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Footpath Cycling Discussion Paper

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1 Executive Summary

This discussion paper has been prepared by MRCagney for Victoria Walks to contribute to an informed debate in response to calls from some cycling organisations for changes to road rules to allow for all-ages cycling on footpaths in Victoria.

Addressing poor cycle safety outcomes is vital. However, there are risks that a rule change may result in unintended negative consequences for both people cycling and walking on footpaths. This paper seeks to provide a holistic view of the potential impacts of increased levels of footpath cycling on all footpath users.

This paper tests a set of six key claims made by proponents and opponents of the proposed law change. It does so by reviewing published evidence on the magnitude of these impacts and providing a professional view from an active transport planning perspective. This summary highlights key findings from the paper.

Will all-ages footpath cycling increase safety risks for people walking?

It is clear that sharing of footpaths by people cycling and on foot introduces risks of cycle-pedestrian collisions. People walking and riding bicycles travel at very different speeds. Road safety principles establish that vehicles and people moving with different levels of kinetic energy should be clearly separated. This clear separation is not possible if people cycling and walking share footpaths that are constrained spaces designed for walking.

While pedestrian-cycle collisions account for a very small proportion of total injuries to pedestrians and cyclists in transport environments, these collisions do have potential to result in serious injury or even fatality. The review of evidence suggests that pedestrians (rather than cyclists) and particularly children and older pedestrians are most at risk from injury from pedestrian-cycle crashes. If a rule change were to result in increased cycling activity on footpaths, there are risks of negative safety impacts for people on foot.

Will all-ages footpath cycling impact on levels of walking activity?

Research on pedestrians' perceptions of footpath cycling and its impacts on levels of walking activity is limited. There are, however, some Australian and international studies indicating the presence of cyclists on footpaths is a real concern for people walking, particularly for elderly or other vulnerable users such as the vision-impaired. Concerns relate to both reduced safety and amenity of footpaths. While a range of other factors are likely to be more important determinants of walking activity, a rule change may shift cyclists' and pedestrians' sense of the 'ownership' of footpath space. The negative impacts of a rule change are likely to be most acutely felt by vulnerable pedestrians such as the elderly.

Will all-ages footpath cycling reduce safety risks for people cycling?

Improving cycle safety is an important goal and an implicit assumption behind advocacy of permitting all-ages footpath cycling is that it will improve safety outcomes for people using bikes. However, footpath cycling represents a heavily comprised approach to separating cyclists from high-speed traffic and best practice cycle facility design guidance is clear that providing dedicated protected cycling space is preferable.

There is no clear evidence that cycling on footpaths is safer than cycling on the street. While the evidence is somewhat mixed, crash risks for cyclists may be higher on the footpath than on the road. There is clear evidence that footpaths should not be considered ideal safe cycling environments. Advocacy for footpath cycling appears to be based on the misconception that it is safer. Footpath cycling is accompanied by a distinct set of safety risks for cyclists, particularly associated with visibility between motor vehicles and cyclists at intersections and driveways. Footpaths are not designed for the speed and dimensions required for cycling, with most footpaths being narrow spaces and many being in poor condition with uneven surfaces.

Will all-ages footpath cycling increase cycling activity?

Clear conclusions on the extent to which a rule change to allow for all-ages footpath cycling would impact on rates of cycling participation appear to be difficult to establish. There have been no studies of the impact on cycling participation accompanying previous road rule changes in Australian jurisdictions. Analysis undertaken for this paper finds that recent rule changes in South Australia and Western Australia have not been accompanied by significant changes in participation rates in the short time period since all-ages cycling has become permitted. While cycling participation is influenced strongly by perceptions of safety and footpath cycling may be perceived as providing a safer cycling option by some users, there are likely to be other policy measures that have a more substantive impact on perceptions of cycle safety and subsequent uptake.

There is also a question whether footpath cycling *should* be accompanied by increased participation (or encouragement of participation) when common perceptions about the relative safety of footpath and on-road cycling appear to be out of step with research findings on actual safety outcomes. Related to this is consideration of the message that legalising footpath cycling would send to the community. It would signal that relevant authorities believe it is appropriate and safe, when the evidence does not appear to support that assertion.

Will all-ages footpath cycling impact on the functionality of footpaths?

There is potential for adoption of all-ages cycling and accompanying increases in footpath cycling activity to threaten the effectiveness of footpaths in accommodating a diverse range of social functions including both transport and public realm functions. While there is little evidence that this is a major problem in jurisdictions that allow all-ages footpath cycling, increased cycling volumes on footpaths are likely to be incompatible with successful multi-function footpath spaces, particularly in activity centres and city centre locations.

Will all-ages footpath cycling change cycle infrastructure decision making?

There are risks that a rule change to allow for all-ages cycling on footpaths may lead infrastructure decision-makers to reduce priority accorded to high-quality on-road separated cycle facilities. There are also risks that issues of liability for local governments may emerge due to the need for footpaths to adequately provide for cycling users.

In summary, decision makers need to consider the full range of impacts for both cyclists and other users of footpaths in making decisions. Footpath cycling is not an adequate solution to the challenge of reducing cycle conflicts with high-speed traffic. Objectives for cycle safety are likely to be more effectively achieved through increased provision of high-quality cycling infrastructure together with a package of alternative measures that avoid unintended negative consequences for other vulnerable road users.

2 Introduction

2.1 Purpose of this paper

This discussion paper has been prepared by MRCagney for Victoria Walks to contribute to an informed debate about changing road rules to allow for all-ages cycling on footpaths in Victoria. In particular, it responds to recent advocacy from some cycling groups to amend rules in Victoria and New South Wales following recent changes in South Australia in 2015 and Western Australia in 2016 which allow for people of all ages to cycle on footpaths.

The purpose of the discussion paper is to provide an independent summary of evidence on the potential positive and negative impacts of such road rule changes in Victoria. It seeks to inform community and government decision-making on this issue.

The public debate on footpath cycling to date has been largely absent of substantive evidence. Proponents of allowing all-ages footpath cycling have generally focused on assumed benefits to cycling safety and participation rates. This paper tests these claims and highlights potential for unintended negative impacts on the safety of people walking and the functionality of footpaths for transport and public space purposes.

2.2 Background

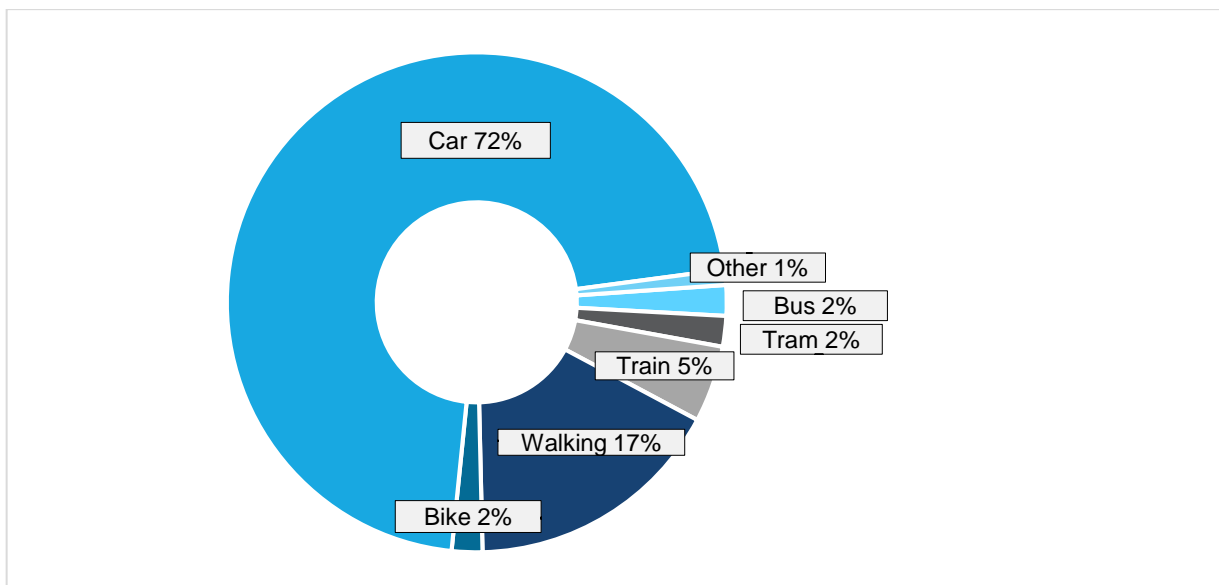
Current road rules in Victoria allow children under 12 and (if applicable) an accompanying adult to use footpaths for cycling. There is also a limited exemption for cyclists with a medical certificate. Otherwise, cyclists of age 12 and above may not legally cycle on footpaths and must cycle on road carriageways and designated shared or cycle paths.

Rules concerning footpath cycling vary across Australian states and territories. All-ages footpath cycling is permitted in jurisdictions other than Victoria and New South Wales. However, the majority of Australia's population (58%, ABS 2018) lives in these two states where all-ages footpath cycling is not permitted.

Various cycling groups have advocated for the age limit to be changed to allow teenagers to ride on the footpath or, especially after the changes in South Australia and Western Australia, to allow adults to ride on the footpath.

Advocacy for all ages footpath cycling in Victoria and New South Wales generally seeks to improve the safety of cycling and uptake of cycling as a transport mode; both objectives which are well-supported by policy across all levels of Australian government. Both cycling and walking are important modes of transport, but there is broad recognition that both modes could play a more significant role in meeting growing transport demands, particularly in urban areas. There are numerous benefits from mode shift to both walking and cycling including health benefits for users and broader traffic congestion and emissions reductions benefits.

Walking is currently used for 17% of all household trips across Metropolitan Melbourne while cycling is used for 2% of trips (VISTA 2016, Figure 1). These are average figures across the metropolitan region and walking and cycling mode share are much higher in some locations within the city. For example, walking trips constitute 66% of all internal trips within the City of Melbourne municipality (VISTA 2016). These figures highlight that walking and cycling are both important transport modes, although walking is more universally adopted. Efforts to increase cycling uptake, such as footpath cycling rule changes, need to ensure that such changes do not impinge on complementary goals for also increasing walking uptake.

Figure 1 Weekday household transport trips by mode, Metropolitan Melbourne 2016

Source: VISTA, 2016.

2.3 Scope

This discussion paper focuses on identifying and summarising the evidence for a range of potential positive and negative impacts of rule changes to allow for all-ages footpath cycling in Victoria. It seeks to understand the incremental impacts from revisions to the existing law that extend permission for footpath cycling from people age 12 and under to people of all ages. It does not seek to question the current rules allowing for children to cycle on footpaths.

This paper also specifically addresses the question of cycling on footpaths rather than the issue of people walking and cycling on off-road shared paths.

This discussion paper summarises key findings from relevant published international literature but does not provide new primary research.

2.4 Approach

This paper is structured around a set of key potential impacts from adoption of all-ages footpath cycling. For each impact, the following is provided:

- a) A summary of relevant published evidence on the extent of the impact
- b) Discussion on the extent of impacts based on our professional view as experts in active transport planning.

The paper aims to test commonly made or implied claims such as 'footpath cycling will increase safety for cyclists' or 'footpath cycling will increase cycling participation'. Table 1 provides a summary of six key impacts identified as potentially arising from adoption of all-ages cycling and the mechanisms through which these impacts are hypothesised to occur. The body of this paper is organised by the six types of potential impacts listed.

In general, a rule change to allow for all-ages footpath cycling can be expected to result in increased cycling activity on footpaths and some shift from on-road to footpath cycling. There is already some non-compliant cycling activity on footpaths. This level of cycling activity can be expected to increase with a rule change, which would be accompanied by various impacts as outlined below. It is important to note, however, that actual level of behaviour change with regard to footpath cycling following a rule change is uncertain and a rule change may not necessarily lead to substantial increases in footpath cycling activity.

Table 1 Overview of theoretical potential impacts arising from adoption of all-ages footpath cycling

Potential impact	How the impact may occur
More (or less) crashes and changes in crash severity for people cycling	<p><i>More crashes:</i> Shift from on-road to footpath cycling and new uptake of footpath cycling may result in increased crashes involving cyclists on footpaths (cycle-vehicle collisions or cycle-only crashes) due to increased safety risks from riding on infrastructure not specifically designed for cycling (eg increased conflict points at driveways and intersections, poor quality footpath surfaces).</p> <p><i>Less crashes:</i> Shift from on-road to footpath cycling may result in reduced crashes or less severe crashes involving cyclists due to lower risks of vehicle-cyclist collision on footpaths compared with roads.</p>
Increased cycling participation and activity	Ability to cycle on footpaths may encourage new cycling users to take up cycling or existing cyclists to increase their cycling activity by reducing barriers associated with perceived (and actual) safety problems from cycling with traffic on roads.
More crashes between people walking and cycling	Increased levels of cycling activity on footpaths may increase risk of cycle-pedestrian crashes.
Reduced functionality of footpaths for transport and public realm functions	Increased levels of cycling activity on footpaths may reduce the functionality of footpaths for walking and for enabling a broader range of public realm functions including footpath dining, lingering, conversation and play.
Reduced walking activity	Increased levels of cycling activity on footpaths may discourage some people (particularly more vulnerable people such as the elderly) from walking due to fears of increased safety risks.
Reduced investment in high quality cycling infrastructure	Allowing all-ages footpath cycling may result in perceptions by infrastructure providers such as local government that safe cycling facilities are now available and that dedicated cycling facilities are unnecessary.

3 Summary of evidence

3.1 Impacts on safety for people walking

A potential negative, but unintended, impact of adopting all-ages footpath cycling is an increased risk of crashes and injury between cyclists and pedestrians operating within confined spaces. While allowing footpath cycling is often intended to reduce safety risks for cyclists, there is also potential for risks to be transferred to pedestrians as cyclists shift from on-road to footpath cycling. Cyclist-pedestrian injury crashes are not as common as motor-vehicle crashes, but they do occur and can be serious and, in some cases, fatal. All ages footpath cycling is likely to lead to higher levels of footpath cycling, increasing the risk of cyclist-pedestrian crashes.

This section describes the nature of the safety risk from pedestrian-cyclist collision, existing rates of pedestrian-cyclist collision and provides an assessment on what impact the introduction of all-ages footpath cycling could have on safety for people walking.

3.1.1 Pedestrian-cyclist safety risks

Safety risks from people walking and cycling sharing footpath space are based on substantial speed differentials between cycles and people walking. People walking generally travel at speeds of 3 – 5km/h while cyclists commonly travel at 20 – 30km/h. Collisions between people or vehicles travelling at speed can lead to serious crashes and a basic principle of safe traffic and transport systems is the separation of traffic flows that differ in speed, direction and mass (differences in kinetic energy).

While the difference in the speed and mass between a car and cyclist would appear to be significantly greater than the speed and mass difference between a cyclist and pedestrian, the kinetic energy differential between a car and a bike is, in fact, similar to that between a cyclist and a pedestrian (Grzebieta et al. 2011). In practice, this means that a typical car travelling at 50 km/hr compared to a typical cyclist travelling in the same direction at around 30 km/hr has a kinetic energy ratio of around 44:1 in favour of the car. By comparison a typical cyclist travelling at 30 km/hr and a typical pedestrian travelling at a walking speed of 5 km/hr in the same direction has a kinetic energy ratio of approximately 48:1 in favour of the cyclist (Grzebieta et al. 2011). However, it is noted that while speed and mass differentials play a significant role in surface transport injuries, the severity and extent of injury is also influenced by the shape and rigidity of the vehicles involved (Khorasani-Zavareh et al. 2015).

The dynamics of pedestrian-cyclist crashes have not been a focus of previous road safety research. However, available literature suggests that in crashes between pedestrians and motor vehicles the primary impact with the vehicle causes the most severe injury to the pedestrian (Graw et al 2002), whereas in crashes between pedestrians and cyclist the most serious injuries sustained by the pedestrian are because of secondary impacts to the pedestrian's head after hitting the ground (Graw et al 2002). Researchers modelling bicycle-pedestrian crashes found that the risk of a head injury to a pedestrian occurs at impacts with bikes travelling as slow as 10 km/h (Short et al. 2007).

Research into the speed of cyclists using footpaths has produced various conclusions with some research suggesting that average cyclists' speeds are lower compared to on-road or shared path environments and others suggesting there is little difference between observed footpath and on-road cycling speeds. A study from Sydney and Newcastle found the average speed of cyclists on footpaths was 21 km/h, the same speed as cyclists on roads. Average observed speeds on a shared path in Brisbane were 6 km/h for walkers and 21 km/h for cyclists (Virkler et al. 1998). Other research finds slower cycling speeds on footpaths in overseas contexts

(11 km/h on footpaths compared with 29 km/h in traffic) (De Rome et al. 2011). A Japanese study found that the average speed of cyclists on the footpath dropped from about 12 km/h when there were no pedestrians to about 6 km/h when there were six pedestrians within 20 metres of the bicycle (Kiyota et al 2000). These overseas findings on footpath cycling speed may not be relevant to Australian contexts due to differences in cycling cultures and the Australian studies suggest people on bikes travel substantially faster than people walking on shared paths or footpaths.

It is clear that there is potential for substantial speed and hence kinetic energy differentials between people riding bikes and people walking on footpaths which creates crash risks.

3.1.2 Rates of pedestrian-cyclist crashes

Data on pedestrian-cyclist crashes is generally incomplete (in contrast to very detailed and complete records of on-road crashes involving registered vehicles). The limited record keeping of pedestrian-cyclist crashes is a key constraint in understanding the prevalence of pedestrian and cyclist conflicts. Several studies have been conducted in Victoria and New South Wales using hospital admissions data to attempt to quantify the number and severity of pedestrian-cyclist crashes.

A study of New South Wales hospital presentations from 2008/09 found that 40 pedestrians had been injured as a result of collisions with cyclists. This accounted for 1.5% of the more than 2,600 hospitalised pedestrians (Henley et al. 2012). A study of traffic-related pedestrian crashes which required hospital treatment in Victoria between 2006 and 2008 found that a total of 3,483 pedestrians were treated (Cassell et al. 2010). Of these, approximately 73 people, or 2.1% were identified as being because of a collision with a cyclist. Of pedestrian crashes with a cyclist requiring a hospital admission, a total of 35 cases were classified as being 'serious' (Cassell et al. 2010). A similar study in Victoria found that between July 2010 and June 2013 a total of 3,075 pedestrians were admitted to hospital for road crashes. Of these, 95, or 3.1% were the result of collision with a cyclist (Oxley et al. 2014). The low proportion of pedestrian injuries resulting from collision with bicycles is generally consistent with the low proportion of transport trips undertaken by bike (2% in Melbourne).

A survey of cyclists in Queensland interviewed 2,500 respondents about crash history (Haworth & Schramm, 2011). Of the respondents' most serious crash-related injuries in the last two years, 72 (5.8%) occurred on the footpath. Of these footpath crashes, 69% were single-vehicle crashes (involving only the bicycle) while 10% involved pedestrians.

According to British government data, between 2003 and 2012, 23 pedestrians were killed in collisions with cyclists and 585 injured, whereas 4,894 pedestrians were killed in collisions with motor vehicles and 45,496 were injured. However, the distance travelled by people in motor vehicles is as much as 50 times the distance travelled by people on bikes in urban areas. Using corresponding casualty data, the relative fatality risk for pedestrians of crashes with motor vehicles is five times higher than from crashes with cyclists, but the risk of serious injury is about the same (Rathi 2014).

A study of NSW hospitalisations for cyclists and pedestrian road crashes provides further detail on differences across age groups and gender. Pedestrians at most risk of hospitalisation from collisions with cyclists are children (less than 10 years) and elderly (over 70 years of age) (Chong et al. 2010) (see Table 2). The study also concluded that in cycle-pedestrian crashes the pedestrian is the one generally at greater risk of injury.

A Victorian study further supports that vulnerable pedestrians such as the elderly and vision impaired are likely to be at most risk of cycle-pedestrian collisions. A survey of 607 Victorians with vision impairment found that 8% had been involved in a road collision while walking and 20% in a near collision over the previous five years. A quarter of these were with bicycles (Oxley et al. 2014).

Table 2: Frequency of hospitalisations for cyclists and pedestrians by collision type, gender and age, NSW July 2010 to June 2005

Age group	Male				Female			
	<10	10-19	20-26	>65	<10	10-19	20-26	>65
Pedestrian injuries resulting from pedal cycle collisions	34	15	22	13	18	7	34	20
Cyclist injuries resulting from collisions with pedestrians or animals	*	*	30	*	*	*	8	*
Cyclist injuries resulting from Motor Vehicle	127	396	784	46	30	38	137	*

*Cell sizes of less than five have been removed to prevent identification.

Source: NSW Admitted Patient Data Collection (HOIST), Centre for Epidemiology and Research. NSW Department of Health in Chong et al. 2010.

3.1.3 Overall assessment

There is clear evidence that people walking and cycling on footpaths generally travel at very different speeds introducing a safety risk. There is also evidence that cyclist-pedestrian collisions do currently occur and can result in serious injury and, in rare cases, fatalities.

Nevertheless, both pedestrians and cyclists are at much greater risk from collision with motor vehicles. Pedestrian crashes with cyclists appear to involve only a very small proportion of total pedestrian road crashes. This may, however, reflect low levels of exposure to cyclists from relatively low levels of cycling activity rather than any inherent safety in the interaction between pedestrians and cyclists.

Chong et al (2010) conclude their NSW study by arguing that the large numbers of collisions between cyclists and motor vehicles resulting in death or injury indicates strong efforts should be made to protect cyclists from motor vehicles. However, the injury from collisions between cyclists and pedestrians is not inconsequential and transforming pedestrian footpaths into shared cyclists and pedestrian spaces needs to be approached with caution. They suggest that an increase in shared space between cyclists and pedestrians without appropriate controls may place an additional injury burden on pedestrians, particularly older pedestrians.

Allowing all-ages footpath cycling and consequent increases in cycling volumes on footpaths can be expected to increase pedestrian's exposure to risks of collisions with cycling. Under a future scenario where both rates of walking and cycling increase this exposure rate could increase further. Additionally, with the projected increase in the size of the aged population in Australia risks from pedestrian-cyclist collision may be further exacerbated.

3.2 Impacts on walking activity

A second potential impact from adoption of all-ages footpath cycling is on levels of walking activity. Increased volumes of footpath cyclists could discourage people from undertaking walking activity. This may be particularly the case for vulnerable groups such as elderly, people with vision impairments and people with a disability for which the presence of cyclists in walking environments may be most concerning.

There is evidence that the presence and behaviour of cyclists is a key concern for older pedestrians. Research on the attitudes and options of senior Victorians regarding walking found that approximately 40% of respondents identified cyclists on shared walking and cycling paths to be a factor which discouraged them

from walking (Garrard 2013). This is similar to the proportion of people who indicated drivers failing to give way to pedestrians as a factor discouraging them from walking. By comparison 50% of respondents identified off-leash dogs, 45% identified poorly-maintained footpaths and 41% identified poorly lit footpaths as barriers to walking. When asked which factors which would impact positively on their feelings of safety, better cyclist behaviour on shared paths and reduced cycling speed on shared paths were identified as being most significant (Garrard 2013).

A study researching the perceived barriers to walking among 750 people participating in walking programmes in England and Scotland also found that perceptions of cyclists were a barrier to walking for a broader range of users beyond more vulnerable elderly pedestrians (Dawson et al. 2007). The study followed participants in walking programmes aimed at encouraging sedentary adults to become more active. Participants were asked to respond to questionnaires at the beginning and the end of a 12-month period to gauge what they perceived to be barriers to neighbourhood walking both before and after participating in a structured walking programme.

At the beginning of the study 9% of respondents indicated that the fear of being knocked down by a cyclist riding on the footpath was a barrier to walking, while after 12 months participating in the programme this grew to 17% of respondents. By contrast, 28% of people at the beginning of the programme expressed a fear relating to personal safety or being attacked in the first questionnaire but this response was significantly reduced in the follow up questionnaire. The study suggests that the presence and behaviour of cyclists in pedestrian environments is perceived by people as a barrier to walking and as people undertake more walking activity it may become a greater concern.

Vision Australia which advocates for people living with vision impairment and the Council of the Aging (COTA) which advocate on the behalf of older Australians have previously opposed attempts to allow increased footpath cycling (Victoria Walks et al. 2015). In their advocacy, these organisations have suggested that footpath cycling increases the risks and barriers to those dependant on walking to access shops, services and participate fully in the community.

3.3 Impacts on safety for people cycling

An apparent underlying assumption for advocacy of all-ages footpath cycling is that it would improve the safety of existing and prospective cyclists by providing an alternative to using high-speed and high-traffic environments for cycling. Bicycle Network's recent *Bike Rider Fatality Report* (2018), for example, includes a recommendation for legalising all-ages footpath cycling in Victoria and NSW among a set of 14 recommendations aimed at reducing cyclist injuries and fatalities from road crashes.

Advocates have generally not provided substantive evidence that footpath cycling will lead to safer outcomes for cyclists. However, these arguments appear to be based on the assumption, that may seem reasonable at face value, that footpaths which are separated from parallel traffic will provide safer environments than on-road cycling. This section tests these claims against available evidence.

3.3.1 Cycle safety risks on roads and footpaths

Current safety outcomes for cyclists in Australia are poor and road crash rates remain unacceptably high. Over the past 20 years, an average of 38 people riding bikes have been killed in road crashes each year, with no clear trend in reduced fatality numbers during this period (Bicycle Network 2018). The main cause of road crash fatalities for people riding bikes is collisions with motor vehicle (83% of total fatalities). Collision with high speed traffic presents particular dangers, with 95% of Australian cyclist fatalities occurring in speed zones of more than 50km/h (Ibid.).

Physically separating people riding bikes from high-speed traffic is a well-established principle behind road safety planning and effective street design. For example, VicRoads guidance on cycle facility design and network planning is underpinned by the principle of separating strategic cycling corridors from high volumes or high speed traffic through route-planning and on-road design treatments (VicRoads 2016). VicRoads guidance suggests that mid-block physical separation of cyclists from traffic should be provided in contexts where average traffic speeds are higher than 30km/h and/ or traffic volumes are higher than 3,000 vehicles/day (Ibid.). Recommended separation treatments include 'protected separated paths' with a raised separator or 'kerb separated paths' with vertical separation between the road carriageway and cycle path.

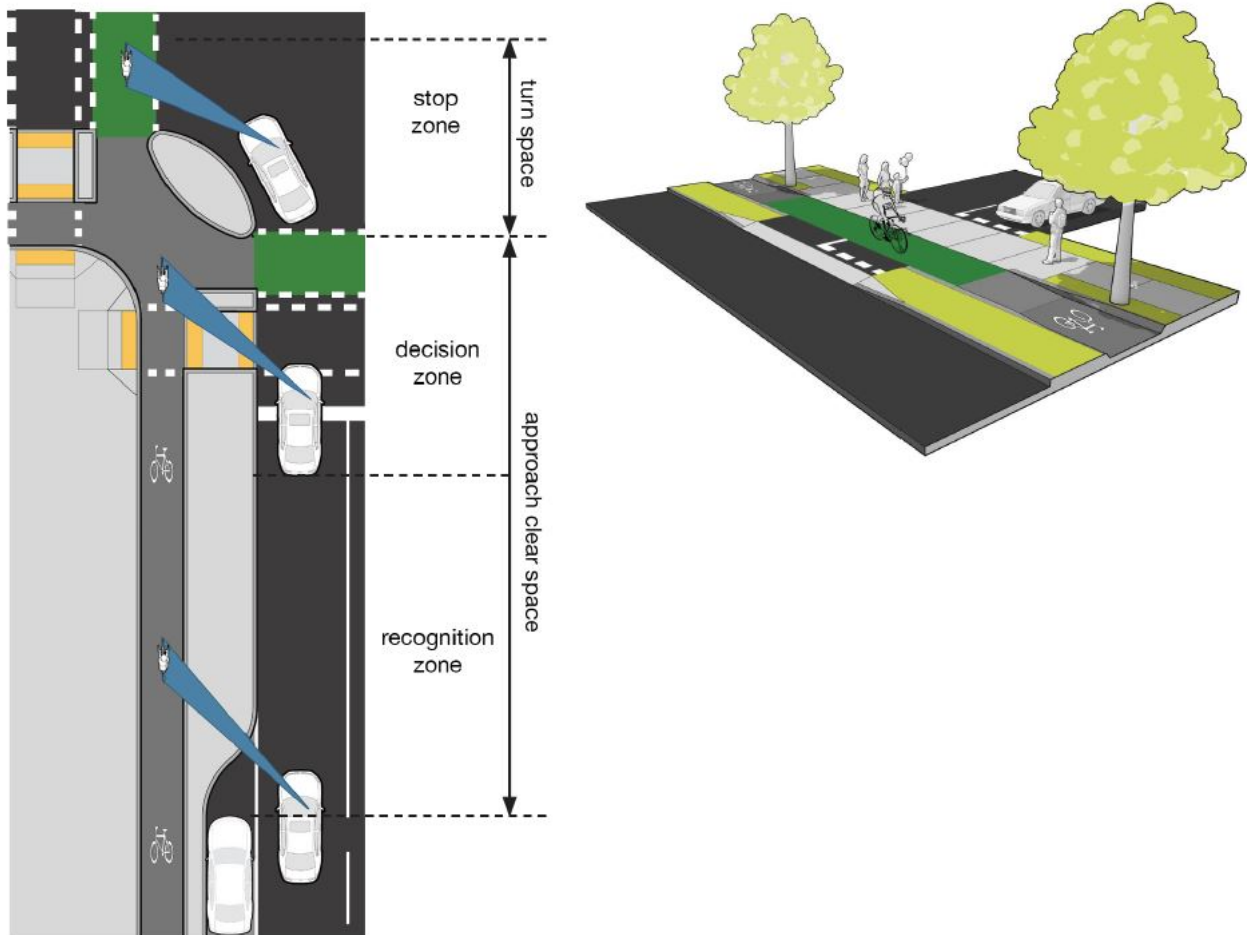
While footpath cycling is not identified as a potential design treatment by existing Victorian cycle design guidance (as it is not permitted for all-ages cycling), with changed road rules, opening up footpaths for cycling could potentially provide a 'second best' and low-cost approach to separating cycling from traffic at mid-block locations.

However, while footpath cycling may reduce some exposure of cyclists to high speed traffic at mid-block locations, it does not constitute an ideal safe cycling environment consistent with best-practice cycle facility guidance. Footpath cycling does little to eliminate conflict points with motor vehicles at intersections or driveways (and may indeed exacerbate potential for conflict) and introduces a number of unique hazards for cyclists associated with using infrastructure that is not designed or intended for cycling use.

At intersections and driveways, footpath cycling may lead to particularly problematic safety conditions for cyclists. Intersections are locations for a high proportion of overall cycle crashes while driveways are the location where most footpath cycling crashes occur (Ward and Mackie 2016). Victorian cycle facility guidance suggests that best practice design for cyclists at intersections will allow for a clear 'recognition zone' ahead of the intersection to allow for turning vehicles to clearly see moving cyclists, a stop zone to allow for both cyclists and vehicles to safely stop and give way to each other and features such as green painted zones over the intersection to indicate the potential for the presence of cyclists (VicRoads 2016, see Figure 2). These features will generally not be provided in contexts where footpaths are opened up for cycling without any additional infrastructural treatments. Such features at intersections are more important for cyclists than pedestrians due to the higher speeds of people on bikes, allowing less reaction time if cyclists are not seen by people in motor vehicles (Ward and Mackie 2016).

Motor vehicle users and people on bikes may also be less aware of each other with footpath cycling as they are not physically present together on the roadway. Cyclists and drivers may potentially be obscured from each other by features such as parked cars, trees, vegetation, fences and street furniture. This reduced awareness may introduce safety risks at intersections where footpath cyclists need to cross the roadway between footpaths. These types of situations may also introduce additional points of confusion for road users, as right of way between vehicles and cyclists may be unclear. Instances of footpath cycling where cyclists are travelling the 'wrong way' (against the traffic direction) across intersections may introduce particular risks of drivers being unaware of cyclists.

Figure 2: Best practice intersection design for cycling in high-traffic, high speed contexts (left) and best practice driveway/ sidestreet treatments (right)



Source: VicRoads (2016).

At driveway and minor side-street intersections, there is also potential for conflict between people cycling on footpaths and motor vehicles. New Zealand research has found that driveway locations pose the greatest safety risk for cyclists on footpaths (Ward and Mackie 2016). Best practice design guidance for accommodating safe cycling in these contexts includes providing clear priority to cyclists through painted lanes or raised platforms and good visibility for both motor vehicles and cyclists approaching the conflict point (Vic Roads 2016, see Figure 2). These conditions are unlikely to be met where most footpaths cross side streets or driveways. Features such as high fences on property boundaries and footpaths being located hard against the property boundary can reduce visibility between motor vehicles using driveways and crossing cyclists (Ward and Mackie 2016). Again, the potential speed of cyclists means that these visibility problems are much greater for cyclists than pedestrians.

In addition to footpath cycling having the potential to exacerbate safety risks for cyclists at intersections and driveways, cyclists can also face a number of unique safety hazards on footpaths. Footpaths are not designed for cycling and the following features can introduce risks for cyclists:

- Narrow width of footpaths and limited passing provision
- People entering and exiting properties (eg shops)
- Cracked, broken and uneven footpath surfaces

- Leaves, rubbish or debris
- Obstacles such as signs, lights, bollards, bus shelters
- Overhanging foliage
- Children playing or dogs, on or off-lead.

The conditions of typical footpaths do not match the design standards for shared paths, which are specifically intended to cater for the safe movement of pedestrians and cyclists travelling at different speeds in a shared environment. The most significant difference is the guidance for path width, with shared paths typically double the width (2.5-3.0 metres) of a residential footpath (1.2 metres). It is also noted that the width of a typical footpath generally does not match the standard set for protected cycle lanes which have a desirable width of 1.5 metres and a minimum of 1.2 metres for unidirectional lanes (VicRoads 2014). Other shared path design standards include requirements for curve radius, side clearance and lines of site. Shared path guidance for adequate side clearance or run off areas is rarely met on residential footpaths with property fences commonly hard up against the footpath. Footpaths are typically bordered on at least one side by nature strips, which are maintained to varying standards by adjoining landowners and may or may not present additional risks if a rider is required to move off the path. Where the footpath immediately adjoins the roadway, the kerb will present an additional hazard. These factors provide little tolerance for error with footpath cycling.

3.3.2 Footpath cycling crashes

The previous section identifies that footpaths do not constitute ideal safe cycling facilities. Nevertheless, a key question in determining the safety impacts of adopting all-ages footpath cycling is whether cycling on footpaths may be safer than cycling on roads. This section reviews the rates and severity of cyclist crashes in footpath environments compared with on-road environments.

Ward and Mackie (2016) reviewed New Zealand road crash records between 2006 and 2015 (when footpath cycling for people of any age was not permitted) and found that 1,055, or 10% of recorded road crashes involving cyclists were on footpaths, with the remainder on roads. They do not attempt to establish a relative exposure rate for crashes on footpaths compared with other environments (eg by relating this proportion of cycling crashes in various environments with the proportion of distance cycled in these environments).

There are serious limitations with road crash records for understanding the frequency of cycling crashes, especially off-road, as many are not recorded. To overcome these limitations, some studies have undertaken interviews with cyclists on crash experiences. A study in the Australian Capital Territory undertook detailed interviews with cyclists on the location and contributing factors of cycling incidents (De Rome et al. 2011). It found that the largest proportion of participants had crashed in an on-road traffic environment (39%), followed by off-road shared paths (36%), off-road footpaths (17%) and on-road cycle lanes (8%). A similar study in Queensland found that of respondents' most serious crash-related injuries in the last two years, 6% occurred on the footpath while the largest number of crashes occurred on urban roads without bicycle markings (38%), followed by off-road/trails (17%) and bike paths (14%) (Haworth & Schramm, 2011). The proportion of crashes on footpaths in this study roughly matched the proportion of cycling distance travelled on footpaths.

In assessing the relative risk of cycling in different environments some research finds that cyclist accidents are more likely on the footpath than the road, particularly where cycle lanes are available. Ward and Mackie's (2016) international literature review reports that cyclist crash rates have generally been found to be higher on footpaths and shared paths than in on-road environments. They suggest this indicates that the separation of cyclists from traffic is not sufficient to enable safe cycling and that many cyclist crashes do not involve motor vehicles but are single-cycle crashes.

A study of crash and injury rates for more than 2,000 adult cyclists in NSW found that 11% of crashes were on the footpath (Poulos et al 2011). Given the comparatively low level of cycling on footpaths compared to other cycling environments, the authors estimated that the crash rate for cyclists on the footpath was 5.6 times that of cyclists on the road and the injury rate was 4.5 times greater.

An international literature review of the impact of cycling infrastructure on cycling injuries found that “most studies that considered sidewalk-riding suggested that it is particularly hazardous for cyclists, with estimates of 1.8 to 16 times the risk of cycling on-road” (Reynolds et al 2009).

With regard to relative crash *severity* for cyclists on footpaths and roads (as opposed to total crash *rate*), Ward and Mackie (2016) report that their literature review is inconclusive. They review eight studies on relative crash severity of road cycling crashes against footpath and shared path crashes. Five studies find that injury severity is lower while three studies find opposing results with cyclist injuries on footpaths and shared paths being more severe than on roads.

De Rome et al's (2011) ACT study finds that cyclists who crashed on shared paths or in traffic experienced higher injury severity (ISS; 4.4, 4.0) compared to those in cycle lanes or on footpaths (3.3, 3.4). A greater proportion of on-road cycle lane accidents were classified as being AIS3 or greater compared to footpath accidents (6.3% to 2.9%). Haworth and Schramm's (2011) Queensland study also found that footpath crashes generally resulted in less serious injuries than crashes on urban roads. Head injuries, concussion and internal injuries were less common in footpath crashes than crashes in other locations, although broken bones were more common and rates of hospitalisation were similar. In contrast, a recent Canadian study (Cripton et al 2014) found that crashes on footpaths or multi-use paths have considerably higher odds of ambulance transport and hospital admission than crashes in other contexts.

The research in this area does not necessarily distinguish between age groups, so it is difficult to reach any conclusions as to whether the risks of footpath cycling would vary between teenagers and adults. Research indicates that teenage cyclists indulge in greater risk-taking behaviour than adults (Ellis 2014). This suggests that, compared to adults, their riding behaviour would be a greater risk to themselves (and potentially others) on the footpath, but they would also be at greater risk on the road.

It should be noted that intersections are key risk locations for cyclists regardless of whether they are riding on the footpath or entirely on the road. This can present methodological challenges in comparing road cycling against footpath cycling, as some footpath cycling crashes will occur on the road when the cyclist reaches an intersection or otherwise exits the footpath. It is not clear whether this type of crash is adequately captured in studies of footpath cycling crashes.

3.3.3 Overall assessment

It is clear that footpaths are not particularly safe environments for cycling and that despite data collection limitations, there is a record of cyclist crashes on footpaths. Cyclist crashes on footpaths have been found to constitute between 6% and 17% of all cyclist crashes in road environments in Australian and New Zealand contexts. This is despite the fact that a low proportion of cycling occurs on footpaths and it is generally illegal in a number of jurisdictions. Key risk locations for footpath cycling crashes are at intersections and driveway entrances to properties. Footpaths are generally not designed to accommodate the relatively high speeds of cyclists compared with pedestrians and visibility problems can be significant.

Reviews of the international literature have concluded that crash exposure rates (in terms of total number of crashes of any severity) are higher on footpaths and on shared paths than in other cycling environments. However, existing research draws less clear conclusions about the relative severity of crashes in different

cycling environments. While there are records of serious injuries on footpaths, some (but not all) of the research finds a greater proportion of lower severity crashes on footpaths than on roads.

3.4 Impacts on cycling activity

Some cycling advocates argue a potential positive impact of all-ages footpath cycling is that it could increase the rate of cycling participation as it would allow less confident riders to cycle in an off-road environment where the level of safety is perceived to be higher. It is well-established that perceptions of the poor safety of cycling are a key barrier to higher rates of cycling participation.

Clear conclusions on the extent to which a rule change to allow for all-ages footpath cycling would impact on rates of cycling participation appear to be difficult to establish and from the outset it should be noted that cycling uptake is influenced by a range of other factors.

Research from Queensland (where on-footpath cycling is legal) explored the characteristics of people who cycle on the footpath and their reasons for doing so (Haworth & Schramm, 2011). It found that footpath cycling was more common among new riders than continuing riders. A larger proportion of the distance ridden by new riders was on footpaths (6.5%) than for continuing riders (3.9%). This suggests that new and less experienced cyclists may be more attracted to footpath cycling environments than more experienced riders. However, it also shows the vast majority of cycling (even for new cyclists) is undertaken within other cycling environments.

The study also found that footpath cycling was more common for utilitarian cycling purposes and least likely for recreational or sporting purposes. This may reflect that footpaths do not provide for cycling at higher, sports cycling speeds (compared with on-road environments) or for recreational cycling in more relaxed states which may be better suited to shared paths. The research found that regardless of trip purpose, about two-thirds of all riders who rode on the footpath reported doing so reluctantly (Haworth & Schramm, 2011).

A 1988 study (Drummond) attempted to quantify the impact legal footpath cycling would have on the number of cycling trips in Victoria. The study conducted a survey and asked respondents to indicate how far they would cycle and on which cycling environments. The survey concluded that if footpath cycling was legalised, 17% of non-cyclists indicated that they would start riding a bicycle.

Recent changes to footpath cycling rules in South Australia (2015) and Western Australia (2016) offer a test case for impacts on cycling participation rates. While the changes are very recent and may require longer to 'bed down' for accurate assessment, analysis of data from the Australian Cycling Participation Survey (National Bicycle Council 2017) does not reveal any clear shift in cycling participation rates since the changes.

In South Australia, between the April 2015 survey and the April 2017 survey, the participation rate for all forms of cycling declined while the rates of people who had cycled in the last week and month remained stable. In West Australia where all-ages footpath cycling was introduced on April 2016 there was a marked decline in weekly and monthly cycling participation in West Australia between April 2015 and April 2017 and a smaller decline in yearly participation. It appears that no effort has been made to study rates of cycling before or after the introduction of all-ages footpath cycling in any Australian jurisdiction and as such it is difficult to evaluate the impact of this rule change on participation. The Australian Cycling Participation survey records participation rates from between 2011 and 2017 and therefore does not enable a direct comparison of the cycling rates before and after its introduction in Australian jurisdictions such as Queensland where all-ages footpath cycling has been legal for a longer time.

Inferring conclusions about the impact of all-ages footpath rule changes on cycling participation rates from this type of analysis should be treated with caution as cycling participation rates are influenced by a range of factors such as economic activity; availability and cost of transport alternatives; location of employment and housing; and the popularity of alternative recreational activities. Nevertheless, it appears that the introduction of all-ages footpath cycling alone has not been able to arrest the long-term decline in cycling participation in the jurisdictions where it has been recently introduced and has not resulted in a significant step change in uptake of cycling.

A final issue about the impacts of footpath cycling on cycling activity and participation is whether permitting footpath cycling *should* be accompanied by increased participation (or encouragement of participation) in a context where common perceptions about the relative safety of footpath and on-road cycling appear to be out of step with research findings on actual safety outcomes. Much of the advocacy for all-ages footpath cycling is predicated on the assumption that footpath cycling is safer than on-road cycling. As explored in Section 3.3, the evidence supporting this assumed benefit is more contested than commonly implied. Footpath cycling poses a number of risks to riders and presents a unique risk profile to cycling compared to other environments. If these risks were more widely recognised or were more transparently presented, impacts on participation may differ.

Related to this is consideration of the message that legalising footpath cycling would send to the community. Legalising footpath cycling would signal that relevant authorities believe it is appropriate and relatively safe. This would risk perpetuating and indeed legitimising what appears to be a false perception that cycling is generally safer on the footpath than on the road.

3.5 Impacts on the functionality of footpaths

Footpaths play a unique role in not only facilitating pedestrian movement but also forming the foundation of public spaces in communities. Footpaths are not only transport movement corridors in the same way that a road carriageway or bike lane are. They are instead multi-functional places accommodating a range of social activities. A potential negative impact of adoption of all-ages cycling and accompanying increases in footpath cycling activity is to threaten the effectiveness of footpaths in accommodating this range of activities.

The role and function of a footpaths can differ depending upon the surrounding environment but there is potential for footpaths to function as public realm in both activity centre and quieter residential urban environments. In addition to facilitating walking movement, footpaths within local residential streets are places for children to play and neighbours to stop and chat. Footpaths in suburban activity centres and commercial precincts are places for shopping and gathering. Footpaths are increasingly being utilised to inject a sense of place and character to communities through the provision of outdoor seating, outdoor dining and increased on street trading. While there is a tension between footpaths providing for efficient pedestrian movement and providing for a range of social, cultural and economic functions, the nature of these places as pedestrian spaces provides sufficient generosity to cater for both simultaneously.

As a consequence of the reaction time, manoeuvrability and turning circle of a human body (Rodier et al 2003), pedestrians on footpaths can accommodate a multiplicity of walking uses simultaneously. A fast walking pedestrian in a rush can easily overtake a slower pedestrian whose intention is to slowly linger or browse at shops. Pedestrians walking in opposite directions along the same path can negotiate the available space and pass each other. Platoons of pedestrians on opposite sides of a busy intersection can cross the intersection without collision. And in busy central city environments significant volumes of pedestrians can walk closely together with relatively limited separation. The same cannot be said about interactions between pedestrians and cyclists. In contrast, as a result of the breaking distance, manoeuvrability, turning circle and need to travel at speed to maintain balance, cyclists require a larger and more generous space around them to

safely navigate through space (Rodier et al 2003). This highlights the incompatibility between the 'slow rhythm' of pedestrian activities and the higher speeds of cycling.

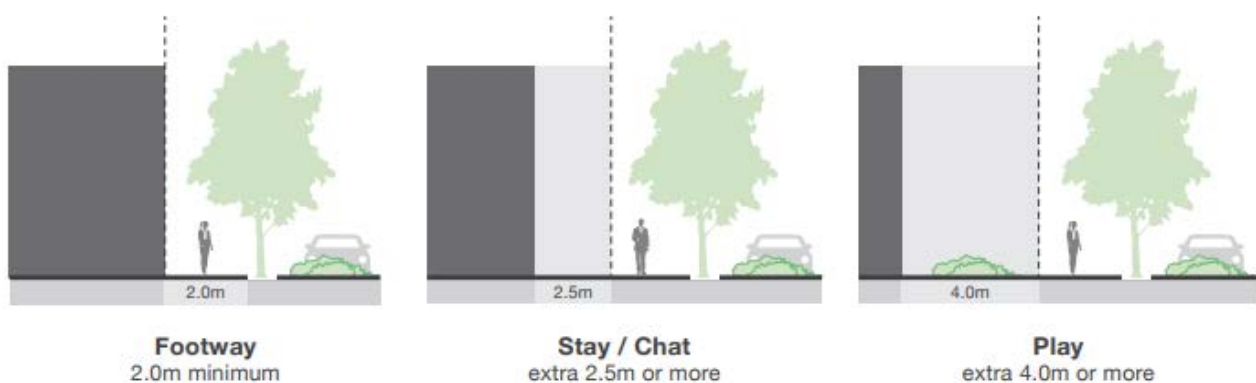
The presence of cyclists on footpaths, particularly in activity centres and commercial areas would have the impact of turning multi-functional public spaces into de facto transport corridors. The generous and forgiving environment which enables slow moving pedestrians and a range of activities would be replaced by a pressure for pedestrians to keep left and keep moving. This would disrupt the existing balance of activities within activity centres and undermine the functionality of footpaths as public spaces.

The current framework used in Victoria to guide road network planning includes an attempt to balance the need to accommodate the use of streets and roads as movement corridors and to recognise the role of streets as destinations and places in their own right (VicRoads 2017). This 'movement and place' framework, while in its infancy in Victoria, acknowledges that there is a relationship between the movement of people through a corridor and the overall quality of place. The framework seeks to assist road managers in prioritising the balance of movement and place within a corridor.

Contemporary street design guidance seeks to provide standards to road managers to allocate sufficient space within streets to accommodate multiple uses. These guides identify a range of features and facilities which provide a favourable environment for people within activity centres. These features include; outdoor dining; on-street trading; street lighting; wayfinding; trees; urban greening; and seating (LADCP, 2014; Adelaide City Council, 2015). These features require space and guides recommend that sufficient space is set aside to accommodate these amenities while not encumbering pedestrian movement.

Guides such as the Complete Streets Design Manual suggests that (as shown by Figure 3) a footpath of a 2.0 metre is sufficient for accommodating pedestrian movement where two pedestrians can walk side-by-side. The guide recommends the provision of footpaths of 4.5 metres width to facilitate people comfortably lingering on the footpath and footpaths of 6 metres in heavily trafficked areas to facilitate lingering on the footpath, seating and outdoor dining while not restricting the free movement of pedestrians. Introduction of bicycle movement into such spaces is likely to be incompatible with effectively providing for these functions.

Figure 3 Typical Recommended Footpath Widths



Source: Complete Streets Design Guide (IPWEAQ, 2010)

3.6 Impacts on investment in cycling infrastructure

A final potential impact of changing road rules to allow for all-ages footpath cycling is on infrastructure decision-making for cycling facilities. There are risks that the rule change may result in perceptions by infrastructure providers such as local government that safe cycling facilities are now available on existing

footpaths and that dedicated cycling facilities are of a lesser priority. This, in turn, may lead to lower levels of investment in high-quality cycling facilities with consequent negative impacts on cycling safety.

This issue is flagged as a potential risk resulting from signals that such a rule change may send. There is, however, limited evidence to help understand the degree to which such a risk may play out. It is important to note that levels of investment currently vary significantly between various infrastructure providers. For example, Inner Melbourne Councils currently spend on average approximately \$17/ person on cycling infrastructure while Outer Melbourne councils spend \$6/ person (Bicycle Network Victoria 2012, BiXE 2012). Cycling investment decision making by councils and other infrastructure providers depends on a range of factors including budget availability, the views and values of the community, advocacy from representative groups and the positions taken by councillors.

At the State level, there is no clear pattern suggesting that Australian states where all-ages footpath cycling has been allowed for many years (eg Queensland, Northern Territory, Tasmania) have higher or lower rates of cycling infrastructure investment than other states. As with local government, there are likely a range of other far more important factors driving investment decision-making.

Table 3: State and Territory Government Expenditure on Cycling Infrastructure (annual \$ per capita)

Year	2011	2012	2013	2014	2015	2016	2011-2016 Average
NSW	3.86	3.49	4.22	4.11	4.08	4.28	4.01
VIC	3.82	3.77	5.41	5.21	4.36	3.01	4.26
QLD	4.53	6.8	5.95	6.17	4.74	7.11	5.88
SA	4.19	3.19	2.89	4.39	3.03	2.15	3.31
WA	2.53	3.94	5.94	4.56	7.6	6.18	5.13
TAS	5.96	0.93	0.85	2.52	3.07	3.64	2.83
NT	3.65	6.91	1.29	3.3	5.13	14.8	5.85
ACT	6.74	6.35	5.79	7.3	50.34	40.71	19.54
TOTAL	4	4.35	4.88	4.88	5.34	5.29	4.79

Source: Australian Bicycle Council 2017b.

In practical terms two of the key motivations for local government in relation to capital works expenditure is community safety and council's exposure to risk and liability. This approach places an emphasis on the maintenance and renewal of existing Council infrastructure at the expense of the construction of new assets.

Preliminary legal advice obtained by Victoria Walks exploring the liability issues which changes to all-ages footpath cycling may present to road managers (including local government) suggests that Councils would be expected to maintain footpaths to a standard suitable for cyclists as they owe a duty of care to users of pathways. It is anticipated that Councils would be required to put in place new Road Management Plans and policies. These would need to take into account the issues of shared footpaths and address them adequately. The Common Law duty owed by road authorities to take reasonable care to avoid risk of foreseeable harm would be extended to include risk of foreseeable harm to cyclists. If Councils negligently maintain the pathways (by breaching the duty of care owed) and that negligence causes injury to a Plaintiff the Council may be liable for damages. It should be noted however that there are a number of statutory defences available to road authorities. These defences act to limit the situations in which claims can be bought against road authorities. Given this context it is possible that all-ages footpath cycling may shift local government capital expenditure priorities to improving footpaths to accommodate footpath cycling rather than providing fit-for-purpose cycling infrastructure.

Further comment from a Victorian local government insurance claims advisor identified a number of other liability questions for local government and communities in relation to footpath cycling. This advice indicated that it "would on face value appear hazardous to combine cyclists and pedestrians on standard dimension footpaths".¹ This advice suggested that driveway crossovers of footpaths are not considered part of either the road or footpath and are therefore the responsibility of the resident. Under a scenario where cycling was permitted on footpaths, private property owners may be at increased risk of personal liability if cyclists allege injuries are caused by defects in a driveway crossover.

¹ Victoria Walks (2018), Personal Communication with the Municipal Association of Victoria. This does not represent a formal organisational view from the Association.

4 Conclusions and directions for further research

4.1 Conclusions

The objectives of increasing active transport participation, improving the experience of pedestrians and cyclists and working towards zero serious injuries and fatalities as a result of transport accidents should be at the core of any approach to transport planning within urban areas in the 21st century.

The prospect of legal all-ages footpath cycling has been proposed as an apparent attempt to work towards the objectives of improving the participation, experience and safety of cyclists within Victoria. However, the policy debate surrounding all-ages footpath cycling to date has largely ignored impacts on the existing users of footpaths and the potential consequences on the participation, experience and safety of pedestrians.

This paper has tested a set of six key claims made by proponents and opponents of the proposed law change. It has reviewed published evidence on the potential impacts of a law change and provided a professional view from an active transport planning perspective. This summary highlights key findings from the paper.

Will all-ages footpath cycling increase safety risks for people walking?

It is clear that sharing of footpaths by people cycling and on foot introduces risks of cycle-pedestrian collisions. People walking and riding bicycles travel at very different speeds. Road safety principles establish that vehicles and people moving with different levels of kinetic energy should be clearly separated. This clear separation is not possible if people cycling and walking share footpaths that are constrained spaces designed for walking.

While pedestrian-cycle collisions are rare events and account for a very small proportion of total injuries to pedestrians and cyclists in road environments, these collisions do have potential to result in serious injury or even fatality. The review of evidence suggests that pedestrians (rather than cyclists) and particularly children and elderly pedestrians are most at risk from injury from pedestrian-cycle crashes. If a rule change were to result in increased cycling activity on footpaths, there are risks of negative safety impacts for people on foot.

Will all-ages footpath cycling impact on levels of walking activity?

Research on pedestrians' perceptions of footpath cycling and its impacts on levels of walking activity is limited. There are, however, some Australian and international studies indicating the presence of cyclists on footpaths is a real concern for people walking, particularly for elderly or other vulnerable users such as the vision-impaired. Concerns relate to both reduced safety and amenity of footpaths. While a range of other factors are likely to be more important determinants of walking activity, a rule change may shift cyclists' and pedestrians' sense of the 'ownership' of footpath space. The negative impacts of a rule change are likely to be most acutely felt by vulnerable pedestrians such as the elderly.

Will all-ages footpath cycling reduce safety risks for people cycling?

Improving cycle safety is an important goal and an implicit assumption behind advocacy for all-ages footpath cycling is that it will improve safety outcomes for people using bikes. However, footpath cycling represents a heavily compromised approach to separating cyclists from high-speed traffic and best practice cycle facility design guidance is clear that providing dedicated protected cycling space is preferable.

There is no clear evidence that cycling on footpaths is safer than cycling on the street. While the evidence is somewhat mixed, crash risks for cyclists may be higher on the footpath than on the road. There is clear evidence that footpaths should not be considered ideal safe cycling environments. Common perceptions are likely to over-estimate the relative safety of footpath over on-road cycling. Footpath cycling is accompanied

by a distinct set of safety risks for cyclists, particularly associated with visibility between motor vehicles and cyclists at intersections and driveways. Footpaths are not designed for the speed and dimensions required for cycling, with most footpaths being narrow spaces and many being in poor condition with uneven surfaces.

Will all-ages footpath cycling increase cycling activity?

Clear conclusions on the extent to which a rule change to allow for all-ages footpath cycling would impact on rates of cycling participation appear to be difficult to establish. There have been no studies of the impact on cycling participation accompanying previous road rule changes allowing all ages cycling in Australian jurisdictions. Analysis undertaken for this paper finds that recent rule changes in South Australia and Western Australia have not been accompanied by significant changes in participation rates in the short time period since all-ages cycling has become permitted. While cycling participation is influenced strongly by perceptions of safety and footpath cycling may be perceived as providing a safer cycling option by some users, there are likely to be other policy measures that have a more substantive impact on perceptions of cycle safety and subsequent uptake.

Will all-ages footpath cycling impact on the functionality of footpaths?

There is potential for adoption of all-ages cycling and accompanying increases in footpath cycling activity to threaten the effectiveness of footpaths in accommodating a diverse range of social functions including both transport and public realm functions. While there is little evidence around this issue, increased cycling volumes on footpaths are likely to be incompatible with successful multi-function footpath spaces, particularly in activity centres and city centre locations.

Will all-ages footpath cycling change cycle infrastructure decision making?

There are risks that a rule change to allow for all-ages cycling may send a signal to infrastructure decision-makers that safe cycling facilities are provided for on footpaths and so reduce priority accorded to high-quality on-road separated cycle facilities. There are also risks that issues of liability for local governments may emerge due to the need for footpaths to adequately provide for cycling users.

In summary, decision makers need to consider the full range of impacts for both cyclists and other users of footpaths in making decisions. Footpath cycling is not an adequate solution to the challenge of reducing cycle conflicts with high-speed traffic. Objectives for cycle safety are likely to be more effectively achieved through increased provision of high-quality cycling infrastructure together with a package of alternative measures that avoid unintended negative consequences for other footpath users.

This paper has focused on the potential impacts of a change of law to allow for all-ages cycling. There have also been suggestions that the age at which footpath cycling is permitted could be increased from 12 years old to, for example, 14 or 16 years. While the magnitude of the impacts from a change in the age limit will be less due to opening up footpath cycling to a lower number of additional people, there does not appear to be strong reasons to suggest that footpath cycling by teenagers will result in different types of negative impacts to adult footpath cycling. A recent assessment in New Zealand recommended changing New Zealand road rules to be consistent with the current Victorian and NSW rules; that is, permitting footpath cycling for only people age 12 and under (Ward and Mackie 2016).

4.2 Further research

In the course of preparing this discussion paper, several gaps in the information base emerged. These are areas where further research and information gathering could assist in making more informed decisions on walking and cycling issues:

- Existing road crash record systems focus on recording crashes involving registered vehicles. This means data on pedestrian-cyclist crashes is very limited. There are likely to be opportunities to more systematically record incidents occurring on footpaths.
- The available evidence on pedestrian's perceptions of cyclist use of footpaths indicates that, for seniors, people cycling on footpaths is stated as a factor influencing walking activity. However, there is limited understanding of impacts on other vulnerable user groups such as children and people with a disability as well as how the general population perceives increased use of footpaths for cycling.
- There are few studies that draw definitive conclusions about the relative safety of footpaths and on-road environments for cyclists. This is related to poor data-gathering of road crashes that do not involve registered vehicles and poor data availability on the extent of cycling activity across different facility types.
- There is limited information about the extent to which allowing footpath cycling would increase overall cycling activity and the volume of on-footpath cycling. Research which compares on-footpath cycling rates across Australian jurisdictions may help address this research gap.

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