Supplement to Austroads Guide to Road Design Part 3

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Supersedes version: 2.1

Geometric Design (2016)
Version 2.2

Austroads has released the Guide to Road Design, Part 3: Geometric Design and all road agencies across Australasia have agreed to adopt the Austroads guides to provide a level of consistency and harmonisation across all jurisdictions. This agreement means that the new Austroads guides and the Australian Standards, which are referenced in them, will become the primary technical references for use within Roads and Maritime Services.

This supplement is issued to clarify, add to, or modify the Austroads Guide to Road Design, Part 3: Geometric Design.

Roads and Maritime accepts the principles in the Austroads Guide to Road Design, Part 3: Geometric Design with variations documented in this supplement under the following categories:

- Roads and Maritime enhanced practice: Roads and Maritime practice that enhances the Austroads Guides
- Roads and Maritime complementary material: Roads and Maritime reference material that complements the Austroads Guides. These documents include Roads and Maritime manuals, technical directions and/or other reference material and are to be read in conjunction with the Austroads Guides
- Roads and Maritime departures: Roads and Maritime practice that departs from the Austroads Guides.

Document information

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Document history

Version	Date	Reason for amendment	Page No.	Editor
2.2	31/08/2017	Added general traffic lane bus stop information Added rural bus stop figure Removed reference to “V” in curve widening formula.	3 4 5	Road Policy, Specifications and Technology
2.1	07/04/2017	Update to align with current Austroads Guide to Road Design Part 3, released September 2016.	All	Road Policy, Specifications and Technology
2.0	12/08/2015	Major amendment in formatting and reduced content to align with current Austroads Guide to Road Design Part 3.	All	Road Policy, Specifications and Technology
1.0	17/03/2011	First issue.	All	Technology Standards (Road)

The use of design parameters outside of Normal Design Domain requires approval from a representative authorised by the Director Road Design.

Roads and Maritime: complementary material

The following documents provide additional detail of Roads and Maritime best practice. It is necessary to comply with complementary material.

- NSW Bicycle Guidelines
- Roads and Maritime Supplements to Austroads Guides
- Roads and Maritime Australian Standards Traffic Supplements
- Roads and Maritime Traffic Signal Design Guide
- Roads and Maritime Delineation Manual
- Roads and Maritime Standard Drawings
- Roads and Maritime Technical Directions.

The documents are published and can be found on the Roads and Maritime website.

Roads and Maritime: enhanced practice and departures

4 Cross-section

4.6.4 Kerb and channel

Refer to Roads and Maritime standard drawings for kerb profiles used in NSW.

4.7.1 Median width

In addition to the values shown in Table 4.15: Urban median widths, Roads and Maritime accept the following:

Median function	Minimum width (m)
Shelter a pedestrian fence	1.2m

4.8.1 Bicycle lanes – wide kerbside lanes

Roads and Maritime practice is not to use widened lanes for joint use of bicycles and traffic. Designs must take into account Roads and Maritime's regional cycleway network plan.

4.9.2 Bus lanes

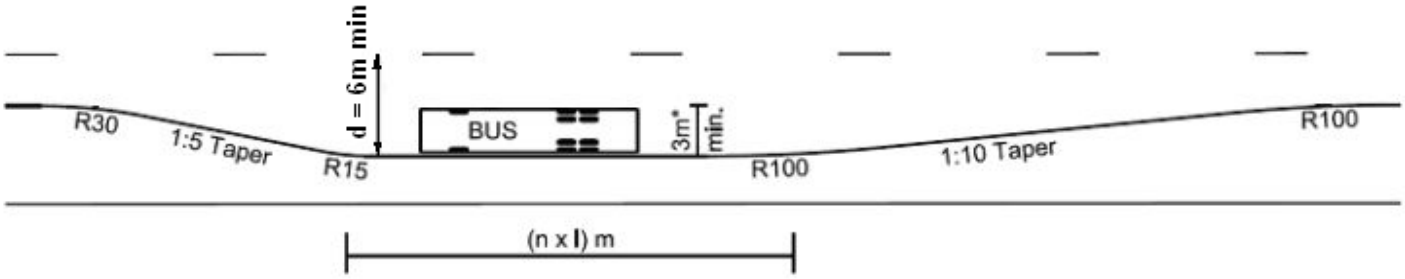
Roads and Maritime practice is to adopt 3.5 metres wide bus lanes for design speeds less than 80 kilometres per hour and 4.0 metres wide bus lanes for design speeds equal to or greater than 80 kilometres per hour.

4.12.2 Bus stops - urban

Where bus stops are located in the general traffic lane, consideration must be given to the adverse effect on traffic.

4.12.3 Bus stops - rural

The approved layout for rural indented bus bays is shown below:



*** Width (including clearances) may need to be increased where large/wide buses are involved**
n = number of buses using stop simultaneously
l = length of bus (including clearances if desired)
d = either centreline of road, designated centreline or first lane line

5 Sight distance

5.2.2 Driver reaction time

Roads and Maritime practice is to use the following driver reaction times:

Table 5.2: Driver reaction times

Reaction Time (s)	Design Speed (km/h)
2.5	≥ 110
2.0	100
1.5	≤ 90

Note: Higher reaction times should be considered where local conditions warrant.

5.2.3 Longitudinal deceleration

Roads and Maritime uses a coefficient of deceleration of 0.36 for cars on sealed roads.

The tabled value of coefficient of deceleration for buses ensures passenger comfort when decelerating on the approach to a bus stop. This should be considered when designing bus specific facilities.

5.3.2 Truck stopping sight distance

Roads and Maritime does not use truck stopping sight distance as a normal design parameter. Truck stopping sight distance should be checked in approach to truck related facilities (such as inspection bays and weigh bridges), assuming the car / truck speed relationship shown in Table 3.5.

7 Horizontal alignment

7.5.1 Compound curves

In Roads and Maritime practice the desirable ratio of the larger radius to the smaller radius should not exceed 1:0.75. However, in low speed designs, where compound curves with radii less than 1000m are unavoidable, the larger radius to the smaller should not exceed 1:0.5. For high speed design, the design speed criteria and not curve ratios should be satisfied.

7.6 Side friction and minimum curve size

Roads and Maritime uses the desirable maximum values of side friction for cars as the normal design parameter for side friction.

7.8 Curves with adverse crossfall

Roads and Maritime does not use the values shown in Table 7.12: Minimum radii with adverse crossfall for existing urban roads.

7.9 Pavement widening on horizontal curves

Roads and Maritime accepts the application of independently widening lanes or widening evenly across all lanes. Existing and/or proposed traffic composition and lane usage should be considered.

8 Vertical alignment

8.6.7 Minimum length of vertical curves

Roads and Maritime does not use the values shown in Table 8.11: Minimum length vertical curves for reconstruction.

A Extended design domain (EDD) for geometric road design

A.5 Pavement widening

Where normal design domain values for lane widening on curves cannot be achieved, lane widening can be calculated using the following formula. The need for lane widening ceases when widening per lane is less than 0.2 metres.

$$W = \left(\sqrt{R^2 + A(2L + A)} - \sqrt{R^2 - \sum \mathrm{Li}^2}\right) \mathrm{x} \left(1 - e^{\frac{-0.015 \mathrm{x}\, D \mathrm{x}\, R}{\sqrt{\sum \mathrm{Li}^2}}}\right) + W_V + C_l$$

Where:

Design vehicle	∑Li²	L	A	Wv
Passenger vehicle (5.2m)	9.3025	3.05	0.95	1.94
Service vehicle (8.8m)	25	5	1.5	2.5
Single unit truck / bus (12.5m)	46.9225	6.85	2.2	2.5
Long rigid bus (14.5m)	70.56	8.4	2.6	2.5
Articulated bus (19m)	61.21	5.5	2.6	2.5
Prime move and semi-trailer (19m)	118.3	5.3	1.6	2.5
Prime move and semi-trailer (25m)	222.21	5.4	1.6	3.0
B-double (25m)	169.81	4	1	2.5
B-double (26m)	168.775	4.5	1.4	2.5
A double (Type I) (36.2m)	228.9	5.5	1.6	2.5
B triple (35.4m)	245.99	5	1.5	2.5
A triple	333.29	6	1.7	2.5

Note: The design vehicles listed in the table are those listed in Austroads Design Vehicles and Turning Path Templates (2013)

W = Widened lane width (m)

Wv = Width of vehicle

R = Radius (m)

e = Exponential mathematical constant “e”

D = Degree of curvature (degrees)

C_l = Lateral clearance (m)

L = Wheelbase of single unit or prime mover (m)

A = Front overhang of inner lane vehicle (m)

Lateral clearance

Lane width (m)	C_l (m)
3.0	0.6
3.2	0.7
3.5	0.8
3.7+	0.9

Sealed shoulders

When adjacent to sealed shoulders, the lateral clearance to an edge line (on the inside of a curve) may be reduced to zero as long as the minimum lateral clearance is available in the sealed shoulder width and the shoulder is not used for parking or on-road cyclists.