CHEAPER PUBLIC TRANSPORT FOR UNDER 25'S

Will Subsidised Bus Travel in Ōtautahi / Christchurch Increase Patronage in Under 25's?

GEOG309 - Group 2

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Executive Summary

- There is recognition that young people are not engaging with the public transport (PT) system in Christchurch as much as Environment Canterbury (ECan) would like them to.
- This research focused on the viability of a subsidy in order to increase ridership among under 25s.
- The aim was to understand what the implications of a transport subsidy would be.
- A survey on transport habits and current price satisfaction was conducted with Christchurch residents both under and over 25 years old. An interview was held with an overseas student to understand what makes PT appealing to young people.
- The interview indicated that PT needed to be attractive and encouraging of riders through extensive networking and frequency.
- The survey results showed that lower fares were consistently chosen as the top improvement across the three demographic groups. The survey also indicated a desire for more direct routes and higher frequency services.
- Our survey results specifically showed that under 25's have a high dissatisfaction with the current PT prices which differs from the results of previous studies.
- Analysis of the cost of a subsidy indicated there would be a resultant revenue shortfall which would require increased funding. Each subsidy scenario modelled by Abley showed an increase patronage and positive environmental and user benefits.
- Although Waka Kotahi New Zealand Transport Agency did not support a subsidy as the current pricing was 'fair'; our results show a subsidy would be beneficial to under 25's, decreasing transport inequities.
- We recommend that ECan trial a subsidy for 18 - 25 year olds for one year.

- Results showed that a subsidy alone would not solve the pitfalls of PT in Christchurch as pricing is not the sole factor of dissatisfaction.
- Normalising bus use is essential to change the habits of users. Further research is needed to understand the effects a subsidy for under 25's would have on travel habits later in life.
- This study was limited by time restrictions, Covid-19, and identified representational bias in our results.

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1.0 Introduction

When it comes to moving people around in an urban area, public transport (PT) is notably the more cost-effective and efficient alternative, when compared to the private car (Greater Christchurch, 2020). Ōtautahi/Christchurch's PT system has long been dissatisfying for most, with the car proving to be the most popular mode of transport (CCC, 2020). With the decrease in ridership, we must consider whether introducing a transport subsidy for U25's would be viable in Christchurch, and increase use. At present, over 19's are regarded as adults and therefore are charged duly until they reach 65.

This project was undertaken with the aid of Environment Canterbury (ECan) Councillor Vicky Southworth. ECan has recognised that young people are not using the system as much as they would like, and this is not fully understood as travel behaviour is complex and additionally, there is little known about the age group specifically. Increasing bus use is a key part of ECan's long term plan and the findings we have gathered will help encourage further discussion in council. This could impact residents of Christchurch for years to come.

1.1 Current Situation in Christchurch

In the year prior to June 2020, there was a 20% decrease in PT according to findings by Greater Christchurch (2021). The figures dropped from 13.69 million boardings to 11.02m. This could be attributed to the Covid-19 lockdown, as there was a similar trend during the 2010 and 2011 earthquakes (Greater Christchurch, 2020). The Life in Christchurch Travel Survey (2020) identified that non-direct routes and infrequency were the key barriers to using the PT system. These barriers were echoed in the University of Canterbury's Students' Association (UCSA)

Travel Survey (2020) as they also identified a cost barrier. 98% of respondents to their survey said they would support a PT subsidy for tertiary students.

Below are the current pricing tiers for the Christchurch region. The $2.65 flat fare for adults in 'Zone 1' is highlighted in the Abley Report (Blackmore & Stranks, 2021) as 'moderately well-priced' when compared to other major cities.

Greater Christchurch Metro fare structure

Fare type	Child		Adult	
	Metrocard	Cash	Metrocard	Cash
Zone 1	$1.50	$2.40	$2.65	$4.20
Zone 2	$2.15	$3.20	$3.85	$5.70
Zone 3	$2.60	$3.70	$4.70	$6.70
Airport one-way	$1.50	$4.90	$2.65	$8.50
Airport return trip included	NA	$8.40	NA	$15.00
Ferry one way	$2.60	$3.70	$4.70	$6.70
Ferry return trip included	NA	$7.40	NA	$13.40

Figure 1 'Christchurch fare zones', from Metro (2021) retrieved from: https://www.metroinfo.co.nz/travel-and-fares-info/fares/

2.0Literature Review

This section reviews the literature around the barriers and benefits of public transport use. It was recognised that 18-25 years olds were an under-studied age group in this field.

2.1 Barriers to using public transport

Multiple studies (Beirão & Cabral, 2007; Broome et al., 2010; Malandrakis et al., 2019) identified lack of information regarding PT services as barriers to people accessing and using the system. Broome et al. (2010) showed that young and old adults have differing requirements for PT. Young adults' priorities include bus punctuality, service availability and a low-cost ticketing system (Broome et al., 2010). This research emphasises the importance of tailored action to entice young people.

Cost has been found as a barrier to PT use (Broome et al., 2010; Mindell et al., 2021; University of Canterbury, 2020) but this entirely depends on the local situation. For example, Beirão and Cabral (2007) found that PT was considered the cheaper transport option in Portugal; therefore, cost was not a barrier in this case.

The Life in Christchurch Travel Survey (2020) found that PT ridership has decreased in the past year and identified the same barriers to using PT as international studies being non-direct routes and infrequent services. These issues have been echoed in the University of Canterbury Travel Survey (2020) where respondents indicated that a more direct route would encourage them to use PT. Others indicated that discounted bus fares would encourage them to ride the bus. The wide range of barriers discussed in the research shows that transport barriers are personal and complex.

There is evidence that these barriers change with age but there is minimal research on barriers for 18-25 year old's especially in a New Zealand context.

2.2 Young adults and their relationship with transport

According to Grimsrud and El-Geneidy (2013b), young people (and the elderly) are the groups most at risk for exclusion from PT services. The paper drew on data from London, where young people and the elderly have subsidies on PT (Jones et al. 2013). Both groups felt their subsidy reflected their perceived 'social worth', and it helped to fight 'social exclusions'(Jones et al. 2013). PT has the potential to create a sense of belonging within a community.

It seems apparent that a multi-faceted and multidisciplinary approach is the key to understanding the how and why of young people's travel habits, as well as predicting outcomes. Grimsrud and El-Geneidy (2013) reflect on how family and household structure changes impact transport use, with the suggestion that private car use is a 'hard to kick' habit. Further research is needed to understand how transport behaviours in young people translate into later life.

2.3 Public transport and the relationship with health

In the past, PT and health have been separately analysed to see the effects of each discipline. When literature that combines the two is analysed, it can be observed how they correlate closely with each other. In 2002 when the New Zealand Public Health Advisory Committee first analysed 'Evidence for health effects of PT', it was stated *"There is no New Zealand data directly examining the relationship between transport and levels of physical activity".*

It is clear, however, that people are relying more on private vehicles as a means of transport, and less on walking or cycling (Kjellstrom & Hill, 2002). Through the Hillary Foundation, there was a push to create positive habits when it came to the use of transport, as it expressed New Zealand had transport networks that were discouraging active mobility (Hillary Commission, 1998). Though outdated, this literature was a basis for New Zealand to move towards encouraging an active mode of transport to promote physical and mental health. Access to PT can provide better health outcomes (Jones et al., 2013), a factor important to a young person's development. Therefore, making transport more accessible for young people has the potential to increase transport equity and benefit health. The Ministry of Transport recognises that there are still improvements needed to better promote sustainable transport through making active travel an appealing option (New Zealand Transport Agency [NZTA], 2020).

2.4 Public transport and the relationship with climate change

One of the most significant contributors to greenhouse gas (GHG) emissions is the transport sector, which produces toxic GHG's such as carbon dioxide, nitrous oxide and methane (NZTA, 2021). Currently, New Zealand's transport sector accounts for 21% of the country's annual GHG emissions and is the most rapidly increasing source of emissions. Therefore one of the target areas for emission reduction needs to be the transport sector. PT is a more environmentally friendly mode of transport compared to private cars and can be used as a form of climate action (Kwan & Hashim, 2016). Increasing the accessibility and attractiveness of PT has the potential to increase usage subsequently benefiting the environment.

3.0 Global case studies

Christchurch has the opportunity in which we can explore what systems are in place and who these subsidies are accessible to on a global and local scale. Through this we can see if any of these could be transferable to Christchurch as well as to determine what works well. Although these locations in Table 1 do not have a similar population size to Christchurch, they are recognised as leaders in delivery of PT, so are of use to analyse.

Table 1: Comparison of subsidy schemes in place in Global examples

	Child Subsidy	School Subsidy	Tertiary subsidy	Seniors' Subsidy	Disability Subsidy	Off-peak Subsidy	Job hunters' Subsidy	Fare Structure
Wellington	✓	✓	✓*	✓	✓*	✓	-	Zone based
Auckland	✓	✓	✓	✓	✓*	✓	-	Zone based
London	✓	✓	✓*	✓	✓*	✓	✓	Zone based
Amsterdam	✓	✓	✓*	✓	✓*	✓	-	Distance based
Melbourne	✓	✓	✓	✓	✓	-	-	Zone based, free central city tram loop
Helsinki	✓	✓	✓	✓	✓*	-	-	Zone based
Christchurch	✓	✓	-	✓	-	-	-	Zone based

*Conditional subsidy

** References: (Greater Wellington Regional Council, 2020) (Transport for London, 2020) (Ministry of Transport, Public Works and Water Management, 2010) (TransMilenio, 2020) (Transport for Australia , 2020) (HSL , 2020) (Metro, 2020)

Globally subsidies tend to favour 3 groups – students, seniors, and disabled people. Investment in other subsidies increases the overall appeal of a PT network as accessibility can be opened to people who otherwise would not have been able to use this mode of transport. There are a variety of fare structures and subsidies in place globally that are used as incentives for people to interact with PT. Table 1 represents only a select few subsidies that are utilised in other cities. The subsidies in the table are chosen as they are most applicable to Christchurch due to being areas that concerns have been raised about in the past. In terms of subsidy structure, there are plenty of differing models that Christchurch could look to for inspiration. As can be seen, the most popular fare structure that cities tend to have is zone based, which is the fare structure that currently exists in Christchurch. In comparison to the cases in Table 1, Christchurch is significantly lacking a subsidy that could encourage an uptake in ridership. It is important to note that in every city in the table, there is a travel subsidy for people with disabilities, however Christchurch has chosen to reject this subsidy and replace it with a 50% off taxi fare for these potential users. Thus, creating a potentially inaccessible means of transport (Blackmore & Stranks, 2021). Christchurch is the only city on Table 1 to not have a tertiary subsidy available. An introduction of a subsidy has the potential to act as an incentive for students (often U25'S) to more frequently use PT, increasing the ridership levels. Globally the more expansive and accessible the PT network is, the more people are likely to uptake its use.

4.0 Methodology

4.1 Ethics

An important factor to consider when planning the survey and interview was to ensure they were aligned with the University of Canterbury's human ethics policy (University of Canterbury, 2020). As part of the Geography 309 course we were given blanket ethics coverage.

4.2 Survey

We created a survey using Qualtrics software to collect data on travel habits and satisfaction with current pricing tiers (Appendix 1). The survey method used a combination of convenience and snowball sampling. This survey method allowed a significant volume of data to be collected in a cost and time efficient way. We considered it the easiest way to get as many responses as possible, primarily due to Covid-19 restrictions. The survey consisted of a mixture of multiple-choice questions and written answer questions.

4.3 Interview

The second method used was interviewing young people who have experienced in the Netherlands which is known for its PT accessibility. An interview was only conducted with one participant as others did not respond in the short time frame. The questions asked included discussion of barriers to PT in the Netherlands and specific aspects of their PT system.

4.4 Analysis of results

Prior to analysis incomplete answers were filtered out of the data set. In total, we got 209 survey responses; however, only 187 have been included in the final analysis. The data was analysed using Excel. Graphs were created to display the quantitative data visually. Qualitative data was analysed thematically.

The interview was audio recorded and transcribed. Key themes were identified from their answers however, due to only having one interviewee we could not conduct further analysis as this was an unrepresentative sample.

5.0 Results

We acknowledge that due to the unrepresentative sample of respondents our findings cannot be generalised for all young people in Christchurch.

5.1 Survey results

Of the 187 complete survey respondents, 75.4% (n =141) were 25 years old or younger (U25's) and 24.6% (n = 46) were 26 years old or older (O25's). U25's main mode of transport for utility trips was a private vehicle 49.6% (n=70) followed by bicycle 20.6% (n=29), walking 16.3% (n=23), bus 12.8% (n=18) and company car 0.7% (n=1). As observed in Figure 2, the main reason participants used their chosen mode of transport was convenience.

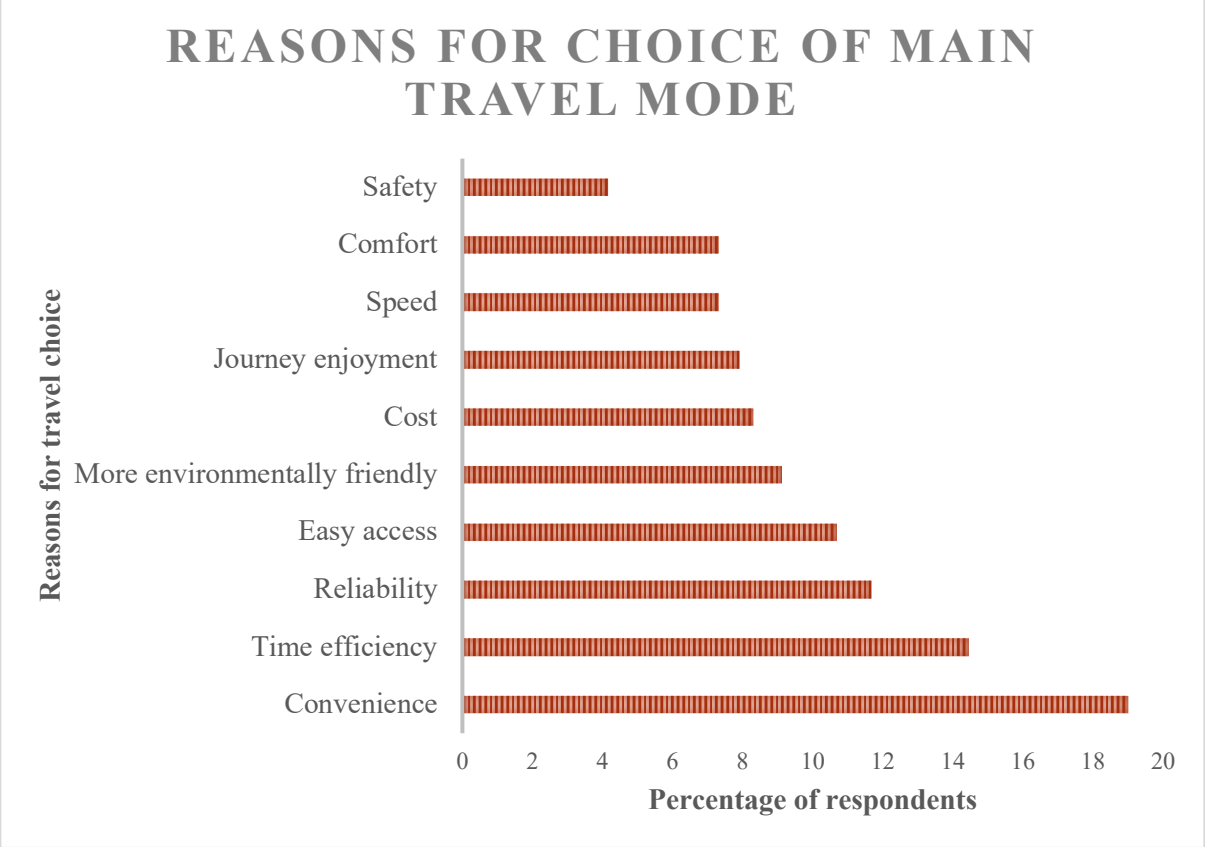

Figure 2 Shows the main reasons people use their primary mode of transport. Convenience of mode was ranked as the highest reason whereas safety was the lowest ranked reason.

Figure 3 shows that 25.5% (n=36) of U25's rode the bus frequently whereas 11.11% (n = 5) of O25's frequently rode the bus.

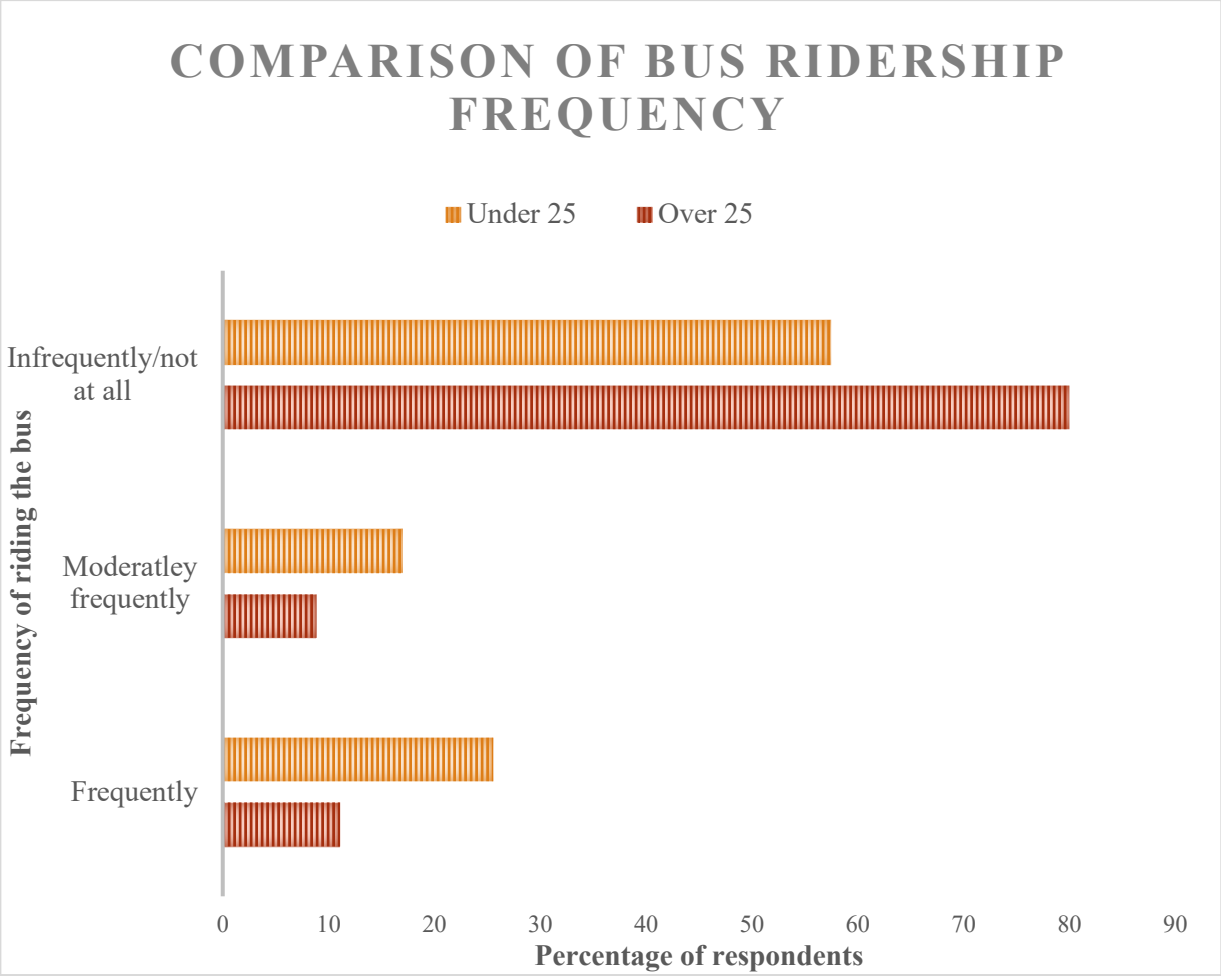

Figure 3 Graph compares the frequency of bus usage between under 25's and over 25's in Christchurch. Infrequently/not at all = riding the bus less than once a month or not at all. Moderately frequently = at least once every 2, 3 or 4 weeks. Frequently = once a week or more. The graph shows that under 25's ride the bus more frequently than over 25's.

Of O25's and U25's that did and did not ride the bus they identified similar improvements to the service, with the key improvement being lower fares (Figure 4).

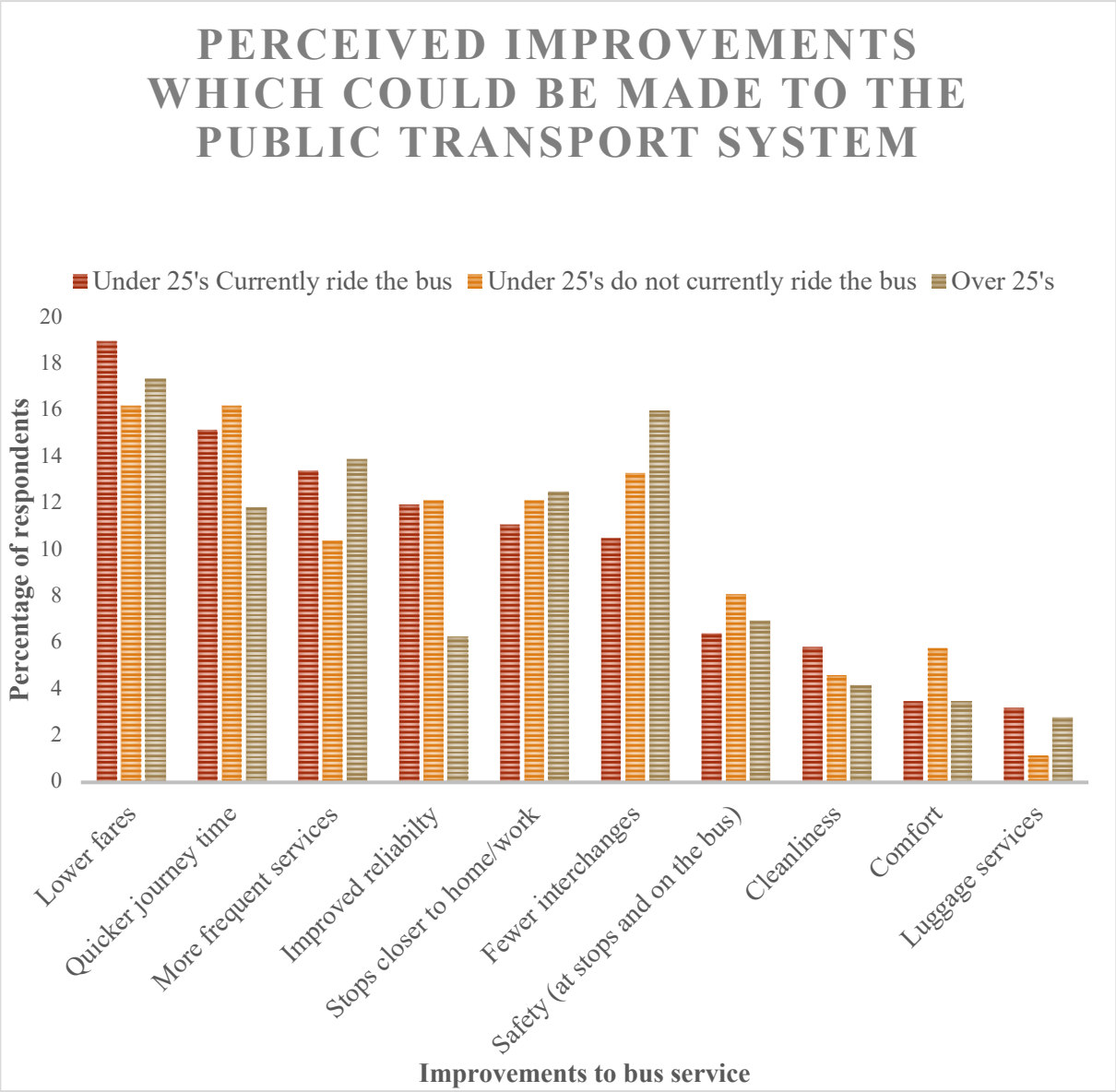

Figure 4 Graph compares the improvements which could be made to the Christchurch bus system across the three survey age groups. Lower fares was the highest or joint highest ranked option for all three groups. Service improvements generally placed higher than bus environment factors such as cleanliness and comfort.

Figure 4 shows that service improvements including quicker journey times, more frequent services, increased reliability, more stops, and fewer interchanges were seen as highly important improvements that could be made to the bus system as well as lower fares.

Figure 5 compares the effect cost of travel has on ridership showing that U25's ridership is more often negatively affected by the cost of bus travel than O25's.

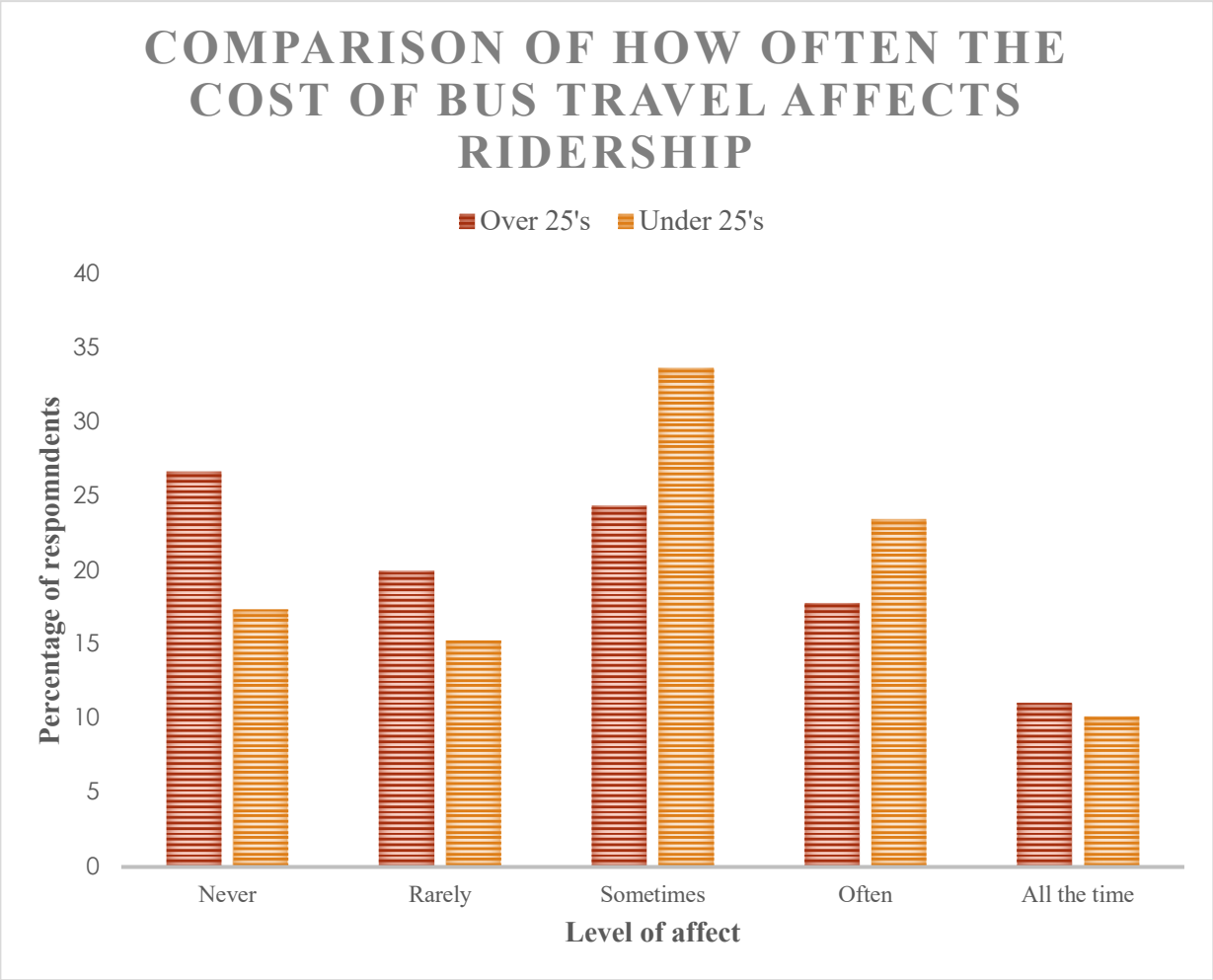

Figure 5 Graph compares how often the cost of bus travel affects ridership for over 25's and under 25's. Shows that Under 25's are more often effected by price thus deterring travel when compared to over 25's.

U25's were asked to rank their level of satisfaction with current adult pricing of buses in Christchurch. Figure 6 shows that respondents who rode the bus had a higher level of dissatisfaction (59.2% n=58) of pricing than those who do not ride the bus (48.9% n=21). Very few respondents from either group were satisfied with the prices.

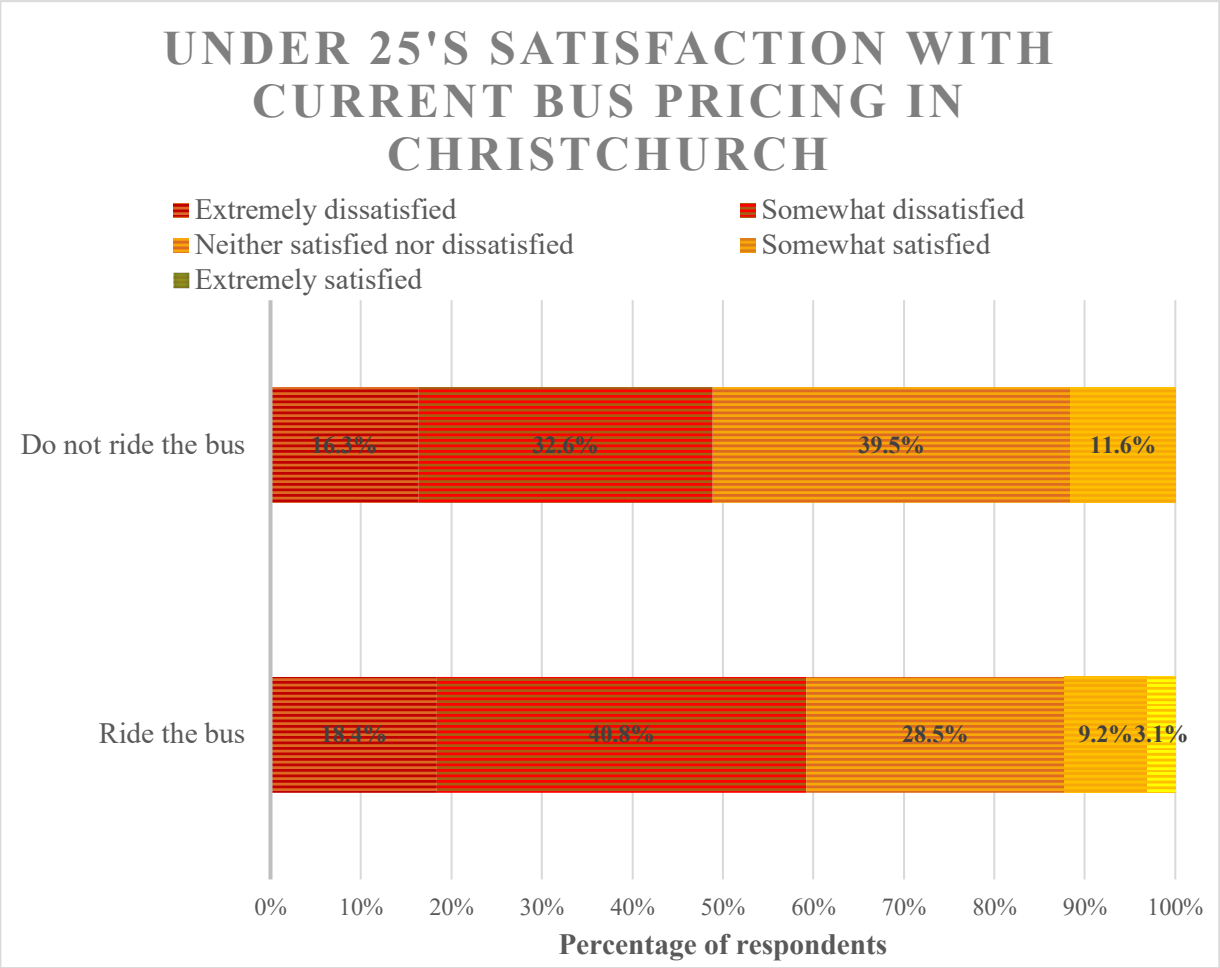

Figure 6 Graph compares the satisfaction with the current bus pricing in Christchurch between under 25's who do and do not ride the bus. Shows that those who ride the bus have a higher dissatisfaction with the prices.

82% (n=116) of respondents would prefer to pay less for the bus while 10.6% would prefer to keep the current prices. 1.4% (n=1) would prefer to pay more on the bus, (noting that this respondent does not currently ride the bus).

Figure 7 shows that a subsidy would likely increase bus ridership. However, the results indicate that this would have a greater benefit on people who are already using the bus compared to people who do not currently ride the bus. Some current bus users commented that it would not change

their bus use as they cannot use the bus more than they are already, but would appreciate a subsidy on travel. For further comments about the bus service see Appendix 2.

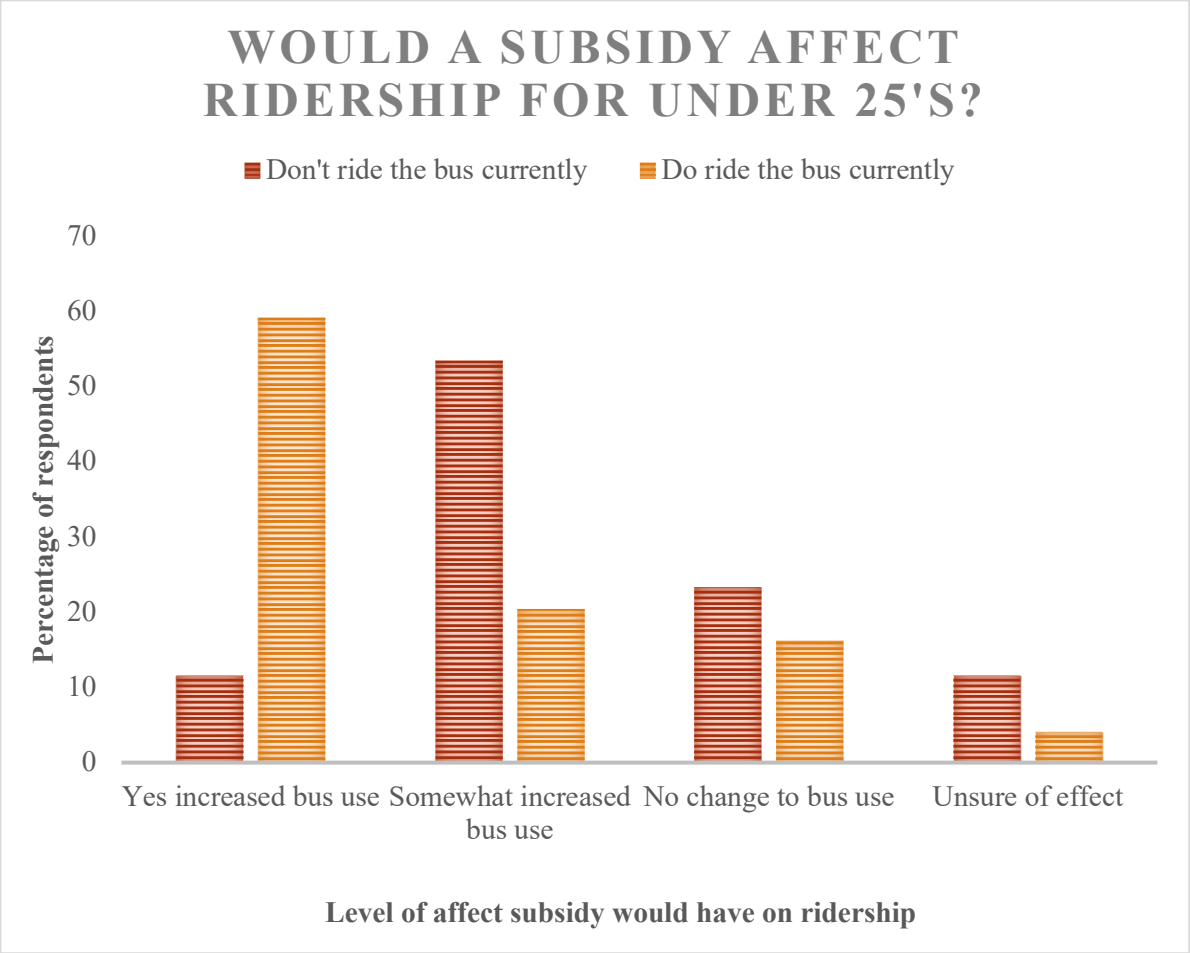

Figure 7 Graph compares how a subsidy may affect ridership for under 25's who do and do not currently use the bus.

5.2 Interview results

The interview from the Netherlands resulted in drawing the conclusion that PT needed to be attractive to encourage ridership through an extensive network and frequency of service. In their opinion a subsidy alone will not encourage bus use. In the Netherlands, PT use is free for students for 5 years. This enables them to travel routes that they wouldn't normally, as cost is a limiting factor for many young people.

6.0 Discussion

6.1 Found improvements for the Christchurch bus network

Lower fares were consistently viewed as the top improvement across the three survey groups. Lower fares were closely followed by service quality improvements such as increased frequency, reliability, and more direct routes. These results are similar to those found by the Life in Christchurch Travel Survey (2020). 42% said more direct routes and 33% said more frequent services would encourage them to use the system more; however, cost was not a significant result. The UCSA Travel Survey (2020) echoed these results where 33% of respondents indicated that more direct routes and 29% said discounted bus fares would encourage increased ridership. We found convenience to be a key factor as to why people choose a mode of transport. Making these changes to the bus network will make the service more convenient for potential users.

The results illustrate that cost is a greater barrier to bus travel for people U25 compared to those who are O25. The barrier of cost may have been more prominent in our results as the majority of under 25's were students who may not have engaged in the council surveys. However, this shows that targeting the subsidy to the U25's age group is highly appropriate. Overall, our survey results support the consensus that the Christchurch bus system needs improving. Multiple international studies have found that lowering the price of PT alone will not have a significant effect on increasing ridership; it must be paired with an efficient and reliable service (Basso & Solva, 2014)

6.2 Subsidy modelling

The assessment on the Metro fare structure conducted by Abley Consultants (Blackmore & Stranks, 2021) was called for by ECan to assess their options in terms of implementing a subsidy,

and the feasibility behind doing so. Currently, the Christchurch fare schedule covers most of the City with a Zone 1 fare at a significantly lower cost than other NZ cities.

Table 2 shows key estimates of patronage & benefits that would be expected from the alternative fare proposals for everyone riding the bus. Each alternative adds more cost to the system, but each scenario is predicted to increase additional patronage. The table shows positive environmental and user benefits as well as a positive benefit net of cost suggesting that a subsidy although it is a significant cost at first has benefits in many ways.

	Flat Rate		Zone Based		Distance Based
Fare Alternative	$2.00	$0.00 fare	25% reduction	50% reduction (off peak only)	25% discount
Additional Estimated Patronage (baseline: 13.51m)	1.56m	4.28m	1.07m	1.37m	1.56m
Revenue Change	-$6.10m	-$22.3m	-$4.11m	-$4.50m	-$6.51m
Cost per Additional Passenger	$3.91	$5.22	$3.84	$3.29	$4.18
Environmental and User Benefits	$9.49m	$27.05m	$6.62m	$6.23m	$9.64m
Benefit net of cost	$3.39m	$4.75m	$2.51m	$1.73m	$3.13m

Figure 8 'Table 2 - Fare reduction analysis summary', from Blackmore and Stanks. (2021). Metro Fares Analysis - Environment Canterbury (EC-J029) retrieved from: https://chchchchchat.files.wordpress.com/2021/08/metro-fares-analysis-final.pdf

Table 3 considers a concession/subsidy being applied to specific groups identified via market research. The modelling is based on youth between the ages of 18-24 years old and Community Service Card (CSC) holders receiving a concessionary fare ($1.50 per trip). The scenarios have a smaller effect on revenue change as the subsidised fares are only applied to a small group of people

with a higher cost per additional customer. The increase in patronage is relatively low compared to the wider effect of a blanket subsidy shown above. However, subsidised fares for youth and CSC holders both show positive environmental and user benefits as well as a positive benefit of the cost. It is not commented on in the report, but we can assume that a subsidy for either of these groups would cost the council significantly less that a blanket subsidy making it easier to implement in the short term.

	Additional Patronage	Revenue Change	Cost per Additional Passenger	Environmental and User Benefits	Benefit net of cost
Youth	337,000	-$1.55m	$4.59	$2.44m	$890,000
CSC Holder	168,000	-$775,000	$4.59	$1.22m	$445,000

Figure 9 'Table 3 - Concession analysis', (Blackmore and Stranks, 2021)

Blackmore and Stranks (2021) discuss that Waka Kotahi New Zealand Transport Agency believes that a reduction in fares have a lower value for money impact on patronage when it is compared to other changes such as reliability and speed of services. Waka Kotahi do not support free fares. Blackmore and Stranks (2021) concluded the current fares to be "appropriately priced" and money would be better spent improving the service despite the positive environmental and user benefits shown in the modelling. We feel this report is inconclusive. Our results show that there is strong support for a subsidy which would likely increase bus ridership. The modelling shows there are positive benefits to a subsidy for youth and that it would increase additional patronage.

6.3 Metro customer satisfaction

Price satisfaction with the service provided is an important component to consider as a part of this research. The results shown in figure 6 show that U25's were mostly dissatisfied with the current prices, wanting to pay less. The Environment Canterbury Christchurch Metro User Survey (2020)

investigates satisfaction with Metro users and for the first time since 2018, overall satisfaction of bus users has climbed to 93% (an increase of 3%). The Abley report deemed the current pricing structure as acceptable and within the expected range (Blackmore & Stranks, 2021). This report and the subsequent findings support the Christchurch Metro User Survey.

The current system and pricing structure presented in both reports shows these to be within the correct range of satisfaction and affordability. This supports the findings from our survey. Our results showed dissatisfaction with pricing, (a new finding), whereas council reports did not. Perhaps this as travel cost affects U25's more than O25's (who have previously been surveyed regarding satisfaction). We acknowledge a subsidy alone will not solve the PT pitfalls in Christchurch, but it may increase satisfaction for U25's, potentially increasing ridership.

6.4 Long term behavior change

The aim of a subsidy is to increase transport equity and encourage bus usage rather than transitioning to driving a car once they reach driving age. There is limited literature surrounding the long-term transport behavioural changes associated with a subsidy. Future research is needed to understand how a PT subsidy for young people can influence transport decisions throughout life. A comment from a survey respondent regarding the benefits of a subsidy stated:

"*I grew up in Scotland and benefited [SIC] enormously from subsidised train and bus transport. I didn't need a car - it was inconvenient because parking was expensive and difficult- and public transport was relatively cheap, frequent and reliable*" 46 years+ female part time worker

This quote highlights the importance of how the available PT system can affect travel behaviour. If the PT system is cost effective, people will be less likely to own/drive cars. In the interview, this point is reiterated - a subsidised service encourages PT use, making cities more livable.

6.5 Support for a subsidy

The UCSA submitted a report to inform ECan about student use of PT. It includes a survey about student travel habits to UC and whether they support a PT subsidy (UCSA, 2021). In addition, it mentions how there are either cheap or free options for students in other cities to use PT. The results showed that in 2020 only 9% of students used the bus, and 39.6% drove; however, there is strong support for a PT subsidy for students (UCSA, 2021). Furthermore, the survey showed that 87.3% of students supported free PT, and 99.4% supported a discount (UCSA, 2021). There is a parallel with the UCSA results and our results as they show strong support for a U25's subsidy from all age groups. Currently, there is a petition for free PT in Canterbury for tertiary students to be taken to Ecan. As of 15 October 2021, there are over 2,000 signatures showing positive support for the initiative (Sign the Petition, 2021). The subsidy proposal has gone forward to ECan twice in 2021, most recently resulting in a split vote bringing the decision to a standstill. There is strong public support for a subsidy, however ECan requires further evidence.

6.6 Waka Kotahi and how subsidies are funded

New Zealand transport is invested in by Waka Kotahi through the National Land Transport Fund (NLTF). The fund for 2021-2024 currently sits at $24.3 billion in which $1.2 billion of this is set to be invested into the Canterbury region (Waka Kotahi NZ Transport Agency, 2021). Typically, 50% of the NLTF is allocated towards funding PT subsidies across the country with the remaining cost of available subsidies being funded by local councils. Through investing into PT schemes,

Waka Kotahi aims to create a more inclusive and accessible PT network for the entirety of New Zealand.

Looking at the local example of Auckland, transport subsidies are funded primarily through Auckland City Council and Waka Kotahi collaboration with 48% of capital projects being funded through this and the remaining 52% being split between 5 different sources of income (Auckland Transport, 2021). Central government funding allows for cheaper fares and subsidy use on PT. In Christchurch fares are set by ECan and with a decrease in ridership, fares have no choice but to increase in order to maintain the fleet operation and prioritise subsidies available, hence making the system less attractive to residents (Environment Canterbury, 2018).

6.7 Transport equity and subsidy investment

Access to PT is something all should have without worrying about where the money is going to come from. This is further explored through the concept of *vertical equity* which requires that people's diverse needs and abilities should be catered to through multimodal transport and subsidies (Litman, 2002). A subsidy for U25's must be viewed as an investment for Christchurch's PT system as it will enable immersion within society. Creating an equitable transport network would encourage a ridership increase through financially aiding those in hardship.

7.0 Limitations of Research

7.1 Time restrictions

The time restriction of 13 weeks was one of the key issues faced during this research process. Fortunately, the ethics process did not take a significant amount of time, due to the GEOG309 course having blanket coverage. Creating and finalising the survey took longer than expected to ensure we would receive responses which would answer our research question. The restricted time frame on our survey also reduced the number of responses we received.

7.2 Representational bias

Representation is critical when conducting research, as it is important to hear the opinion from a range of societal and demographic groups. To avoid representational bias, we asked multiple community groups through Facebook as well as Ara and Lincoln University to share the survey. In addition to this, we asked every person that we sent the survey to, to share it on to a few more people (to employ the snowball sampling technique). We received more survey responses from females; only 60 of 187 participants were male.

7.3 Coverage bias

It was our intention to inhibit representational bias through the sharing of the survey to groups across Christchurch, rather than Ilam and Riccarton, where many university students are located. We did get a good spread of respondents from a variety of suburbs, however less from the East and North-East. The majority of U25 respondents were students who have been surveyed on the issue many times before. It seems apparent we missed out on gathering results from many working young people. The demographic results from the survey show that over 150 of the participants were of European/Pakeha descent, with 8 Māori. Due to our primary method of distributing the

survey through Facebook, there is immediate bias as this does not include those who do not have Facebook or would have issues with internet connectivity (Couper, 2000).

7.4 Mana Whenua engagement

Engagement with mana whenua was limited, due to a lack of time to organise and hold a focus group specifically for mana whenua. This is something which would be assessed in future research, as mana whenua are important to consider in a research project such as this.

7.5 Covid-19 reemergence

Due to the Covid-19 lockdown, the amount of data collection techniques we could use for our research was limited. Social distancing and time restrictions prevented us from running focus groups. Due to this, we decided to interview students from the Netherlands, as we could use Zoom for this. Unfortunately, due to lack of time, and response from people contacted, we did not get a wide sample of interviews, ultimately interviewing one male student.

8.0 Recommendations

8.1 Recommendations to Environment Canterbury

We recommend a subsidy for U25's as there is strong public support and we recognise that although it does not fix the issues with the PT system, it is a step towards transport equity. Through analysis of the Abley modelling of fare reduction, it is our recommendation to ECan that they consider a one-year trial period of a concessionary fare ($1.50) for 18-25 year olds.

We acknowledge that ECan is aware of the issues and planning for service improvements to be made and these are part of the long-term plan. We support a subsidy because this can be implemented relatively quickly as a short -erm improvement to increase ridership.

Our recommendations to increase U25 ridership long term are:

- Investment in the PT network increasing frequency and reliability of the service.
- Extensive and more direct routes making buses a more accessible and convenient mode of transport for all.
- Reevaluation of the fare structure to a distance-based fare, making inner city travel cheaper.

8.2 Future research

We found the U25 age group to be under-researched, particularly in a New Zealand transport context. The habits and motives behind U25's travel behaviour is an area which must be further investigated for informed policy change. Further research is needed to understand how cheaper public transport can affect long-term behaviour change. The difficulty in researching this age group is due to the spread of occupation, such as tertiary students, full time/part time workers,

unemployed and those in apprenticeships. To overcome this limitation, wider surveys and a focus group using a representative sample of U25's in Christchurch would be beneficial.

9.0 Conclusion

Young people are dissatisfied with the current pricing structure – especially those who already use the bus as a main mode of transport and a subsidy alone is not enough to encourage people who don't ride the bus frequently to increase their ridership. As previously mentioned, lower fares, quicker journey time, and more frequent services are the key factors that will encourage an increase in ridership. These are not findings specific to our research. They are echoed in previous studies and confirm that access to PT is a matter of equity and that it is not right for the groups in need to be unable to access this. It appears that although a concession sounds nice on paper, it is not something that can stand alone if the PT system in place has existing flaws. A subsidy is an investment and if we invest in the system the system will give back to us in terms of profit, ridership, and overall satisfaction with the services. It is in ECan's best interest to henceforth invest in improving the existing system before the introduction of another subsidy should be considered.

10.0 Acknowledgements

First and foremost, we would like to thank Councillor Vicky Southworth and Dr Lindsey Conrow for answering emails promptly and guiding us through this research. We would also like to thank our survey participants and interview participant in the Netherlands for their contribution to our research. We would also like to thank GEOG309 coordinators Dr Jillian Frater and Prof. Simon Kingham.

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Appendix 1

Public Transport Subsidy for Under 25's

Start of Block: Default Question Block

Q1 Kia ora,

You are invited to participate in a research study on the feasibility of a public transport subsidy in Christchurch for under 25 year olds. This study is being conducted by Benjamin Salt, Daisy-Bea Scrase, Florence Ferguson, Nelly Skelton and Pippa Sheppard from the University of Canterbury | Te Whare Wānanga o Waitaha. The study is being carried out as a requirement for GEOG309 Research for Resilient Environments and Communities.

What is the purpose of this research?
This research aims to determine whether a public transport subsidy for under 25 year olds in Christchurch is a viable option which will increase bus usage. We are interested in finding out about the transport habits of Christchurch residents and the effect the cost of public transport has on bus usage. The information from this study will provide Environment Canterbury Councilor Vicky Southworth with the necessary information about the viability of a public transport subsidy to bring to council.

Why have you received this invitation?
You are invited to participate in this research because you have responded to a request for participants who are over 18 years old. Your participation is voluntary (your choice). If you decide not to participate, there are no consequences. Your decision will not affect your relationship with the University of Canterbury or any member of the research team or external organisation.

What is involved in participating?
If you choose to take part in this research, please complete the online survey that follows this information page. The survey involves answering approximately 15 questions. Completing the survey should take around 5-15 minutes.

Are there any potential benefits from taking part in this research?
We do not expect any direct benefits to you personally from completing this survey. However, the information gathered will potentially benefit Christchurch's public transport system in the future.

Are there any potential risks involved in this research?
We are not aware of any risks to participants in the research. If any questions make you feel uncomfortable, you are welcome to skip them and you may stop the survey at any time.

What if you change your mind during or after the study?
You are free to withdraw at any time. To do this, simply close your browser window or the application (App) the survey is presented on. Any information you have entered up to that point will be deleted from the data set. As this is an anonymous survey it will not be possible to withdraw your information after you have completed the survey.

What will happen to the information you provide?
All data will be anonymous. All data will be stored on the University of Canterbury's computer network in password-protected files. All data will be destroyed after completion of the study/publication of study findings. Pippa Sheppard will be responsible for making sure that only members of the research team use your data for the purposes mentioned in this information sheet.

Will the results of the study be published?
The results of this research will be published in a final report and presented at a conference open to the public on October 9. This report will be available to the public through the UC website. You will not be identifiable in any publication. I will send a summary of the research to you at the end of the study, if you request this. If you provide an email address for this purpose, it will not be linked with your survey responses.

Who can I contact if I have any questions or concerns?
If you have any questions about the research, please contact: Daisy-Bea Scrase dbs50@uclive.ac.nz. If you have any concerns about the research, please contact our supervisor Dr Lindsey Conrow lindsey.conrow@canterbury.ac.nz . This study has been reviewed and approved by the University of Canterbury Human Research Ethics Committee (HREC). If you have concerns or complaints about this research, please contact the Chair of the HREC at human-ethics@canterbury.ac.nz.

What happens next?
If you would like a PDF version of this information sheet, please email Daisy-Bea at the email address above. Please read the following statement of consent and start the survey below.

Statement of consent
I have read the study information and understand what is involved in participating. By completing the

survey and submitting my responses, I confirm that I am at least 18 years old and that I consent to participate (select 'I consent to participate' and click the next button to continue).

☐ I consent to participate (1)

End of Block: Default Question Block

Start of Block: Conditional Question

Q2 What age bracket do you fit into?

○ - 18-25 years old (1)

○ - 26-35 years old (3)

○ - 36-45 years old (4)

○ - 46 years old or older (5)

○ - Prefer not to answer (6)

End of Block: Conditional Question

Start of Block: Further comments

Q32 Any further comments you'd like to make about a possible public transport subsidy?

_____

End of Block: Further comments

Start of Block: Over 25's questions

Q28 O25 Do you ever ride the bus? If so, how frequently?

- ○ No - I never ride the bus (1)
- ○ Yes - Daily (2)
- ○ Yes - At least 5 days a week (3)
- ○ Yes - At least 3 days a week (4)
- ○ Yes - At least 1 day per week (5)
- ○ Yes - Once a fortnight (6)
- ○ Yes - Once a month (7)
- ○ Yes - But less than once a month (8)

Q29 O25 What improvements to public transport might encourage you to use it more frequently? (Select more than one)

- ☐ Fewer interchanges (more direct routes) (1)
- ☐ Stops closer to work/home (2)
- ☐ Lower fares (3)
- ☐ Improved reliability (4)
- ☐ More frequent services (5)
- ☐ Quicker journey time (6)
- ☐ Cleanliness (7)
- ☐ Comfort (8)
- ☐ Safety (at stops and on the bus) (9)
- ☐ Luggage services (including animals) (10)
- ☐ Other (please specify) (11) _____

Q30 O25 How often does the cost of a bus trip ($2.65 with a metrocard, $4.20 without) influence your decision to take the bus?

- Never (1)
- Rarely (2)
- Sometimes (3)
- Often (4)
- All the time (5)

Q37 O25 How or why does this affect your bus travel?

_____

Q31 O25 Did you ride the bus when you were between the ages of 18-25?

- Yes (1)
- No (2)

Q32 O25 Would a subsidised public transport fare have influenced how you traveled between the age of 18-25?

- Yes - I would have used the bus more (1)
- Somewhat - I may have used the bus more (2)
- No - I would not have used the bus more (3)
- Unsure (4)

Q33 O25 Would you support a subsidy for bus travel for under 25s? Eg $1.50 instead of $2.65 when using a metrocard.

- ○ Yes (1)
- ○ Maybe (2)
- ○ No (3)
- ○ Unsure (4)

Q33 O25 If a bus fare subsidy was offered, to which group(s) do you think it should apply?

- ☐ All under 25s (1)
- ☐ Tertiary students (2)
- ☐ Community Service Card holders (3)
- ☐ All of the above (4)
- ☐ Other (please specify) (5) _____

Q40 O25 Which of the following personal aspects of your main mode of transport are most important to you?

- ☐ Concerns about sustainability/environmental issues (1)
- ☐ Reflecting my identity (2)
- ☐ Exercise and physical activity (3)
- ☐ Engaging with technology/devices (4)
- ☐ Challenge, adventure or risk (5)
- ☐ Socialising/connecting with community (6)
- ☐ Other (7) _____

End of Block: Over 25's questions

Start of Block: Transport habits for under 25s

Q29 ALL U25 What is your main mode of transport for utility trips (eg, commuting to work or study, shopping or other errands)?

- ○ Company car/truck (1)
- ○ Private vehicle (car, electric car, truck etc) (2)
- ○ Bus (3)
- ○ Bicycle (including e-Bike) (4)
- ○ Scooter or e-Scooter (5)
- ○ Motorcycle/moped (6)
- ○ Rideshare (7)
- ○ Walking (8)
- ○ Other (please specify) (9) _____

Q4 ALL U25 What are the reasons you use this mode as your main form of transport?

- [ ] Reliability (1)
- [ ] Convenience (2)
- [ ] Time efficiency (3)
- [ ] Speed (4)
- [ ] Easy access (5)
- [ ] More environmentally friendly (6)
- [ ] Comfort (7)
- [ ] Safety (8)
- [ ] Journey enjoyment (9)
- [ ] Cost (10)
- [ ] Other: (11) _____

Q30 ALL U25 Which of the following personal aspects of your main mode of transport are most important to you?

- [ ] Concerns about sustainability/environmental issues (1)
- [ ] Reflecting my identity (2)
- [ ] Exercise and physical activity (3)
- [ ] Engaging with technology/devices (4)
- [ ] Challenge, adventure or risk (5)
- [ ] Socialising/connecting with community (6)
- [ ] Other (7) _____

Q7 ALL U25 Does your financial situation affect your chosen travel method? (you do not need to answer this question if you feel uncomfortable)

- ○ Yes (1)
- ○ No (2)
- ○ Somewhat (3)
- ○ Prefer not to answer (4)

Q8 ALL U25 Do you ever ride the bus? If so, how frequently?

- ○ No - I never ride the bus (9)
- ○ Yes – More than once daily (10)
- ○ Yes – Once daily (11)
- ○ Yes – Five days a week (12)
- ○ Yes - At least three days per week (13)
- ○ Yes – At least one day per week (14)
- ○ Yes - Once a fortnight (15)
- ○ Yes - Once a month (16)
- ○ Yes - But less than once a month (17)

End of Block: Transport habits for under 25s

Start of Block: U25s who ride the bus

Q10 U25R Why do you ride the bus? Tick all that apply

- [ ] Convenience (1)
- [ ] Reliability (2)
- [ ] Time efficiency (3)
- [ ] Speed (4)
- [ ] Ease of access (5)
- [ ] Safety (6)
- [ ] Cost - money saving (7)
- [ ] Environmental reasons (8)
- [ ] Comfort (9)
- [ ] No other option (i.e don't own a private vehicle) (10)
- [ ] Journey enjoyment (11)
- [ ] Other (please specify) (12) _____

Q11 U25R Do you own a metrocard?

- ○ Yes (1)
- ○ No (2)

Q12 U25R How often does the cost of a bus trip ($2.65 with a metrocard, $4.20 without) influence your decision to take the bus?

- Never (1)
- Rarely (3)
- Sometimes (4)
- Often (5)
- All the time (6)

Q29 U25R How satisfied are you with the current pricing tiers of the bus services?

- Extremely dissatisfied (1)
- Somewhat dissatisfied (2)
- Neither satisfied nor dissatisfied (3)
- Somewhat satisfied (4)
- Extremely satisfied (5)

Q30 U25R In terms of your satisfaction with bus pricing would you:

- Prefer to pay less (1)
- Prefer to keep current costs (2)
- Prefer and/or willing to pay more (3)

Q35 U25R Would your behaviour associated with mode of transport change if subsidised public transport was introduced? Eg $1.50 instead of $2.65 for a bus trip when using a metrocard.

- ○ Yes - I would use the bus more (1)
- ○ No - It would not change how frequently I use the service (2)
- ○ Somewhat - It would increase how much I use the bus slightly (3)
- ○ Unsure (4) _____

Q31 U25R What improvements to public transport might encourage you to use it more frequently? (Select more than one)

- ☐ Fewer interchanges (more direct routes) (1)
- ☐ Stops closer to my home/work (2)
- ☐ Lower fares (3)
- ☐ Reliability (4)
- ☐ More frequent services (5)
- ☐ Quicker journey time (6)
- ☐ Cleanliness (7)
- ☐ Comfort (8)
- ☐ Safety (at stops and on the bus) (9)
- ☐ Luggage services (including animals and bicycles) (10)
- ☐ Other (please specify) (11) _____

End of Block: U25s who ride the bus

Start of Block: U25s who don't ride the bus

Q25 U25D What are the main factors keeping you from riding the bus?

_____

Q22 U25D What improvements to public transport might encourage you to use it more frequently? (Select more than one)

- ☐ Fewer interchanges (more direct routes) (1)
- ☐ Stops closer to work/home (2)
- ☐ Lower fares (3)
- ☐ Improved reliability (4)
- ☐ More frequent services (5)
- ☐ Quicker journey time (6)
- ☐ Cleanliness (7)
- ☐ Comfort (8)
- ☐ Safety (at stops and on the bus) (9)
- ☐ Luggage services (including animals) (10)
- ☐ Other (please specify) (11) _____

Q38 U25D How satisfied are you satisfied with the current pricing tiers of the Christchurch bus services?

- Extremely dissatisfied (1)
- Somewhat dissatisfied (2)
- Neither satisfied nor dissatisfied (3)
- Somewhat satisfied (4)
- Extremely satisfied (5)

Q39 U25D In terms of your satisfaction with bus pricing would you:

- Prefer to pay less (1)
- Prefer to keep current costs (2)
- Prefer and/or willing to pay more (3)

Q36 U25D Would your behaviour associated with mode of transport change if subsidised public transport was introduced? Eg $1.50 instead of $2.65 for a bus trip when using a metrocard.

- Yes - I would use the bus more (1)
- No - It would not change how frequently I use the service (2)
- Somewhat - It would increase how much I use the bus slightly (3)
- Unsure (4) _____

Q26 U25D What would make use of a public transport subsidy more desirable?

- ○ Increased accessibility to bus services (1)
- ○ More frequent services (2)
- ○ Timetables fit better with personal schedule (3)
- ○ Decreased length in journey (4)
- ○ No change would make using the subsidy more desirable (5)
- ○ Other (6) _____

Q27 U25D If a subsidy was offered, to which group(s) do you think it should apply?

- ☐ All under 25s (1)
- ☐ Tertiary students (2)
- ☐ Community Service Card holders (3)
- ☐ All of the above (4)
- ☐ Other (please specify) (5) _____

Page Break

End of Block: U25s who don't ride the bus

Start of Block: Demographics

Q34 DEMO What suburb of Christchurch do you live in?

_____

Q35 DEMO What is your main occupation?

- working full time (1)
- working part time (2)
- self employed (3)
- student (4)
- unemployed (5)
- retired (6)
- not working by choice (7)

Q36 DEMO What gender do you identify with?

- Male (1)
- Female (2)
- Gender diverse/non-binary (3)
- Unsure (4)
- Other (please specify) (5) _____
- Prefer not to answer (6)

Q37 DEMO What is your ethnicity?

- European/ Pākehā (1)
- Māori (2)
- Pacific peoples (3)
- Asian (4)
- MELAA (Middle Eastern/Latin American/African) (5)
- Other (please specify) (6) _____
- Prefer not to answer (7)

End of Block: Demographics

Start of Block: Block 8

Q34 If you would like to be contacted for a focus group around this topic please leave your email (focus groups may be held virtually depending on COVID lockdown levels). Your survey responses will remain anonymous.

_____

End of Block: Block 8

Appendix 2

Further comments from survey

Price	Service
"I have recently changed from a child's fare to an adults and have seen a massive impact on my travel options. Depending on how badly I need to get to a place I would rather walk than bus so I can save money" 18-25 year old, female student. "As a university student, every single penny counts. Subsidised bus fare would be great, so more students like me would also use the bus more" 18-25 year old female student "Why have you not done this? The bus from Lincoln Uni is EMPTY and you could at least make a bit of money if you lower the fares!" 36-45 female working full time "Maybe a reduced fee for students travelling to and from Riccarton and Lincoln. Would encourage Lincoln students to take the bus to uni instead of driving everyday." 18-25 year old, male student "This would certainly help families and tertiary students who struggle financially and also contribute to less cars on the road" - "There was talk about trialing free buses to see if that increased usage. Do this. Please. Subsidized for under 25s is not enough." - 26 - 35 years, gender diverse, working part time	"At the moment, driving a car is more convenient yet having to park in the city for college is expensive, if buses were cheaper or were better timed for me then I would take them instead" 18-25 year old, male student "Personally, I'm not worried about a subsidy. The main barrier to me using the bus services is that it takes 3 to 4 times as long to do the main trip I would do on the bus as it takes me in a car. Furthermore, the car is more comfortable, and I am not beholden to other people when using it, plus it enables me to do multiple stops and detours etc." 18-25 year old male working part-time. "Subsidising bus costs is absolutely necessary in Christchurch. It MUST also coincide with quicker and more frequent routes so that it is a PREFERABLE option to private vehicle ownership. I would 100% use Chch's bus system if it suited me, but it is currently so unreliable and such a long time from A to B that I am basically forced to use a private vehicle. I would welcome the opportunity to use an improved system. Perhaps a free bus trial to gauge interest could prove the possibilities with our transport system." 18-24 year old, female student "I find the routes to also be difficult, especially if I want to go out for a day and run a lot of errands. For example, from my flat in Lincoln, to UC for a guest lecture, to Hornby for some things from Dressmart and back to Lincoln. Even that you have to take two busses from Lincoln to UC, even though there are students who attend lectures at both campusses, makes no sense- no wonder so many students choose to drive." 26-35, male, working full time