Darwin Shared Path & Bicycle Lane Technical Notes

9. Line marking and surface treatments

Objective

The objective of the *Darwin Shared Path & Bicycle Lane Technical Notes* is to provide direction and guidance for the planning and delivery of cycling facilities within the City of Darwin area. These technical notes are also intended to provide information for other stakeholders including the NT Government, cycling groups and the community.

References

Throughout this document, references have been made to the following technical standards and guidelines:

- AS 1742.9-2000 *Manual of Uniform Traffic Devices Part 9: Bicycle Facilities*
- Austroads *Guide to Traffic Engineering Practice Part 14: Bicycles (1999)*
- Austroads *Guide To Traffic Management Part 10: Traffic Control and Communication Devices* (2009)
- Department of Transport WA *Shared Path Design – Technical Guidelines* (Draft 2016)
- Road and Traffic Authority *NSW Bicycle Guidelines* (2005)

The technical note should be read in conjunction to these documents.

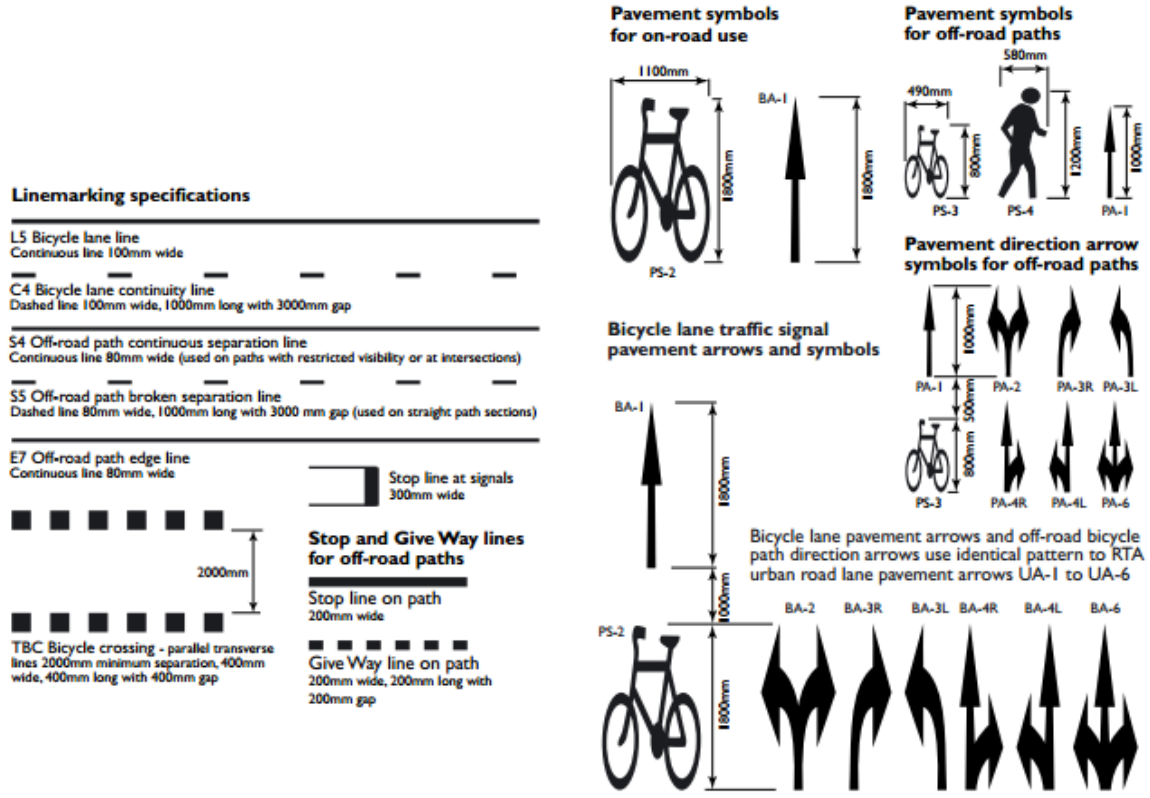
Introduction

This technical note provides direction and guidance on line marking and surface colour treatment of bicycle paths. The information is compiled from multiple sources detailing good design practices adopted throughout Australia.

Line marking and surface treatments help delineate cycling or shared paths and provide good route coherence and passive wayfinding. Clear demarcation of cycling lanes also improves safety for cyclists.

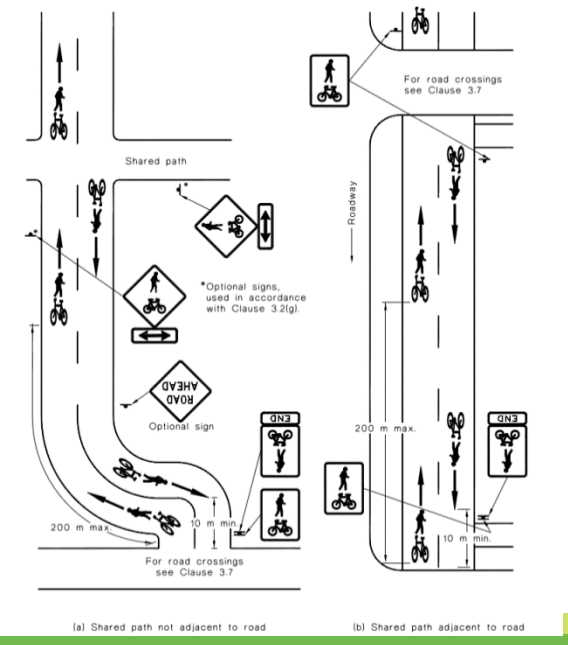
Line marking

The figure below provides an example of the types of line marking and pavement symbols for bicycle paths. These bicycle lane markings should be designed and installed to AS 1742.9 specifications where applicable.



SOURCE: RTA NSW BICYCLE GUIDELINES

AS1742.9 recommends the following line marking treatment for shared path adjacent and not adjacent to the road.



SOURCE: AS1742.9 MANUAL OF UNIFORM TRAFFIC DEVICES PART 9: BICYCLE FACILITIES

RTA *NSW Bicycle Guidelines* recommends that off-road shared paths should have centre line marking to provide separation between two-way flows and encourage safe operation of the shared path. As a general rule, all shared paths should have centre line marking to clearly delineate the purpose of the path and assist with passive wayfinding.

Centre linemarking tends to improve safety for all path users by encouraging pedestrians to keep left and providing clear demarcation of opposing traffic flows. As a result, cyclist speeds can increase compared to paths without centre linemarking which may decrease safety in some locations.

In some circumstances centre linemarking can be omitted, for example:

- In low-speed 'mixing zones' where there are high volumes of pedestrians and cyclists are encouraged to travel at very low speeds (these area also need other delineation measures, such as a change in surface type or colour, warning signage, and/or pavement stencils that indicate the low speed environment).
- On low-speed recreational paths which have heavy pedestrian usage, and are designed more for families and children on bicycles rather than commuter cyclists. In these locations it is critical to have a safe and attractive alternative route for commuter cyclists to minimise conflicts between slower and faster path users.
- Long sections of generally straight path without intersections or crossings, where usage is low (<50 bicycles or pedestrians per hour).
- On paths narrower than 3.0m wide, pending an upgrade to meet shared path width requirements.
- On paths that experience high levels of "tidal flow", for example, a shared path going to a school where everyone approaches in one direction in the morning and departs in the after in the afternoon.

The use of unbroken centrelines on paths should be restricted to those path sections where it is essential that overtaking of other path users be discouraged (e.g. approaching a horizontal or vertical curve with significantly reduced sight distance, or within approximately 30m of a path or road intersection). Where unbroken centrelines are provided through horizontal curves, the path designer shall ensure that a bicycle can actually be ridden through the curve without crossing the centreline – this is particularly important where paths have small radius curves on the approach to road crossings or intersections.

Austroads *Guide to Traffic Management Part 10: Traffic Control and Communication Devices* suggests that white colour is used for the majority of Australian road marking unless otherwise specified. It also recommends that for light-coloured pavement, white markings on black background may be used to improve contrast.

Surface treatments for Off-Road Paths

Coloured surfaces provide differentiation and wayfinding for path users. The following provides some general guidance for the use of colouration, consistent with guidance in Austroads *Guide to Traffic Management Part 10: Traffic Control and Communication Devices.*

Where a concrete path forms part of the cycling network, it may be distinguishable by cyclists only by stencils and linemarking. As most footpaths are concrete, the linemarking acts as a passive wayfinding tool and allows path users to easily recognise the continuation of the primary route. The use of colour to reinforce shared path status can be of value when combined with these other forms of differentiation. However, the use of coloured concrete is inconsistent throughout Australia and does not inherently define a shared path.

The colour of linemarking should be in good contrast to the path surface. For black asphalt paths, white is the preferred colour for linemarking as it provide sufficient contrast. For concrete path with light grey surface, white linemarking does not provide sufficient contrast. White markings on black background may be used to improve contrast and shown in example below.

Surface Treatments for On-Road Bike Facility

Surface treatments are meant to be an advisory treatment and should only be applied in situations where it is required. Typical situations where surface treatments are generally used include:

- On the approach or departure to a busy or complex intersection or one with uncommon layout alignment features.
- Where large numbers of vehicles change lanes or turn across a bicycle lane
- Where a bicycle lane crosses a free flowing merge or diverge lane
- For a bicycle lane adjacent to a bus lane, busy loading zone or high turnover kerbside parking lane
- For contraflow bicycle lane
- At other locations where drivers may not expect to encounter cyclists
- To discourage driver encroachment into a bicycle lane near an intersection or within a bicycle storage box or hook turn space.

The treatments are intended to:

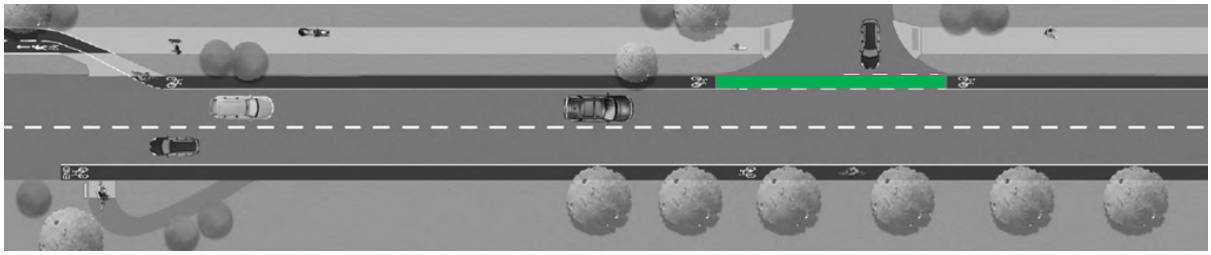
- Highlight the presence for conflict between bicycles and other vehicles; and
- Improve the visibility of bicycle operating space where an intersection or road environment is busy or complex.

Green is the standard colour used for cycling lanes throughout Australian cities though red is also used, primarily for off road shared paths. Where a green surface colour is used, composition and shade should be consistent with Australian Standards *AS2700 Emerald Green G13*. It is noted that the City of Darwin does not use coloured surface for their on-road bicycle lane however the green colour may be used at conflict points (e.g. intersections).

Painted coatings should be chosen such that they do not create an additional hazard. This may involve the addition of non-skid elements, with a corresponding maintenance requirement for replacement. The coating should consist of a long-life material with a skid resistance factor similar to the surface.

Surface treatments should not be used when its use, in conjunction with linemarking and/or pavement symbols, is liable to misrepresent the facility or its legal use, i.e. where the mixture of colour, lines and pavement symbols creates a hybrid facility which looks like it has priority when it legally does not.

The figure below is an example of cycling lane surface treatments.



SOURCE: DEPARTMENT OF TRANSPORT WA SHARED PATH DESIGN – TECHNICAL GUIDELINES (2016 DRAFT)