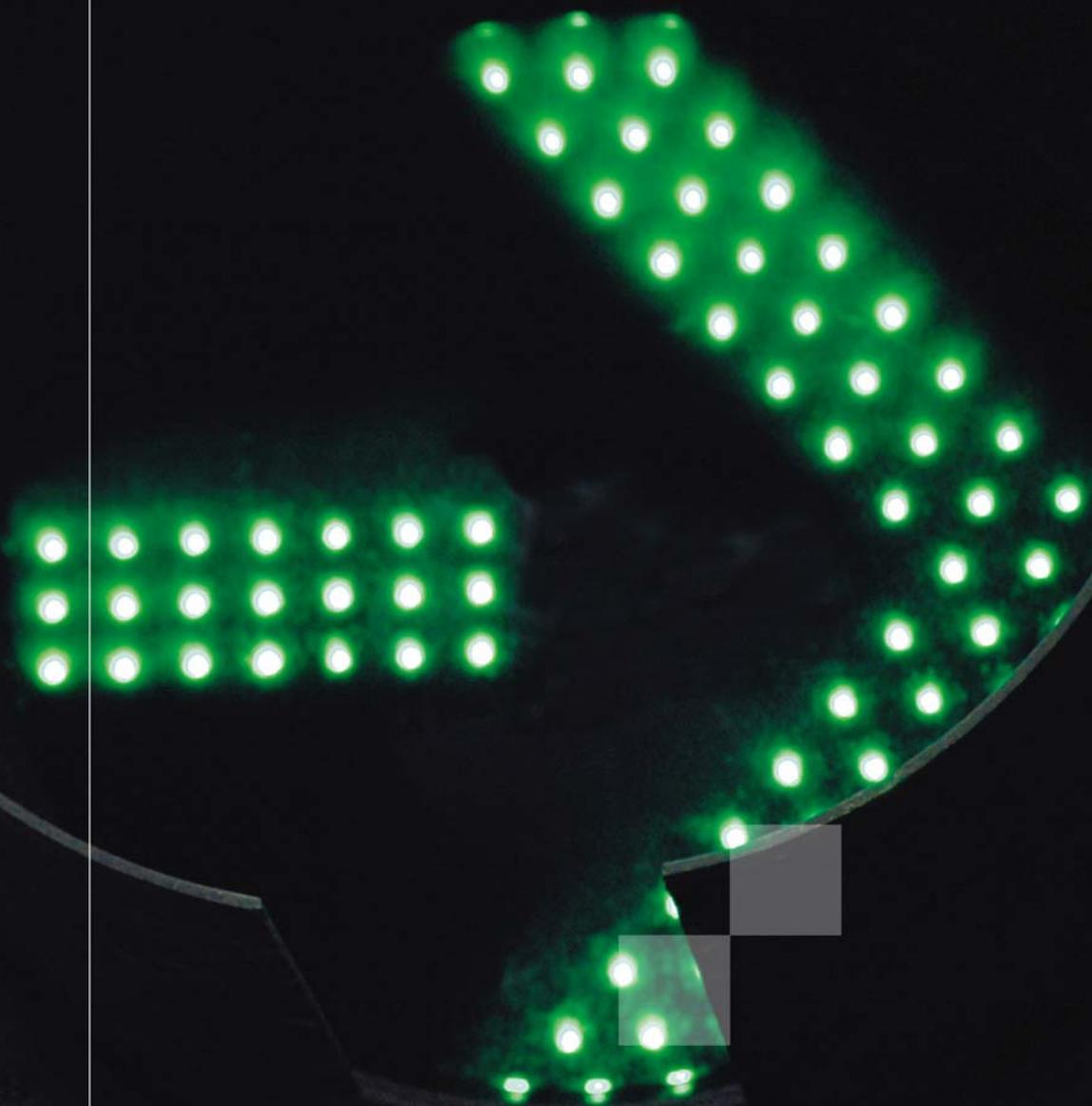


Traffic signal design

Section 6 - Pavement Marking



The traffic signal design guidelines have been developed to assist in designing traffic control signals.

The guidelines are to comprise 16 sections and 5 appendices. These are initially being released individually and in no specific order. The sections which are to be released are as follows:

Part	Title
Section 1	Investigation
Section 2	Warrants
Section 3	Design Process
Section 4	Plan Requirements
Section 5	Geometry
Section 6	Pavement Marking
Section 7	Phasing and Signal Group Display Sequence
Section 8	Lanterns
Section 9	Posts
Section 10	Signs
Section 11	Detectors
Section 12	Controller
Section 13	Provision for Future Facilities
Section 14	Signalised Mid-block Marked Footcrossings
Section 15	Special Situations
Section 16	References
Appendix A	Design Plan Checklist
Appendix B	Traffic Signal Symbols
Appendix C	Location and Function of Lanterns
Appendix D	Location and Dimensions of Components
Appendix E	Left Turn on Red
Appendix F	Level Crossing Interface – Concept of Operations
Appendix G	Level Crossing Interface – Traffic Signal Design Guidance

To determine which sections are currently available go to:

www.rta.nsw.gov.au/doingbusinesswithus/downloads/technicalmanuals/trafficsignaldesign_dll.html

The information contained in the various parts is intended to be used as a guide to good practice. Discretion and judgement should be exercised in the light of the many factors that may influence the design of traffic signals at any particular site. The guidelines make reference, where relevant, to current Australian Standards and are intended to supplement and otherwise assist in their interpretation and application.

Traffic Signal Design

Section 6

PAVEMENT MARKING

Special Note:

As of 17 January 2011, the RTA is adopting the Austroads Guides (Guide to Traffic Management) and Australian Standards (AS 1742, 1743 & 2890) as its primary technical references.

An RTA Supplement has been developed for each Part of the Guide to Traffic Management and relevant Australian Standard. The Supplements document any **mandatory** RTA practice and any complementary guidelines which need to be considered.

The RTA Supplements **must** be referred to prior to using any reference material.

This RTA document is a complementary guideline. Therefore if any conflict arises, the RTA Supplements, the Austroads Guides and the Australian Standards are to prevail.

The RTA Supplements are located on the RTA website at www.rta.nsw.gov.au





Roads and Traffic Authority

www.rta.nsw.gov.au

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Amendment record

Please note that the following updates have been made to this document.

Amendment No	Page	Description	Issued	Approved By
1	6-3	Amended distance for first pavement arrow	June 2010	R O'Keefe Mgr Traffic Policies, Guidelines & Legislation

6.1 INTRODUCTION

This section discusses some of the pavement marking requirements specific to signalised intersections. This is not a replacement for relevant RTA guidelines, but merely supplements them. The following sub-sections should be read in conjunction with Appendix D [Location & Dimension of Components](#).

For further details about pavement markings refer to the RTA document [Delineation](#).

6.2 STOP-LINES

Stop-lines should be located:

- so as to minimise intergreen times and clearance times.
- no less than 5.4 m from the prolongation of the kerb line of the cross street. This distance is measured from the prolongation of the kerb line of the cross street to the front edge of the stop line and will allow the immediate installation of a marked foot crossing, or an installation in the future. If it is known that there is very little likelihood of a marked foot crossing ever being installed, this distance may be reduced to 3 m, with the concurrence of the Manager Network Operations, Transport Management Centre.
- clear of the swept path of vehicles (especially articulated vehicles) turning from other approaches. In this situation a set-back of the stop line of up to 10 m from the prolongation of the kerb line of the cross street is acceptable. Any distance greater than 10 m must be approved by the Manager Network Operations, Transport Management Centre.
- 1.2 m from parallel marked foot crossing lines at intersections (measured from the outside edge of the marked foot crossing line to the front edge of the stop-line).
- 6.0 m from signalised mid-block marked foot crossings (measured from the outside edge of the marked foot crossing line to the front edge of the stop-line)
- at a desirable minimum of 10 m (absolute minimum 6 m) in advance of the starting lantern for that approach
- at a maximum skew of 70 degrees to the direction of travel

The standard width of a stop-line is 300 mm. This width does not need to be shown on the design layout. However, if the approach speed is 80 km/h or more, the width of the stop-line should be increased to 600 mm and the dimension shown on the design layout.

6.3 MARKED FOOT CROSSINGS

Marked foot crossings should be located:

- as near as possible to the desire line of pedestrians.
- as near as possible and no greater than 20 degrees to the shortest path across the carriageway to minimise clearance times. Pedestrian clearance times are based on an average walking speed of 1.2 m/s. This may be decreased to 0.8 m/s if it is a site frequently used by "slow walkers" such as the elderly or people with disabilities.
- a minimum of 0.6 m clear of parallel vehicle movements, measured back from the prolongation of the kerb line.

The standard width of a marked foot crossing at an intersection is 3.6 m, measured to the outside edge of the dashed paint lines. This dimension does not need to be shown on the

design layout. However, where large flows of pedestrians use the crossing (more than two ranks per cycle in either direction during peak periods) or large numbers of pedestrians arrive in platoons (e.g. near railway stations or schools), wider crossings may be used. Wider crossings should be 4.5 m, 6 m or 10 m and the width shown on the design layout.

The standard width of the paint lines which define the marked foot crossing is 150 mm. The lines are comprised of dashed segments, 1.0 m long with 300 mm gaps. The 150 mm width does not need to be shown on the design layout.

Where two marked foot crossings meet, the intersection point should be at the lip line or, if there is no lip line, 0.5 m from the kerb. This is to minimise conflicts by pedestrians in separate phases, to deter pedestrians from waiting on the road pavement, and to allow minimum construction of the kerb ramps without unusual footpath and/or kerb shapes. Refer to Appendix D [Location & Dimension of Components](#).

6.4 SCRAMBLE CROSSINGS

Pavement markings are shown in Figure 10.8 in [Signs](#). Note that the inside marked foot crossing line is not marked on the pavement. (see Section 2.6 in [Warrants](#), Section 7.9.2 in [Phasing & Signal Group Display Sequence](#) and Section 10.6 in [Signs](#)).

6.5 LANE LINES (TYPE L1 OR L2)

Lane lines should be provided where possible for at least 51 m on the approach and 27 m on the departure side of a signalised intersection. Lane lines consist of 3 m of paint separated by a 9 m gap. Hence the length of lane lines is always $(12 \times n) - 9$, where n is the number of paint lines. The lengths should be shown for each set of lane lines, e.g. "L1 51 m long" or "L1 continuous".

Departure lane lines are not needed in the stem of a T-junction unless more than one stream of traffic turns into the stem simultaneously or the need for marked lanes is continuous.

Lane widths should conform to Sections 3 and 4 of the *Road Design Guide*.

6.6 DOUBLE BARRIER LINES (TYPE BB)

Where there is no median, a minimum of 48 m of barrier lines should be provided in approach to the stop line. In narrow streets, this length may be impractical due to the restrictive effect on vehicles needing to park on the departure side. In such cases, a minimum of 24 m may be provided. Where medians are used (the minimum length is 10 m), a minimum of 30 m of double barrier lines should be provided in approach to the median. The lengths should be shown for each set of double barrier lines, e.g. BB 48 m long.

6.7 TURN LINES (TYPE T1)

Turn lines may be used to provide delineation for traffic in the following situations:

- guide two or more streams of traffic which turn simultaneously in the same direction

- provide guidance through intersections with unusual geometry, skewed approaches or lanes not aligned across the intersection

The turn line need not necessarily continue until it reaches the departure lanes, especially if there is a danger of confusing other traffic movements.

6.8 PAVEMENT ARROWS

Pavement arrows should be used:

- in auxiliary lanes (left or right turns) to avoid inadvertent use by through vehicles
- to allow movements that would not otherwise be allowed under traffic regulations (e.g. a three-lane approach in the stem of a T-junction would need pavement arrows to permit the centre-lane vehicles to turn left or right, or left and right)
- to prohibit movements that would otherwise be allowed under traffic regulations (e.g. using right-turn pavement arrows to prohibit through movements from an exclusive right-turn lane or right turn bay)
- to indicate the through movement when necessary
- to indicate a one-way street.

Pavement arrows should not be used to reinforce lane usage which is regulated by traffic regulations (e.g. using left-turn pavement arrows in the kerbside lane of a two-lane approach at the stem of a T-junction). If motorists are breaking the law relating to lane usage, it may indicate that the existing lane distribution is inappropriate and needs to be changed.

Where geometry permits, the **start** of the first pavement arrow should be placed 6 m from the stop line. Then additional pavement arrows should be spaced 20 m apart, measured from the tail of the first arrow to the tip of the following arrow, and so on. The resultant effect will be that the pavement arrows will be placed approximately adjacent to the centre of alternate gaps in the lane lines.

Where turn bays are provided, a minimum of two turn arrows should be provided to reserve these bays for exclusive use by turning vehicles, thus legally preventing queue jumping or overtaking manoeuvres.

Where pavement arrows are used to prohibit through movements in a continuous lane, a minimum of four arrows per lane should be used in each approach. The use of complementary regulatory signs such as LEFT LANE MUST TURN LEFT R2-9 will be necessary where the approach lanes lead directly into exclusive turn lanes.

6.9 BUS ONLY LANES

On approach to a signalised intersection with white B aspects, the bus lane must be marked as Bus Only. The Bus Only pavement markings are placed at approximately 50 m spacing. Letter heights are to be 2.5 m high with a 2.5 m space between “BUS” and “ONLY”. The first “BUS ONLY” marking is placed at the start of the Bus Only section and the last “BUS ONLY” marking no closer than 15 m in approach to the stop line. The lane lines defining the Bus Only lane should be L6 lines (80 mm wide, 35 m long with a 1 m gap).

In circumstances where an access driveway to property is located near a signalised intersection and the frontage lane on approach is a Bus Only lane, it will be necessary to either provide a

break in the Bus Only lane or commence the Bus Only lane after the driveway. This is to allow legal entry or exit to the property.

Pavement arrows may be necessary in approach lanes to make some of the other vehicle movements legal. For example, left turn vehicles in the lane immediately right of the Bus Only lane require left turn/through arrow markings to legally turn left across the Bus Only lane (see Section 8.12 in [Lanterns](#)).

6.10 TRANSITWAYS (T-WAYS)

A Transitway (in some jurisdictions called a Bus Way) is a dedicated roadway for buses and is operationally the same as a Bus Only lane, except that access is restricted to authorised vehicles only.

The T-Way marking and T-Way logo is placed at the initial point of entry at each intersection. Letter heights are to be 2.0 m for “T-WAY” and 2.4 m for the T-Way logo, with a 2.4 m space between “T-WAY” and the T-Way logo. The “T-WAY” pavement marking should be positioned 2.0 m into the Transitway, measured from the prolongation of the stop line, or in a suitable location clearly visible to drivers entering the Transitway (see Section 8.12 in [Lanterns](#)).

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