

Contract Report

Pedestrian/Cyclist Conflict Minimisation on Shared Paths and Footpaths

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for Austroads

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Technical Summary

Most urban transport strategies in Australia include the desire to increase walking, cycling and public transport and, correspondingly, to reduce the extent of reliance on the private car. This has arisen for a range of reasons, initially environmental and sustainability-related, but increasingly related to issues of community and individual well-being.

Pedestrians and cyclists, whilst both being vulnerable road users compared to the occupants of a motor vehicle, differ greatly from each other in terms of speed of travel, ability to take evasive action and even the nature of the movement activity, which is much more likely to be a social activity for the pedestrian.

The interaction between pedestrians and cyclists is increasingly causing safety concerns, exacerbated by the use of wheeled recreational devices, including wheelchairs, powered scooters and gophers. Some of these concerns are real and others are perceived, but nevertheless important in terms of people's willingness to walk. The more governments are successful in increasing the amounts of walking and cycling, the greater these concerns will become – potentially limiting the extent and sustainability of such gains.

Paths and footpaths are essential spaces in the transport network to support walking and cycling activities. If they are to continue to effectively support increased usage by both groups, management of shared use, particularly where that results in actual or potential conflict, will need to be addressed.

Austroroads has commissioned ARRB Transport Research to investigate actual and potential conflicts between cyclists and pedestrians and to develop best practice engineering, traffic management and urban design measures and education and awareness strategies to minimise conflict and to improved both perceived and actual safety on shared paths and footpaths.

This Working Paper identifies key issues associated with pedestrian/cyclist interaction and conflict through a literature review and consultation with key stakeholders. It also includes a review of current practice in Australia and overseas.

A specific review of the Austroroads *Guide to Traffic Engineering Practice, Part 13 (Pedestrians) and Part 14 (Bicycles)* indicated that, whilst there are no major conflicts between the two documents, neither deals with conflicts in a very complete or satisfactory way. It concludes that:

- Part 13 does not deal to any great extent with shared use or the pedestrian/cyclist conflict that may arise;
- Part 14 has several references to pedestrian/cyclist conflict but there is a need to relate the potential for conflict to engineering design parameters and standards; and
- amendments to reflect the outcome of the study should be produced in a form that suits the new Austroroads publications series, namely a concise guide on the subject supported by a commentary on the issue.

The key issues identified in this review are listed in Table A, overleaf, have been considered and confirmed by the project Steering Committee.

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Table A Key Conflict Issues between Pedestrians and Cyclists on Shared Paths and Footpaths

	Issue	Brief Description
<u>Users and Usage</u>		
Footpath Users	Cycling on footpaths	In some States/Territories, cyclists of all ages are permitted to ride on footpaths. Whilst this has caused concern for some, it appears that the perception of resulting pedestrian/bicycle conflict is greater than the actual number of incidents.
	Education issues	Different rules on roads and paths may send confusing messages to path users.
	Other legal users of paths	Wide range of legal users adds to the complexity of interactions and conflicts between pedestrians and cyclists.
	Unauthorised use of paths	Cyclists using walking paths and trails, or riding illegally on footpaths. May include anything from in-line skates and motorised (2-wheel) scooters to horse riders and trail bikes in various jurisdictions and places. May include illegal parking of vehicles on paths.
	Non-movement uses in activity centres and other busy places	High level of competing, non-movement uses, with consequent pedestrian distraction, as well as high volumes of pedestrians and cyclists in a low-speed environment.
People with Disabilities	Range of abilities	People with disabilities may have physical, sensory, cognitive or intellectual impairments, that are not always apparent to other path users.
Young and Inexperienced Users	Child pedestrians and cyclists	Younger people have little perception of left, right and give way and have immature peripheral vision. They have limited skills, control and co-ordination. Uncontrolled child pedestrians may exacerbate the conflict.
	Novice and returning adult cyclists	Inexperienced adult cyclists are likely to be most comfortable riding on paths, rather than on the road, as a way of gaining experience and developing confidence necessary for riding on the road. They may lack knowledge, competence and/or confidence.
User Behaviour: Awareness	Lack of awareness	Users may be unaware of the fact that the paths is to be shared with other users, and/or of the speed characteristics of the other user. Many pedestrians do not realise they cannot walk on a cycle only path.
	Lack of etiquette knowledge	Both cyclists and pedestrians may lack knowledge as to the rules/guidelines on shared path etiquette and laws.
	Lack of courtesy	Cyclists may not slow down when overtaking pedestrians, or pedestrians may not move over to let the cyclist pass. The conflict may be exacerbated by inattention by pedestrians using earphones and portable music players, hence unable to hear the cyclist.
	Lack of give way	Cyclists not giving way to pedestrians. Complicated by removal of requirement for pedestrians to keep left on paths.
	Poor conspicuity	Users wearing dark clothing, and cyclists not using proper lighting at night. [Note: Solutions may include

	Issue	Brief Description
		improved lighting for paths, as well as user actions.]
User Behaviour: Operational	Users not keeping left	Pedestrian and cyclists not keeping left, even though they would do that if driving/riding on the road. Complicated by removal of requirement for pedestrians to keep left on paths, as advice to pedestrians walking on roads without footpaths is to face the oncoming traffic. As the bicycle is a quiet vehicle, pedestrians (especially those with a hearing impairment, for example) may feel more comfortable facing oncoming cyclists.
	Users travelling in groups	Users taking up the entire width of the path. Walking as a social activity with lack of focus on what is going on around. Walking as 'sightseeing' activity, with lack of focus on what is happening on the path. Cyclists in groups may be in 'social' mode or 'training' mode where the emphasis is on sustained effort.
	Unpredictable user behaviour	Some users such as dog-walkers, children, adults getting a fright may behave unpredictably.
	Lack of warning of presence	Cyclists may lack bells or fail to use them at all or with no sufficient warning, due to image problem, poor enforcement and general poor knowledge of the device. Pedestrians may also fail to give adequate warning of presence.
	Sudden entry onto path	Users entering the path at right angles to approaching users. Poor lateral sightlines especially at property boundaries and minor intersections. Lack of 'access control' (eg continuous accessibility from beaches or recreation areas. Can also occur at train and bus stations, where there may be large numbers of people moving across the path at particular times.
	Users with ancillary equipment	Pedestrians or cyclists carrying large loads occupy more space (eg on entering path with long item such as surfboard – see the TV advert with canoes for a brand of beer). Load itself may be 'unstable' – light but large items (eg surfboard) may blow across path in side breezes. Users may pay attention to managing the load rather than to other users of the path.
	Uncontrolled dogs	Dogs may run out under cyclists if owners are not keeping them on a leash or within arm's reach. Also, parents pushing prams (or people riding bikes) whilst walking the dog may be an issue. Some types of leash not readily visible. Extendable leashes do not necessarily prevent dog from rushing across path away from owner.
Speed	Speed differential between cyclists and pedestrians	Many cyclists wish to travel fast, which causes angst amongst slowly travelling pedestrians and less able cyclists. Many cyclists, even the 'less able' travel faster than pedestrians, or the cyclists themselves, realise. On the other hand, some pedestrians move more slowly than a cyclist might expect.
	Speed differences of different types of pedestrian or cyclist.	Neither pedestrians nor cyclists are homogenous groups. Speed (and style of use) differences within each group will add complexity to interactions <u>between</u> the two groups.
	Speed of other users	Other users will travel at a variety of speeds and may be

	Issue	Brief Description
		less predictable – either objectively, because their speed varies, or subjectively, because pedestrians and cyclists are less familiar with them.
<u>Footpath and Shared Path Planning</u>		
Shared Strategy and Planning	Potential conflict resolution at early stages.	Pedestrians and cyclists have issues in common (especially with respect to motor vehicle traffic) but also issues of conflict. Dealing effectively with these at the early stages of strategy and planning (including organisational structures) would be beneficial.
Network Continuity	Different types of users	Paths are often not suitable facilities for some users (eg commuter cyclists). May be desirable to provide both on-road and off-road facilities for cyclists where there is substantial commuter-type use.
	Lack of linkage	Lack of opportunities to link communities with open space networks, community facilities and public services as well as lack of good connection with local streets. Important to have information and visual linkage as well.
	Interruption of path network	Path interrupted by roads and driveways. Lack of visual, as well as physical, continuity. Infill development can increase the number of driveways and the frequency of usage. Visual continuity can be impaired if crossover/driveway is continuous across path.
Path Location	Inappropriate path location	Inappropriate siting may contribute to conflict, e.g. where a cycle park is placed between a car park and BBQ areas, or in dog leash areas. People will tend to walk on the side of the path that has attractions. Attractions on both sides of path will increase the amount of movement across the path.
	Car parking adjacent to paths	Angle parking adjacent at path at the kerb leads to parked cars overhanging the path and reducing the effective path width. Parallel parking adjacent at path at the kerb leads to problems with car doors opening into the travelled way and, effectively reduces the width of the path as users avoid the kerbside part of the path. Either can adversely affect usability of paths in close proximity to activities/destinations (eg schools, shops) for both pedestrians and cyclists.
	General location deficiencies	User unfriendly and commuter unfriendly paths. Paths adjacent to property boundaries/fences make it difficult and potentially dangerous for both path users and motorists exiting properties across the path – will be exacerbated with infill development (see <i>Network Continuity</i>).
<u>Path Design</u>		
Design Standards	Historically variable, often constrained, with variety of users/usage, including people with disabilities.	May need to design multi-purpose facilities for the ‘higher’ types of usage where there are multiple types of users, either together or at different times (but see, also, <i>Network Continuity</i>). A path may be recreational (relatively slow cycling and possibly high levels of walking) at weekends but commuter during the week.

	Issue	Brief Description
		Primary issue is safety and amenity rather than simple capacity. It may be technically possible to carry a large number of users, but if people don't feel safe they will not use the facility.
Path Capacity	Narrow paths	Paths may be too narrow to comfortably cater for users each way, especially where usage is high and passing frequent. Cyclists may need to leave path if it is not wide enough, which can be dangerous.
	Insufficient path capacity	Paths may be of insufficient capacity to cope with high user volumes and numerous user types, or simply be adapted footpaths.
	High Usage	There will always be greater conflict on shared paths where there is heavy traffic. May require separate facilities for different users.
Path Access and Continuity	Access issues	Issues such as footpaths lacking a ramp to road level or adequate road crossing points.
	Design unsuitable for people with disabilities	People with disabilities and elderly people may be apprehensive about facilities that are not segregated by kerb or physical barrier, or has poor access. The detail of path design (and construction/maintenance) is critical for people with disabilities, as a single non-accessible point can preclude the whole journey.
	Inappropriate landscaping	Poor landscaping may include lack of flat wide grassed area on both sides of the path.
	Lack of detour provisions	Lack of detour provisions and signage when paths are closed.
Path Geometry	Design speed for facilities	Most footpaths are not designed for the speed at which cyclists travel – even 'slow' cyclists will often be travelling 10+km/h.
	Poor line of sight	Poor line of sight on the path may result in collisions from not seeing each other
	Inappropriate path gradients and curves	Paths can be unnecessarily winding, causing cyclists to speed up to reach their destination, have square corners, or be too hilly. Provision of 'rest points' for people with disabilities can introduce disturbing and distracting elements for cyclists.
	Path obstructions	Paths may be obstructed and constricted through the use of seating (formal and informal), bollards, grab rails, signs, safety barriers, bus shelters and bus stop furniture, and other obstacles.
	Street furniture	Street furniture, not directly associated with the movement purpose of footpaths, may impede movement and exacerbate conflicts. Most important for cyclists, at one end of the spectrum, and people with disabilities (including vision-impairment as well as physical disabilities) at the other.
Path Quality	Inappropriate path surface	Path surfaces may not be appropriate to shared use paths, eg. brick paving, concrete joiners. Also, surface changes may lead to confusion. Skid resistance in the wet may be an issue for some surfaces in some locations –affects cornering and braking and on hills.

	Issue	Brief Description
	Path surface irregularities	Potential conflicts between requirements for tactile ground surface indicators (for people with vision impairments) and other users (particularly those with wheels). Issues with utility service covers within footpaths.
	Poor path lighting	Lack of lighting on paths reduces levels of safety and legibility. Includes path delineation as well as overhead illumination.
	Control of loose material	In locations where loose material (eg beach sand) is a consistent hazard, path design/construction should also address management of such material.
Signage and Information	Poor path signage and line marking	Signage could be missing or unclear, with no marked centreline. Poor directional/destination signage can affect levels of use and can also distract users from what is going on around them (other users).
	Unclear map information	Maps and directories not updated and/or not easy to read. Applies to both paper and e-maps. Refer to TravelSmart access maps and DPI (electronic) Access Map for central Perth.
Path Safety	Safety Audit	For new shared facilities and modifications to existing (including change in footpath/shared path status), impacts on safety and convenience of both pedestrians and cyclists need to be assessed.
<u>Path Maintenance</u>		
	Poorly maintained paths	Maintenance activities do not always happen in a timely manner, allowing dangerous conditions to remain. Common issues include flooding, cracks, broken edges, potholes, poorly maintained linemarking signage and landscaping (including overhanging branches).
	Management of extraneous material	Loose material (eg drifting sand, leaves, broken glass and fruit drop from trees, litter) or other impediments (which may include long-term ones such as adjacent to building sites) reduce the effective path width and also create hazards (eg reducing cyclist ability to steer or brake).
	Public utilities	Local governments consistently have problems with path management during, and adequacy of reinstatement of paths following, work by utilities (eg water, gas, electricity, telecoms). Leads to uncertainty, lack of continuity and/or loss of effective width.