

# A mixed-methods exploration of the factors affecting bike riding participation in Victoria, Australia

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## 1 INTRODUCTION

Participation rates in Australia remain low compared to other international settings, and gross inequities exist in participation, including for women and people living in low socioeconomic areas <sup>[1]</sup>. In recognition of the health and environmental benefits of increasing cycling participation, governments in Australia are increasing investment in initiatives to increase bicycling <sup>[2]</sup>. Recent research found that 78% of people in Greater Melbourne (a major Australian metropolitan region) are interested in riding a bike <sup>[3]</sup>. This demonstrates an opportunity for considerable modal shift to bike riding. There is, however, insufficient knowledge of the barriers to, and enablers of cycling for transport in this context.

Research of barriers and enablers in Australia is very limited, however the majority of what has been conducted has been quantitative research in groups whom are already cyclists. Existing research explores factors affecting cycling for all purposes, potentially overlooking differences in barriers and enablers reported for either riding a bike for transport, or recreational purposes. Further, quantitative studies often present the prevalence of a particular barrier or enabler, without consideration of the strength of how preventative, or encouraging the factor may be.

This has resulted in cycling strategies being largely uninformed by the needs of people who are not current cyclists, and without consideration of the needs of people who ride a bike for transport, compared to recreational riders. To increase cycling participation, it is essential to understand the barriers and enablers of cycling for all people of all ages and abilities, and to understand the nuances of their perception of safety. This requires a mixed-methods approach, with a robust sampling approach, to consider the prevalence and strength of the varying factors that influence people's decision to ride a bike or not. We conducted an online survey and semi-structured interviews with people living in nine selected local government areas across Greater Melbourne.

## 2 METHODS

We aimed to identify the prevalence and strength of barriers and enablers of cycling, stratified by trip purpose in Greater Melbourne, Australia. Quantitative data were collected through an online survey between November 2021 and February 2022. We recruited adults who lived in one of nine selected local government areas in Greater Melbourne using Council social media platforms and electronic and print newsletters, and targeted advertising. The nine selected local government areas were selected with an aim for representation across previously developed urban typologies. These typologies classified areas of Melbourne based on similar land use, bike infrastructure, and population demographics <sup>[1]</sup>. The survey included questions regarding

demographics, bike ownership and frequency of use and questions regarding barriers and enablers to riding a bike for both transport and recreation. Questions regarding the barriers and enablers people experience for riding a bike were separated by trip purpose, where one set asked people to detail the barriers they experience for riding a bike for transport purposes (for example, commuting), and one set for recreational purposes (for example, exercise). Participants were asked to tick all barriers and that applied to them from a list that was randomised between surveys. If a barrier or enabler was chosen, the participant was then directed to a 3-point Likert scale to indicate the relative strength of that factor. For barriers, this Likert scale was rated from 1 = “deters me a little” to 3 = “completely deters me”. The Likert scale for enablers was rated from 1 = “encourages me a little” to 3 = “very much encourages me”. Descriptive analysis and chi-squared tests were conducted to identify differences between population groups.

Participant classified as ‘Interested but Concerned’ and that indicated that they were willing to participate in future research were contacted for a further semi-structured interview. Sampling was stratified by gender and region of residence to enable representation and diversity. The interview guide was informed by the survey findings and the Theoretical Domains Framework <sup>[4]</sup>, with an aim to identify potential drivers for behaviour change. Qualitative data were analysed thematically with an inductive and deductive approach to identify emergent themes and to inform the Theoretical Domains Framework.

### 3 RESULTS

Of the 912 people who began, 717 completed the survey (79%) and were included in analyses. Age and gender of the sample were representative of the populations selected. However, the sample had a relatively higher income. The majority of the sample (73%) owned a bike, and 64% had ridden a bike in the past 12 months. At the time of writing, 5 out of 40 interviews were complete. All potential participants had indicated that they were interested in riding a bike, rode a bike and would like to ride more or for a different purpose (for example, wanted to ride for transport and currently rode for recreation only).

The most highly reported barriers to riding a bike for transport included not wanting to ride on the road with motor vehicle traffic (56%), concern about collision with a motor vehicle (54%), bad weather (53%) and motorist aggression (53%). Findings were similar for barriers to riding a bike for recreation, however bad weather was the second most highly reported enabler (49%). When interviewed, the majority of people reported issues with quality and consistencies of existing infrastructure that would force them to ride a bike on the road. Many noted this as their major barrier to riding a bike, despite substantial interest. Qualitative exploration identified nuances in quantitative findings on numerous occasions. Many participants that had not reported issues relating to storage of their bike in the survey, expanded in the interview that while they had storage spaces available, these were often inadequate and met the needs of light-weight recreational bikes rather than the diversity of bikes used. Several participants reported discontinuous infrastructure between local government areas and commented that current infrastructure met the needs of local recreational trips only.

The most highly reported enablers to bike riding for transport included having a bike-lane physically separated from motor vehicle traffic or an off-road bike path (66%), to improve physical health (65%) and to reduce environmental impact (57%). Enablers for recreational riding were similar, however the ride being scenic was more highly reported (54%). Qualitative findings supported survey findings, where the majority of participants reported having protective and connected infrastructure as being their ideal intervention to increase their participation. Participants highlighted a need for protective infrastructure that enabled efficient and direct trips for transport purposes, including to local shops, schools and childcare, as well as commuting.

Bike riding being a positive, healthy and sustainable mode was a view shared across all participants in the qualitative study. An emergent theme, however, was that on and off-road infrastructure, types of bikes available, end of trip facilities and wayfinding resources were designed for the needs of solely recreational riders, or able-bodied people using light-weight racing-style bikes.

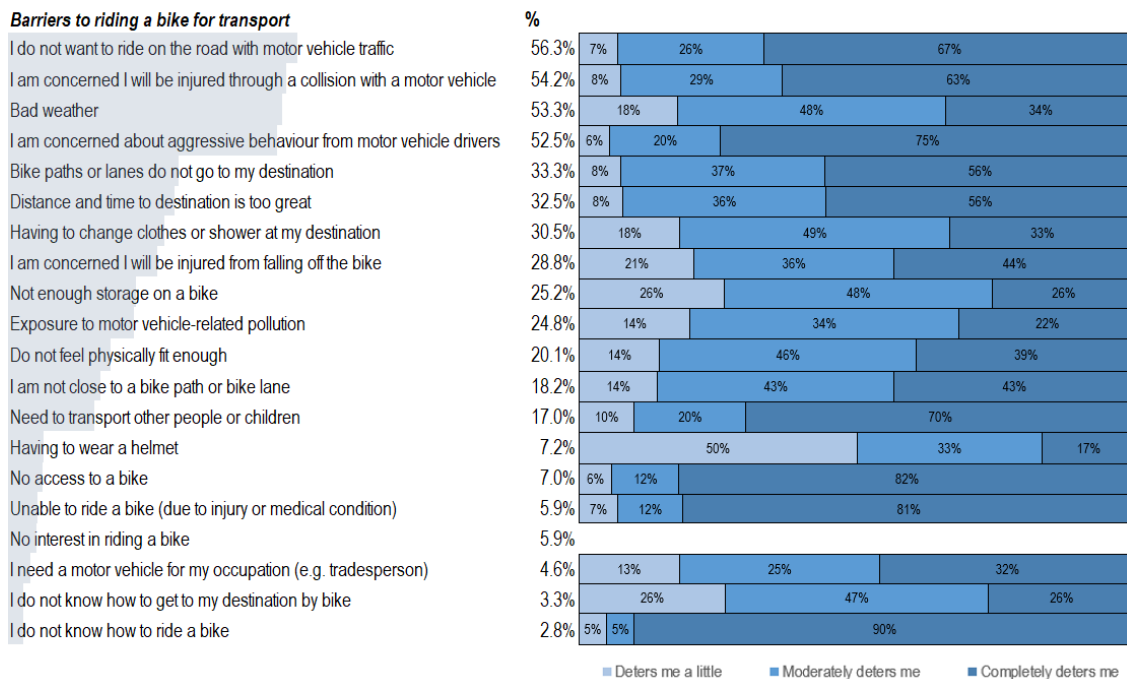


Figure 1. Survey findings: prevalence and strength of barriers to riding a bike for transport

#### 4 CONCLUSIONS

Using a mixed-methods approach, we identified that factors relating to feeling unsafe due to riding a bike on the road alongside motor vehicle traffic are key in preventing people in Greater Melbourne from riding a bike. Participants in the qualitative study thought of bike riding and bike riders as healthy, sustainable and positive. However, they reported that while they wanted to ride a bike, the facilities available to them were inadequate for their needs.

Our results further support the substantial potential for cycling in Greater Melbourne, and identify key infrastructural requirements to enable this. This includes the provision of a network of protected and connected cycle paths to enable efficient transport trips to be made by bike. Other infrastructure measures, such as slow speed areas or diversions through residential streets, may enable supportive links throughout this network. Other facilities and resources, including end of trip services and promotional campaigns, should be designed for the needs and requirements of people of all ages and abilities, and for a diversity of types of bikes. These measures, alongside promotional campaigns to encourage the physical, environmental and mental health benefits of bike riding, may be effective at substantially increasing participation in bike riding across Greater Melbourne.

#### REFERENCES

- [1] B. Beck et al., “Developing urban biking typologies: quantifying the complex interactions of bicycle ridership, bicycle network and built environment characteristics”, *SocArXiv Papers* (2021).
- [2] Transport for Victoria, *Victorian Cycling Strategy 2018-28*, Department of Economic Development, Jobs, Transport, and Resources, 2017.
- [3] L. Pearson et al., “The potential for bike riding across entire cities: quantifying spatial variation in interest in bike riding” *Journal of Transport and Health* (2022), pp. 101290.
- [4] L. Atkins et al., “A guide to using the Theoretical Domains Framework of behaviour change to investigate implementation problems” *Implementation Science*, pp. 1-18.