OPPORTUNITES FOR EVERYDAY MOBILITY CHOICES

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Executive Summary

Project Outline

Many New Zealanders currently take most of their daily trips by petrol or diesel driven private vehicles. With the global move to improve the sustainability of transport systems, there is a need to better understand where opportunities lie for everyday New Zealanders to shift towards more sustainable travel choices for some everyday trips.

This research aimed to fill this knowledge gap by examining the conditions that would lead to everyday New Zealanders who typically drive for most of their trips, to transfer some trips to more sustainable options including other modes and efficient vehicle use.

Methods

A scan of readily available New Zealand and international literature was first carried out to understand what is known about attitudes, barriers, and opportunities for transitioning towards more sustainable mobility options or driving practices.

Following this, four focus groups were conducted with a total of 44 participants from different sized cities and towns across New Zealand. These explored the context, motivations, and constraints which interact to inform current travel behaviour, opportunities for more efficient vehicle trips, and likely actions around a range of trip scenarios to identify where sustainability 'wins' are most likely.

Findings - Literature Scan

The literature scan covered five topic areas: Travel choice theories and models, attitudes and perceptions towards travel modes, environmental and personal factors affecting mode choice, opportunities to influence mode choice, and efficient private vehicle use. Pre-existing attitudes and social norms are important for modal perceptions, but uptake is often driven by pragmatic considerations such as reliability, time, cost, and safety.

The findings of the literature scan were used to inform the design of the focus groups and contributed to the conclusions.

Findings - Focus Groups

Overall, the focus groups told us that everyday New Zealanders are open to sustainable travel and are already using and considering their options in many circumstances. This was the case in both larger cities and smaller towns. An overarching theme of pragmatism emerged. People choose options that enable them to go about their day efficiently. In making these choices, no inherent bias towards cars was noted. However, alternative modes in their current form were often deemed not to 'stack up' to the benefits provided by private cars. Often this was because provision for the alternatives was poor where they lived. Cycling was the preserve of younger males, with others only interested if it felt safe.

Participants had a relatively conservative view towards purchasing hybrid and electric vehicles. A key barrier is the upfront and ongoing costs. However, others are related to the knowledge and confidence road users have in the technology. Most people already used at least one efficient driving practice (eco-driving, grouping trips together when driving, working from home, or carpooling) and were supportive of further use of these for their vehicle trips. Motivations for doing so were typically cost savings rather than environmental concerns.

When asked about their priorities for transport provision, participants generally supported action across the transport system, with support for public transport being a clear theme across all groups, and for some maintaining roads.

What are the Opportunities for Sustainable Everyday Mobility?

The everyday, pragmatic, New Zealander weighs carefully how various travel options fit with their daily routine, within their knowledge and experiences. When looking at the conditions required for participants to shift to these alternatives, each mode had unique requirements:

		
Generally, New Zealand has a relatively undeveloped public transport system. Therefore, when opportunities and incentives for increasing public transport use are considered, there's a focus on foundational issues such as route availability, frequency, reliability, and for some safety and comfort.	Cycling is often viewed as unsafe which is a key barrier to its uptake. However, there was enthusiasm for cycling or supporting their children in cycling. This is particularly true for younger men, and in smaller towns where cycling distances are less and the traffic is lighter, and larger cities in areas where parking is difficult.	Walking is generally seen as an alternative transport mode, particularly for shorter, local trips where not much needs to be carried. However, personal safety was a concern, particularly for women.

The literature scan found that car travel disincentives (e.g., congestion charging) are needed alongside incentives for other modes for shifts to happen. Commuting trips show the most promise for change, along with specific scenarios for other trips, such as short walking trips for shopping when a personal shopping trolley can be used.

Up-front cost barriers and various other negative perceptions may hinder EV uptake, whereas efficient vehicle use shows more immediate promise. Widespread education about the benefits of efficient vehicles and more efficient use of vehicles is needed.

Overall, there's a strong theme of people wanting better provision across the transport system, particularly public transport, and this theme appears to endure throughout New Zealand. Other engagement activities with New Zealanders have also found strong preferences for public transport, walking and cycling, and improved urban development.

There's plenty of scope for people adopting more sustainable transport practices for a range of trips, but better provision, nudges, and sometimes simply information or experience of what is possible are all likely to be needed depending on the situation.

CONTENTS

1. INTRODUCTION

1.1. Background

In response to climate change, as well as a need to improve congestion management, transport efficiency, and equity of access, there has been a global move to improve the sustainability of the transport system. This has led to efforts to transition towards more efficient vehicles and alternative transportation modes such as public transport, cycling, walking, and micromobility. A strategic priority for the AA is to lead members in the transition to more sustainable mobility options.

Many everyday New Zealanders currently take most of their daily trips by petrol or diesel driven private vehicles and therefore, the transition towards sustainable trips requires behaviour change. How to manage this transition has led to much debate in recent years. One approach could be to focus on the views and experiences of the everyday 'centrist' New Zealander, particularly those who mostly drive, but who might consider other options.

Past surveys of AA members have indicated that they see moving towards sustainable mobility as hard or impossible. By engaging with everyday New Zealanders, the goal of this project is to better understand the sets of conditions that would lead to some trips being transferred to more sustainable modes (including more efficient vehicles). Understanding the scenarios where sustainability 'wins' are most likely will also uncover levers that are likely to be effective in achieving these wins.

While the most sustainable transport options are walking, cycling, or public transport, for many New Zealanders, these modes are not currently available for their regular trips due to where they live, or are not feasible given their travel requirements, or personal factors (e.g. fitness or disabilities). Therefore, understanding the factors that would encourage people to increase the sustainability of their private vehicle trips by choosing a more efficient vehicle or driving their vehicle in a more efficient manner is also an important component of sustainable mobility in the New Zealand context.

Significant research on sustainable transport has been undertaken both internationally and in New Zealand. This project aims to build on the findings of overseas and local research by identifying and focusing in on those areas where, in the views of everyday New Zealanders, improvements in travel sustainability are most achievable.

1.2. Objectives

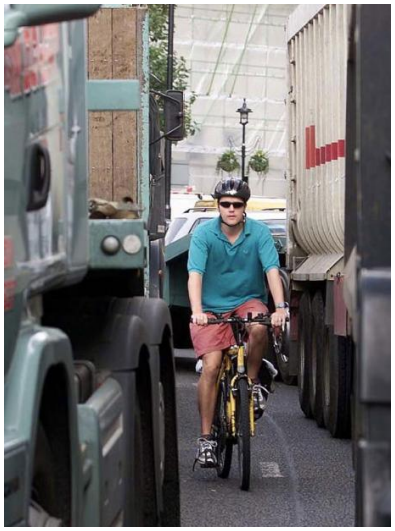
The objective of this work is to examine the conditions that would lead to everyday New Zealanders who typically drive for most of their trips, transferring some trips to more sustainable options. Specifically, the study examined views about:

- Shifting some trips to an alternative, non-private vehicle, mode of transport: Resulting in information about situations in which participants would be willing/able to transfer some car trips to other modes.
- Efficient private vehicle use: Identifying situations where participants feel they could make changes to drive more efficiently (either through choosing a more efficient vehicle or through efficient driving practices).

The focus of this work was on the 'everyday' New Zealander. We defined this group as New Zealanders who engage in typical travel behaviour as informed by recent New Zealand transport research and hold moderate attitudes to transport sustainability. This can be summarised as individuals who:

- Take most of their regular trips by private vehicle, and
- Are willing to either:
  - Consider changing some of their trips to a non-private vehicle travel option if the circumstances allowed it, or,
  - Consider a more efficient vehicle or way of driving their vehicle.

Participants in this study were recruited to fit this profile.



2. RESEARCH APPROACH

This work was undertaken in two phases, of which the findings came together to arrive at overall conclusions:

1. Scanning and summarising existing, readily available information to understand what is known about attitudes, barriers, and opportunities for transitioning towards more sustainable mobility options or driving practices.
2. Focus groups with everyday road users (as defined above). The goal was to explore the context, support, barriers, motivations, and ultimately likely actions around a range of mode choice scenarios to identify where sustainability 'wins' are most likely.

2.1. Phase 1: Literature Scan

A literature scan was completed to gather existing knowledge on everyday travel choices and sustainable mobility. This work formed an output in itself, and also contributed to the design of focus groups in the second stage of the work.

Scope

To ensure coverage of all relevant sustainable mobility topics, a set of areas were defined:

- **Travel choice theories and models**: Studies of models, and analytical tools that attempt to predict and understand the factors that influence travel choices.
- **Attitudes and perceptions towards travel modes:** Studies related to individual/ community attitudes, perceptions, and discourse that influences mode choice.
- **Factors affecting travel mode choice (individual and environmental):** Studies related to personal factors that act as barriers and enablers to an individual's decision to take trips by different transport modes. Also, those investigating the influence of built environment, and effect of the size of city/town on mode choice.
- **Opportunities to influence mode choice:** Studies examining interventions aiming to shift trips to sustainable mobility options.
- **Efficient private vehicle use:** Studies examining factors influencing the uptake of electric and efficient vehicles and efficient driving practices including studies of eco-driving practices, congestion management interventions, carpooling and other shared modes, and remote work.

A breakdown of the search strategy and specific search terms is provided in Appendix A.

Scan outputs

Each article included in the scan was reviewed by a project team member and presented in an annotated bibliography (Appendix B). In the bibliography the following information is provided:

- Citation
- Study aim
- Methods
- Main findings and conclusions

Short summaries of the main themes in each topic area are also provided in Section 3. The summaries provide highlights of some of the research findings most pertinent to this work.

2.2. Phase 2: Focus Groups

The purpose of the sustainable travel focus groups was to examine the conditions that need to be in place for everyday New Zealanders to consider making some of their regular trips more sustainable by shifting to non-private vehicle modes and/or by improving the sustainability of their private vehicle trips. The focus group approach was chosen so we could understand the deeper reasoning and themes behind travel decisions, which is not possible in a survey alone.

Four online focus groups were organised and a detailed description of these is provided below.

Focus group participants

Fifty participants were recruited by a specialist recruitment company. They were allocated to one of the following four focus groups, with at least 12 people per group:

- Auckland
- Large cities: Wellington, Christchurch
- Mid-sized cities: Dunedin, Tauranga, Hamilton
- Smaller regional centres: examples include Dargaville, Blenheim, Ashburton

The main criteria for inclusion were that participants mostly used a private car for their regular trips (as opposed to being a cross-section of the New Zealand population), and were willing to consider changes towards sustainable mobility, either through mode choice or improving the sustainability of their private vehicle use. All participants were also required to have a computer, suitable internet connection, and sufficient English to participate.

The recruitment process was structured so that the sample of participants recruited reflected the population they were drawn from. This including ensuring an appropriate mix in terms of gender, age, ethnicity, household income, employment status, and household composition. The screening questionnaire used for the recruitment process is available in Appendix C.

Six participants did not attend their focus group session. Therefore, the final number of participants was 44. A breakdown of participant demographics is provided in Appendix D.

Focus group design

The literature scan was used to identify useful methods and approaches, and to develop the content of the focus groups. This enabled the team to structure the discussion and to probe on specific areas of interest.

Focus groups were structured into three main parts:

1. **Reflections on current travel behaviour and perspectives**. Covering regular trips taken, mode choice including reasoning for mode selection, and details about trips (time taken, passengers/ goods carried, other trips taken at the same time), modes available for trips, whether other modes were used sometimes, and mode choice of other household members.
2. **Opportunities for mode shift (to non-vehicle modes)**. Covering mode choice if a car was unavailable, perceived practicality of the mode, where they sat on the behaviour change spectrum for using the mode, and the conditions that need to be in place for them to use the alternative mode regularly.
3. **Efficient driving practices**. Covering current vehicle type, conditions/incentives needed to switch to a more efficient vehicle, and use of efficient driving practices.

The focus groups were focussed around five trip types developed to encompass most regular trips. The reasoning behind the trip types selected was that each has its own characteristics (e.g. trip distance, items carried, etc). Because of these characteristics, previous research indicates that some trips are easier to shift to sustainable modes than others. The trip types included were as follows:

1. Commuting for work[1]
2. Shopping trips
3. Travel to visit friends/family
4. Trips to recreation and sporting activities
5. Assisting children to travel to school

Within each of the three parts of the workshop, participants were asked to complete a workbook (Qualtrics survey) and take part in a group discussion. This approach ensured that quantitative data was first collected from each participant uncontaminated by others' views, then the following discussion enabled more detailed information about the specifics of their perspective gained. A copy of the workbook is provided in Appendix E.

During focus group part two, the group discussion was centred around a scenario-based Miro (an online whiteboard tool) exercise. This exercise was conducted for each of the trip types mentioned above. However, trips to visit friends/ family and for recreation/sporting activities were combined due to time constraints in the focus group. This meant that the Miro exercise was conducted four times per focus group.

During the Miro exercise, participants were first asked to indicate through hand raises the mode they would choose for the trip type if a car was unavailable. Generally, the most commonly chosen mode was selected for the scenario (e.g. public transport for commutes to work). In some cases, if that mode had already been discussed for other trip types and/or where the project team thought valuable information could be gained, another mode of travel (e.g. cycling) was selected instead.

Through the discussion, participants collaborated to identify all the factors they thought would be necessary for them to regularly shift to the selected mode for the trip type. The discussion was closed out by another hand raise exercise asking participants to choose the two most important conditions that would need to be in place for them to consider using the mode regularly. This enabled the identification of the factors that were most important to the group.

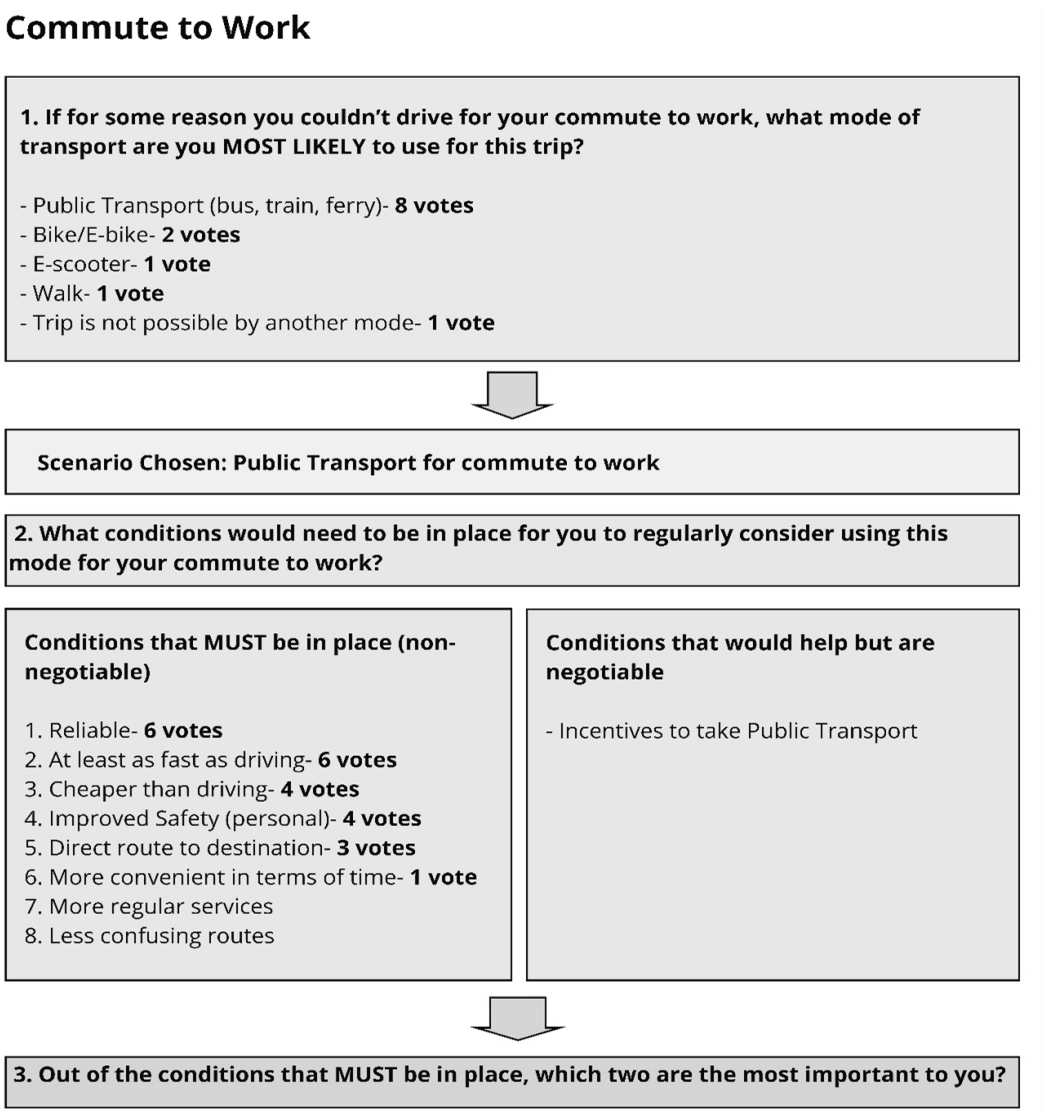
An example of a completed Miro board is provided on the next page.

The focus groups were intensive with a range of activities that required participants to respond to specific scenarios and questions. On reflection, after the first focus group, we decided to open up the conversation near the end of the remaining focus groups, to ask participants a very open question:

"What would be your priorities for funding in the transport system?"

This was a final chance for participants to state what their preferences would be, in line with the objective of exploring the appetite for alternative modes unencumbered by any specific constraints or requirements, in contrast to the very structured session they had just participated in. It was also in response to a very clear emerging theme around service provision (which requires funding) and mode choice.

[1] These include only travel to a participants' primary work location (i.e., not travel for work).



Focus group analysis

The quantitative outputs of the focus groups (workbooks) were analysed using Power BI. Descriptive statistics for each question were used to gain an understanding of participants' current travel behaviour and their views on opportunities for more sustainable mobility.

The focus of the quantitative analysis was to look for patterns in responses across the whole sample (n=44). Any notable differences in responses between different demographics were also identified (e.g., by location or household composition). However, breakdowns by demographics are based on small sample sizes and so this wasn't the focus of the analysis.

The qualitative outputs of the focus group (group discussions and Miro board) were analysed to identify themes and explanations in participants responses, information that further illustrated the thinking underpinning the quantitative responses, and key illustrative quotes.

The results of the focus groups are presented in Section 4 and are structured by trip scenarios (e.g., commuting). For each scenario, current travel behaviour, perceived opportunities for more sustainable travel, and conditions that would be necessary to move to sustainable modes are described. Separately, Section 4 also provides the results and discussion around use of efficient driving practices and priorities for investment.

3. FINDINGS: LITERATURE SCAN

The following section provides a short summary for each topic area in the literature scan. It is not intended to be an exhaustive or comprehensive description of knowledge in the area. Rather, it summarises the findings of interest in relation to this project. The annotated bibliography in Appendix B provides the details of each paper reviewed. Full-text versions of these papers can be provided if needed.

3.1. Travel choice theories and models

Studies examining the psychological mechanisms behind transport decision making have provided useful information about how beliefs, attitudes, and decision-making processes ultimately lead to travel choices. This research has informed the development of theories and models for transport decision making.

The scan did not identify a commonly agreed upon model of travel decision making, rather a wide range have been used or tested through research. Many of these models are more general psychological models used widely in other disciplines such as public health. In some cases, researchers have attempted to modify or integrate several existing models to more accurately capture travel decision making, in particular, Krueger et al, (2018), and Fu and Juan, (2017).

Due to the volume of models used in this area, researchers have developed descriptive terms for groups of similar models. Adjei and Behrens (2012) provide a simple grouping approach by categorising the models in terms of theories that:[2]

- Explain how choices are made when a decision-maker is confronted with behavioural alternatives, including Rational Choice Theory and Prospect Theory.
- Explain the factors that affect transport mode choices, including the Theory of Planned Behaviour, the Theory of Interpersonal Behaviour, and Norm Activation Theory.
- Explain the stages through which behavioural change occurs, including Habit Formation Theory, Cognitive Dissonance Theory, and the Stage Model of Self-Regulated Behaviour Change.
- Explain how decision-makers respond to behaviour change interventions, and the strength of their response, including Self-Perception Theory and Goal Setting Theory.

The most frequently mentioned models in the papers reviewed were the Theory of Planned Behaviour, the Stage Model of Self-Regulated Behaviour Change, and the Norm Activation Theory. To show how these types of models are constructed, two examples are provided below.

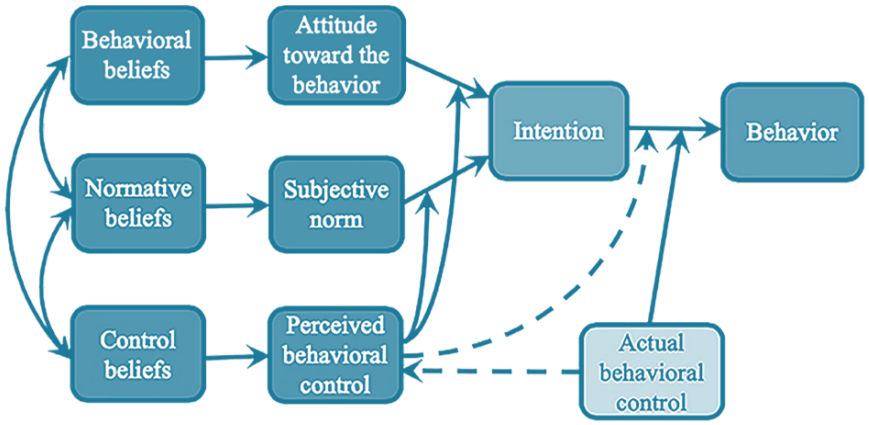
Theory of Planned Behaviour

The Theory of Planned Behaviour is broadly used in public health. It is a psychological theory that links beliefs to behaviour (Chng, 2021). The theory maintains that a person is more likely to engage in a behaviour (intention) if they believe others support the behaviour (subjective norm), they evaluate the behaviour positively (attitude), and they perceive that they have the ability to perform the behaviour (perceived behavioural control).

In the transport context, an example of this may be that a person may be more likely to intend to take public transport to work if they believe others support public transport to reduce

[2] Note that other researchers have suggested alternative groupings.

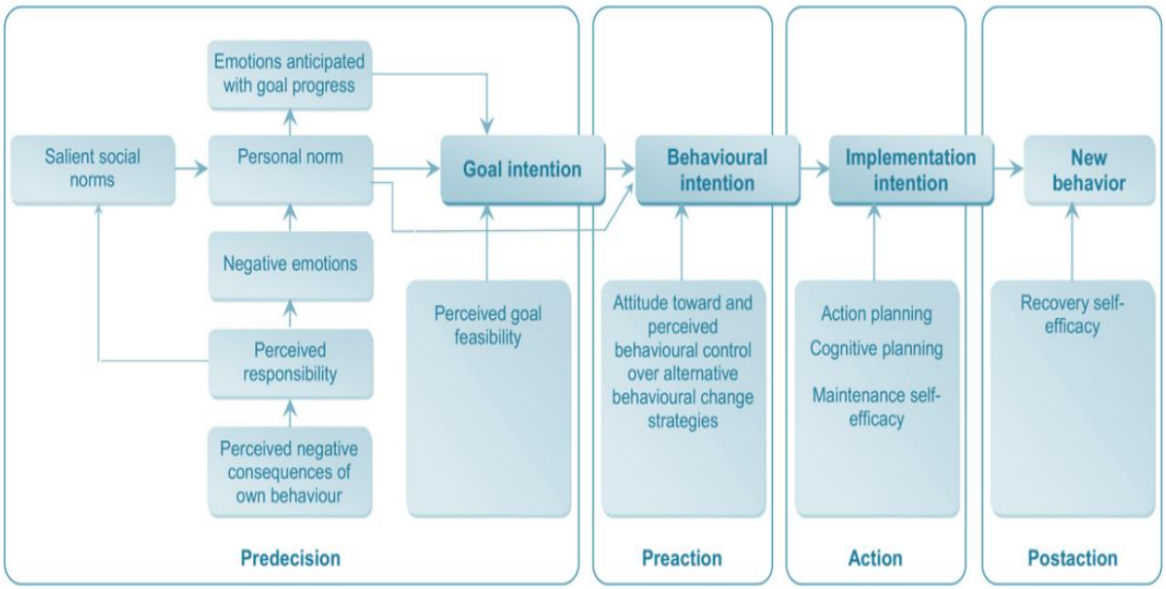
congestion, they view public transport positively, and they consider that they are able to use public transport given their work situation and the options in their area. It should be noted that the research does not show a direct relationship between behavioural intentions and behaviour. In this example, this might occur if public transport reliability was insufficient since then the individual's behavioural control is incomplete.



Stage Model of Self-Regulated Behaviour Change

The Stage Model of Self-Regulated Behaviour Change proposes that people who intend to change their behaviour progress through a series of discrete cognitive stages until, ultimately, they engage in the new behaviour (Bamberg, 2013). It extends beyond prior models by describing the multiple stages of decision making, and the factors that influence them.

In the first stage, pre-decision, current behaviour comes to be viewed as problematic, leading to an intention to change (goal intention). Following this, alternative behaviour is chosen (behavioural intention). Next, a plan must be made to implement the new behaviour in everyday life (implementation intention). Finally, in the post-action stage, the new behaviour must be maintained without permanent relapse.



To date, insights from the range of models tested in transport research have not directly led to effective approaches to encouraging sustainable travel choices. Rather, they have aimed to conceptualise thought processes and the stages of change that lead regular behaviour change. However, these models could be used to inform, and sense check, sustainable transport interventions, particularly by articulating the mechanisms through which an intervention aims to incite behaviour change.

Interestingly, Hoffman et al (2017) in their meta-analysis of 43 studies of cognitive mechanisms that relate to car use and alternative transport modes conclude that the strongest correlates of alternative transport use were intentions, perceived behavioural control, and attitudes. This suggests that interventions tackling these mechanisms may be effective. How these correlates emerge, and how design of transport provision influences intent to use other modes is also an important issue that is addressed in Section 3.3.

3.2. Travel attitudes and perceptions

A significant body of research has been conducted examining transport attitudes/beliefs and perceptions. Through these studies, researchers have identified a range of underlying attitudes and perceptions about different transport modes. This understanding provides opportunities to develop interventions and campaigns for more sustainable transport.

The influence of social meanings and norms on transport attitudes and perceptions

Several studies have examined the role of social meanings (shared understandings) and norms (accepted ways of behaving) in transport choices, particularly those to do with car use compared to other modes. An example of this is provided by Fitt (2017) who conducted focus groups of Christchurch adults. They found that almost all participants reported that social meanings influenced their mode and vehicle choices. For example, driving rather than travelling by motorcycle to a work meeting was considered more 'professional'. Further, half reported that social meanings were a major influence on their choice to use (or not use) at least one transport mode and 20% of participants said they were a major influence on their everyday transport choices.

Studies show that social norms about driving for transport embed early in life in New Zealand. In a study examining driving attitudes in adolescents, Hopkins et al (2021) found strong social norms prioritising motorised mobility and learning to drive over other modes of transport. Key narratives were that driving is better than relying on active or public transport, the convenience of motorised mobility, the 'cool factor', independence, and because it is 'adult like' behaviour.

Despite the evidence of positive attitudes towards driving in early life, other, broader studies have found little evidence of widespread positive feelings towards driving. For example, in an Auckland-based study by Ovenden and Allpress (2024) driving was described as stressful and people indicated that they drove because other options were poorly provided for. These findings likely reflect attitude modification following the lived experience that many Aucklanders have of congested roads and traffic.

The influence of social meanings and norms extends beyond individuals and into transport strategies and policy. Analysing transport and planning documents in three New Zealand cities, Imran and Pearce (2015) found that economic, mobility, safety, consumer, and funding storylines were used to justify transport policies, and that these show a developmental bias towards justifying policy priority for roads as compared to other modes. They also found that once a road-based policy path has been taken, discourse strengthens that path and helps actors to consistently ignore the need for other sustainable transport options and obstruct change in policy implementation.

When considering sustainable transport options, it is clear that some individuals need to overcome strongly embedded social meanings, norms, and beliefs. This suggests that effective interventions supporting attitude change may be important. For others, pragmatic considerations, such as service reliability of driving alternatives, may sway decision-making.

Attitudes and perceptions towards changing to more sustainable travel options

Both international and New Zealand-based research show that, in general, individuals are most motivated to shift modes if they are well informed of their options, they value a low carbon lifestyle, and they perceive that they have personal control over decisions (Javaid et al., 2020, Sogbe et al., 2024).

The perceived quality of services strongly influences the likelihood of using public transport (these will be discussed in Section 3.3). Interestingly, Sheng and Sharp (2019) also showed that commuters in Auckland have a higher probability of using transit services if they are surrounded by other public transport users (i.e., neighbours or colleagues).

Individual attitudes and perceived social norms have also been shown to influence decisions whether to cycle. A systematic review by Willis et al (2015) found that perceptions of cyclists, cycling routes, other transportation options, perceived behavioural control, and the benefits, barriers, and safety of cycling are associated with likelihood of cycling for transportation. Research in New Zealand suggests that perceptions of cycling are driven predominantly by perceived safety and practicality (Mandic et al., 2017, Ovenden and Allpress, 2024). Further, Fitt (2017) found that cycling was encouraged by social meanings of fitness and environmentalism.

While general beliefs about walking for transport are often positive, research shows that prominent barriers exist, particularly in terms of personal and traffic safety concerns, and convenience, particularly the time taken to walk (NZTA, 2022).

A further issue commonly discussed in the research is how perceptions affect the ways in which people compare the feasibility of different modes of transport. A recent Auckland-based study showed more negative perceptions of public transport, cycling, and walking compared with driving (Ovenden and Allpress, 2024). A large majority, 81%, indicated that public transport would make their trip much less convenient, mostly due to trip length and reliability issues. Also compared with driving, cycling, and walking were perceived to be less convenient, more stressful, and less safe from crime and harassment.

3.3. Factors affecting travel mode choice (individual and environmental)

A wealth of research has shown that a complex range of individual and environmental factors interplay to determine everyday transport decisions. Understanding these factors provides opportunities to inform interventions to encourage sustainable travel.

This section provides a summary of key individual and environmental factors and how they affect transport mode decisions. The key factors affecting decisions to use public transport, cycling, and walking for transport are then summarised.

Here we refer to environmental factors broadly as everything external to the individual, including the physical, natural, and social environment.

Factors affecting transport mode decisions

The literature scan suggests that despite the important social means and norms that influence travel attitudes and perceptions as outlined earlier, the most important individual factors influencing everyday transport mode decisions are:

- Convenience (ease of access and trips, and ability to combine trips)
- Cost
- Reliability
- Actual, and perceptions of, personal and road safety
- Time available/trip distance

Javaid et al (2020) and others identify the following important environmental factors that also affect mode choice:

- Neighbourhood characteristics (e.g., population density and connectivity) affect trip distances and therefore, mode choice.
- Land-use mix (proximity between different land uses- housing, commercial, institutional) reduces vehicle travel and increases non-car travel, particularly walking.
- Centeredness (portion of jobs in commercial centres) affects non-car travel.
- Regional accessibility (location of development relative to regional centres) affects vehicle kilometres driven.
- Public transport availability (infrastructure, system coverage, connectivity, and quality) affects the use of non-car modes.
- Active travel connectivity (degree that road, walking, and cycling infrastructure are connected) affects the use of active modes.
- Scale, design and management of streets (e.g. multimodal streets increase use of non-car modes and traffic calming increases non-car travel).
- Parking management affects vehicle kilometres driven.

For example, neighbourhoods with higher population density have been shown to have lower rates of vehicle ownership and travel, and increased proportions of trips taken by using sustainable modes (Littman and Steele, 2024). This is because neighbourhoods with higher density, particularly those developed using mixed use urban development principles, typically have shorter trip distances to amenities and better neighbourhood connectivity.

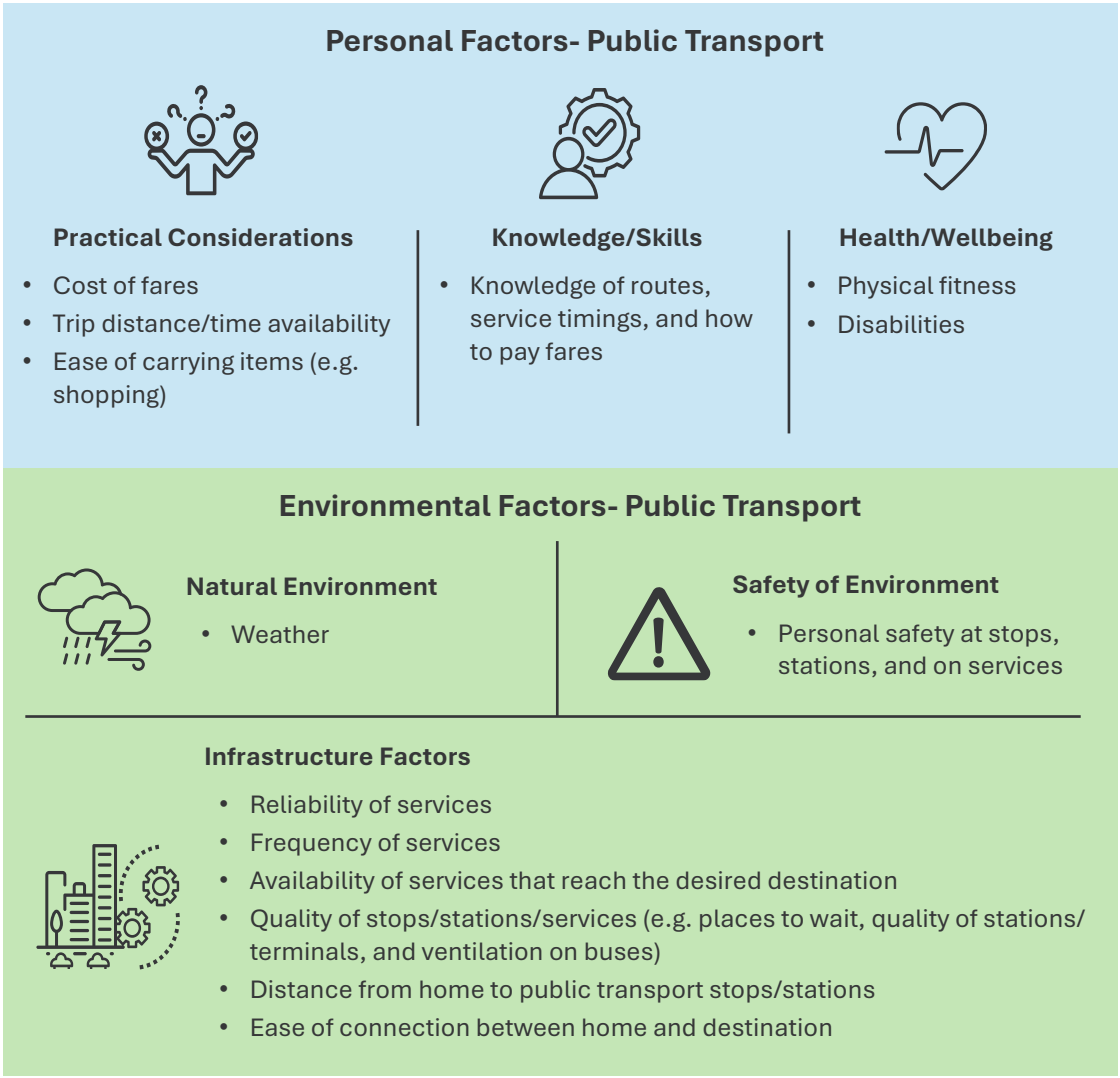
In New Zealand, and many countries internationally, urban planning decisions from the 1950s to the early 2010s typically favoured transportation by private vehicles (Lee et al., 2024). This has led to low population density, centredness, street connectivity, and land-use mix in neighbourhoods and cities (Boulange et al., 2017). As a result, environmental and infrastructure issues are often prominent barriers to increasing trips by non-private vehicle modes.

Furthermore, the size of town of residence and living in rural areas also affects mode choices and the transport options available. Options such as public transport have all but disappeared in some small towns and rural areas of New Zealand, except those areas bordering on cities (Fitzgerald, 2012). In addition, many rural settlements do not have sufficient services and employment to meet the needs of their residents, and they must increasingly rely on nearby cities and large towns, with private vehicle use required to reach these.

A more detailed summary of the factors affecting uptake of public transport, cycling, and walking are presented below.

Factors affecting decisions to take public transport

The personal and environmental factors affecting decisions whether to use public transport identified in the studies included in the annotated bibliography are summarised below. These are in addition to the norms and attitudes discussed in Section 3.2.

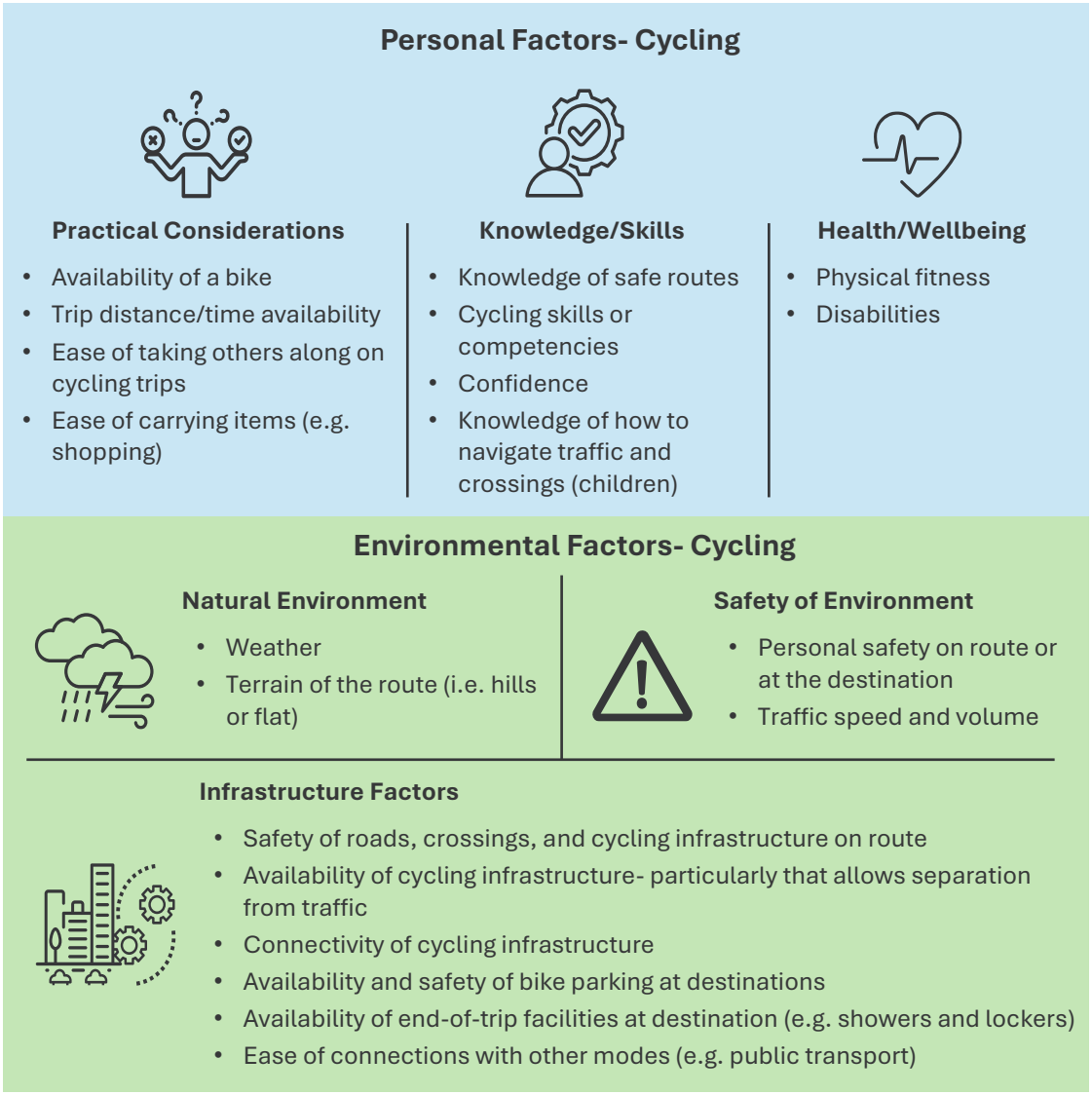


Service quality and perceptions of safety consistently emerged as the most important factors in the studies reviewed in this scan. Service quality encompassed service reliability, availability, crowdedness, and connectivity in the first and last mile (Sogbe et al., 2024, Göransson and Andersson, 2023). For car users in particular, intention to shift was also influenced by perceptions of cost, comfort, and travel time (Sogbe et al., 2024).

New Zealand-based research concurs with the findings described above. In addition, these studies have found that urban design and planning influences public transport use decisions, particularly housing density, land-use mix, walkability, proximity to a public transport stop, main business district travel/location, parking costs, and carpark access (Badland et al., 2010, Dingena et al., 2016). Fluctuations in fuel price were also associated with increased public transport patronage (Wang, 2011, Chowdhury and Ceder, 2013).

Factors affecting decisions to cycle for transport

The key personal and environmental factors influencing decisions to cycle for transport identified in the studies included in the annotated bibliography are summarised below. These are in addition to the norms and attitudes discussed in Section 3.2.



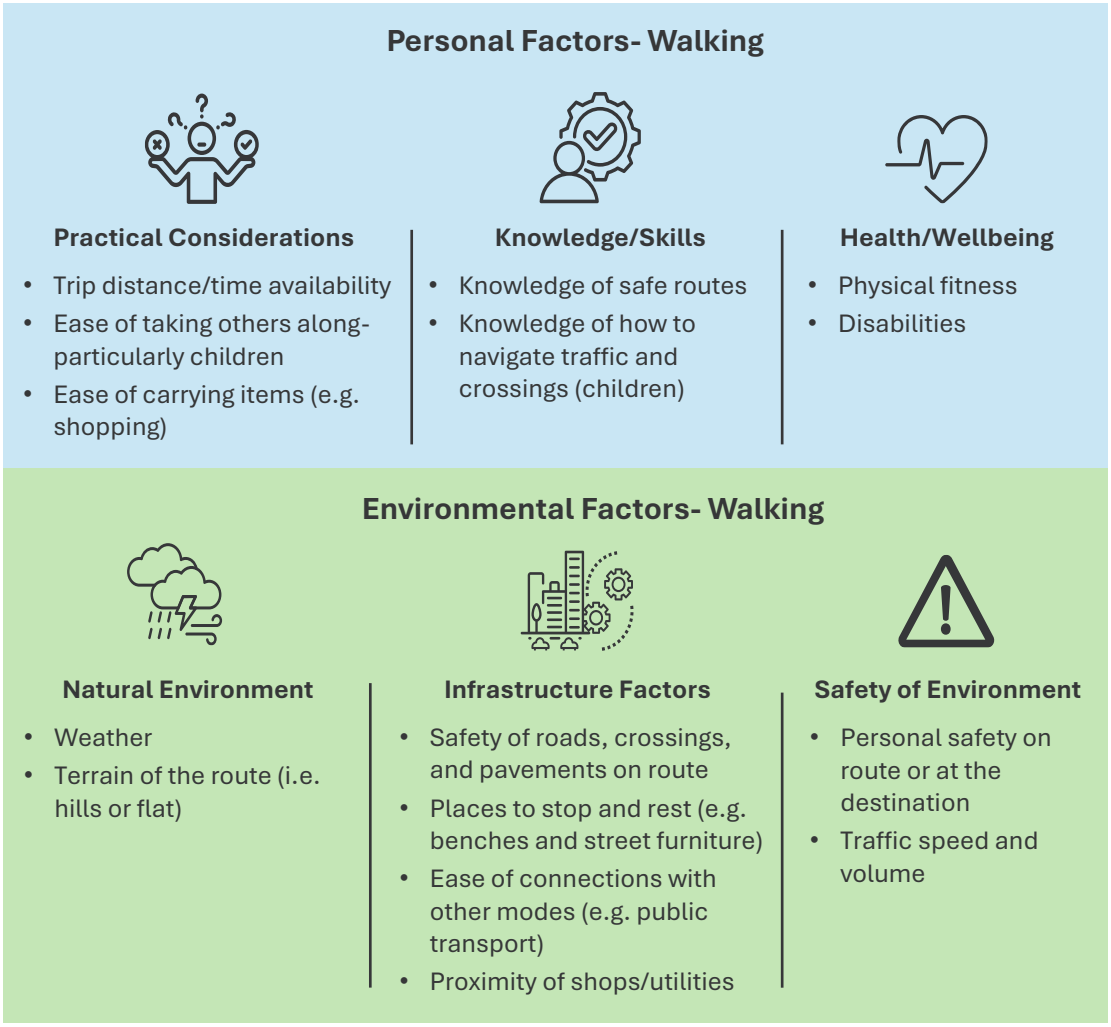
A systematic review of factors affecting decisions to cycle suggests that there is a complex set of influential factors (Pearson et al., 2023). These are a combination of safety concerns, key competencies, practical considerations, and infrastructure factors.

New Zealand research suggests that safety concerns are the most important deterrent to cycling for infrequent, potential, and non-cyclists (Wang, 2014, Chowdhury and Costello, 2016). These concerns predominantly related to cycling alongside traffic and outside of daylight hours. They were also more prevalent amongst women. One study in Māngere, also identified danger from dogs and other people as concerns (Thorne et al, 2024).

Interestingly, in New Zealand, factors supporting decisions to cycle for transport more commonly include fitness, enjoyment, and leisure than motivations related to traffic avoidance and environmental issues (Chowdhury and Costello, 2016, Thorne et al, 2024).

Factors affecting decisions to walk for transport

The key personal and environmental factors influencing decisions to walk for transport identified in the studies included in the annotated bibliography are summarised below. These are in addition to the norms and attitudes discussed in Section 3.2.



In the studies reviewed, the most frequently identified deterrents to walking were safety (particularly walking in the dark) and practical considerations, such as distance (NZTA, 2022). As with cycling, research suggests that personal safety from other people and dogs were concerns, particularly in some lower-socio economic areas (Thorne et al., 2024).

The factors supporting decisions to walk included exercise, health, and weight loss (NZTA, 2022, Thorne et al., 2024). Studies of school children have found that, compared to cycling, walking to school is a more common transport mode, it is preferred by both students and their caregivers, and is highly influenced by distance to school (Calverley et al., 2022, Mandic et al., 2017). This preference for walking may be partly because, in most locations, there is more provision of infrastructure for walking than cycling in New Zealand.

3.4. Opportunities for influencing mode choice

This section covers approaches/interventions which aim to encourage individuals to make non-private vehicle mode choices. Approaches to increase the uptake of efficient vehicles and practices are covered in Section 3.5.

The interventions identified in the literature scan can be broadly grouped into the following types of strategies:

- **Positive strategies:** interventions that motivate individuals to make behaviour changes towards more sustainable travel such as infrastructure or service improvements (e.g. installation of separated cycle lanes), incentives to shift modes (e.g. reduced public transport fares or e-bike subsidies), activation events, and information and attitude change/influence campaigns.
- **Negative strategies:** interventions that disincentivise car use to make it a less attractive option such as time of use/congestion charging, restrictions on parking availability, and policies which raise the cost of fuel or parking.
- **Combined strategies:** multi-part interventions that involve both positive and negative strategies to reduce car use (e.g. improvements in public transport followed by time of use/congestion charging).

The most common factors associated with changing from private vehicles to other, more sustainable, modes identified in the literature scan were:

- High fuel or parking prices
- Limitations on parking availability
- Limited access to private car or work vehicle
- Improvements to the quality of alternative options (i.e. to infrastructure or services)
- Attitudinal factors (e.g. dislike of traffic congestion)

Interestingly, this suggests that negative strategies may be required to shift behaviour. Research supports this, indicating that while positive strategies are more commonly implemented and evaluated, interventions combining positive and negative strategies were generally more effective at the population level (Xiao et al., 2022, Roaf et al., 2024).

For walking and cycling, area level infrastructure interventions applied either alone, or ideally, in combination with personal security, road safety, and pavement interventions were found to be effective in increasing walking and cycling (Thomas et al., 2022).

For increasing public transport usage, positive interventions including social, behavioural, or policy elements alone generally had little impact and had to be repeated or sustained for any impact to be maintained (Roaf et al., 2024, Zarabi et al., 2024). This suggests that combined strategies that also include infrastructure investments and basic affordances such as reliable, frequent and cost-effective services are essential.

3.5. Efficient private vehicle use

For those that need to use private vehicles for some or all trips, efficient private vehicle use can reduce fuel consumption and improve the sustainability of vehicle trips. Efficient use broadly takes two forms:

1. Selecting and purchasing a more efficient private vehicle
2. Using the private vehicle in a way that reduces fuel consumption

A brief summary of findings on encouraging sustainability in both vehicle selection and use are presented below.

Efficient vehicles

Particularly in New Zealand, electric (EV) and hybrid vehicles are relatively new to the market. EVs show significant promise to reduce carbon emissions, however, international research shows that barriers remain to their widespread uptake (Coffman et al., 2017). These include beliefs or perceptions about:

- The purchase price of electric and hybrid vehicles
- Driving range
- Availability of public charging infrastructure

Interestingly, Coffman et al (2017) also note that social/network effects may be important in EV and hybrid uptake. This highlights how friends, family, coworkers, and others can influence views on EVs. It also suggests that simply seeing more EVs may serve as an incentive to their uptake.

A New Zealand-based case study, Broadbent et al (2021), provides insight into the perceptions and beliefs of New Zealanders. Similar to international studies, New Zealand road users perceived the strongest barriers to EV purchase as vehicle expense, range, inconvenience of charging, and the unknown value proposition of batteries. The authors note that policies such as the 'Clean Car Discount', funding towards fast-charger deployment across the road network, and increased procurement of EVs by government departments were favoured by participants.

Efficient driving

A range of options are available for individuals and households to reduce the fuel consumption of their private vehicles. These include eco-driving techniques, remote working, carpooling, and congestion charging.

A New-Zealand based study (Scott and Lawson, 2018) examined motivations for eco-driving. This found that, when driving efficiently was considered, it was usually linked to concerns about fuel cost or saving money rather than environmental reasons. There was a clear lack of connection between carbon emissions and driving practices. In terms of training for eco-driving, Tu et al (2022) found that dynamic assistance (rather than static training) and regular reminders, were necessary to achieve transfer of eco-driving practices to everyday driving.

Studies of remote working such as Hook et al (2020) have sought to determine the extent to which the reduced need to travel to work impacts on economy-wide energy consumption. Their systematic review indicated that remote working does reduce energy use for individuals. However, the available evidence suggests that economy-wide energy savings are modest (Hook et al., 2020).

Studies of carpooling have generally been in the context of work commutes and have shown that factors such as organisation size, presence of carpooling programmes, gender, and work schedules influence uptake. Interestingly, Neoh et al (2017) identified a profile of those more likely to carpool: a female car owner, in full-time employment with a fixed (regular) work schedule. In the New Zealand context, Abrahamse et al (2012) demonstrated the effectiveness of the Let's Carpool scheme in Wellington, although it no longer exists. The number of commuters in the scheme who carpooled as their main mode of transport for getting to work increased significantly after the scheme was introduced (from 12% to 27%).

Another carpooling option is shared taxis and taxi buses. A study, which included New Zealand, by Petrik et al (2017) found that current public transport users, younger people, and women are the most likely adopters of these services. Factors related to likely uptake were fares, waiting time, detour time, distance to a stop, number of passengers, safety, and availability of child seats. Interestingly, Auckland car users were less willing to substitute their trips with shared mobility services, and tended to perceive their travel cost as only the out-of-pocket cost of the fuel, while valuing private vehicles for flexibility and convenience.

Another option to reduce car use is congestion charging. This has proven to be effective internationally (Cheng et al, 2024, Zhou et al, 2024). However, the success of these measures depends on the application of parallel measures to improve public transport. Charging, coupled with public transport improvement, has been shown to have a long-term effect in London, Oslo, Stockholm and Singapore (upgraded cycling infrastructure may also have contributed). Zhou et al (2024) comment that in the long-term, studies show that some residents change their residential location and job choice after the implementation of road congestion pricing, which has a clustering effect on the population in the city centre.

3.6. Summary

This brief scan of key literature found that perceptions of modes of transport other than private vehicles are influenced by intentions, perceived behavioural control, attitudes, and social norms. However, ultimately decisions about whether to use alternative modes are generally influenced by more pragmatic considerations such as reliability, time, cost, and safety; although it may be experiences with these practical things that in turn influence attitude and social norms.

While positive strategies for increasing the uptake of transport mode alternatives are common, negative strategies such as limiting parking, increased running costs, or congestion charging are likely to be important ingredients for behaviour change. A strategy of both positive and negative strategies are likely to be most effective and supported.

For efficient use of vehicles, to some extent efficient driving and better utilisation already occur in some circumstances, usually as a result of focusing on saving money than environmental considerations such as climate change. To stimulate further uptake, incentives and better provision for EVs, active carpooling programmes, and congestion charging are initiatives with demonstrated promise.

While the literature outlines key areas of potential for, as well as barriers to, wider mobility choices, there are likely to be more nuanced circumstances in which different modes might be chosen. The next section outlines the results of focus groups with everyday New Zealanders who typically drive for most of their trips, and the possibilities for using other modes.

4. FINDINGS: FOCUS GROUPS

The following section provides the results of the four focus groups with everyday New Zealand drivers completed during this project.

As stated in the methods section, the focus groups involved a total of 44 participants,[3] selected to represent a broad cross section of typical New Zealand road users. A summary of the demographics of participants is provided in Appendix D.

The focus groups were structured by location so that participants experienced similar road senvironments. They were:

- Auckland
- Large cities: Wellington, Christchurch
- Mid-sized cities: Dunedin, Tauranga, Hamilton
- Smaller regional centres: examples include Dargaville, Blenheim, Ashburton

All participants used a private car for most of their regular trips. However, they were also open to considering other modes and/or more efficient driving practices.

The focus group results are presented in the following sections:

1. **Reflections on current everyday travel choices**: focus on participants' general travel behaviour and their views on travel.
2. **Sustainable commute opportunities**: commute specific travel choices and opportunities for improved sustainability.
3. **Sustainable shopping trips**: shopping specific travel choices and opportunities for improved sustainability.
4. **Sustainable recreation trips**: recreation specific travel choices and opportunities for improved sustainability.
5. **Sustainable trips to visit friends and family**: travel choices specific to socialising and opportunities for improved sustainability.
6. **Sustainable school travel**: school travel specific choices and opportunities for improved sustainability.
7. **Efficient driving practices**: focus on both vehicle selection and driving practices.

Generally, the focus group results were similar across geographic locations and participant personal demographics. Therefore, the default is to present results for all 44 participants. Where there were any notable differences between groups were observed, these are highlighted.

[3] Fifty participants were recruited to focus groups. However, ultimately, only 44 attended. This was considered sufficient for analysis.

4.1. Reflections on current everyday travel choices

The first stage of each focus group concentrated on understanding the kinds of everyday travel the participants did, the mode choices that were available to them, the modes they used, and the reasons for their choices.

All the 44 participants regularly undertook a broad range of everyday trips, as shown below:

Shopping Trips (e.g. groceries)

=43 (98%)

Recreation Activities (e.g. sport)

=40 (91%)

Visiting Friends and Family

=37 (84%)

Commute to Work

=36 (82%)

Taking Children to School

=13 (30%)

When asked which of the travel options they ***typically* used** for each of their regular trips (as described above), consistent with the selection criteria, the vast majority used a car. This indicates that even in larger cities, with a greater range of travel options such as more frequent busses and ferries, participants still opted to use a private vehicle for most of their regular trips.

Private/Work Vehicle= 156

(92%)

Public Transport= 5

(3%)

Cycling= 3

(2%)

Walk= 3

(2%)

Motorcycle/ scooter= 2

(1%)

Due to the selection process for the focus groups, all participants had access to a private vehicle. However, all also had ***access to other transport options*** on route to at least one of their regular trips (as shown below), even if they did not use these modes. It should be noted that this access could be limited by, for example, the frequency or reliability of bus services, or the safety of cycle facilities on a busy road. This was particularly the case in smaller towns, and where people lived semi-rurally.

Bus= 39 (89%)

Walking= 34 (77%)

Cycling= 21 (48%)

E-scooter= 12 (27%)

Train= 8 (18%)

Ferry= 5 (11%)

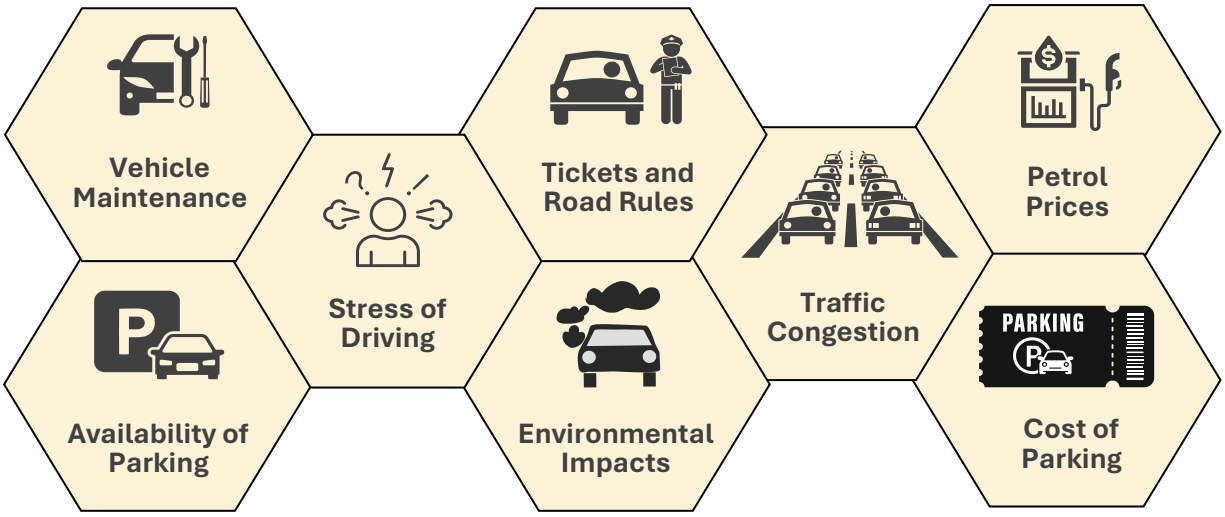
Reasons for mode choice

Guided discussion provided some interesting insights into how, and why, participants made the everyday travel choices they did. It revealed a pragmatic approach that involved weighing up a relatively complex set of factors including time availability, cost, flexibility, reliability, required planning, and comfort. There was no suggestion that participants held strong negative beliefs or attitudes about using non-private vehicle modes. In many cases, other household members already used more sustainable modes and/or the participant used them when they felt it was practical.

Generally, other non-private vehicle modes were considered time consuming, unreliable, and insufficiently flexible. Several also noted that they required planning and an understanding of timetables and apps that they did not possess.

For a few participants, accessibility reasons put them off using other travel modes. One participant mentioned that their damaged leg meant it was not easy to walk to the bus stop. Several others mentioned neurodiversity made public transport overwhelming and confusing.

Despite this, for many, driving a private vehicle also had significant drawbacks. Most particularly those highlighted below. This suggests that there are considerable disincentives to private vehicle use for some regular trips. However, the issues with other modes noted above are currently, for many everyday New Zealanders, an even greater barrier.

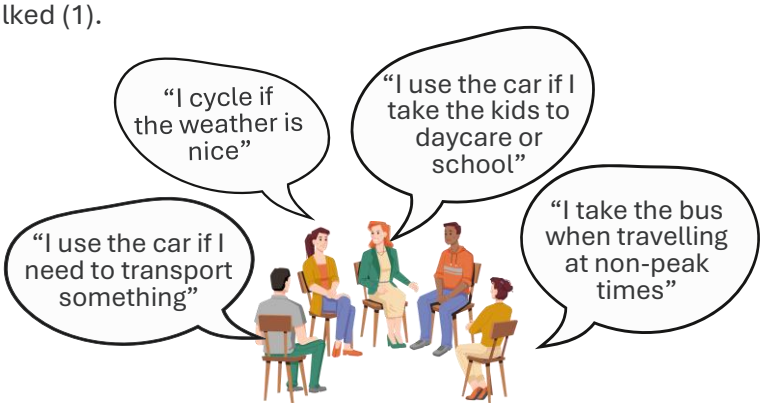


4.2. Sustainable commutes

Current mode choices

81% of the focus group participants regularly commute to work. The vast majority *usually* travelled by private car or work vehicle (25), while only a few biked (2), motorbiked/scootered (1), used public transport (2) or walked (1).

Half of the participants also used another mode of transport some of the time



Participants chose their usual travel mode for a range of reasons, most commonly:

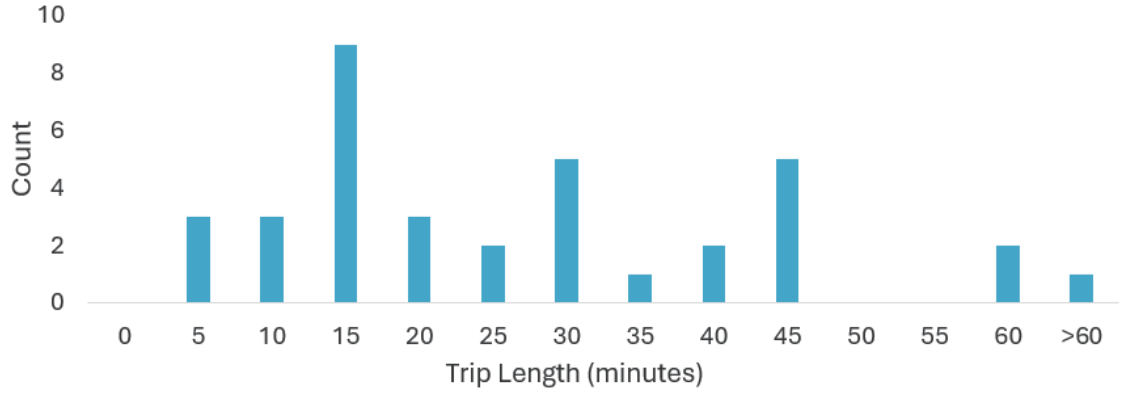
It is the fastest option (n=33)	**To carry items or passengers (n=22)**	**Weather Protection (n=17)**	**It fits in with other trips (n=16)**
It is low cost (n=9)	**Low emissions (n=6)**	**There are no other viable options (n=5)**	**It is good for my health (n=1)**

Features of current commuting trips

Almost all participants linked their work commutes to other trips either sometimes or regularly (30). Linked trips included shopping, recreation/gym, and picking up/dropping off children.

All participants commuted carrying typical work items such as bags, laptops, lunches. However, those that biked also carried biking related equipment, and those who dropped off/picked up children also had children's equipment (bags, sports gear, instruments etc).

Using their usual mode, work trips averaged 30 minutes, with a range of 7 to 150 minutes.

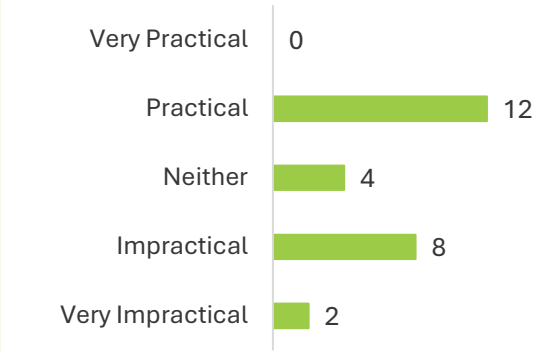


Mode choice if participants usual private vehicle was not available

Participants who usually use private vehicles (car or motorbike/scooter) for work commutes (26), said that if they couldn't use their car, they would choose the following modes:

#1	#2	#3	#4	#5
Bus= 18	Bike/E-bike= 5	Not Possible by Another Mode= 3	Train= 2	Walk= 1

More participants thought that their chosen alternative mode was a practical option than that thought it was impractical.



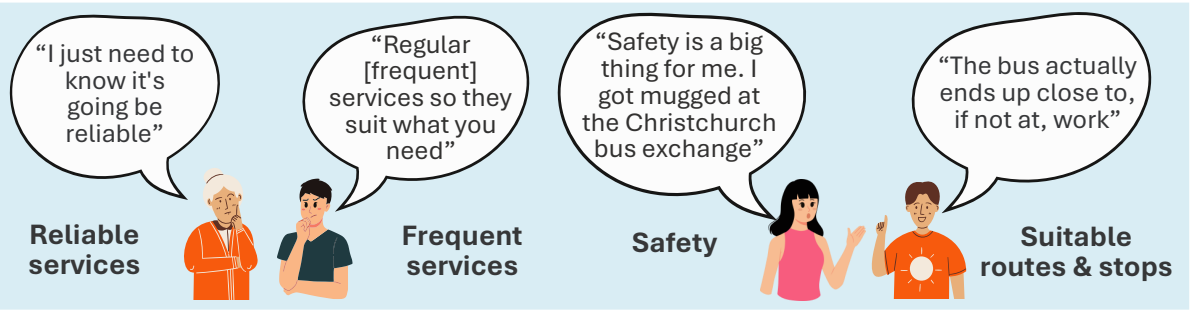
Most participants had already at least explored using the alternative mode for their commute to work.

- I have tried it but don't use this mode regularly (n=10)
- I have explored using this mode but haven't tried it (n=10)
- I've thought about using this mode (n=3)
- I've never thought about using this mode before (n=2)

Scenarios for regular sustainable commuting trips

Most participants from large to medium urban areas indicated they would use public transport if they couldn't drive for their commute to work. By contrast, those in rural areas or smaller towns were more likely to say they would bike.

Non-negotiable factors most often mentioned for shifting to public transport regularly are noted below. Quality and clarity of information about routes and timings was also raised by some.



The non-negotiables identified indicate that, for many, public transport doesn't meet basic requirements (e.g., reliability). For others, public transport might just be practical in some situations, but on balance, the car wins. Equivalence to driving was frequently mentioned. Public transport was not expected to be more convenient than driving, but participants would not accept less convenience. Interestingly, incentives such as cheaper fares weren't raised, possibly because they wouldn't induce participants if basic service provision was inadequate.

Participants in larger cities required more reliable services with fewer transfers between routes. Those in smaller cities required new and more frequent routes that reached their desired destinations. This may reflect differences in the services currently available. Where bigger cities have existing options, participants wanted improved quality. However, in smaller centres, participants may not currently have a feasible route at all.

4.3. Sustainable shopping trips

Current mode choices

Forty-three (98%) of the focus group participants regularly take shopping trips. All but two usually travel by private or work vehicle for this trip. Two participants walked or carpooled.

34% of the participants also used another mode of transport some of the time.

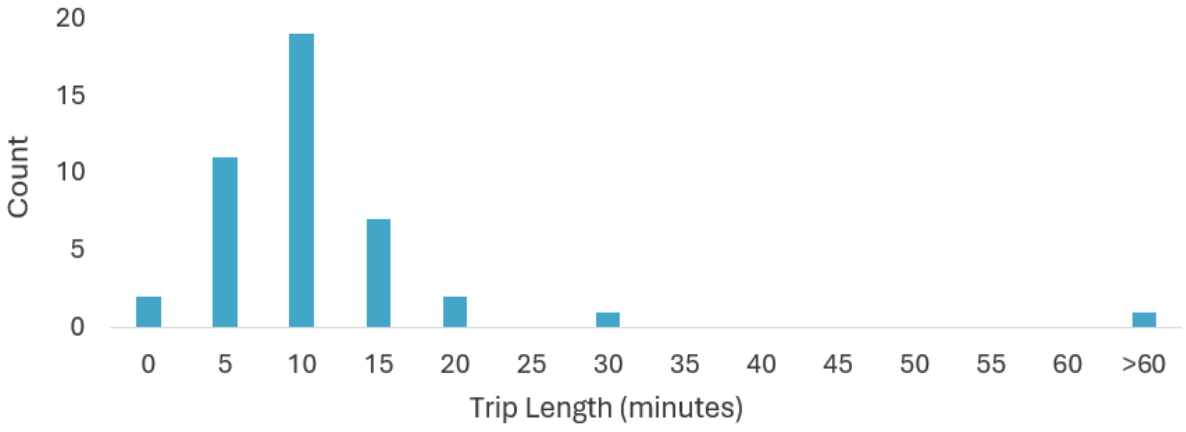
Participants chose their usual mode for a range of reasons, most commonly:

To carry items or passengers (n=39)	**It is the fastest option (n=36)**	**It fits in with other trips (n=21)**	**Weather Protection (n=17)**
There are no other viable options (n=7)	**It is low cost (n=6)**	**Low emissions (n=2)**	**It is good for my health (n=1)**

Features of shopping trips

All participants travelled with typical shopping items such as shopping bags and personal items (e.g. wallet, handbag, etc.). Most travelled with another person, commonly their spouse/partner or kids. Almost all (79%) linked their shopping trips with other trips either sometimes or regularly. These links were typically work commutes, recreation, or visiting friends/family.

Using their usual mode, trips to shopping averaged 12 minutes, with a range of 2 to 90 minutes.

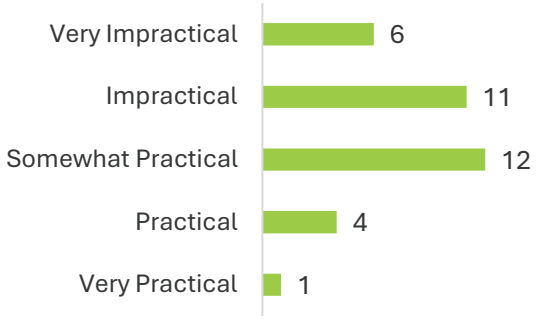


Mode choice if a vehicle was not available

Participants who usually use a private vehicle (car or motorbike/scooter) for shopping trips (41), said that if they couldn't use their car, they would use the following mode:

#1	#2	#3	#4	#5=	#5=
Bus= 15	Walk= 14	Not Possible by Another Mode= 7	Bike/E-bike= 3	E-scooter= 1	Train= 1

Most participants felt the alternative mode they selected was either impractical or only somewhat practical.



Many participants had already explored or tried the alternative mode. However, a number had not thought about it before.

- I have tried it but don't use this mode regularly (n=14)
- I have explored using this mode but haven't tried it (n=5)
- I've thought about using this mode (n=5)
- I've never thought about using this mode before (n=10)

Scenarios for regular sustainable shopping trips

Even though a range of alternative modes were available to many participants, most, from all geographic areas, felt that shopping trips were often impractical using sustainable modes. Reasons for this tended to be environmental (e.g., trip distances, carrying things, or weather).

The scenario of walking was chosen for detailed discussion. All groups found it difficult to identify non-negotiables that would shift them to regularly walking for shopping. Those that were identified were:

For participants, shopping trips seemed less feasible to shift to more sustainable modes than other types of trips (e.g., commuting). Therefore, in general, targeting shopping as part of mode shift initiatives may not be as successful as other trips in the New Zealand context. Although there are likely specific instances in larger cities where improvements (e.g., to safety) may be effective. Public transport and walking may be feasible in some circumstances, if services and distance allow, and if the amount of shopping to be carried was minimal.

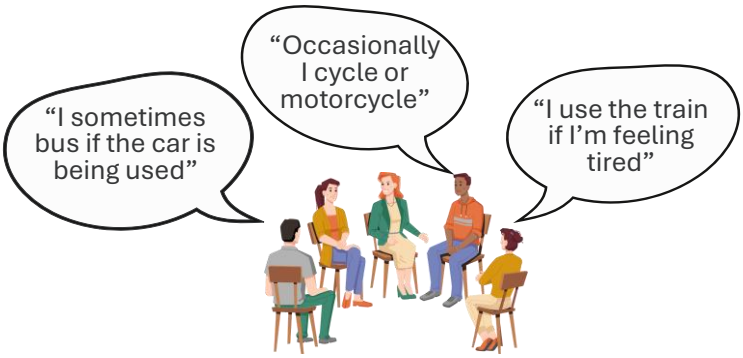
The degree of trip chaining (combining shopping and other trips) was notable. This suggests that focusing on efficient vehicle use might, overall be more successful to encourage more sustainable shopping trips. Many participants stated that they often used online shopping, eliminating the need for the trip altogether.

4.4. Sustainable recreation trips

Current mode choices

Forty (91%) of the focus group participants regularly travel to recreation activities (e.g. sports, classes, hobbies, etc.). All but one participant mostly travelled by private car or work vehicle. The remaining participant cycled to their recreation activities.

42% of the participants also used another mode of transport some of the time.



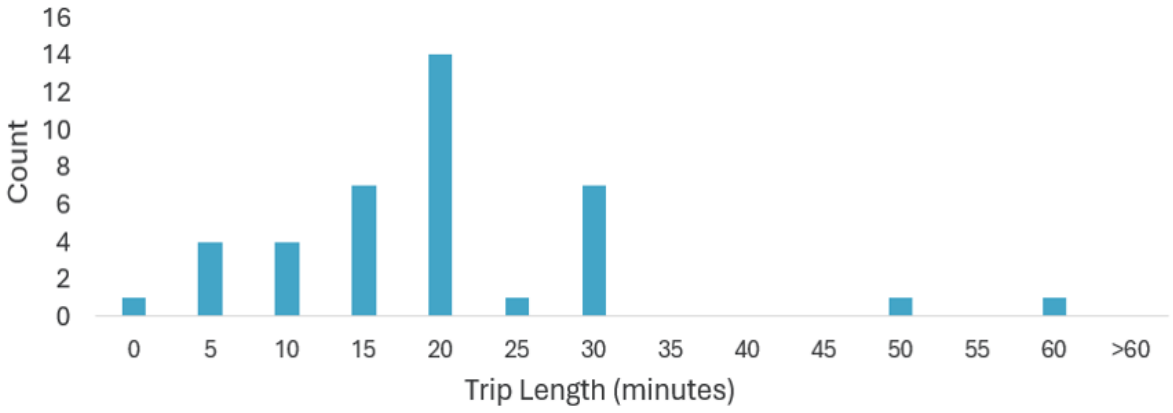
There were a range of reasons why participants chose the travel mode they did. These were:

It is the fastest option (n=30)	**To carry items or passengers (n=28)**	**Weather Protection (n=17)**	**It fits in with other trips (n=16)**
There are no other viable options (n=8)	**It is low cost (n=6)**	**Low emissions (n=4)**	**It is good for my health (n=2)**

Features of trips to recreation activities

Participants travelled with a range of gear for their recreation activities such as gym gear, and sports and music equipment. Approximately half said they travelled with another person, usually family members or friends. Approximately 60% of participants linked their recreation trips to other trips either sometimes or regularly. These links were typically to work and shopping trips.

Using their usual mode, trips to activities averaged 20 minutes, with a range of 4 to 60 minutes.

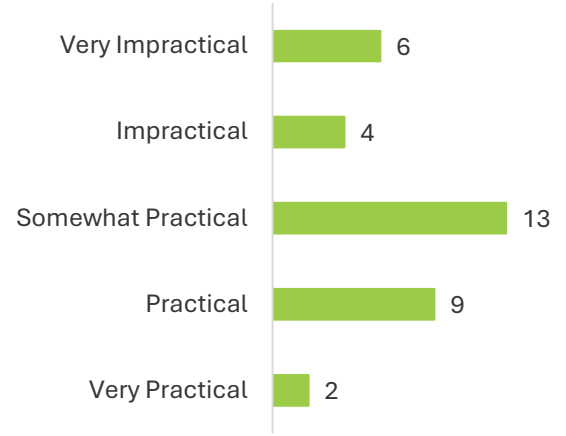


Mode choice if a vehicle was not available

Participants who usually use a private vehicle (car or motorbike/scooter) for recreation trips (39) said that if they couldn't use their car, they would use the following mode:

#1	#2	#3	#4	#5	#6
Bus= 18	Bike/E-bike= 7	Walk= 6	Not Possible by Another Mode= 5	Train= 2	E-scooter= 1

Most participants felt that their alternative mode was relatively practical.



Most participants had at least thought about using the alternative mode, while a quarter hadn't considered it before.

- I have tried it but don't use this mode regularly (n=11)
- I have explored using this mode but haven't tried it (n=4)
- I've thought about using this mode (n=11)
- I've never thought about using this mode before (n=8)

Conditions that would need to be in place for participants to regularly consider the mode

Alternative modes, particularly buses and active modes, were available to most participants and many felt that these could be a practical option. Most focus group members had relatively local recreational activities (e.g., at a local sports ground) so trip distances were often short.

The public transport scenario was chosen for detailed discussion, except for the mid-sized city group who selected biking. For public transport, the following non-negotiables were identified:

In the case of biking for recreation trips, the non-negotiables identified were improved road and personal safety. However, participants also raised concerns about distances that need to be travelled and the need to carry bulky equipment.

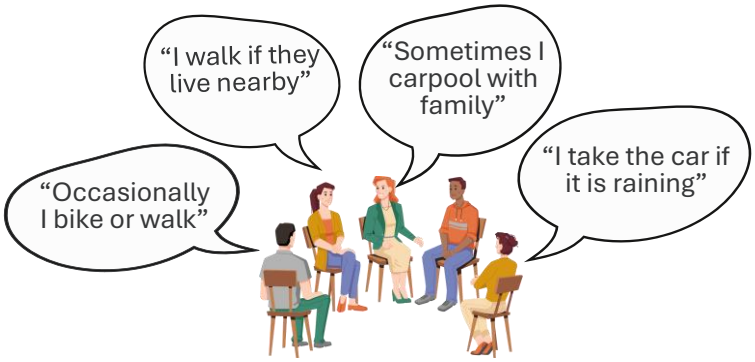
The public transport issues raised seem to be related to the way public transport systems are commonly designed, with a focus on spoke and hub transport to major employment and town centres. This can mean accessing cross town routes for non-commute travel requires many transfers or is not possible with the current available routes.

4.5. Sustainable trips to visit friends and family

Current mode choices

Thirty-seven (84%) of the focus group participants regularly travel to visit friends and family. All but two participants mostly travelled by private car or work vehicle. The other two participants used public transport and motorbiked/ scootered, respectively.

35% of the participants also used another mode of transport some of the time.



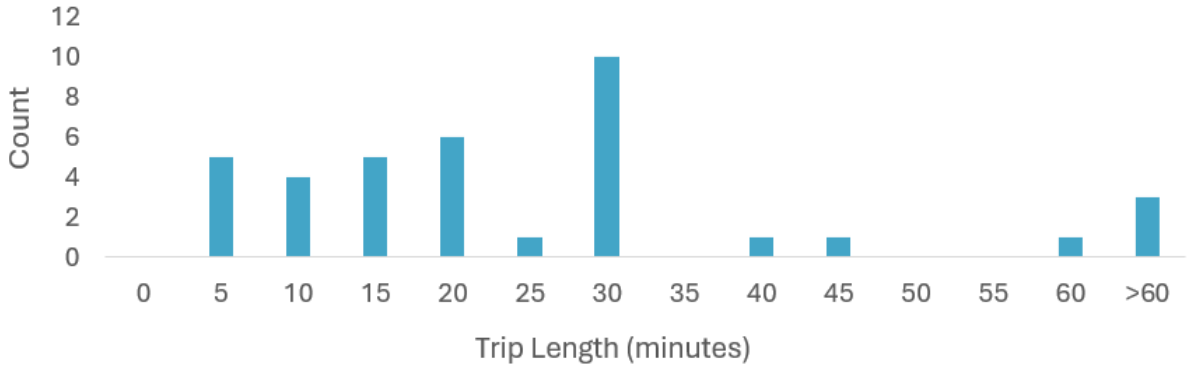
There were a range of reasons why participants chose the travel mode they did. These were:

- **It is the fastest option (n=36)**
- **To carry items or passengers (n=26)**
- **It fits in with other trips (n=18)**
- **Weather Protection (n=14)**
- **There are no other viable options (n=12)**
- **It is low cost (n=7)**
- **Low emissions (n=2)**
- **It is good for my health (n=2)**

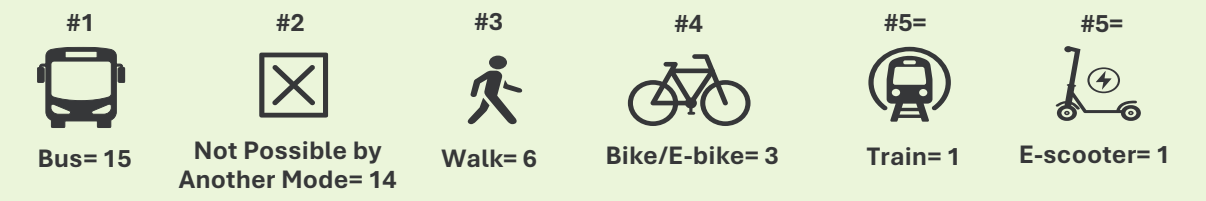
Features of trips to visit friends and family

Participants travelled with a range of items such as personal items (e.g. wallet), food, drinks, and things to keep their children occupied. Most also travelled with another person, commonly their partner/spouse and children. Approximately two thirds of participants linked their trips to visit friends and family to other trips either sometimes or regularly. These links were typically trips to visit other friends/family and shopping trips.

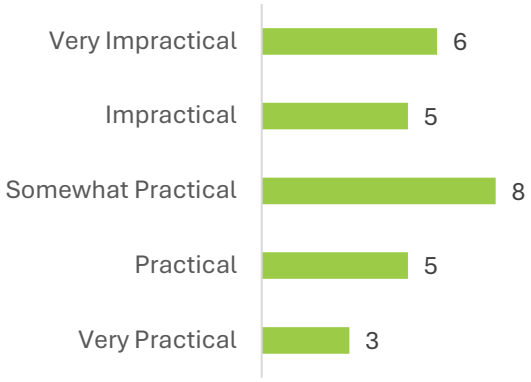
Using their usual mode, trips to visit friends and family averaged 30 minutes, with a large range of 5 minutes to 3 hours.



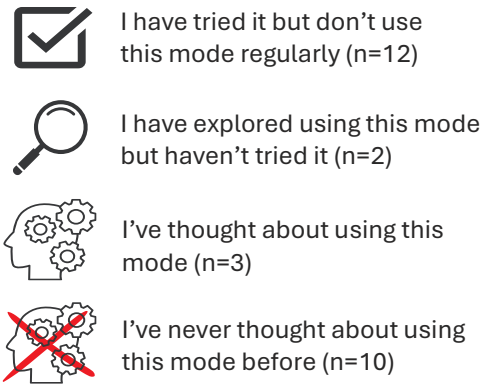
Participants who usually use a private vehicle (car or motorbike/scooter) for visiting friends and family (37), said that if they couldn't use their car, they would use the following mode:



Ratings of practicality of using the alternative mode to visit their friends and family were varied likely due to the large variation in trip length.

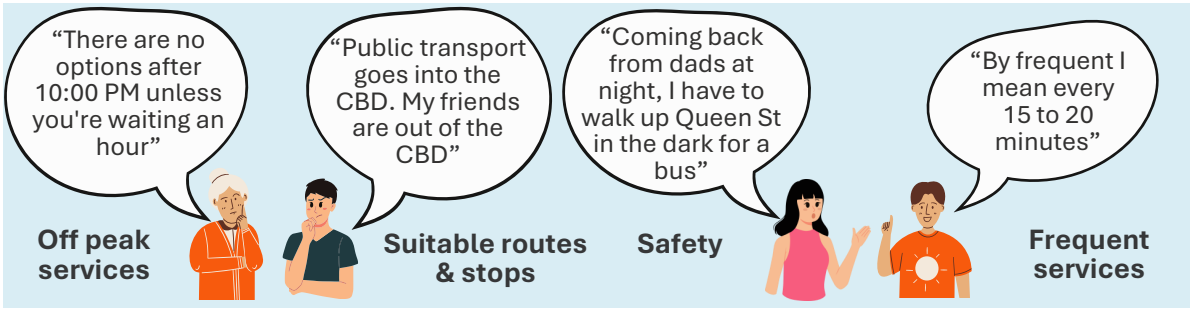


Most participants had at least thought about using the alternative mode while over a third hadn't considered it before.



Scenarios for regular sustainable trips to visit friends and family

Alternative modes, particularly busses, were available to some participants. However, a notable number, much more than other scenarios, said other modes were not possible. This is probably due to the distances involved in some visits and their locations (for example rural family). The public transport scenario was chosen for detailed discussion, except for the mid-sized city group where the biking was selected. In terms of public transport, the following non-negotiables were identified:



Participants identified specific non-negotiables for trips to visit friends and family. These were mostly related to service provision and frequency. Lack of provision also resulted in personal safety concerns, particularly voiced by women.

As with recreation, some issues with the current system that cause issues with travel for social activities may be due to the nature of public transport design, which is more commute focused. As such, off-peak services to non-employment centre locations are not available or infrequent in most areas of New Zealand. Addressing these non-negotiables for this type of trip is likely to be difficult and expensive in the New Zealand context.

In addition, alternative modes were considered impractical for many trips. Likely due to trip length and family/friends' location.

4.6. Sustainable school trips

Current mode choices

Thirteen (30%) of focus group participants had children requiring transport to and from school. All but two transported them by private car or work vehicle. The other two participants children used public transport or walked.

38% of the caregivers and children also used another mode of transport some of the time.

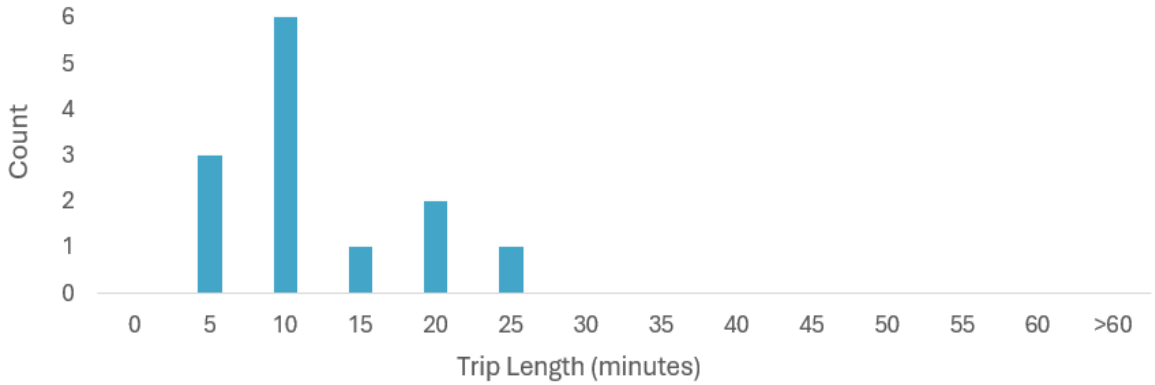
There were a range of reasons why a school travel mode was chosen. These were:

To carry items or passengers (n=13)	**It is the fastest option (n=12)**	**It fits in with other trips (n=9)**	**Weather Protection (n=5)**
It is low cost (n=2)	**Low emissions (n=2)**	**There are no other viable options (n=1)**	**It is good for my health (n=1)**

Features of school trips

All participants, or their children, carried items such as school bags, equipment for recreation activities, and other belongings. Approximately two thirds of participants linked school travel trips to other trips either sometimes or regularly. These links were typically with work trips.

Using their usual mode, school trips averaged 12 minutes, with a range of 5 to 25 minutes. This is relatively short compared to other trip types and reflects the local nature of many schools.

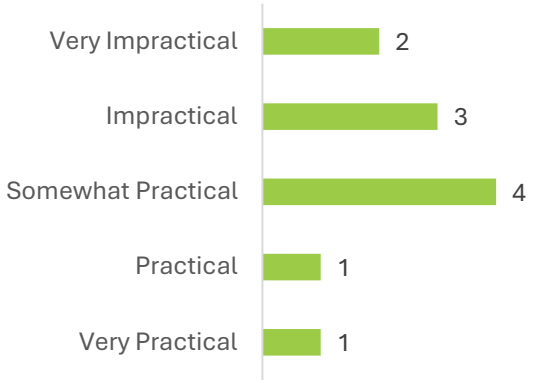


Mode choice if a vehicle was not available

Participants who usually use a private vehicle (car or motorbike/scooter) for school trips (11) said that if they couldn't use their car, they would use the following mode:

#1	#2	#3	#4
Bus= 6	Bike/E-bike= 2	Walk= 2	Train= 1

Most participants felt the alternative mode they selected was either impractical or only marginally practical.



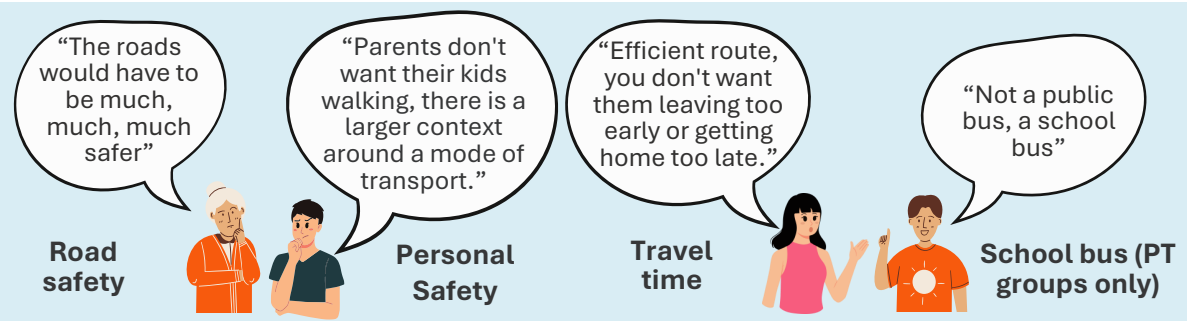
Most participants had at least thought about using the alternative mode while a quarter hadn't considered it before.

- I have tried it but don't use this mode regularly (n=3)
- I have explored using this mode but haven't tried it (n=4)
- I've thought about using this mode (n=2)
- I've never thought about using this mode before (n=3)

Scenarios for regular sustainable school trips

Most participants (11/13) said they were able to use alternative modes. However, very few rated them as practical. A range of scenarios were chosen for detailed discussion, with public transport being discussed in the small town and Auckland groups, biking being discussed in the Wellington/Christchurch group, and walking being discussed in the mid-sized city group. This probably reflected the most likely alternative modes for these groups. The public transport option for small regional centres largely focused on school buses.

The following non-negotiables, in various guises, were commonly mentioned for all modes:



The non-negotiables listed above were identified, in different forms, across modes. For example, road safety referred to pedestrian crossings for walking and cycle lanes for biking.

Given the relatively short travel times to schools, it is interesting to note that most participants from this small group did not consider these modes practical. The main factor seemed to be safety concerns. This included personal safety, particularly when walking or on a public bus, and road safety, particularly when biking or walking.

4.7. Efficient driving practices

The final part of each focus group focussed specifically on efficient driving practices. This includes:

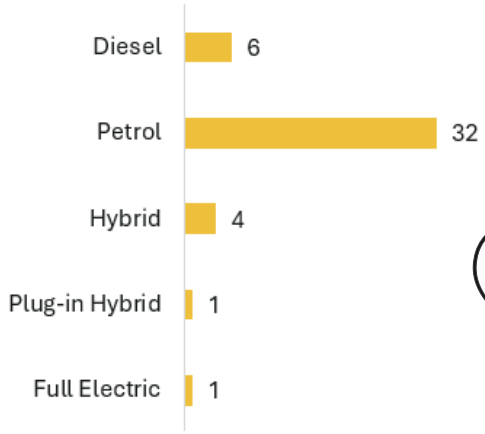
- Driving a fuel-efficient vehicle (including EVs, hybrids, and smaller engine cars).
- Driving in a fuel-efficient way (including eco-driving, carpooling, home working and other fuel use reduction approaches).

Participants were first asked to provide information about the vehicles they currently drove to provide context to their comments about efficient driving. They then were asked to comment on their willingness to improve the sustainability of their private vehicle use, either by switching to a more efficient vehicle or through efficient driving practices. Their feedback is summarised in the following sections.

Vehicles currently owned/operated

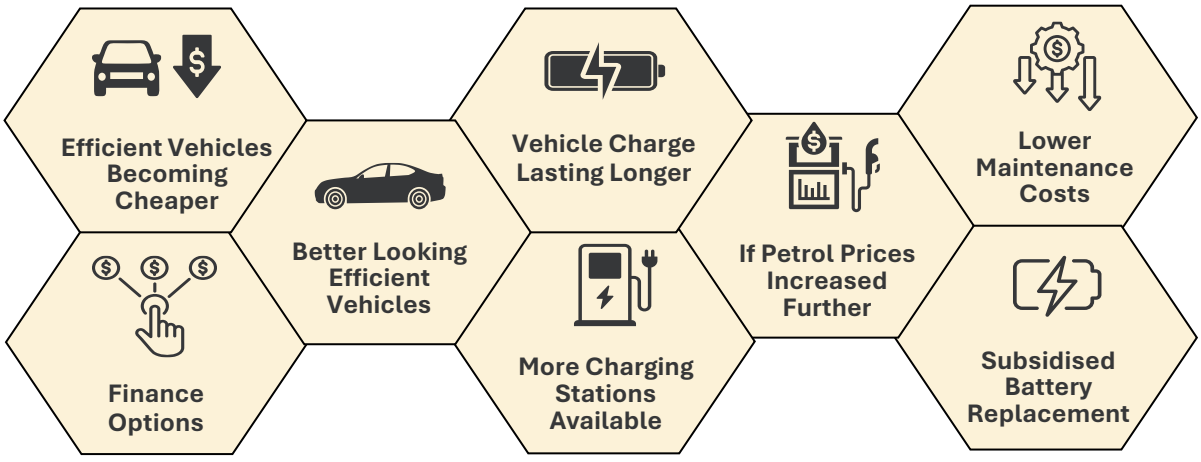
Across all focus groups, participants overwhelmingly indicated that they drove a petrol-powered vehicle (see below). There were no notable differences by geographical location.

Participants gave a range of reasons for the vehicle choice. Most particularly, these focused on the cost of the initial purchase, the cost of running the vehicle, and the ability of the vehicle to meet their needs (e.g., enough space, goes off-road etc.). In some cases, participants operated a company vehicle, and they had not had input into the type of vehicle selected.



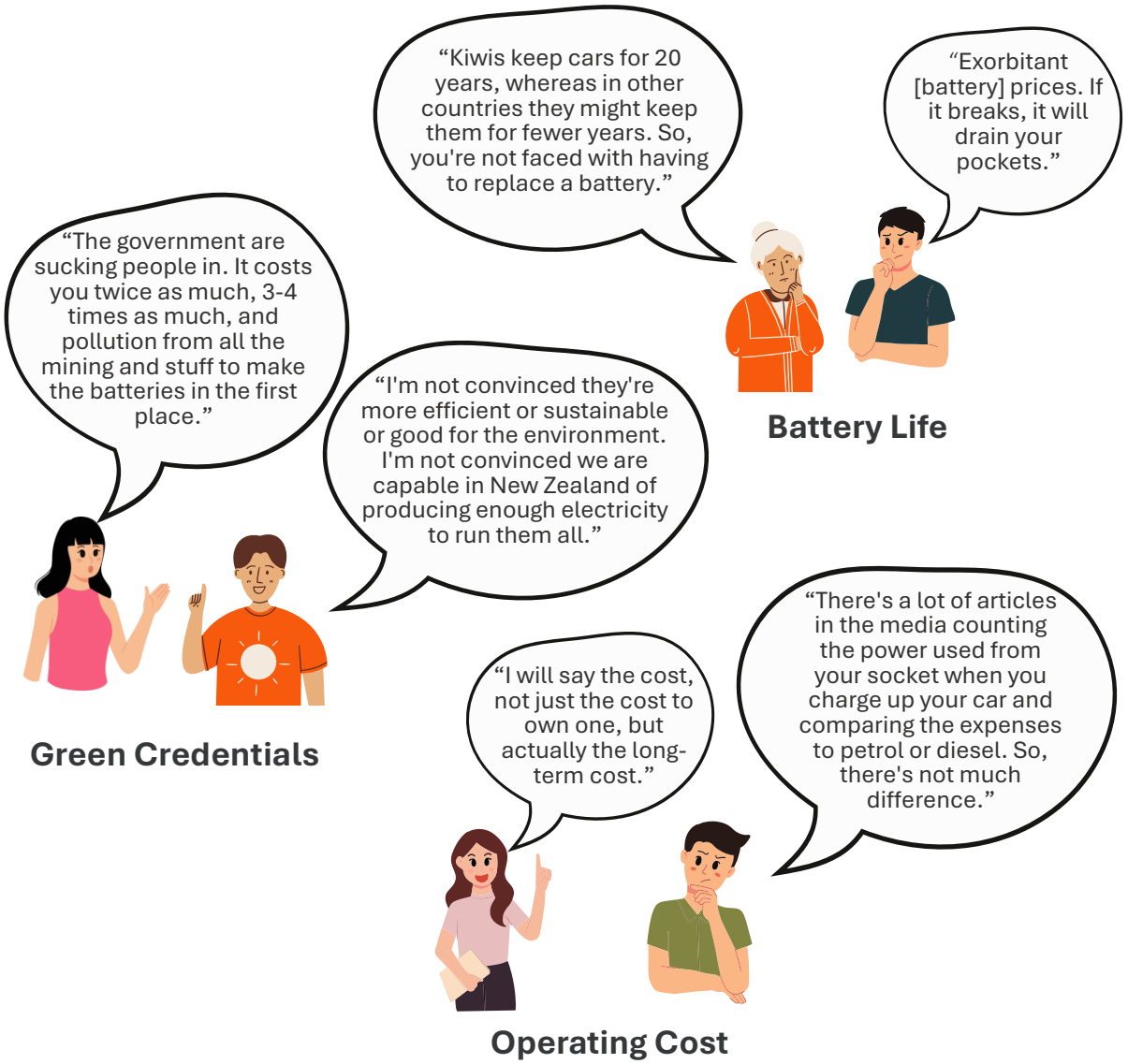
Switching to a more fuel-efficient vehicle

Participants were asked what would incentivise them to move to a more fuel-efficient vehicle. A range of incentives were identified. These were:



It is notable that very few participants mentioned being more ‘environmentally friendly' as an incentive for moving to a more fuel-efficient vehicle. This didn’t seem to factor into their thinking on the issue.

One of the most significant themes to emerge from this discussion was the level of distrust participants had about electric and hybrid vehicles. Collectively this distrust emerged as a lack of confidence in the vehicles, and a reluctance to consider purchasing one given the significant up-front cost. The main types of concerns expressed were:



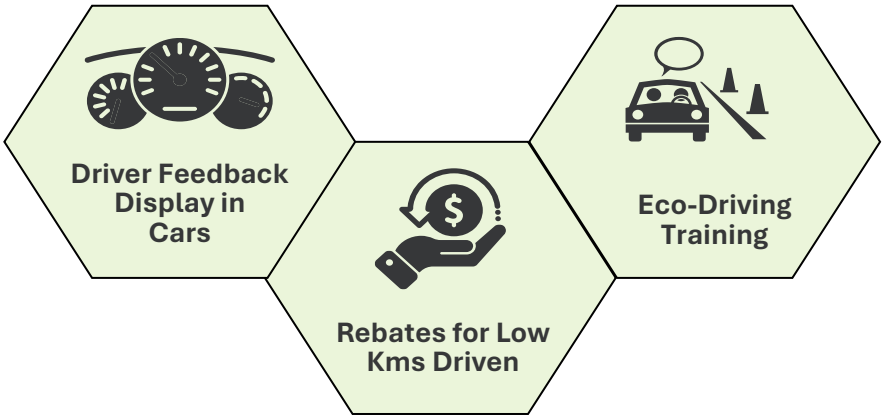
The level of distrust was quite notable and suggests that a first move in encouraging the purchase of electric or hybrid vehicles would be driver education from a trusted source aimed at providing clear, factual information about the pros and cons of an electric vehicle.

Fewer participants commented on the possibility of purchasing a smaller, more fuel efficient, petrol or diesel vehicle. When they did, two main themes emerged:

- Those interested in purchasing a smaller vehicle when it made sense to them in terms of financial outlay and the lifespan of their existing vehicle.
- Those unwilling to purchase a smaller vehicle because it would not have the carrying capacity they require or would not be safe to operate in situations such as off-road.

Switching to more efficient driving practices

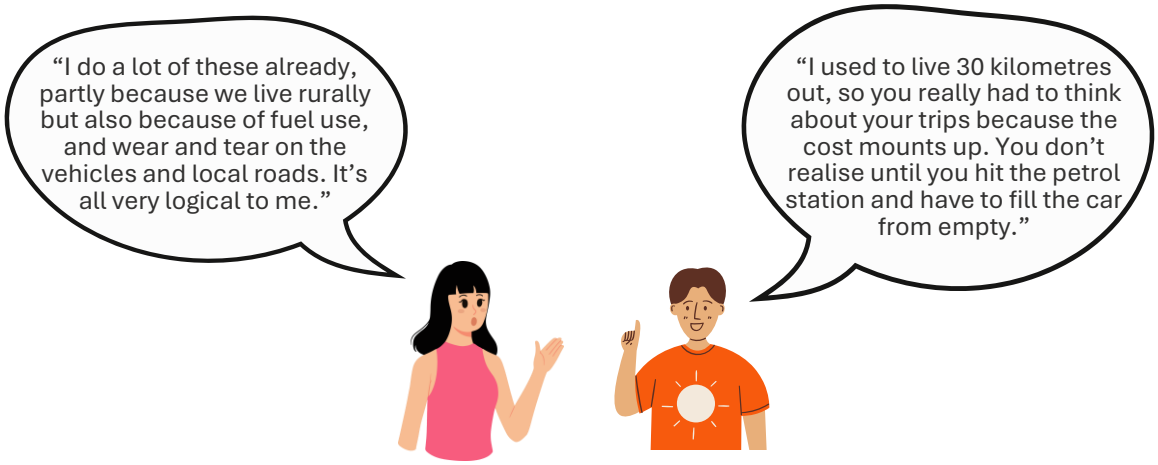
Participants were asked what would incentivise them to use more efficient driving practices. Interestingly, most felt the incentive was inherent in the activity, fuel cost savings. However, a few other incentive options were identified.



In many cases, participants indicated that they were already using efficient driving practices:

Eco-Driving Practices	Working From Home	Grouping Trips When Driving	Carpooling With Others
=27 (63%)	=20 (47%)	=37 (86%)	=20 (47%)

Those living rurally were particularly engaged around efficient driving given the fuel costs they incur and the lack of other options.



For the everyday New Zealanders who took part in these focus groups, efficient driving practices were strongly supported. Participants appeared to feel that these practices were things they could do to reduce their fuel consumption easily, cheaply, and at low risk (compared to an EV or hybrid purchase). Interestingly, very few, if any, indicated an interest in doing these things for environmental reasons. The main motivation was cost savings, particularly in situations where fuel prices were rising.

4.8. Priorities for areas of focus

Near the end of the focus groups (excluding the first one) participants were asked an open question, *"what would be your priorities for funding in the transport system?"*. There were a range of ideas provided by focus group participants about transport priorities. While they can't be taken to provide weight to any particular action since they were more informal and open comments at the end of the session, they do provide an interesting indication of the priorities that participants would support. Interestingly, it appears that action across the transport system, particularly to support public transport, and for some driving, was favoured. Some examples of the feedback received are provided below, noting that these did not include the views of Aucklanders.

When comparing what was mentioned between focus groups, participants from small centres tended to mention improvements to roads, and people from large cities reducing parking costs more frequently than other groups. Support for public transport improvements, reductions in public transport fares and the costs of EVs was received in all focus groups.

5. WHAT ARE THE OPPORTUNITIES FOR SUSTAINABLE EVERYDAY MOBILITY?

In this final section, we pull together the findings from the literature scan and focus groups to identify opportunities to support everyday New Zealanders in changing some of their trips to more sustainable options.

For this work, everyday New Zealanders were defined as people who usually use a private or work vehicle for most trips, but who hold moderate attitudes to transport sustainability, and are willing to consider changing to more sustainable options. Behaviour change theory points to this group having the most potential for change. There is a need to understand the transport experiences of everyday New Zealanders, what is important to them in terms of transport decision making, and what opportunities they see for sustainable everyday mobility.

Our focus groups gathered the views from everyday New Zealanders living across the country from Auckland to Invercargill. They told us that their transport choices are inextricably bound to their, often complex, daily routines. **An overarching theme of pragmatism emerged.** People choose options that enable them to go about their day efficiently. This often involved weighing up a relatively complex set of factors, particularly travel time, the ability to carry items, weather protection, and fit with other trips (i.e., ability to trip chain).

In making these choices, **no inherent bias towards cars was noted.** Everyday New Zealanders, and other members of their households, use alternative transport modes when they see them as practical. Many already use alternative modes for their regular trips some of the time due to a range of circumstances. In addition, many participants, especially those living in smaller towns or semi-rural areas already regularly use fuel efficient driving practices such as eco-driving, trip chaining, and carpooling.

Interestingly, our focus groups suggest that everyday New Zealanders have a **relatively conservative view towards purchasing EV and hybrid vehicles.** Most view purchasing a vehicle as a major financial decision. They also often see it as a long-term purchase that needs to remain reliable for years to come, a view that may differ from other countries where vehicles are upgraded more regularly. As such, many expressed concerns about purchase price, vehicle reliability, battery life, and costs of maintenance and battery replacement. Some also questioned the 'green credentials' of EVs and hybrids, expressing concerns about materials and power usage. These questions and concerns were barriers to choosing an EV or hybrid for their next vehicle.

To understand transport preferences in more depth, trip scenarios (e.g., commuting) were discussed. The most salient opportunities for alternative modes and efficient driving are presented in infographics on the following pages. After this, these opportunities are brought together and considered through the lens of each trip scenario. Note that for school trips the group was relatively small, and although changing modes was seen as impractical by some despite short travel times, we know from school examples and literature that school trips can in many cases be shifted to bus, walking, and cycling trips with the right leadership and provision[4].

[4] Smith, M. et al, (2020). An integrated conceptual model of environmental needs for New Zealand children's active travel to school. Journal of Transport and Health 16(6): https://doi.org/10.1016/j.jth.2019.100814

5.1. Opportunities for sustainable modes

The following infographic highlights opportunities emerging from the focus groups and literature for each sustainable transport mode available in some, or all, parts of New Zealand.

When considering opportunities for sustainable modes, the decision-making process should be considered. The everyday, pragmatic, New Zealander weighs carefully how various travel options fit with their daily routine, albeit within their existing knowledge of what is practically available. Alternatives need to 'stack up' compared to a car. The literature makes clear that to achieve a shift, incentives for alternate modes and disincentives to car travel would both be needed. Carrying items, weather protection, and trip chaining are examples of things that need to be considered. People don't 'love their car' but it is often convenient.

Public Transport (bus, train, ferry)

Generally, New Zealand has a relatively undeveloped public transport system. Therefore, when focus group participants discussed opportunities and incentives for increasing public transport use, they raised foundational issues such as route availability, frequency, and reliability. Cost issues were also raised, reflected in public transport subsidies as a preferred investment.

There is significant opportunity to increase public transport usage by getting the 'basics' right. In smaller centres, this is more services. In larger centres this involves more frequent and reliable services that run off-peak, and 'across town' (rather than just to employment or town centres). Generally, people were happy to use public transport if the foundations are in place.

Personal safety is also a foundational issue, especially for women. Safety came through as a strong theme (possibly due to recent media coverage of violence on public transport). It is a significant barrier to travelling off-peak and at night.

Cycling

Focus group participants viewed cycling as unsafe which is a key barrier to its uptake. However, people were generally enthusiastic about cycling or supporting their children in cycling. This is particularly true for younger men, and people in smaller towns where cycling distances are less and the traffic is lighter, and larger cities in areas where parking is difficult.

The best opportunities to improve cycling uptake require infrastructure improvements on the main travel pathways of these demographics.

Walking

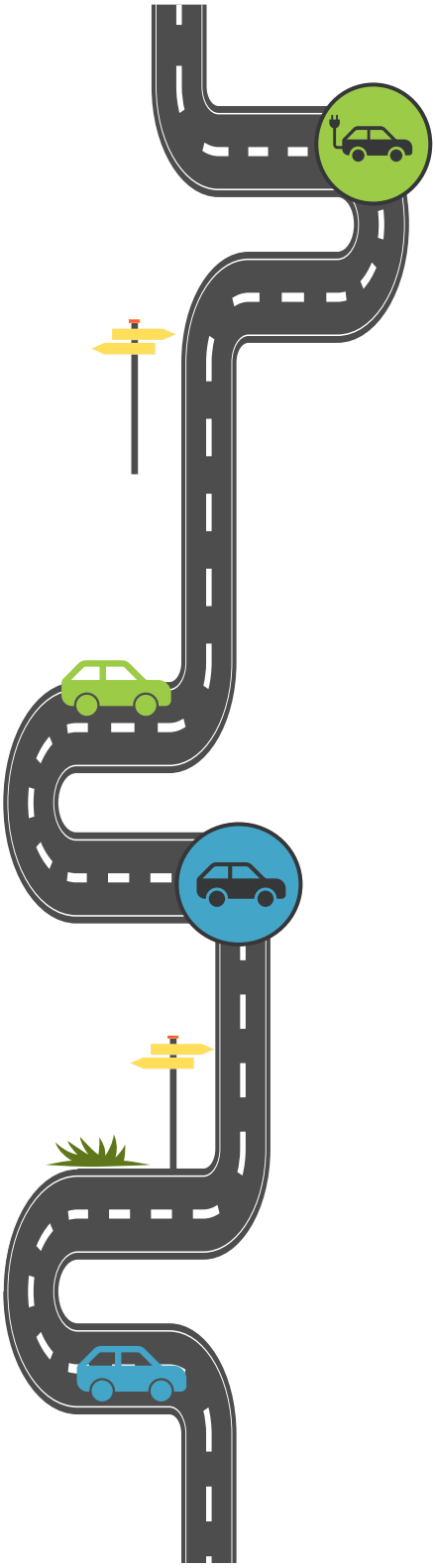
Participants were fairly positive about walking as an alternative transport mode, particularly for shorter, local trips where not much needs to be carried. However, personal safety was a concern, particularly for women, and this also applies to walking to and from public transport.

The best opportunities to increase walking for transport involve using urban design principles to develop neighbourhoods where key amenities and services are close to residences, and walking facilities that afford both personal and road safety.

5.2. Opportunities for efficient driving practices

The following infographic highlights the opportunities for everyday New Zealanders to become more fuel efficient in their use of their private vehicle.

When considering opportunities for efficient driving, both vehicle selection and driving practice were considered. These are each discussed below.



Uptake of efficient vehicles

The focus group results suggested there are significant barriers to purchasing a fuel-efficient car for many New Zealanders.

A key barrier is the upfront cost and ongoing costs. However, others are related to the knowledge and confidence road users have in the technology.

One important opportunity to increase the uptake of hybrid and electric vehicles is the provision of information about fuel efficient vehicles by a trusted source. This should cover information about the vehicle technology, carbon reduction benefits, maintenance, and charging options. Comparisons to typical petrol vehicles should also be provided.

Other opportunities to increase uptake are around purchase cost reduction. Several focus group participants suggested re-introducing EV incentives and/or providing incentives for drivers of hybrid and electric cars through reducing road user charges.

Efficient driving practices

Everyday New Zealanders were strongly supportive of efficient driving practices, with many indicating that they already use at least one these practices (eco-driving, carpooling, remote work, and grouping trips together when driving).

The fuel savings themselves were considered by most to be a sufficient incentive to their uptake. With that in mind, the greatest opportunity to increase efficient driving appears to be educating drivers about the practices and the potential cost savings.

For eco-driving techniques, people also favoured vehicle displays which give them real-time feedback. This approach is supported by research that shows this feedback is more effective for maintaining eco-driving behaviour long-term.

For working from home, there were some barriers such as employer preferences for working arrangements and the industry in which the participants worked. However, there was significant demand for this option and many already are working from home sometimes suggesting that this is already an important mechanism for reducing vehicle trips.

5.3. Sustainable trip scenarios

The best opportunities to switch modes for some everyday trips varies depending upon the type of trip are shown below. Where these vary by factors such as city size or distance, specific opportunities are identified. There is an overarching theme of better public transport across the scenarios and efficient driving practices and vehicles should be assumed appropriate for all trips. The red outline shows the most promising scenarios.

Commute to Work	School Trips	Trips to Recreation Activities	Trips to Visit Friends & Family	Shopping Trips
Trips to workplace hubs (city/commercial centres) Frequent, reliable and safe public transport or high-quality cycle routes with secure bike storage and end of trip facilities. Driving disincentives through parking availability and congestion charging.	**Trips to schools in medium & large cities** Reliable school and public buses, with accessible and safe stops. Local bike networks and facilities at schools (e.g. storage and changing areas). Safe speeds and crossings and walking promotion.	**Trips to recreation hubs (e.g., major venues)** Frequent reliable public transport, with accessible stops and that operates off-peak particularly in the evening. Driving disincentives through parking availability and congestion charging.	**Long distance visits** Frequent enough reliable public transport, with accessible stops that operates off-peak particularly in the evening. Efficient driving such as trip chaining, carpooling, and eco-driving	**Trips to shopping hubs** Frequent reliable public transport, with accessible stops. Efficient driving such as trip chaining, carpooling, and eco-driving
Trips to workplaces outside of hubs Efficient and appropriate vehicles for driving for work Workplaces to support alternative modes where possible and carpooling. Safe, suitable walking and cycling facilities for shorter trips.	**Trips to schools in small centres & semi-rural areas** Regular reliable school buses for rural students with frequent safe access points (stops) Cycling and walking provision as above, in lower speed areas.	**Trips to local facilities** Mixed urban development with amenity close to residences. Safe, suitable walking and cycling facilities for shorter trips, with bike parking	**Local visits** Safe, suitable walking and cycling facilities for shorter trips. Efficient driving such as trip chaining, carpooling, and eco-driving	**Trips to local shops** Mixed use urban development with shopping amenity close to residences. Safe, suitable walking and cycling facilities for shorter shopping trips Use of wheeled shopping carriers such as personal shopping trolley bag

Overall, the focus groups told us that everyday New Zealanders are **open to sustainable travel** and are already considering their options much more than they are generally given credit for. This was the case in both larger cities and smaller towns. Even though in smaller towns services were usually far too limited for people to consider using public transport, examples of interesting alternatives were raised such as community funded vans which could be booked and used so older people and others could attend appointments without driving.

Everyday New Zealanders seem to **need a 'nudge' towards using sustainable options more regularly**. In many cases, they have already considered or tried sustainable transport, and it may just require the right incentive for it to become a viable option. An example is provided by the Māngere e-bike trial.[5] Given the opportunity to try an e-bike in everyday life, many participants switched some trips from private car to the bike after realising there were significant cost savings to be gained, as well as other family and health benefits.

People are looking for **practical solutions that fit with their daily routine**. While social norms and attitudes affect perceptions of transport options, actions are ultimately based on pragmatic decisions given the opportunities available. Someone may strongly support public transport but be unable to use it for commuting due to the unreliability of services.

Currently, given most everyday New Zealanders aim to make **choices that minimise travel time and cost**, as well as enabling them to carry what they need and chain trips together as required, the incentive structure usually favours cars. This can be changed by providing reliable frequent alternate modes and disincentivising car use, according to literature. One focus group participant commented that she didn't bother owning a car when living in Melbourne, but now she was living in New Zealand she almost always used her car for travel. While no New Zealand cities compare with Melbourne's infrastructure and scale, the point is that less reliance on a private car is possible in certain circumstances. For example, many students living in the central city areas of New Zealand do not own cars but may still use them from time to time.

While electric and hybrid vehicles were viewed with suspicion by many, most were **enthused about efficient driving**. Rural people, in particular, already use many efficient driving techniques to reduce fuel costs.

There was little discussion about people with disabilities, as to be expected given the focus of the groups. However, there was a clear voice around people who are neurodivergent who felt stressed by unpredictable, noisy, and crowded public transport. This may point to further work to better understand the needs of those with cognitive and other disabilities using public transport.

5.4. How do the findings compare with other engagement initiatives?

The previous literature and research findings converge on a theme of pragmatic transport choices based on what people believe is available to them, and that modes other than a private car are often used for some trips and may be used more with some nudges or better provision. Other engagement activities in New Zealand have also been carried out to explore people's transport preferences. In particular, the following initiatives are relevant to the present study:

[5] Raja, A., Opit, S., Mackie, H., Witten, K. (2023). Māngere e-bike trial- stage 2: Integrating an e-bike into everyday life. https://healthierlives.co.nz/wp-content/uploads/Ebike-trial-Stage-2-Report.pdf

- **The Future of Transport in Aotearoa NZ: Who should pay for what?** Report on deliberative mini publics (workshops that bring together broadly representative groups of the public to discuss complex decisions), Koi Tū The Centre for Informed Futures, Auckland University- for the Ministry of Transport.[6]
- **The Future of Transport in Tāmaki Makaurau Auckland**: Analysis of a deliberative forum with Aucklanders, Koi Tū The Centre for Informed Futures, Auckland University- for the NZ Transport Agency.[7]

These engagement activities differed from the present research in that they sought to share background and expert knowledge with participants about contemporary transport planning principles before a deliberative process where options and trade-offs were considered. The present research was more focused on the raw perceptions of everyday New Zealanders who typically use private cars for their travel, without any background knowledge.

The initiatives outlined above both had strong themes of New Zealanders preferring investment in good public transport and provision for walking and cycling, along with planning approaches such as transit-oriented development. This isn't surprising given that contemporary transport planning tends towards the concept of integrated transport, where the various modes are all 'doing their bit' and being used optimally.

Despite the more car-oriented themes in the present research based on the chosen method, there are clear overlaps with these earlier engagement initiatives where people stated that they would use public transport, walking, or cycling more for some trips if there were better provision for these modes. In the present research there was also a theme of needing to adequately maintain roads, again in line with the chosen method of focusing on the views of those who predominantly use their cars for most trips.

5.5. Opportunities for future focus and actions

The findings of this study indicate there are opportunities for individuals to exchange some private car trips for more sustainable modes. A range of themes emerged from the research that suggest areas of future focus, including making walking and cycling safer, promoting and implementing mixed use urban environments so that short shopping trips are possible by walking, and others. However, the following themes were very strong from the research which suggest the opportunities that may be most attractive to everyday road users.

Public transport

Participants suggested that the value proposition of public transport needs to be made equal to that of the private vehicle. The time duration to complete a trip and reliability are particularly key, but other considerations such as safety and ease of carrying items are also important. To achieve this, investment is needed by local and central government to improve existing services and/or establish new ones. The feasibility of this is likely to be greatest in major urban centres where there is a larger population to service with public transport.

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[6] Bardsley, A., & Harvey, F. (2023). The future of transport in Aotearoa NZ: Who should pay for what? Report on deliberative mini publics. https://informedfutures.org/wp-content/uploads/2023/09/The-Future-of-Transport-in-Aoteroa-NZ-Minipublics-Report12.pdf

[7] Bardsley, A., Buklijas, T., Allen, K., & Harvey, F. (2023). The future of transport in Tamaki Makaurau Auckland: Analysis of a deliberative forum with Aucklanders. https://bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/2/799/files/2024/04/Deliberative-Forum-Interim-Report-da7347c925f76404.pdf

Participants from regional locations also supported better public transport, but the feasibility of providing this in lower population/density places is likely to be challenging. Examples of existing community run and supported shuttles and vans were however mentioned.

It is recommended that future research looks to establish the amount and nature of investment required to make public transport as attractive as private vehicles in the eyes of drivers. According to behaviour change literature, this may involve the use of 'carrots' such as enhancing public transport services, or 'sticks' such as 'time of use' charging for vehicles. Opportunities may be possible at multiple levels, including central government (policy and investment signals), local government (delivering improved public transport services), and even local communities (e.g., privately sponsored options such as a shuttle buses provided by hospitals or rest homes).

The most immediate audience for this opportunity is likely to be councils and council-controlled organisations in larger centres such as Auckland Transport, Greater Wellington Regionals Council, and Environment Canterbury. These organisations are continually seeking to improve public transport, and so the opportunity could be to provide a more nuanced view of what it would take to shift some trips to public transport. In turn, this would assist with investment and planning in these areas.

Education for EVs

Participants demonstrated misunderstanding of a range of considerations for EVs (full EV and hybrid), including battery life, replacement, and the overall cost of running them. The environmental credentials of EVs in New Zealand were also commonly questioned. There is an opportunity to provide widespread clarity about a range of questions related to EVs. We understand the AA are working with the Energy Efficiency and Conservation Authority to further investigate this issue, and then plan and deliver education and publicity, accordingly.

Given that EVs are sold by private companies, there is also an opportunity for vendors to provide this information when marketing EVs. A model for consumer uptake of new knowledge for advanced driver assist system (ADAS) features has been researched,[8] including the pre-consumer, consumer, and user stages, and may provide a useful model for clear messaging around EV considerations.

[8] McCarthy, L., Blewden, M., Raja, A., Tedestedt George, C., & Mackie, H. (2021). Consumer awareness, understanding, and use of advanced driver-assistance systems currently available in vehicles on New Zealand roads. NZ Transport Agency research report 685. https://www.nzta.govt.nz/assets/resources/research/reports/685/685-consumer-awareness-understanding-and-use-of-ADAS.pdf

Appendix A: Literature Scan Search Terms

Search strategy

The scan was limited to studies of everyday mobility. This was defined as 'travel that the individual undertakes regularly or routinely'. Examples include commuting, school drop off/pick up, regular errands, hobbies, regular visits/socialising. Literature on novel or one-off travel was excluded (e.g., planning travel for a holiday) because the factors influencing this are likely to be quite different to everyday travel.

The search terms described in Appendix A were used to complete a search for each topic area. To manage the scope of the scan and ensure coverage of each topic area, the following set of search procedures were developed:

1. An initial search was completed to identify seminal papers related to each topic area (e.g., systematic reviews, meta-analyses, or foundational research). At this time, reference sections of these papers were reviewed to identify any further seminal papers.
2. The search was then extended to include New Zealand literature published from 2015 onwards using the google scholar database. Additionally at this stage a scan of relevant websites (e.g., New Zealand Transport Agency (NZTA) and Councils) was undertaken to further identify grey literature for each topic area.
3. Where 10 or fewer papers were identified and/or where the literature returned didn't fully cover the topic area, a broader search for New Zealand literature pre-2015 and international literature was conducted.

Literature scan review process

The literature scan uncovered a total of 118 relevant papers. The team worked together to review the longlist and identify a shortlist of papers that were most relevant to the topic areas. Some of the papers included in the literature review covered content related to multiple topic areas. Where this was the case, the paper was added to the topic area which it had the most relevance to.

The papers were selected using the following process:

- A selection of the most recent systematic reviews and seminal papers relevant to each topic area were selected first.
- Following this, up to 10 papers from the New Zealand literature were selected. Papers published before 2015 were typically excluded unless they were considered seminal literature because transport sustainability is a fast-developing field, older papers were considered likely to have been superseded by more recent research.
- If New Zealand literature was not available, international literature was included.

This led to a total of 63 papers being selected for inclusion in the annotated bibliography.

Search terms

Travel choice theories and models:

- Mode choice models
- Sustainable transport models
- Transtheoretical model
- Theory of Planned Behaviour
- Norm-Activation Theory

Travel choice attitudes and beliefs:

- Attitudes towards cycling, walking, public transport, active transport, sustainable transport
- Beliefs about cycling, walking, public transport, active transport, sustainable transport
- Cultural differences in travel attitudes/beliefs
- Gender differences in travel attitudes/beliefs

Factors affecting transport mode choice (individual and environmental):

- Barriers to cycling, walking, public transport, active transport
- Enablers for cycling, walking, public transport, active transport
- Urban design/built environment factors and mode choice
- Density/sprawl/city size and mode choice

Opportunities to influence mode choice:

- Mode shift/mode choice interventions for cycling, walking, public transport, active transport
- Encouraging sustainable transport choices
- Encouraging mode shift

Efficient private vehicle use:

- Electric vehicle uptake/incentives
- Efficient vehicles (import standards)
- Optimal traffic flow/congestion management
- Efficient driving (eco-driving) uptake/incentives
- Carpooling uptake/incentives
- Remote work and sustainability in transport

Appendix B: Annotated Bibliography

Travel choice theories and models

Citation	**Pawluk De-Toledo, K., O'Hern, S., & Koppel, S. (2022). Travel behaviour change research: A scientometric review and content analysis. *Journal of Travel Behaviour and Society*, 28(10). https://doi.org/10.1016/j.tbs.2022.03.004**
Aim	To review travel behaviour change literature to identify the main characteristics, key journals, research categories, keywords, authors, institutions, countries, cited references, and research directions.
Method	The scientometric review analysed the bibliographic data of 323 academic records and provided content analysis of 17 recent studies.
Key Findings	The content analysis found that 10 of the 17 papers included a theory to underpin the study. The main theory used was the Stage Model of Self-Regulated Behavioural Change (SSBC) (n = 4) which was used to examine all stages of change (pre actional, actional, and post actional). Also, the Theory of Planned Behaviour (TPB) and the Normative Action Model (NAM) were integrated into two studies. Some alternative theories were used, including Goal-Framing Theory, the Model of Human Needs, Six Persuasion Principles, and the Four Quadrant Model.
Conclusion	There is diversity of theories applied in the field. While several theories continue to be applied (SSBC, TPB and NAM), a range of other theories are also currently in use.

Citation	**Hoffmann, C., Abraham, C., White, M., Ball, S., & Skippon, S. (2017). What cognitive mechanisms predict travel mode choice? A systematic review with meta-analysis. Journal of Transport Reviews, 37(5). www.doi.org/10.1080/01441647.2017.1285819**
Aim	To identify cognitive mechanisms that relate to car use and use of alternative transport modes to assist in behaviour change interventions.
Method	A systematic review and meta-analysis of the literature (n= 43) of cognitive mechanisms that relate to car use and use of alternative transport modes.
Key Findings	• 333 associations were found between a cognitive mechanism measure and a measure of car use/non-car-use frequency or intensity. They can be stratified into 26 conceptually distinct mechanism categories. • The strongest correlates of car use were intentions, perceived behavioural control, attitudes, and habit. • The strongest correlates of alternative transportation choices were intentions, perceived behavioural control, and attitudes. • Two theories, the Theory of Planned Behaviour and the Norm Activation Model were widely applied. The results support continued use of the Theory of Planned Behaviour but offer less support for the Norm Activation Model because, measures of perceived behavioural control, intentions, and habit generated consistently higher average effect sizes than measures of norms.
Conclusion	The review highlights the wide range of such mechanisms, and the limited number of theories used to conceptualise these. In particular, the use of theories other than rational choice models could advance our understanding of the motivation to drive.

Citation	**Pronello, C.; Gaborieau, J.-B. (2018). Engaging in pro-environment travel behaviour research from a psycho-social perspective: A review of behavioural variables and theories. *Sustainability*, 10. https://doi.org/10.3390/su10072412**
Aim	To review variables and behavioural theories originating from social and environmental psychology as applied to transport research, to better understand decision-making mechanisms, information processing and modal choice.
Method	Review of the literature (n= 25) applying behaviour change theories to transport.
Key Findings	• In the early 1990's, a shift was observed from the empirical correlation between variables and behaviour towards the construction of theories, psycho-social constructs, and causal processes generating the behaviour. • Many theoretical frameworks have been developed to capture the factors leading to decision-making or behavioural choices. There are three different groups of theories: individual-focused theory of decision-making, individual-focused theory of behavioural change, and community-focused theory. • Individually focused theories of decision making include the Theory of Planned Behaviour, Theory of Interpersonal Behaviour, Norm Activation Theory, and Value Belief Norm Theory. • Individually focused theories of behavioural change include the Trans Theoretical Model, Stage Model of Self-Regulated Behaviour Change, and Protection-Motivation Theory. • Community focused theories include Social Cognitive Theory and Social Comparison Theory.
Conclusion	Psychological studies on travel behaviour have provided a better understanding of the cognitive processes behind modal choice. However, this understanding of mobility related dynamics has not led to effective approaches for moving people towards more sustainable mobility. We have gained insights about what drives behaviours, but the real interest remains unclear: what is the way to achieve massive car-use reduction?

Citation	**Adjei, E. & Behrens, R. (2012). Travel behaviour change theories and experiments: *A review and synthesis*. 31st Southern African Transport Conference, Pretoria, South Africa. http://hdl.handle.net/2263/20018**
Aim	The aim of this paper is to review theories relevant to travel behaviour choice and change and their link to behavioural change experiments or interventions.
Method	A detailed literature review of theories and interventions was undertaken.
Key Findings	Travel behaviour change theories can be broken into four groups, theories that: • Explain how choices are made when a decision-maker is confronted with behavioural alternatives including Rational Choice Theory, Prospect Theory, Habit Formation Theory, and the Theory of Interpersonal Behaviour. • Explain what factors affect choice-making including the Theory of Planned Behaviour, the Theory of Interpersonal Behaviour, and Norm Activation Theory. • Explain when behavioural change occurs including Habit Formation Theory, Cognitive Dissonance Theory, and the Stages of Change Model. • Theories that explain how decision-makers respond to behaviour change interventions, and the strength of this response, including Self-Perception Theory and Goal Setting Theory.
Conclusion	There appears to be considerable potential for theoretical innovation in travel behaviour experiment construction. Travel demand management interventions should address how choices are made, what factors influence choices, when change is executed, and how decision-makers respond to interventions.

Citation	**Chng, Samuel. (2021). Advancing behavioural theories in sustainable mobility: A research agenda. Journal of Urban Science, 5(43). https://doi.org/10.3390/urbansci5020043**
Aim	Behaviour and behaviour change theories have an important role to play in informing mobility behaviour research and practices. This discussion paper considered the application of these theories in research and practice.
Method	Review of, and commentary about, the context and current application of behaviour change theory in transport research.
Key Findings	The most common theories in mobility research were developed before 2000 and are broadly used in public health. These theories are Theory of Planned Behaviour, Norm Action Model, Value Belief Norm Theory, and Theory of Interpersonal Behaviour. More recently, a shift from using theories that explain human behaviour generally and independently of context to those addressing specific behaviours, such as mobility behaviours, has occurred. Some suggest that newer theories such as Comprehensive Action Determination Model (CADM) and Stage Model of Self-Regulated Behaviour Change offer a more comprehensive explanation of mobility behaviours.
Conclusion	Behaviour change theories have an important role to play in understanding mobility choice and good progress has been made in developing and applying these. However, there is currently many theories in use making it challenging to decide which to use. There is a need to consolidate existing theories into frameworks that provide accessible summaries and guides for researchers and practitioners.

Citation	**Krueger, R., Vij, A. & Rashidi, T.H. (2018). Normative beliefs and modality styles: a latent class and latent variable model of travel behaviour. *Journal of Transportation*, 45. https://doi.org/10.1007/s11116-016-9751-1**
Aim	To propose a new model of travel behaviour that integrates psycho-social constructs including normative beliefs with a lifestyle-oriented approach to identify segments or modality styles.
Method	A conceptual model was developed based on existing theory. The conceptual model was then operationalised using a latent class and latent variable model and empirically validated using data collected through an Australian consumer panel.
Key Findings	The conceptual model developed integrated two theories: the socio-psychological approach to travel behaviour analysis (e.g., Theory of Planned Behaviour, the Norm-Activation Theory, and the Theory of Cognitive Dissonance) and the lifestyle-oriented approach. The lifestyle approach contends that travel behaviour is an integral part of an individual's lifestyle. In this vein, the concept of modality style has been put forward to describe aspects of an individual's lifestyle that are characterised by the repeated use of a certain set of travel modes. Testing of the proposed model demonstrated that the framework can be used to understand the relationship between normative beliefs, modality styles, and travel behaviour. In addition, the study showed how the model can be applied to predict how extant modality styles and patterns of travel behaviour may change over time in response to concurrent shifts in normative beliefs.
Conclusion	This study provided a promising approach to integrating several behavioural theories to describe travel behaviour. Future work may expand this framework, by incorporating other latent constructs such as values, goals and personal identity to allow for a more comprehensive representation of social context.

Citation	**Fu, X. & Juan, Z. (2017). Understanding public transit use behavior: integration of the theory of planned behavior and the customer satisfaction theory. *Journal of Transportation*, 44. www.doi.org/10.1007/s11116-016-9692-8**
Aim	To develop a more comprehensive model of psychological process to understand on how individuals systematically consider, dispose, and utilize available information to arrive at a final behavioural decision.
Method	A model was developed that integrated the Theory of Planned Behaviour and the Customer Satisfaction Theory. Data to test the model was collected a Household Travel Survey conducted in China in October 2013.
Key Findings	Empirical examination of the model supported the validity of the integrated framework to model public transit use behaviour, with a set of hypothesized cause-and-effect relationships among the concerned psychological constructs being confirmed.
Conclusion	This model is expected to provide useful insights into transport policies to retain the current passengers as well as to attract new users in the future.

Citation	**Bamberg, S., Fujii, S., Friman, M. & Gärling, T. (2011). Behaviour theory and soft transport policy measures. *Journal of Transport Policy*, 18(1). https://doi.org/10.1016/j.tranpol.2010.08.006**
Aim	The aim of this study was to propose a theoretical grounding of soft transport policy measures that aim to promote voluntary reduction of car use.
Method	A detailed review of existing theories formed the basis of the developed integrated self-regulation theory.
Key Findings	Interventions encouraging reduction in car use can be broken into two groups: • Soft measures including techniques of information dissemination and persuasion to influence car users to voluntarily switch to sustainable travel modes. • Hard measures including improvements of infrastructure for and management of public transport services, increased costs for car use, and prohibition or rationing of car use. A general conceptual framework was developed to clarify how hard and soft transport policy measures interact or work together to impact on car-use reduction. Two different behavioural theories, the Theory of Planned Behaviour and Norm Activation Theory, were used to account for car use and car-use reduction and then integrated in a self-regulation theory. The self-regulation theory identifies four stages of the process of voluntarily changing car use: setting a car-use reduction goal, forming a plan for achieving the goal, initiating and executing the plan, and evaluating the outcome of the plan execution.
Conclusion	Based on the self-regulation theory, more cost-effective personalised travel planning programs may be developed. Particularly important is the conceptualization of voluntary car-use reduction as a transition through different stages, that is forming a goal intention to reduce car use, behavioural intention to do this, and choosing the alternative travel option that reduces car use. If car-use reduction is a transition through different stages, more flexibility would be needed, allowing matching the measure employed to the stage of the car user.

Attitudes and perceptions towards travel modes

Citation	**Sogbe, E., Susilawati, S., & Pin, T.C. (2024). Scaling up public transport usage: a systematic literature review of service quality, satisfaction, and attitudes towards bus transport systems in developing countries. *Journal of Public Transport, 16(2).* https://doi.org/10.1007/s12469-024-00367-6**
Aim	To explore the attributes influencing public transport usage, focusing specifically on service quality, satisfaction, and attitudes towards public transport usage.
Method	The paper systematically reviews 104 papers on public transport service quality, satisfaction, and attitudes towards bus transport.
Key Findings	• Perceived safety and security were crucial dimensions influencing users' overall perception of service quality and satisfaction. Commuters' perception of reliability also correlates with usage and satisfaction. Availability, crowdedness, and connectivity in the first and last mile were also key factors. • The convenience of individuals accessing and using public transport services is crucial in determining the systems' overall effectiveness and inclusivity. • Instrumental aspects such as convenience and social-symbolic aspects such as social standing influence attitudes towards public transport usage. • The intention of car users to use public transport is considerably influenced by perceived cost, reliability, comfort, travel time, and connectivity.
Conclusion	Perceived safety, security, comfort, reliability and accessibility are the most substantial determinants shaping users' views on service quality and satisfaction.

Citation	**Javaid, A., Creutzig, F., & Bamberg, S. (2020). Determinants of low-carbon transport mode adoption: systematic review of reviews. *Environmental Research Letters,* 15. https://doi.org/10.1088/1748-9326/aba032**
Aim	To identify the main determinants of travel mode choice and examine how these different determinants are linked to each other.
Method	Systematic review of reviews (n= 75) of the evidence for individual, social, and infrastructure level factors affecting mode choice.
Key Findings	• All three dimensions (individual, social, and infrastructure) unambiguously interfered with mode choice. New shared mobility modes, and teleworking and shopping have had minor impacts on encouraging mode shift. • Individuals are most motivated to shift modes if they are well informed, their personal norms match low-carbon mode use, and, most importantly, if they perceive they have personal control over decisions. • Perceptions about common travel behaviour (descriptive social norms), especially if supported by perceived normative beliefs of others (injunctive norms), are highly influential to support mode shift. • Infrastructure factors (land use, neighbourhood characteristics, multimodal infrastructure, public transport system coverage, connectivity, and quality) explain large differences in mode choice.
Conclusion	We conclude that a transition to low-carbon mobility requires low-carbon infrastructure, which leverages enthusiastic individuals' concerns and empowers them for mode change. Mode shifts to low-carbon options can then be sustained and enhanced by collective social norms.

Citation	**Willis, D. P., Manaugh, K., & El-Geneidy, A. (2015). Cycling under influence: Summarizing the influence of perceptions, attitudes, habits, and social environments on cycling for transportation. *International Journal of Sustainable Transportation,* 9(8). https://doi.org/10.1080/15568318.2013.827285**
Aim	The goal of this paper is to summarize knowledge on the effect of perceptions, attitudes, habits, and social environments on the decision to cycle for transportation and the methods used to measure these effects.
Method	This paper reviews 24 studies *of* the influence of these social and psychological factors on the choice to cycle for transportation.
Key Findings	• Perceptions of cyclists, cycling routes, transportation options, the benefits, barriers, and safety of cycling, perceived behavioural control, and parental perceptions are associated with the likelihood of cycling for transportation. • Attitudes positively correlated to bicycle use included enjoyment of cycling and physical activity, concern for the environment, and dislike for driving or an attempt to drive less. The opposite is true for stronger attitudes in favour of car use. • Social-environmental factors, such as the subjective norm, descriptive norm, the influence of parents on children, the community opinion on cycling, and the workplace environment all influence the decision to cycle for transportation.
Conclusion	The findings highlight the importance of perceptions and the influence of family, friends, and the workplace on decisions to cycle for transport. The results show that social factors clearly affect the decision to commute by bicycle.

Citation	**Ovenden, K., & Allpress, J. (2024). Perceptions of public transport, cycling and walking among Auckland drivers- technical report 2024/2. Prepared for the Research and Evaluation unit (RIMU), Auckland Council. https://knowledgeauckland.org.nz/media/ksml4zc4/tr2024-02-perceptions-of-public-transport-cycling-walking-auckland-drivers.pdf**
Aim	To explore the ability and willingness of Aucklanders to shift their private vehicle trips to public transport, cycling, or walking.
Method	An online survey among a representative sample of Auckland drivers that had a trip start and end point within the Auckland Major Urban Area (n= 2,799).
Key Findings	• Participants reported more negative perceptions of public transport, cycling, and walking compared with driving. This result showed little variation across trip features or demographic characteristics. However, we found no evidence of positive feeling towards driving with most describing it as stressful. • Most participants (81%) reported that doing the trip they had described by public transport would be 'much less convenient' than driving due to the lack of ease, trip length, or lack of reliable services at the right times. • Almost half of participants stated it would not have been possible for them to do the equivalent driving trip by bike. Safety was the main reason they felt that it would not be possible with prominent concerns including busy roads, unsafe routes, a lack of cycleways, and limits on the personal capability to cycle.
Conclusion	Compared with driving, public transport, cycling, and walking were perceived to be less convenient, more stressful, and less safe from crime and harassment for most participants. However, people don't drive because they like doing so and often find it stressful; they drive because other options are poorly provided for.

Citation	**Fitt, H. (2017). Do social meanings matter? How and how much do social meanings influence everyday transport practices? *New Zealand Geographer*, 73. www.doi.org/10.1111/nzg.12158**
Aim	To determine whether social meanings and norms influence transport practices sufficiently to be the focus of future research and transport policy.
Method	In-depth engagement with a cohort of 32 research participants involving focus groups and the Repeat Question Diary exercise in Christchurch, New Zealand.
Key Findings	• Almost all participants reported that social meanings influenced their mode choices, vehicle choices, and travel performances. 20% of participants reported that social meanings were a major influence on their transport choices. • Half of the participants reported that social meanings were a major influence on their choice to use (or not use) at least one transport mode. For this group, influences on motorcycling and cycling were most expressed. • Although social meanings can be grouped into three very distinct categories (influences on mode choices, vehicle choices, and travel performances), the influences of social meanings vary considerably, particularly between different people, over time, and in different contexts.
Conclusion	The results suggest that social meanings are important influences on transport practices, but that they co-exist with many other influences and may be more important in some contexts than in others.

Citation	**Imran, M., & Pearce, J. (2015). Discursive barriers to sustainable transport in New Zealand cities. *Urban Policy and Research*, 35(4). https://doi.org/10.1080/08111146.2014.980400**
Aim	To investigate barriers to sustainable urban transport by applying the concept of discursive path dependence to the way in which policymakers conceive and address problems in an institutional context.
Method	The discursive barriers are investigated through the identification of 'storylines' from Auckland, Wellington, and Christchurch transport and planning documents dating from the mid-1950s until late 2012.
Key Findings	• Economic, mobility, safety, consumer, funding and environment storylines to justify transport policies show a developmental bias towards justifying policy priority for roads as compared to sustainable transport. • There were similar storylines told across Auckland, Wellington, and Christchurch although the detail often differed. • The application of path dependence shows that once a road-based policy path has been taken, discourse strengthens that path and helps actors to consistently ignore the need for sustainable transport and obstruct change in policy implementation.
Conclusion	This article concludes that discourse constructed in the past, but continuously reiterated, has created a path dependency which is a barrier to sustainable transport in all three cities.

Citation	**Hopkins, D., García Bengoechea, E. & Mandic, S. (2021). Adolescents and their aspirations for private car-based transport. *Journal of Transportation,* 48.** https://doi.org/10.1007/s11116-019-10044-4
Aim	This study investigated aspirations for motorised mobility and examined whether norms and practices which help to replicate automobility are evident in this cohort.
Method	Mixed methods study utilising a quantitative survey of high school students (n = 1,240) and qualitative focus groups (n = 10, 54 participants) in Dunedin.
Key Findings	• Half of the participants perceived driving a car as very important or essential and over 40% perceived owning a car as 'very important' or essential. Adolescents living in households with two or more vehicles who drove a car, and who were driven by others often were more likely to attach importance to driving a car. • The main motivations for getting a driving licence were driving being perceived as convenient, parental encouragement to learn to drive, and to a lesser extent adolescents' perception that they were expected to learn to drive. • This is evidence of strong social norms prioritising motorised mobility and learning to drive. Seven themes arose as motivation for learning to drive: driving is better than relying on active or public transport, convenience of motorised mobility, the 'cool factor', family dynamics, independence, a skill to report on their CV, and because it is 'adult like' behaviour.
Conclusion	We find evidence of ongoing preference for car-based transport, and intentions to learn to drive amongst the cohort of young urban millennials. The findings signal the importance of socialisation processes and everyday travel decisions (e.g. mode choice) for long term aspirations to replicate practices of automobility.

Citation	**Chowdhury, S., Zhai, K., & Khan, A. (2016). The effects of access and accessibility on public transport users' attitudes. *Journal of Public Transportation,* 19(1).** https://doi.org/10.5038/2375-0901.19.1.7
Aim	To investigate existing users' attitudes towards public transport from two perspectives: (1) the effects of accessibility to destinations and (2) ease of access to terminals on existing users' attitudes.
Method	A user-preference survey (n= 300) was undertaken in Auckland, New Zealand, at two terminals (Constellation Bus Station and Papakura Transport Centre).
Key Findings	• Findings showed that residential density, the quality of the built environment, and perceived safety influence the number of pedestrians who access a terminal. • Accessibility of public transport to work, education, and other suburbs were associated with existing users' satisfaction with the current system. • Ease of access to terminals and accessibility to various destinations influence existing users' satisfaction with ridership. This result indicates that although commuters have already decided to use public transport, access to terminals and accessibility to various destinations remain as influential factors. • Negative experiences of others have an adverse effect on existing users' intentions to continue ridership.
Conclusion	Overall, the results showed that to retain existing patronage, the ease of access to terminals and connectivity to various destinations need to be of a high standard.

Citation	**Sheng, M., & Sharp, B. (2019). Commuter's transport mode preferences and social network effects in New Zealand.** ***Journal of Transport Economics and Policy,*** **53(1). https://www.jstor.org/stable/90026259**
Aim	To investigate commuters' travel demand preferences in Auckland, choosing between public transport and private cars.
Method	A two-step spatial probit model is applied to analyse the impact of endogenous social network effects on public transport usage.
Key Findings	• After controlling for personal/household factors, trip characteristics, petrol prices and time-effects, commuters have a higher probability of using transit services if they are surrounded by other public transport users (i.e., neighbours or colleagues). • Social network effects had the second largest impact on this transport mode choice model, while number of vehicles in the household had the largest impact. • Women, younger workers (30 years or younger), and inner-city workers were more likely to use public transport while adults with children, more than one household vehicle, or higher than average income were less likely to use public transport. • The closer households and workers live or work to transit stations, the more likely they are to use transit for commuting. The longer the trip distance, the less likely public transport will be used.
Conclusion	Results show that social network effects have the second largest impact on commuter's transport mode choice in Auckland. Therefore, campaigns tapping into social network effects to adopt low-carbon modes could effectively complement, and augment returns to infrastructure investment.

Citation	**Waka Kotahi New Zealand Transport Agency. (2022). Understanding attitudes and perceptions of cycling & walking- 2021 study. https://www.nzta.govt.nz/assets/resources/understanding-attitudes-and-perceptions-of-cycling-and-walking/Waka-Kotahi-Attitudes-to-cycling-and-walking-final-report-2021.pdf**
Aim	To evaluate attitudes and behaviours around walking and cycling, in response to efforts to improve New Zealand cities for people getting around on foot or by bike.
Method	An online survey among a representative sample of New Zealanders (n= *2,947).*
Key Findings	• 72% of respondents saw walking as a great way of getting around town quickly and easily and 80% felt safe walking. The most prominent barriers to walking were safety concerns walking in the dark and convenience, particularly the time taken to walk. Walking barriers were generally more prominent in Auckland, Hamilton, and Tauranga. Women were more likely to walk as a means of transportation. • Over half of respondents saw cycling as a great way of getting around and perceived cycling as safe. Important barriers to cycling were safety, particularly from motor vehicle drivers and cycling in the dark. Logistical barriers were also important, particularly having too much to carry and the weather.
Conclusion	Walking and cycling levels and perceptions have remained stable since sampling began in 2018. Barriers to walking and cycling remain consistent overtime suggesting that more is needed to address these and improve the attractiveness of active modes.

Citation	**Jahanshahi, D., Costello, S., Dirks, K., Chowdhury, S., & van Wee, B. (2023). Understanding Perceptions of Cycling Infrastructure Provision and its Role in Cycling Equity. *Transportation Research Record*, *2677*(3). https://doi.org/10.1177/03611981221117821**
Aim	To address a gap in understanding of people's perceptions of cycling infrastructure provision, their relationships to the physical infrastructure provided, the ways in which sociodemographic characteristics influence those perceptions, and how these are influenced by individual experiences of using cycling infrastructure.
Method	Online survey of adults (n= 506) selected from 27 post codes in Auckland.
Key Findings	• Regular cyclists had more positive perceptions of bicycle infrastructure compared with non-cyclists and potential cyclists. For regular cyclists, age, education level, and cycling injury experience affected perceptions of cycling provision. • Among non-cyclists and potential cyclists, ethnicity was the only factor found to significantly influence perceptions of cycling infrastructure. Māori and Pacific Islanders rated the provision of cycling infrastructure more positively than others for the same level of bicycle infrastructure in their community. • Descriptive analyses indicated that Māori had the highest percentage of potential cyclists among all ethnicities.
Conclusion	The study showed that cycling provision perceptions were more affected by factors like ethnicity, education, and bicycle user type than objective measures of bicycle infrastructure.

Citation	**Calverley, J., Hopkins, D., Garcia Bengoechea, E., Coppell, K., Spence, J. C., & Mandic, S. (2022). Active Travel in Rural New Zealand: A Study of Rural Adolescents' Perceptions of Walking and Cycling to School. *Active Travel Studies: An Interdisciplinary Journal*, 2(2). https://doi.org/10.16997/ats.1222**
Aim	This study examined perceptions of walking and cycling to school amongst adolescents living within 4.8 km of school in rural Otago, New Zealand.
Method	Adolescents (n=62) residing and attending a secondary school in a rural setting completed an online survey about their perceptions of walking and cycling to school.
Key Findings	• Overall, 73% of adolescents walked and 11% cycled to school. • Compared to cycling, adolescents reported a greater desire and intention to walk to school and perceived more support from friends, parents, and schools. • Adolescents also reported better physical infrastructure (presence or availability of footpaths vs cycle lanes) for walking versus cycling to school. Over 95% of adolescents perceived both walking and cycling to school as safe.
Conclusion	Compared to cycling, walking to school was a more common and preferred transport mode, with greater social support and physical infrastructure, whereas both modes were perceived to be safe by rural adolescents living within 4.8 km of their school. The findings suggest that supportive social and built environments appear to encourage walking to school in rural areas.

Citation	**Mandic, S., Hopkins, D., Garcia Bengoechea, E., Flaherty, C., Williams, J., Sloane, L., Moore, A., & Spence, J. C. (2017). Adolescents' perceptions of cycling versus walking to school: Understanding the New Zealand context.** ***Journal of Transport & Health,*** **4. https://doi.org/10.1016/j.jth.2016.10.007**
Aim	To compare perceptions of walking versus cycling to school drawing from the theory of planned behaviour and additional individual, environmental and safety factors among adolescents from Dunedin who lived within 4 km from school.
Method	Adolescents (n= 764) from 12 secondary schools completed an online survey about perceptions of walking and cycling to school.
Key Findings	• 50.8% of adolescents walked and 2.1% cycled to school, 44.1% liked cycling for recreation and 58.8% were capable/able/confident to cycle to school. • Adolescents expressed more positive experiential and instrumental beliefs towards walking more than cycling to school. • Compared to walking, adolescents reported that cycling to school was perceived as less safe by themselves and their parents and was less encouraged by their parents, peers, and schools. • Cycle friendly uniforms, safer bicycle storage at school, slower traffic, bus bicycle racks, and bicycle ownership would encourage cycling to school.
Conclusion	Compared to walking, cycling to school among Dunedin adolescents was less common, perceived as less safe and had less social and infrastructure support. Future interventions should focus on creating supportive physical and social environments and improving road safety for cyclists in New Zealand.

Factors affecting travel mode choice (individual factors)

Citation	**Göransson, J. & Andersson, H. (2023). Factors that make public transport systems attractive: a review of travel preferences and travel mode choices.** ***European Transport Research Reviews,*** **15(32). https://doi.org/10.1186/s12544-023-00609-x**
Aim	To determine what makes the public transport (PT) system attractive and what factors encourage more travel using PT and less with private cars.
Method	Systematic review of the reviews (n= 19) of factors that make PT systems attractive. Searches were conducted internationally and for Nordic countries.
Key Findings	• Reliability and frequency are important factors for creating an attractive PT supply. However, the extent to which improvements in these attributes affect public transport demand remains uncertain. • Potential PT users have high levels of reliability and flexibility in their current travel modes. Not degrading the current level of reliability and frequency is important to keep existing users, and a high level of reliability and frequency is crucial to make PT a reasonable travel mode for potential users. • To attract car users to the PT system, it is important to show them the benefit they can receive by travelling by PT. Habit-interrupting transport policies and reduced PT prices can lead to an initial mode shift effect. However, the duration of the effect is affected by how the PT system is perceived.
Conclusion	This review finds that reliability and frequency are important factors for creating an attractive public transport supply. It also highlights the importance of understanding the underlying motivations for travel mode choice.

Citation	**Pearson, L., Berkovic, D., Reeder, S., Gabbe, B., & Beck, N. (2023). Adults' self-reported barriers and enablers to riding a bike for transport: a systematic review. *Transport Reviews*, 43(3). www.doi.org/10.1080/01441647.2022.2113570**
Aim	To identify the perceived barriers and enablers to adults riding a bike for transport in OECD countries.
Method	The paper systematically reviewed peer-reviewed scientific and grey literature (n= 45) related to barriers and enablers of cycling for transport in OECD countries.
Key Findings	• The leading barriers related to riding on the road alongside motor vehicles. Other factors identified included the provision and quality of cycling infrastructure, personal factors such as physical fitness, attitudinal factors such as community perceptions of cyclists, and environmental factors. • There is complexity in the factors that influence the uptake of riding a bike for transport. However, many of the leading factors can be overcome through the provision of high-quality protected infrastructure for bike riders. • Other interventions to address other known barriers and enablers are needed to increase the uptake of bike riding.
Conclusion	This systematic review identified a diverse and interconnected range of barriers and enablers using quantitative and qualitative data, highlighting the importance of safety and infrastructure in shifting trips to cycling.

Citation	**Hopkins, D., & Stephenson, J. (2016). The replication and reduction of automobility: Findings from Aotearoa New Zealand. Journal of Transport Geography, 56. https://doi.org/10.1016/j.jtrangeo.2016.09.005**
Aim	To examine the factors that contribute to the replication or reduction of automobility amongst young adults. Also, to identify the cultures of replication and reduction of automobility and to identify ways to promote a cultural shift away from automobility
Method	Semi-structured interviews conducted in Auckland, Dunedin, and a rural area (Balclutha), with 51 drivers and non-drivers, aged 18–35 years old.
Key Findings	• Many of the participants expressed traditional notions of independence, freedom, and autonomy associated with car use. • Driving was seen as necessary to commute to work and to improve employability due to demands for licenced employees. Driving was also seen as necessary to participate in social and recreational activities. The built environment and home location appear to have a significant impact on car dependency and the perceived need to drive and own a vehicle. • Perceived safety of using active or public transport modes, particularly amongst those working non-standard hours, and the availability of parking close to the trip destination seemed to be important influences on mode choice. • There was evidence of emerging norms, including new conceptualisations of freedom and independence, a desire to 'dematerialise', increasing willingness to share transport, and a range of competing priorities, that destabilise automobility.
Conclusion	The system of automobility has locked-in car dependency in many industrialised countries and increasingly in emerging economies. However, this study provides evidence of a counter multi-mobility culture, challenging the hegemony of automobility.

Citation	**Mohammadzadeh, M. (2020). Exploring tertiary students' travel mode choices in Auckland: Insights and policy implications. *Journal of Transport Geography*, 87. https://doi.org/10.1016/j.jtrangeo.2020.102788**
Aim	To examine tertiary students' travel mode choices in Auckland, particularly the factors that inform these choices when they travel to the universities' city campuses.
Method	A mixed methodology approach including a questionnaire-based survey (n= 249) and semi-structured interviews with students (n= 10) was utilised.
Key Findings	• Most respondents utilised public transport, active modes, and car-pooling when commuting to the university's city campus. In total, 66% of students who participated in the survey used sustainable travel mode choices. • Seven factors were identified that informed tertiary students' travel mode choices: cost, parking availability and cost, access to a car, travel time, physical environment, reliability, and attitudinal variables. • The interviewees mostly indicated that travel cost (mainly the cost of parking) and lack of or limited access to a private car were the primary drivers of their travel mode choices.
Conclusion	This research demonstrates that tertiary students mostly use sustainable transport modes such as public transport, carpooling, walking, and cycling. It also finds that there are unique factors affecting mode choice among tertiary students.

Citation	**Wang, J. (2011). Appraisal of factors influencing public transport patronage in New Zealand- report prepared for NZTA. *The University of Auckland*. https://www.nzta.govt.nz/assets/resources/research/reports/434/docs/434.pdf**
Aim	To examine factors affecting demand for local bus and rail services in the three major regions in New Zealand: Auckland, Wellington and Canterbury.
Method	Econometric models were applied to estimate the relationships between public transport patronage and key factors and hence estimate elasticities for each of the key factors identified.
Key Findings	• The results indicated that the three cities all have different characteristics and the drivers behind the long-run and short-run trends were also different. • Quality of service had a significant influence in all three cities improving patronage. Bus fare was a significant influencing factor in both Wellington and Canterbury but not in Auckland. Car ownership reduced public transport patronage in Auckland and Wellington. • Household income was positively associated with public transport use in Auckland, but in Wellington had the opposite effect, reducing use and increasing car ownership. • It also appeared that the significant fluctuation in fuel price in recent years has contributed to increased public transport patronage in all three cities.
Conclusion	Quality of service, fare price, car ownership, income, and fuel price were found to be important factors affecting public transport patronage in New Zealand cities.

Citation	**Badland, H., Garrett, N., & Schofield, G. (2010). How does car parking availability and public transport accessibility influence work-related travel behaviours? *Sustainability*, 2.** www.doi.org/10.3390/su2020576
Aim	To investigate the relationships between car parking, public transport, travel behaviours, and health outcomes for adults traveling to a worksite.
Method	Survey of a random sample of residents (n= 1,188) from the North Shore, Auckland.
Key Findings	• Those who had higher levels of walking, no worksite car park access, lived proximal to a public transport stop, had limited car availability, travelled to the main business district, perceived public transport as accessible, or did not have company car access were more likely to use public transportation. • Those who perceived they have accessibility to car parking at their worksite or had a company car available were more likely to commute to work by private vehicle • Findings indicated that work-related travel behaviours are strongly associated with issues of convenience and accessibility.
Conclusion	Proximal residential transit stops and restrictions on company car accessibility and parking at the worksite are needed to shift trips from cars to public transport.

Citation	**Walton, D., & Sunseri. (2010). Factors influencing the decision to drive or walk short distances to public transport facilities. *International Journal of Sustainable Transportation*, 4(4).** https://doi.org/10.1080/15568310902927040
Aim	To identify the factors affecting walking as defined as the access sub-mode for short trips (less than 1km) to public transport facilities.
Method	A survey (n= 348) of a sample of drivers and walkers to selected public transport facilities was conducted in Auckland and Wellington.
Key Findings	• Results show the convenience of a car park induces park-and-ride demand. • A reasonable walking distance for the access sub-mode of travelling to the train station is perceived to be around 820 meters. • When this distance is controlled, and appropriate comparison groups are obtained, walking is not impeded by factors such as distance, fear of crime, carriage of goods, or concern for time, but weather remains an influence on decisions to walk.
Conclusion	When trip distance to public transport facilities is 820m or less, factors that are usually found to impede walking are less important, and mode choice is predominantly determined by the weather and convenience of a car park.

Citation	**Chowdhury, S., & Ceder, A. (2013). A psychological investigation on public transport users' intention to use routes with transfers. *International Journal of Transportation*, 1(1).** http://dx.doi.org/10.14257/ijt.2013.1.1.01
Aim	To use the theory of planned behaviour to explore the cognitive factors which influence travellers' willingness to make transfers.
Method	User preference surveys (n= 263) were conducted at two bus stations to validate the conceptual model developed from a literature review of the topic area.
Key Findings	• Travel patterns related to gender, frequency of public transport (PT) use, and current use of transfer routes were seen to influence intention. PT users preferred the transfer time or walking time to be within 10 minutes. • PT users needed to feel capable of making their transfers. Personal security and perceived difficulty were seen to have a greater influence on PT users' confidence than high quality information.

	• High quality trip attributes such as comfort and attractive transfer routes (e.g. those with travel time savings) create positive self-efficacy and perceived controllability which increases PT users' intention to use routes with transfers.
Conclusion	Authorities need to focus on developing attractive transfer routes with comfortable transfers, from a user perspective, to encourage ridership of PT.

Citation	**Wang, J., Mirza, L., Cheung, A. & Moradi, S. (2014). Transforming Auckland into a bicycle-friendly city: Understanding factors influencing choices of cyclists and potential cyclists. *Journal of Road & Transport Research*, 23(3).** www.doi.org/10.3316/informit.805624961459739
Aim	To determine what the deterrents to cycling in Auckland might be, and what motivators might be effective to promote cycling.
Method	A survey of Auckland University staff and students (n= 140) was conducted. The survey questions were informed by an international literature review.
Key Findings	• Safety was the number one deterrent to cycling for infrequent, potential, and non-cyclists. Women were more conscious about safety than men. Other strong deterrents include unfavourable weather conditions and the need to carry things. • The most important motivators of cycling in current cyclists were to improve health and fitness, followed by care for the environment and enjoyment. • Cyclists preferred to be separated from traffic as well as pedestrians. Sharing a lane with buses and roadside parking on routes are deterrents to cycling. Cyclists prefer routes with less interaction with traffic and riding in safer conditions (lower speed limits and priority for cyclists). • Secure indoor/covered bicycle parking and being able to take bicycles on public transport are potential levers to increase the number of trips for irregular cyclists.
Conclusion	There are five main factors missing in Auckland to encouraging cycling. These are safety, a well-connected network of cycleways, convenience, policies to discourage car use, and a public transportation system integrated with cycling facilities.

Citation	**Shaw, C., Russell, M., Keall, M., MacBride-Stewart, S., Wild, K., Reeves, D., Bentley, R., Woodward, A. (2020). Beyond the bicycle: Seeing the context of the gender gap in cycling. *Journal of Transport & Health*, 18.** https://doi.org/10.1016/j.jth.2020.100871
Aim	To identify patterns of travel and personal, sociodemographic, and household factors that explain the differences in cycling frequency among men and women.
Method	Secondary analysis of data from the New Zealand Household Travel Survey between 2003-2014.
Key Findings	• Women took more trips but travelled 12–17% fewer kilometres per day and were more likely to walk and use public transport than men. Women also undertook more potentially replaceable trips per day (car trips less than 5 km) than men. • After adjusting for the other household and socio-demographic factors, most other ethnic groups were less likely to cycle than NZ Europeans. • Women who had larger household sizes and more children in their household were much less likely to cycle than women who had smaller households. • There was a linear association between cycling and household car access. The more cars in the household the less likely cycling was.
Conclusion	There are clear differences in travel behaviours between genders and these are largely maintained even in men and women who are regular cyclists.

Citation	**Chowdhury, S., & Costello, S. (2016). An examination of cyclists' and non-cyclists' mode choice under a new cycle network. *Journal of Road & Transport Research*, 25(4). www.doi.org/10.3316/informit.727168780082449**
Aim	To determine cyclists' and non-cyclists' perceptions towards cycling following the introduction of new infrastructure and the associated promotional campaigns.
Method	Secondary analysis of the Active Modes 2016 survey (n= 1178, 424 cyclists and 754 non-cyclists).
Key Findings	• Most cyclists ride to and from work and the remainder cycle predominantly for short trips including visiting friends/family and other leisure activities. Personal motivations for cycling including fitness, enjoyment, and leisure were more common than motivations related to traffic avoidance and environmental issues. • Most (64%) non-cyclists would not consider cycling for transport in the future. The most important barrier was safety concerns related to traffic, cycling in the dark, and the lack of separated facilities. This was more prevalent among women. Other common barriers included the weather, distance, time required to cycle, having to shower/change, lack of secure bike parking, needing to transport other people, cycling uphill, access to a bike, need to carry items, and the effort required. • Cyclists tend to have a positive attitude towards cycling. However, they do not perceive Auckland's cycling network to be well-connected. Non-cyclists tend to have a strong negative perception of Auckland's cycling network.
Conclusion	Overall, this work highlights the importance of perceptions of cycling and the cycling network in determining mode choice.

Citation	**Thorne, R., Fanueli, E., Wild, K., Raja, A., Witten, K., Mackie, H., Woodward, A., & Hirsch, L. (2024). 'Everyone rides together, everyone rolls together': exploring walking and cycling cultures in South Auckland. *Journal of Mobilities*, 19(3). www.doi.org/10.1080/17450101.2023.2289441**
Aim	To determine how walking and cycling is practised in South Auckland, how these practices are promoted and maintained, and what can be done to support and build upon existing walking and cycling practices.
Method	Semi-structured interviews with local walking and/or cycling promoters, interviews with residents (n= 10), and observations of walking and biking in Māngere and Otara.
Key Findings	• Walking was generally positioned as a more common practice than cycling. Age and gender appear to shape both its purpose and sociability, with it perceived to be a fairly solitary activity for men and older people, while women and children were positioned as 'group' walkers. • Exercise, health, and weight loss were frequently reported as being important motivators for adults to take up walking and cycling. Social connection was described as a further motivator and source of personal security for women walking and of traffic safety for those cycling in groups. • Traffic danger and personal safety from dogs and other people were ongoing barriers to walking and cycling. Dealing with these threats requires advanced skills or 'competences' to sustain walking and cycling, particularly amongst women.
Conclusion	Transport experiences are embedded in webs of social, community, and family life with needs and solutions collective and extend beyond individual factors towards meeting a range of pressing social and economic survival needs.

Citation	**Hinckson, E. (2016). Perceived challenges and facilitators of active travel following implementation of the School Travel-Plan programme in New Zealand children and adolescents. *Journal of Transport & Health*, 3. https://doi.org/10.1016/j.jth.2016.05.126**
Aim	To explore the perceived challenges and facilitators of active travel to and from school following implementation of the School Travel Plan Programme.
Method	Focus groups consisting of 4–6 children and 6–12 adolescents were conducted in 10 primary schools and three high schools respectively.
Key Findings	• For children, five main themes emerged: (1) the enjoyment of socialising with peers and (2) being outdoors, (3) the need for safety (from traffic, uncontrolled dogs, taunting from teenagers, and cars reversing out of driveways), (4) parent behaviour (both as facilitators and challengers to active travel depending on their attitudes and availability) and (5) health and fitness benefits. • The main themes for adolescents were (1) peers/enjoyment particularly on school bus journeys, (2) driving became the preferred mode once they had their driving licence, (3) safety of buses and active modes, and (4) the health and engagement of being able to exercise, enjoy the outdoors, etc.
Conclusion	Overall, children and adolescents preferred active modes from passive ones, understood the benefits of active travel, and provided valuable suggestions which formed the basis of future planned implementation.

Citation	**Cheyne, C., Imran, M., Ahmed, W., & Potroz, C. (2017). Barriers to active transport in Palmerston North: Experiences and perspectives of secondary school students. Massey University, Living Labs, Palmerston North. https://www.massey.ac.nz/massey/fms/sustainability/documents/Cheyne%20et%20al_%20(2015)_%20Barriers%20to%20Active%20Transport%20in%20Palmerston%20North_%20(MU-PNCC%20Living%20Lab).pdf**
Aim	To gather qualitative data related to attitudes and experiences of cycling as a mode of transport among secondary school students in Palmerston North.
Method	Focus groups were conducted with senior high school students from three schools in Palmerston North.
Key Findings	• There are geographical and community-specific barriers to participation in active transport to secondary school in general particularly among senior students. • Students perceive safety as the main concern for cycling. Cycle lanes, roundabouts, intersections, and general street design were not considered to be sufficiently safe for cycling. • Convenience, comfort, distance to travel, image, and time-saving use were key considerations about transport modes among senior high school students. • The two schools with lower cycling rates required female students to wear a uniform skirt, pinafore or kilt, which other research has found to be less conducive to cycling.
Conclusion	Overall, there is a need to provide further education around cycling, address traffic congestion, and improve cycling facilities and infrastructure to improve both safety and convenience of cycling as a means of transport.

Factors affecting travel mode choice (environmental factors)

Citation	**Littman, T., & Steele, R. (2024). Land use impacts on transport how land use factors affect travel behaviour. *Victoria Transport Policy Institute*. https://www.vtpi.org/landtravel.pdf**
Aim	To examine how various land use factors such as density, regional accessibility, mix and roadway connectivity affect travel behaviour, including per capita vehicle travel, mode split and nonmotorized travel.
Method	Review of systematic reviews of land use impacts on transportation.
Key Findings	• Regional accessibility (location of development relative to regional centres) reduces per capita vehicle kilometres driven. Central area residents typically drive 10-30% less than at the urban fringe. • Population density reduces vehicle ownership and travel and increases the proportion of trips taken using of non-auto modes. • Land-use mix (proximity between different land uses- housing, commercial, institutional) reduces vehicle travel and increases non-auto travel, particularly walking. Mixed-use areas typically have 5-15% less vehicle travel. • Centeredness (portion of jobs in commercial centres) increases non-auto travel. Typically, 30-60% of commuters to major commercial centres use non-auto modes compared with 5-15% at dispersed locations. • Network connectivity (degree that walkways and roads are connected) reduces total vehicle travel. Improved walkway connectivity increases non-auto travel. • Complete streets (scale, design and management of streets). Multimodal streets increase use of non-auto modes. Traffic calming reduces vehicle kilometres travelled and increases active travel. • Improving active travel conditions (quantity/quality of walking and cycling infrastructure) increases use of these modes and reduces automobile travel. Residents of walkable communities typically walk 2-4 times more and drive 5-15% less than in auto-dependent areas. • Public transport quality and accessibility increases ridership and reduces automobile trips. Residents of transit-oriented developments typically to own 20-60% fewer vehicles, drive 20-40% fewer miles, and use non-auto modes 2-10 times more than in automobile-oriented areas. • Efficient parking management (number of parking spaces per building unit or acre, and how parking is managed and priced) reduces vehicle ownership and use and increases non-auto travel. Cost-recovery pricing (users finance parking facilities) typically reduces affected vehicle trips 10-30%. • Site design (whether oriented for auto or multi-modal accessibility) can reduce vehicle trips, particularly if implemented with improvements to non-auto modes. • Smart Growth programs (integrated programs that result in more compact development, multimodal transport systems and various travel demand management incentives).
Conclusion	Although most land use factors have modest individual impacts, typically affecting just a few percent of total travel, they are cumulative and synergistic. If integrated with other policy changes such as increased investments in alternative modes and more efficient transport pricing, they can have even larger impacts.

Citation	**Lee, C., Li, V., Stringer, K., Goodall, D., Wingham, A., Hafoka, J., Sharp, M., Te Tena, M., & Khoo, J. (2024) Assessing the relationship between the sustainability of urban form and transport in Aotearoa New Zealand. *NZ Transport Agency Waka Kotahi research report* 726.** https://www.nzta.govt.nz/assets/resources/research/reports/726/726-assessing-sustainability-of-urban-form-and-transport.pdf
Aim	To enhance understanding of the relationship between the sustainability of urban form and transport in New Zealand.
Method	Literature review of the impacts of different types and mixes of urban form and transport on sustainability other core transport outcomes. Interviews (n= 8) with planning professionals, and digital 'conversations' (n= 135) with the general public.
Key Findings	There are a range of pre-conditions for integrated planning of transport and urban form in New Zealand to achieve sustainable transport outcomes: • The public have access to a range of viable sustainable transport options that allow them to access social infrastructure and local amenities regardless of their social identity and where they live, work, learn, and play. Public transport services need to be reliable, efficient, affordable, and safe regardless of trip origin and destination. Footpaths, walkways and cycleways must provide safe, efficient journeys for people of all ages and abilities to enjoy. • The housing market needs to deliver a range of housing typologies at a range of price points in locations that are well serviced by viable, sustainable transport options, social infrastructure, and local amenities. • Local planning and regulation need to enable the integration of transport and urban form. Roads need to be improved for sustainable transport as part of road maintenance and renewals.
Conclusion	A range of necessary pre-conditions are required to enable integrated planning of transport and urban form in New Zealand to achieve sustainable transport outcomes. This requires clear roles to be determined and collaboration between agencies.

Citation	**Boulange, C., Gunn, L., Giles-Corti, B., Mavoa, S., Pettit, C., & Badland, H. (2017). Examining associations between urban design attributes and transport mode choice for walking, cycling, public transport and private motor vehicle trips. *Journal of Transport & Health*, 6.** https://doi.org/10.1016/j.jth.2017.07.007
Aim	To explore associations between urban design attributes and transport mode choices including walking, cycling, public transport and private motor vehicle use.
Method	Secondary analysis of the Victorian Integrated Survey of Travel Activity 2009–2010 (n= 16,890) in metropolitan Melbourne, Australia.
Key Findings	• Urban environments with residential densities exceeding 20 dwellings per hectare, a well-connected street network, access to 9 or more local living destinations and short distances to public transport services (i.e., ≤ 400 m for bus and ≤ 800 m for train) encourage walking, cycling, and public transport use and discourage driving. • If residential density, street connectivity, and land-use mix is too low, this will continue to encourage driving and discourage active transport modes.
Conclusion	Comprehensive integrated urban planning of transport infrastructure, land use development and service provision is required to create neighbourhoods that support sustainable living and allows for a flexible mix of land uses and transport options.

Citation	**Dingena Mackenbach, J., Randal, E., Zhao, P., & Howden-Chapman, P. (2016). The influence of urban land-use and public transport facilities on active commuting in Wellington, New Zealand: Active transport forecasting using the WILUTE model. *Sustainability*, 8. www.doi.org/10.3390/su8030242**
Aim	To investigate socioeconomic differences in active commuting and assess the impact of urban land-use and public transport policies on active commuting in the Wellington region in New Zealand.
Method	Modelled changes in active commuter trips associated with changes in the built environment using data from the New Zealand Household Travel Survey, GIS data on land-use and public transport facilities and the Wellington Integrated Land-Use, Transportation and Environment (WILUTE) model.
Key Findings	• High income individuals were more likely to commute actively than individuals on low income. • Both the areas where trips started and ended were of importance for active commuting. Higher housing density, walkability, and access to public transport in the home area, a higher parking price, number of rail stations, land-use mix, and job accessibility in the area where people ended their commuter trips were associated with higher likelihood of active commuting. • There is potential to increase active commuting by increasing bus frequency and parking fees at the end location of commuter trips.
Conclusion	Regional level policies stimulating environmental factors that directly or indirectly affect active commuting may be a promising strategy to increase population level physical activity. Access to, and frequency of, public transport in the neighbourhood can act as a facilitator for a more active lifestyle.

Citation	**Mandic, S., Garcia Bengoechea, E., Hopkins, D., Coppell, K., Smith, M., Moore, A., Keall, M., Ergler, C., Sandretto, S., Wilson, G., Kidd, G., Flaherty, C., Mindell, J., Stephenson, J., & Spence, J. (2023). Examining the transport to school patterns of New Zealand adolescents by home-to-school distance and settlement types. Journal of Transport & Health, 30. https://doi.org/10.1016/j.jth.2023.101585**
Aim	To examine adolescents' patterns of transport to school in diverse settlement types and in relation to home-to-school distance in the Otago region, New Zealand.
Method	Patterns of transport to school by home-to-school distance, and across school locations (large, medium, and small urban areas and rural settings), are described from a survey of 2,403 adolescents.
Key Findings	• Transport patterns to school differed significantly across 'walking', 'cycling' and 'beyond cycling' distance to school categories. There were lower active travel to school rates and higher rates of motorised transport with increasing distance. • Profiles of different transport user groups showed significant variability in sociodemographic characteristics, family factors, average distance to school, self-reported physical activity, and perceived health. • Transport patterns varied across settlement types and were present within the distance to school categories. Rates of car travel within short distances to school were greatest in large urban areas and lowest in rural settings.
Conclusion	Initiatives to promote sustainable transport need to pay attention to the settlement types, distance to school, and characteristics of different transport user modes.

Citation	**Ikeda, E., Stewart, T., Garrett, N., Egli, V., Mandic, S., Hosking, J., Witten, K., Hawley, G., Tautolo, E., Rodda, J., Moore, A., & Smith, M. (2018). Built environment associates of active school travel in New Zealand children and youth: A systematic meta-analysis using individual participant data. *Journal of Transport & Health*, 9. https://doi.org/10.1016/j.jth.2018.04.007**
Aim	To examine the associations between active travel to school and the neighbourhood built environment in children and youth.
Method	Systematic review and meta-analysis including data from five New Zealand studies involving 2844 children and youth aged 6–19 years.
Key Findings	• Active travel to school was positively associated with intersection density and inversely associated with school socioeconomic status, dwelling density (1km buffer), and distance to school when including age, sex, ethnicity and number of siblings as fixed effects. • The relationship between distance to school and odds of active travel to school had the greatest magnitude of all associations observed even after accounting for all other factors in the final model.
Conclusion	Factors that influence distance to school such as school location and school zoning/catchment policies have significant influence on school travel mode. Therefore, these factors should be considered in planning decisions for school locations. In addition, improving connectivity in school neighbourhoods may have positive effects on active travel to school in New Zealand children and youth.

Citation	**Fitzgerald, G. (2012). The social impacts of poor access to transport in rural New Zealand. *NZ Transport Agency research report 484*. https://www.nzta.govt.nz/assets/resources/research/reports/484/docs/484.pdf**
Aim	To investigate poor access to land transport in New Zealand rural communities and its social consequences to inform and enhance planning for sustainable communities.
Method	Combined analysis of data from the New Zealand Household Travel Survey and the 2006 Census, consultation with sector stakeholders, and community case studies.
Key Findings	• Rural New Zealand has been depopulating for decades because of changes in transportation, agricultural technology and scale, and rationalisation of the provision of services. Therefore, many rural settlements do not have sufficient services and employment to meet the needs of their residents, and they have to increasingly rely on nearby cities and large towns. • Access to a motor vehicle is essential to mobility among rural people. This mobility is essential for getting access to the goods, services, activities and opportunities that rural people need to sustain themselves. • 90% of rural people travelled to work away from their place of residence, up 27% from 1996. In two thirds of rural census area units in 2006, no one reported using public transport to get to work. • The main impacts of poor access to transport are not being able to access the goods, services, activities and opportunities and the significant efforts and investments made by individuals to overcome these accessibility problems.
Conclusion	With various social and economic changes and pressures over time, public transport and other forms of passenger transport have all but disappeared in rural areas except those areas bordering on cities perpetuating car dependence in rural communities.

Opportunities to influence mode choice

Citation	**Xiao, C., van Sluijs, E., Ogilvie, D., Patterson, R., & Panter, J. (2022). Shifting towards healthier transport: carrots or sticks? Systematic review and meta-analysis of population-level interventions. *The Lancet: Planetary Health*, 6(11).** https://doi.org/10.1016/S2542-5196(22)00220-0
Aim	To compare the effectiveness of interventions with positive (i.e., carrot), negative (i.e., stick), or a combination of strategies on changing population-level travel behaviour and to identify which intervention functions, or mechanisms of how interventions seek to alter behaviour affect transport outcomes.
Method	Systematic review and meta-analysis of controlled before-and-after studies (n= 102) of population-level interventions and travel behaviours.
Key Findings	• For interventions aiming to reduce vehicle use, stick strategies and combined carrot-and-stick strategies had point estimates of greater magnitude than those for interventions with carrot strategies. • For interventions aiming to increase active travel, combined carrot-and-stick strategies had a higher point estimate compared with carrot interventions. • Functions thought to change behaviour using financial means were effective at decreasing driving behaviour, whereas those improving access, safety, and space were effective for increasing active travel outcomes.
Conclusion	Although transport interventions with only positive strategies are more commonly evaluated, interventions that combine both positive and negative strategies might be more effective at encouraging alternatives to driving at the population level.

Citation	**Roaf, E., Larrington-Spencer, H., & Lawlor, E. (2024). Interventions to increase active travel: A systematic review. *Journal of Transport & Health*, 38.** https://doi.org/10.1016/j.jth.2024.101860
Aim	To synthesise the evidence on interventions aiming to promote active travel.
Method	Systematic review of studies of interventions aiming at increasing active travel with pre- and post-intervention measurement of active travel levels (n= 78).
Key Findings	• Common interventions included those relating to children, access to/subsidies for bicycles, infrastructure/environmental change without other interventions, social/behavioural/policy interventions, and multicomponent interventions. • Interventions that only included social/behavioural/policy elements generally had little impact and had to be repeated/sustained for any impact to be maintained. • Increasing the walkability of an area increases walking rates, but small- scale cycling infrastructure improvements without other supportive measures often leads to route substitution rather than an increase in cycling rates. • E-bike loans increased active travel and reduced car use, at least in short-term. • In studies targeting children, walking buses/cycle trains showed positive impacts.
Conclusion	Interventions combining infrastructure change with behavioural/social programmes, interventions involving e-bikes, and cycle-sharing schemes had most impact on active travel levels. Interventions that only address behavioural or social aspects of active travel have long- not short-term funding. If population level change is to be achieved, such interventions should also be accompanied by environmental and infrastructure changes, including road space reallocation and access to e-bikes.

Citation	**Zarabi, Z., Waygood, O., Olsson, L., Friman, M., & Gousse-Lessard, A-S. (2024). Enhancing public transport use: The influence of soft pull interventions. *Journal of Transport Policy*, 153. https://doi.org/10.1016/j.tranpol.2024.05.005**
Aim	To determine how travel behaviour change research can be effectively utilized to promote public transport usage through soft-pull measures.
Method	Scoping review of 36 publications that intervene at psychological elements of individuals' behaviours.
Key Findings	• There are three key categories of soft pull interventions: 1) Internally motivating strategies that instil pro-sustainability attitudes and norms; 2) Strategies that aim to retain current users and attract new patrons by improving the service factors and modifying perceptions of the service; 3) Stimulating public transport and car-habit disrupting strategies such as attractive incentives to try public transport. • Launching public information campaigns alone is unlikely to be effective.
Conclusion	Innovative behavioural science-based policies can complement traditional approaches by incorporating internally motivating strategies, satisfaction increasing methods, and car use habit-disrupting solutions to increase public transport use effecting meaningful change.

Citation	**Adhikari, A., Ryan, M., & Harrington, M. (2024). Proactive investment Policies to increase rates of active transportation- discussion paper. The Australia Institute. https://australiainstitute.org.au/wp-content/uploads/2024/10/Policies-to-increase-rates-of-active-transportation.pdf**
Aim	To summarise policy options for increasing rates of active transportation and reducing car use in Australian cities.
Method	A review of policy options to increase active transportation and online survey (n= 1,031) to gauge public support for the suggested policy actions.
Key Findings	There are three major ways in which Australian governments could help increase rates of active transportation: • Improving infrastructure by ensuring transport and road legislation includes requirements for active transport infrastructure, making infrastructure safer to encourage more use of active transport and public transport, increase funding for active transportation to the equivalent of at least 10% of road-related expenditure. • Allowing for the use of personal e-mobility devices through appropriate legislation with supporting rules, regulation, and infrastructure. • Creating financial incentives for the purchase of bicycles, e-bikes, and other similar modes of transportation, specifically by subsidising the purchase of e-bikes, applying subsidies available for electric vehicles to e-bikes, scrapping scheme for old cars in exchange for e-bike rebates or public transport tickets, or introducing a tax-deductible per/km ride to work mileage allowance.
Conclusion	The review identified three major ways in which Australian governments could help increase rates of active transportation. Greater investment in active transport infrastructure is needed now to avoid congested, polluted, car-dependent cities in the future.

Citation	**Mandic, S., Jackson, A., Lieswyn, J., Mindell, J., Garcia Bengoechea, E., Spence, J., Coppell, K., Wade-Brown, C., Wooliscroft, B., & Hinckson, E. (2020). Development of key policy recommendations for active transport in New Zealand: A multi-sector and multidisciplinary endeavour. *Journal of Transport & Health*, 18. https://doi.org/10.1016/j.jth.2020.100859**
Aim	To develop key policy recommendations for increasing active transport in New Zealand and inform decision making in central and local government agencies.
Method	A ten-member working group consisting of delegates working in academia, industry, and non-governmental organisations led the development of the recommendations.
Key Findings	The 13 policy recommendations (and 39 associated actions) included: • Evaluation, governance, and funding: set and monitor shared targets for the proportion of trips by active modes and public transport, ensure the value of interventions is recognised in policies and investment decisions, continually update information on the health and economic impacts of interventions. • Education and promotion: promote active transport to schools and workplaces, make public transport affordable and accessible, improve motorist education. • Infrastructure and built environment: require and fund a universal and connected active transport network, design and transform towns and cities for people. • Enforcement and regulation: change the decision-making frameworks that affect transport options to prioritise population health, improve road safety for active transport users, and regulate healthy school transport options.
Conclusion	This cross-sector effort resulted in a set of recommendations designed to stimulate the development of an active transport strategy for New Zealand.

Citation	**Thomas, J., Malcolm, L., Cooper, D., Cross, T., Cai, L., Thomas, F., & Frith, B. (2022). Safety interventions and their contribution to mode shift. *Waka Kotahi NZ Transport Agency research report 701*. https://www.nzta.govt.nz/assets/resources/research/reports/701/701-safety-interventions-and-their-contribution-to-mode-shift-summary.pdf**
Aim	To investigate the impact of road and personal safety interventions on transport mode shift towards sustainable modes of travel.
Method	Literature review assessing the impact of safety interventions on mode shift, interviews with road safety professionals (n=7), and case studies.
Key Findings	• Infrastructure interventions alone, and a combination of personal security, road safety, and pavement interventions were effective in creating mode shift with the combination being more effective. When safety interventions were applied to routes, area-wide treatments, or cities and combined with safety education, they showed the strongest increase in walking and cycling. • Specific factors were associated with shifts to each mode. Cycling can be increased by delivering infrastructure which separates cyclists and vehicles, and lowering speed limits with traffic calming. Walking can be increased by delivering safe routes to school and public transport, reducing speed limits with traffic calming, and improving lighting. Shifts to public transport were increased by safe routes to public transport, real time public transport information, and lighting.
Conclusion	Transport and road safety strategies for New Zealand should address a wider range of harms and use a funding approach that includes whole-of-journey safety.

Citation	**Ensor, M., Maxwell, O., Bruce, O. (2021). Mode shift to micromobility. Waka Kotahi *NZ Transport Agency research report 674*.** https://www.nzta.govt.nz/assets/resources/research/reports/674/674-Mode-shift-to-micromobility.pdf
Aim	To investigate the role that micromobility modes could have on other modes and shifts towards sustainable modes of travel in New Zealand.
Method	Literature review assessing the current micromobility modes, models for use, and the mode shift and other impacts of micromobility, a review of New Zealand data on micromobility use, and modelling of the likely use of micromobility.
Key Findings	• The likely range of mode shift to micromobility in New Zealand could be between 3% and 11% of all urban trips by 2030. This depends on factors including the proximity of routes to 'attractive' destinations and the quality of active mode route infrastructure, including physically separated cycle lanes. • Public transport patronage is expected to grow by up to 9% by 2030 because of first/last mile micromobility use, depending on context, with car trips expected to decrease by up to 2% for CBD and fringe areas, and 1% or less for other areas. • Twenty-one interventions were suggested to boost the uptake of micromobility and mitigate potential negative impacts. These related to funding and operational matters, infrastructure, regulatory/legislative changes, and education/awareness.
Conclusion	The growth of micromobility both in the capabilities of already 'established' modes such as e-bikes and e-scooters, as well as the evolution of novel modes is predicted to have both positive and negative impacts on transport outcomes.

Citation	**Magill, T. (2024). RN 009C- Impact of half-price public transport fares- a research note. *Waka Kotahi NZ Transport Agency*.** https://www.nzta.govt.nz/assets/resources/research/research-notes/009/009C-impact-of-half-price-fares-on-public-transport.pdf
Aim	To evaluate the impact of half-price public transport fares in New Zealand.
Method	An analysis of survey data from the Waka Kotahi Customer Journey Monitor (n=2000) and Waka Kotahi COVID Transport Impacts Survey (n= 1,259) and a range of non-survey data related to public transport patronage, traffic, costs, and scheduled trips.
Key Findings	• Patronage during the half-price fares period was lower than pre-COVID levels. There is evidence of long-term adjustments in travel patterns that could continue to suppress public transport patronage going forward, even if fares are reduced. • Around 7-8% of New Zealanders made PT journeys in this period that they otherwise wouldn't have taken. Most new journeys were for work purposes. Where completely new journeys were added, these appear to be one-off or infrequent trips, rather than a new regular journey being added to weekly travel. • High fuel prices and cost of living concerns have been significant push factors for those making new journeys, particularly those switching from private vehicles. • For those still not using public transport services, price hasn't been the main barrier since 2019. Non-users perceive commonly public transport as an unrealistic alternative for travel as it is not widely available in their area, that it is not realistic for the distance that they need to travel, or it will take too long.
Conclusion	With key barriers of availability issues and disrupted services unresolved, half-price fares won't be sufficient to make non-users trial services, limiting its impact.

Citation	**Wild, K. & Woodward, A. (2018). E-bikes and the future of cycling in New Zealand-report on the Electric City research programme. *The University of Auckland*. https://bpb-ap-se2.wpmucdn.com/blogs.auckland.ac.nz/dist/c/520/files/2018/08/Electric-City-Ebikes-and-the-Future-of-Cycling-in-NZ-1rihn5y.pdf**
Aim	To use two case studies to explore the potential of electric bikes to improve efficiency, sustainability, and wellbeing within New Zealand's urban transport systems.
Method	In-depth interviews with e-bike users, retailers, and planning/policy experts, and an e-bike trial at Auckland City Hospital.
Key Findings	• E-bikes are expanding Auckland's 'active transport radius' from approximately 5km for bikes to regularly users comfortably commuting 15km to work and back. • E-bikes are having many positive impacts including making 'trip-chaining' easier, increasing commuting efficiency, making active transport easier for women. • The increased speed at which e-bikes can travel is viewed as a risk and an opportunity by e bike users as it makes longer distances more realistic but also increased severity of injury when crashes occur at higher speeds. • To increase the uptake of e-bikes suggested interventions include separated cycle lanes and to separate cyclists and pedestrians where possible, reduce speed limits on urban roads to 30km/hr, provide opportunities for people to trial e-bikes, provide reduce the cost of e-bikes and investigate subsidies/schemes for low-income earners, and provide secure bike parking with e-bike charging facilities.
Conclusion	E-bikes are creating new opportunities for active and sustainable transport. However, more work is needed to make e-bike use safer, and more attractive and affordable.

Citation	**Smith, M., Hawley, G., Mackay, L., Hosking, J., Mackie, H., Ikeda, E., Egli, V., Ellaway, V., Witten, K. (2020). Impact of changing road infrastructure on children's active travel: A multi-methods study from Auckland, New Zealand. *Journal of Transport & Health*, 18. https://doi.org/10.1016/j.jth.2020.100868**
Aim	To evaluate the impact of infrastructural changes in a school neighbourhood.
Method	A survey of children and telephone interview of parents to assess behaviours, neighbourhood perceptions, and reasons for school travel mode. Tube counters and video cameras were used to measure traffic speeds and volume, and counts of pedestrians and cyclists, respectively.
Key Findings	• Reductions in traffic speeds but increases in traffic volumes were observed post-intervention. Video observation also showed an increase in pedestrians. • Positive and negative shifts in child and parent neighbourhood perspectives were observed. There was an increase in children's perceived road and neighbourhood safety, however, parental safety concerns remained. • Distance to school, convenience, and traffic safety concerns were raised as key factors of importance by parents and children.
Conclusion	Despite this school travel intervention, we saw decreases in active travel and increases in car travel at follow-up. This suggests that reversing declines in active travel may require more intensive, community-wide interventions that substantially improve neighbourhood safety and perceptions of safety.

Efficient private vehicle use

Citation	**Coffman, M., Bernstein, P., & Wee, S. (2017). Electric vehicles revisited: a review of factors that affect adoption. *Journal of Transport Reviews*, 37(1). https://doi.org/10.1080/01441647.2016.1217282**
Aim	To summarise knowledge and identify gaps in understanding related to electric vehicle (EV) uptake with the purpose of informing policymakers and researchers.
Method	Review of peer-reviewed papers (n= 50) assessing factors affecting EV adoption.
Key Findings	• High purchase price is a major impediment to EV uptake. Even though there is some evidence that EV ownership costs can be competitive with other vehicles, upfront costs still dominate. Though many governments offer incentives to support EV uptake, there are mixed findings as to their efficacy. • EV driving range is identified as another major impediment to EV adoption. For short commutes within urban areas or longer trips, range anxiety gives rise to the literature's findings that Plug-in Hybrid EVs serve as a solution. • Public charging infrastructure is an important factor associated with EV uptake, though the direction of causality is yet unclear. Public charging infrastructure can ease range anxiety, particularly for battery electric vehicles. • The literature shows mixed evidence that characteristics like income, education, and age can determine whether a person will be interested in purchasing an EV. There is some evidence that social/network effects are important in the uptake of new vehicle technology.
Conclusion	EVs show significant promise to reduce carbon emissions, however, barriers remain to their widespread uptake. The literature to date has largely relied on surveys about hypothetical situations due to the emerging status of EVs and highlights substantial gap between people's stated likelihood of EV adoption and actual adoption trends.

Citation	**Broadbent, G., Metternicht, G., & Wiedmann, T. (2021). Increasing electric vehicle uptake by updating public policies to shift attitudes and perceptions: Case study of New Zealand. *Energies*, 14(10). https://doi.org/10.3390/en14102920**
Aim	To investigate motorists' perceptions and attitudes to EVs and factors that influence car buying to provide evidence to suggest actions to encourage demand for EVs.
Method	Mixed methods study utilising a cross-sectional consumer survey (n= 588) and follow-up interviews of survey participants (n= 31).
Key Findings	• New Zealand motorists perceived the strongest barriers to EV purchase were vehicle range, driver perceptions that EVs are expensive, inconvenience relating to charging, and the unknown value proposition of batteries. Other perceptions were that EVs were economical, eco-friendly, and fun. • Policies to increase uptake of EVs that were favoured by respondents included the 'Clean Car Discount' to reduce EVs' purchase price, increase funding for fast-charger deployment nation-wide, increase procurement of EVs by government departments to increase sales certainty for car dealers.
Conclusion	Rates of EV adoption could be accelerated by addressing the barriers identified to EV update, and by implementing motorists' preferred incentives.

Citation	**Tu, R., Xu, J., Li, T., & Chen, H. (2022). Effective and acceptable eco-driving guidance for human-driving vehicles: A review. *International Journal of Environmental Research and Public Health*, 19.** https://doi.org/10.3390/ijerph19127310
Aim	To review existing studies on eco-driving guidance for human-driving vehicles of road transport, focusing on the effectiveness and acceptance of the guidance.
Method	Review of published literature (n= 41) on eco-driving guidance techniques.
Key Findings	• We find that influencing factors, such as the content of suggestions, the display methods, and drivers' socio-demographic characteristics have varied effects on the guidance results across studies. • Static eco-driving training cannot ensure a sustainable change in driving behaviour while whether regular incentives help maintain the training effect or not is debatable across studies. • "Semi-dynamic" guidance, a periodic driving report, leads to energy savings and emission reductions in a longer time span than training alone. The consequent behavioural change is affected by the feedback's frequency and content. • Environmental concerns and a positive attitude towards eco-driving improve the acceptance level of guidance but drivers need reminders to use their eco-driving knowledge in practice. Inexperienced and unprofessional drivers are more likely to adopt driving suggestions and change their behaviour, although exceptions exist.
Conclusion	We find that dynamic assistance is more effective than static training although difficulties in transferring eco-driving knowledge into practice remain.

Citation	**Scott, M., & Lawson, R. (2018). The road code: encouraging more efficient driving practices in New Zealand. *Journal of Energy Efficiency*, 11.** www.doi.org/10.1007/s12053-017-9538-z
Aim	To understand whether people knew how to drive efficiently, whether they ever drove efficiently, and what ways there could be to influence people to drive more efficiently.
Method	Semi-structured focus groups conducted in Dunedin, Auckland, and rural areas (n= 14, including 96 participants).
Key Findings	• In every focus group, there was knowledge and discussion about what efficient driving practices are; however, these practices were rarely engaged in. • When driving efficiently was considered, it was usually linked to concerns about fuel cost or saving money rather than environmental reasons. There was a clear lack of connection between carbon emissions and driving practices. • The idea of additional training was received very positively across the groups, especially if it was incentivised by removing demerit points or reducing insurance costs with the feeling that a driver's licence alone does not equip one with the varied skills necessary to be a confident driver.
Conclusion	Our findings show that rather than a one size fits all solution to encourage more efficient driving, there are a range of flexible points where more efficient driving practices or choices may be encouraged.

Citation	**Hook, A., Court, V., Sovacool, B., & Sorrell, S. (2020). A systematic review of the energy and climate impacts of teleworking. *Environmental Research Letters*, 15. https://doi.org/10.1088/1748-9326/ab8a84**
Aim	To determine the extent to which teleworking reduces the need to travel to work and the consequent impacts on economy-wide energy consumption.
Method	A systematic review of the current peer-reviewed papers on the energy impacts of teleworking (n= 39).
Key Findings	• 26/39 studies suggest that teleworking reduces energy use, and only eight studies suggest that teleworking increases, or has a neutral impact on energy use. However, differences in the methodology, scope and assumptions of the different studies make it difficult to estimate 'average' energy savings. • The main source of savings is the reduced distance travelled for commuting, potentially with an additional contribution from lower office energy consumption. • Despite the generally positive verdict on teleworking as an energy-saving practice, there are numerous uncertainties and ambiguities about its actual or potential benefits. These relate to the extent to which teleworking may lead to unpredictable increases in non-work travel and home energy use that may outweigh the gains from reduced work travel.
Conclusion	Overall, although teleworking has been found to reduce energy use for individuals, the available evidence suggests that economy-wide energy savings are typically modest, and in many circumstances could be negative or non-existent.

Citation	**Neoh, J., Chipulu, M., & Marshall, A. (2017). What encourages people to carpool? An evaluation of factors with meta-analysis. *Journal of Transportation*, 44. www.doi.org/10.1007/s11116-015-9661-7**
Aim	To synthesise the empirical evidence of non-household carpools to identify the key factors influencing the commuter's decision to participate in carpooling and policy recommendations that can be made to increase carpooling.
Method	A quantitative systematic review and meta-analysis of existing empirical studies (n= 22) on the factors that affect decisions to carpool.
Key Findings	• 24 factors affecting the decision to carpool were identified. Factors such as the number of employees in a business, partner matching programs, gender, and work schedule, were found to have strong effects on carpooling while judgmental factors (such as the motivation to save costs) only exhibited a small influence. • Prospects to improving carpooling uptake may include developing target demographics, selling points for marketing, carpooling partner programs, and multiple employer 'super-pools'. • Campaigns are best advised to strategically target groups which are more likely to carpool. Our findings reveal the profile of this individual: female, in full-time employment with a fixed (regular) work schedule, and has vehicle ownership.
Conclusion	We conclude that a range of factors influence decisions to carpool. Interventions to increase carpooling uptake should strategically target groups who are more likely to carpool and consider selling points to incentivise carpooling.

Citation	**Abrahamse, W., & Keall, M. (2012). Effectiveness of a web-based intervention to encourage carpooling to work: A case study of Wellington, New Zealand. *Transport Policy*, 21.** https://doi.org/10.1016/j.tranpol.2012.01.005
Aim	To examine the effectiveness of a regional carpool scheme in changing mode choice and the frequency of driving alone, as well as examining factors related to solo driving.
Method	Online survey (n=1,273) of participants in the Let's Carpool scheme in Wellington.
Key Findings	• The number of commuters in the scheme who carpooled as their main mode of transport for getting to work increased significantly (from 12% to 27%), while the percentage of commuters indicating they drove alone decreased significantly. • Interestingly, the use of public transport was also replaced by carpooling to some extent. This perhaps reflects the unreliability of Wellington public transport over the period evaluated. • Perceptions of carpooling were better able to explain differences in driving alone than socio-demographic variables. • Respondents who chose to drive alone to work were concerned about the arrangement of costs, comfort, and convenience of carpooling.
Conclusion	A combination of personalised information about carpool matches and incentives delivered via a website can be successful in encouraging the uptake of carpooling. Behavioural antecedents to solo driving need to be addressed if mode shifts are a desirable outcome for a policy or programme.

Citation	**Cheyne, C., & Imran, M. (2016). Shared transport: Reducing energy demand and enhancing transport options for residents of small towns. *Journal of Energy Research & Social Science*, 18.** https://doi.org/10.1016/j.erss.2016.04.012
Aim	To explore travel patterns and the willingness of small-town residents to uptake shared mobility.
Method	Analysis of Census and Household Travel Survey data from fifteen small towns in three non-metropolitan regions (Taranaki, Hawkes Bay and Manawatu-Wanganui), and semi-structured interviews (n= 19).
Key Findings	• There is considerable diversity in people's travel needs reflecting age, employment status and household income, size and composition. • Similar experiences in terms of lack of choice and car dependence because of the lack of alternatives. As a result of these difficulties and the generally poor quality of infrastructure and service, public transport is often viewed negatively. • However, people often willingly share transport (e.g., families often transport children from other households to children's activities). This suggests there is scope to promote shared transport.
Conclusion	This study highlights the importance of socio-economic variables (including age, household income, and internet access), travel patterns, travel purposes and reasons for living in small towns in shaping attitudes towards shared transport.

Citation	**Petrik, O., Martinez, L. M., Furtado, F., & Kauppila, J. 2017. Are transport users willing to share? Focus groups and stated preferences study on shared mobility in Auckland, NZ, Dublin, IR, and Helsinki, FI. *Transportation Research Board 97th, Washington DC, USA*.**
Aim	The aim of this study is to investigate the preferences of the potential users in relation to the introduction of two shared modes (shared taxi and taxi bus).
Method	Mixed methods study involving focus group discussions (n= 5, 42 participants) regarding the current user preferences in Auckland, Dublin and Helsinki and the proposed new modes and a stated preference survey.
Key Findings	• Most respondents are willing to share vehicles rather with more rather than fewer travellers. Current public transport users, younger people, and women are the most likely earlier adopters of shared services. • Opinions towards the shared modes were typically related to fares, waiting time, detour time, walking time to a stop, and number of passengers. Other concerns included safety and the availability of seats for children. • Cost is the most important attribute, and most of the respondents expect it to be lower than the current public transport modes (for Taxi-Bus) and conventional taxi or private car (for Shared Taxi). • Car users in Auckland are less willing to substitute their trips with shared mobility services and tend to perceive their travel cost only as the out-of-pocket cost of the fuel, while valuing cars for flexibility and convenience.
Conclusion	Shared mobility has an important potential in all cities studied, but success of its implementation will strongly depend on the transport system design, policies to stimulate the citizens to use the new services, and information campaigns.

Citation	**Cheng, Y., Watkins, S., Anciaes, P. (2024). What interventions are effective in reducing congestion? *Advances in Transport Policy and Planning*, 13. https://doi.org/10.1016/bs.atpp.2023.11.002**
Aim	To investigate existing interventions aiming to reduce congestion to determine the mechanisms involved and whether they can lock-in changes in congestion.
Method	Systematic review of interventions aiming to reduce congestion (n= 50).
Key Findings	• Road user charging is proved to be effective in many cities. • In many cases, the success of interventions to reduce congestion depends on the application of parallel measures to improve public transport. • The main reason for the failure of the interventions is unexpected behavioural changes, such as strategies to avoid driving restrictions; changes in the spatial and time patterns of trips; and even changes in the type of vehicles used. • Charging coupled with public transport improvement has had a long-term effect in London, Oslo, Stockholm and Singapore, although improvement in cycling infrastructure may also have contributions. This combination of policies seems therefore to lock-in its effects. • Using behavioural measures such as health information, travel choice information, rewards and incentives and encouragement by employers are particularly well evidence based as having an effect on mode choice.
Conclusion	Cities seeking to reduce congestion should refrain from roadbuilding, introduce road user charging, improve public transport, walking and cycling infrastructure, and consider behavioural measures to reduce car use.

Citation	**Zhou, X., Zhong, S., Liu, A., Gong, Y., Zhou, H., Li, X., & Li, Z. (2024). Review on road congestion pricing: a long-term land use effect perspective.** ***Proceedings of the Institution of Civil Engineers- Transport*****.** **https://doi.org/10.1680/jtran.24.00039**
Aim	To review the effects of road congestion pricing, from the short term to the long-term including the shortcomings of existing studies and research directions.
Method	Scoping review of studies on the long-term effects of road congestion pricing.
Key Findings	• In the short term, road congestion pricing has been shown to change residents' travel paths, departure times, travel modes, and travel frequency. • In the long-term, studies show that some residents change their residential location and job choice after the implementation of road congestion pricing, which has a clustering effect on the population in the city centre. • Road congestion pricing can have negative impacts on businesses in the toll zone, such as loss of customers/decrease in sales, and have a dispersing effect on jobs. • The impact of road congestion pricing on land use is not only related to the pricing scheme but is also affected by a series of built environment factors, such as land use and road network characteristics, and public transportation networks.
Conclusion	Road congestion pricing affects residents' travel behaviour in the short term and can lead to changes in location decisions in the long run, thus creating new travel demands and travel modes, affecting the transportation system and urban spatial patterns

Appendix C: Screening Questionnaire

Question 1

Type - Free Text

Thank you for taking the time to complete this survey. Please answer the following questions as accurately and honestly as possible.
Please note that when filling our surveys, you need to complete it in one sitting. If you exit out of the survey part way through and plan to do the rest later, the survey will not allow you back in to continue. Please read each answer before making your selection, as some of our questions will jump straight to the next question as soon as you select an answer. Once an answer has been selected and you have gone to the next question, you cannot go back. Please click "Next" to get started!

Question 2

Type - Single Choice

Do you, or anyone in your immediate family or household, work in any of the following industries or occupations? Select all that apply:

Statement	Action	Staff Notes
Marketing / Market Research	Go to next question	
Advertising / Promotions	Go to next question	
Public Service / Education	Go to next question	
Media / Public Relations	Go to next question	
Banking / Finance	Go to next question	
Alcohol / Beverages wholesale or retail	Go to next question	
Journalism / TV or Radio	Go to next question	
None of the above	Go to next question	

Question 3

Type - Single Choice

When was the last time you took part in any market research interview or discussion?

Statement	Action	Staff Notes
Less than 6 months ago	Go to next question	
6 - 12 months ago	Go to next question	
More than 12 months ago	Go to next question	
Never	Go to question 5	

Question 4

Type - Free Text

What was the subject of that research?

Question 5

Type - Single Choice

If selected to take part in this project, you will be required to attend a 1.5-hour online workshop on 10th, 11th, 12th, or 13th February (depending on where you live).
You will need a laptop or desktop computer and a reliable internet connection to take part. This cannot be done on a smartphone.
Are you available on those dates, and happy to participate in this way?

Statement	Action	Staff Notes
Yes	Go to next question	
No	End Survey	

Question 6

Type – Single Choice

Do you own a car, or is a car available to use when needed?

Statement	Action	Staff Notes
Yes	Go to next question	
No	End Survey	

Question 7

Type - Single Choice

Thinking about what kind of trips you take regularly; for the following questions, please tell us what mode of transport you take, and the reasons you chose that mode....

Let's start with: Which mode of transportation do you mostly use to commute to work?

Statement	Action	Staff Notes
Private vehicle (car / station wagon / SUV / 4WD)	Go to next question	
Work vehicle	Go to next question	
Public transport (bus/train/ferry)	Go to next question	
Motorbike or scooter	Go to next question	
Bike/e-bike/e-scooter (inc hired)	Go to next question	
Walk	Go to next question	
Taxi / Uber	Go to next question	
Other (Please Specify)	Go to next question	
I do not regularly commute to work	Go to question 9	

Question 8

Type - Multi-Select

And what are your reasons for choosing that method? Select all that apply:

Statement	Action	Staff Notes
To be able to carry equipment / passengers	Go to next question	

It fits in with other trips I take at same time	Go to next question	
It is the fastest option to get to the destination	Go to next question	
There are no other viable options available	Go to next question	
Low emissions	Go to next question	
It is good for my health	Go to next question	
It is low cost	Go to next question	
Weather protection	Go to next question	
Other (Please Specify)	Go to next question	

Question 9

Type - Single Choice

What method of transportation do you regularly use to transport children to school?

Statement	Action	Staff Notes
Private vehicle (car / station wagon / SUV / 4WD)	Go to next question	
Work vehicle	Go to next question	
Public transport (bus/train/ferry)	Go to next question	
Motorbike or scooter	Go to next question	
Bike/e-bike/e-scooter (inc hired)	Go to next question	
Walk	Go to next question	
Taxi / Uber	Go to next question	
Other (Please Specify)	Go to next question	
I do not regularly transport children to school	Go to question 11	

Question 10

Type - Multi-Select

And what are your reasons for choosing that method? Select all that apply:

Statement	Action	Staff Notes
To be able to carry equipment / passengers	Go to next question	
It fits in with other trips I take at same time	Go to next question	
It is the fastest option to get to the destination	Go to next question	
There are no other viable options available	Go to next question	
Low emissions	Go to next question	

It is good for my health	Go to next question	
It is low cost	Go to next question	
Weather protection	Go to next question	
Other (Please Specify)	Go to next question	

Question 11

Type - Single Choice

What method of transportation do you use for shopping trips (e.g. groceries)?

Statement	Action	Staff Notes
Private vehicle (car / station wagon / SUV / 4WD)	Go to next question	
Work vehicle	Go to next question	
Public transport (bus/train/ferry)	Go to next question	
Motorbike or scooter	Go to next question	
Bike/e-bike/e-scooter (inc hired)	Go to next question	
Walk	Go to next question	
Taxi / Uber	Go to next question	
Other (Please Specify)	Go to next question	
I do not regularly go on shopping trips	Go to question 13	

Question 12

Type - Multi-Select

And what are your reasons for choosing that method? Select all that apply:

Statement	Action	Staff Notes
To be able to carry equipment / passengers	Go to next question	
It fits in with other trips I take at same time	Go to next question	
It is the fastest option to get to the destination	Go to next question	
There are no other viable options available	Go to next question	
Low emissions	Go to next question	
It is good for my health	Go to next question	
It is low cost	Go to next question	
Weather protection	Go to next question	
Other (Please Specify)	Go to next question	

Question 13

Type - Single Choice

What method of transportation do you use for any regular (weekly) activities? (e.g. sports, classes, recreation, hobbies, etc)

Statement	Action	Staff Notes
Private vehicle (car / station wagon / SUV / 4WD)	Go to next question	
Work vehicle	Go to next question	
Public transport (bus/train/ferry)	Go to next question	
Motorbike or scooter	Go to next question	
Bike/e-bike/e-scooter (inc hired)	Go to next question	
Walk	Go to next question	
Taxi / Uber	Go to next question	
Other (Please Specify)	Go to next question	
I do not regularly go any regular activities	Go to question 15	

Question 14

Type - Multi-Select

And what are your reasons for choosing that method? Select all that apply:

Statement	Action	Staff Notes
To be able to carry equipment / passengers	Go to next question	
It fits in with other trips I take at same time	Go to next question	
It is the fastest option to get to the destination	Go to next question	
There are no other viable options available	Go to next question	
Low emissions	Go to next question	
It is good for my health	Go to next question	
It is low cost	Go to next question	
Weather protection	Go to next question	
Other (Please Specify)	Go to next question	

Question 15

Type - Single Choice

What method of transportation do you regularly use for visiting friends or family?

Statement	Action	Staff Notes
Private vehicle (car / station wagon / SUV / 4WD)	Go to next question	
Work vehicle	Go to next question	
Public transport (bus/train/ferry)	Go to next question	
Motorbike or scooter	Go to next question	
Bike/e-bike/e-scooter (inc hired)	Go to next question	
Walk	Go to next question	
Taxi / Uber	Go to next question	
Other (Please Specify)	Go to next question	
I do not regularly visit anyone	Go to question 17	

Question 16

Type - Multi-Select

And what are your reasons for choosing that method? Select all that apply:

Statement	Action	Staff Notes
To be able to carry equipment / passengers	Go to next question	
It fits in with other trips I take at same time	Go to next question	
It is the fastest option to get to the destination	Go to next question	
There are no other viable options available	Go to next question	
Low emissions	Go to next question	
It is good for my health	Go to next question	
It is low cost	Go to next question	
Weather protection	Go to next question	
Other (Please Specify)	Go to next question	

Question 17

Type - Single Choice

Thinking about the trips you usually take by CAR, would you consider changing any to another mode of travel (e.g., walk or bus) for some of those trips if the circumstances allowed it?

Statement	Action	Staff Notes
Yes	Go to question 19	
No (Please Specify)	Go to next question	

Question 18

Type – Single Choice

Would you consider a more efficient way of driving and using your vehicle (including buying a more fuel-efficient vehicle, eco driving, ride sharing, combining trips etc).

Statement	Action	Staff Notes
Yes	Go to next question	
No	End Survey	

Question 19

Type - Free Text

Please tell us what suburb / town you live in?

Question 20

Type - Single Choice

What is your current working status?

Statement	Action	Staff Notes
Working full time	Go to next question	
Working part time	Go to next question	
Student full time	Go to question 11	
Student and working part time	Go to next question	
Stay at home parent	Go to question 11	
Beneficiary	Go to question 11	
Retired	Go to question 11	
Other (Please Specify)	Go to next question	

Question 21

Type - Free Text

What is your current job title and occupation?

Question 22

Type - Single Choice

Which best reflects your annual household income?

Statement	Action	Staff Notes
Less than $50,000	Go to next question	
$50,000 - $75,000	Go to next question	
$75,001 - $100,000	Go to next question	
$100,000 - $125,000	Go to next question	
$125,001 - $$150,000	Go to next question	
$150,001 - $200,000	Go to next question	
More than $200,001	Go to next question	

Question 23

Type - Single Choice

Which of the following best describes your household composition?

Statement	Action	Staff Notes
Living with parents	Go to next question	
Living on my own with housemates or boarders	Go to next question	
Living with partner / spouse, never had kids	Go to next question	
Parent / guardian; youngest child aged 0-6 years living with me	Go to next question	
Parent / guardian; youngest child aged 7-12 years living with me	Go to next question	
Parent / guardian; youngest child aged 13-17 years living with me	Go to next question	
Parent / guardian; youngest child aged over 18 years living with me	Go to next question	
Single / couple with all children now living out of home	Go to next question	
Other (Please Specify)	Go to next question	

Question 24

Type - Single Choice

Which ethnicity do you mainly identify with?

Statement	Action	Staff Notes
NZ European	Go to next question	
Māori	Go to next question	
Pasifika	Go to next question	
Asian	Go to next question	
Indian	Go to next question	
Other (Please Specify)	Go to next question	

Question 25

Type - Single Choice

How long have you been living in New Zealand?

Statement	Action	Staff Notes
Less than 1 year	End Survey	
1 - 5 years	Go to next question	
5 - 10 years	Go to next question	
More than 10 years	Go to next question	
All my life	Go to next question	

Question 26

Type - Single Choice

Which of the following best describes your English language skills?

Statement	Action	Staff Notes
English is my first language	Go to next question	
English is my second language – I speak it as fluently as my first language	Go to next question	
I speak conversational English – I am not as fluent in English as in my first language	End Survey	

Question 27

Type - Single Choice

What gender do you identify with?

Statement	Action	Staff Notes
Male	Go to next question	
Female	Go to next question	
Non-Binary	Go to next question	
Other (Please Specify)	Go to next question	

Question 28

Type - Single Choice

What age bracket do you fall in to?

Statement	Action	Staff Notes
Younger than 18 years old	End Survey	
18 - 29 years old	Go to next question	
30 - 39 years old	Go to next question	
40 - 49 years old	Go to next question	
50 - 59 years old	Go to next question	
60 - 69 years old	Go to next question	
70 years old or older	Go to next question	

Question 29

Type - Free Text

Thank you for completing this survey. If you meet the specific requirements for this project, we will contact you phone to confirm/clarify your responses and book you in.

Appendix D: Demographics

Summary of participant demographics overall and by focus group

	Overall (n=44)	FG1: Auckland (n=12)	FG2: Wellington/ Christchurch (n=13)	FG3: Dunedin/ Hamilton/ Tauranga (n=11)	FG4: Small towns [1] (n=8)
Age [2]	42.3 (15.8)	42.6 (14.8)	41.2 (16.1)	45.4 (16.2)	41.8 (15.1)
Gender					
- Male	24 (54.5%)	6 (50.0%)	7 (53.9%)	6 (54.5%)	5 (62.5%)
- Female	20 (45.5%)	6 (50.0%)	6 (46.1%)	5 (45.5%)	3 (37.5%)
Ethnicity					
- NZ European/ Pākehā	23 (52.3%)	5 (41.7%)	8 (61.5%)	5 (45.5%)	5 (62.5%)
- Māori	7 (15.9%)	3 (25.0%)	2 (15.3%)	1 (9.1%)	1 (12.5%)
- Asian	6 (13.6%)	2 (16.7%)	3 (23.1%)	1 (9.1%)	0 (0.0%)
- Pacifica	2 (4.5%)	1 (8.3%)	0 (0.0%)	0 (0.0%)	1 (12.5%)
- Other	6 (13.6%)	1 (8.3%)	0 (0.0%)	4 (36.4%)	1 (12.5%)
Working status					
- Full time	30 (68.2%)	9 (75%)	10 (76.9%)	7 (63.6%)	4 (50.0%)
- Part time	6 (13.6%)	1 (8.3%)	0 (0.0%)	3 (27.3%)	2 (25.0%)
- Student	4 (9.1%)	1 (8.3%)	1 (7.6%)	1 (9.1%)	1 (12.5%)
- Retired	4 (9.1%)	1 (8.3%)	2 (15.3%)	0 (0.0%)	1 (12.5%)
Household Income					
- More than $200,001	6 (13.6%)	1 (8.3%)	2 (15.3%)	3 (27.3%)	0 (0.0%)
- $150,001 to $200,000	5 (11.4%)	0 (0.0%)	0 (0.0%)	1 (9.1%)	4 (50.0%)
- $100,001 to $150,000	18 (40.1%)	6 (50%)	6 (46.1%)	5 (45.5%)	1 (12.5%)
- $50,001 to $100,000	12 (27.3%)	5 (41.7%)	3 (23.1%)	2 (18.1%)	2 (25.0%)
- Less than S50,000	3 (6.8%)	0 (0.0%)	2 (15.3%)	0 (0.0%)	1 (12.5%)
Household composition					
- Living with partner, never had kids	11 (25.0%)	2 (16.7%)	3 (23.1%)	5 (45.5%)	1 (12.5%)
- Living on own or with housemates	8 (18.2%)	0 (0.0%)	3 (23.1%)	3 (27.3%)	2 (25.0%)
- Living with parents	2 (4.5%)	1 (8.3%)	1 (7.6%)	0 (0.0%)	0 (0.0%)
- Parent/ guardian; youngest child aged 0-6 yrs living in the home	7 (15.9%)	2 (16.7%)	2 (15.3%)	1 (9.1%)	2 (25.0%)
- Parent/ guardian; youngest child aged 7-12 yrs living in the home	3 (6.8%)	1 (8.3%)	1 (7.6%)	0 (0.0%)	1 (12.5%)
- Parent/ guardian; youngest child aged 13-17 yrs living in the home	5 (11.4%)	4 (33.3%)	1 (7.6%)	0 (0.0%)	0 (0.0%)
- Parent/ guardian; youngest child aged 18+ yrs living in the home	2 (4.5%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	2 (25.0%)
- Single/ couple with all children now living out of the home	6 (13.6%)	2 (16.7%)	2 (15.3%)	2 (18.1%)	0 (0.0%)

[1] Small towns included: Blenheim, Ashburton, Invercargill, Rotorua, Palmerston North, Richmond, and Katikati
[2] Reported as mean (standard deviation)

Appendix E: Focus Group Workbook

Part 1: Reflections on Current Travel Behaviour and Perceptions

This section will ask you about your current travel habits and the modes of transport that are available to you. Please answer the following questions based on your current situation.

1. Participant name. **Open text box**.
2. What regular trips do you take? **Select all that apply**- commute to work, take your children to school, shopping trips (e.g. groceries), regular (weekly) activities (e.g. sports, classes, recreation, hobbies, etc), visiting friends/family.

   For all trip types that are selected, respondents were asked:

   a) Which mode of transportation do you MOSTLY use to (trip type)? **Multi-choice**- private vehicle (car / station wagon / SUV / 4WD), work vehicle, motorbike/scooter, public transport (bus/train/ferry), bike/e-bike, e-scooter (including hired), walk, taxi/uber, other (please describe).

   b) Using the prompts and text boxes below, please describe a typical example of your (trip type). **Open text box** with series of questions

      - On average, how long (in minutes) does it take you to travel to …?
      - What/who do you take with you? This includes the items and people who travel with you.
      - Do you link your (trip type) with other trips (e.g. regular recreation activities)?

   c) Do you sometimes use other modes of transport for your (trip type)? **Multi-choice-** Yes- please state which mode of transport and the circumstances under which you use it, No.

3. What modes of transport other than driving are available in your neighbourhood or for some of your regular trips? **Select all that apply**- bus, train, ferry, bike/e-bike, e-scooter, walk.

This is the end of part 1 of the workbook. Please leave the browser tab open and stop filling in the survey here so that you can participate in the group discussion.

Part 2: Opportunities for Mode Shift

You have indicated that you use a car for most of your regular trips and have been selected to participate in this focus group for this reason. This section will ask your likely actions under a scenario where you couldn't drive for your regular trips and instead have to consider other modes of transport. Please answer the following questions with this scenario in mind.

4. For each trip type selected in question 2a as being taken by car/motorbike:
   a) If for some reason you couldn't drive for your (trip type), what mode of transport are you MOST LIKELY to use for this trip? **Multi-choice**- bus, train, ferry, bike/e-bike, e-scooter, walk, this trip is not possible by another mode (please explain why).

If trip is selected as possible to be taken by an alternative mode in Q4a the participants were asked:

b) Where are you at for trying this mode for your trip to (trip type)? **Multi-choice**- Haven't thought about it, thought about it, explored doing it, have tried it but don't do it regularly.

c) Please rate the practicality of using this mode for your (trip type) on a scale of very practical to very impractical. **Likert scale.**

d) What conditions would need to be in place before you would consider regularly (using the mode selected) for (trip type)? **Select all that apply**- different options for each mode based on findings from literature scan. See below:

Public transport- bus/train/ferry:

- More frequent services
- Increased reliability of services
- Stops closer to my home or destination
- Better connections from my home or destination to the nearby station/terminal
- Direct route from my home to my destination (i.e. no or easy transfers)
- For the trip to be faster or take a similar time as a car trip to the destination
- Reduced cost of fares
- Improved safety at stations/terminals
- Increased quality of stations, stops, or buses/trains/ferries themselves (e.g. places to wait, ventilation on buses, etc.)
- For taking public transport to become more normalised in my social circles
- Increase my knowledge of routes, timings, and/or how to pay
- Change in personal circumstances (please describe)
- Other (please describe)

Cycling:

- Purchase or repair bike/e-bike
- A cycleway/path that is separated from traffic for the length of my journey
- On-road cycle lane for the length of my journey
- Lower speed limits on the road
- Improved personal safety in my neighbourhood or the areas around my destination
- Availability of bike parking facilities near my destination
- Improved security of bike parking facilities near my destination
- Being able to take bikes on public transport
- For others that travel with me for this trip to also cycle with me
- Lockers, showers, changing rooms at my workplace or destination
- For cycling to become more normalised in my social circles
- Increase my cycling knowledge (e.g. gear required, safe routes, etc.)
- Purchase other bike accessories (e.g. to help carry items/improve visibility)

- Improved confidence in my cycling ability
- Increased availability of bike repair/maintenance hubs
- Improved fitness
- Change in personal circumstances (please describe)
- Other (please describe)

E-scooter:

- Purchase or repair e-scooter
- A cycleway/path that is separated from traffic for the length of my journey
- Lower speed limits on the road
- Improved personal safety in my neighbourhood or the areas around my destination
- Availability of scooter parking facilities near my destination
- Improved security of scooter parking facilities near my destination
- For using e-scooters to become more normalised in my social circles
- Increase my knowledge (e.g. gear required, safe routes, etc.)
- Purchase other accessories (e.g. to help carry items/improve visibility)
- Improved confidence in my ability
- Change in personal circumstances (please describe)
- Other (please describe)

Walking:

- Improved road crossings on the route to my destination
- Improved footpaths on the route to my destination
- Less/slower traffic on the route to my destination
- Improved personal safety in my neighbourhood or the areas around my destination
- For walking for transport to become more normalised in my social circles
- Improved fitness
- Change in personal circumstances (please describe)
- Other (please describe)

Part 3: Efficient Driving Practices

This section will ask you about your current vehicle and driving practices. Please answer the following questions based on your current situation.

1. Participant name. **Open text box.**
2. Vehicle driven
    a) What model of car do you drive (e.g. Toyota Corola)? **Open text box**.
    b) How is your vehicle powered? **Multi-choice**- full electric, plug-in hybrid, hybrid, petrol, diesel
    c) Why have you chosen this type of vehicle? **Open text box.**

d) What things would encourage you to continue using or switch to a more efficient option (e.g. smaller, electric, or hybrid) when you next purchase a vehicle? **Open text box**

3. Have you considered or used any of the following efficient driving practices? **Multiple questions in same section. Multi-choice-** Yes, I use it, yes, I've thought about it, no I haven't considered it (please explain why)
   a) Eco-driving (managing speed, braking, acceleration)
   b) Carpooling
   c) Working from home at least one day a week
   d) Grouping trips together when driving