# COVID-19 and Cycle Commuting in Inner Melbourne

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## Abstract

The purpose of this paper is to document and explain potential differences in the attitudes towards, and use of, cycle commuting before and after the Melbourne COVID-19 lockdowns. This case study in inner Melbourne is based on quantitative and qualitative findings from both an online survey and individual semi-structured interviews. The main finding is that COVID-19 had a significant, and largely positive, effect on cycle commuting for regularly commuting Melbournians. There was a general improvement in attitudes towards, and increased frequency of, cycle commuting due to COVID-19, one year after the final lockdown had ended. The primary reasons for this were the minimal infection risk while cycling, the periods of temporarily decreased traffic, and the newly installed bicycle infrastructure. Despite the largely positive findings, a need for development was also found in multiple areas to continue the growth of cycle commuting, particularly regarding an expansion in the bicycle network and improvements in commuter safety. Overall, the research found that COVID-19 has accelerated public and political support but also uncovered an overwhelming desire amongst commuters to use this acceleration as a springboard for the future, in the context of Melbourne's past, present and future development.


## Introduction

The COVID-19 pandemic has hugely impacted daily travel around the world. Attention has been drawn to a current window of opportunity in which altered mobility routines may develop as commuters and cities adapt to a "new normal" post-pandemic.

Generally, prior research in Melbourne has shown low levels of cycle commuting. In 2016, just 2% of Melbournians cycled to work (Australian Bureau of Statistics, 2016) and in 2018, cycling comprised 3% of the city's weekday trips (Department of Transport, 2018). This contrasts with

overseas cities like Amsterdam, whose pre-pandemic cycle commuting rates were approximately 27% (Ministerie van Infrastructuur, 2019). Consequently, increasing cycle commuting was already identified by the Victorian Government in 2017 as an essential strategy to benefit public health, the environment and traffic congestion (Transport for Victoria, 2017).

Most research on how the pandemic influenced Australian travel has focused on international trips over regular commuting. However, Thomas et al. (2021) found significant and lasting effects on domestic travel modes, even after the withdrawal of explicit travel restrictions, though this research only included cars, public transport, and planes. Increased cycling behaviour was suggested by the 23% surge in Australian bike sales between 2019 and 2020 (Buehler & Pucher, 2021), together with a global growth in cycling traffic fuelled by its minimal viral risk and the consequential public and political support (Buehler & Pucher, 2021). Lock (2020) and Fuller et al. (2021) both found cycling increases during Australian lockdowns, however they focused on recreational cycling, and post-pandemic trends remained to be seen. Furthermore, Melbourne experienced 262 days of lockdown, more than any other city (Lally, 2022). This magnitude of disruption, alongside new bicycle infrastructure, whose quality and uptake are necessarily city-specific, means that important research is lacking regarding the pandemic's influence on Melbourne cycle commuting.

Understanding key factors that have and will influence the uptake of cycle commuting in Melbourne is important for moving forward as a sustainable, growing city in the era of living with COVID-19. Cycle commuting brings significant individual and societal health benefits, and reduces congestion and pollution (Francke, 2022). For this reason, this paper addresses the research question "to what extent have commuters' attitudes towards, and use of, cycling as a form of commuting in inner Melbourne changed as a result of the COVID-19 pandemic?"

## Method

The first stage of data collection involved an online survey available to anyone over 18 who commuted within inner Melbourne. These were classed as any regular trips, occurring at least monthly, where part or all of the travel took place within 10km of Melbourne's CBD. The survey was disseminated through the snowball sampling method, across various social media between October 12th and October 19th, 2022.

This method was extremely successful, with 9085 impressions on Twitter and high engagement on Facebook and LinkedIn. This enabled data collection from a larger-than-expected sample of 66 volunteers. It was time- and cost-efficient and permitted interested commuters to self-screen for the requirements and respond at their convenience.

The greater reach allowed increased statistical power and an improved approximation of a random sample (Naderifar et al., 2017), also ensuring representation of both cyclists and non-cyclists. However, this form of convenience sampling still carried risk of bias (Kirchherr, & Charles, 2018), with those interested in cycling perhaps more likely to volunteer.

The second stage of data collection involved five individual semi-structured interviews conducted over Zoom. This methodology is powerful for qualitative geographical research and an in-depth understanding of experiences (Dowling et al., 2016). It also allowed participants to feel relaxed in their own home (Adams-Hutcheson & Longhurst, 2016). The interviewees were recruited from the online survey, so two men and three women with varying cycle commuting experiences were selected.

The questions for both the survey and interviews were specifically designed to answer the research question and explore potential effects of the COVID-19 pandemic on participants' experiences of inner Melbourne cycle commuting. There were three key periods of time identified, namely 2019, which was "before the pandemic", 2020 and 2021, which were "during the pandemic", and 2022, which was referred to as "now". Questions focused on attitudes to, and use of, cycle commuting before, during and after the lockdowns, as well as potential pandemic-related changes in attractions and barriers to cycle commuting.

The survey included an information section and eleven questions. It took 5 to 10 minutes to complete and incorporated closed-ended, open-ended and slider questions. The interviews involved open-ended questions in the form of a discussion, with follow-up prompts dependent on interviewees' responses. As part of the analysis, qualitative data was thematically coded to expand upon the quantitative data collected.

## Results and Discussion

Data that were analysed quantitatively resulted from the survey questions focusing directly on answering the research question "to what extent have commuters' attitudes towards, and use of, cycling as a form of commuting in inner Melbourne changed as a result of the COVID-19 pandemic?" These results show significant pandemic-related impacts on both attitudes and frequency.

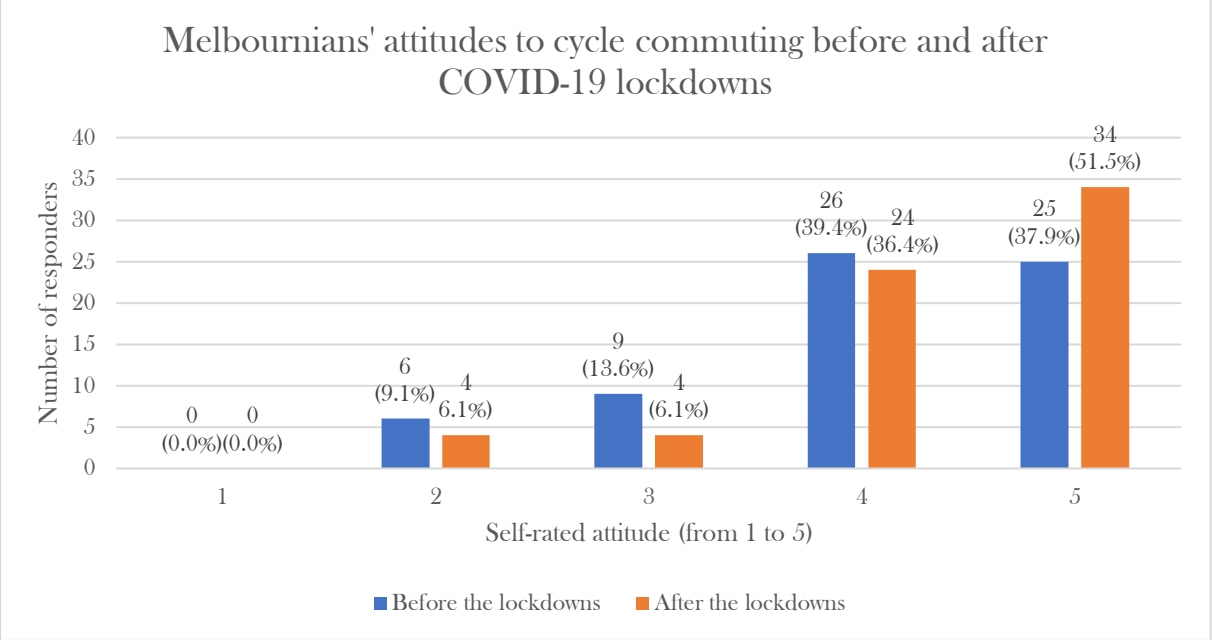


Figure 1. Comparison of attitudes towards cycle commuting in inner Melbourne on a 5-point scale before and after the 2.5-year period of lockdowns in Melbourne.

Firstly, survey participants rated their attitude towards cycle commuting on a 5-point scale, where 1 was "extremely negative" and 5 was "extremely positive". The responses for the period pre-pandemic and for 2022 were compared, demonstrating an overall improvement in commuter attitudes. Importantly, the percentage of participants who rated their attitude towards cycle commuting as 5 out of 5, or "extremely positive", increased by 13.6%, to over half of the 66 participants after the lockdowns, compared to 38% before the lockdowns.

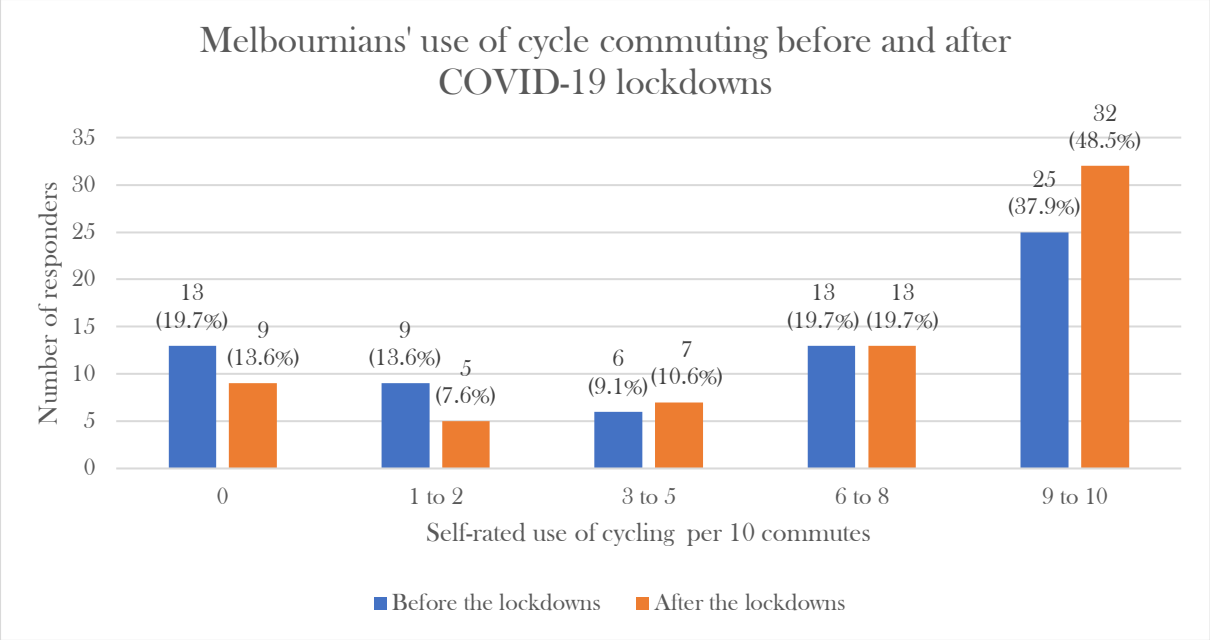


Figure 2. Comparison of frequency of cycle commuting in inner Melbourne, per 10 commutes, before and after the 2.5-year period of lockdowns in Melbourne.

Secondly, survey participants stated their number of bike commutes for every ten total commutes, for both before and after the lockdowns. As Figure 2 shows, a higher proportion of commutes are made by bike now than in 2019. The proportion of responders who never cycle commute decreased by 31% of the original 19.7%, down to 13.6%, while the proportion who ride at least nine of every ten commutes increased by 28% of the original 37.9%, up to 48.5%.

These results align with the global findings of Nikitas et al. (2021), who researched cities in the year following their last lockdown and found post-pandemic increases in cycling of 27% in Paris, 12% in Barcelona and 44% in Brussels. The remaining data, from other survey questions and the interviews, provides explanations for the improvements in attitude and frequency of Melbourne cycle commuting. The key themes identified were minimal infection risk, fewer cars, and new bicycle infrastructure.

### Minimal infection risk

83% of survey participants cited the minimal risk of viral infection as an attraction to cycle commuting arising from the pandemic. Cycling is an individual, outdoor mode of transport that enables social distancing, so commuters have a much lower likelihood of catching COVID-19 compared to those in shared, indoor modes like trams, trains, and buses, where social distancing is often difficult (Francke, 2022). Interviewees also mentioned this as motivation for cycle commuting, commonly alongside a continued COVID-related dislike of public transport. This advantage of cycling was also noted by Lock (2020), however it was classed as a "short-term health benefit" at the time, during Sydney's initial lockdown in early 2020, which contrasts with this paper's newer findings that show continued relevance over two years later.

### Fewer cars

75% of survey participants indicated that the decreased traffic during lockdowns made cycle commuting more attractive due to increased safety. It was also mentioned as a key motivator to increase cycling by all five interviewees, in statements such as "roads were for bikes" and "minimal cars made me feel a lot safer". This importance of safety to commuters is supported by prior government work, which found that 60% of Victorians are curious about cycling but deterred by safety concerns (Transport for Victoria, 2017). Unlike the decreased infection risk though, decreased traffic was generally a temporary, lockdown-specific benefit. This aligns with the findings of Boroujeni et al. (2021), which demonstrated significant reductions in car usage during Melbourne lockdowns that returned to normal levels within two months of restrictions easing. Although traffic levels rebounded, some participants kept cycle confidence that had initially been gained from those periods. This included one interviewee, a new cyclist, who explained that "when the cars

came back, I knew how to get through the intersections that had always bothered me."

### New bicycle infrastructure

The third attraction to cycle commuting resulting from the pandemic was newly-installed bicycle infrastructure, cited by 59% of survey participants as a drawcard. Three interviewees mentioned Heidelberg Road by name as a "fantastic" – and lasting – pop-up bike lane that felt "really safe". 100 kilometres of these pop-up bike lanes have been fast-tracked and installed in Melbourne since late 2020. They were a measure implemented in many cities globally, used since the pandemic began to encourage active modes of transport. The appraisal of pop-up lanes by the participants in this paper aligns with overseas findings, such as that of Kraus and Koch (2021), who found an average cycling increase of 42% in cities with pop-up lanes compared to control cities.

### Further motivators of change

Disruptions to an established routine and an increased awareness to physical and mental health benefits were other motivators commonly mentioned in both the survey and interviews, largely due to an awareness of decreased exercise during lockdowns. Interviewees referred to "not really having done much for two years" and "really needing to get outside and exercise". Environmental benefits were not mentioned as a key individual motivator for cycle commuting more, contrasting with the societal-level work of Francke (2022).

### Building for the future

Despite the pandemic causing more attraction to cycle commuting, participants also indicated many current areas for improvement. When asked what would make people more likely to commute by bike in the future, most mentioned building upon changes that were implemented during the pandemic.

### Improved bike lanes

The most common answers to “what would make you more likely to cycle commute in inner Melbourne?” involved further improvements in the bicycle network. Separation from cars – either by barriers or off-road trails – was generally a priority, perhaps explained best by one interviewee who "preferred “falling off onto grass” to making “life or death decisions in traffic”. Secondly, 30.2% of survey participants noted that existing bike lanes and shared paths currently felt dangerously crowded, due to pedestrians, other cyclists, and e-scooters. Many indicated that more and wider lanes, separate from pedestrians, would motivate them to cycle commute more. Finally, the connectivity and routing of bike lanes was commonly indicated as problematic. Both survey participants and interviewees described bike lanes often ending coming into intersections, in addition to not directly connecting across Melbourne. These were all fields for development noted in the Plan Melbourne document, which aimed “to provide more direct cycling corridors” (Victorian State Government, 2016).

### Road rule changes

Many participants indicated that most pop-up bike lanes they had used since 2020 still remained, however some specified that measures like reduced speed limits and introductions of car-free or one-way streets had been temporary, and since removed. These participants shared that like the pop-up lanes, the temporary measures had also been extremely beneficial to their safety, and expressed desire of their permanent re-introduction in the CBD. This subjective feeling of safety relayed by participants who hoped for the measures’ reinstatement aligned with objective findings regarding accident numbers globally. In cities that introduced measures including reduced speed limits and one-way streets, there were significantly decreased numbers of cycling accidents and deaths compared to control cities (Francke, 2022).

## Conclusion

This paper aimed to explore the extent of the pandemic's effects on cycle commuting in Melbourne, and suggest ways in which this information could be used to promote a sustainable future. The research showed that COVID-19 significantly, and largely positively, influenced cycle commuting in Melbourne. Both attitudes towards, and use of, cycle commuting improved amongst regularly commuting adults in inner Melbourne.

The pandemic offered a rare opportunity to not only disrupt past routines but also to trial new structures. The additional measures implemented were seen as favourable, although there is room for improvement regarding bike lanes' abundance and connectivity. Alongside the minimal viral risk of cycling, these measures are largely responsible for the recent uptake of cycle commuting, and this could be used to justify further expenditure.

The results align with many global findings while also giving specific insights into Melbourne. This paper is therefore relevant and timely given the recent controversy surrounding the pause in the Hoddle Grid Bicycle Network expansion, which contrasts with the previously announced plan to accelerate the 2030 Transport Strategy and to use COVID-19 as an opportunity to become less car-centric.

Although the survey was open to any interested adults who commuted regularly in inner Melbourne, there was likely a bias towards people keen on cycling. Therefore, further work could increase the sample size while also specifically targeting non-cyclists, for a more rounded overview. The survey was also based on self-assessments, which can be notoriously subjective.

This research did not cover the pandemic's effects on youth riding to school, nor did it explore the extent to which workplaces facilitation of cycle commutes may have changed. However, riding to school and improved end-of-trip facilities were both popular topics of conversation in the interviews and would make for interesting and relevant research topics in the future.

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# Appendices

## Appendix 1

Table A1. Key themes derived from codes.

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| Improved cycling confidence | "I was quite nervous on the bike, so riding in the inner city was pretty unpleasant and I never really did it. I thought maybe I should give it a try so I started trying to do it more"<br><br>"I was too timid"<br><br>"I didn't cycle at all because it didn't feel safe."<br><br>"The road outside was a barrier to me riding pre-covid. I couldn't work out how to get through the intersection to the bike path on the opposite side. Suddenly there were no cars on the road and the intersection outside my house was not an obstacle anymore, so I started to use my bike."<br><br>"I explored my local area in all directions, which I had not done previously. I found backroads which feel safer to me even now."<br><br>"My confidence increased and when the cars came back I knew how to get through the intersections that had always bothered me. When lockdown finished, I just kept riding." |
| Physical health benefits | "During lockdown I was not really doing much, so when I was starting to commute back on train, I was like why don't I kill two birds with one stone and actually get some exercise while doing that"<br><br>"Because you were locked inside for 23 hours a day, it really made you think 'gee, when I get outside I really need to get outside and exercise' so that became really important to me and it stayed with me after COVID" |
| Disruption to old routine | "I was out of the habit of commuting and so when it came back, it allowed me to not be just kind of stuck in the same routine, and to think about it more"<br><br>"It made me think more 'do I need to jump in the car?' It was good to make me aware that the car is not really a necessity, whereas probably pre-COVID I thought it was a necessity"<br><br>"I went from hardly riding because I was scared that my bike would be stolen, to riding all the time so that I didn't feel scared of COVID all the time. This change |

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| | happened over a period of one month. I have ridden for so long now that it has become an ingrained habit with so many benefits"<br><br>"I think that now having the equipment, like oversocks for when it's really cold, helps me get to the hospital without being really cold. Now there is less stress." |
| Benefit of pop-up bike lanes | "it's a step in the right direction"<br><br>"On Heidelberg Rd, that was great, they just removed a whole car lane and turned it into a bike lane and that feels really safe when you ride along there. Also in the city I noticed there were more bike lanes and I felt safer in the city too"<br><br>"I did notice pop-up lanes in the city, down William St and Elizabeth St."<br><br>"There was new bike infrastructure on Heidelberg Rd. I was always scared that it was going to be torn down, but it's been there forever now and that is fantastic. I do appreciate when it is safer" |
| Better bike infrastructure needed | "The bike lane doesn't actually go anywhere, it just starts and then it ends"<br><br>"If you look at the VicRoads website for the official route, you're supposed to go through some convoluted route that you would have to have a map in front of you to figure out where you were going"<br><br>"You still have this awful kind of junction of all these huge roads"<br><br>"They can't stop when it gets difficult to fit a cyclist on the road"<br><br>"I am not a confident rider in traffic where decisions can be life or death. I like bike paths where, if you make a mistake, you are likely to fall onto the grass nearby"<br><br>"Better infrastructure with separated bike lanes would help me commute more often and feel safer."<br><br>"Shared paths are dangerous and insane – pedestrians, with children and dogs, and cyclists doing 25km/h do not mix."<br><br>"Having wider bike lanes with to give cars enough passing distance would help" |

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| | "Bringing in reduced speeds in all of the CBD and more one way roads would encourage active commuting"<br><br>"Infrastructure on major, direct routes rather than winding via complex paths and backroads is a next step." |
| End of journey facilities | "I work at a hospital and they provide good facilities for locking up the bikes and for showering. One day they even provided breakfast for people using active transport, which was great."<br><br>"I wish there were more facilities here, especially when compared to Europe."<br><br>"They definitely improved bike infrastructure which was good. You can now securely park your bike and have a shower if you need it."<br><br>"I have been lucky to work in buildings where end of trip facilities are good and incentives for business to maintain will help." |
| Fewer cars during lockdowns | "When there were hardly any cars on the road, I would do all my work commutes by bicycle, even if they were far away"<br><br>"There were minimal cars and a lot more cyclists and this made me feel a lot safer." |
| Risk from more new cyclists | "You want to be happy about it because it's so good to see. But if you are on a bike path, you feel like these groups should not ride five wide and make you feel less safe."<br><br>"There are so many scooters and e-bikes which surge in speed and power. They are less predictable than a regular cyclist."<br><br>"Some riders are cycling too fast on inappropriate bike paths. When I commute as a cyclist I'm quite often more scared of other cyclists than cars."<br><br>"I don't feel safe cycling especially with scooter riders and cyclists who don't follow regulations, making it unsafe for others" |
| Avoiding public transport | "I liked the bike because I didn't have to get on the train for anything"<br><br>"Trams are less comfortable for me even now, because the bike has less risk of COVID."<br><br>"Once COVID hit, I got scared being on public transport, even with masks. I didn't trust people. I went from hardly |

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| | riding to riding all the time. I am now so used to riding to work that I feel like getting on a bus or tram full of people would be a backwards move." |
| Mental health benefits/hobby | "The longer the work commute during COVID, the more I enjoyed my ride. It gave me freedom to be outside and it gave me longer than the 1 hour that was allowed by the government"<br><br>"It was good for my mental health. If it rained, I even started riding on the trainer in my lounge room."<br><br>"I have gone for rides in places that I would not previously have been interested in riding to. I have enjoyed Yarra Trails. Going on trails where there are less people has been awesome. I explored every street in the 5km radius."<br><br>"it was hard to have hobbies during the lockdown so I enjoyed commuting by bike more. The actual riding was more pleasant." |