The actual danger presented to other road users by bicycles is insignificant next to the very real threat that motor vehicles present both to other motor vehicle occupants and, even more so, vulnerable road users. Basic physics dictates that the speed, mass and rigidity of a motor vehicle presents a potentially-lethal danger to vulnerable road users. Risk factors such as speeding, fatigue and the growing problem of distracted driving further compromise the safety of vulnerable road users.

In order to keep pedestrians and bicycle users safe on our streets, it is important that the behaviour of drivers is regulated and that the legitimacy of cycling as a mode of transport is maintained. The regulation of driver behaviour can be done through policing but can be even more effectively achieved through the appropriate design of roads and the built environment.

The legitimacy of cycling can be achieved through the normalisation and mainstreaming of bicycle transport. Increasing cycling participation has a big role to play in the normalisation of cycling. When every person is good friends with a person who rides regularly, there will be a reduction in the "cars vs bicycles" narrative that plays out regularly in the media.

Efforts to improve the behaviour of bicycle users should focus on improving their skill levels from a young age. It is in these early years where good habits are formed and where confidence and competence can best be established. Bicycle education not only improves actual safety by building skills, it also builds confidence that can help overcome the barriers to cycling and lead to a lifetime of healthy activity.

References

1. Queensland Dept. Transport and Main Roads (Prepared by SKM and PWC), Benefits of Inclusion of active transport in infrastructure projects, 2011.
2. Austroads, National Cycling Participation Survey, 2013.
3. Heart Foundation, Cycling Promotion Fund, Riding a bike for transport, 2011.
4. S. Suhood, Profile of CTP Claims Involving Pedestrians, 2013.

About the Australian Bicycle Council (ABC)

The role of Australian Bicycle Council is to coordinate and oversee the implementation of the National Cycling Strategy. The ABC reports annually on the implementation of the Australian National Cycling Strategy to the Transport and Infrastructure Council, through Austroads and the Transport and Infrastructure Senior Officials' Committee (TISOC).

Key influences on cycling for transport

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Introduction

Over recent years, the health, transport and environment sectors have been increasingly focused on the promotion of transport cycling. From a health perspective, transport cycling is recognised as a beneficial form of physical activity as it can be easily integrated into daily living, is done at an intensity that confers health benefits, and is associated with reductions in mortality and morbidity [1]. From a safety perspective, the risk of a serious cycling injury decreases as cycling increases [2] as having more cyclists on roads increases motor vehicle drivers' awareness of cyclists and in turn makes cycling safer.

Whereas cycling for recreation is the fourth most commonly reported physical activity among Australian adults [3], transport cycling is an underutilised travel mode. Approximately 1.3% of journeys to work in Australia are made by bicycle [4]. This low prevalence is mirrored in the UK and the US, but not in some European countries like the Netherlands and Denmark, where over 18% and 26%, respectively, of all journeys are made by bicycle [5].

In the past decade, concerted efforts have been made by Australian state and local governments to increase cycling rates [6]. Notably, Melbourne, Sydney and Brisbane have implemented policies, increased bicycle commuting infrastructure, and offered information and promotion programs to encourage commuter cycling [6,7]. Governments have also developed comprehensive long-term plans for guiding future cycling strategies, using lessons learned from around the world in developing

successful cycling policy and promotion [6,7]. Changes in transport cycling rates in inner cities since these efforts have been implemented are encouraging. In Sydney, census data indicate an 83% increase in the number of people using a bicycle for commuting between 2001 and 2011 [8]. Counts of bicycles being ridden along major cycling commuter routes indicate increases in weekday morning cycling trips in Brisbane (63% increase from 2004 to 2010) [7] and in Melbourne (a 43% increase from 2006 to 2008) [9]. However, bicycle mode share to work has changed little: for example, between 2001 and 2011, it decreased slightly from 1.6% to 1.3% in Brisbane [10,11].

Researchers have been investigating factors that may be contributing to low rates of cycling for transport, to inform future policy and programming to encourage transport cycling. The aim of this paper is to overview our work to date in this area of research in Queensland.

Cycling in Queensland Study

The first study was a survey of cyclists in Queensland, undertaken to understand their attitudes about, and experiences with, cycling. Respondents were members, aged ≥18 years, of Bicycle Queensland (BQ), a statewide non-profit organisation that promotes cycling and advocates for better cycling facilities and improved safety (see bq.edu.au). As reported elsewhere [12], 2356 individuals (47% response rate) completed the survey.

The data from the survey were used in part to examine factors that may be influencing decisions to cycle for transport. An initial examination of the data revealed that transport cyclists tended to be male, young to early mid-aged (aged 18-44 years), and of a higher socio-economic position (in full-time jobs and educated at a tertiary level) [13]. In addition to these demographic characteristics that were associated with the behaviour, certain constraints were reported by high proportions (>40%) of both transport and recreation-only cyclists that limited the appeal of transport cycling. These included concern with cycling in traffic and aggression from motorists [14]. Alarmingly, of the transport cyclists, 76% reported harassment from motor vehicle drives; mainly driving too close, shouting abuse, and making obscene gestures/sexual harassment [15]. Not surprising then, respondents preferred to cycle off-road [14]. The cyclists were also concerned with cycling in rainy or stormy weather, cycling to places that lack a safe place to store bicycles and inhaling fumes from motor vehicles [14]. These factors led the cyclists to perceive that the built, natural and social environments for cycling were unsafe for transport cycling.

Cyclists were also asked to describe in their own words what would motivate them to cycle for transport (more) [16]. The most often mentioned motivators fell within the theme 'improving the built environment', which included calls for building more and 'better' bikeways; improving safety for cyclists at intersections, at pinch points and on overpasses/underpasses; better maintenance of roads and paths used by cyclists; and moving bikeways away from parked cars. Improving the convenience of cycling was the second most important theme that emerged, with cyclists reporting that greater connectivity among bikeways, more direct safe routes to destinations, and better linkages with public transport would make cycling a more convenient and safe mode of transport. These qualitative data therefore further suggest that safety of the built and social environment for cycling is paramount to increasing transport cycling, and add that safe paths must make getting to destinations of interest convenient as well, to increase rates of transport cycling.

Further analysis indicated gender differences in transport cycling [14]. More women reported certain constraints to transport cycling, which included lack of time for transport cycling, the inability to put a bicycle on public transport, the decrease in daylight hours during winter, the presence of hills, their lack of fitness and their lack of confidence in bicycle maintenance and bicycle skills. Thus, the women in the study perceived additional constraints to transport cycling that need to be addressed in order to increase their participation in transport cycling.

Together these findings indicate that only certain populations are choosing to cycle for transport in Queensland; namely young, highly educated men. The main constraint to transport cycling is the perception that the environment is unsafe for transport cycling; a finding supporting other research in Australia and other low-cycling countries. To encourage cycling for transport in Queensland then, the findings suggest that the environment needs to improve: most importantly, bicycle infrastructure and end of trip facilities that support short, safe and direct trips to regularly-travelled destinations are needed.

HABITAT study

The next series of analyses is using data from a representative sample of Brisbane residents to understand the factors influencing cycling for transport in the general population. The data are being collected for HABITAT (**H**ow Areas in **B**risbane **I**nfluence heal**T**h and ac**T**ivity), a multilevel longitudinal study of physical activity, sedentary behaviour, and health in Brisbane adults aged 40–65 years [17]. The primary aim of HABITAT is to examine patterns of change in physical activity, sedentary behaviour, active transport and health between 2007 and 2018 and to assess the relative contributions of environmental, social, psychological and socio-demographic factors to these changes. Both survey data from residents and objective measures of the built environment are being collected. Further details about the HABITAT study are available at http://www.habitat.qut.edu.au/.

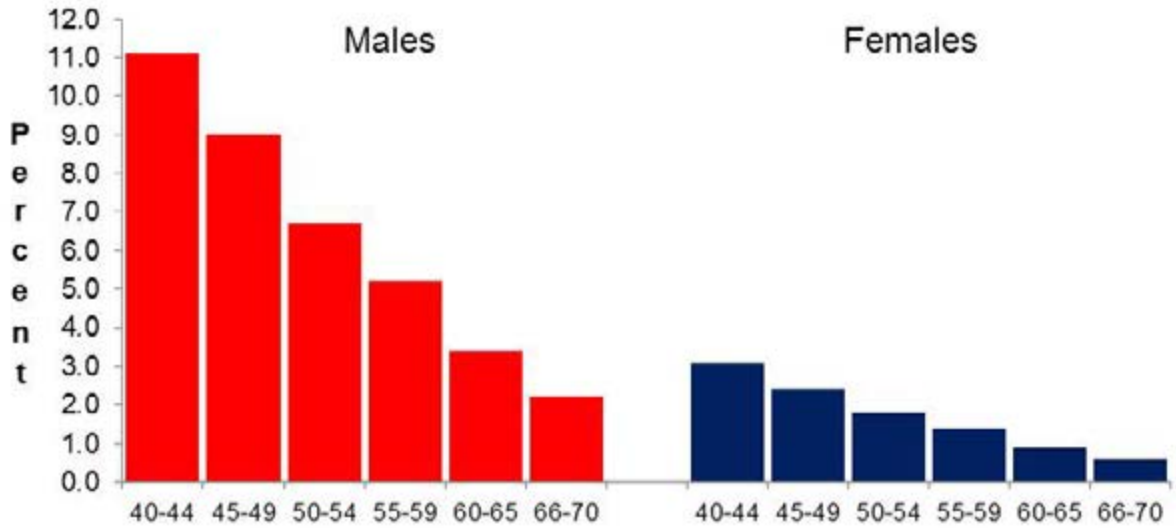
In the first analysis [18], survey data from 2007 were used to examine whether individual characteristics and perceptions were associated with cycling for transport. As shown in the Cycling in Queensland Study, socio-demographic characteristics were associated with transport cycling, with males, younger residents (aged 40-44 years), and those in a high socio-economic position (household income ≥ $130,000) more likely to cycle for transport. Age and gender data pooled from the 2007, 2009 and 2011 surveys from HABITAT show a large difference between men and women in the percentage who cycled for transport and also show decreases in transport cycling behaviour as age increases for both men and women (see Figure 1).

Also of interest here is that perceptions of less supportive neighbourhoods were associated with a lower likelihood of cycling for transport. Such neighbourhoods were ones that had the most crime; had many streets with cul-de-sacs (so fewer direct routes to destinations); were lacking in nearby recreational facilities (e.g., bike path, public park, public swimming pool) or had few nearby transport destinations (e.g., supermarket, post office, cafe/restaurant, bus stop, ferry terminal, train station). These findings suggest that developers and planners should consider addressing these features of the built environment in future developments and the revitalisation of older developments, as doing so could encourage transport cycling [18].

Currently, analyses are underway to examine the influence of objectively-measured built environment factors on transport cycling. These analyses are using Geographic Information Systems (GIS) layers that were compiled for the neighbourhoods of the Brisbane residents participating in HABITAT. When complete, the analyses will indicate whether connectivity, residential density, land use mix, hilliness, aesthetics, bicycle path lengths, street lighting, and distances to key destinations are associated with transport cycling. Future analyses are planned to more closely examine interactions between the built environment and individual characteristics and perceptions that influence transport cycling behaviour. It is expected that this work will inform developers, planners, and policy makers on key attributes of neighbourhoods that encourage cycling for transport and thus should be considered in future developments in urban areas that aim to create sustainable, liveable neighbourhoods.

Conclusions

What is clear to date is that few women and older populations are cycling for transport in Brisbane and Queensland more generally. This is likely linked to perceptions of a hostile environment for cycling. To truly increase the numbers of people cycling for transport will require its uptake by these populations, and this will demand that policy and programs be put in place that transform the current culture into a transport cycling culture where these groups feel safe to cycle for everyday transport to their local shops, recreational areas, and to work.



Males		Females	
2007	6.4%	2007	1.8%
2009	6.4%	2009	1.9%
2011	6.9%	2011	1.8%

Figure 1. Percent of the sample who reported cycling for transport in the previous week: 2007-2011

References

1. Oja P, Titze S, Bauman A, De Geus B, Krenn P, Reger-Nash B, et al. Health benefits of cycling: a systematic review. Scandinavian Journal of Medicine & Science in Sports 2011;21(4):496-509.
2. Jacobsen PL, Rutter H. Cycling safety. In: Pucher J, Buehler R, editors. City cycling. Cambridge, MA: MIT Press, 2012.
3. Australian Sports Commission. Participation in exercise, recreation, and sport: Annual Report 2010. Canberra: Australian Sports Commission, 2011.
4. Australian Bicycle Council. Australian Census 2011 travel to work by bicycle only. Sydney: Australian Bicycle Council, 2013.
5. Pucher J, Buehler R. Promoting cycling for daily travel: conclusions and lessons from across the globe. In: Pucher J, Buehler R, editors. City cycling. Cambridge, MA: MIT Press, 2012.
6. Buehler R, Pucher J. Big city cycling in Europe, North American and Australia. In: Pucher J, Buehler R, editors. City cycling. Cambridge, MA: MIT Press, 2012.
7. Brisbane City Council. Brisbane active transport strategy, 2012-2026. Brisbane: Brisbane City Council, 2011.
8. Rissel C, Munro C, Bauman A. Assessing cycling participation in Australia. Sports 2013;1:1-9.
9. City of Melbourne. Melbourne bicycle account: Cycling Census 2007. Melbourne: Melbourne City Council, 2013.
10. Cridland M. Cycling - why it matters. In Asia-Pacific Cycling Congress, Gold Coast, 2013.
11. Zander A, Rissel C, Bauman A. Cycling to work in Sydney: analysis of journey to work Census data from 2001 to 2011. Camperdown: Prevention Research Collaboration, The University of Sydney, 2012.
12. Heesch KC, Garrard J, Sahlqvist S. Incidence, severity and correlates of bicycling injuries in a sample of cyclists in Queensland, Australia. Accident Analysis and Prevention 2011;43(6):2085-92.
13. Sahlqvist SL, Heesch KC. Characteristics of utility cyclists in Queensland, Australia: an examination of the associations between individual, social, and environmental factors and utility cycling. Journal of Physical Activity & Health 2012;9(6):818-28.
14. Heesch KC, Sahlqvist S, Garrard J. Gender differences in recreational and transport cycling: a cross-sectional mixed-methods comparison of cycling patterns, motivators, and constraints. International Journal of Behavioral Nutrition & Physical Activity 2012;9:106.
15. Heesch KC, Sahlqvist S, Garrard J. Cyclists' experiences of harassment from motorists: findings from a survey of cyclists in Queensland, Australia. Preventive Medicine 2011;53(6):417-20.
16. Heesch KC, Sahlqvist S. Key influences on motivations for utility cycling (cycling for transport to and from places). Health Promotion Journal of Australia 2013;24(3):227-33.
17. Burton NW, Haynes M, Wilson LA, Giles-Corti B, Oldenburg BF, Brown WJ, et al. HABITAT: a longitudinal multilevel study of physical activity change in mid-aged adults. BMC Public Health 2009;9:76.
18. Heesch KC, Giles-Corti B, Turrell G. Cycling for transport and recreation: associations with socio-economic position, environmental perceptions, and psychological disposition. Preventive Medicine 2014;63:29-35.

Cycling and children

by Eric Chalmers
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There are many good reasons to encourage children to cycle more, in part because of the great need to improve the level of physical activity and to reduce the health impacts of obesity in the community. Whilst we are encouraging children and adults to cycle more, there are a number of things we need to keep in mind.

Children are not small adults. They perceive danger and react quite differently to adults. Their perception of distance is not as developed and they tend to focus their vision quite tightly. They often assume that if they can see you, you can see them and have little understanding of the distances involved in stopping or changing direction in a moving vehicle or of the force of impact of being hit by a large vehicle.