UNDERSTANDING THE TRAVEL BEHAVIOUR OF YOUNG ADULTS

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Abstract

Driver licensing rates among youth in Auckland, New Zealand have shown to be declining in recent years. In an effort to understand this decline, this research project aims to explore trends occurring in alternative modes of transport among youth that may be contributing to this shift in mode choice. Specifically, active modes of transport such as walking and cycling have been investigated due to their high potential for future growth. Using information collected from the Active Mode surveys conducted by Auckland Transport over 2014 and 2015, analysis of these active modes was undertaken on the target age range of 15-24 year olds living in Auckland. It was determined that there has been a significant increase in the popularity of walking, whereas cycling frequency has stagnated despite the increase in the number of cycleways available for use. Findings from the analysis showed that the primary reason behind the use of active modes has been for health and fitness purposes, with other factors such as perceived levels of safety and public perception contributing as demotivating factors. The findings of this research project can be used to help assist New Zealand Transport Agency and Auckland Transport in prioritising future developments surrounding active modes.

1. Introduction

The declining rate of driver licensing among young adults is a prominent trend across many major developed countries around the world. Variables such as alternative modes of transport, congestion, travel safety, cost, among other things are thought to be major contributing factors to this perceived declining trend. In an attempt to identify whether this trend is present in Auckland, New Zealand, a study on the travel behaviour and habits of young adults (15-24 year olds) has been conducted in Auckland. The results from this study have been used to identify the shift in mode choice among young adults in Auckland, predominately walking and cycling, and their subsequent reasons to explore the significance and prevalence of these factors in relation to Auckland youth.

Like many other developed cities in the world, Auckland mainly relies on cars as their main mode of transport, counting for almost 80% of all transport journeys. Although there is a declining rate of driver licensing among young adults in Auckland, our roads will not be able to cater for such dependency on cars with the rapid population increase Auckland is facing. Because of this issue, Auckland in recent years has started to undergo transformations to promote and increase usage of alternative modes of transport such as walking and cycling. With this initiative being fairly new, it is important to understand the current travel behaviour of young adults in Auckland to identify the potential factors that will influence travel mode choices in the future.

2. Literature Review

This literature provides an overview of the main concepts behind this research; the factors influencing travel behaviour of young adults, and the effect these collective behavioural habits could have on New Zealand's transport network as a whole.

2.1. The Decline in Youth Driver Licensing

A decline in driver licensing among young people has been observed in 9 of 14 developed countries studied (Delbosc & Currie, 2012; Delbosc & Currie, 2013; Raimond & Milthorpe, 2010) From 1983 to 2010, the USA experienced a decline in licensing for all age groups below 30, with the largest decrease occurring among the youngest age groups (Kuhnimhof et al., 2012; Sivak & Schoettle, 2012b). Canada also experienced a similar decline to a lesser degree, as the licensing rates for those aged 25-34 decreased from over 90% to around 85% between 1999 and 2009 (Sivak & Schoettle, 2012a). Great Britain also experienced significant decreases in licensing rates among youth, with licensing rates among 17-20 year olds dropping from 44% to 35% between 1995 and 2009.

When comparing the unweighted average of licensing rates between all monitored developed countries, an apparent licensing decline of 0.2% per year is evident. For the nine countries showing a decline in licensing, an average decrease of 0.6% per year can be seen. An inclination to a decline in licensing rates; particularly among younger age groups may be suggested

after analysis of these results. Thus, it seems many young people in developed countries are less likely to hold a driving license than they would be 10-20 years earlier. This was also found to be the case for young Aucklanders, with details surrounding this trend being outlined in the background section of this report.

2.2. Demotivating Factors of Private Vehicle Use

2.2.1. Costs of Motoring and Disposable Income

Household income has seen to be a significant factor of influence for young adults when choosing their mode choice. Evidence of this can be seen in the United States, where licensing rates have been observed to be reducing mainly due to the perceived cost of motoring. This can be seen in studies when looking at the results of several surveys that have been carried out, showing young adults mention costs as the main reason for not acquiring a license (Berg, 2001; Noble, 2005). Similarly, in the United Kingdom, cost of insurance, the cost of learning to drive, and the cost of driving a car were found to be governing reasons discouraging young adults from driving (Noble, 2005). Another study in the United States showed 30% of 18 year olds without a driver's license collectively stated they had "no car available" and can get to "where they want without driving" (Williams, 2011). The extent to which cost is an influencing factor can be better seen when looking into the modern trend of young adults delaying full-time work, leading to a reduction in disposable income (Delbosc & Currie, 2013), as further outlined below.

Developed countries such as Australia and the United States have seen declining trends in full-time employment among young people, with young people instead of being more likely to be in part time employment or enroll in tertiary education (Bureau of Labour Statistics, 2011). For example, Australia experienced a decline in full time employment of young adults from almost 50% in 1985 to 33% in 2011, while part time employment saw an increase of 11% to 29% during the same time frame (Delbosc & Currie, 2013). A similar trend has also been observed in New Zealand's labour market (Smith, M, 2016). The 18% rise in part time employment is possibly correlated to the increasing trend of young adults, aged between 20 and 24, enrolling into tertiary education. These trends in education and employment are likely to restrict and impact the amount of disposable income available to young adults. When looking at an analysis that compared the spending patterns of income of young adults in 1998/99 to 2009/10, the trends suggested that young adults, compared to a decade ago, are spending a significantly larger percentage of their income on housing (Delbosc & Currie, 2013). Meanwhile, discretionary spending such as on recreation, clothing, and alcohol have not reduced. Spending on transport however has reduced considerably. When looking at the higher amount of spending required for young adults in recent years, an increase in the financial dependency of young adults can be seen due to lacking sufficient income to purchase and maintain a car. This, in turn, has played a part in leading to lower licensing rates among young adults and an increased likeliness to adopt other cheaper modes of transport.

2.2.2. Traffic Congestion and Discomfort

Auckland has seen a consistently high growth rate regarding the number of cars on Auckland's roads. This coupled with the comparatively small increase in the number of roads and motorways (Wang et al., 2014) has resulted in high congestion levels to be a common problem causing discomfort and frustration for many motorists (Novaco, Stokols, & Milanesi, 1990). Such frequent daily nuisances have become a salient source of everyday stress (Gulian, Glendon, Matthews, Davies, & Debney, 1990). In addition, hassles such as time pressure during adverse driving conditions have found to have an additive effect, where the influence of one event can add to the severity of another (Kanner, Coyne, Schaefer, & Lazarus, 1981). Alternative modes of transport to private vehicles such as public transport and active modes have the ability to reduce levels of discomfort that are commonly attributed with driving under stressful traffic conditions. It should be noted that cycling can be stressful and dangerous if proper safe facilities are not provided. Using active modes of transport for daily travel may relieve daily stresses that are integrated when driving a private vehicle which are particularly prevalent when travelling in urban areas such as Auckland.

2.2.3. Social status of car

The perception of car ownership as a symbol of social status is an idea that is quite prominent among older generations (Hiscock, Macintyre, Kearns, & Ellaway, 2002; Steg, 2005). In particular, participants of Steg's study saw cars as a symbol of independence and freedom. Thus, young adults that embrace these views would be more likely to use a private vehicle. In addition, Delbosc held three discussion forums in Australia with young adult participants (aged 18-23 years old) to determine what young adults thought a car represented in terms of status. The general consensus suggested young Australians see car ownership as a symbol of adulthood and maturity, rather than status (Delbosc & Currie, 2013). Additionally, the discussion opened views interpreting car ownership as added responsibility, with young adults without cars not being categorised in a lower status. Resultantly, if car ownership is regarded as a phase into adulthood, this may relate to recent studies of young adults delaying life stages such as finding full-time employment.

2.2.4. *Environmental awareness*

A prime factor influencing mode choice among youth is believed to be attitudes and perceptions. The attractiveness of the car as a mode of transport is a particular topic of interest as there are suggestions that shifting environmental attitudes may be drawing young adults away from private vehicle use. Evidence supporting this belief was found in a Swedish longitudinal survey of young adults, which saw a slight increase in the number of young people citing environmental reasons as to why they have refrained from getting a license (Forward, Åretun, Engström, Nolén, & Börjesson, 2010). However, this may be just an indication of the younger generation's increased environmental awareness, as there are other studies that have questioned whether these attitudes have a tangible impact on behavior. For example, a qualitative study carried out in Australia found that environmental attitudes are unlikely to be a major contributor to these trends (Delbosc & Currie, 2012).

2.3. Factors contributing to the success of alternative modes of transport

Auckland has been a car-based city for decades, as evidenced by the modal share of car trips Auckland wide being 78.8% (Statistics NZ, 2006). There are however many cities worldwide which benefit from a healthy mode share of active mode users. In order to determine what factors contributed to the success of these alternative modes of transport in larger cities, research was carried out on cities with thriving active transport mode shares, such as London, Copenhagen, and Berlin. The factors found to have the most significant effects on the use of active modes have been outlined below. It should be noted however that other factors such as topography, weather, trip lengths, and the number of other people using active modes are also underlying influences that play a part in motivating the use of active modes.

2.3.1. *Safety*

Safety is consistently identified as a highly influential factor in commuters' decision to cycle (Akar & Clifton, 2009). Having cycling-favoured traffic laws that put more responsibility of crashes on motorists help improve safety for cyclists. This is enforced by implementing the cyclist's right of way by police and courts ((Pucher & Buehler, 2008). This can also be achieved through proper safety education to both cyclists and motorists, similar to the way it has been implemented in developed countries such as Norway. This would in turn help commuters better understand how to interact with each other on the road space (Akar & Clifton, 2009; Gatersleben & Appleton, 2007; Pucher & Buehler, 2008).

2.3.2. *Health & Fitness*

Walking and cycling can provide valuable daily physical activity, in turn proving to have a major influence on health and longevity. European countries with high rates of walking and cycling such as Denmark are continuously promoting these active modes, and resultantly have lower obesity rates than places with low rates of active mode use such as Australia and North America.

2.3.3. *Well connected active mode networks*

One of the most important motivating factors for cyclists are the presence of well-connected cycleways (Akar & Clifton, 2009; Dill & Voros, 2007). This includes making cycle lanes more direct and segregated with smooth surface quality, and improving continuity of routes and en-route facilities to allow for more efficient connections ((Dill & Carr, 2003; Dill & Voros, 2007; Hunt & Abraham, 2007; Stinson & Bhat, 2003).

3. Background: Travel Behaviour and Infrastructure

In order to identify trends in licensing among young people in Auckland, relevant data was acquired from NZTA and subsequently plotted in Figure 1. This information shows that although there has been a slight increase in recent years, the number of 15-24 year olds in Auckland holding restricted licenses had indeed seen an overall decrease over the last 10 years. This trend is similar to many other countries outlined in the literature review.

3.1. License for 15-24 years old commuters

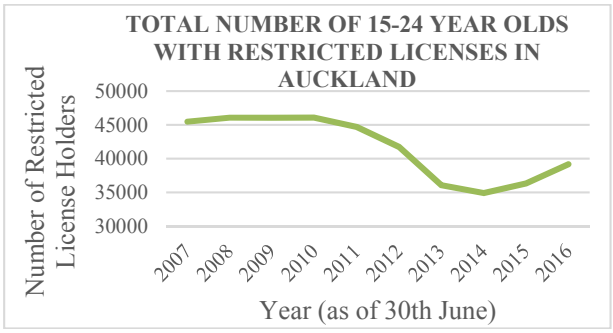

Figure 1: Restricted Licensing Trends among youth in Auckland

Despite the consistently high population growth rate in Auckland, it is quite noteworthy that the number of Restricted License holders has still decreased over the last 10 years. As a result, research has been conducted on alternative modes of transport that young people may have adopted. Active modes, namely walking and cycling, have been chosen as the transport modes of interest to analyse. This is due to a combination of factors involving increasing investments made by government organisations into active modes, and the high potential

adoption rate these modes have with our target age range of 15-24 year olds.

3.2. New Infrastructure

There have been six new cycle paths opened up in 2015 and three more during the first half of 2016, with an additional three more expected by the end of December 2016. Resultantly, it can be seen that increasing the variety of alternative modes of transport is an important priority for Auckland city. The $200 million investment for the construction of new cycling infrastructure between 2015 and 2018 is further evidence of this goal. Complementing this, campaigns on the benefits of walking have also been emphasised in recent years, with Auckland seeing the rise of more dedicated walkways and the creation of walking routes within the CBD.

Quantitatively, a total of 186 education events and training courses were inducted in 2015 where 8,539 children participated in cycling programmes and 756 adults received cycle training. One Auckland study has estimated that creating cycle-friendly streets yields benefits that are over 10 times greater than the initial cost whilst transforming Aucklanders into a more active and healthier people.

Although the overall percentage of cyclists in Auckland has increased over the last year, the percentage of young adults cycling stayed relatively similar from 2015 to 2016. Walking, however, experienced a significant increase among young adults, being the most popular mode share among 15-24 year olds in Auckland. Given that, there is still definitely more capacity for young adults to adopt active modes for everyday use in Auckland.

3.3. Study Focus

Before investigating trends surrounding the target age group of 15-24 year olds, research was carried out on all Aucklanders first in order to form a better perspective when taking results into consideration. The focus of this research is subsequently on 15-24 year olds in Auckland, as this is the target age group believed to hold the greatest amount of potential for influencing change.

4. Methodology

Since 2013, Auckland Transport (AT) has conducted an Active Mode survey annually. From 2015 onwards, the survey was undertaken by a different survey consultant (IPSOS) and, as such, the questions and format were different to that of previous years. These Active Mode surveys include previous questions related to their previous year's travel behaviour. Firstly, an initial screening was conducted by the survey consultant (TRA) to invite participants to use an online research panel, "Research Now". The criteria was to attain a representative sample of Auckland in terms of socio-economic status and to have a minimum of 200 regular cyclists. The surveys are undertaken annually every May over the course of a two-week period, and cover the two most popular active modes, walking and cycling. The analysis and research carried out in this report is based on the results obtained from the last two years of Active Mode survey data.

The methodology consisted of background data collation, acquiring information through TRA's 2015 and 2016 surveys on 'Measuring and Growing Active Modes of Transport in Auckland', and statistical analysis of said data collected. The following section describes how this research was carried out, and how each of these categories was used to understand the travel behaviour of young adults.

Consultation was initially undertaken through contacting Statistics NZ, New Zealand Transport Agency (NZTA), AA, and Auckland Transport (AT). As such, formal requests were made in regards to obtaining licensing data from NZTA covering a period of the last 10 years. In addition, communication with AT was set up in order to help make resources more readily available for our research.

The survey data used for analysis consisted of data focused solely on active modes of transport such as cycling and walking. The survey was representative of the Auckland population by age, gender and location (ward). The data obtained from these surveys made it possible to understand the current behaviour and perceptions people have regarding active modes, and subsequently what barriers need to be surpassed in order to achieve behavioural changes. The raw data collected from the survey was analysed using the Statistical Package for Social Sciences (SPSS) to identify trends and changes in the use, behaviour, and perceptions of active modes between 2015 and 2016. The data gained from the surveys were then analysed against the licensing rates of youth in New Zealand, and also compared against results from existing studies to greater understand how the promotion and perception of active modes in Auckland contributes to the current trends in transportation.

5. Results

The following data was obtained from a series of surveys carried out by Auckland Transport over the years 2015 and 2016. The data collected in these surveys covered respondents of all ages, however as our research focuses on young New Zealanders, the age group of 15-24 year olds was the focus point.

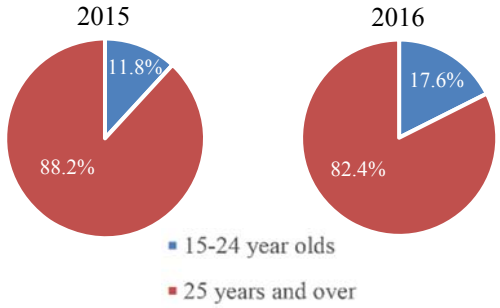

Figure 2: Proportion of 15-24 Year Olds in Surveys

5.1. General Findings

The following section outlines backgrounds of the survey participants of Auckland's general population. This includes the socio-economic make-up of the survey participants, outlining the distribution of age, gender, ethnicity, and income among the respondents.

The total number of participants in this age group in 2015 was 191, consisting of 75 males and 116 females whereas in 2016, a total of 207 people participated, with 58 being male and 149 being female. It can be seen that females had a higher participation rate in the surveys for both 2015 and 2016. A relatively low number of 15-16 year olds participated in the surveys, whereas there was a random distribution of 17-24 year old respondents that took part.

A diverse range of ethnicities participated in the surveys across both years. NZ European or Pakeha was the largest ethnic group, with 49.1% and 50.2% of respondents being of that ethnicity in 2015 and 2016. The second largest ethnic group across both years again was Chinese, with 11.5% and 13.1% of respondents being of that ethnicity, while the third largest ethnic group was Indian, with 9.2% and 7.2% of respondents. In both years, the majority of participants preferred not to disclose their income.

Table 1 presents the mode share among 15-24 year olds in Auckland over 2015 and 2016. It is evident that the most popular mode choices in Auckland in 2015 and 2016 are private vehicles, walking and the bus. An increase in the proportion of young adults walking can be noted, with the mode share rising 5.1%. Mode choices that decreased in mode share from 2015 to 2016 include private vehicle and bus usage. The cycling mode share stayed consistent from 2015 to 2016. Ferry and motorbike usage among young adults is noted to be too negligible to be able to analyse any changes across both years.

Table 1: Mode Choice of Participants

YEAR	2015	2016
Mode Choice	**Mode Share (%)**	**Mode Share (%)**
Private Vehicle	28.8	26.9
Motorbike	0.3	0.9
Bus	28.5	23.9
Train	6.4	8.1
Ferry	0.3	0.9
Walking	28.8	33.9
Cycling	4.6	4.5
Do not use any of these regularly	2.1	0.9

5.2. Walking

The following section details the results of analysis regarding walking as a mode choice. Included are details regarding the various factors as to why walking has become a more popular mode choice among young adults in Auckland recently.

As seen in Table 1, walking was found to be the mode choice with the greatest increase among 15-24 year olds living in Auckland, with approximately 5.1% more 15-24 year olds choosing to walk in 2016 compared to 2015. More specifically, when this increase in walking trend was analysed against the geographical location of residence of the survey participants, it was found that the trend was prevalent across all areas of Auckland.

It was noticed that the areas with the most extreme contribution towards the rising rate of walking as a transport mode choice among youth is occurring in West and East Auckland. West Auckland in particular found the largest rise in the percentage of respondents who walk, increasing from 40% in 2015 to 96% in 2016. The consistent trend of increased walking habits among all areas of Auckland align well with the rising walking trend identified in the introductory section above.

The general equal distribution among the percentage of 15-24 year olds who regularly walk indicated little to no correlation between employment status and walking as a mode choice. However, the data collected in 2015 does show a higher proportion of unemployed individuals and students that regularly walk in comparison to the employed population, potentially indicating there being a relationship between walking and employment status. This could be showing that lack of employment, and therefore income, could lead to an increased frequency of walking due to the lack of monetary requirements needed in order to travel in comparison to a private vehicle or a bus.

As all data collected follow a consistent trend regardless of geographical location of residence, it can be concluded that location is not an influential factor as to whether or not they are walking more or less. These consistent trends show that a large amount of 15-24 year olds walked more in 2015 compared to 2014. This makes sense since the 2016 survey showed trends for walking increased among 15-24 year olds in 2016.

The 2016 survey instead showed a significant increase across the board for people who walk the same as last year, meaning after increasing their walking habits from 2014 to 2015, they have been maintained from 2015 to 2016. Finally, fewer people in 2016 are walking less compared to 2015, meaning there is a smaller drop in the number of people walking in 2016 compared to 2015. This correlates with the increase in walking among 15-24 year olds from 2015 to 2016.

The attitudes that 15-24 year olds have on the quantity of walking they do were analysed. It was found that a very small minority would like to walk less in both 2015 and 2016 while approximately 30% of respondents would like to walk more. Approximately 50% of respondents were happy with the amount of walking they do in 2015, this then dropped to approximately 40% in 2016. The general consensus was that Central Aucklanders were not as satisfied with the amount of walking they did in 2016 compared to 2015, and resultantly wanted to walk more.

Analysis was carried out on separating respective purposes of walking according to the travel times taken. Through observation of this information, it was seen that the majority of reasons had skewed walking times of 19 minutes or less. This indicates a tendency to walk when the travel time is relatively low.

In order to gain a deeper understanding of the reasons behind walking for youth, the 15-24-year-old target age group was split into smaller sub-groups based on age, as seen in Figure 3. Overall, all three sub-groups followed a similar trend in terms of selecting their favourite reasons to walk, with there being slight variances in the popularity of each reason among age groups.

It can be seen that the most popular reasons to walk among all young adults was keeping fit. It should be noted that this reason was also the most popular when looking at key reasons to cycle. The second most popular reason for walking among age groups from 15-18 and 19-21 was found to be the fact that walking saves money. This differed slightly among 22-24 year olds, as their second most popular reason was that walking provided them with some 'me time'. This change in preference could be due to time taking a higher preference over money at a later age, possibly due to the trend of progressively making more money with age. Other reasons of significant popularity included walking being fun, and walking allowing people to enjoy the weather.
Alongside outlining the key reasons for walking, Figure 3 provides an insight into the attitudes that 15-24 year olds have on walking, and the factors that would encourage walking more often or for greater distances. The 19-21-year-old and 22-24 groups ranked highly that if routes were more attractive and interesting they would be encouraging to walk more often. The condition of the footpath, or their cleanliness was not a major contributing factor to encourage greater walking for all sub-groups.

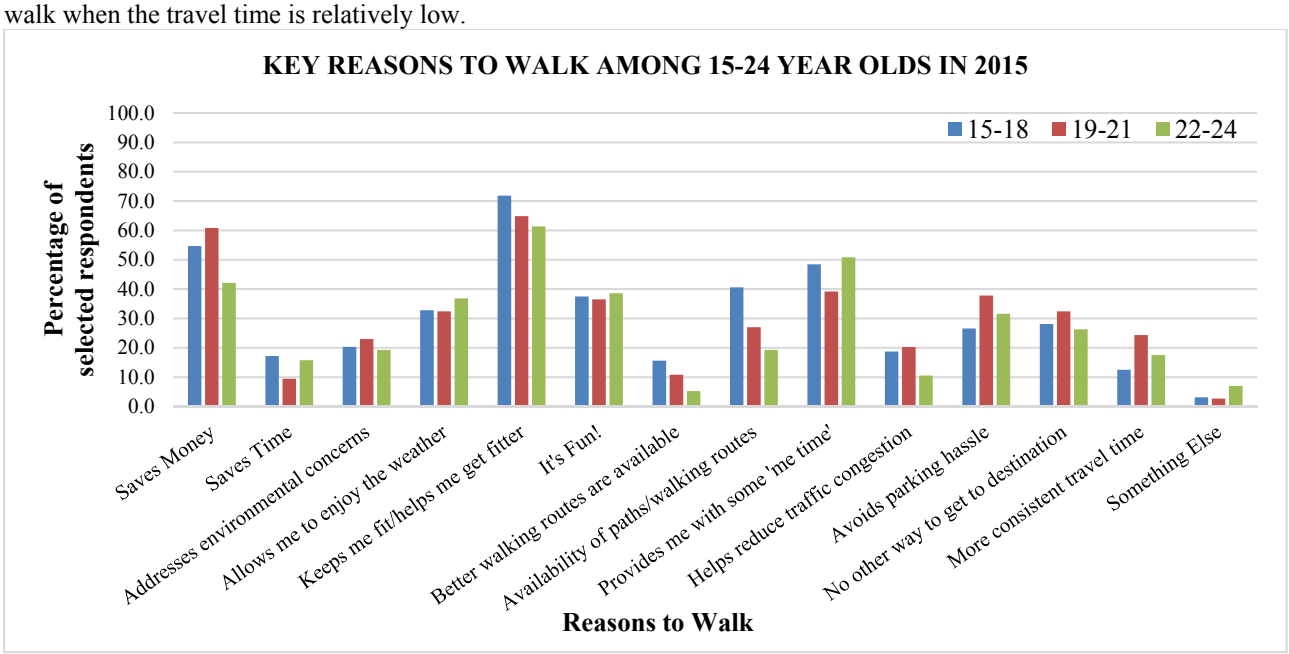

Figure 3: Key reasons to walk

Another main factor of significance that could encourage more walking was having friends and family to walk with, and better personal security on walking routes. This evidence is strongly complemented by the fact that people feel less safe at night when walking. Thus having friends walking with them would make them feel more inclined to walk due to increased perceived safety.

In order to attempt to understand the reasons behind the opinions young people have on walking, various statements regarding walking were investigated based on gender. These statements were used to clarify the stance young people had when it came to walking and their perceptions on active modes. Overall there was little variation between genders regarding their opinion on statements. The only significant difference between The major discouraging factors young adults identified were predominantly safety and convenience issues. Specifically, young adults felt unsafe walking in the dark, and felt walking was not a quick enough way to get to their desired destination. Young adults also agreed that they "have too much stuff to carry" which may be also be correlated to living too far away for walking to be practical.

West Aucklanders and South Aucklanders felt the most unsafe walking during night time whilst Central Aucklanders did not take this as a significant factor. This can be because of better street lighting and the greater amount of people that walk, which was identified to be an encouraging factor for young adults to walk more.

Although walking is increasing, it is evident that walking is not desirable to many due to the aspect of adding too much time to the journey. Instead, most see walking as a way of getting fit rather than for reasons such as saving time or avoiding traffic.

5.3. Cycling

Cycling was determined to be the 4th most popular mode choice behind walking, private vehicles, and buses, among 15-24 year olds in Auckland, as seen in Table 1. These aforementioned modes of transport all saw an increase in usage in 2016 compared to 2015, whereas cycling saw a relative stagnation, if not slight decline. This cycling trend was then analysed against the geographical location of residence of the survey participants, and it was found that the decrease was prevalent across North and Central Auckland areas, with the Northern region being home to the largest decrease, with a drop of approximately 40% from 2015 to 2016.

The first aspect looked at regarding cycling was the travel time taken. The information analysed showed the majority of reasons listed had skewed cycling times of less than 19 minutes, indicating a tendency to cycle when the travel time is relatively low, as similarly implied from the walking results. Despite the relatively less amount of data analysed when compared to walking, a clear relationship between increasing travel time and decreasing frequency of cycling is prominent when viewing the results from the 2016 survey.

The key reasons for young adults cycling in Auckland can be seen in Figure 4. As seen, the most popular reasons behind young adults cycling has been identified as to keep fit, save money, and to have fun. Meanwhile, reasons which decreased in popularity included environmental concerns, enjoying the weather, the option of better routes, availability of cycle ways, reduction of traffic congestion, and the avoidance of parking hassle. On the other hand, the reason with the largest increase in popularity was found to be the availability of cycle parking at public transport interchanges, with a significant increase of 17% from 2015 to 2016. Other reasons on the way up in terms of popularity included saving time, and fun factor.

When looking at the most popular trip types, recreation and fitness was the clear outlier, holding a significantly high selection rate of 52.5% and 60.3% in 2015 and 2016 respectively. The second most popular trip type; to the shops, held 16.1% and 38.5% for 2015 and 2016. These selection rates align with previous results seen in Figure 4, as keeping fit was again noted as the most popular reason across both years.

Health and fitness was seen as a particular aspect of focus regarding practical steps taken to cycle more often, with 58% of people in 2015 citing this as a driver. It should be noted however that the improvement of health was the second most popular reason behind 'nothing' in 2016, with a rise of 45% in popularity from 2015 to 2016, showing a larger proportion of respondents choosing not to make an active effort towards cycling more often. This increasing trend in lack of motivation amongst young people correlates with the stagnation in the cycling mode share from 2015 to 2016.

opinions came regarding the statement: "Walking is only for people who can't afford other ways of getting there" where for males the mean was 5.1, while for females the mean was 3.3.

Generally, the most agreed upon statement for both genders was "Walking would be a good way for me to get/stay fit". This is consistent with the most agreed upon reason for cycling and walking, which was shown to be for fitness purposes. Other statements that were commonly identified with, included walking being a method of transport that young people would be happy to be seen using, walking being enjoyable, and walking for 10 minutes or longer being something many people would happily consider doing.

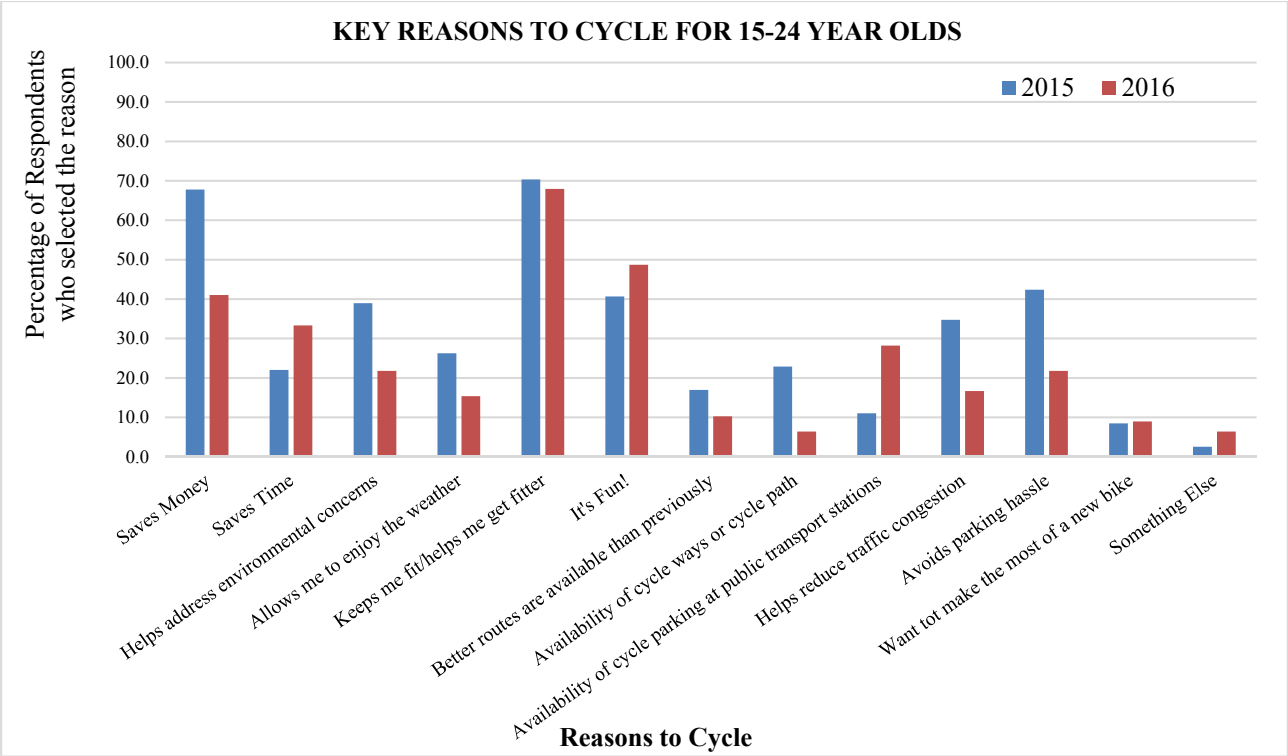

Figure 4: Reasons 15-24 year olds cycle

To further analyse the key reasons influencing young adults to cycle more, the young adults were split into three sub-groups (15-18 year olds, 19-21 year olds, 22-24 year olds) to determine how significant of a factor age was among our target demographic.

The results subsequently showed all sub-groups felt that if more cycle lanes were physically separated from other traffic, they would consider cycling more often, with the 15-18 age group making up the majority of this stance. Reasons such as the ability to acquire a new/ better bicycle and if parking became too difficult/ expensive were other noteworthy factors, with the cost factor impacting the 22-24 age group the least. This is possibly due to a higher source of income this group has access to in comparison to the younger groups. Subsequently, it seems that monetary factors have a significant influence on dissuading young adults to cycle more. Better availability of cycling parking at public transport interchanges/ stations such as train stations and ferry terminals was highly ranked among other factors. This could suggest that cycling has ample opportunity to supplement public transport, rather than act as a primary mode choice. Regarding priorities surrounding employment, both 19-21 and 22-24 year olds felt they would cycle more if their job required it, whereas 15-18 year olds felt this had minimal impact.

When looking at factors turning people away from cycling, the most popular reason for 19-21 and 22-24 year olds was due to not feeling safe as a result of how people drive. On the other hand, the primary concern among 15-18 year olds was “having too much stuff to carry”. In addition, many 22-24 year olds feel they live too far away for cycling to be practical, possibly as a result of their higher perceived value of time in comparison to the younger age groups. Relating back to the main theme of safety, another popular reason for disliking cycle is due to not feeling safe when cycling in the dark.

The confidence levels surrounding riding a bike in Auckland were gauged based on a scale ranging from 1 to 10 (1 = not confident at all, 10 = extremely confident). A 2 to 3 point gap was noted in both years between genders, showing the general level of confidence in males is higher than that of females. These findings followed the trend set out in the perceived level of safety of genders covered previously in the walking section. This increased perception of safety for males could be a contributor as to why males have a higher level of confidence when it comes to cycling in Auckland.

The most popular response across all sub-groups (50% of 19-21 year olds, 56% of 22-24 year olds) was feeling that cyclists are brave for riding in Auckland traffic. This coincides well with the number one reason young adults dislike cycling, due to feeling unsafe regarding how people drive. These perceptions indicate a substantial barrier exists surrounding the safety of cycling in Auckland. Further emphasizing this is the fact the oldest sub-group (22-24 year olds) felt that cyclists are usually inconsiderate and a danger to themselves and other road users.

Table 2: Reasons that would influence 15-24 year olds to cycle more often

Reasons that would most likely to make you consider cycling more	Age groups that agree with the statement (% of year-olds)			
	15-18	19-21	22-24	Total
If there were more cycle lanes that were physically separated from other traffic	75	61	57	61
If you were able to get a new / better bicycle	40	43	29	36
Better availability of cycling parking at public transport interchanges / stations such as train stations and ferry terminals	35	38	25	32
If parking became too difficult / expensive	40	27	29	30
If your health / fitness enabled you	20	29	25	26
If traffic congestion got too bad	15	29	27	26
If better shower or storage facilities were installed where you work or study	35	15	29	25
If your job required it	5	29	27	24
If members of your family or friends started cycling more	15	31	13	20
Something else	5	2	3	3
None of these	0	13	3	6

Considering the risks faced by cyclists on Auckland's roads, is not surprising that many people feel cyclists are brave for riding in Auckland traffic. This coupled with many desiring more sufficiently separated cycle ways results in the assumption that the greatest barrier preventing people from cycling more is safety. Through increasing availability of safer and higher quality cycle paths, a greater level of confidence among young adults can be expected. Preliminary indications of this can be seen in the survey using a 10-point scale. Specifically, the mean level of confidence of 15-24 year olds cycling in the Auckland area has slightly increased across both genders from 2015 to 2016 from 3.45 to 3.92. This shows that although there has been a slight increase, much more can be done to increase the confidence and subsequent mode share of cycling in Auckland.

6. Discussion

Compounding issues such as increasing roading network congestion, parking frustrations, and significant population growth throughout the Auckland region has brought on a collective recognition and focus that active modes have a strong opportunity to thrive as a more prominent mode of transport in the future. This has been evidenced by the 5.1% increase in walking mode share from 2015 to 2016. Despite the fact cycling's mode share has stayed relatively consistent, an increase in confidence among young adults regarding cycling as a mode choice has been noted, mainly as a result of the impression that cycle lanes in Auckland are increasing in quality. There is room for improvement, especially when considering connectivity, as there is an exceptionally strong belief among young adults that there needs to be more physical separation between cyclists and other traffic, with 61% of respondents agreeing with this statement.

The results have also indicated a high potential for expanding cyclists mode share moving forward, with research showing at least 38% of respondents want to cycle more across both years of the survey. In addition, there is a substantial portion of young adults who have the potential to adopt cycling as an active mode, with 36.6% of respondents saying they can cycle as an option to get to work or school, but currently don't. In an attempt to capture this potential for growth, factors of high importance to young adults were identified. When reviewed across both years, these factors were found to be similar across both walking and cycling. The primary factors identified for walking and cycling were found to be 'Health and Fitness purposes', 'Saves Money', 'For Fun', and 'To Avoid Parking Hassle'. Following this, research was then conducted on reasons that would most influence an increase in the use and adoption of these active modes. For walking, the primary factors were found to be 'if walking routes had better personal security', 'if routes were more attractive and interesting', and 'if more people were out walking'. Whereas for cycling, the primary factors were found to be 'physical separation from traffic', 'better availability of cycle parking at public transport interchanges', and 'if parking became too difficult or expensive'.

A variety of improvements have subsequently been recommended to address the aforementioned factors of interest. This in turn is expected to result in an increase to the mode share of young adults using active modes of transport. First and foremost, perceived safety is a primary barrier holding many back from walking more often. Through implementing facilities into neighbourhoods to promote a more walking-centric environment, these issues may be promptly addressed. This can be achieved by adding shared spaces to pedestrian heavy areas to minimise segregation between pedestrians and vehicles. A prime example of this is the shared space on Elliot St in the CBD. Improving street lighting in neighbourhoods with lower perceived safety levels is also recommended, as this promotes a more open and transparent environment. In addition, young adults already have a tendency to walk due to the ease of accessibility of the mode in comparison to alternatives. When taking this into account, getting more people walking can be achieved by appealing to the health and fun factors that young adults identified to be their key

reasons behind walking. This would entail hosting and promoting active events such as fun runs and walks. Events like these would ease people into the concept of walking as a prominent mode of transport within their everyday lives.

For cycling, safer cycle routes are a key priority. Cycle routes such as the Light Path on Nelson Street and Beach Road are prime examples of properly implemented cycle-ways that provide sufficient separation between cyclists and other traffic. Better interconnections for cyclists at public transport interchanges are also desired by young adults. This correlates to more cycle centres and secure bike parking region-wide as seen at the Smales Farm Bus Station or the Papakura Interchange Station. Improvements such as these are greatly desired by young adults, and if properly implemented, would allow easier and more secure transitions between different modes of transport. Given these considerations, a more comprehensive cycle network throughout Auckland will surely increase usage of cycle commutes.

The findings from this research strengthen the evidence base to support efforts by Auckland Transport and the New Zealand Transport Agency to help better prioritise future work in Auckland based on the current wants and needs of the younger generation of commuters. Through further research with a higher emphasis on geographical location, areas may be better identified that would be in need of improvements. It is recommended for Auckland to also place a higher importance on studying the effectiveness of good traffic demand management and smart mobility trends such as bike sharing, given the successful progress other countries have made in light of implementing these strategies. It should be noted that the surveys conducted did not focus on multi-modal journeys, and as a result, lost potentially valuable opinions and data on people who travel using multiple modes of transport. Taking this into account in future research would gain a fresh perspective on the extent to which young adults integrate active modes of transport into their lives. In addition, annualisation of the surveys coupled with further promotion to attract a greater number of participants is recommended in order to maintain consistency amongst results while gaining a more comprehensive set of data.

7. Conclusions

There has been a decline in driver licensing among young adults in Auckland in recent years, and as such, further research has been conducted on alternative modes of transport that young adults may be adopting. The primary focus of this research has been on active modes such as walking and cycling due to their high potential of growth given Auckland's highly saturated road networks.

Although there has been a slight increase in popularity of walking and a better recognition and perception of cycling, research has identified a large market of people willing to incorporate these modes into their daily travel habits. As such, a greater focus should be placed on promoting these active modes based on what makes them appealing to the younger generation. Analysis has shown that the primary motivators for young adults was found to be for health and fitness purposes. Further analysis revealed that walking required a greater emphasis placed on safer and more attractive routes with more people walking, resulting in a friendlier environment. Cycling on the other hand has a demand for segregated cycle lanes and better connected routes; especially with integration alongside public transport interchanges. Through formulating solutions based on the findings of this paper, works can be better prioritised based on what appeals to the future generation of commuters. This focus can subsequently result in an increasing expected adoption rate of active modes in the years to come.

These findings will help planners understand the next steps that are needed in order to better resonate with the future of young commuters of Auckland. Further research is recommended to further understand the needs and perceptions towards active modes among the younger generation in Auckland. Thus, through formulating solutions based on the findings of this paper, Auckland Transport and planners can prioritise solutions on what appeals to the future generation of commuters and subsequently, can expect an increasing adoption rate of active modes in the future.

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