Cycling Infrastructure Adjacent to Bus and Tram Stops

RDN 06-17
Version 1.0

Purpose:	The purpose of this document is to provide guidance on the design of cycling infrastructure adjacent to bus and tram stops with a focus on managing potential pedestrian and cyclist conflict using appropriate traffic control devices.
Applicability	This document applies to practitioners involved in the design of cycling infrastructure adjacent to bus and tram stops.
Document context:	This document should be read in conjunction with *Movement and Place in Victoria* and other associated documentation, *Austroads Guide to Road Design (AGRD) Part 6A – Paths for Walking and Cycling*, *Australian Standards AS 1742.9 Bicycle Facilities*, relevant disability standards (such as Australian Standard AS 1428 series and *Disability Standards for Accessible Public Transport* (DSAPT)) and any Department of Transport and Planning (DTP) supplementary information to these documents.

1 Introduction

As the world shifts towards more sustainable transport options, cycling is becoming increasingly popular, and cities are working to create improved cycling infrastructure. However, managing interactions between cyclists and other transport users remains a challenge, especially in areas with high pedestrian and public transport activity. Good design of spaces where cycling facilities are adjacent to bus and tram stops is an important part of providing an overall safe and comfortable environment for all transport users.

This Road Design Note (RDN) provides guidance on the design of cycling infrastructure adjacent to bus and tram stops, with a focus on managing potential pedestrian and cyclist conflict using appropriate traffic control devices. Practitioners are expected to use this RDN and apply engineering judgment in designing facilities based on the Movement and Place categorisation of the road space, an understanding of the needs and behaviours of transport users, infrastructure demand and the Safe System.

This guidance emphasises that synergy between cyclists and pedestrians or public transport users can be achieved by creating consistently recognisable treatments that allow each transport user group to know how to proceed in areas where conflict may be encountered. The likelihood of conflict can be reduced by providing adequate warning, time, space and visibility for users to make decisions and act, as well as managing the consequences of potential crashes by reducing speeds.

2 Legal Considerations

Practitioners should be aware of relevant legislation when designing cycling infrastructure adjacent to bus and tram stops, particularly the Road Safety Road Rules 2017 (referred to here as the Road Rules) that regulate pedestrian and cyclist movements on footpaths, bicycle paths, and shared paths.

The following Road Rules are considered particularly relevant:

For shared paths and footpaths
"The rider of a bicycle on a footpath or a shared path must give way to any pedestrian… on the footpath or shared path" (RR 250(2)(b)).

For bicycle paths and separated footpaths
"A pedestrian who is crossing a bicycle path, or a part of a separated footpath designated for the use of bicycles and electric scooters, must keep out of the path of any bicycle or electric scooter…" (RR 239(3)).

It should also be noted that the implementation of pedestrian crossings across bicycle paths (as shown in some of the examples provided in Section 5) is a relatively new practice in Victoria. Though preliminary legal advice (based on hypothetical scenarios) suggests that pedestrian crossings across bicycle paths *are* recognised under the road rules, it is recommended that further legal advice be sought before implementing such treatments on projects that differ considerably from the examples provided.

3 Design Considerations

The type of cycling infrastructure provided adjacent to bus and tram stops should be influenced by the strategic intent of the corridor, users and their needs and infrastructure demand. It is acknowledged that, at times, the type of bicycle facility provided before and after the bus/tram stop and physical and/or environmental constraints may influence or limit the outcome that can be achieved.

The standard of cycling infrastructure adopted should be informed by the DTP Movement and Place Framework and designed using *Austroads Guide to Road Design Part 6A – Paths for Walking and Cycling* and DTP supplementary information to this document. Bus and tram stops should be designed in accordance with (DTP) PTV bus stop standard drawings and Yarra Trams *Infrastructure – Tram Stop Platform Design Standard* respectively.

When cycling infrastructure interacts with bus and tram stops, this RDN should also be referred to and the following principles applied to the design in the vicinity of the interaction:

Principle 1 Designs should ensure physical separation of cyclists from pedestrians and public transport users with conflict points minimised. Designs should seek to create separate and clearly identifiable spaces for cyclists, waiting passengers, boarding and alighting passengers and other pedestrians, rather than creating areas where cyclists and passengers are involved in complex, unexpected or unnecessary interactions. In most cases, this would mean prioritising designs where the cycling infrastructure passes behind the bus/tram stop.

Principle 2 Designs should incorporate features that heighten transport user's awareness of their surroundings and appropriately manage cyclist speeds. Each user group should have adequate warning and visibility of potential conflicts with time and space to avoid them.

Principle 3 Designs should consider how each element of the bus/tram stop may impact mutual sight lines between modes. Consideration should be given to matters such as shelter types and positioning (e.g. selecting and installing a shelter type that does not create blind corners), the provision of vegetation (e.g. if required, planting shrubs that will not at any point in time obstruct mutual sight lines), path alignment (e.g. realigning paths to reduce speeds and maximise visibility), etc.

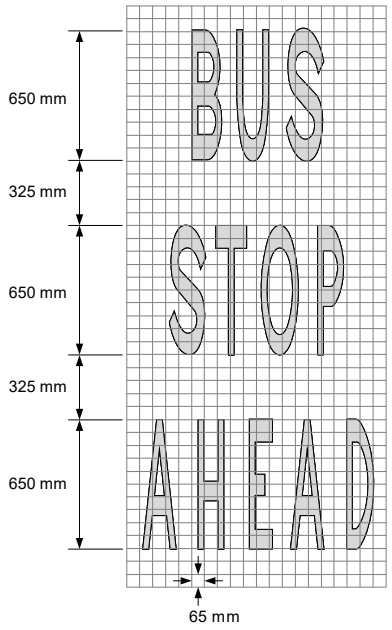
Principle 4 Designs should ensure that obligations under the *Disability Discrimination Act* (DDA) are fulfilled by providing safe, equitable and dignified access to all people regardless of disabilities. This includes compliance with all relevant disability standards (such as DSAPT and the AS 1428 Series).

Principle 5 Designs should consider the legal context within which they are developed and not introduce movement restrictions or 'right of way' requirements that do not align with the Road Rules and/or road user expectations.

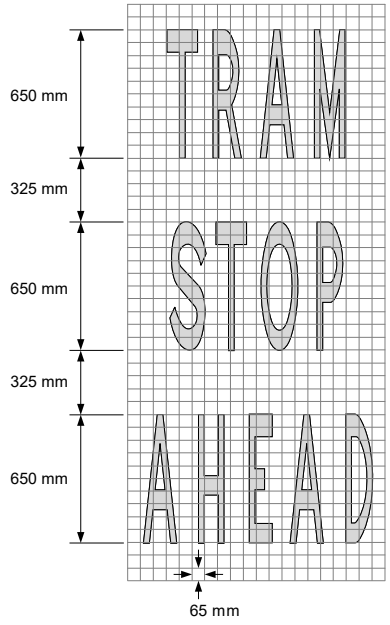
4 Schedule of Traffic Control Devices

The following is a schedule of traffic control devices that should be considered for use when designing cycling facilities adjacent to bus and tram stops. Other traffic control devices may also be required (refer to AS 1742.9).

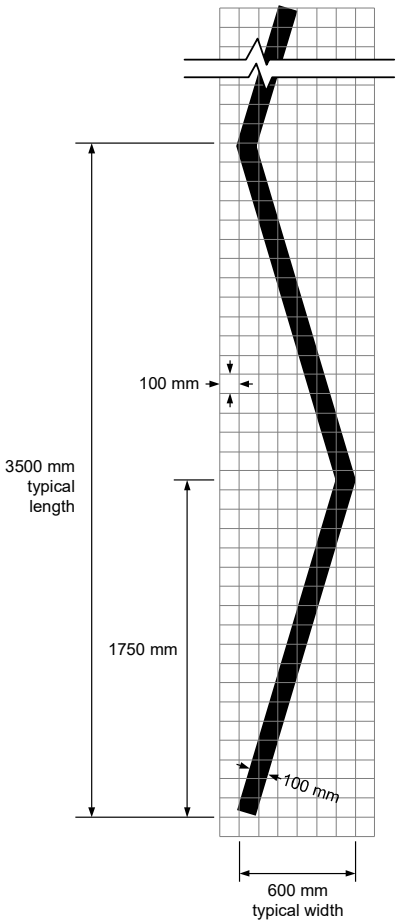
Device	Reference	Size (mm)	Figure
Pedestrian Warning sign (W6-1)	AS 1742.9 AS 1742.10	450 x 450	
BUS STOP supplementary sign (W8-V131)	AS 1742.10	450 x 300	
TRAM STOP supplementary sign (W8-V132)	AS 1742.10	450 x 300	
Pedestrian Crossing sign (R3-1)	AS 1742.10 (road application)	600 dia.	
Bicycle LANE sign (R7-1-4)	AS 1742.9	450 x 600	
Bicycle Path ONLY sign (R8-1)	AS 1742.9	300 x 400	
Shared Path sign (R8-2)	AS 1742.9	300 x 400	
Separated Path sign (R8-3 (L/R))	AS 1742.9	300 x 300	
END supplementary sign (R7-4)	AS 1742.9	300 x 100	
Coloured pavement (Emerald Green)	AS 1742.9	Varies	



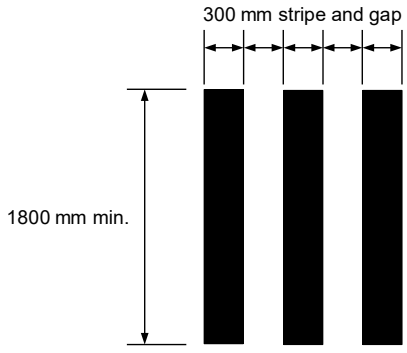
BUS STOP AHEAD pavement marking *
(path use only)



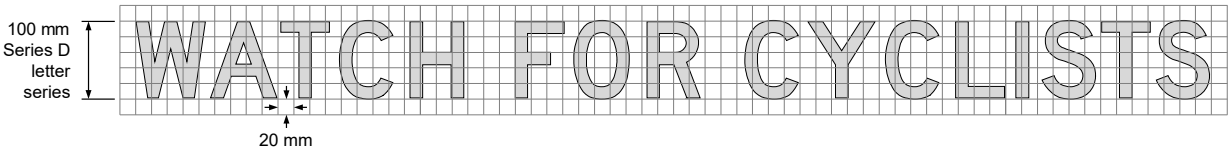
TRAM STOP AHEAD pavement marking *
(path use only)



Zig zag pavement marking *
(path use only)



Pedestrian crossing pavement marking
(across bicycle path)



WATCH FOR CYCLISTS pavement words

**** These pavement markings should be used at higher risk and/or higher volume locations only***

5 Typical Scenarios

This section provides examples of designs for typical scenarios of cycling infrastructure adjacent to bus and tram stops that have been developed in accordance with the guidance provided in this RDN.

These scenarios have been categorised as follows:

Off-road cycling infrastructure:

- passing behind bus/tram stops *(generally preferred over 'passing through')* (see Section 5.1)
- passing through bus/tram stops (see Section 5.2)

On-road cycling infrastructure:

- passing behind bus/tram stops *(generally preferred over 'passing in front of')* (see Section 5.3)
- passing in front of bus/tram stops (see Section 5.4)

The examples highlight a range of key design elements and traffic control treatments that are specific to the design of cycling infrastructure adjacent to bus and tram stops. Practitioners are encouraged to review the suite of examples provided when developing a site specific solution as it will often be appropriate to incorporate design features from one example into another (e.g. incorporating a path deflection to reduce cyclist speeds into a design based on an example in this RDN that doesn't include this treatment).

An indication of relevant Movement and Place categories that each example may be suitable for is also provided (see Figure 1 for example).

Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

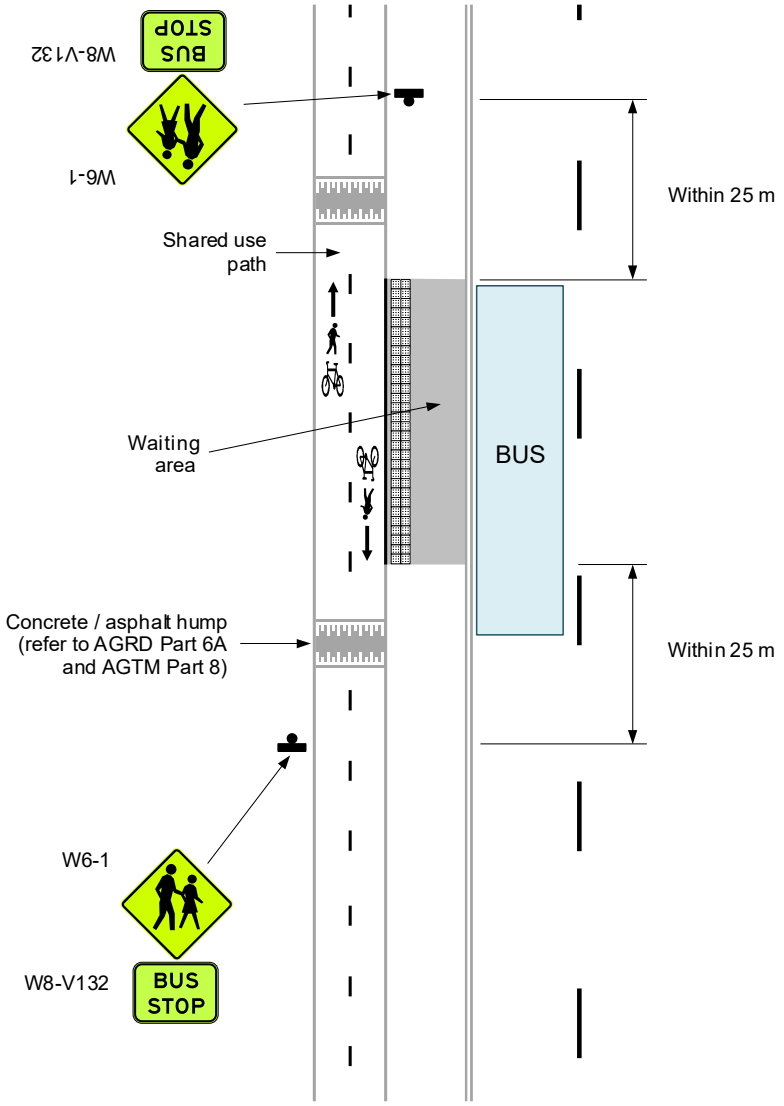
Figure 1: Example indicator of relevant Movement and Place category application

The listed Movement and Place categories that each example may be suitable for are indicative only, based largely on the type of pedestrian, cyclist and bus/tram facilities provided (not the types of treatments used). Suitability could vary depending on context specific factors such as 'place' function, the type of infrastructure provided upstream and downstream of the bus/tram stop, path dimensions, various user demand volumes etc.

For complete and comprehensive technical standards and guidance associated with the design of cycling infrastructure adjacent to bus and tram stops, practitioners should also refer to *AGRD Part 6A – Paths for Walking and Cycling*, *AS 1742.9 Bicycle Facilities* and relevant disability standards (such as the AS 1428 series and *DSAPT*) and any DTP supplementary information to these documents.

Note: The examples provided do not cover every possible scenario or factor in physical and/or environmental limitations that may exist within a particular site. Practitioners should use engineering judgement in applying the principles, guidance and examples provided in this RDN to suit their project. **Refer to *Austroads Guide to Road Design Part 1 – Objectives of Road Design*.**

5.1 Off-road cycling infrastructure passing behind bus/tram stops



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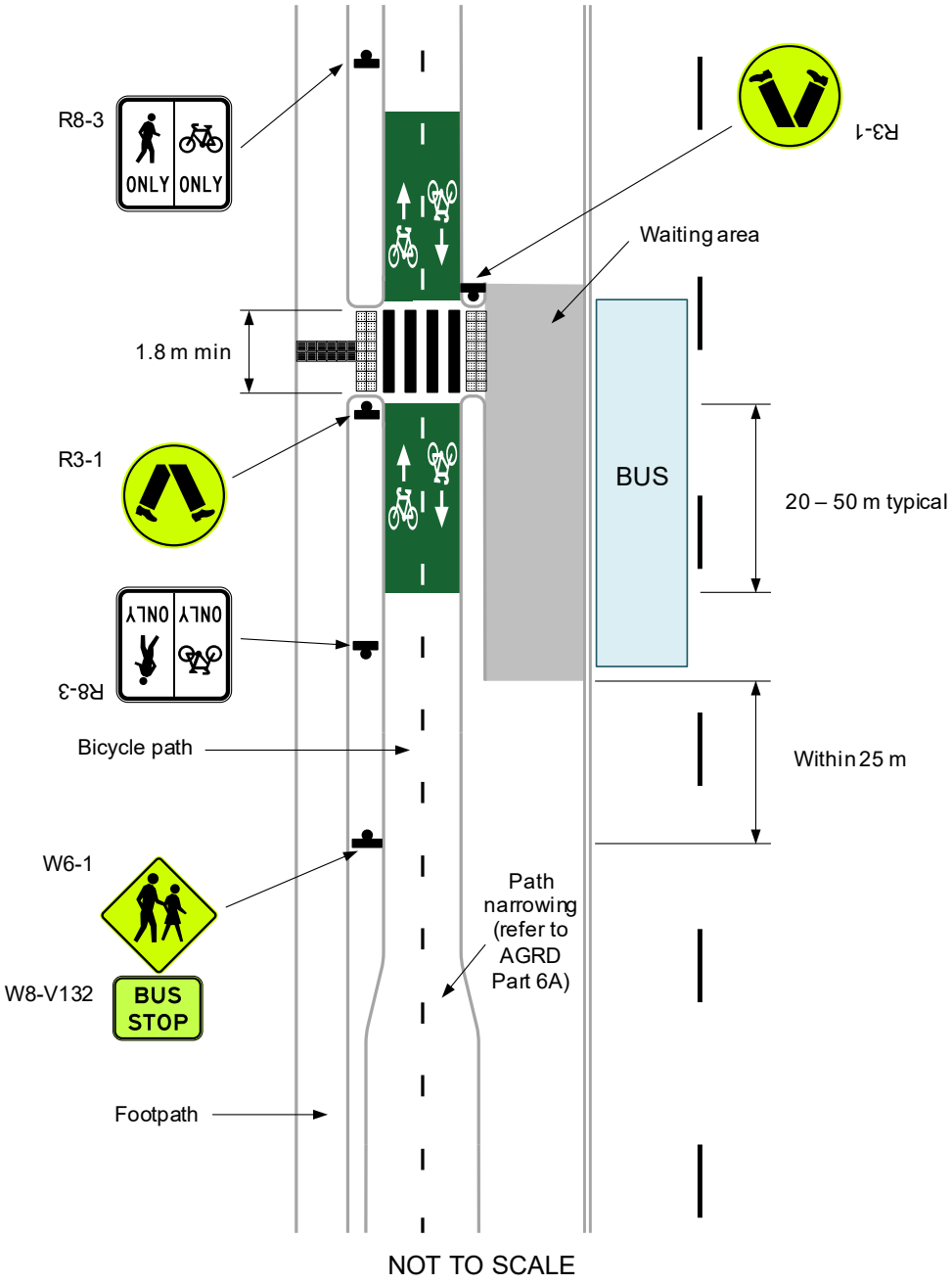
Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 2: Shared use path passing behind bus stop

Notes to Figure 2:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths (note: only select TGSIs shown in Figure), refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***
- ***WATCH FOR CYCLISTS pavement markings omitted for shared use paths adjacent to bus/tram stops.***

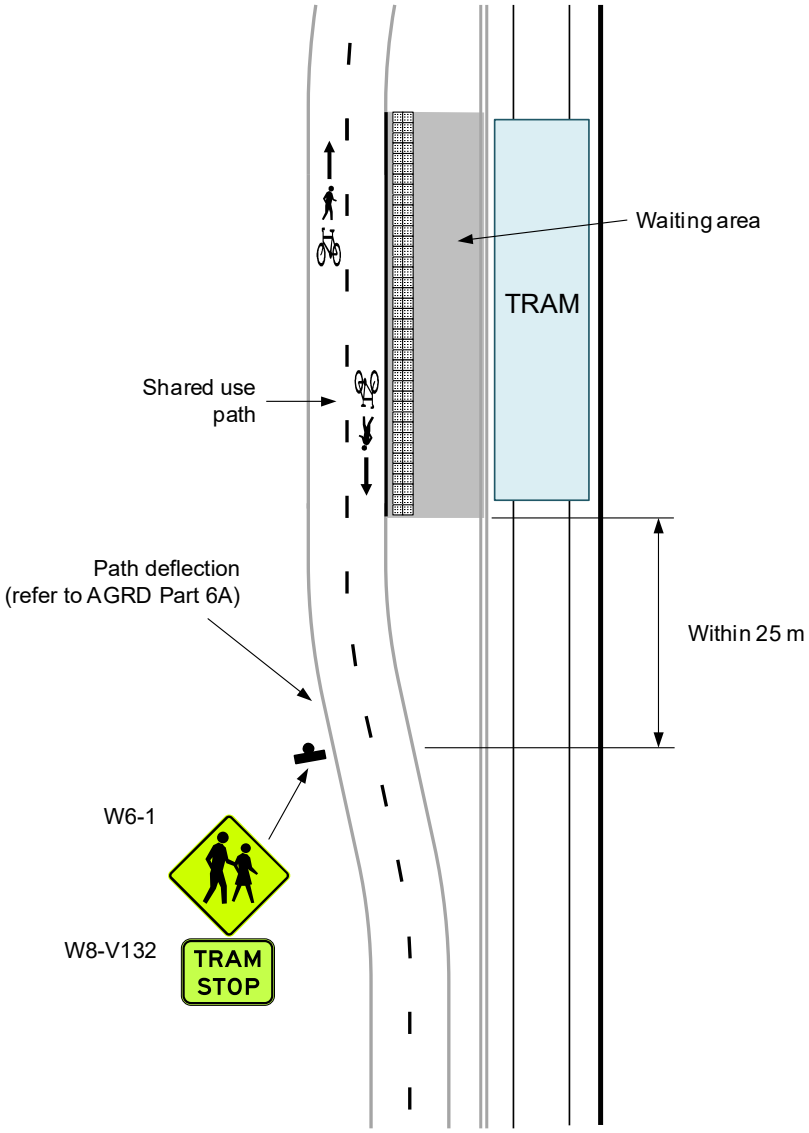


Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 3: Separated path passing behind bus stop

Notes to Figure 3:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths (note: only select TGSIs shown in Figure), refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***



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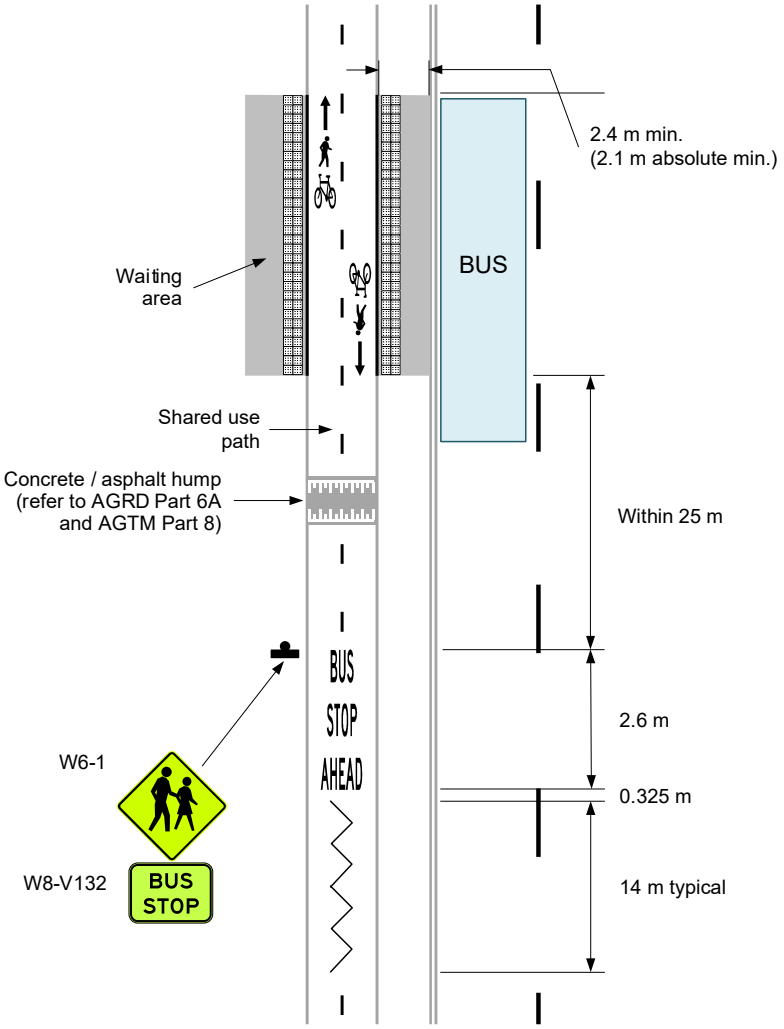
Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 4: Shared use path passing behind tram stop

Notes to Figure 4:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths (note: only select TGSIs shown in Figure), refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***
- ***WATCH FOR CYCLISTS pavement markings omitted for shared use paths adjacent to bus/tram stops.***

5.2 Off-road cycling infrastructure passing through bus/tram stops



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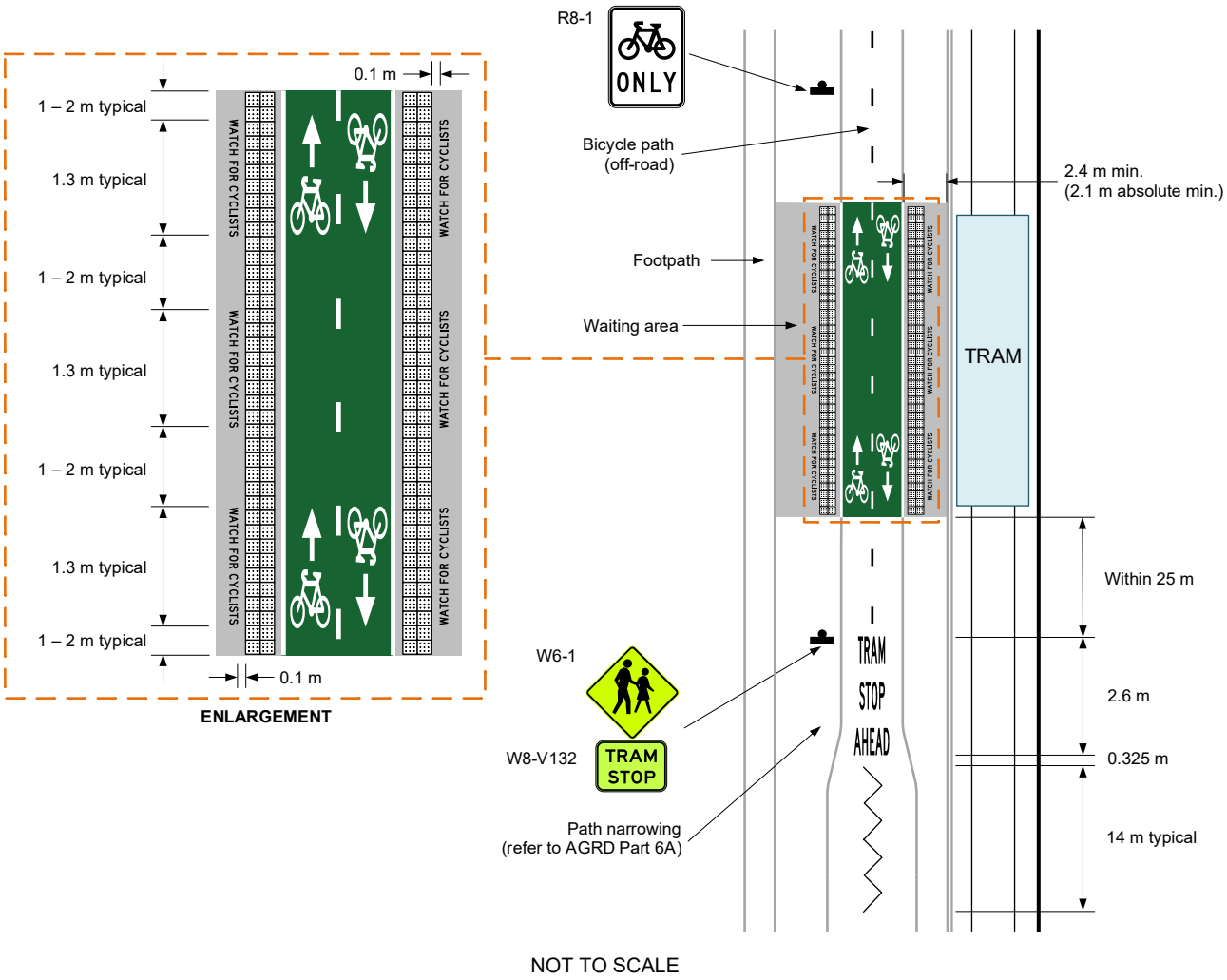
Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 5: Shared use path passing through bus stop

Notes to Figure 5:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths (note: only select TGSIs shown in Figure), refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***
- ***WATCH FOR CYCLISTS pavement markings omitted for shared use paths adjacent to bus/tram stops.***
- ***BUS / TRAM STOP AHEAD and zig zag pavement markings should be used at higher risk and/or higher volume locations only.***



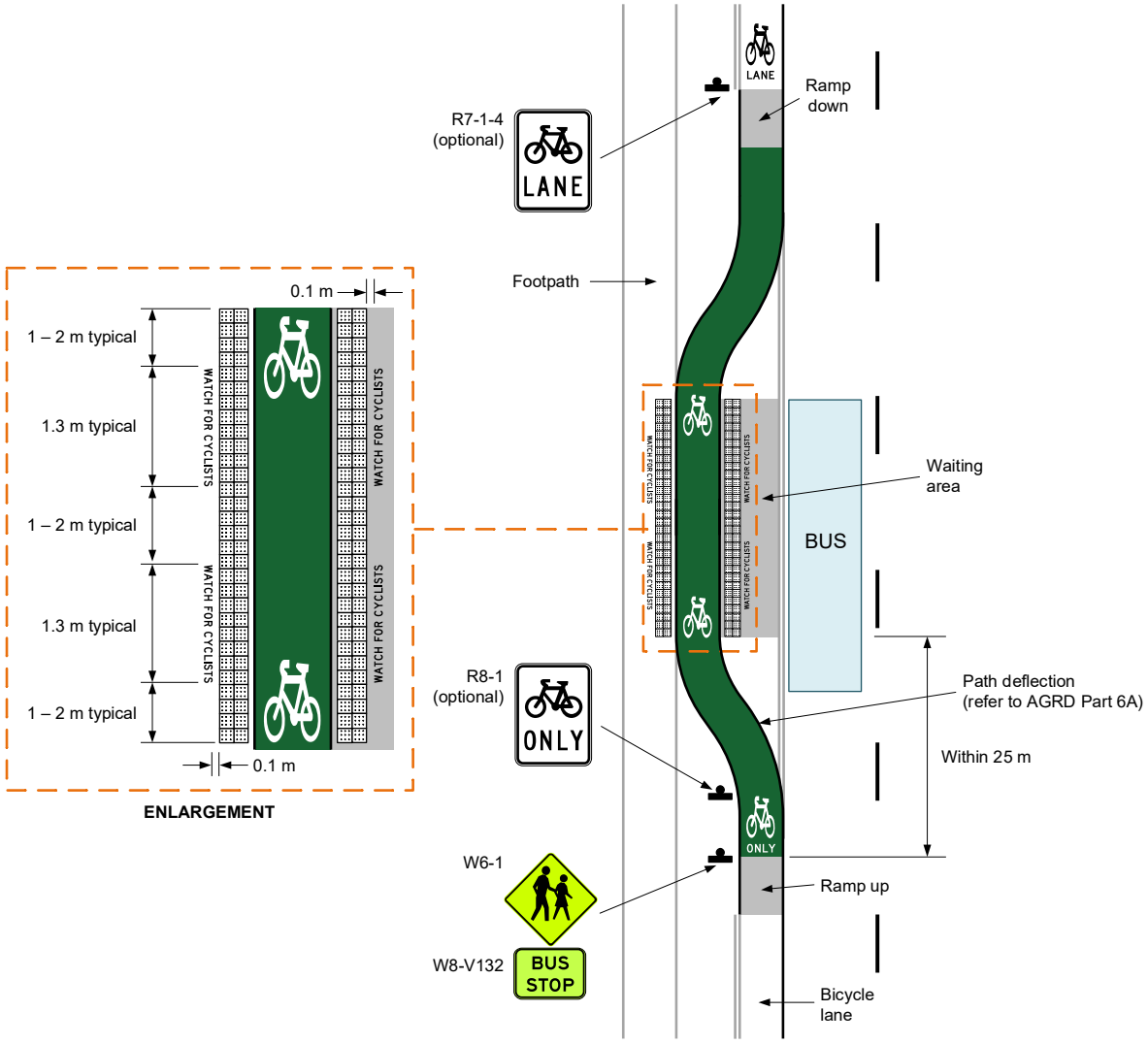
Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 6: Bicycle path passing through tram stop

Notes to Figure 6:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths (note: only select TGSIs shown in Figure), refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***
- ***Number of WATCH FOR CYCLISTS pavement markings will vary depending on the length of the bus/tram embarking/disembarking area.***
- ***BUS / TRAM STOP AHEAD and zig zag pavement markings should be used at higher risk and/or higher volume locations only.***

5.3 On-road cycling infrastructure passing behind bus/tram stops

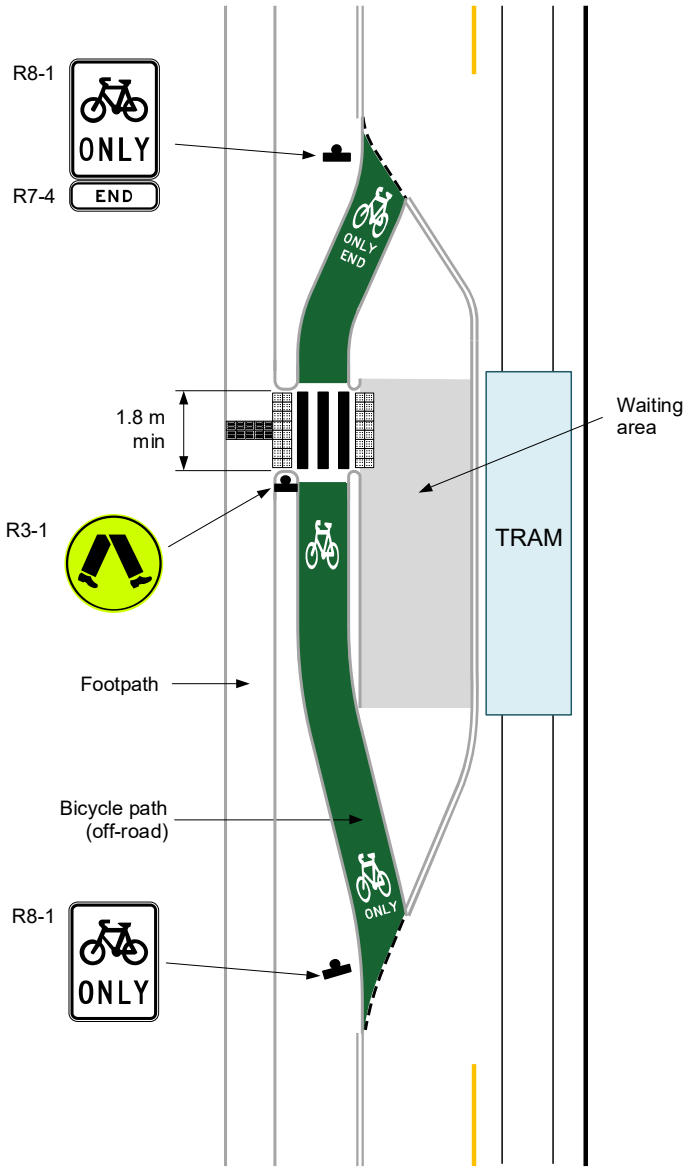


Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 7: Bicycle lane passing behind bus stop

Notes to Figure 7:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths (note: only select TGSIs shown in Figure), refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***
- ***Number of WATCH FOR CYCLISTS pavement markings will vary depending on the length of the bus/tram embarking/disembarking area.***



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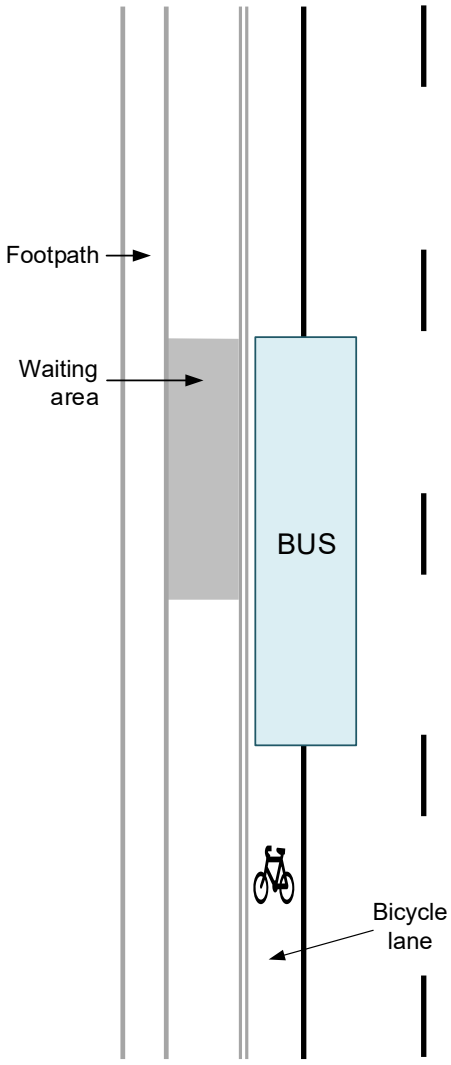
Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 8: Wide kerbside lane passing behind tram stop

Notes to Figure 8:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths (note: only select TGSIs shown in Figure), refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***

5.4 On-road cycling infrastructure passing in front of bus/tram stops



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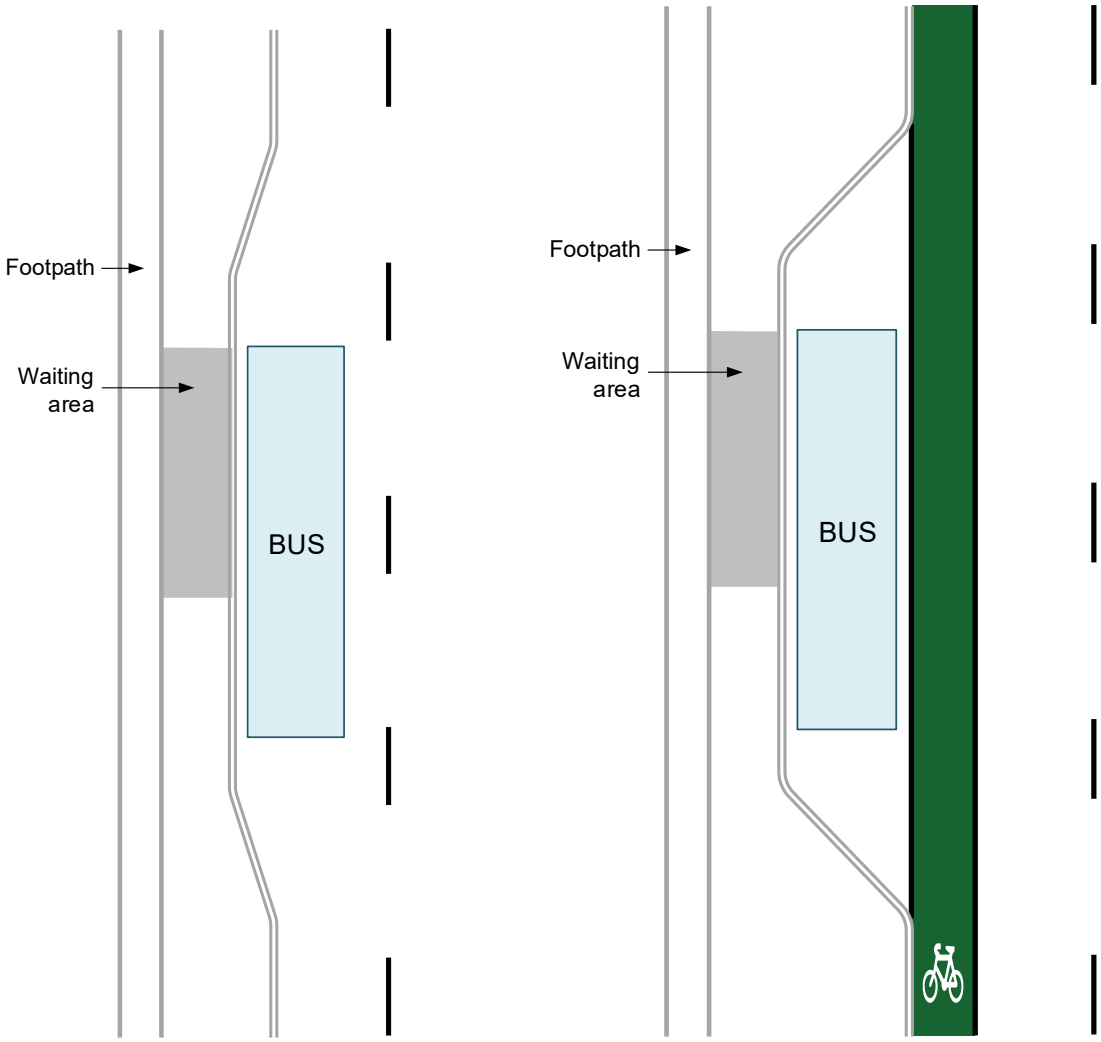
Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 9: Bicycle lane with bus stop

Notes to Figure 9:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths, refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***



Movement & Place Mode	Indicative Suitable Category(s)							
Walking	W1	W2	W3	W4	W5	WR	-	-
Cycling	C1	C2	C3	C4	CD	CNP	CR	CT
Bus/Tram	B/T1	B/T2	B/T3	B4	B5	-	-	-

Figure 10: Wide kerbside / bicycle lane with semi / fully indented bus bay

Notes to Figure 10:

- ***For design of paths for walking and cycling (including dimensions, sight distance and lighting), refer to Austroads Guide to Road Design Part 6A and DTP supplementary information to this document.***
- ***For bus and tram stop design refer to (DTP) PTV bus stop standard drawings and the Yarra Trams Infrastructure – Tram Stop Platform Design Standard respectively.***
- ***For accessibility requirements at the bus/tram stop and paths, refer to Disability Standards Accessible Public Transport (DSAPT) and AS 1428 Series.***

6 Document Terms & References

6.1 Acronyms

Acronym	Term
AGRD	Austroads Guide to Road Design
AGTM	Austroads Guide to Traffic Management
AS	Australian Standard
DDA	Disability Discrimination Act
DSAPT	Disability Standards for Accessible Public Transport
DTP	Department of Transport and Planning
RDN	Road Design Note
RR	Road Rule

6.2 Terminology

Term	Description
Department of Transport and Planning	Means the Victorian (Australia) Department of Transport and Planning.
Movement and Place	Means the framework that takes a future-focussed, multi-modal approach to network planning, taking into consideration the diverse role places play in planning the types of transport modes appropriate to a local road or street.

6.3 Statutory Requirements

The following legislation was used in the development of this standard. Note that the following references do not constitute all legislation applicable to cycling infrastructure adjacent to bus and tram stops.

Title	Reference
Disability Discrimination Act 1992	http://www.legislation.vic.gov.au
Road Safety Road Rules 2017	http://www.legislation.vic.gov.au

Document Information

Criteria	Details
Document Title	RDN 06-17 Cycling Infrastructure Adjacent to Bus and Tram Stops
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Release Date	September 2023
Replaces	N/A
Contact	standardsmanagementrd@roads.vic.gov.au

Document History

Version	Date	Description
1.0	September 2023	Initial release

Interpretation

In this document, except where the context otherwise requires—

- The word “shall” or “must” is to be understood as denoting a requirement which is mandatory.
- The word “should” is to be understood as denoting a requirement which is not mandatory but recommended.
- The word “includes” in any form is not a word of limitation. Mentioning anything after "includes" or similar expressions (including "for example") does not limit what else may be included.
- A reference to a section, clause, schedule or appendix is a reference to a clause of or schedule or appendix of this document.

Nomenclature

Where any of the following symbols are used within this document, the textual description provided to the right is its intended meaning:

ⓘ This symbol intends the accompanying text to be read as INFORMATION. Common information accompanying this symbol includes RATIONALE and GUIDANCE for the associated requirement.

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