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Active transport in general has been associated with lower status (Fitt, 2018). Males have also been shown to value social status highly, this has been linked to the fact that they are normally a household's source of income (Stroh et al., 1996). Females on the other hand, are more motivated to change their behaviour towards being more environmentally friendly to enhance social status. Climate change action has also been shown to increase an individual's social status in recent studies. In addition peer influence, the behaviour change driver here, has been shown to be one of the most influential forms of behaviour modification.

Infrastructure

Poor infrastructure has been noted in the literature to be a hindrance and a barrier towards women's involvement in active transport. It is especially prominent when women are the primary caregiver of children in a household (Emami, 2020). In addition, some studies show that current city infrastructure has neglected to consider indigenous people. These same studied indicated facilities have often been structured for cars, not people. Emami, (2020) showed how much women can be put off using buses or other forms of active transport due to safety concerns triggered by poor infrastructure. Within the survey, the issue of safety and security in different public spaces such as bus routes, and hubs was widely addressed.

There are apparent gender differences in the purpose of bicycle trips, desired amenities and safety perceptions on cycling infrastructure (Krizek et al., 2005). Furthermore, women's perspective towards infrastructure is not primarily based on directness or time but on an ecological approach that combines physical environment and social and safety concerns (Camp, 2013).

Climate Change

in response to this threat (Huda, 2013). Those who identify as gender diverse were highly underrepresented in the existing literature on climate change and transport choice.

Safety

Safety is usually mentioned as a significant barrier while using active transport in Christchurch. Cycling is a common mode of transportation in Christchurch for many individuals. The top three safety concerns for cyclists were sharing the road with other vehicles, exceeding the speed limit, and sharing the road with heavy vehicles (Christchurch City Council, 2020). The risks associated while riding a bus include Offensive and threatening behaviours, mostly in isolated back streets, fear of intoxicated people, criminals and inadequate street lighting. Most female passengers encounter safety issues such as harassment and stalking while waiting for the bus (Kennedy, 2008). The main risks associated with walking are driver behaviour, particularly speeding and drinking and driving and poor infrastructure (Ministry of Transport, 2018). The government is developing a strategic plan to improve active transportation safety. This plan aims to improve the accessibility of transportation across the city and ensure citizens feel safe when travelling in Christchurch (Christchurch City Council, 2020).

Methods

Ethics

The Human Ethics Committee Policy was necessary for ethical review and approval in order to conduct the survey. The Human Research Ethics Committee (HREC) evaluates all research conducted inside or outside the University of Canterbury. Therefore, a survey consent application was created and submitted to the Human Ethics Committee at the University of Canterbury. This application contained research proposals, the research's main purpose, and research methodology.

All participants provided voluntary consent before beginning the survey. Voluntary consent is a basic concept of research ethics that permits participants to complete the survey voluntarily after receiving sufficient details about what it implies to be a part of the study and providing consent before taking part in the survey (Xu et al., 2020). Using a *Qualtrics* survey, participants were informed in detail about the research questions and purpose before providing voluntary consent. Participants in the survey were requested to confirm their age beforehand, and only those over the age of 18 were allowed to participate.

methods would be excluded at this point; however, it is suggested that these occur in the future, should research continue.

Data Collection

To create the survey, the online software *Qualtrics* was used. The web-based survey included 35 questions on the various modes of active and private transportation used by participants. In addition, reasons behind use and suggestions for encouraging other individuals to use active transport were also asked. A combination of qualitative and quantitative methodology was

research question thus the difference between means is of interest. One of the questions was asking how much participants through their mode of transport was reflective of their social

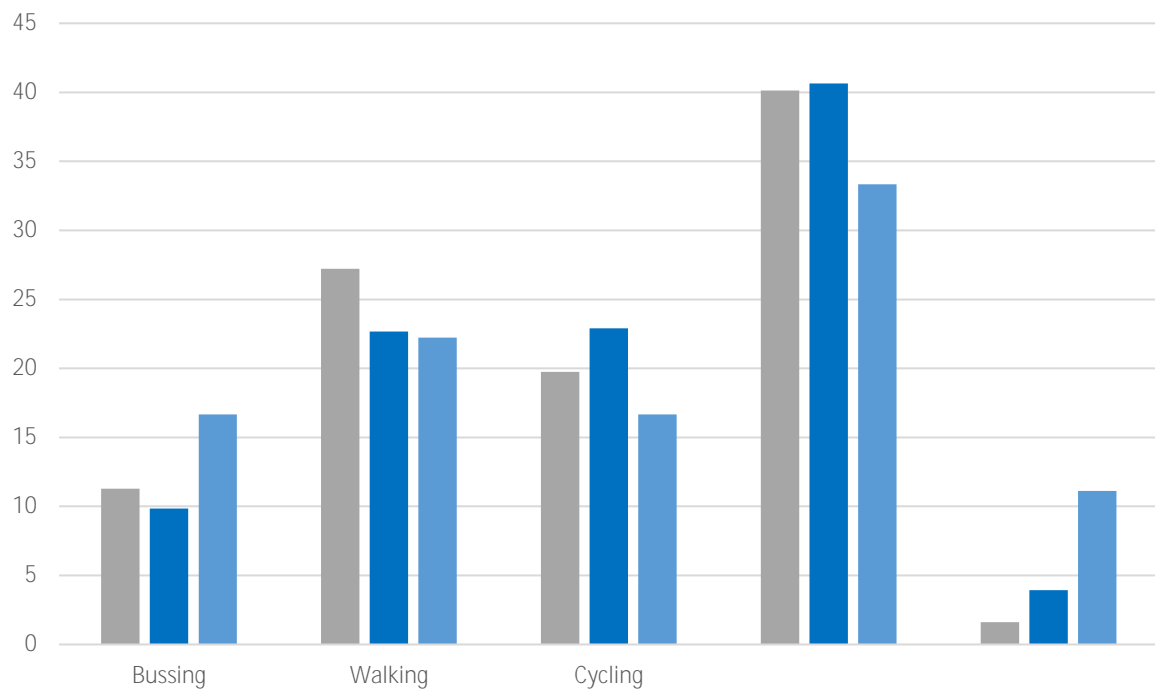


Figure 1: Indicated Preferred Mode of Transport in Terms of Gender.

Figure 2: Indicated Motivations for Cycling in Terms of Gender.

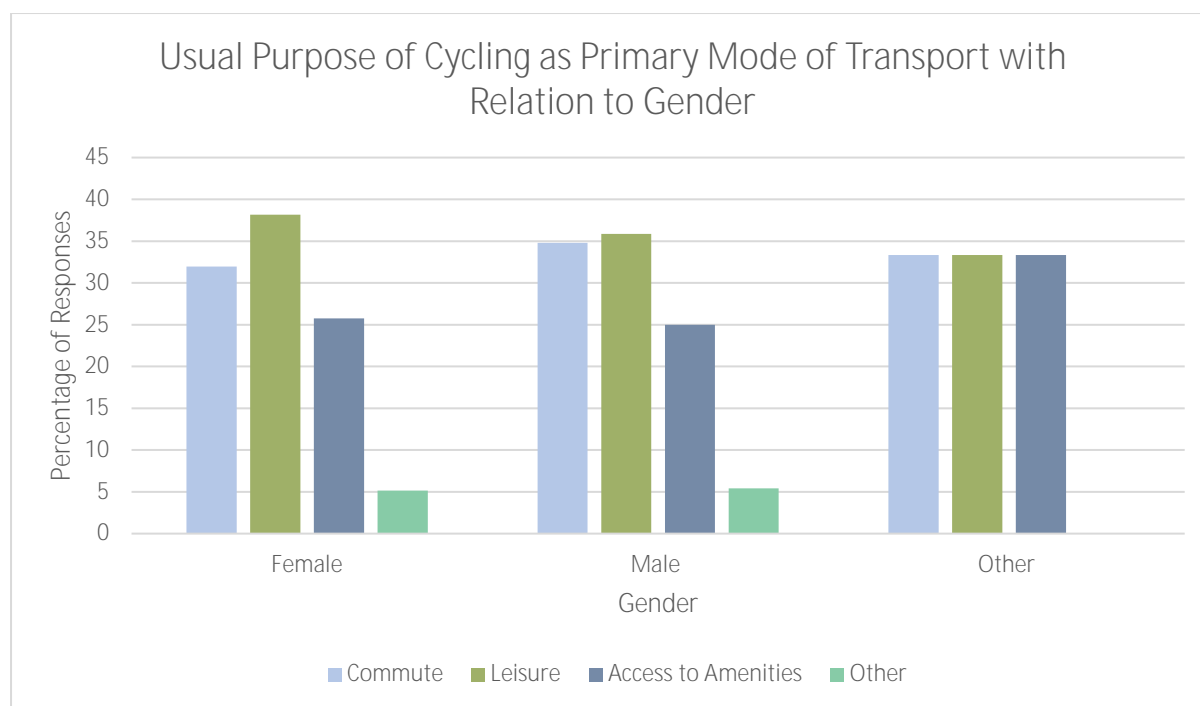


Figure 3: Usual Purpose of Cycling as Primary Mode of Transport with Relation to Gender.

Cycling

For cycling, wellbeing was the most significant motivator for females (n=103) and males (n=87) while those who indicated themselves as ‘other’ showed travel cost to be the most significant motivator (n=3) as seen in Figure 2. Males indicated travel cost, travel time and congestion to be highly motivating factors along with wellbeing. For females and those who indicated themselves as ‘other’, travel cost, climate action, general convenience and congestion were also shown to be highly motivating although wellbeing was by far the most prominent motivator for both these groups. Results showed the main purpose of choosing to bike was for leisure or commuting for females and males followed by access to amenities then ‘other’ reasons (*Figure 3*). For those who indicated their gender as other, all motivations aside from ‘other’ reasons were equal.

Once individuals have purchased a bicycle and required safety equipment, there is very little cost associated with cycling. This makes it accessible to all genders, hence the most prominent motivating factors being travel cost, general convenience, travel time and congestion. Cycling allows for users to move through traffic with relative ease, often making it the ideal choice for those who do not wish to spend time in traffic. Cycling is a form of active transport that requires significant physical activity. It is therefore a very accessible form of exercise for individuals who wish to increase their overall wellbeing, without taking time out of their day to attend a gym class or complete an alternative form of exercise. This is reflected in wellbeing being a prominent motivating factor for all genders. It did not appear that social status impacted upon any of the gender's choice to cycle. Unfortunately, infrastructure and safety can impact upon some individuals' choice to cycle. For women, it is more likely that a lack of adequate infrastructure, and the associated safety risks will be a discouraging factor. This is reflected in the survey results, as seen in Figure 1,

Age Group

It was proposed by the community partner that the age group of the survey participants may impact their chosen mode of transport and whether they think this choice is impacted by climate change. Figure 8 shows the percentage of each age bracket which selected each mode of transport as their preferred. Ages 18 to 24 (n=100) showed an almost even spread between walking, cycling and driving with slightly less choosing bussing as their primary mode and a very small percentage indicating 'other' as their primary mode. Participants who indicated their age group as 25 to 44 (n=33) tended to prefer driving as a transport mode followed by walking, cycling and bussing at similar percentages with 'other' transport modes showing only a very small percentage. The age group 45 to 64 (n=45) had an interesting spike in 'other' transport modes with it being the most preferred transport mode. This was followed by driving, walking then cycling with bussing being the least preferred transport mode. Finally the age group 65 plus (n=12) showed similar results to that of the 45 to 64 age group without the unusual 'other' transport mode spike with driving being the most preferred followed by walking, cycling then bussing with the least percentage indicating it as their preference. These results show that age could be a factor influencing the results. This area should be explored in further studies.

Policy Recommendations

Changing regulations to improve road safety for active transport complies with the data and

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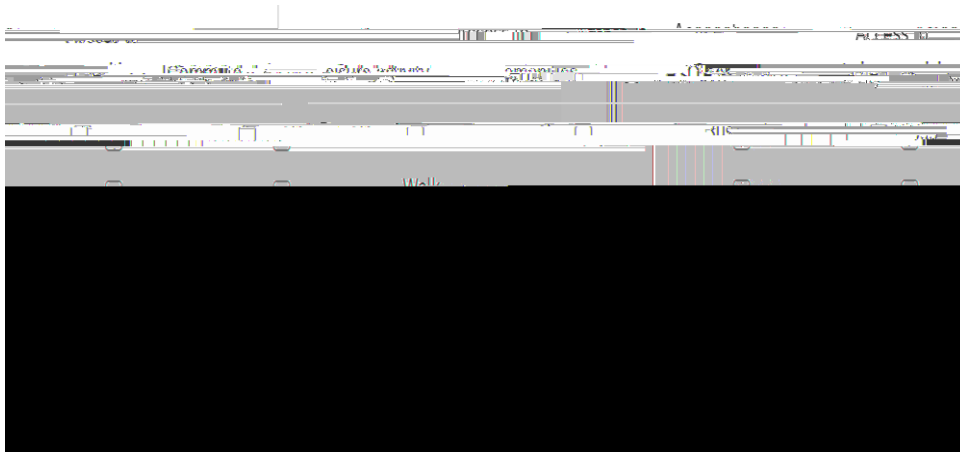
Appendix

Qualtrics Survey

Kia ora,

You are invited to participate in a research study on the impact of gender on transport choices and decisions. This study is being conducted by Luca Ware, Grace Stapleton, Sarika Ramola, Ilfaaz Huk and Kug Lee from the University of Canterbury

What is your usual travel mode to your destination? Please specify what each was used for:



Allow multiple answers

Skip logic :

If a car(commute, leisure activity, access to amenities and others) is selected from (what is your usual travel mode to your destination) = link to the car section

Skip logic :

If a bus(commute, leisure activity, access to amenities and others) is selected from (what is your usual travel mode to your destination) = link to the bus section

Skip logic :

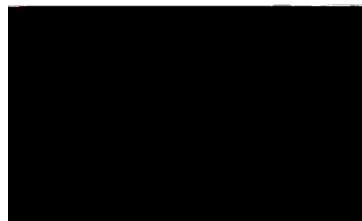
If cycling(commute, leisure activity, access to amenities and others) is selected from (what is your usual travel mode to your destination) = link to the cycling section

Skip logic :

If walking(commute, leisure activity, access to amenities and others) is selected from (what is your usual travel mode to your destination) = link to the walk section

What are your main reasons for choosing to drive? Select as many as apply.

A screenshot of a survey question with the following options: Travel time, Fuel costs, Travel convenience, Travel distance, Wellbeing, Personal security, and Children not in car.



Allow multiple answers

Display this question :

if what is your usual travel mode to your destination? = Car is not empty

Do you ever have difficulty finding a parking space?

A screenshot of a survey question with a Likert scale. The scale has 11 circular markers, with the first marker on the left and the last marker on the right.

Display this question :

if what is your usual travel mode to your destination? = Car is not empty

How stressed does traffic congestion make you?

A screenshot of a survey question with a Likert scale. The scale has 11 circular markers, with the first marker on the left labeled "Not stressed at all" and the last marker on the right labeled "Highly stressed".

Display this question :

if what is your usual travel mode to your destination? = Car is not empty

What are your main reasons for choosing to bike? Select as many as apply

[REDACTED]

Display this question :

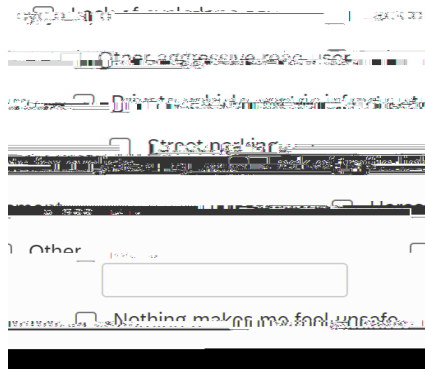
if what is your usual travel mode to your destination? = Cycling is not empty

[REDACTED]

Display this question :

if what is your usual travel mode to your destination? = Cycling is not empty

What, if anything, makes you feel unsafe when cycling? Select as many as apply



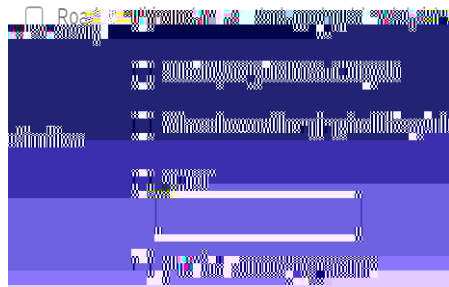
Allow multiple answers

Display this question :

if what is your usual travel mode to your destination? = Cycling is not empty

What, in general, do you think needs to improve/change to support cycling? Select as many as apply

- Safer cycle routes
- More cycle routes
- More cycle storage facilities
- Security from the bicycle theft



Allow multiple answers

Display this question :

if what is your usual travel mode to your destination? = Cycling is not empty

What are your main reasons for using the bus? Select as many as apply

The screenshot shows a survey question with two radio button options: "Travel congestion" and "Travel distance". Below the options is a large black rectangular area, likely a redaction or a placeholder for an image.

Allow multiple answers

Display this question :
if what is your usual travel mode to your destination? = Bus is not empty

How safe do you feel for using the bus?

The screenshot shows a survey question with a Likert scale ranging from "Not safe at all" to "Completely safe". The scale is represented by a horizontal line with several tick marks.

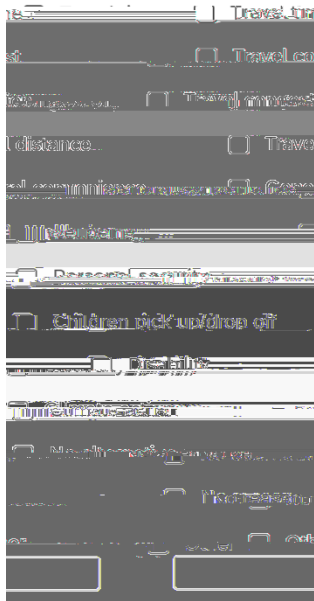
Display this question :
if what is your usual travel mode to your destination? = Bus is not empty

What, if anything, needs to change to improve the experience of the bus users? Select as many as apply

[Allow multiple answers](#)

[Display this question :](#)

What are your main reasons for choosing to walk? Select as many as apply



Allow multiple answers

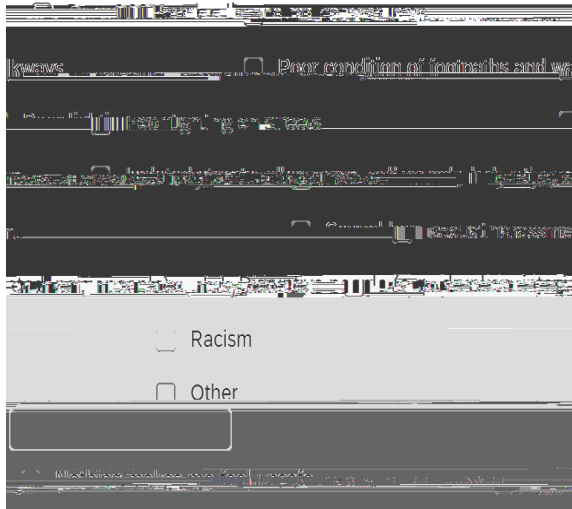
Display this question :
if what is your usual travel mode to your destination? = Walking is not empty

How safe do you feel for walking in Christchurch?



Display this question :
if what is your usual travel mode to your destination? = Walking is not empty

What, if anything, makes you feel unsafe when walking? Select as many as apply



Allow multiple answers

Display this question :
if what is your usual travel mode to your destination? = Walking is not empty

What, if anything, needs to change to improve for walkers? Select as many as apply



Allow multiple answers

Display this question :
if what is your usual travel mode to your destination? = Walking is not empty

Second section

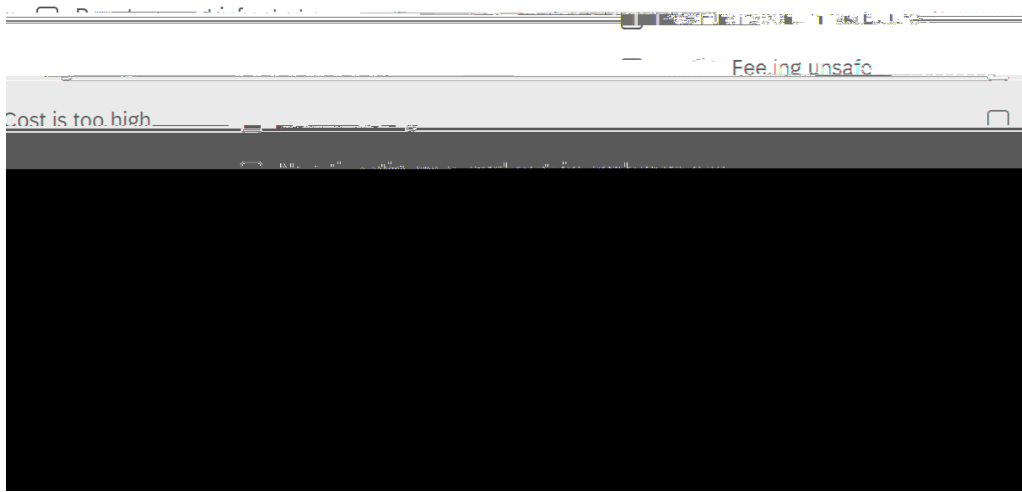
What is dissatisfying about the bus service/performance in Christchurch?

Allow multiple answers

Display this question :

if how satisfied are you with the bus service quality/service performance = Net promoter score(0,1,2)

In your opinion, what are some reasons people choose not to use active transport modes(walking, cycling, busing) in Christchurch?



Allow multiple answers

In what ways has COVID-19 affected your transport mode use and choice? Select as many as apply



Allow multiple answers

How much does your choice of transport mode reflect your social status?



How much do cultural norms impact your transport choices?

What is your age?

What is your ethnic group(s)?

Allow multiple answers

In which Christchurch 74 6374MC /P /MCID 24BDC q0.000008866 0 594.96 842.04 reW*nBT/F2 11.04 Tf1 0 0 1 7

