# Designing good quality on-road cycling facilities

## Purpose

This note aims to raise awareness of the on-road cycling facilities available to improve conditions for people who choose to cycle.

## Introduction

One of the easiest and least expensive ways to create a safe and enjoyable environment for cycling is to provide space for bicycles on existing roads.

## Types of on-road facilities

There are a number of ways roads can be engineered to support and encourage the presence of bicycles. These treatments generally involve the provision of painted line markings, on-road symbols and signing. They can be accommodated into the existing road environment if there is sufficient width or can be provided for by realigning and remarking all traffic lanes.

## Aim

This series of notes is designed to assist planners and engineers to provide for cycling in their local area.

The Cycle Notes should be read in conjunction with:

- Guide to Traffic Engineering Practice, Part 14 - Bicycles (Austroads, 1999), and
- Queensland Manual of Uniform Traffic Control Devices, Part 9 Bicycle Facilities.

## Contents



**Figure 1**
*Exclusive bike lane*

The types of treatments are:

- exclusive bike lane (see Figure 1)
- bicycle/car parking lane - parallel parking
- bicycle/car parking lane - angle parking (see Figure 2)
- contra-flow bicycle lane (see Figure 3)
- sealed shoulders (see Figure 4)
- two-way protected lane
- wide kerbside lane
- bus/bicycle lane; and
- advisory treatments.

Table 1 outlines the key features of each type of on-road facility. NOTE: Other facilities are being developed and trialled throughout Queensland. For example, Brisbane City Council are developing a line marking called the “Bicycle Awareness Zone”. This particular treatment is still in its evaluation stage and will be discussed in a separate note.

**Figure 2**
*Bicycle/car parking lane - angle parking*

**Figure 3**
*Contra flow bike lane*


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**Table 1:** *Key features of on-road bicycle facilities*

| On-road facility | Definition | When to use it | Width | | | | Signs, symbols and markings | Other issues | Figures and Table from *Austroads Part 14* |
|---|---|---|---|---|---|---|---|---|---|
| Exclusive bike lane | A dedicated bike lane marked on both sides of the road with white lines. | Arterial roads, key bike routes, near schools, shops, etc. | Road speed (km/h) | Lane width (m) | | | Signs and symbols as per AS1742.9 | Apply to both sides of road where possible, do not place between kerb and parked cars, use on steep terrain for safety, "peak period" bike lanes can be installed where appropriate. | Figure 4.2 (p20)<br>Table 4.1 (p20)<br>Figure 4.3 (p21)<br>Figure 4.4 (p22) |
| | | | | 60 | 80 | 100 | | | |
| | | | Desirable | 1.5 | 2.0 | 2.5 | | | |
| | | | Acceptable range | 1.2 - 2.5 | 1.8 - 2.7 | 2.0 - 3.0 | | | |
| Bicycle/ car parking lane - parallel parking | Lane marking and signage to encourage safe travel for bicycles between parked and moving cars. | Where both cycling and parking demands are high | | | Lane width (m) | | Safety strips between the bike lane and the parking bay keep users separate | Kerb projections at regular intervals may be required to keep through motor traffic out of the parking lanes. | Figure 4.6 (p24)<br>Table 4.2 (p24)<br>Figure 4.7 (p25) |
| | | | Road speed (km/h) | | 60 | 80 | | | |
| | | | Desirable | | 4.0 | 4.5 | | | |
| | | | Acceptable range | | 3.7 - 4.5 | 4.0 - 4.7 | | | |
| Bicycle/ car parking lane - angle parking | | To prevent cyclists travelling close to cars reversing out of angle parks | Parking angle (degrees) | Overall facility width (m) | | | | May be unsafe if the angle parks are the "reverse in" type. Motorists tend to exit these parks at high speed. | Figure 4.8 (p26)<br>Table 4.3 (p26)<br>Figure 4.9 (p26) |
| | | | | 45 | 60 | 90 | | | |
| | | | Desirable | 7.3 | 7.6 | 8.0 | | | |
| | | | Acceptable range | 7.1 - 7.8 | 7.4 - 8.1 | 7.8 - 8.5 | | | |
| Contra flow bicycle lane | Two-way cycling in a one-way street. | This may be the best solution when developing a bicycle network plan | | | Lane width (m) | | Colouring the surface of the lane can improve safety | If parking is required on the "right side" of the street, a contra-flow lane can be installed kerbside of the parked cars. | Figure 4.10 (p28) |
| | | | Desirable | | 1.8 | | | | |
| | | | Acceptable range | | 1.5 - 2.5 | | | | |
| | | | *Note: Facility only suited to 60km/h or less zones.* | | | | | | |
| Sealed shoulders | Sealing a rural road beyond the traffic lanes. | Where there is a demand for cycling facilities and where there is no kerb. | | Overall facility width (m) | | | Symbols can be placed in the shoulder at 500m intervals. Freeways require special signage | If budget is tight, initally treat only crests and tight horizontal curves. Take care with the placement of road furniture. An exclusive bike path adjacent to the road may be a better option. | Figure 4.11 (p28) |
| | | | Road speed (km/h) | 60 | 80 | 100+ | | | |
| | | | Desirable | 1.5 | 2.0 | 3.5 | | | |
| | | | Acceptable range | 1.2 - 1.8 | 1.8 - 2.5 | 3.0 - 4.0 | | | |

**Table 1 *(continued)*:**
*Key features of on-road bicycle facilities*

| On-road facility | Definition | When to use it | Width | | | Signs, symbols and markings | Other issues | Figures and Table from Part 14 |
|---|---|---|---|---|---|---|---|---|
| Two-way protected lanes | An exclusive bike path on one side of the carriageway. | Where the origin and destination are on the same side of the road. Where there are limited parking and access requirements. | | Overall facility width (m) | | See Cycle Note B9. | A built up median separates the facility from motor traffic lanes. Bus stop requirements include a raised section of pavement to facilitate the movement of passengers across the path. | Figure 4.12 (p29) |
| | | | Desirable | 3.0 | | | | |
| | | | Acceptable range | 2.5 - 3.5 | | | | |
| Wide kerbside lane (WKL) | Wider than a standard traffic lane where bicycle and motor vehicle traffic travel side by side. | In zones up to 70km/h, above this an exclusive bike lane is required. If this cannot be achieved in higher speed roads, a WKL may be used if on-street parking demand is low. | | Lane width (m) | | Logos and signs are not necessary but can indicate the lane's capacity for both bicycles and motor vehicles. | This is the most cost effective treatment if road space is available. Can be installed gradually through a road marking maintenance programme. | Figure 4.18 (p32)<br>Table 4.4 (p33)<br>Table 4.5 (p33)<br>Figure 4.19 (p33)<br>Table 4.6 (p34)<br>Table 4.7 (p34) |
| | | | Road speed (km/h) | 60 | 80 | | | |
| | | | Desirable | 4.2 | 4.5 | | | |
| | | | Acceptable range | 3.7 - 4.5 | 4.3 - 5.0 | | | |
| Bus/bicycle lane | This refers to cyclist use of lanes marked as bus lanes during peak periods. | Where a peak period exclusive bus lane is marked, it is unreasonable to expect cyclists to use the normal traffic lanes. | | Lane width (m) | | Signage that indicates the legitimate use of a bus lane by cyclists is important. | The following factors must be considered: the preference of cyclists who use the route, the speed of buses and other traffic, the location of bus stops, the frequency with which buses stop in a length of road, and the available width. | Section 4.4.8 |
| | | | Road speed (km/h) | 60 | 70+ | | | |
| | | | Desirable | 4.25 | 4.75 | | | |
| | | | Acceptable range | 4.0 - 4.5 | 4.5 - 5.0 | | | |

# Designing good quality on-road cycling facilities

## Finding space on the road

A practical technique for assessing existing lane configurations and finding space on the road for bicycle riding is presented in Cycle Note B5.

## Benefits of providing on-road cycling facilities

As well as the economic, environmental and health benefits available to communities that encourage cycling, there are also clear benefits in providing bike lanes and/or sealed shoulders:

- safety is improved for all users including pedestrians when space is clearly allocated to bicycles
- exclusive bike lanes improve on-road space for motorists' emergency stopping requirements to escape potential crashes
- sight stopping distance is improved at curves and for vehicles entering the roadway from a driveway or side street
- pavement life is increased especially where sealed shoulders of rural roads are widened, reducing edge breaks and the ravelling effects caused by motor vehicles.

## Wide kerbside lanes

In a multi-lane environment, the ability of bicycles and motor vehicles to share a lane depends upon the width available for safe overtaking within the lane. Ideally, there will be enough space so that the motor vehicle will not need to move into the adjacent lane to safely overtake a bike rider.

Table 2 demonstrates the contribution kerbside lane width plays in the convenience, comfort and safety of all road users. Such widths must particularly be considered on roads that are favoured by both bicycle riders and truck drivers. Note from Table 1 the speed environment affects the requirement for lateral space. Where there is high demand for cycling and limited lane width, lowering the speed environment is another option to improve safety.

**Table 2:**
*Lane widths and overtaking safety*[1]

| Effective lane width (m) | Overtaking a person on a bicycle |
|---|---|
| ‹ 2.75 | Cars: very few can overtake<br>HVs*: cannot overtake |
| 2.75 - 3.25 | Cars: some can overtake with adequate safety<br>HVs: cannot overtake |
| 3.25 - 3.5 | Cars: most can overtake with adequate safety<br>HVs: cannot overtake |
| 3.5 - 3.75 | Cars: can overtake with adequate safety<br>HVs: overtaking possible but without adequate safety |
| › 4.0 | Cars: can overtake with adequate safety<br>HVs: can overtake with adequate safety |

**Figure 4**
*Bike lane/sealed shoulder on multi-lane road*

### Other references


1. Department of Environment, Transport and the Regions (1997) Traffic Advisory Leaflets – Traffic Management: Cycles and Lorries, Department of Environment, Transport and the Regions, UK


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