Bicycles and bus lanes

Purpose
This note aims to raise awareness of the policy, design and management issues associated with bicycles travelling in bus lanes and other high occupancy vehicle (HOV) lanes.

Definitions
Bus lanes are traffic lanes reserved solely for the use of buses, bicycles, taxis, limousines, emergency vehicles and any other vehicle turning within 100m of an intersection, regardless of occupancy.

HOV lanes (sometimes referred to as transit lanes) are physically and operationally similar to bus lanes. In addition to the above users, they may also be used by cars carrying the appropriate number of occupants. Cars in T2 lanes must carry two or more persons; cars in T3 lanes require three or more persons. Buses, taxis, limousines, motorcycles, bicycles, emergency vehicles and any vehicle turning within 50m of an intersection are allowed in HOV lanes regardless of occupancy.

Buses are usually segregated facilities that give priority movement to buses.

Principles
A dedicated bicycle lane is generally preferred for on-road cycling. A shared lane is the next best option.

Bus lanes and HOV lanes, like on-road and off-road bicycle facilities, promote more sustainable transport modes. Bicycle riders can legally use these facilities so their needs should be considered in the planning, design and funding of all bus lane and HOV lane projects.

Design that delivers greater priority to one mode of transport should not constrain, prohibit or restrict the use or purpose of other facilities. An alternative route or road should be considered. By considering this interaction, the planner/designer can select the best option to meet complex traffic situations and changing conditions.

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Bus lanes
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Buses
Light rail.

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

The Cycle Notes should be read in conjunction with:
- Road Planning and Design Manual (Queensland Department of Main Roads).

Potential conflicts between buses and bicycles

Shared use of a bus lane between bicycle riders and buses can create conflict where there is insufficient room for users to safely overtake each other within the same lane. On occasions buses fail to acknowledge the rider’s right to be in a bus lane and bus drivers can ‘squeeze’ the rider between the gutter and the bus. Wind turbulence generated by the bus can also be hazardous to cyclists. Bus lanes may need signs or bicycle lanes on the road to indicate that people are permitted to cycle in these lanes. Cyclist safety in bus lanes may also be improved if bus drivers are educated about the needs during training.

It is often perceived that bicycle delays buses. Buses stopping frequently can create ‘loop flogging’ where the bicycle rider overtakes the bus while stopped, then the bus overtakes the rider etc. Planners and designers can help to mitigate problems associated with this pattern by ensuring that the bus lane is wide enough for safe overtaking (i.e. providing a wider shared lane) where space permits. Alternatively, short off-road bicycle facilities on the footpath would allow bicycles to safely overtake buses loading and unloading passengers, in any of these cases, specific provisions for road cycling is only required for a bus lane that forms part of a designated cycling route or all form part of one in the future.

Bus lane design
The design of bus facilities requires consideration as the likely interaction between bicycles, buses, pedestrian and passenger traffic. When provision for on-road cycling is made by a separate cycling lane, there is no need to make provision (e.g. wide bus lane for cyclists in the bus lane). The bus lane therefore should be designed to cater to the needs of the bus lane standards. However, interaction that occurs between buses and cyclists still needs to be considered. By considering this interaction, the planner/designer can select the best option to meet complex traffic situations and changing conditions.

Unless explicitly banned or limited, cyclists may use any bus lane at any time. Where a bus lane forms part of a designated cycling route or all form part of one in the future, the method by which it is practicable to do so (Table 1: desired widths for different speed environments).

In speed environments that are >70 km/h but <80 km/h, the desired minimum is 4.5m. The preferred width of the cycling lane is 5.0m but may be as low as 4.5m in constrained situations. Where the speed environment is >60 km/h but <70 km/h, the desired minimum is 4.0m. Where the speed environment is >50 km/h but <60 km/h, the desired minimum is 3.5m. Similarly, in cases where the bus lane is identified as part of an existing or future cycling route, a greater minimum width is desired for buses on existing roads. Planners and designers should investigate the possibility of finding space (refer to Cycle Note B5 – Finding space for on-road bicycle lanes) in an attempt to provide the desired minimum width. However, it may not be possible to provide the desired minimum width on existing routes. In this case, a narrower bus lane may have to be accepted, or provision for cycling via an alternative facility or route may need to be considered.

Avoid banning cycling in bus/HOV lanes if it is a designated cycling route and the speed environment is >70 km/h. Bus lanes are frequently planned along arterial roads on corridors linking major destinations. Banning cycling in bus lanes that form part of a designated cycling route should not occur as this can leave cyclists without a route of equivalent convenience and safety. Designing and commissioning bus lanes that are too narrow to safely meet bus and cycling needs should also be avoided.

In congested city areas where the average traffic speeds in peak periods are about 40 km/h and speeds are less than this, it may be preferable to provide an exclusive or separate cycling lane to the right of the bus lane. Where the speed environment is >60 km/h, the preferred width of the cycling lane is 5.0m but may be as low as 4.5m in constrained situations. Where the speed environment is >50 km/h but <60 km/h, the desired minimum is 4.0m.

Examples of measures that may be employed. Table 2 gives some further guidance.

Table 1: Desired widths for speed environments

<table>
<thead>
<tr>
<th>Speed environment</th>
<th>Desired minimum width (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;80 km/h</td>
<td>5.0m</td>
</tr>
<tr>
<td>70 km/h – 80 km/h</td>
<td>4.5m – 5.0m</td>
</tr>
<tr>
<td>60 km/h – 70 km/h</td>
<td>4.0m – 4.5m</td>
</tr>
<tr>
<td>50 km/h – 60 km/h</td>
<td>3.5m – 4.0m</td>
</tr>
<tr>
<td>&lt;50 km/h</td>
<td>3.0m – 3.5m</td>
</tr>
</tbody>
</table>

Table 2: Shared Bus/Bike Lane Arrangements

<table>
<thead>
<tr>
<th>Kerb</th>
<th>Lane</th>
<th>Designated route with speed environment 70 km/h</th>
<th>Designated route with speed environment 70 km/h to 80 km/h</th>
<th>Designated route 80 km/h and above</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bus</td>
<td>3.0m</td>
<td>1.5m</td>
<td>4.5-5.0m</td>
<td>5.0-5.5m</td>
</tr>
<tr>
<td>Bicycle</td>
<td>1.5m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General</td>
<td>3.1m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Traffic</td>
<td>3.1m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lane</td>
<td></td>
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The use of narrow (e.g. 3.0m to 3.5m wide) shared lanes is recommended.

- only under very congested conditions, or
- in very constrained circumstances, or
- when the lane is not, or will not, form part of a designated cycling route.

Despite these recommendations some requirements may still be needed if the route preferences of bicycle riders is a significant concern.

In environments that are too narrow but more than 80 km/h, a shared lane 4.0m to 5.0m wide is necessary so that cyclists and buses can safely overtake each other within the lane.

In addition to the considerations required to develop a Local Cycle Network Plan (refer to Cycle Note B5 – Finding space for on-road bicycle lanes) and an Integrated Regional Cycle Network Plan, the following factors also need to be considered in choosing the most appropriate solution for a shared bus/HOV lane:

- the route preferences of bicycle riders
- the speed of buses and other traffic
- the location of bus stops
- the frequency of buses stopping along a length of road, and
- the available width, or width that can be found (refer to Cycle Note B5 – Finding space for on-road bicycle lanes).
Bicycles and bus lanes

**Figure 1:** Cycle lanes passing bus indents.

There are other innovative international design solutions to address some of the conflicts between buses, bus passengers and bicycle riders. An example of an innovative design from Portland, Oregon, USA avoids conflict by physically segregating cyclists from bus and pedestrian traffic at the bus stop. The segregated bicycle lane passes behind the bus shelter and bay, then rejoins the bus lane. This treatment requires a wide footpath (i.e. width of bus stop, plus width of cycle path, plus width of footpath).

**Education strategies**

Other strategies for managing potential conflict in bus lanes include educating all users about their shared responsibilities as bus drivers or bicycle riders. An advisory leaflet containing generic text for this purpose is shown in Figure 2.

**Bus Lane**

- Buses, taxis, limousines, emergency vehicles, bicycles and any vehicle turning within 100 m of an intersection.

**Cycle Lane**

- If the right-hand indicator of a bus switches on and you are still behind the bus, you must give way and allow the bus to pull out. If you are stopped at a bus stop with no indicators on or with both indicators on, it is likely to be stopped for some time. However, if its right hand indicator is on it may start moving at any moment.

- If you try to overtake the bus, you must give way to the bus and allow it to proceed. If you overtake a bus, you must give way to other vehicles as well.

- Do not take risks in front of, alongside or immediately behind a bus. Buses take longer to stop than cars and block your forward vision when you are behind them.

- If the kerb lane is too narrow to allow cyclists and buses to pass one another and a suitable footpath is available for a long split on slow sections, then consider using it. Footpaths with driveways and poor visibility are generally not suitable for use by cyclists. Cyclists must give way to pedestrians when riding on a footpath.

- Set a good example by obeying the road rules. This will motivate other riders to do the right thing and will encourage drivers to look out for, respect and assist bicycle riders.

**Other references**


**Figure 2:** Generic bicycles and bus lanes educational leaflet

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**HOV Lanes**

HOV lanes are physically and operationally similar to bus lanes. They therefore have many things in common for cycling design. Given that cyclists can legitimately use HOV lanes, the needs of bicycle riders should be considered during the planning, design and funding of HOV projects. It is generally recommended that a HOV lane be considered as part of a designated bicycle route, or will form part of one in the future. It should be noted that cycling facilities along a HOV lane should be designed to be a separate bicycle lane or an off-road facility. It is important not to ignore bicycles along light rail corridors as they frequently provide the direct and convenient routes favoured by bicycle riders. They may also parallel identified priority bicycle routes.

Light rail cars can pose problems for cyclists (e.g. wheel slippage/locking on the rail surface, catching a wheel in the flange (i.e. the vertical web between the base and the top of the rail)). Important design considerations for cyclists at crossings of light (or heavy) rail are smoothness, the angle of crossing and flange depth and width. It is recommended the crossing angle between the bicycle direction of travel and rail should be as perpendicular as possible. Desirably, it should be more than 45 degrees. Concrete pavements are preferred at rail crossings to flexible (e.g. bituminous) pavements. When designed correctly, they provide a durable crossing that generally remains smooth but not slippery. Heavy duty asphalt pavements may also be suitable. In either case, advice should be sought from a specialist pavement engineer to determine the best solution (e.g. pavement design and pavement surfacing).

Where light rail operations in urban areas are on-street in mixed traffic, treatments to manage bicycle manoeuvres (i.e. ability to cross light rail tracks when turning) and signage are needed to ensure that light rail is bicycle friendly.

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**Busways**

Busways are segregated facilities designed and dedicated to the priority movement of buses for public transport operations. Busways offer commutepaths direct, safe and convenient routes. They also parallel identified priority bicycle routes. If off-road cycling facilities are not incorporated into the early planning and design of busways, it may prove expensive and technically difficult to retrofit cycling facilities into the corridor. Therefore, where an off-road cycling facility along a busway corridor is identified as part of a designated cycling route, or will form part of one in the future, the funding, planning and design of a busway should include provision for an off-road cycling facility.

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**Planners and designers should give particular attention to the treatment of bicycle facilities at busway stations and consider how best to provide access to stations for cyclists and pedestrians.**