facilities at Traffic Control Signals". These guidelines also provide guidance for appropriate crossing treatments for left turn slip lanes at signalised intersections based on the pedestrian usage and traffic volumes.

Main Roads WA "Application and Technical Guidelines for Pedestrian Crossing Facilities" provides guidance on selecting the most suitable pedestrian crossing facilities for safer, accessible and convenient pedestrian movements for locations that are not under traffic signal control.

Main Roads WA "Cycling Infrastructure Policy" makes the following references to crossings used by pedestrians and cyclists:

- Grade separation of freeway interchanges will incorporate grade separated crossing facilities for pedestrians and cyclists.
- Where required to prohibit vehicular traffic, bollards should be placed on local access paths and not on the through path. Bollard design details and pavement markings are shown in Main Roads Standard drawing 200531-0008.
- Grab rails will only be installed on shared paths near road crossings that are frequently used by aged or disabled pedestrians and alongside median openings. Where installed, grab rails are to be fabricated and positioned in accordance with Main Roads Standard drawing 9831-5649.

Pedestrian kerb ramps at intersections are to be designed as shown in Main Roads WA Standard drawing 9831-5649 and have an absolute maximum grade of 1:10. Positions of Tactile Ground Surface Indicators on ramps and cut throughs are shown in Main Roads WA Standard drawings 200931-0089, 200931-0090 and 200931-0091.

9.2 Mid-block Crossings

Pedestrian zebra crossing details are shown in Main Roads WA Standard drawing 200331-0164. Puffin and Pelican crossing details are shown in Main Roads Guideline drawing 200431-0116.

The Main Roads WA document "Traffic Warden Controlled Children's Crossing" contains variations and additions to AS 1742.10 Clause 7.2 and Figures 3 and 4. The layout for a children's crossing with static signs is shown in Main Roads WA Standard drawing 9120-0174 and with advance warning flashing signals in Standard drawing 9531-2169.

9.3 Bicycle Treatments at Intersections

Cyclist advance stop cycling facilities are detailed on Main Roads WA Standard drawings 200531-0006 and 200531-0007.

APPENDIX A SIGNALISED INTERSECTION GUIDANCE

Main Roads has no supplementary comments for this section.

APPENDIX B SAFE SYSTEM ASSESSMENT FRAMEWORK SUMMARY

The Safe Systems Assessment Framework is a methodology that may be applied within the Road Safety Management (ROSMA) process.

COMMENTARY 1 – 26

Main Roads has no supplementary comments for these sections.