



Impacts of a public sector e-bike scheme: Final evaluation report

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Abbreviations and acronyms

C2W	Cycle to Work (UK scheme)
E-bike	electric bicycle
E-cargo bike	electric cargo bicycle
E-scooter	electric scooter
RFP	request for proposal

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Executive summary

Introduction

Waka Kotahi NZ Transport Agency launched the public sector electric bike ('e-bike') purchase support initiative ('national initiative') in late 2019 to make e-bikes more affordable for public sector employees. While not limited to public sector employees, the initiative was initially targeted to the public sector to support government organisations to lead by example in the development of sustainable and active travel programmes that lead to mode shift. The initiative supports employers to establish e-bike purchase schemes in partnership with approved e-bike suppliers. Financial mechanisms to reduce the upfront purchase price may include salary advance, employee loan, product discounts, and interest-free finance terms. Participating e-bike suppliers provide pre-purchase supports such as the opportunity to trial an e-bike and the provision of advice. Some schemes also include pushbikes and electric scooters ('e-scooters'); however, the primary focus is on e-bikes.

Process evaluation

A process evaluation of the national initiative was undertaken between May and September 2020. The evaluation comprised a literature review, a survey of organisations that had registered with the national initiative, and interviews with scheme coordinators, e-bike suppliers, and employees who had purchased e-bikes. The literature review identified seven success factors for effective e-bike support schemes:

- the opportunity to trial e-bikes
- localised/sustained campaigns
- targeted financial incentives
- product range, simplicity, and accessibility
- integration with other enablers
- a partnership approach
- monitoring and evaluation.

The design and implementation of the national initiative was examined against these success factors as well as other criteria.

As of May 2020, 112 public sector organisations had registered interest in the initiative, and 58 completed the organisation survey. At the time of the survey (May to June 2020), 22 organisations had established an e-bike purchase scheme and 13 were establishing schemes. However, 60% of organisations reported that COVID-19 had impacted their planning or progress, and many anticipated the further development and roll-out of schemes. These findings indicated that at the time of the survey there was significant further potential yet to be realised under the initiative.

The process evaluation found that the national initiative performed strongly on being of relevance to stakeholders, being easy to understand, access, and implement, and offering effective pre-purchase supports. Recommendations were made to further enhance performance on these criteria, and future initiatives should be cognisant of these. The process evaluation found lower performance on having effective financial incentives and being equitable and sustainable. For example, salary advance or employee loans are generally not available to core public service staff, leaving product discounts and interest-free terms as the primary incentives offered. The evaluation showed that discounts alone, of the magnitude sustainable for suppliers, are unlikely to address the price barrier for lower-income earners. Suppliers also questioned the equity and sustainability of discounts if these were the only incentives available, principally because the

investment risk fell totally on suppliers. These findings suggested that further attempts should be made to increase access to salary advance and employee loan facilities. The process evaluation concluded that purchase subsidies may also be required for any initiative to perform more satisfactorily on equity and sustainability criteria.

See Appendix G for the process evaluation executive summary.

Outcome evaluation

An outcome evaluation of the national initiative was undertaken between March and April 2021. This part of the evaluation examined whether assistance to purchase an e-bike, pushbike, or e-scooter through the national initiative led to their use for trips previously undertaken by car. The evaluation consisted of an online survey of employees from organisations registered with the national initiative and that offered e-bike schemes. Where possible, the survey was targeted to employees known to have purchased any type of bike or an e-scooter through a scheme. A total of 492 employees completed the survey, with 26% ($n = 130$) having purchased an e-bike or e-scooter through a scheme ('direct purchasers'). Another 16% of respondents ($n = 80$) reported purchase of any type of bike or an e-scooter that was somehow influenced by a scheme ('influenced purchasers'). A further 20% of respondents ($n = 98$) already owned an e-bike before the schemes were available ('existing e-bike owners'). Most ($n = 165$) of the direct and influenced purchasers had bought an e-bike. Most e-bikes purchased were urban/commuter types ($n = 124$), although electric mountain bikes ($n = 41$) were also bought.

Almost half (48%) of the employees who bought an e-bike were female, and 39% were male (13% gave no answer or preferred not to answer). The majority of e-bike purchasers were in an older age category, with 62% over 40 years of age. Three-quarters of the e-bike purchasers who provided their ethnicity were New Zealand European, and about 8% were Māori. Just under half (46%) of the e-bike purchasers had a pre-tax total household income of \$100,000 or more, while a third reported an income of less than \$100,000.

The majority of respondents who bought an e-bike, either directly through a scheme or because they were influenced by a scheme, were using their e-bikes for commuting. On average, commuting trips were by far the most common type of weekly trip being undertaken (6.3 trips). The average number of weekly e-bike trips increased as the length of ownership increased, a finding which suggests that uptake and mode shift continue to develop over time.

On average and for most trip types examined, at least 50% of current weekly e-bike trips were trips previously undertaken by car. Existing e-bike owners reported an average of 63% of current weekly e-bike commuting trips previously undertaken by car. For e-bike purchasers, the average was 48%. Car trip replacement also increased as the length of e-bike ownership increased, a finding that again suggested the ongoing accrual of mode shift outcomes over time.

Existing e-bike owners estimated an average of 90 km now biked weekly (all trips) that had, prior to purchase, been travelled by car. E-bike purchasers estimated a weekly average of 64 km of previous car travel replaced, while this result for pushbike riders was 44 km. The average number of kilometres replaced was also shown to increase as length of ownership increased.

Modelling the average five-day weekly car travel replacement result for e-bike purchasers to 10% of all public sector employees gave a total of 96,397,600 km of car travel replaced annually, with this equating to 18,508,339.2 kg of carbon emissions saved each year.

Other results from the employee survey strengthened the conclusion that impacts from the national initiative are of value and significance. Over a third (39%) of employees who purchased an e-bike through an employer scheme reported their purchase would have been 'unlikely' or 'very unlikely' in the absence of a

scheme. Employees who purchased an e-bike reported an average of 3.2 weekly days of physical activity prior to their purchase and 4.4 days following. For those who bought a pushbike, the result was 4.0 days before and 4.4 days following. Multiplying the increase in days by the total number of respondents in each group gives a total weekly increase of 174 days for e-bike purchasers and 12.4 days for pushbike purchasers. About a quarter of employees who purchased any type of bike reported they were now more likely to reduce or not increase the number of cars in their household. A significant proportion of e-bike purchasers described having encouraged others to also buy an e-bike or to trial riding one. Many reported positive family impacts, including the ability to bike with children and for partners to bike together.

Future directions

We conclude that e-bike support initiatives in Aotearoa New Zealand should continue to be designed to meet criteria of relevance, awareness, access, efficiency, and ease. The evaluation confirms the importance of financial incentives in enabling the purchase of e-bikes. However, it is concluded the national initiative is performing less strongly on having effective incentives, particularly those which reduce the purchase price sufficiently for people on lower incomes. The evaluation found that product discounts offered through schemes were often similar to those available to the general public. Many employees who bought e-bikes did so independently of schemes or reported they would have purchased anyway in the absence of a scheme. Buyers were also generally skewed to higher-income earners. Employees commonly advocated for enhanced financial incentives, including greater price discounts. Suppliers interviewed in the process evaluation questioned the feasibility, equity and sustainability of discounts alone, and described design barriers to achieving bulk purchase discounts. These findings further reinforce the importance of making salary advance and employee loans as widely available as possible and suggest that purchase subsidies may ultimately be required in the mix of incentives.

The evaluation confirmed the importance of providing the opportunity to trial e-bikes and support to ensure that local schemes receive necessary leadership buy-in, senior management support, and commitment of resources. Scheme coordinators may require further training, particularly if they are not experienced cyclists themselves. Future initiatives should also consider how interventions can be integrated with other enablers of e-bike uptake. This might include expanding the scope of interventions – for example, supporting access to safety and security equipment and supporting the development of facilities such as secure parking and end-of-journey facilities.

Conclusion

The evaluation concludes that, to date, the national initiative has achieved outcomes of considerable merit and worth. The demand for and relevance of e-bike schemes were confirmed. The initiative is performing strongly on important success criteria, and a roadmap for further design improvements is provided. Reported e-bike uptake and mode shift outcomes should give confidence that further investments in e-bike schemes are warranted. The evaluation confirms the need for financial incentives that sufficiently reduce the purchase price of e-bikes. Further consideration is needed to determine the best mix of incentives that will stimulate widespread uptake and address the price barrier for those on lower incomes.

Abstract

The public sector e-bike purchase support initiative ('national initiative') was launched by Waka Kotahi NZ Transport Agency in late 2019 to make e-bikes more affordable for public sector employees. While not limited to public sector employees, the initiative was initially targeted to the public sector to support government organisations to lead by example in the development of sustainable and active travel programmes. Participating employers establish purchase support schemes in partnership with approved e-bike suppliers. Financial mechanisms can include salary advance, employee loans, discounts on e-bikes and accessories, and interest-free finance terms. Other supports include opportunities to trial e-bikes, and pre-purchase information and advice.

A 2020 process evaluation examined the design and implementation of the initiative and gave direction to further design enhancements. An outcome evaluation conducted early in 2021 examined how many trips previously undertaken by cars were now being undertaken by e-bikes that were purchased either directly through employer schemes or because the purchasers were influenced by employer schemes. The evaluation found that on average and for most trip types examined, at least half of current weekly e-bike trips were trips previously undertaken by car. The replacement result for commuting trips specifically was even higher. For e-bike and pushbike riders alike, the replacement rate equated to a significant number of kilometres now biked weekly that had previously been travelled by car.

Overall, we conclude that, to date, the national initiative has achieved outcomes of considerable merit and worth. Reported e-bike uptake and mode shift outcomes should give confidence that further investments in e-bike schemes are warranted. However, further consideration is needed to determine the best mix of incentives that will stimulate widespread uptake and that will address the price barrier for those on lower incomes.

1 Introduction

1.1 The national e-bike purchase support initiative

Electric bikes ('e-bikes') extend the range of destinations people can access (Langford et al 2013) and can support a shift to active, lower cost, and sustainable transport modes (Cairns et al 2017; Johnson and Rose 2015; Plazier et al 2017a). However, for many people the upfront cost of purchasing an e-bike can be a significant barrier to uptake (Wild and Woodward 2019). Prices for e-bikes range roughly between \$1,400 and \$12,400. There is considerable evidence that reducing this barrier can increase uptake, particularly for lower-income users (Johnson and Rose 2015; Simsekoglu and Klöckner 2018; Wolf and Seebauer 2014).

Other countries, mostly in Europe, have developed e-bike incentive schemes to accelerate the uptake of e-bikes as a mode of transport and reduce car travel (European Cyclists Federation 2016; McQueen et al 2019). Schemes typically seek to reduce barriers to entry and encourage travel behaviour change through financial incentives and other supports (McQueen et al 2019). Incentivising the uptake of e-bikes is a more cost-effective way to decarbonise the transport system than incentivising electric vehicles (European Cyclists Federation 2016).

Market analysis by ViaStrada Ltd shows substantial growth in e-bike sales in Aotearoa New Zealand, with further growth predicted (Lieswyn et al 2017). Further data confirms recent significant increases in e-mobility (Gregory et al 2021). Other countries show that e-bikes have the potential to make up a significant proportion of the bike market. For example, in Belgium, Austria, and the Netherlands, e-bikes account for 30% of total bike sales (Newson and Sloman 2019). Reviews partially attribute these higher market shares to e-bike incentive schemes (Cairns et al 2017; European Cyclists Federation 2016; McQueen et al 2019).

Waka Kotahi NZ Transport Agency launched the public sector e-bike purchase support initiative ('national initiative') in late 2019 to address the cost barrier to e-bike uptake. The initiative aligns with the Government's intent to increase the uptake of electric vehicles as well as other strategic priorities. The initiative supports public sector organisations to establish purchase support schemes in partnership with approved e-bike suppliers. Financial incentives can include salary advance, employee loan, discounts on e-bikes and accessories, and interest-free finance terms through the retailer. Approved e-bike suppliers are expected to provide pre-purchase supports such as demonstration events, information, and advice.

1.2 Evaluation of the national initiative

Mackie Research, with Auckland University, was commissioned by Waka Kotahi to evaluate the national initiative. The evaluation seeks to advance understanding of success factors for effective e-bike support schemes, and how such schemes can work best within Aotearoa New Zealand. The impact of the national initiative on cycling uptake and mode shift was also examined. The findings will inform the further development of e-bike support schemes in Aotearoa New Zealand, including potentially the further roll-out of the national initiative.

1.3 Overview of this report

Section 2 of this report details the evaluation purpose, objectives, and key evaluation questions. Section 3 details the evaluation design, methods, and limitations. The evaluation findings are presented in section 4, which includes a summary of the previously reported literature review (Hawley et al 2020) and process evaluation (Blewden et al 2020). All the evaluation findings are integrated and discussed in section 5, followed by a short conclusion.

2 Evaluation purpose and objectives

2.1 Evaluation purpose

The evaluation seeks to help government and industry to better understand how e-bike purchase support schemes can best be implemented, if and how they can be used to improve access to active modes of travel, and if they are successful in enabling mode shift.

2.2 Evaluation objectives

The objectives and evaluation questions are shown in Table 2.1.

Table 2.1 Evaluation objectives and key evaluation questions

	Objective	Key evaluation questions
1	To identify the key components of an effective e-bike purchasing initiative.	<ul style="list-style-type: none"> How and to what extent has the national initiative been implemented to date? What are success factors for an employer e-bike purchase support initiative in the Aotearoa New Zealand context?
2	To determine whether assistance to purchase an e-bike leads to greater uptake in e-bike use for trips that would have otherwise been undertaken in a motor vehicle, and if so, how the uptake manifests over time.	<ul style="list-style-type: none"> Is uptake different for different groups (eg, gender, income, age, ethnicity, level of current exercise), different types of e-bike purchased, and different regional factors (eg, topography, cycling network development, existing mode share)? How would trips now taken on an e-bike have been taken previously, and does this mode transfer differ for various trip types?
3	To identify how e-bike purchasing initiatives would be best rolled out in the future.	<ul style="list-style-type: none"> What have we learnt from the e-bike purchasing initiatives in terms of shaping future e-bike mode shift initiatives?

3 Evaluation approach and methods

3.1 Evaluation approach

The national initiative piloted a range of supports to the establishment and execution of e-bike purchase support schemes. At the time of the process evaluation (mid-2020), the initiative was in an early stage of implementation, and the evaluation overall sought to advance understanding of what an effective initiative in Aotearoa New Zealand would look like. For these reasons, the overall evaluation approach drew from formative evaluation (Dehar et al 1993) and learning-orientated evaluation (Watts 2005) approaches, with outcome evaluation a relatively minor part of the overall evaluation.

Formative evaluation is undertaken during the early stages of a programme's implementation to inform programme development. Programme design and implementation is examined to determine whether programmes are operating as intended. Learning-orientated approaches emphasise the use of evaluation to inform programme learning and development. Such an approach is appropriate when evaluation is being used to develop an understanding of best practice.

To examine what an effective support scheme will look like, the evaluation developed an initial set of performance criteria (Table 3.1). The criteria were informed by the objectives of the national initiative, success factors identified from overseas schemes, and stakeholder input. The design and implementation of the national initiative was then examined against the criteria. The criteria may evolve as understanding of effectiveness develops.

Table 3.1 Initial criteria of an effective e-bike purchase support scheme (Blewden et al 2020)

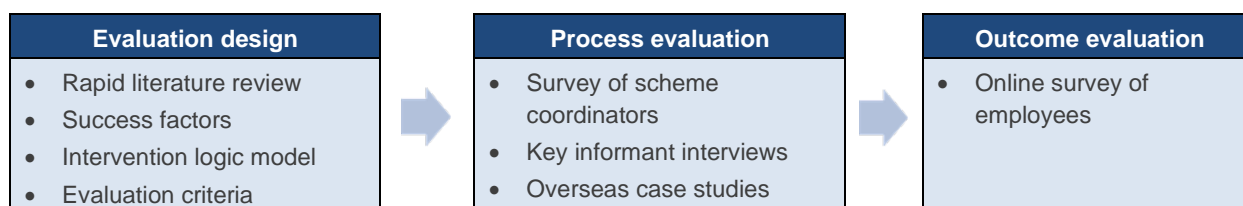
Criteria	Dimensions
Relevance	Strong interest and uptake by employers.
	Senior level organisational support.
	Alignment between the objectives of the national initiative and strategic priorities of employers.
	Alignment between the objectives of the national initiative and objectives of e-bike suppliers.
	Appropriate range of e-bikes (however, range does not exclude specific types of users and uses).
	Satisfaction for employers and employees that e-bike suppliers are meeting their needs.
	National initiative delivers benefits and value to participating e-bike suppliers.
Awareness and access	Employers are aware of and understand the national initiative.
	Employees are aware of and understand their employer's scheme. Communications and promotions are localised, tailored, and motivating.
	Employers to access the national initiative relatively easily.
	Employees to access their employer's scheme relatively easily.
Efficiency and ease	It is relatively easy for organisations to participate in the national initiative.
	It is relatively easy and efficient for employees to participate in their employer's scheme.
	Requirements and criteria to be an approved e-bike supplier are appropriate.
	Financial mechanisms/incentives are easy and efficient to set up and administer.
Effectiveness	Systems/processes under the national initiative support participation by employers.
	Pre- and post-purchase support is available to employees (eg, try before you buy, short-term trials).
	Safe, high-quality e-bikes are incentivised through the initiative and within schemes.

	Financial mechanisms effectively address the upfront cost-of-purchase barrier.
	Appropriate e-bikes are purchased through the scheme (ie, appropriate to the purchaser’s needs, intended use, motivations, experience and capability).
	Purchase of an e-bike leads to mode shift from cars.
	Purchase of an e-bike has a positive impact on improving the rider's physical fitness.
Sustainability	Uptake and use of e-bikes is supported and sustainable (eg, e-bike security, storage).
	Purchase of an e-bike leads to owners reconsidering car ownership (number of cars per household).
	There is high likelihood that employers will continue to participate in the national initiative.
	Running e-bike purchase support schemes is sustainable for employers.
	Being a preferred e-bike supplier is sustainable for suppliers.
Equity	Type/profile of employers participating in the national initiative.
	Type/profile of employees purchasing e-bikes.
	Effectiveness of financial mechanisms for different income groups. For example, lower-income employees may require additional supports and subsidies.
	Mutual benefits for government, suppliers, employers, and employees.

3.2 Evaluation stages

The evaluation comprised an initial design stage followed by the process and outcome evaluation stages (Figure 3.1).

Figure 3.1 Components of an effective e-bike purchase support scheme



3.2.1 Design stage

A rapid literature review was undertaken to identify design and implementation characteristics of similar overseas initiatives and key success factors (Hawley et al 2020). The review informed a draft intervention logic model (Appendix A) and the criteria in Table 4.1. The key findings from the literature review are summarised in section 4.1.1 of this report.

3.2.2 Process evaluation

The process evaluation examined the design and implementation of the national initiative and advanced understanding of success factors. The executive summary from the process evaluation report is presented in Appendix G.

The process evaluation comprised the following methods.

3.2.2.1 Survey of coordinators

In May 2020, a SurveyMonkey online survey (Appendix B) was sent to all 112 public sector organisations recorded by Waka Kotahi as having registered interest in the national initiative. The survey findings provide

information on the implementation of schemes as of May to June 2020. Areas examined included reasons for organisations being interested in the initiative, scheme design and implementation, including the impact of COVID-19, use and satisfaction of available supports under the initiative, the number of e-bikes purchased to date, and future intent.

The survey was sent to the person identified by each organisation as their contact person for the initiative; however, this person did not necessarily complete the survey. For consistency, respondents to the organisation survey are referred to in this report as ‘scheme coordinators’.

The survey was open between 15 May and 5 June 2020, and 58 surveys were completed (response rate 52%). The data was exported to Excel and analysed using quantitative and qualitative data analysis procedures.

The survey findings were previously reported in detail (Blewden et al 2020). Key findings are summarised again in this report.

3.2.2.2 Key informant interviews

Twenty key informant interviews were conducted between 8 June and 17 July 2020. Participants included scheme coordinators, e-bike suppliers, and employees who had purchased an e-bike. The interviews were conducted by telephone or video conferencing using interview guides tailored to each stakeholder group (Appendix C). Appendix D provides the participant information sheet and consent form. With participants’ consent, all interviews were audiotaped. Key findings were identified using thematic analysis.

Eight interviews were conducted with **scheme coordinators**, with participants drawn from the organisation survey (Table 3.2). Participants represented a range of organisations by progress in establishing schemes, sector, organisation size and type (eg, ministries, local government, district health boards), and location. Participants held a variety of roles, including transport planning, human resources, fleet management, health and safety, and sustainability.

Table 3.2 Number and progress of scheme coordinators interviewed

Progress	Number
Scheme established; employees have ordered/received e-bikes	5
Scheme established; employees have not yet ordered/received e-bikes	1
Scheme in process of being established	1
Organisation has decided not to establish a scheme	1

Interviews were conducted with five out of the eight approved **e-bike suppliers** participating in the national initiative. The interviews were targeted to suppliers identified from the organisation survey as having the most involvement in the scheme to date.¹

Seven interviews were conducted with **employees** who purchased an e-bike directly through their employer’s scheme (‘direct purchasers’) (Table 3.3). Participants were recruited via scheme coordinators who were willing to assist with recruitment. A convenience sampling approach was adopted while seeking a mix of participants by type of e-bike purchased,² cycling experience, and gender.

¹ Based on the supplier/s named by organisations as participating in their schemes.

² With a focus on commuting bikes.

Table 3.3 Number and type of scheme participant interviews

E-bike type purchased		Active travel experience		Gender	
Commuting	Sports/ Mountain bike	Some	Little/No	Male	Female
6	1	4	3	2	5

The key informant interview findings were previously reported in detail (Blewden et al 2020). Key findings are summarised again in this report.

3.2.2.3 Overseas case studies

Further literature review and interviews were undertaken to provide deeper understanding and to draw relevant learning from three overseas initiatives. A brief case study was written for each initiative (Appendix E).

3.2.3 Outcome evaluation

3.2.3.1 Online survey of employees

The outcome evaluation was conducted between March and April 2021 and comprised an online survey of employees from organisations that had registered in the national initiative (see Appendix F for the survey). Areas examined included product type purchased, influence of schemes in the purchase decision, number and types of trips taken, mode shift, other impacts on travel, and impacts on physical activity. 'Trips' were defined as a one-way movement between a start point (origin) and a destination using the same mode of travel.

Note: The survey was also open to employees whose purchase of an e-bike, pushbike, or e-scooter was in some way influenced by an employer scheme but not directly conducted through a scheme. This group is referred to as 'influenced purchasers'. The survey was also open to employees who already owned an e-bike before the schemes were available (referred to as 'existing e-bike owners').

Note: For most analyses, the findings for direct and influenced purchasers are combined to ensure the evaluation captures impacts that can at least be indirectly attributed to schemes. However, findings for existing e-bike owners are generally reported separately to e-bike purchasers.

As pre-purchase travel data was not available, respondents were required to recall both pre- and post-purchase trips in the employee survey. Respondents were also asked to calculate the number of trips previously undertaken by car now undertaken by e-bike or e-scooter and the total number of kilometres previously travelled by car.

The draft survey was pre-tested with nine employees from three participating organisations, with the pre-test informing minor revisions. Waka Kotahi then sent an email invitation and URL link to the survey to 59 scheme coordinators who were willing to distribute the survey to employees. Coordinators either sent the invitation and link directly to employees who had purchased an e-bike (records permitting) or to all employees if needed. Employees who did not purchase an e-bike through a scheme or who did not already own an e-bike were asked a limited number of questions. If a purchase was made for someone else in an employee's family, that other person was asked to complete the survey.

The survey was open between 4 and 26 March 2021, and 492 surveys were completed. The data was exported to Excel and analysed using quantitative and qualitative data analysis procedures.

3.3 Evaluation limitations

The process evaluation findings are limited to the perspectives and experiences of the evaluation participants. Approximately half of organisations registering interest in the national initiative did not complete the organisation survey. Three of the eight approved e-bike suppliers participating in the initiative were not interviewed.

The accuracy of the number of e-bike purchases reported in the 2020 organisation survey cannot be verified. It is not known how many scheme coordinators kept accurate records of purchases and how many have reported estimates only. Due to respondent error, three respondents with established schemes did not report the number of e-bikes purchased.

To reduce response burden, respondents to the organisation survey were not asked about the type and model of e-bikes purchased. Uncertainty about the accuracy of available sales data informed this decision. Due to commercial sensitivities, e-bike suppliers were also not asked to disclose sales data.

As pre-purchase travel data was not available from other sources, respondents to the employee survey were asked to recall their travel behaviour before and after purchase. Pre-purchase travel estimates may decrease in accuracy as the length of time since purchase increases.

Respondents to the employee survey were asked to estimate the total (ie, all trips combined) number of weekly trips now travelled by e-bike, pushbike, or e-scooter that prior to purchase were travelled by car. This question and the required calculation were carefully pre-tested for comprehension and feasibility. However, a number of respondents undertook an incorrect calculation,³ and these responses were removed from the analysis.

Note: To minimise response burden, and after consultation with Waka Kotahi, the employee survey examined only mode shift from car and did not examine mode shift by trip type. Consequently, the evaluation does not fully address all the mode shift questions originally specified for the evaluation.

The e-bike mode shift data collected through the employee survey is limited to the number of respondents who were existing e-bike owners or who were direct or influenced e-bike purchasers. It is not known how many employees in total have bought an e-bike through an employer scheme, and therefore an overall purchase rate cannot be calculated. Similarly, an overall car trip displacement result attributable to the national initiative is also not possible.

³ The number of replacement trips given was larger than the number of current weekly trips.

4 Evaluation findings

4.1 An effective e-bike purchase support initiative

4.1.1 Literature review findings

The literature review (Hawley et al 2020) identified nine characteristics of an effective e-bike purchase support scheme (Figure 4.1). Each characteristic is summarised following the figure. Overall, the review recommended a co-design approach, iterative roll-out, and evidence-based decision making. Attention to ensuring schemes are accessible to low-income and other vulnerable groups was also stressed.

Figure 4.1 Components of an effective e-bike purchase support scheme



Source: Hawley et al 2020

4.1.1.1 Level and structure of the financial incentive

Schemes employ a range of financial mechanisms to reduce cost barriers. A range of factors (eg, scheme budget, target groups, tax law) influence what approaches are used and shape how and for whom schemes operate. Mechanisms can include partial purchase subsidies, discounts funded by e-bike retailers, employer-sponsored programmes, and government-sponsored loans. Accessibility for low-income and other vulnerable groups must be addressed if benefits are to be equitable. Reducing the cost of e-biking accessories can support access, particularly for those on lower incomes. Approaches should incentivise ‘new’ cycle trips and should subsidise ‘new’ users, rather than simply enabling an e-bike ‘upgrade’.

4.1.1.2 Simple processes

The structure of schemes should be simple. Schemes should be easy to understand, access, and navigate. Leveraging existing systems and channels can be useful.

4.1.1.3 Opportunity to try an e-bike

The opportunity to trial e-bikes prior to purchase can increase the likelihood of uptake and subsequent use. Trials enable people to determine whether and how they will use an e-bike and what type of e-bike will be appropriate. Trials can reduce apprehension about the upfront cost of an e-bike – for example, by providing assurance about value and utility.

4.1.1.4 The type of e-bike

The type/s of e-bikes incentivised is important. Different motivations, experience, needs, and interests need to be accommodated. While schemes should target e-bikes that encourage commuting, the range should not be so restrictive that it excludes other types of users. Schemes should incentivise e-bikes of appropriate quality.

4.1.1.5 Sustained campaigns and local support

Support schemes should be well communicated and backed by sustained campaigns that build consumer awareness. E-bikes should be framed as a ‘normal’ mode of travel to reduce stigma and perceptual barriers. ‘Good news stories’ can help to develop a positive e-biking culture.

Schemes should be localised – for example, located in workplaces, education, or community settings. Access to personalised support and local champions can assist uptake, particularly in settings where e-biking is new or unfamiliar.

4.1.1.6 Security

Concern about e-bike security can be a barrier to uptake, and schemes can include access to security accessories (eg, discounts on locks). Supports may also be provided to the development of secure bike parking.

4.1.1.7 Supporting facilities and infrastructure

While e-bikes may reduce the need to change clothes or shower, access to end-of-journey facilities is still important. Access to charging points may also reduce ‘range anxiety’. Schemes should be integrated as far as possible with existing and future cycling infrastructure.

4.1.1.8 Strategic partnerships

Purchase support schemes require a partnership approach with employers, suppliers, retailers, and other stakeholders. Effective partnerships leverage existing opportunities and deliver equitable benefits.

4.1.1.9 Evaluation and feedback loops

Monitoring/evaluation is important for understanding implementation and outcomes, and for improvement.

4.1.2 Case study findings

Three overseas case studies were compiled: the United Kingdom Cycle to Work (C2W) scheme, the North Brabant (Netherlands) e-bike pay-to-ride scheme (2013–2017), and Scottish initiatives (current). Key findings are summarised below. Each case is presented fully in Appendix E.

4.1.2.1 Scheme descriptions

The C2W scheme is a ‘hire to buy’ salary sacrifice scheme that has been in operation since 1999. The scheme includes all types of bikes, including e-bikes and pushbikes. About 140,000 people participate annually. The North Brabant scheme provided payment for kilometres travelled by e-bike and was integrated

with complementary initiatives (eg, infrastructure, employer purchase subsidies, cycle skills training). The Scottish initiatives complement C2W by funding local authorities and organisations to provide supports such as secure parking, safety equipment, showers at work, e-bike pools, and hire schemes. Interest-free loans are available for individuals and businesses to purchase e-bikes and electric cargo bicycles ('e-cargo bikes'). Other supports include cycle skills training, accreditation of 'Cycling Friendly Employers', and funding to enable pre-purchase trials.

4.1.2.2 Scheme objectives

Both C2W and North Brabant targeted employees and aimed to increase the number of people cycling to work by e-bike. The Scottish initiatives seek to increase the use of e-bikes in all population groups and contribute to an overall target of increasing cycling mode share to 10%.

4.1.2.3 Scheme targeting

Employees eligible for C2W must have employment contracts for more than the 12-month hire period and must earn more than the National Minimum Wage after the deduction of loan repayments. Both conditions may have been set to avoid the risk of an unreasonable debt burden. The Brabant scheme was open to employees aged 18–65 who did not already ride an e-bike and whose commute was undertaken by car at least 50% of the time. The Scottish initiatives have a wider reach, available to people with disability, those unemployed or on short-term contracts, rural people, and for other types of e-bike use in addition to commuting.

4.1.2.4 Scheme mechanisms

Under C2W, employers purchase bikes and hire them to employees for 12 months. Hire cost is deducted monthly from the employee's salary, and after 12 months the employee may renew the hire or buy the bike. The employee saves on income tax and National Insurance contributions while the employer saves National Insurance payments on the reduced salary. Private sector companies can also reclaim Value Added Tax on bike purchases. Third-party providers act as go-betweens, linking employers, employees, and retailers. A historical upper limit (£1,000) on purchases was removed in June 2019.

In the Brabant scheme, kilometres travelled were monitored by a phone app, which also provided ride feedback and access to resources and rewards. Payment to riders was €0.15 per km for travel at peak hours and €0.08 per km at other times, up to a maximum annual payment of €1,000.

4.1.2.5 Scheme outcomes

The Scottish incentives provide grants to businesses and organisations up to approximately £25,000. Interest-free loans of up to £6,000 are available to purchase e-bikes, with a repayment period of four years. E-bikes, e-cargo bikes, and adaptive bikes are included. Workplace initiatives such as the NHS Worker Fund provide grants to staff on temporary contracts and apprenticeships.

C2W typically achieves around a 33% reduction in the purchase price of bikes; however, higher salary earners gain further through additional tax and insurance benefits. Evaluation showed two-thirds of scheme participants increased the amount they were cycling. An overall 250% increase in distance cycled to and from work was reported. Utility cycling also increased, with at least a tripling of the biking proportion for shopping, leisure, visiting and taking children to school. Car travel was reduced on average by about 20 miles per week. Social benefits of reduced work absences and improved physical health were estimated at more than twice the cost of lost tax and National Insurance. However, a Yorkshire evaluation found roughly half of scheme participants already owned a bike and cycled regularly prior to the scheme.

Approximately 10,000 employees registered with the Brabant scheme. The scheme was estimated to reduce peak-hour motor vehicle traffic by about a million cars. Half the e-bike commuting trips recorded replaced car trips. Travel satisfaction increased by 1.4 points on the 7-point Satisfaction with Travel Scale.

There is wide, positive engagement by businesses and organisations in the Scottish initiatives, though limited data is available on cycling for transport outcomes. There was evidence of a positive shift in attitudes by scheme participants regarding the suitability, feasibility, and safety of e-bikes. There was evidence of access by people on low incomes, the self-employed, those occasionally employed, and people with disability.

4.1.2.6 Success factors

Identified success factors for C2W include solid legislative base, scheme simplicity, size of financial incentive, established scheme providers with strong connections with suppliers, and range of bikes. The stability and longevity of the scheme reduces risk for employers and providers. Innovations include try before buy, adapted bikes for those with disability, folding bikes to facilitate integration with public transport, and grants for those on low incomes. Integration with other enablers (eg, secure parking, infrastructure) was shown to enhance outcomes.

Identified success factors for the North Brabant scheme included generous eligibility criteria, generation of mutual benefits (eg, data), strong/close partnerships, high quality/effective communications, and integration with other cycling initiatives and enablers.

Identified success factors for the Scottish initiatives included providing complementary and more localised opportunities from the national C2W scheme, try before you buy, integration with cycling skills training, ring-fenced funding for workplace supports (eg, secure parking, showers), and range of e-bikes, including e-cargo bikes.

4.2 Implementation of the national initiative

4.2.1 Overview of the initiative

The launch of the public sector e-bike purchase support initiative by Waka Kotahi in late 2019 followed the earlier development of a general employer e-bike support scheme in August 2019. The objective of the national initiative is to provide incentives that will increase the uptake of e-bikes by employees. While the initiative is not intended to be limited to public sector employees, the public sector was initially targeted to support government organisations to lead by example in the development of sustainable and active travel programmes.

In principle, the initiative does not prevent organisations from including pushbikes in schemes. However, the primary aim is to reduce the cost barrier to the purchase of e-bikes because they are more likely to induce new riders and to displace car trips. Delivering the scheme was part of the Keeping Cities Moving national mode shift plan. Reflecting this intent, the key success measures for the initiative are the uptake of e-bikes and evidence of trip transfer from private cars to e-bikes.

Using an 'Invitation to Quality' process, Waka Kotahi established a list of eight preferred e-bike suppliers that were able to offer discounts on e-bike purchases and that could meet other supplier criteria (Waka Kotahi NZ Transport Agency 2019). In addition to the supplier panel, other supports under the initiative are:

- an online guide⁴ to establishing an e-bike purchase support scheme and selecting a supplier⁵
- process checklists and templates (eg, scheme proposal template)
- a Microsoft Teams platform enabling sharing and support between participating employers
- facilitation of peer-to-peer support between participating employers
- direct support from Waka Kotahi staff.

Employers interested in the initiative were initially required to register interest with Waka Kotahi and to provide contact details for a scheme coordinator. The online guide recommends that employers should initially conduct a needs assessment to determine potential interest and demand. It is also advised that establishing a scheme requires:

- a proposal backed by appropriate evidence (eg, assessment of potential demand)
- the appointment of appropriate project staff (eg, sponsor, champion, coordinator)
- support and endorsement from senior leaders
- selecting an e-bike supplier to work with (from the pre-approved panel)
- setting up financial mechanisms and incentives (see below)
- marketing and promotion, including demonstration and ‘have a go’ events
- the provision of cycling facilities (eg, storage, parking, re-charging facilities, showers).

4.2.2 Financial mechanisms

In addition to product discounts, the national initiative encourages employers to establish a salary advance or employee loan facility to help employees meet the upfront purchase cost. There are similarities and differences between the two facilities.⁶ A salary advance involves funds being transferred to the employee’s bank account, and the employee is responsible for making payment to the supplier. In the case of a loan, the employer raises the loan and makes the payment directly to the supplier. In both cases, if the purchase price⁷ is more than the amount of the salary or loan amount, the employee is responsible for meeting the additional cost.

For a salary advance, \$2,000 is the maximum amount that can be advanced without incurring Fringe Benefit Tax. While there is no maximum amount for a loan, \$2,000 is a typical figure. If the loan is provided at a preferential interest rate, the benefit is also liable for Fringe Benefit Tax.

The employee pays the salary advance or loan back to the employer through a series of wage deductions over a set period. Individual payroll agreements are established so if an employee ceases employment before completing their repayment, the remaining debt can be automatically debited from their final pay.

Procedures for employers and employees taking part in schemes therefore vary depending on the financial mechanisms employed. If discounting is the only mechanism, employees may simply only need to confirm with the retailer they are employed by a participating organisation.

⁴ The online guide was initially published in August 2019 as a resource for the general employer bike scheme (ie, not limited to the public sector). Further resources were later introduced as part of the November launch of the public sector initiative.

⁵ The guide is available at <https://www.nzta.govt.nz/walking-cycling-and-public-transport/cycling/workplace-cycling-guide/resources/employer-e-bike-purchase-support-schemes/>

⁶ A comparison of the options is available at <https://www.nzta.govt.nz/assets/workplace-cycling-guide/docs/employer-e-bike-purchase-support-schemes-financing-and-payment-options-comparison.pdf>

⁷ Many e-bikes cost in excess of \$2,000.

Legal advice received by Waka Kotahi during the establishment of the initial general employer scheme suggested that section 65K of the Public Finance Act 1989 prevents core government agencies from participating in e-bike purchase support schemes. This Act potentially prevents government agencies from lending money to employees in the form of salary advances or employee loans.⁸

Waka Kotahi unsuccessfully sought ministerial approval to overturn the restrictions through a provision within the Public Finance Act that allows restrictions to be removed if this meets a Public Interest threshold. Public sector organisations are currently advised under the initiative to seek their own legal advice on whether they can offer a salary advance or loan facility.

4.2.3 Scheme establishment

At the time of the organisation survey (May to June 2020) over half (55%) of the respondents had established an e-bike support scheme or were in the process of doing so (Table 4.1).⁹ A further 14% of respondents were deciding whether to establish a scheme, while 5% had decided not to.

Table 4.1 Progress in establishing and implementing e-bike purchase support schemes

Progress	%
Organisation has established a scheme; staff have ordered and received e-bikes	29
Organisation has established a scheme; staff have ordered but not yet received e-bikes	2
Organisation has established a scheme; staff have not yet ordered or received e-bikes	7
Organisation is in the process of establishing a scheme	22
Organisation is in the process of deciding whether to establish a scheme	14
Organisation has not taken any action to decide whether to establish a scheme	5
Organisation has decided not to establish a scheme	5
Other	7
No response	9

Note: $n = 58$

4.2.4 Features of established schemes

Most respondents who had established or were establishing schemes reported the inclusion of demonstration events (84%) (Table 4.2). Supporting communication from senior leaders was also common (78%). About half (47%) reported payback mechanisms such as salary advance; however, some respondents may have included interest-free repayment terms through the retailer in this.

⁸ Note, however, this restriction does not apply to local government organisations.

⁹ Respondents to the organisation survey with established schemes ($n = 22$) collectively reported that a total of 37,870 employees were eligible to take part in schemes.

Table 4.2 Features of established or establishing e-bike purchase support schemes

	'Demo' events (%)	Communications from leaders (%)	Bikes paid back over time (%)
A feature	84	78	47
Not a feature	6	19	38
Not decided	9	3	16

Note: $n = 32$

4.2.5 E-bikes purchased

Collectively, survey respondents identified a total of 236 e-bikes purchased.¹⁰ As discussed, this is an underestimate and there are likely to be other limitations in the data.¹¹

4.2.6 Positive features and challenges

Coordinators who had established or were establishing schemes identified positive features of their schemes to date (Table 4.3). Demonstration events, enabling e-bikes to be trialed, and providing access to information and advice were all reinforced as important.

Table 4.3 Positive features of schemes

Feature	Number of responses
Demonstration days/events	10
Staff interest/positive engagement	7
Discounts offered	2
Expansion of workplace facilities/infrastructure	2
Bikes have been purchased	1
Integration with existing relevant initiatives	1
Too early to say	8

Reported challenges to staff engaging in schemes and to e-bike uptake included staff being unable to attend demonstration events, lack of cycling infrastructure, and the perception that on-road cycling was unsafe.

4.3 Process evaluation performance assessment

This section summarises the findings from the process evaluation on the performance of the national initiative at the time of the process evaluation. The summary is focused on advancing understanding of success factors. The criteria identified in the evaluation design stage are used to structure the summary. Note: These criteria

¹⁰ From an estimated total of 37,870 eligible employees. The number of e-bikes purchased is an underestimate due to respondent error completing the survey (ie, three respondents with established schemes through which e-bikes have been sold did not provide data on the number of bikes).

¹¹ Sales data reported by three of the main suppliers in the initiative showed that approximately 800 bikes had been purchased through schemes as of November 2020. Data on what proportion of these bikes were e-bikes was not available to the evaluation.

were informed by the success factors identified through the literature review, but they are not identical to those factors.

4.3.1 Relevance

The national initiative performed strongly on the criterion of relevance. Scheme coordinators reported support schemes as relevant, attractive, and of interest to their organisation. There was alignment between the objectives of the national initiative and organisational objectives or areas of interest. These areas included staff health and well-being, improving access to sustainable and healthy transport options, and environmental goals.

Scheme coordinators identified staff health and well-being as a key reason for their organisation's interest in the initiative. Ensuring schemes supported a range of e-bikes and pushbikes, as well as types of biking, was therefore considered important by many. E-bike suppliers also felt schemes should offer a range of bikes, including e-bikes and pushbikes. Note: These preferences could be considered inconsistent with the primary aim of the national initiative, which is to reduce the cost barrier to the purchase of e-bikes because they are more likely to induce new riders and displace car trips.

The process evaluation confirmed that effective schemes require senior leadership support and the commitment of resources. Promoting the longer-term cost savings of e-bikes (despite the upfront cost) and the longer-term benefits of schemes (eg, improved health of employees) may help to secure both inputs.

E-bike suppliers reported alignment between the objectives of the national initiative and business, social, and health objectives of importance to them. However, most suppliers interviewed were yet to see a return on their investment, and some doubted the initiative would fully realise its potential in the current form. Suppliers noted heavy discounting was not a sustainable business practice and described constraints on their ability to achieve bulk purchase discounts. For example, once a commitment to purchase was made, customers generally wanted immediate access to their e-bike rather than waiting until the end of a scheme and the placement of a bulk order. Purchases through schemes also generally occurred at different times, making it further difficult for suppliers to commit to an upfront bulk purchase.

4.3.2 Awareness and access

The process evaluation findings confirmed that to be effective, a national e-bike purchase support initiative needs to have high awareness amongst target groups and must be easy to understand and access. Coordinators agreed it was relatively easy to understand what the national initiative offered and how to take part. Information and supports available were mostly useful to those who had accessed these. However, coordinators sought greater access to personalised and timely support when required. This support may be particularly important for organisations with less experience developing cycling initiatives.

Employees interviewed agreed that it was relatively easy to access and understand their employer's scheme. Employees valued having schemes 'brought to them', having easy access to information, and having the opportunity to trial an e-bike.

The process evaluation found that uncertainty about the legality of schemes had been a barrier to some organisations establishing schemes. Legal issues applying to wage advance, employee loan facilities, and health and safety responsibilities were discussed previously in section 4.2.2.

4.3.3 Efficiency and ease

The process evaluation findings confirmed that an effective national e-bike purchase support initiative must be easy for organisations and staff to participate in. Coordinators confirmed that taking part in the national initiative was relatively easy, and employees reported the same in respect to their employer's scheme.

Coordinators valued the efficiencies of having a single national supplier panel and access to resource templates. Once established, schemes were generally easy to manage. However, effective schemes also needed to generate 'buzz', conversation, and momentum. This required leadership drive, resourcing, and comprehensive engagement and communication.

Coordinators reported the main cost to organisations when establishing schemes was staff time. Salary advance was the most time consuming and potentially challenging to establish. Organisations should be advised to carefully assess demand before establishing the facility.

E-bike suppliers also reported it was relatively easy to participate in the national initiative. They were satisfied with the application process for joining the preferred supplier panel and valued the efficiency of having a single panel. Supplier criteria were considered fair and appropriate. Business operations under the initiative had, to date, largely fitted within existing systems and capacity.

Suppliers observed that in the absence of wage advance, discounting became the primary incentive, and the responsibility and cost of this lies fully with them. Some considered this to be inequitable and therefore questioned the long-term sustainability of the initiative.

4.3.4 Effectiveness

An effective e-bike purchase support initiative needs effective mechanisms for supporting the purchase of an e-bike and reducing the upfront cost. Employees interviewed were generally satisfied with pre-purchase supports available. Demonstration days enabled trials and provided access to information and advice, enabling employees to consider the appropriateness and type of e-bike. Demonstration events could also be an enjoyable and social staff activity.

Some employees were not aware of any additional support, education, or trial opportunities as part of their schemes. In such cases, it would appear schemes were primarily experienced as a discount offering.

The process evaluation suggested the effectiveness of salary advance or employee loan as an incentive could be influenced by a range of factors (eg, employee income, whether competitive interest-free terms were also available). Reflecting this, participants had different perspectives regarding these facilities. Those who had experienced low uptake questioned the cost effectiveness of establishing them, given the time and resources required. Suggested explanations for low uptake included that interest-free terms through the retailer could be more attractive and that staff could be reluctant to take on two debt commitments.¹²

Other participants believe that a salary advance or loan facility was critically important if schemes were to provide an incentive beyond product discounts. These facilities signalled the employer's commitment and support to schemes and to wider objectives. Lower-income employees were considered less likely to be reached without such facilities, with discounting alone considered unlikely to address the price barrier.¹³ Lower-income employees in general may require additional supports.

The process evaluation reinforced the importance of workplace demonstration days and the opportunity for employees to trial e-bikes. Easy access to pre-purchase information and advice is also important. Reported barriers to engaging staff in schemes included:

- insufficient internal communications

¹² Limits on the amount of salary that can be advanced means that purchasing a more expensive bike may also require employees to enter into an additional interest-free repayment contract through the retailer.

¹³ Whether lower-income employees may be more or less willing to enter into salary advance or loan agreements was not examined in the evaluation.

- constraints on the ability of staff to attend demonstration events
- staff not feeling mandated to attend events during work hours
- staff not being sufficiently incentivised by discounts alone.

The evaluation indicated the value of further supports in addition to demonstration events. More tailored support could address more personal barriers such as body consciousness, safety concerns, and confidence. The value of extended trial periods – allowing ‘real life’ trialling over time – was also indicated. Communications that help employers and employees to ‘reinterpret’ the upfront cost of an e-bike may also be useful. An important message is that, assuming a sufficient level of use, the upfront capital cost is offset over time by minimal ongoing operational costs.

E-bike suppliers also confirmed that effective schemes require considerable input from participating organisations – in particular, senior leadership commitment, resourcing, and appropriate skills (eg, marketing, project execution). Given this, suppliers had experienced schemes of variable quality, uptake, and yield. A degree of business risk was therefore inevitable. This risk could be accentuated when a salary advance or employee loan facility was not available because this meant that the successful execution of other elements of schemes became even more critical to success (eg, the effective communication of schemes, ensuring staff could easily attend demonstration events). However, performance on these dimensions could be variable. Suppliers reported a number of responses to minimise business risk. One suggested that for some suppliers this may include scaling back sales supports.

Some suppliers were concerned there could be further pressure to reduce margins if discounting remained the only incentive. A smaller supplier noted a low-margin, high-volume approach was only likely to be viable for larger suppliers and if accompanied by minimal sales support. The risk that price pressures might undermine the willingness of suppliers to provide pre- and post-sales support was of particular concern to suppliers who stressed these inputs as critical to success (ie, well informed consumers buying and safely riding an e-bike appropriate to their needs). Overall, these findings indicate salary advance and employee loan facilities should be made as widely available as possible. The need to investigate other financial incentives, such as product subsidies, is also indicated.

One supplier believed that current schemes were realising about 20% of potential and were unlikely to reach new riders. In their experience, barriers to executing effective schemes were more pronounced in larger organisations, particularly when schemes were insufficiently resourced and the range of levers¹⁴ being used was limited.

The process evaluation interviews with employees showed schemes could accelerate the decision to purchase an e-bike or could move pre-contemplators to contemplation. For example, a product discount combined with payment over time could make it attractive to buy ‘now’. Other factors that supported the purchase decision included easy access to e-bikes and the opportunity to trial e-bikes, the ease of accessing schemes, and the heightened awareness and interest generated by schemes.

Employees commonly weighed-up the purchase cost against their anticipated use of the e-bike. Higher anticipated use was generally associated with greater comfort with the purchase. Assurance the e-bike would meet its intended use was therefore also important in decision making.

¹⁴ For example, senior leadership drive and support, salary advance, comprehensive marketing, other supporting behaviour change strategy.

Six of seven employees interviewed purchased a commuter style e-bike as commuting was their primary intended use. However, e-bikes were also being used for utilitarian and leisure purposes. Employees identified a number of ways their e-bikes supported commuting, including:

- enhanced ability to bike the distances required and manage the physical demands of the commute
- reduced travel time and greater travel time reliability
- ability to avoid parking difficulties and costs
- ability to avoid the congestion of public travel
- ability to bike in work clothes.

4.3.5 Sustainability

An e-bike purchase support initiative should be relatively easy to maintain and continue over time. Process evaluation on this criterion was difficult due to COVID-19 disruptions. There was a common view that schemes were most appropriately executed over spring and summer. At the time of the organisation survey, many respondents indicated they were likely to take further future action under the initiative. All employees interviewed supported the continuation of schemes on a regular basis. This would enable new employees to be reached and provide ongoing opportunities to purchase as circumstances and readiness changed over time.

All e-bike suppliers interviewed supported ongoing leadership and advocacy from government in regard to schemes. Most of their recommendations for improvements centred on greater input from government (eg, to reduce duplicated effort and inputs, ensure schemes were more effectively executed, to deliver complementary behaviour change strategies).

Only one larger supplier predicted the initiative in its current form would have a significant future positive impact on their business. Two believed the initiative would be more effective and the investment risk more equitably distributed if subsidies were introduced. Suppliers indicated they would continue under the national initiative if it continued in its current form – however, in some cases, only under conditions or with reservation. Suppliers with existing schemes indicated they would also continue to work through these regardless of what direction the national initiative took.

4.3.6 Equity

The risks and benefits of support schemes should be equally distributed across stakeholders and beneficiaries. Further, all employees should have equitable access to benefits. At the time of the process evaluation, most e-bike suppliers described the national initiative as having imposed greater costs than delivered benefits. Due to design issues (as discussed), some suppliers did not see returns increasing substantially, regardless of how many organisations took part. When a salary advance or employee loan was not available, product discounts became the primary incentive offered. In this situation, the investment risk fell totally on the supplier. Some suppliers questioned the sustainability of discounts within the COVID-19 environment (eg, increased worldwide demand for bikes, supply disruptions).

4.4 Impact of e-bike purchase assistance on mode shift

This section presents the findings of the employee survey, including all findings on the impact of the national initiative on mode shift. Due to the low number of respondents who purchased e-scooters ($n = 7$), the detailed demographic and use findings for these riders are not reported.

4.4.1 Employee survey respondents

A total of 492 employees from 26 organisations¹⁵ completed the 2021 employee survey. Slightly more respondents were female (42%) compared to male (35%); however, one in five did not specify gender (Table 4.4). Almost half (43%) of the respondents who provided their age were between 41 and 60 years old, and over half who specified their ethnicity were New Zealand European (54%). Half (51%) of respondents reported pre-tax total household incomes of \$75,000 and above; about a third did not provide income details.

Table 4.4 Employee survey respondents

Gender	(%)	Ethnicity	(%)
Male	35	New Zealand European	54
Female	42	Māori	5
Prefer not to answer	1	Samoan	1
No answer	22	Chinese	2
Age	(%)	Indian	2
21–25 years	3	Other	11
26–30 years	6	Prefer not to answer	4
31–40 years	17	No answer	22
41–50 years	20	Pre-tax household income	(%)
51–60 years	23	Less than \$50,000	3
61–70 years	6	\$50,000 to \$74,999	10
71 years or older	1	\$75,000 to \$99,999	10
Prefer not to answer	1	\$100,000 to \$149,999	20
No answer	23	\$150,000 or more	21
		Not sure	1
		Prefer not to answer	11
		No answer	23

Note: $N = 492$; may not total 100% due to rounding

4.4.2 Bikes and e-scooters purchased

Just over a quarter (26%, $n = 130$) of respondents purchased an e-bike, pushbike, or e-scooter through a scheme ('direct purchasers'). Another 16% ($n = 80$) reported purchase of an e-bike, pushbike, or e-scooter that was somehow influenced but not purchased directly through a scheme ('influenced purchasers'). A further 20% ($n = 98$) reported already owning an e-bike before a scheme was available to them ('existing e-

¹⁵ Rotorua Lakes Council; Whanganui District Council; Ministry of Health; Ministry for Primary Industries; Rotorua Lakes Council; Canterbury District Health Board; West Coast District Health Board; Accident Compensation Corporation; Massey University; Canterbury Health Laboratories; Greater Wellington Regional Council; South Island Alliance Programme Office (SIAPO); Auckland Transport; Dunedin City Council; Department of Internal Affairs; Hamilton City Council; The Treasury; National Library; Wellington City Council; Christchurch City Council; Enviroschools; Ministry for Culture and Heritage; Te Herenga Waka – Victoria University of Wellington; Waikato District Health Board; Te Aho o Te Kahu, Cancer Control Agency; Bay of Plenty District Health Board.

bike owners').¹⁶ One hundred and eighty-four respondents (37%) were neither direct nor influenced purchasers nor existing e-bike owners.

Table 4.5 shows the type of bikes and scooters bought by direct and influenced purchasers. Consistent with core objectives, two-thirds purchased an e-bike, mostly an urban/commuter type.

Table 4.5 Bike and scooter types purchased

Type	(%)
Electric urban/commuter bike	57
Electric mountain bike	19
Non-electric urban/commuter bike	7
Non-electric mountain bike	11
Electric scooter	3
Something else	3

Note: $n = 217$

4.4.2.1 Length of bike ownership

At the time of the employee survey, the greatest proportion of e-bike purchasers¹⁷ had owned their e-bike for more than 12 months (38%) (Table 4.6). For both e-bikes and pushbikes, a significant proportion of purchasers had owned their bike for six months or less (e-bikes 38%, pushbikes 64%).

Table 4.6 Length of bike ownership

Length of ownership	E-bike purchasers (%)	Pushbike purchasers (%)
Less than 1 month	8	14
1–3 months	18	17
4–6 months	12	33
7–9 months	12	6
10–12 months	11	6
More than 12 months	38	25
Not sure	1	–
	($n = 161$)	($n = 36$)

4.4.3 Demographics of bike purchasers

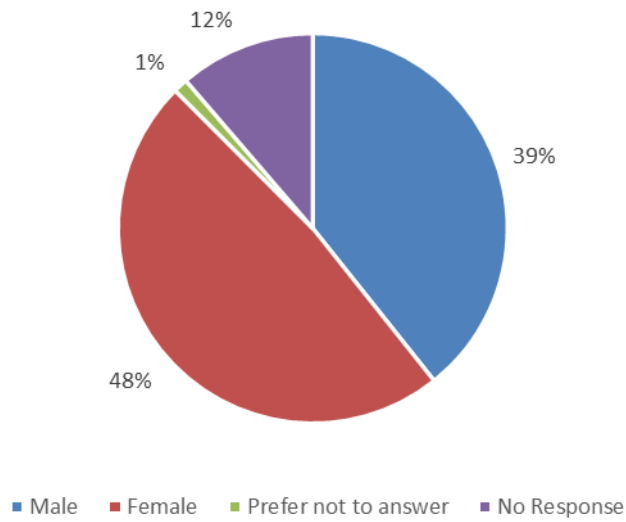
4.4.3.1 Gender

A slightly higher proportion of e-bike purchasers were female (48%) compared to male (39%) (Figure 4.2); however, this pattern was reversed for pushbike purchasers (Figure 4.3).

¹⁶ Note that existing e-bike owners were asked all questions about the use of their e-bikes and trips made.

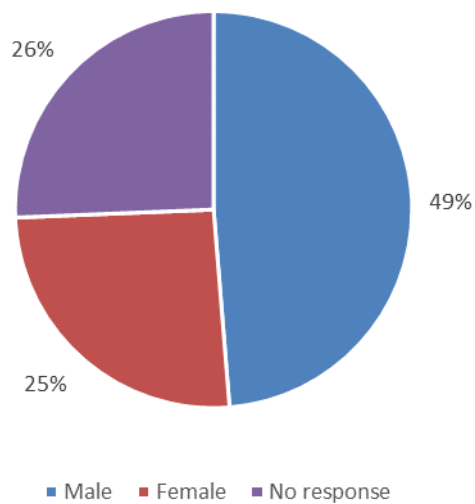
¹⁷ Throughout this section, the term 'purchasers' includes both direct and influenced purchasers.

Figure 4.2 Gender of e-bike purchasers



Note: $n = 168$

Figure 4.3 Gender of pushbike purchasers

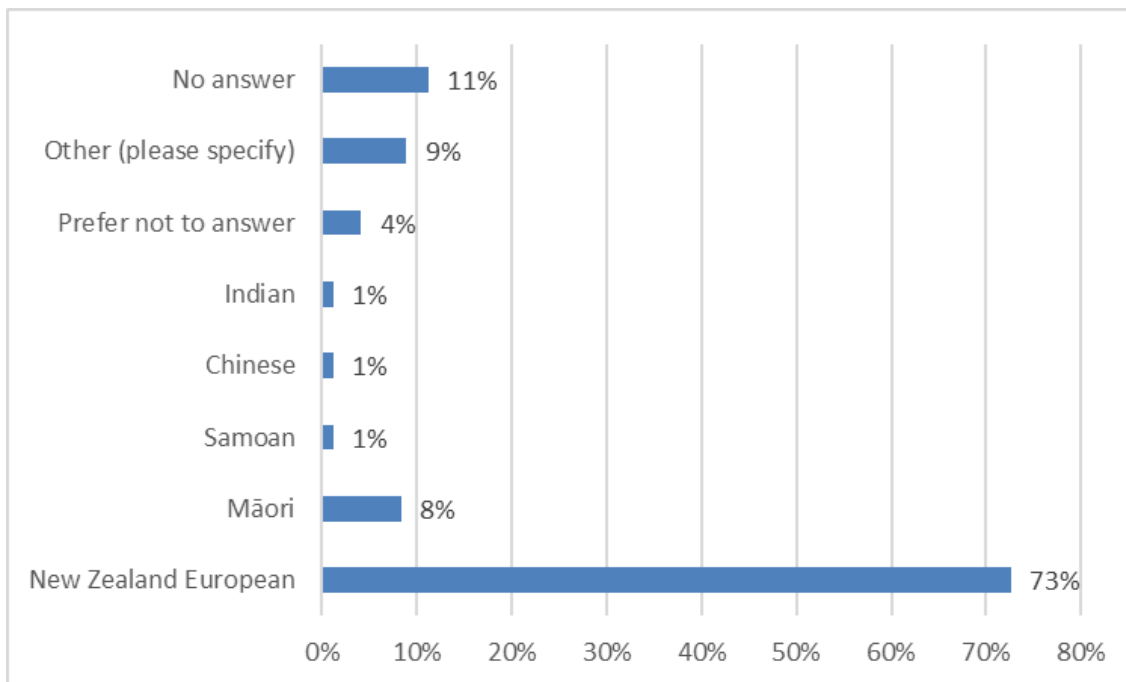


Note: $n = 39$

4.4.3.2 Ethnicity

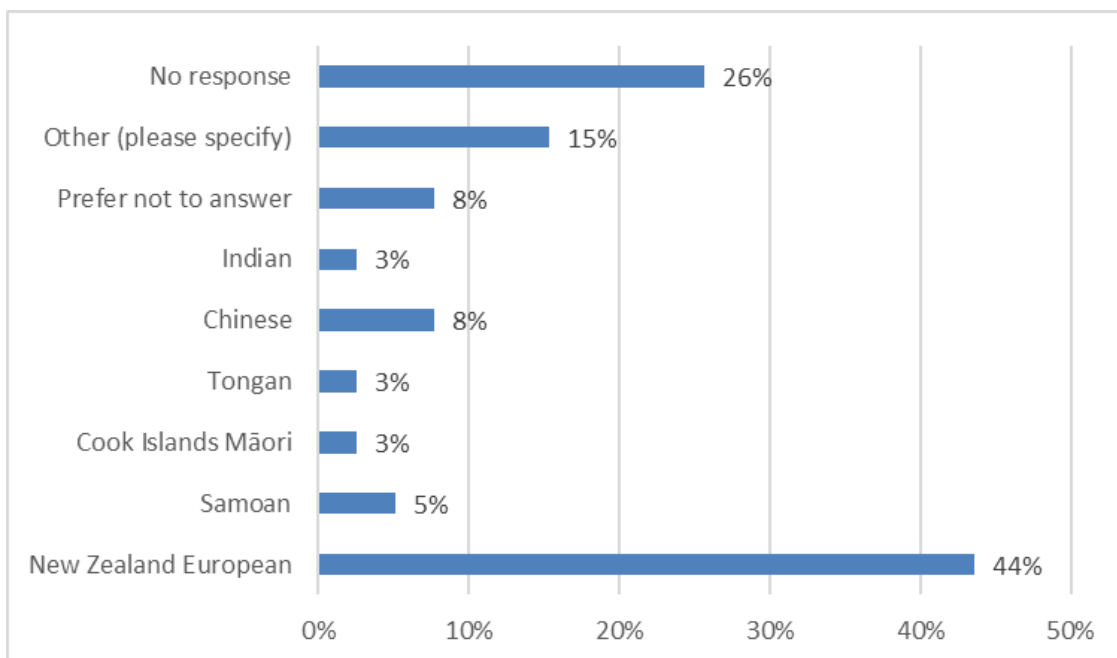
Of those who reported their ethnicity, three-quarters of e-bike purchasers (Figure 4.4) and just under half of pushbike purchasers (Figure 4.5) were New Zealand European. No Māori bought a pushbike.

Figure 4.4 Ethnicity of e-bike purchasers



Note: $n = 168$

Figure 4.5 Ethnicity of pushbike purchasers

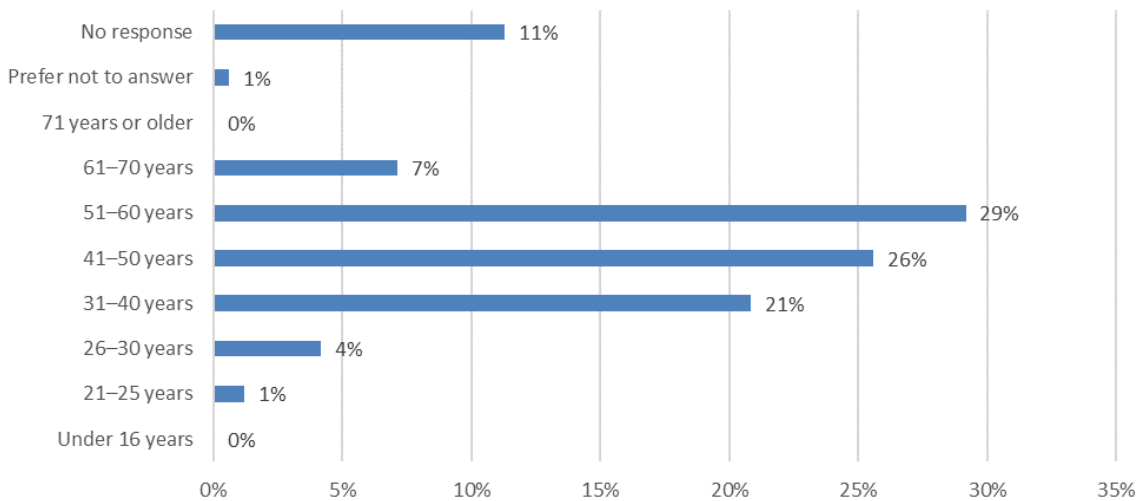


Note: $n = 39$

4.4.3.3 Age

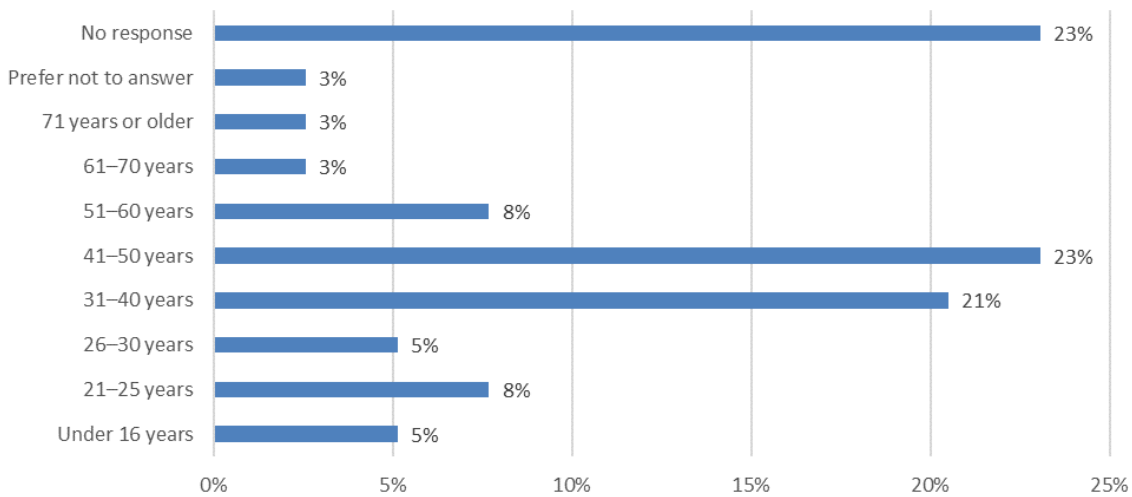
Most e-bike and pushbike purchasers were between 31 and 60 years of age (76% and 52% respectively) (Figure 4.6 and Figure 4.7). Perhaps not unexpectedly, most respondents who bought a pushbike were under 50 years of age.

Figure 4.6 Age of e-bike purchasers



Note: $n = 168$

Figure 4.7 Age of pushbike purchasers

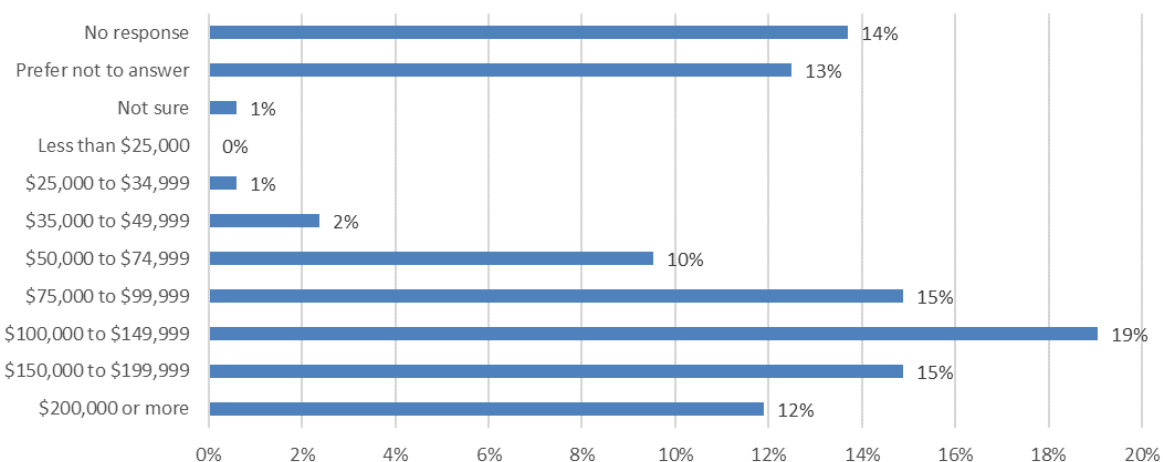


Note: $n = 39$

4.4.3.4 Pre-tax household income

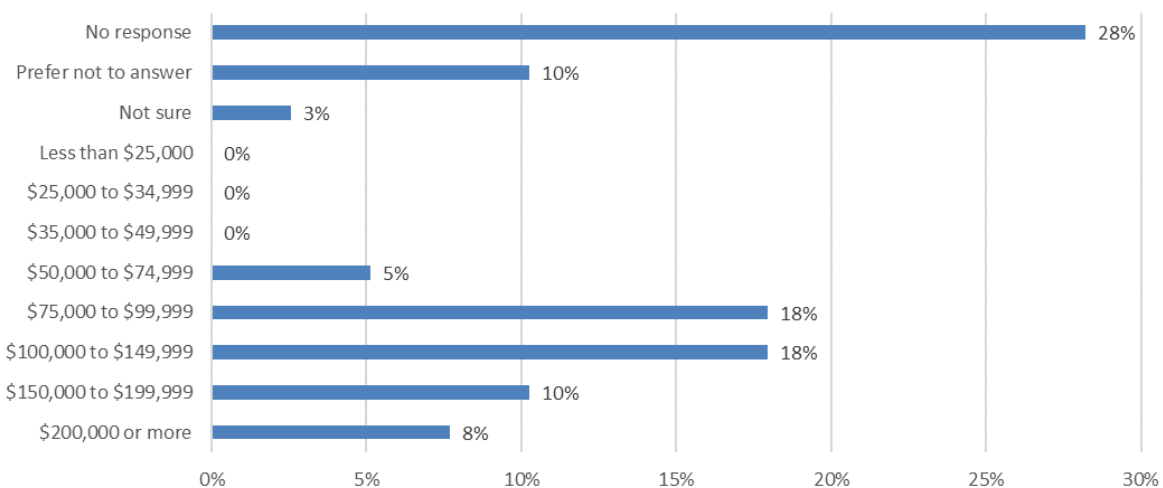
Just under half (46%) of the e-bike purchasers who reported income data had a pre-tax total household income of \$100,000 or more (Figure 4.8). A third of e-bike purchasers had a household income of less than \$100,000. Most of the respondents who bought pushbikes had higher incomes, even though pushbikes are generally less expensive than e-bikes (Figure 4.9).

Figure 4.8 Pre-tax total household income of e-bike purchasers



Note: *n* = 168

Figure 4.9 Pre-tax total household income of pushbike purchasers



Note: *n* = 39

4.4.4 Use of bikes

Most respondents from each of the bike owner groups surveyed were currently using their bikes in a typical seven-day week (Table 4.7). Note: This question simply asked respondents whether they were currently using their bikes for any purpose and did not ask about their use (eg, frequency, length and duration of trips).

Table 4.7 Currently using bike for any purpose

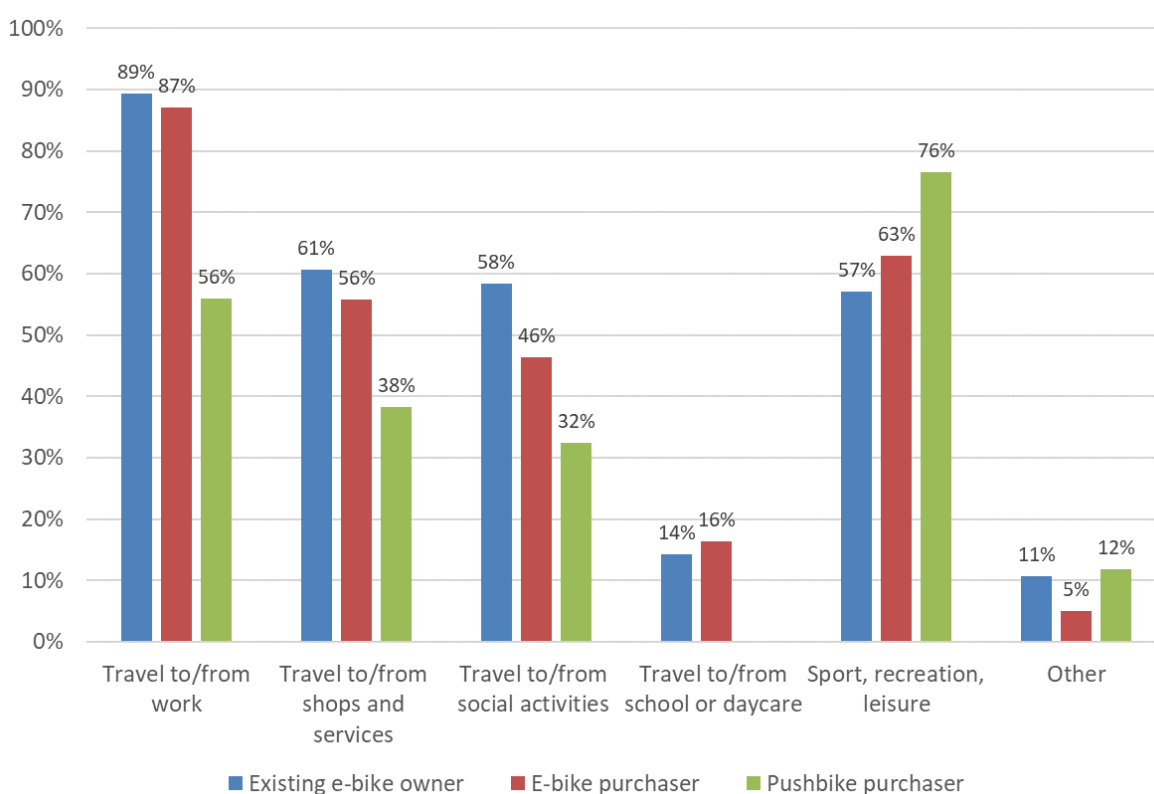
	Existing e-bike owner (%)	E-bike purchaser (%)	Pushbike purchaser (%)
Yes	92	91	94
No	8	9	6
	<i>n</i> = 98	<i>n</i> = 168	<i>n</i> = 39

4.4.5 Bike trips undertaken

4.4.5.1 Bike trip types

In a typical seven-day week, similar proportions of existing e-bike owners and respondents who bought an e-bike were using their bikes for each trip type examined (Figure 4.10). For both groups of riders, the greatest proportion were using their bikes for commuting. A smaller proportion of pushbike riders used their bikes for commuting and for all other types of utility trips examined. Perhaps not unexpectedly, a greater proportion of pushbike riders used their bikes for ‘sport, recreation, or leisure’ compared to e-bike riders.

Figure 4.10 Types of bike trips



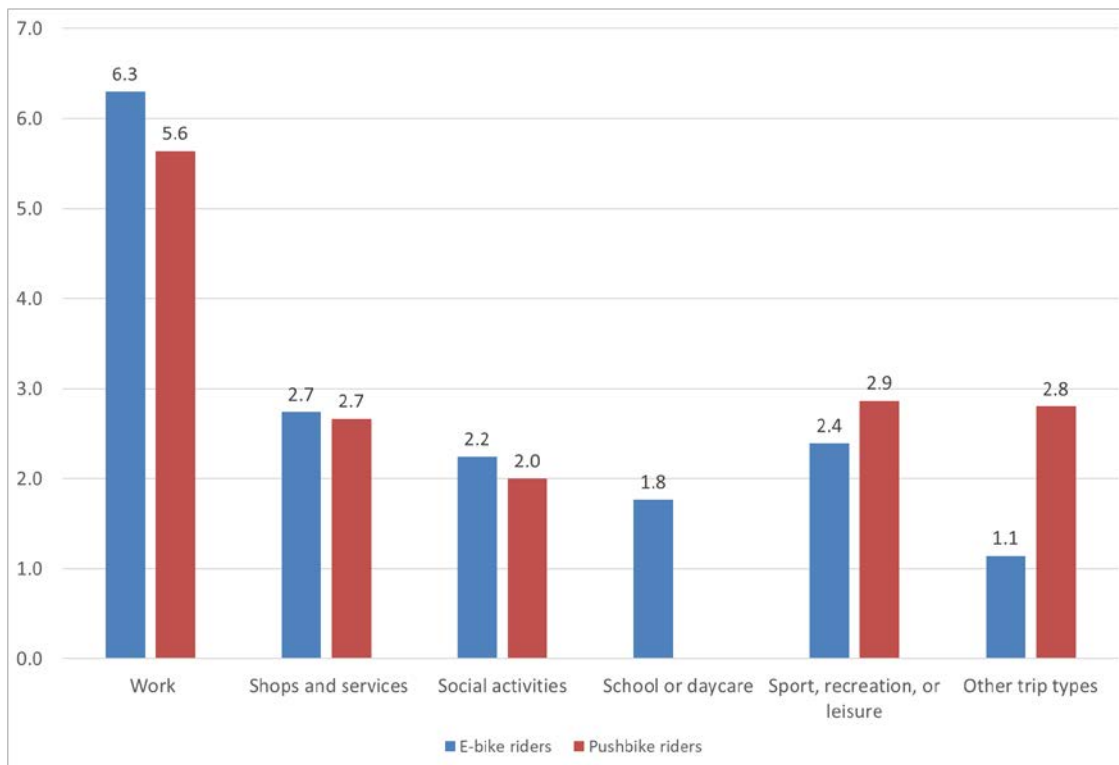
Note: Existing e-bike owners: $n = 84$. E-bike purchasers: $n = 140$. Pushbike purchasers: $n = 34$. Pushbike purchasers were not asked ‘Travel to/from school or daycare’.

4.4.5.2 Number of bike trips by bike type

Figure 4.11 shows the average number of trip types in a typical seven-day week for those who bought an e-bike or pushbike, respectively. For each group, this analysis again combines direct and influenced purchasers. For both rider groups, the average number of weekly trips is highest for commuting trips. It is notable the average number of commuting trips is only slightly lower for pushbike riders compared to those riding e-bikes.¹⁸ The average number of other weekly trip types are broadly similar across e-bike and pushbike riders with the exception of ‘other’ trips.

¹⁸ Note: This result was not analysed by age.

Figure 4.11 Average number of weekly bike trips for e-bike riders and pushbike riders

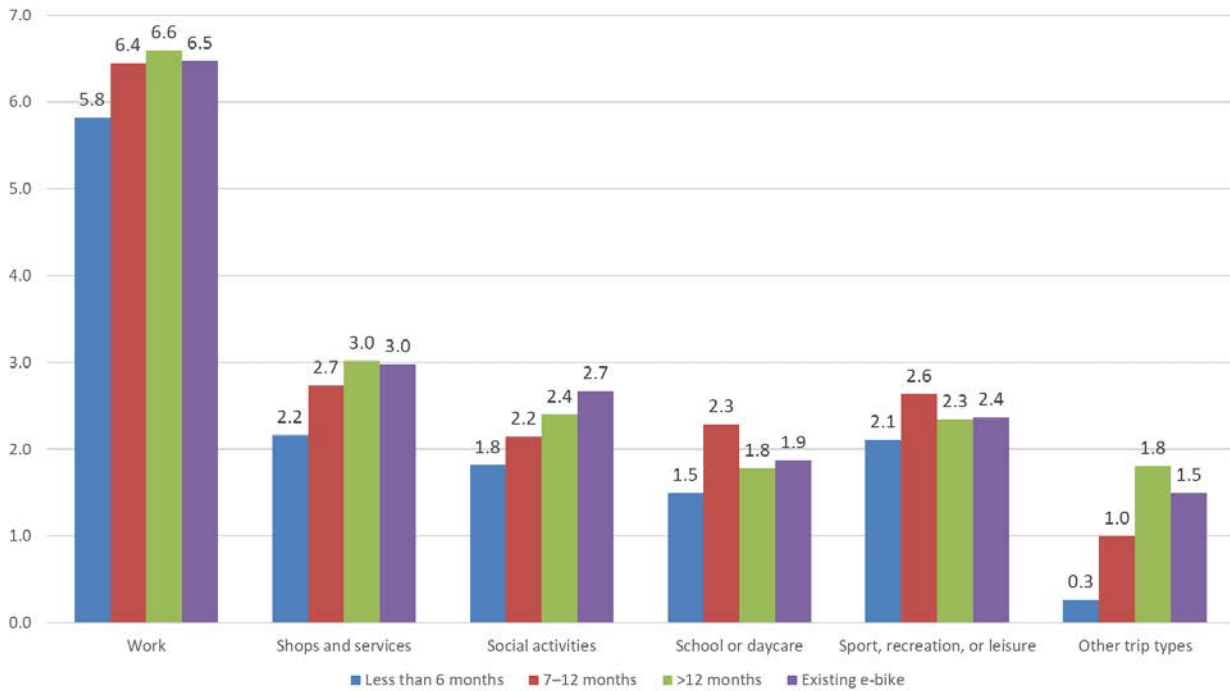


Note: E-bike riders: $n = 138$. Pushbike riders: $n = 32$. Pushbike riders were not asked about trips to 'school or daycare'.

4.4.5.3 Number of e-bike trip types by length of ownership

Figure 4.12 shows, by length of e-bike ownership, the average number of trip types in a typical seven-day week for existing e-bike owners and for e-bike purchasers. Existing e-bike owners were not asked the 'length of ownership' question; however, it might be assumed that on average, they had owned their e-bikes for longer than the e-bike purchasers. Commuting trips are clearly the most frequently undertaken. This result remains constant for all lengths of ownership and for e-bike purchasers and existing e-bike owners. Note: Across most trip types there is a general trend of the average number of weekly trips increasing as the length of ownership also increases. A range of factors might explain this relationship – for example, increased confidence, experience, and route finding over time.

Figure 4.12 Average number of weekly e-bike trips, by length of bike ownership



Note: $n = 211$

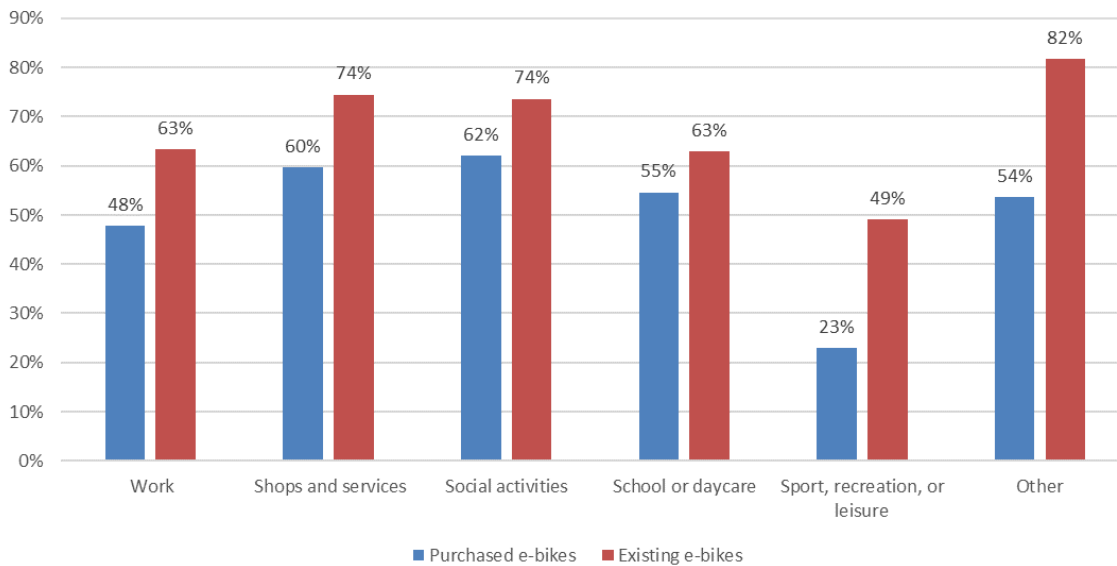
4.4.6 Mode shift

4.4.6.1 Replacement of trips previously travelled by car

Existing owners of e-bikes and e-bike purchasers were asked to estimate how many weekly trips now undertaken by e-bike were previously undertaken by car (ie, prior to the purchase of their e-bike). Figure 4.13 shows for each e-bike group, and by trip type, the average proportion of current e-bike trips previously undertaken by car.¹⁹ Across both groups and most trip types, at least 50% of weekly bike trips were previously undertaken by car. The average proportion of current commuting trips by e-bike previously undertaken by car is 48% for e-bike purchasers and 63% for existing e-bike owners. Average replacement is higher for existing e-bike owners across all trip types, with the difference most pronounced for ‘sport, recreation, or leisure’ and ‘other’ trips.

¹⁹ For example, if an individual was currently biking four trips to work each week, and if two of these current trips were previously by car, 50% of their current bike trips to work would be car replacement trips.

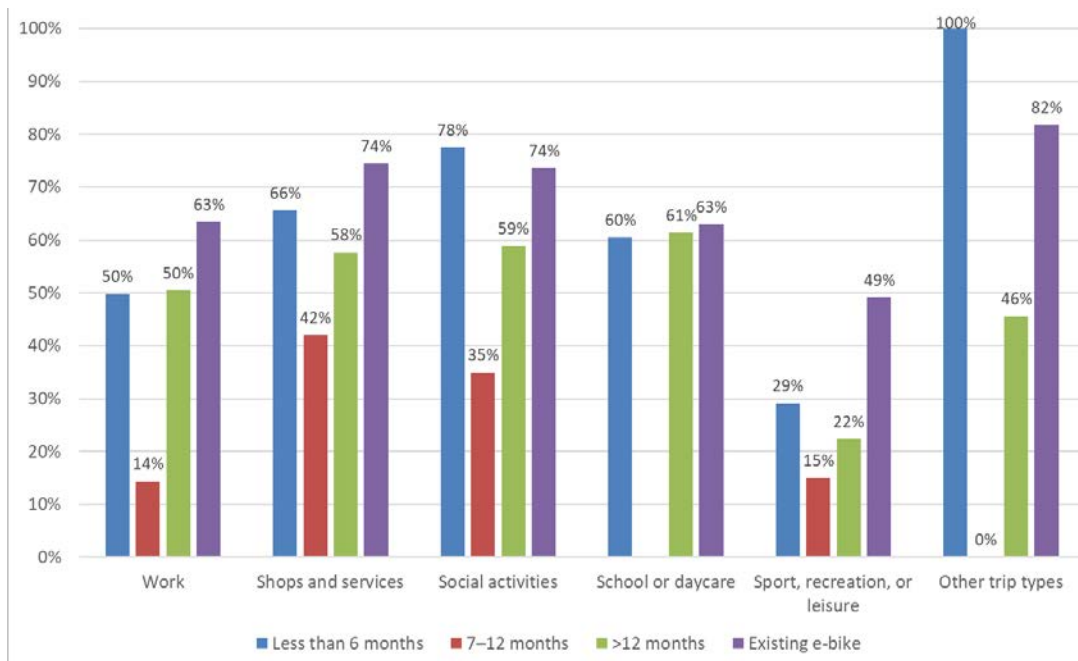
Figure 4.13 Average proportion of current trips by e-bike previously travelled by car



Note: Purchased e-bikes: $n = 168$. Existing e-bikes: $n = 98$.

Figure 4.14 shows the same analysis as in Figure 4.13, but this time by length of e-bike ownership. Existing e-bike owners are again shown as a separate ownership category. The analysis shows a general trend of replacement being high initially, falling back for 7–12 months, and then increasing again for more than 12 months of ownership. The general trend of replacement increasing with length of ownership continues if the assumption is made that on average, existing e-bike owners have owned their bikes for longer than e-bike purchasers. Seasonal factors may influence the results.

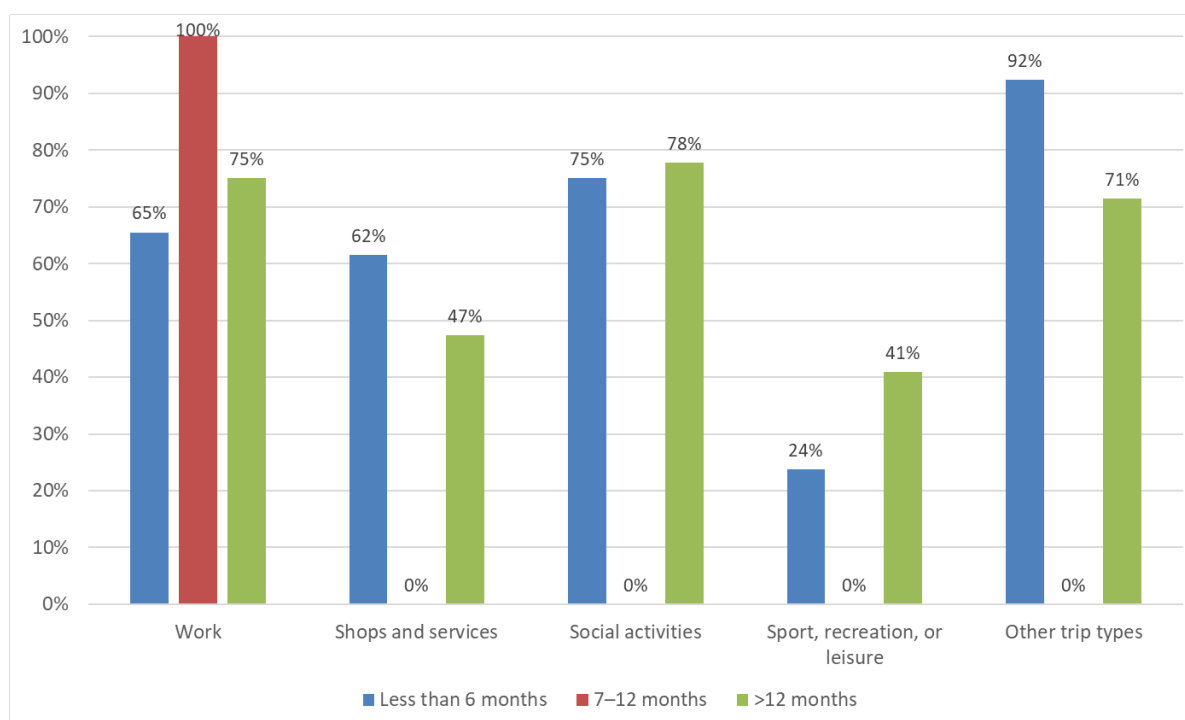
Figure 4.14 Average proportion of current trips by e-bike previously travelled by car, by length of bike ownership



Note: $n = 158$

Figure 4.15 shows the same analysis as previously but this time for pushbike purchasers. The analysis shows similar replacement rates and range of results as for e-bikes. Note: The number of respondents in each trip type and ownership sub-group is limited, so results should be interpreted with caution. For example, only four respondents had owned a pushbike for 7–12 months. The result is zero percent at 7–12 months for a number of trip types because the limited number of riders in these sub-groups did not report any current trips of these types having previously been by car. There was only one 7–12-month ownership respondent who replaced previous commutes by car (two pushbike trips to work previously made by car), hence the 100% trip replacement result for this ownership and trip type sub-group.

Figure 4.15 Average proportion of current trips by pushbike previously travelled by car, by length of bike ownership



Note: $n = 36$

4.4.6.2 Replacement of kilometres previously travelled by car

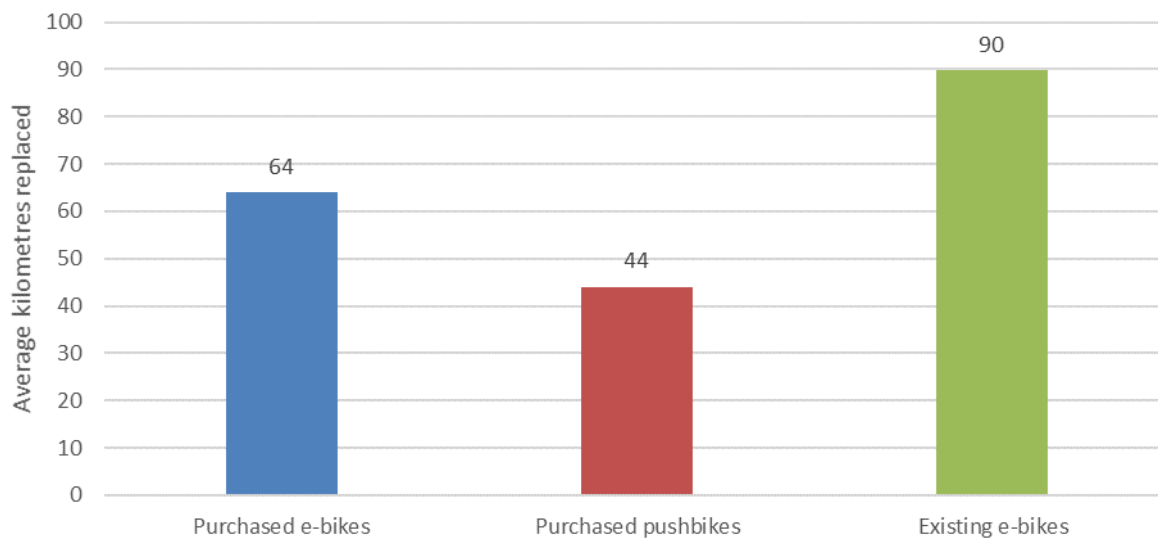
Existing owners of e-bikes and respondents who purchased an e-bike or pushbike were asked to estimate in a typical seven-day week how many kilometres previously travelled by car were now undertaken by bike (ie, following purchase of their bike). Respondents were asked to estimate this for all bike trip types now undertaken rather than for each trip type.

Figure 4.16 shows the average number of kilometres estimated to have been replaced in a typical seven-day week. As might be expected, the replacement average is highest for existing e-bike owners (90 km) and lowest for pushbike riders (44 km). If the assumption is again made that e-bike owners have had the longest ownership, these results indicate that replacement increases as length of ownership increases.

Note: There were approximately 403,000 public sector employees in 2018 (State Services Commission 2018). As a thought experiment, applying the average five-day weekly car travel replacement result for e-bike purchasers to 10% of these employees would give a weekly replacement of 1,853,800 km. Multiplying this result over one year (52 weeks) would give a total of 96,397,600 km of car travel replaced annually. With

a medium-size petrol car emitting 192 grams of carbon dioxide per passenger kilometre,²⁰ the total car travel replaced would save 18,508,339.2 kg of carbon emissions each year. Other more ambitious scenarios might also be considered.

Figure 4.16 Average number of kilometres previously travelled by car replaced by bike (typical seven-day week)

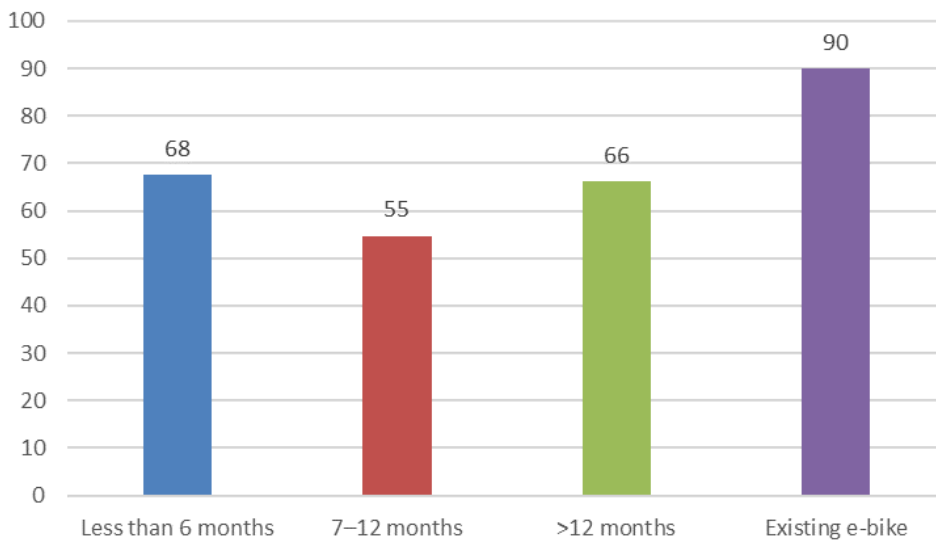


Note: Purchased e-bikes: $n = 105$. Purchased pushbikes: $n = 24$. Existing e-bikes: $n = 58$.

The relationship between kilometres replaced and length of bike ownership was further examined for those who bought an e-bike or pushbike. For each group, this analysis again combines direct and influenced purchasers and is for a typical seven-day week. Figure 4.17 shows for e-bikes, average replacement is initially high for those owning less than six months, drops back for 7–12 months, and increases again for more than 12 months of ownership. This trend continues under the assumption existing e-bike owners have the longest ownership. As would be expected, the replacement and ownership trend is consistent with that for the proportion of current bike trips that replaced previous car trips. Once again, seasonal factors may influence these results.

²⁰ Based on estimates from Our World in Data: <https://ourworldindata.org/travel-carbon-footprint>

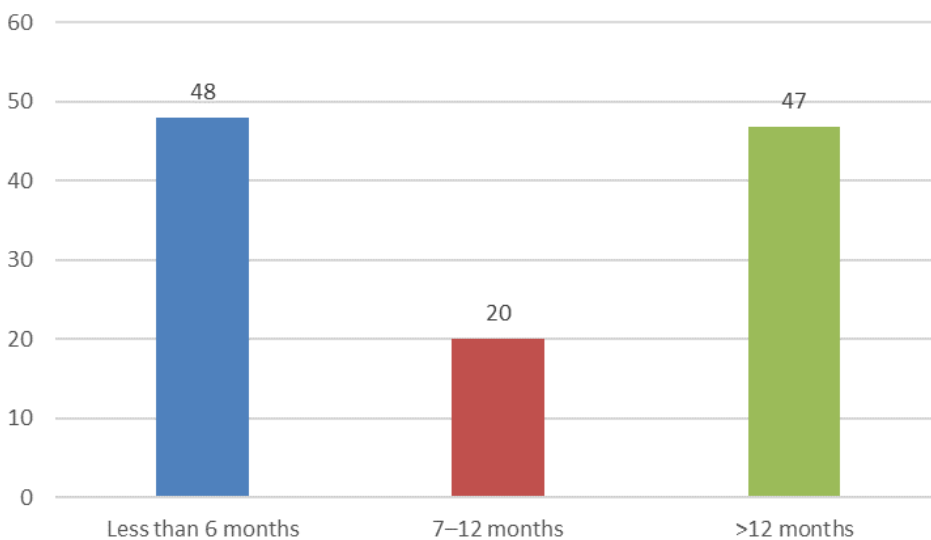
Figure 4.17 Average number of e-bike kilometres previously travelled by car, by length of bike ownership (typical seven-day week)



Note: $n = 163$

Figure 4.18 shows the same relationship between average kilometres replaced and length of bike ownership for pushbikes as for e-bikes. Replacement is initially high for less than six months, decreases for 7-12 months, and then increases for more than 12 months.²¹ Again, seasonal factors may influence these results.

Figure 4.18 Average number of pushbike kilometres previously travelled by car, by length of bike ownership (typical seven-day week)



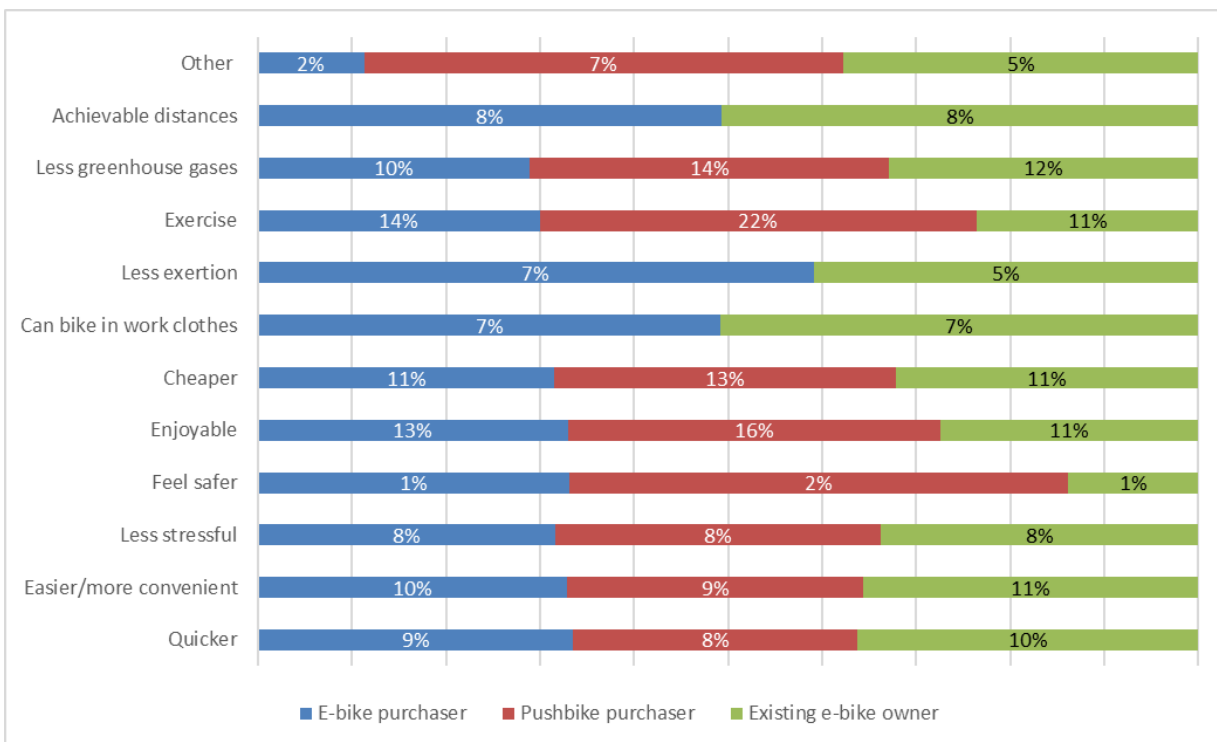
Note: $n = 24$

²¹ Existing owners of pushbikes were not included in the survey and therefore data does not exist for this group.

4.4.6.3 Reasons for mode shift

Respondents now biking trips previously undertaken by car were asked why this was the case (Figure 4.19). It is not surprising that reasons commonly identified by e-bike riders refer to proven benefits of e-bikes (eg, trips are quicker, easier, enjoyable, cheaper). A greater proportion of existing e-bike owners identified most reasons compared to e-bike purchasers. Assuming existing e-bike owners have the longest ownership, this trend suggests that riders’ awareness of the advantages of e-bikes develops over time. While riding an e-bike provides many of the physical activity benefits associated with regular cycling (Fishman et al 2018), it is not surprising that compared to e-bike riders, a greater proportion of pushbike riders identified ‘Trips provide exercise’ as a reason for their mode shift.

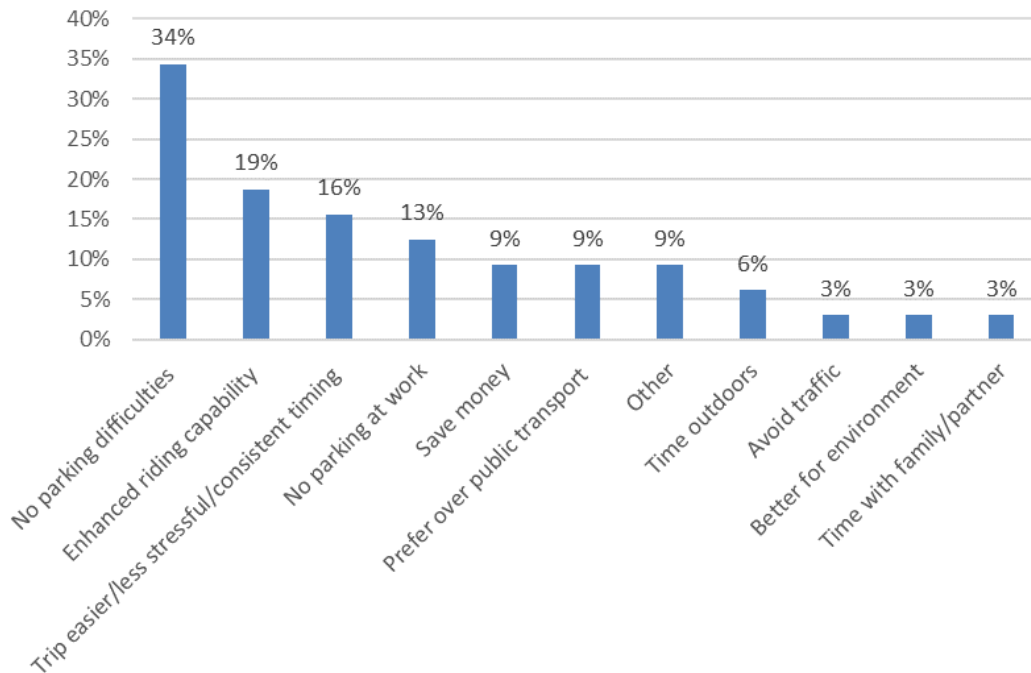
Figure 4.19 Reasons for replacing previous travel by car with travel by bike



Note: E-bike purchasers: $n = 104$. Existing e-bike owners: $n = 59$. Pushbike purchasers $n = 25$. Pushbike purchasers were not asked ‘Can now bike in work clothes’, ‘Trips require less exertion’, and ‘Trip distances are now achievable’.

Other reasons that e-bike riders gave for their mode shift (Figure 4.20) are consistent with the literature (Jones et al 2016; MacArthur et al 2018; Popovich et al 2014). About a third (34%) of respondents giving other reasons cited the elimination of parking difficulties. Enhanced biking capability (19%) and that trips were enhanced (eg, easier, less stressful, more consistent travel time) (16%) were commonly reported.

Figure 4.20 Other reasons for mode shift (e-bike riders)



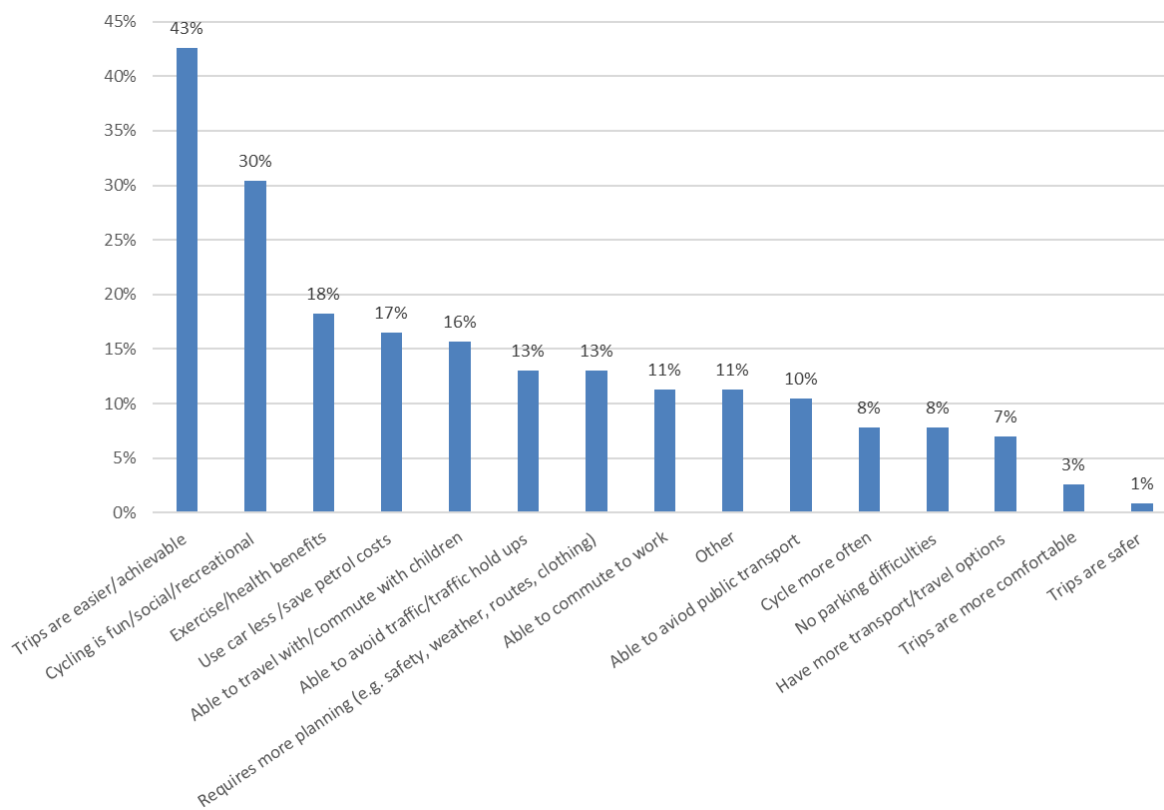
Note: $n = 32$

4.4.7 Other impacts

4.4.7.1 Other impacts of e-bikes on travel

E-bike riders were asked to describe other impacts their bikes had on their travel (eg, when, where, with whom). Figure 4.21 shows the results for existing e-bike owners and e-bike purchasers combined. Consistent with the literature (Cairns et al 2017; Fishman et al 2018), almost half the respondents to this question cited that trips are now easier or more achievable (43%). Also consistent with the literature (Jones et al 2016; Popovich et al 2014; Wild and Woodward 2019), almost a third (30%) described having fun, including enjoyable social or recreational use.

Figure 4.21 Other impacts of e-bikes on travel



Note: *n* = 115

4.4.7.2 Physical activity undertaken

Respondents who bought an e-bike or pushbike were asked on how many days in a typical seven-day week before and after their purchase they did 30 minutes or more of physical activity that was enough to raise their breathing rate (Table 4.8). For both groups, the average number of reported days was greater after purchase compared to before purchase, with the increase greatest for those who bought an e-bike. Multiplying the increase in days by the total number of respondents in each group gives a total weekly increase of 174 days for e-bike purchasers and 12.4 days for pushbike purchasers.

Table 4.8 Average number of days per week of physical activity before and after bike purchase

Type of purchaser	Average number of days of physical activity before purchase	Average number of days of physical activity after purchase
E-bike purchasers (<i>n</i> = 145)	3.2	4.4
Pushbike purchasers (<i>n</i> = 31)	4.0	4.4

4.4.7.3 Number of cars in household

Respondents who bought an e-bike or pushbike were asked whether their purchase would impact the likelihood of their household reducing or not increasing the number of cars in their household (Table 4.9). About a quarter from both groups reported this was now more likely, and a small proportion had already reduced the number of cars.

Table 4.9 Likelihood of household reducing or not increasing number of cars in household

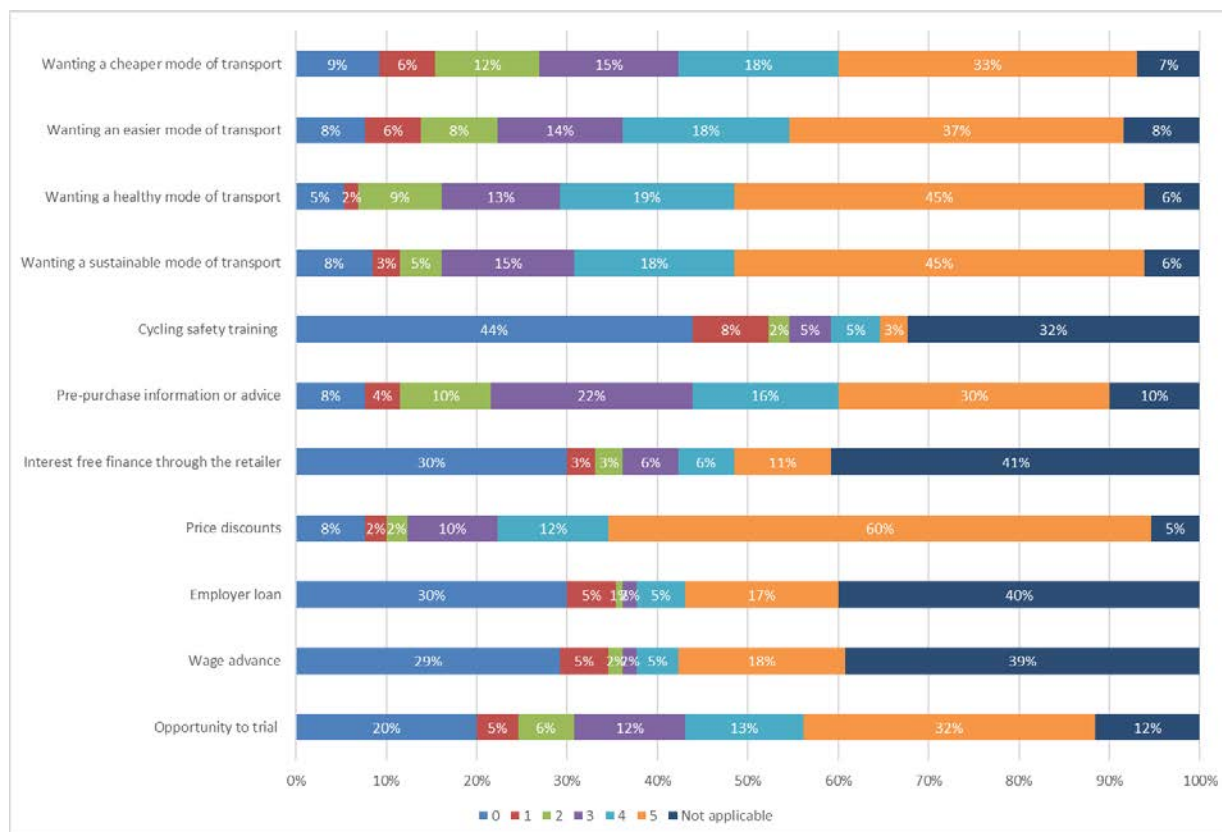
Likelihood	E-bike purchasers (%)	Pushbike purchasers (%)
More likely	23	26
Less likely	3	6
No change in likelihood	61	61
Have reduced number of cars in household	6	3
Not sure	6	3
	<i>n</i> = 145	<i>n</i> = 31

4.4.8 Influence of schemes

4.4.8.1 Influence of incentives and supports on purchase decision

Respondents who bought an e-bike or pushbike were asked what influence incentives and supports available through schemes had had over in their purchase decision (0 = No influence and 5 = Significant influence). Figure 4.22 shows the proportion of e-bike purchasers who reported each level of influence for each incentive and support examined. Price discounts and wanting a sustainable, healthy, easier, and cheaper mode of transport were influential for many. The opportunity to trial an e-bike and access to pre-purchase information or advice was also important. The ‘Not Applicable’ result for many financial items suggests these incentives were not available to many.

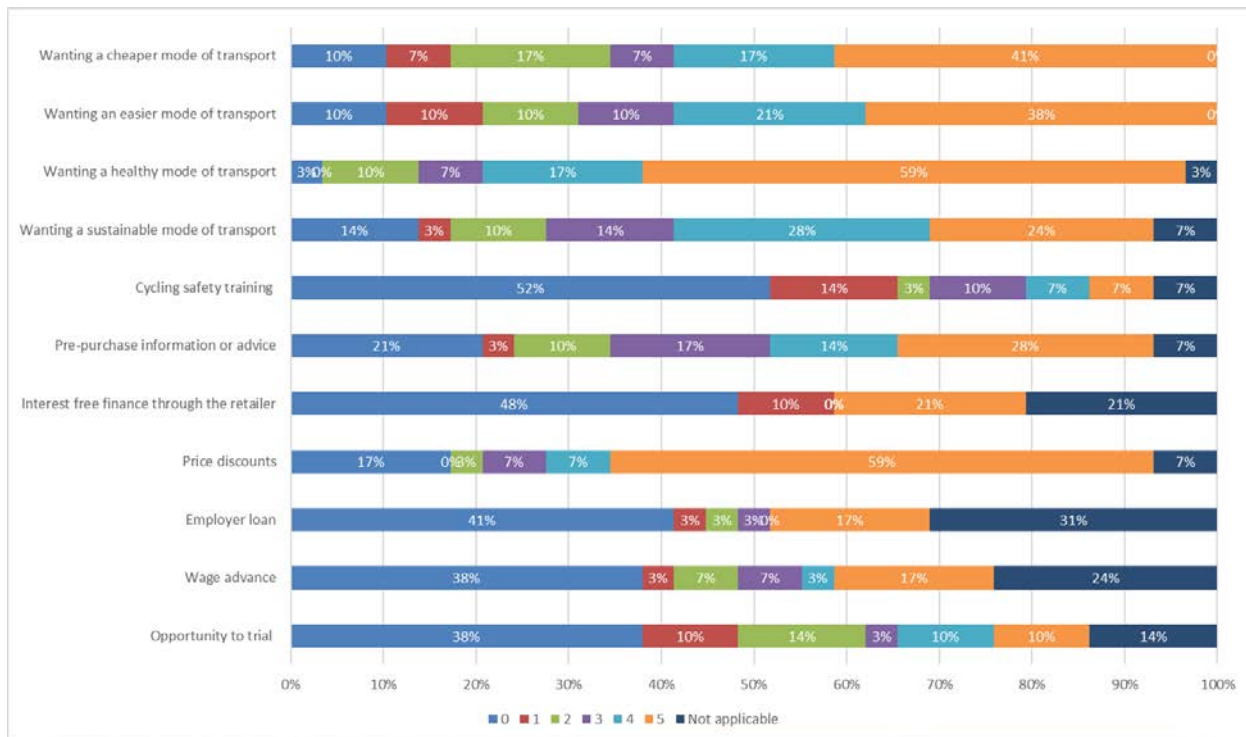
Figure 4.22 Influence of incentives/supports over decision to purchase an e-bike



Note: *n* = 130. 0 = No influence; 5 = Significant influence.

Figure 4.23 shows the same analysis above for respondents who bought a pushbike. Similar to e-bikes, price discounts and seeking a healthy, easier, and cheaper mode of transport were particularly influential. As might be expected given the lower purchase price generally of pushbikes, other financial incentives were less influential. Similarly, the opportunity to trial a bike and access to cycle skills training or safe riding advice²² were not particularly influential for many who bought a pushbike.

Figure 4.23 Influence of incentives/supports over decision to purchase a pushbike

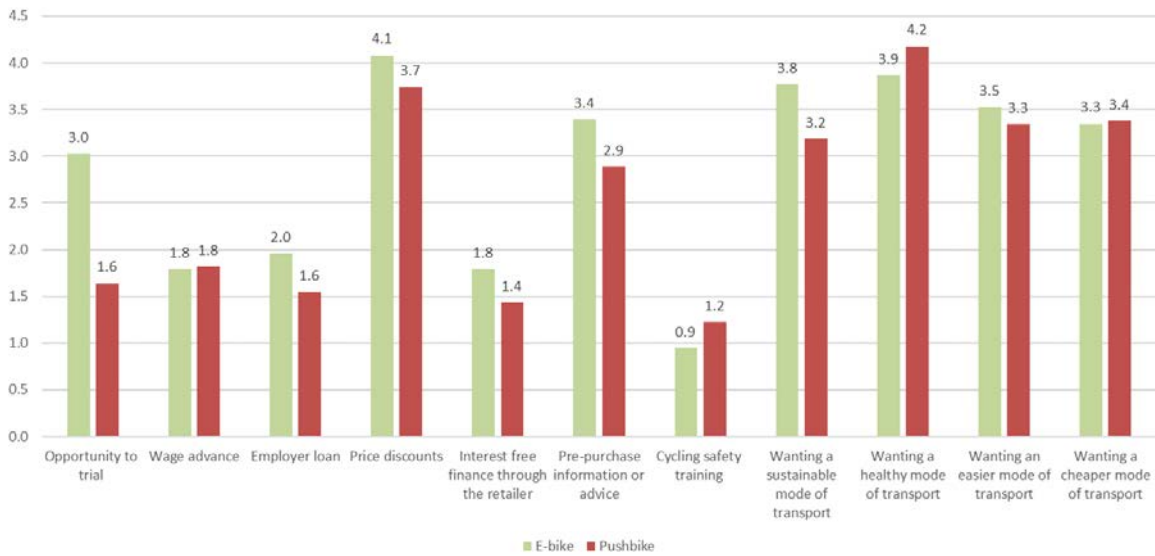


Note: $n = 29$. 0 = No influence; 5 = Significant influence.

Figure 4.24 shows the average level of influence each incentive and support had over the purchase decision of employees who bought either an e-bike or pushbike. For both groups, price discounts and mode-specific benefits are again shown as particularly influential, as is the opportunity of trials for those who bought an e-bike.

²² Assuming training/advice is geared towards or is perceived to be geared towards riding an e-bike.

Figure 4.24 Average influence of incentives/supports over purchase decision

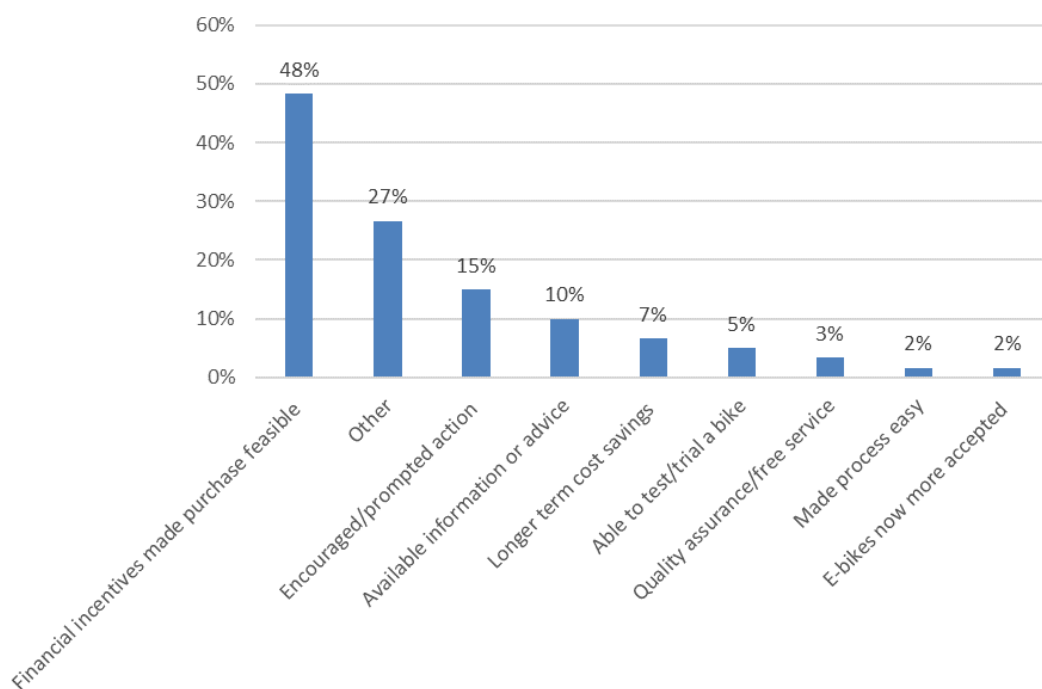


Note: E-bike: $n = 130$. Pushbike: $n = 29$.

4.4.8.2 Other influences on e-bike purchase through a scheme

Respondents who had directly purchased an e-bike through their employer's scheme were asked to describe anything else that influenced their purchase decision (Figure 4.25). Note: A number of respondents identified factors similar to those examined in the previous question. Almost half (48%) noted that financial incentives had made their purchase feasible.

Figure 4.25 Other influences on decision to purchase e-bike through employer scheme

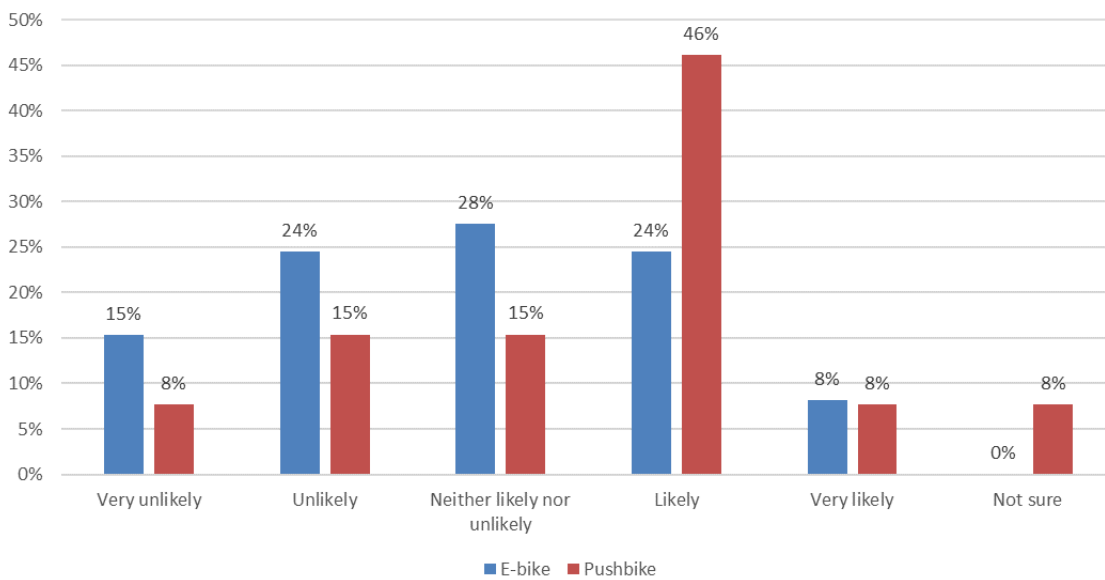


Note: $n = 60$

4.4.8.3 Likelihood of purchase in the absence of an employer scheme

Direct purchasers of e-bikes and pushbikes were asked how likely or unlikely it was they would have made their purchase in the absence of an employer scheme (Figure 4.26). Over a third (39%) of direct e-bike purchasers reported this as ‘Unlikely’ or ‘Very unlikely’, while a similar proportion (32%) reported this as ‘Likely’ or ‘Very likely’. Given the lower cost generally of pushbikes, it is perhaps not surprising that almost half (46%) of employees who bought these bikes said their purchase was ‘Likely’ and, compared to e-bikes, a much smaller proportion said their purchase would have been ‘Very unlikely’ or ‘Unlikely’. These results support the targeting of purchase support schemes to e-bikes, given the higher barriers to purchase compared to pushbikes.

Figure 4.26 Likelihood of bike purchase without an employer scheme



Note: E-bike: $n = 98$. Pushbike: $n = 13$.

Respondents who purchased an e-bike were asked to explain their rating above. Table 4.10 (overpage) shows the number of respondents by explanation type and by likelihood rating. Most respondents who described their purchase as ‘Neither likely nor unlikely’, ‘Likely’, or ‘Very likely’ described schemes acting as an impetus, prompt, or additional motivation to activate an existing desire or earlier decision to purchase. This description is similar to how many employees interviewed in the process evaluation described the influence of schemes in their decision to buy an e-bike. Most respondents who reported that their purchase would have been ‘Unlikely’ reported financial incentives as a factor that made the difference.

Table 4.10 Reasons for likelihood of e-bike purchase without an employer scheme

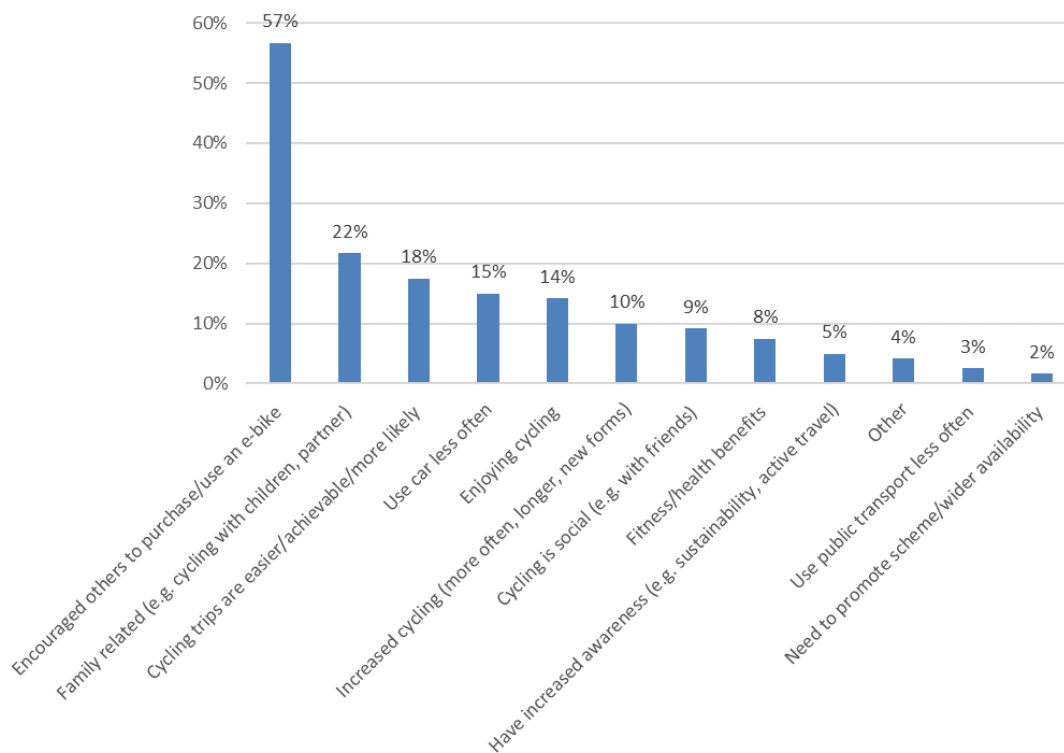
Likelihood	Convenience or ease of scheme	Financial incentives (in general) made the difference	Discount made the difference	Salary advance made the difference	Employee loan made the difference	Also used other financial supports	Already planning to buy – scheme provided further impetus	E-bike so useful would have bought anyway	Needed an e-bike regardless (eg, due to disability)	Scheme did not offer any extra financial incentive	Raised awareness, interest, or motivation	Product range and suitability of range
Very likely	0	0	2	0	0	1	3	1	0	0	0	1
Likely	0	0	0	0	0	0	17	1	2	0	0	0
Neither likely nor unlikely	0	0	4	0	0	2	14	0	1	1	1	0
Unlikely	1	6	3	2	0	0	0	0	0	0	6	0
Very unlikely	2	8	2	1	1	0	1	0	0	0	1	0

Note: Number of respondents is shown.

4.4.8.4 Other scheme impacts

Direct and influenced purchasers were asked to describe any other impacts for them or others from employer schemes. Figure 4.27 shows the results from this question for e-bike, pushbike, and e-scooter purchasers combined. Of 120 respondents, over half (57%) described having encouraged others to buy an e-bike or to try riding one. Attitudes towards e-bikes can become more positive with use (Plazier et al 2017b) and people taking part in e-bike trials can be particularly motivated to advocate e-bikes to others (Strele 2010). Almost a quarter (22%) of respondents who described other impacts reported positive family impacts. These included being able to bike with children, partners now biking together, and families having an expanded range of transport options available to them. Previous research has also shown that the desire for parents and children, or couples, to ride together, can motivate the purchase of an e-bike (Wikstrøm and Böcker 2020).

Figure 4.27 Other impacts from e-bike support schemes

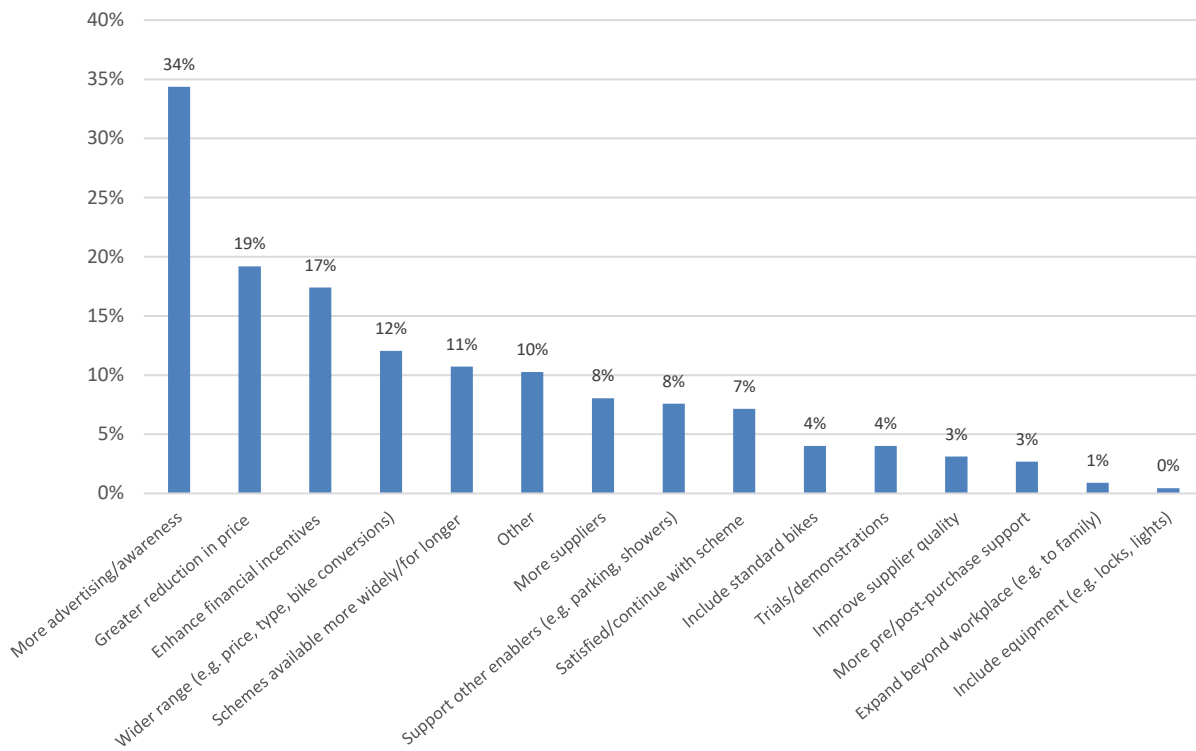


Note: n = 120

4.4.9 Improving schemes

All respondents except existing e-bikes owners were asked how employer e-bike purchase support schemes could be improved (Figure 4.28). Note: Respondents to this question included employees who were neither direct nor influenced purchasers nor existing e-bike owners. Reflecting the inclusion of these latter groups, a third (34%) of respondents called for better communication and promotion for schemes. Many noted they were not aware of their employer's scheme at the time of the survey. Collectively, just over a third (36%) of respondents to this question called for enhanced financial incentives, either expanding the range and type of incentives available or achieving greater price discounts. Many noted that despite the financial incentives available through schemes, pricing was still prohibitive for many.

Figure 4.28 Recommendations for improving employer e-bike purchase support schemes



Note: *n* = 224

5 Discussion

This final section discusses the evaluation findings to identify key learnings for future e-bike mode shift initiatives. The findings for uptake and mode shift are initially discussed, followed by consideration of overall learnings for the future roll-out of initiatives.

5.1.1 E-bike uptake

The 2021 employee survey showed positive impacts from the national initiative in respect of e-bike uptake, although it should be noted that uptake as a proportion of the total number of employees eligible to take part in schemes was not calculated. This would assist in judging outcomes from the initiative relative to the performance of other interventions that also seek to increase uptake. Assessment of uptake relative to the cost of the initiative would also assist in a comparative judgement of value.²³

Consistent with the core objectives of the national initiative, the employee survey showed that the majority of direct and influenced purchasers chose to purchase an e-bike and that most of these were an urban/commuter type. Further, at the time of the employee survey, the majority of respondents who purchased a bike of any type were using their bike.

The demographics of employees who purchased an e-bike provide further information about uptake, although many respondents did not provide personal information. Women are more likely than men to report interest in buying an e-bike (Fyhri and Sundfør 2014), and the employee survey showed a greater proportion of e-bike purchasers were women compared to men. This is an encouraging finding because women are currently less likely to cycle compared to men. For example, 2015–18 data from the New Zealand Household Travel Survey showed that 36% of males 15 years and older cycled in the past year compared to 26% of females (Ministry of Transport, n.d.). Women face gendered barriers to cycling, and e-bikes can help to reduce these (Russell et al 2021). E-bikes can increase uptake for women (Gregory et al 2021; MacArthur et al 2018; Wild and Woodward 2018), in part because they can make it easier to undertake activities such as shopping and childcare, which are disproportionately undertaken by women (Heinen 2011).

E-bikes can extend biking capacity for older people and those with physical limitations (Langford et al 2013; MacArthur et al 2014; Rose 2012). Reflecting this, riders of e-bikes in Western countries are typically older than those who ride pushbikes (Fishman et al 2018). Not unexpectedly therefore, the employee survey showed that employees buying e-bikes tended to be older.²⁴ Consistent with the literature (Cairns et al 2017; Fishman et al 2018), enhanced biking capability was commonly cited by purchasers as a reason for buying an e-bike, and for subsequent mode shift.

E-bike users have higher incomes than pushbike riders (Fishman et al 2018). The national initiative seeks to address this disparity by attempting to reduce the price barrier to uptake. While the employee survey showed that buyers tended to have higher incomes, a third reported pre-tax total household incomes of less than \$100,000. This result may indicate some success in reducing the price barriers for lower-income earners.

In Aotearoa New Zealand, other ethnic groups, including Pasifika and Asian New Zealanders, are much less likely to be regular cyclists than Pākehā or Māori (Shaw et al 2020). The ethnicity of employees who reported

²³ While the direct cost of the national initiative to Waka Kotahi is currently limited, other costs under the scheme would need to be considered (eg, cost to suppliers of product discounts, organisations' time to establish and execute schemes).

²⁴ Note that buyers also tended to have higher incomes, and this may further explain the older age of purchasers if it is assumed older employees are likely to have higher incomes than younger employees.

buying an e-bike and who provided their ethnicity²⁵ was consistent with this; three-quarters were New Zealand European, about 10% were Māori, and very few were Pasifika.

5.1.2 Mode shift

The employee survey showed positive impacts on mode shift; however, note again that further analyses that would support a comparative judgement of value were not undertaken. The majority of respondents who bought an e-bike, either directly through a scheme or because they were influenced by a scheme, were using their bikes for commuting. On average, commuting trips were also by far the most common type of weekly trip. These results are consistent with the core objectives of the national initiative, as well as other studies that have examined e-bike trip types (Drage and Pressl 2012; Fishman 2017; Ling et al 2017; MacArthur et al 2018). While the literature and this study show that commuting trips are most common, e-bikes are also used for a range of other trip types (eg, shopping, leisure, business travel, visiting friends) (Cairns et al 2017). This evaluation finds a similar range of use, with half or more of e-bike riders reporting almost all of the other trip types examined.

The employee survey also showed that the average number of weekly e-bike trips tended to increase as length of ownership increased. Given the limitations of the method used to determine use, this result should be treated with caution. However, it does suggest that uptake and mode shift outcomes accrue over time. Previous research has also indicated that the frequency of use increases as the length of time using an e-bike increases (Fyhri and Fearnley 2015).

It was notable that commuting trips were also the most frequently undertaken trips for employees who bought a pushbike. Further, the average number of commuting trips undertaken by pushbike riders was only slightly lower than e-bike riders. Over half (54%) the respondents who bought a pushbike were under 40 years of age, and these results may reflect a higher level of active commuting amongst younger employees. Indeed, most pushbike riders in the survey who reported mode shift identified the exercise provided as a reason for this. Early research also showed that e-bikes can have a negative social stigma (eg, is considered 'cheating') (Jones et al 2016). If this is still the case, such stigma may be particularly felt by younger riders. It seems possible that up to a certain age, there will be a group of riders who will have a clear preference to commute by pushbike.

The overall findings for pushbikes suggest there is value – for example, in promoting equity – in including access to these bikes within schemes. The literature review also recommended the range of bikes offered should cater for different motivations, levels of experience, needs, and interests. The process evaluation also found the health and well-being of staff was a common reason for why organisations were interested in establishing schemes. Many of the coordinators interviewed therefore supported schemes offering a range of bikes. While these findings suggest the need to balance cycling for transport objectives with general health objectives, the focus should remain on the primary objective to reduce the purchase price of e-bikes because they have the most potential to achieve desired mode shift.

The employee survey showed on average and across most trip types, a significant proportion of weekly trips now undertaken by e-bike were trips previously undertaken by car. Previous research also shows that utilitarian e-bike trips most commonly replace trips previously undertaken by car (MacArthur et al 2018). Our analysis also showed that car trip replacement increased as length of e-bike ownership increased, a result that further indicates the accrual of mode shift outcomes over time. The reasons e-bike riders gave for their mode shift were highly consistent with the drivers of the use of e-bikes widely reported in the literature (Jones et al 2016; MacArthur et al 2018; Popovich et al 2014).

²⁵ Fifteen percent of e-bike purchasers did not provide their ethnicity.

Car trip replacement was further examined through the estimates that bike riders gave of the total number of kilometres now biked weekly that prior to their bike purchase would have been travelled by car. Analysis of this data showed an average weekly replacement of 90 km for existing e-bike owners, 64 km for e-bike purchasers, and 44 km for pushbike purchasers. These results are consistent with replacement outcomes reported by other studies (Drage and Pressl 2012; Hiselius and Svenssona 2014; Wright 2013; Strele 2010). The result is also consistent generally with the evidence that e-bikes increase the frequency of riding, the length of trips, and overall distances covered (Cairns et al 2017; Ling et al 2017; MacArthur et al 2014; MacArthur et al 2018; Mercat 2013).

Modelling the average five-day weekly car travel replacement result for e-bike purchasers to 5% of all public sector employees gave a total of 48,198,800 km of car travel replaced annually, with this equating to 9,254,169.6 kg of carbon emissions saved each year.

5.1.3 Other outcomes

Other identified outcomes from schemes further strengthen the conclusion that impacts from the national initiative are valuable and significant. Employees purchasing either an e-bike or pushbike reported an increase in the average number of weekly days of physical activity following their purchase. Previous research has reported similar findings (Cairns et al 2017). Riding an e-bike provides many of the same physical activity benefits as riding a pushbike (Fishman et al 2018), and the energy expenditure required is within the range necessary for health enhancement (Sperlich et al 2012). Note also that the least active individuals have the greatest gains in health outcomes from active commuting (Kelly et al 2014, Oja et al 2011), a trend also observed for e-bike riding in general (Malnes et al 2016). Around a quarter of employees purchasing either an e-bike or pushbike reported they were now more likely to reduce or not increase the number of cars in their household. Purchasers also reported positive family impacts, including the ability to bike with children or partners. A significant proportion of e-bike purchasers also reported having encouraged others to also buy an e-bike or to trial riding one.

5.1.4 Best future roll-out of initiatives

A literature review conducted early in this evaluation identified nine success factors²⁶ for effective e-bike support schemes. Findings throughout subsequent stages of the evaluation reinforced the importance of many of the factors and that they should be core design principles in future initiatives. The process evaluation found the national initiative performed strongly on being of relevance, being easy to understand, access, and participate in, and having effective pre-purchase supports. The process evaluation provided extensive recommendations for further enhancing performance on these criteria (Blewden et al 2020, pp. 48–56), and future initiatives should note these.

A range of findings from this outcome evaluation suggest that future initiatives should provide access to a range of bike types, including pushbikes not specifically designed for commuting. The position could be taken that all biking is good biking and therefore worthy of incentivising. However, it should also be kept in mind that the primary aim is to achieve mode shift by reducing the cost barrier to the purchase of e-bikes because they are more likely to induce new riders. For example, the Scottish initiatives included e-cargo bikes because these enhance the use of bikes for utilitarian purposes.

The absolute relevance of e-bike schemes to employers was demonstrated through the proportion of organisations that responded to the organisation survey that had established or were establishing a scheme.

²⁶ Opportunities to trial e-bikes; Sustained campaigns and local support; Effective financial incentives; Range of e-bike types; Simplicity; Other enablers; Partnerships; Ongoing evaluation

This was despite the disruption of COVID-19 and indicated significant unrealised potential under the initiative.

Employees who bought an e-bike commonly reported that core benefits of e-bikes (eg, sustainable, healthy, easy, cheaper) were influential in their purchase decision and subsequent mode shift. These findings further indicate the relevance of e-bike schemes to employees as well as the relevance of schemes in mode shift strategy more generally.

The literature review and case studies conducted in this evaluation reinforced that financial incentives should enhance uptake for low-income and other vulnerable groups. In addition, 'new' cycle trips and 'new' users should be incentivised. The employee survey confirmed that price discounts offered under the national initiative were influential in the decision of employees to buy an e-bike. Salary advance or an employee loan were also influential for those able to access these. For most buyers who would not have purchased without a scheme, financial incentives were the main factor that made the difference.

As noted in section 4.2.2 and evidenced through the 'Not applicable' responses in the employee survey, salary advance or employee loan facilities are not widely available to the core public sector. In the absence of these incentives, product discounts become the primary incentive offered under the national initiative. Respondents to the employee survey noted that available discounts were often similar to those accessible to the general public. The proportion of respondents who bought independently of schemes suggests that standard discounts provide limited incentive. Further, many buyers who would have purchased an e-bike without a scheme described schemes acting as more of a prompt or additional impetus to an existing decision to buy. The employee survey also showed a skew to higher-income earners amongst those who did buy. Further, many respondents who recommended improvement to schemes advocated for enhanced financial incentives, including greater price discounts. These respondents commonly reported that the discounts currently available were insufficient to address the price barrier. By way of comparison, typical savings reported from the UK C2W scheme are around 33% off the purchase price of an e-bike, with further gains achieved by those on higher salaries. Finally, e-bike suppliers interviewed in the process evaluation questioned the feasibility and equity of the financial incentives currently offered. They described design barriers to achieving bulk purchase discounts and concern that the investment risk fell totally on suppliers when schemes were only able to offer discounts. Suppliers also questioned the sustainability of discounts, including the level of discounting possible as well as the willingness of suppliers to continue to offer discounts in the context of product shortage created by COVID-19.

Taken collectively, the evaluation findings indicate that the national initiative is underperforming on having effective financial incentives. Partial purchase subsidies combined with discounts may ultimately be required if initiatives are to more satisfactorily meet equity and sustainability criteria. Previous research in the UK recommended a similar mix of incentives (Newson and Sloman 2019). Further efforts to ensure that salary advance and employee loan facilities are as widely available as possible seem important. Both facilities signal employer commitment and support. However, the process evaluation showed a range of factors could influence employee uptake of these facilities, and organisations should carefully research demand before committing the time and resources required to establish them.

The findings from this evaluation also reinforce the importance of schemes providing the opportunity to trial an e-bike. The employee survey showed trials were influential in the decision of employees to purchase an e-bike. There is widespread evidence that trials can enhance interest in purchasing an e-bike and can build positive attitudes towards mode shift (Cairns et al 2017; Fyhri and Fearnley 2015; Fyhri et al 2017; Moser et al 2018). The literature review and findings from the Scottish case study also showed that much can be done to enhance outcomes from trials. This includes the provision of extended trial periods, which offer more 'real

life' testing. Strategies for enhancing trials should be explored in future initiatives – for example, whether workplace fleet bikes could be used to deliver enhancements.

The value of more tailored support was also indicated by the process evaluation. This included support to address specific or more personal barriers such as body consciousness, safety concerns, and confidence.

The literature review concluded that schemes should:

- be local
- be well communicated and backed by sustained campaigns
- build consumer awareness and knowledge
- deliver appropriate messages.

The process evaluation also showed that well executed workplace schemes required senior leadership support and appropriate resourcing. However, suppliers noted that inputs to schemes, and therefore scheme quality and outcomes, could vary. It was notable that a third of the respondents to the employee survey who recommended improvements to schemes identified the need for enhanced communication and promotion. These findings suggest further consideration should be given to how initiatives can further support organisations to execute schemes successfully. This could include further training and support to local scheme coordinators, particularly if they are not experienced cyclists (eg, to ensure coordinators are supporting schemes with appropriate messaging). Any initiative should be sufficiently staffed to provide participating organisations with access to personalised and timely support when required.

Multiple findings from this evaluation reinforced that e-bike initiatives cannot be designed in isolation from other enablers and barriers to e-bike riding. The Scottish case study showed the value of integrated strategies on multiple fronts rather than focusing on one element in isolation. Other studies have also observed the need for integrated supports (Newson and Sloman 2019). Future planning should consider the appropriate integration of initiatives as well as how the scope of supports might be expanded. For example, Scottish initiatives provide funding to support the development of secure parking, safety equipment, end-of-journey facilities, e-bike pools, and hire schemes. Expanding scope need not be complex nor expensive. For example, including security accessories in product discounts or repayment options may help to alleviate security concerns, which are a barrier to uptake (Wikstrøm and Böcker 2020) and, anecdotally, an increasing problem in Aotearoa New Zealand.

6 Conclusion

Process and outcome evaluation of the public sector e-bike purchase support initiative shows that the initiative has achieved outcomes of considerable value and significance. The demand for and relevance of e-bike schemes to reduce the upfront price of e-bikes was confirmed. The evaluation identified a range of success factors for effective schemes and showed that the national initiative was performing strongly on many of these. This performance, and earlier recommendations from the process evaluation for design enhancements, provides a roadmap for the future development of initiatives.

The evaluation showed positive outcomes from support schemes in respect of e-bike uptake and mode shift. While there are limitations in the evaluation methods used to determine and evaluate these outcomes, the reported results should give confidence that there is considerable potential for achieving positive health, safety and environmental outcomes, and further investments in e-bike support schemes are warranted. However, the evaluation concludes that further consideration should be given to the mix of financial incentives needed to reduce price barriers to the extent that would lead to widespread uptake and that would enhance uptake for those on lower incomes. The literature review conducted as part of this evaluation undertook some initial analysis of incentives; however, a more detailed analysis now seems appropriate.

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Appendix A: E-bike national initiative intervention logic model

Problem/Opportunity	Inputs	Activities	Outputs
<ul style="list-style-type: none"> The upfront cost of purchasing an e-bike is a considerable barrier to e-bike uptake. Compared with conventional bikes, e-bikes²⁷ have superior capacity to induce new people to cycling and to displace car trips, both commuting and work-related travel. 	<ul style="list-style-type: none"> Waka Kotahi staff Cross-agency collaboration Initiative resources (website, templates, employer guide) Other national-level supports available under the initiative Public sector organisations signed up to or expressing interest in the national initiative Participating employees Pre-selected e-bike suppliers²⁸ Pre-selected supplier list and supplier offers Microsoft Teams for project leads 	<ul style="list-style-type: none"> Activities to design/establish the national initiative Activities to select e-bike suppliers Activities to develop information and supporting resources Activities to promote/market the national initiative Activities to administer/manage the national initiative Activities undertaken by employers to sign-up to and participate in the national initiative Activities undertaken by employers to address workplace responsibilities under the Health and Safety at Work Act Activities to monitor/evaluate schemes 	<ul style="list-style-type: none"> National initiative systems and processes National initiative information and supporting resources Pre-approved e-bike suppliers and e-bike discounts offered Signed-up public sector organisations Purchase support schemes established by participating employers E-bike demonstration sessions ('have-a-go' offers) Other pre- and post-purchase support services delivered under the national initiative and/or each scheme E-bikes purchased by public sector employees under each scheme

²⁷ Type of e-bike and different features of e-bikes may be influential in the extent of resultant mode shift.

²⁸ Big Street Bikers; Bikes International and Electrify NZ; Electric Bike Team; Evo; Giant Bicycles; PRV; Sheppard Cycles; Torpedo 7.

Short-term outcomes	Medium-term outcomes	Long-term outcomes	Impacts
<ul style="list-style-type: none"> • Raised profile of e-bike purchase support schemes within the public sector • Public sector seen to be leading by example • Simplified procurement processes • Financial barriers to e-bike purchase reduced • E-bikes are purchased by employees 	<ul style="list-style-type: none"> • Mode shift (specifically private motor vehicle to e-bike) • Reduced dependency on private motor vehicles • Reduced travel time and costs (commuting) • Reduced travel time and costs (work-based travel) • Cost savings on organisational fleet purchases • Organisational outcomes (supporting health, well-being, sustainability goals, meeting corporate social responsibility and sustainability objectives) 	<ul style="list-style-type: none"> • Improved employee morale • More active employees • Healthier employees • More engaged employees • Fewer sick days • Reduced carbon dioxide emissions • Reduced congestion 	<ul style="list-style-type: none"> • Not examined

Assumptions and conditions of the logic model

- 'Timing' may be influential (eg, summer may be most enabling, avoiding competing sales/product discounts, running offer for limited time to maximise demand, align purchase window to 'Have a go' day).
- Extent of discount achieved may depend on the total number of sales that can be batched together at the same time (bulk buy).
- Level of discount achieved on e-bike purchase costs will be motivating for public sector organisation employees.
- Wage advances, staggered payments, and loan schemes are generally not available to the core public service (however, these offers may be particularly motivating).

Appendix B: 2020 public sector organisation survey (process evaluation)

Introduction

Thank you for completing this survey, it should take about ten minutes. Your feedback will help Waka Kotahi NZ Transport Agency to evaluate the success of the e-bike purchase support initiative and to consider next steps.

You will not be personally identified by completing this survey. To start the survey, please click Next below.

Your organisation

1. What is the name of your organisation? [Open-ended text box]

Note: By naming your organisation, your organisation's level of involvement in the initiative and the number of any e-bikes ordered and/or received by your staff so far may be reported. The name of your organisation will not be reported in relation to any other information you provide.

Awareness and interest

2. What were or are the main reasons for your organisation's interest in the e-bike purchase support initiative? Tick all that apply.

- Support more sustainable modes of transport for commuting or work-related travel
- Support healthier modes of transport for commuting or work-related travel
- Reduce the time and cost of commuting or work-related travel
- More engaged employees/improved morale
- Healthier employees/fewer sick days
- An opportunity for discounts on organisational fleet e-bikes
- Good alignment with strategic priorities of our organisation
- Contribute to the appeal of this organisation as a place to work
- No main reason/s
- Not sure

3. Prior to becoming aware of the national initiative, was your organisation involved in any other schemes to encourage staff to purchase or use e-bikes for commuting or work-related travel? [Yes/No/Not sure]

3a. [If Yes Q3]. What previous schemes was your organisation involved in? [Open-ended text box]

Usefulness of available supports

4. Please rate the usefulness to your organisation of the following supports available under the e-bike purchase initiative. [Very useful/Useful/Neither useful nor not useful/Not useful/Not at all useful/Not applicable].

- Employer E-bike Purchase Support Initiative 'How-to guide'
- Approved e-bike supplier list; guidance on selecting a supplier

- Microsoft Teams (enabling sharing and support between organisations)
- Peer-to-peer support (eg, from other organisations)
- Direct support from Waka Kotahi staff

4a. Please explain any of your answers further. [Open-ended text box]

Participation in the initiative

5. Has COVID-19 impacted in any way your organisation's response, planning, progress, or outcomes under the initiative so far? [Yes/No/Not sure]

5a. [If Yes Q5]: What impact has COVID-19 had?

6. Which statement best describes your organisation's involvement in the national initiative now? (Please tick one).

- My organisation established an e-bike purchase support scheme; some staff have ordered and received e-bikes
- My organisation established an e-bike purchase support scheme; some staff have ordered e-bikes but have not yet received them
- My organisation established an e-bike purchase support scheme; staff have not yet ordered or received e-bikes
- My organisation is in the process of establishing an e-bike purchase support scheme
- My organisation is in the process of deciding whether to establish an e-bike purchase support scheme
- My organisation has not taken any action to decide whether to establish an e-bike purchase support scheme
- My organisation has decided not to establish an e-bike purchase support scheme
- Not sure

Your organisation's scheme

7. How many staff have ordered and/or received e-bikes through your organisation's scheme so far? Please include any staff that have ordered but not yet received bikes. [Open-ended text box]

8. How many staff were or will be invited to take part in your scheme? [Open-ended text box]

9. Does or will your organisation's scheme comprise any of the following features? [Yes – a feature/No – not a feature/Not decided/Not sure]

- 'Demo days' held so staff can try out e-bikes before they purchase
- Senior leaders/managers communications to staff in support of your scheme
- A mechanism that allows staff to pay for their e-bikes over time

E-bike suppliers

10. Which e-bike supplier/s does or will your scheme use? Tick all that apply.

- Big Street Bikers
- Bikes International and Electrify NZ

- Electric Bike Team
- Evo
- Giant Bicycles
- PRV
- Sheppard Cycles
- Torpedo 7
- Not sure

11. Please rate your organisation's satisfaction with the performance of the e-bike supplier/s you use or intend to use. If you have or will use more than one supplier, please rate your overall satisfaction. Ratings may be provided to the e-bike suppliers but will be anonymous (ie, not linked to your organisation).

- Very satisfied
- Satisfied
- Neither satisfied nor not satisfied
- Not satisfied
- Not at all satisfied
- Not sure

11a. Please explain your answer. [Open-ended text box]

Your organisation's scheme

12. What successes, if any, has your organisation had under the e-bike purchase support initiative so far? For example, a success might be something you did that really engaged staff in your scheme. [Open-ended text box]

13. What challenges, if any, has your organisation faced under the e-bike purchase support initiative so far? For example, a challenge might be something that made it difficult to get staff engaged in a scheme. [Open-ended text box]

14. Please tick any ways your organisation evaluated or is planning to evaluate the success of your scheme. (Tick all that apply.)

- Record of how many employees purchased e-bikes
- Record of employees' use of e-bikes following purchase (personal purchases)
- Record of employees' use of e-bikes following purchase (organisational fleet purchases)
- Assessment of employees' experience/satisfaction under the scheme
- Reasons for staff wanting to take part in the scheme
- My organisation is still determining what evaluation will be undertaken
- My organisation is not undertaking any evaluation
- Other (please describe)
- Not sure

Participation in the initiative

15. Will your organisation undertake any further actions under the initiative in the future? For example, consider again whether to take part, continue with setting up a scheme, or continue with your scheme. [Yes/No/Not sure]

15a [If Yes Q15] Please give an approximate date/month from when you expect your organisation will undertake further actions.

Participation in interview

16. Would you be willing to take part in a confidential 30-minute interview to further discuss your organisation's experience, progress, and future needs under the e-bike purchase support initiative? If you are selected for an interview, your name and the name of your organisation will not be used or reported at any stage. [Yes/No]

16a [If Yes Q16]. Please provide your name and contact details below. Information supplied will only be used to contact you about an interview and will not be connected to your survey responses.

End of survey

This is the end of the survey. Thank you for your time and responses. To submit your survey, please click 'Done' below.

Appendix C: 2020 key informant interview schedules (process evaluation)

Scheme coordinators

Criteria	Focus	Interview questions	Objective
	<ul style="list-style-type: none"> Background 	<ul style="list-style-type: none"> Brief introduction – organisation/coordinator Establish: <ul style="list-style-type: none"> when ‘signed-up’ stage/extent of scheme implementation COVID impacts 	<ul style="list-style-type: none"> Involvement to date
<ul style="list-style-type: none"> Awareness Access 	<ul style="list-style-type: none"> Awareness of initiative Ease of access/ understanding 	<ul style="list-style-type: none"> When/how became aware of initiative How developed understanding of what the initiative offered and required – easy/difficult? Motivations/appeal of initiative 	<ul style="list-style-type: none"> Success factors Key components Best roll-out
<ul style="list-style-type: none"> Relevance Equity 	<ul style="list-style-type: none"> Level/nature of interest Leadership team support 	<ul style="list-style-type: none"> How went about deciding to establish a scheme: <ul style="list-style-type: none"> who involved²⁹ what involved Level of interest/engagement: <ul style="list-style-type: none"> leaders/senior managers employees – any demographic trends (eg, age, gender) 	<ul style="list-style-type: none"> Who benefitting Success factors Key components Best roll-out
<ul style="list-style-type: none"> Efficiency Ease 	<ul style="list-style-type: none"> Ease of scheme setup/admin Scheme design Cost–benefit evaluation 	<ul style="list-style-type: none"> How went about designing/establishing scheme: <ul style="list-style-type: none"> who involved what involved Describe design of scheme: <ul style="list-style-type: none"> e-bike supplier incentive/discount/financial arrangement promotion/supports administration Why that design/administration? Other costs/requirements³⁰ generated by scheme? <ul style="list-style-type: none"> expected/unexpected reasonable/unreasonable Cost–benefit evaluation of scheme setup <ul style="list-style-type: none"> inputs/costs v benefits/outcomes 	<ul style="list-style-type: none"> Success factors Key components Best roll-out

²⁹ Administration, finance, payroll, human resources, and sustainability functions.

³⁰ For example, secure storage, charging facilities, showers.

Criteria	Focus	Interview questions	Objective
<ul style="list-style-type: none"> Effectiveness Equity 	<ul style="list-style-type: none"> Effectiveness of support Bike purchases Impacts on travel behaviour Other impacts 	<ul style="list-style-type: none"> Information/support from national initiative used: <ul style="list-style-type: none"> satisfaction with support available other support/information needed? Extent e-bike suppliers met needs/expectations: <ul style="list-style-type: none"> product range discount supply capability try before buy other pre/post-purchase supports Number of bikes purchased to date: <ul style="list-style-type: none"> patterns in who (eg, sex, age, income) patterns in what (utilitarian v sport/recreation) Any insight into impact on travel behaviour: <ul style="list-style-type: none"> barriers to specific trips Other impacts from scheme: <ul style="list-style-type: none"> intended/unintended 	<ul style="list-style-type: none"> Who benefitting Bike type Mode shift Success factors Key components Best roll-out
<ul style="list-style-type: none"> Sustainability Equity 	<ul style="list-style-type: none"> Key success factors Future participation Improvements Developments 	<ul style="list-style-type: none"> Key factors shaping organisation's progress/outcomes so far. Key lessons learnt? Current/future challenges – what impact? Likelihood of continuing participation: <ul style="list-style-type: none"> changes/development to scheme? sustainability (eg, requirements, demand) Further development/improvement of the national initiative 	<ul style="list-style-type: none"> Who benefitting

E-bike suppliers

Criteria	Focus	Interview questions	Objective
	<ul style="list-style-type: none"> Introduction and background 	<ul style="list-style-type: none"> Brief intro – organisation/respondent Establish: <ul style="list-style-type: none"> history/background to becoming a supplier stage/extent of involvement 	<ul style="list-style-type: none"> Involvement to date
<ul style="list-style-type: none"> Relevance 	<ul style="list-style-type: none"> Why involved 	<ul style="list-style-type: none"> Motivations/appeal of initiative Perceived value/benefits at outset 	<ul style="list-style-type: none"> Success factors Key components Best roll-out
<ul style="list-style-type: none"> Efficiency Ease Relevance 	<ul style="list-style-type: none"> Becoming a supplier Meeting supplier criteria Appropriateness of supplier criteria 	<ul style="list-style-type: none"> Request for proposal (RFP) process: <ul style="list-style-type: none"> evaluation of process satisfaction with process Actions taken to set up as supplier: <ul style="list-style-type: none"> ability to meet supplier criteria appropriateness of criteria? 	<ul style="list-style-type: none"> Success factors Key components Best roll-out

Criteria	Focus	Interview questions	Objective
		<ul style="list-style-type: none"> How managing/administering scheme: <ul style="list-style-type: none"> any unique needs/requirements Cost–benefit so far 	
<ul style="list-style-type: none"> Effectiveness 	<ul style="list-style-type: none"> Bike sales Impact on travel behaviour Other impacts 	<ul style="list-style-type: none"> Financial incentive/mechanism used: <ul style="list-style-type: none"> effectiveness so far size/type of incentive ideally needed Trends/patterns in sales: <ul style="list-style-type: none"> who (eg, gender, age) bike type (commuter v sport/rec) Travel behaviour impacts? <ul style="list-style-type: none"> bike types sold/mode shift objective Other impacts from involvement: <ul style="list-style-type: none"> economic/employment growth intended/unintended 	<ul style="list-style-type: none"> Who benefitting Uptake (bike type) Mode shift
<ul style="list-style-type: none"> Sustainability 	<ul style="list-style-type: none"> Benefits/value delivered Key success factors Future participation Improvements Developments 	<ul style="list-style-type: none"> Key success factors so far Key learnings/lessons so far Likelihood of continuing as supplier: <ul style="list-style-type: none"> extent value/benefits delivered Sustainability: <ul style="list-style-type: none"> growth/challenges Further developments/improvements in the national initiative 	<ul style="list-style-type: none"> Success factors Key components Best roll-out

Employees who purchased bikes

Criteria	Focus	Interview questions	Objective
	<ul style="list-style-type: none"> Background 	<ul style="list-style-type: none"> Brief introduction to respondent Establish: <ul style="list-style-type: none"> when signed up to scheme when purchased bike/type of bike prior cycling experience/activity COVID-19 impacts 	<ul style="list-style-type: none"> Involvement to date
<ul style="list-style-type: none"> Awareness Access Relevance Efficiency Ease 	<ul style="list-style-type: none"> Awareness of initiative Ease of access/ understanding Pull/push factors 	<ul style="list-style-type: none"> When/how became aware of the scheme Ease of understanding: <ul style="list-style-type: none"> what was offered and why what was required Motivation/appeal of the scheme: <ul style="list-style-type: none"> financial/discount motivation What required to sign-up: <ul style="list-style-type: none"> ease/clarity of process 	<ul style="list-style-type: none"> Who benefitting Success factors Key components Best roll-out

Criteria	Focus	Interview questions	Objective
<ul style="list-style-type: none"> • Relevance • Efficiency • Ease 	<ul style="list-style-type: none"> • Scheme design • Cost–benefit evaluation 	<ul style="list-style-type: none"> • Clarify financial arrangement/discount utilised: <ul style="list-style-type: none"> – how/why motivating specifically • Describe purchase decision-making process: <ul style="list-style-type: none"> – information sought/received – try before buy – other pre-purchase supports – post-purchase support • Cost–benefit evaluation of scheme participation: <ul style="list-style-type: none"> – inputs/costs v benefits/outcomes 	<ul style="list-style-type: none"> • Success factors • Key components • Best roll-out
<ul style="list-style-type: none"> • Effectiveness • Equity 	<ul style="list-style-type: none"> • Effectiveness of support • Bike purchased • Impact on travel behaviour • Other impacts 	<ul style="list-style-type: none"> • Likelihood of purchase without the scheme • Post-purchase reflection: <ul style="list-style-type: none"> – sufficient access to info/support/range to make correct purchase decision – any other support/information needs? • Impact on travel behaviour so far: <ul style="list-style-type: none"> – when/how using (transportation/leisure) – mode replacement – car to e-bike shift – commuting/work travel – change in use/trips over time – why – barriers to specific use/trip types • Other benefits – health, costs, time: <ul style="list-style-type: none"> – current/future car ownership • Any other impacts from scheme? 	<ul style="list-style-type: none"> • Who benefitting • Uptake (bike type) • Mode shift • Success factors • Key components • Best roll-out
<ul style="list-style-type: none"> • Sustainability 	<ul style="list-style-type: none"> • Improvements • Developments 	<ul style="list-style-type: none"> • Challenges (eg, with ownership, future use) • Any other costs/requirements generated? <ul style="list-style-type: none"> – expected/unexpected – reasonable/unreasonable • Scheme development/improvements – why 	<ul style="list-style-type: none"> • Success factors • Key components • Best roll-out

Appendix D: Key informant interview information sheet/consent form

What is the purpose of the review?

The public sector e-bike purchase support initiative was established by Waka Kotahi NZ Transport Agency in 2019 to make it easier and cheaper for people to own e-bikes. Mackie Research is helping Waka Kotahi to review and further develop the initiative. As part of the review, we are interviewing e-bike purchase scheme coordinators, people who have bought e-bikes, and e-bike suppliers.

What will I be asked to do?

You are invited to participate in an interview with a researcher from Mackie Research. We will discuss your organisation's involvement in the e-bike initiative so far, whether and what type of scheme you have developed, and what has worked well and not so well.

Participation, consent, and confidentiality

Participation is voluntary and you can withdraw at any time. We will not use or report your name, position, or any other information that could identify you or your organisation.

What will happen to the information I provide?

The information you provide will be collated in a report that will be used by Waka Kotahi NZ Transport Agency in their review and further development of the e-bike initiative.

For more information or if you have any questions, please contact:

Michael Blewden
Mackie Research
Mobile: 021 308 203
Email: michael@mackieresearch.co.nz

Participant Consent Form

I have read the Information Sheet and understand the nature of the review. I have had the opportunity to ask questions and have had them answered to my satisfaction.

- I agree to take part in the interview.
- I understand my participation is voluntary and I can withdraw at any stage.
- I agree/do not agree for the interview to be voice-recorded.
- I understand that myself and my organisation will not be identified.

Participant name: _____

Signature: _____

Date: _____

Appendix E: Case studies of overseas schemes

Case Study 1 – the United Kingdom Cycle to Work (C2W) scheme

Programme dimension	Detail
Design	<ul style="list-style-type: none"> Objective: to increase the number of people cycling to work and to increase the amount of cycling. No specific targets. No provisions for people with disability. To qualify, employees must have employment contracts for more than the period of hire (12 months) and must be earning more than the National Minimum Wage after the loan repayment (typically £50–£70 per month) has been deducted. On entering the scheme, employees are committed to the full 12-month repayment. Typical savings on the purchase price are around 33%, but those on high salaries gain more from the scheme in tax and National Insurance ‘savings’. Supporting programme elements vary depending on location and employer.
Financial incentives	<ul style="list-style-type: none"> A salary sacrifice scheme, running since 1999. Employers purchase bikes, then hire them to employees for a period of 12 months, paid by way of a monthly deduction from gross salary. Employees may renew the hire or buy outright after 12 months. The employee saves on income tax and National Insurance contributions. The employer saves its National Insurance payment (12.8%) on the reduced salary. Private sector companies may also reclaim the Value Added Tax on bike purchases. Third-party providers act as go-betweens, linking employers, employees, and retailers. Until June 2019, there was an upper limit (£1,000) on purchases; this is no longer in force. E-bikes are covered by the scheme.
Effectiveness/ Outcomes	<ul style="list-style-type: none"> In the largest survey of users, two-thirds reported they had increased the amount they were cycling. There was a 250% increase in miles cycled to and from work compared with before joining the scheme. A more detailed assessment of users in Yorkshire found roughly half the users already owned a bike and cycled regularly before joining the scheme. Utility cycling (for other reasons than going to work) also increased, with at least a tripling of the proportion using a bike for shopping, leisure, visiting and taking children to school. Car travel was reduced on average by about 20 miles per week.
Evaluation	<ul style="list-style-type: none"> Surveys of users of the scheme, gathering self-reported data on travel behaviours before and after joining the scheme. Many commissioned by the C2W Alliance, a coalition of four of the largest providers. Response rates are generally not given or are poorly described. Economic analyses have been conducted; the Institute for Employment Studies estimates that the social benefit each year from reduced work absences and improved physical health is more than twice the cost to the Treasury in lost tax and National Insurance.
Success factors	<ul style="list-style-type: none"> C2W has been running nationally for two decades; about 140,000 people participate each year. In broad terms, it meets its objectives of increasing the amount of cycling, including trips to and from work. Success factors: the legislative base (the Finance Act 1999); the simplicity of the scheme; the size of the financial incentive; well-established providers with strong connections with suppliers; the choice of bikes (including e-bikes). The stability and longevity of the scheme reduces risk for employers and providers. The scheme is generally conservative – there has been little change and development. However, C2W has perhaps encouraged smaller schemes that offer more (eg, opportunities

	<p>to try bikes before buying, access to adapted bikes for those with disability, folding bikes for use on public transport, grant schemes to support those on low incomes).</p> <ul style="list-style-type: none"> • See Case Study 3 on the Scottish experience – this is a good example of local initiatives that extend the opportunities offered by C2W. • There is some evidence that C2W has been most successful where there are supporting facilities (eg, secure parking facilities such as ‘bike hangars’) and good infrastructure (bike ‘superhighways’).
Key lessons for New Zealand	<ul style="list-style-type: none"> • Moderately strong evidence that financial incentives in the form of a salary sacrifice scheme encourage both the purchase of bikes and lead to the increased use of bikes. • Moderate mode shift from cars to bikes. • Incentives do not apply to those out of employment, are often not accessible for those in short-term employment, and generally advantage high-income earners.

References for Case Study 1

Cairns, S, L Hopkinson, Z Schuller, I Stoddart, E Heinen and L Sloman (2019) *CWIS Active Travel Investment Models: Model structure and evidence base. Technical appendix 5 – Compendium of interventions*. Transport for Quality-of-Life.

Clarke, A, J Shires and J Laird (2014) Cycle to Work scheme – Weekend warriors or daily commuters. *The Scottish Transport Applications and Research (STAR) Conference 2014*. Glasgow, Scotland.

Senior OD and HR Business Partner C&P CCG (2019) *Cycle scheme policy and procedure*. Cambridge and Peterboroughshire Clinical Commissioning Group report. 13 pp.

Swift, S, M Green, J Hillage and V Nafilyan (2016) *Impact of the Cycle to Work scheme – Evidence report*. Institute for Employment Studies research report. 40 pp.

Zoom call with Professor Rachel Aldred, University of Westminster, 16 July 2020.

Case Study 2 – B-Riders: North Brabant e-bike pay-to-ride scheme

Programme dimension	Detail
Design	<ul style="list-style-type: none"> • Objective: to encourage travel to work by e-bike in place of motor vehicle; reduction of car trips, car traffic volume and congestion. • Scheme open to all 18–65-year-olds in the province who did not already ride by e-bike and at the time of joining made 50% or more of their weekly trips to and from work by car – there were no specific provisions for people with disability or on low incomes. • Payment per kilometre travelled by e-bike monitored by a phone app, which was also used to provide feedback to participants, links with resources, and access to rewards (eg, coffee vouchers). • This scheme was one element in the Dutch bike programme at the time (2013–2017), alongside extensive infrastructure investments, subsidies available through employers to assist purchase of e-bikes, and training programmes of various kinds.
Financial incentives	<ul style="list-style-type: none"> • For those registered with the scheme, payment of €0.15 per km for travel at peak hours, €0.08 per km at other times, up to a maximum of €1,000 per participant in a period of one year.
Effectiveness/ Outcomes	<ul style="list-style-type: none"> • The pay-as-you-ride scheme operated for 3 years (approx. 2013–2017). Loss of political support in the provincial government meant the funding did not continue. In a revised form (B-Riders 3), payments were made for a short time by employers for e-bike commuting to work. In total, approximately 10,000 employees registered with the scheme. It is estimated

	<p>the increase in e-biking due to incentives reduced peak-hour motor vehicle traffic by about a million cars. The proportion of commuting trips by e-bike rose from zero to 68% after one month and remained high (73%) after 6 months. Half these trips replaced car trips; most of the remainder displaced conventional cycling. Travel satisfaction increased by 1.4 points on the 7-point Satisfaction with Travel Scale – this gain persisted and actually increased slightly over 6 months. Increased satisfaction with the commute by e-bike was associated with improved health status (self-reported) and was influenced by components of the trip environment (eg, green space, ‘liveliness’ of the commute, pleasing landscapes, and lack of congestion).</p> <ul style="list-style-type: none"> • Forty-three percent of participants reported a household income of less than €3,000 per month (which is close to the median income nationally): satisfaction levels were slightly higher in this group than those with higher incomes.
Evaluation	<ul style="list-style-type: none"> • Time and distance travelled data were obtained by the purpose-built app that all participants used in the scheme. • For (PhD) research purposes, detailed questionnaires were filled in at entry to the scheme, after one month, and after 6 months. Evaluation reports were based on 547 participants who fully completed all three questionnaires. • The project team also collected behaviour change data from participants.
Success factors	<ul style="list-style-type: none"> • Generous eligibility criteria. • The scheme served several purposes, as the information generated by the app was available to the transport authority and added greatly to existing data on cyclist route choice and time of travel. • Those managing the scheme worked closely with employers and bike retailers in the province. • The organisers paid close attention to communications with those registered to ensure complaints and questions were handled promptly (the scheme won a prize for innovative and effective communications). • The robust, detailed evaluation. • The fact that this scheme was not an isolated project but was part of the provinces’ cycle programme (including cycle highways and other major infrastructure improvements during the life of the scheme).
Key lessons for New Zealand	<ul style="list-style-type: none"> • Payment for use of e-bikes is feasible, and evidently leads to widespread use of e-bikes, displacing car trips to work (as well as trips by conventional bicycle). Whether this effect fully persists after the incentive ceased is not known. Satisfaction with the trip to work was much higher when using e-bikes than driving by car, which might encourage long-term continuation.

References for Case Study 2

- De Kruijf, J, D Ettema and M Dijst (2019) A longitudinal evaluation of satisfaction with e-cycling in daily commuting in the Netherlands. *Travel Behaviour and Society* 6: 192–200.
- De Kruijf, J, D Ettema, CBM Kamphuis and M Dijst (2018) Evaluation of an incentive program to stimulate the shift from car commuting to e-cycling in the Netherlands. *Journal of Transport and Health* 10: 74–83.
- European Cyclists’ Federation (2016) *Electromobility for all – Financial incentives for e-cycling*. European Cyclist’ Federation research report. 16 pp.
- Ministerie van Infrastructuur en Milieu (n.d.) *Evaluation of B-Riders Brabant*. Accessed 19 May 2021. <https://www.brabant.nl/-/media/469cd88e2de349b6bb07283f48cd0a38.pdf?la=nl>
- Zoom call with Prof Joost de Kruijf (Utrecht University) and Mr Nathan Hooghof (Project Leader, B-Riders Brabant), 15 July 2020.

Case Study 3 – Scottish initiatives to promote e-bikes

Programme dimension	Detail
Design	<ul style="list-style-type: none"> • Objective: to increase the use of e-bikes in all population groups. • Designed to meet specific targets in the Scottish Cycling Action Plan, which has an overall goal to increase cycling mode share to 10%. • The Scottish programme includes a number of elements: <ul style="list-style-type: none"> – Funding local authorities and other organisations to support uptake of e-bikes. Covers items such as secure parking, safety equipment, showers at work, e-bike pools, hire schemes. – Interest-free loans are available for individuals and businesses to purchase e-bikes and e-cargo bikes (with a more generous cap than C2W). – Funds are set aside specifically to give members of the public the chance to test-ride e-bikes before deciding on whether to buy. • This sits alongside, and in many ways complements, C2W, which is a UK-wide salary sacrifice scheme run by the Treasury. • The Scottish initiatives have wider coverage, specifically including those with disability, those not employed or on short-term contracts, people in rural areas, and those who use the bikes for other reasons than commuting. • Support for the promotional schemes includes provision of training, accreditation of Cycling Friendly Employers, funding of evaluation.
Financial incentives	<ul style="list-style-type: none"> • Businesses and organisations apply for grants, usually up to £25,000. • Support for e-bike purchases takes the form of interest-free loans, up to £6,000, with repayment period of four years. Covers (per household) up to two e-bikes (capped at £3,000 each), one e-cargo bike (£6,000 limit), and one adaptive bike. Applications processed on first-come first-served basis. • Funding comes from Transport Scotland. • The Scottish Energy Saver Trust administers funding to organisations and consumer grants. • The Cycling Friendly programme, located in Cycling Scotland, administers funding for special workplace initiatives (eg, the NHS Worker Fund, which ensures bike grants are available also for staff on temporary contracts and apprenticeships).
Effectiveness/ Outcomes	<ul style="list-style-type: none"> • These initiatives explicitly cover utility and recreational travel as well as commuting. But we could not locate any information on the effects of these schemes on travel by bicycle. There is wide-ranging engagement by businesses and a spread of organisations, including third-sector and community groups. • Surveys of organisations and individuals supported by the initiatives are positive. There are signs that attitudes have changed amongst those participating in the schemes – more agreeing that e-bikes are suitable for travel, both business and personal; that e-bikes are an option for sustainable travel; and that e-bikes are safe. • There is evidence that the schemes are accessed by people on low incomes, by those who are self-employed or only occasionally employed, and by people with disability.
Evaluation	<ul style="list-style-type: none"> • Surveys of participants (both organisations and individuals) shortly after taking part in e-bike supporting schemes.
Success factors	<ul style="list-style-type: none"> • The Scottish programme has extended the opportunities offered by the national C2W scheme to workplaces and settings that would not otherwise benefit. Examples include an e-bike scheme for staff providing home care in the rural Highlands, and community policing teams in Dundee were funded to replace their cars with e-bikes. • The 'try before you buy' option is popular.

	<ul style="list-style-type: none"> • Essential cycling skills training provided through Cycling Scotland has been adapted for e-bikes and e-cargo bikes and is delivered through a network of accredited service centres. • Funding is specifically set aside for changes in the workplace that support e-bike use (safe parking, showers). • The variety of e-bikes on offer through the various schemes is a positive feature – e-cargo bikes are specifically included. However, participants report there are still design issues with e-bikes: women in particular are sometimes poorly served by what is on the market (eg, too big, too heavy, seat too high).
<p>Key lessons for New Zealand</p>	<ul style="list-style-type: none"> • Approaching the challenge on multiple fronts appears to be a more successful approach than relying entirely on one element. • Grants for purchase of e-bikes are more generous than those available under C2W, and explicitly apply to e-cargo bikes. • Under the trial scheme, roughly half the participants were able to test-ride e-bikes for an extended period (more than two weeks). • Information on e-bike usage is not yet available, which may weaken the case for continued funding. • Evaluation of the initiatives concluded that more could be done to support access for those on low incomes, and that additional data are needed on trip purpose, mode shift, and bike recycling.

References for Case Study 3

Cycling Scotland (n.d.) *Cycling friendly employer*. Accessed 19 May 2021. <https://www.cycling.scot/what-we-do/cycling-friendly/employer>

Energy Saving Trust (2020) *E-bike participant trial*. Energy Saving Trust report.

McQueen M, J MacArthur and C Cherry (2019) *How e-bike incentive programs are used to expand the market*. Transport Research and Education Centre (TREC) financial report.

Newson C and L Sloman (2019) *The case for a UK incentive for E-bikes*. Bicycle Association and Transport for Quality of Life research report. 25 pp.

Personal communications: Keith Irving (Chief Executive, Cycling Scotland); Katharine Brough (Head of Behaviour Change, Cycling Scotland).

Appendix F: 2021 employee survey (outcome evaluation)

Introduction

Thank you for completing this survey. Your participation is voluntary and your responses are anonymous. Depending on your answers, the survey will take about 10 minutes.

The survey asks about the purchase and use of an electric bike, non-electric bike, electric scooter, or non-electric scooter through or in some way because of an employer's electric bike purchase support scheme. Your answers will help to determine the value of such schemes and will guide their further development.

If you purchased a bike or scooter through your employer's scheme for someone else in your family, this person should complete the survey.

To start the survey please click [Next](#) below.

Background

1. Did you, or someone on your behalf, purchase any type of bicycle ('bike') or scooter through an employer's purchase support scheme?
 - Yes [go to Q3]
 - No
2. Did you, or someone on your behalf, purchase any type of bike or scooter independent of an employer's scheme, but in some way influenced by a scheme?
 - Yes
 - No [go to Q5]
3. What did you or someone on your behalf purchase? (Note: If a bike was purchased, please select one of the bike types described even if the description does not exactly match the type of bike purchased).
 - Electric urban/commuter bike
 - Electric mountain bike
 - Non-electric urban/commuter bike [go to Q26]
 - Non-electric mountain bike [go to Q26]
 - Electric scooter [go to Q41]
 - Non-electric scooter [go to Q58]
 - Something else (please specify) [go to Q58]
4. How long have you had the electric bike purchased?
 - Less than 1 month [go to Q12]
 - 1–3 months [go to Q12]
 - 4–6 months [go to Q12]
 - 7–9 months [go to Q12]
 - 10–12 months [go to Q12]

- More than 12 months [go to Q12]
- Not sure [go to Q12]

Existing ownership of an electric bike

5. Do you already own an electric bike? (ie, not purchased directly or indirectly through an employer's bike purchase support scheme)
- Yes
 - No [go to Q57]

While you did not purchase your electric bike directly or indirectly through an employer's scheme, we still want to know about the trips you are now making by your electric bike.

In this survey, a 'trip' is defined as a one-way movement between a start point (origin) and a destination using the same mode of travel. For example, if you travel from home to the bus station by electric bike, this would be one trip. If you then travel from the bus station to work by bus, this would be another trip. If you travel to the shops by bike and then continue on to football practice, this would be two trips.

6. Currently, in a typical 7-day week, do you ride your electric bike for any purpose?
- Yes
 - No [go to Q57]
7. For what purpose do you ride your electric bike? Tick all that apply.
- To travel to/from work
 - To travel to/from shops and services (eg, mall, bank, post office)
 - To travel to/from social activities (eg, seeing friends, going to the pub)
 - To travel to/from school or day-care (ie, for the 'school drop-off')
 - For the purpose of sport, recreation, or leisure (eg, riding in the park or on a trail)
 - Other purpose (please specify)
8. Please record how many of each trip type you currently make in a typical 7-day week using your electric bike. Remember for this question, a trip is a one-way movement between a start point and a destination that you make using your electric bike.
- Travel to/from work
 - Travel to/from shops and services
 - Travel to/from social activities
 - Travel to/from school or day-care
 - For sport, recreation, or leisure
 - Other trip types
9. How many of the trips above would you have previously made by petrol or diesel car? By 'previously' we mean before you got your electric bike.
- Travel to/from work
 - Travel to/from shops and services
 - Travel to/from social activities

- Travel to/from school or day-care
 - For sport, recreation, or leisure
 - Other trip types
10. Thinking of all the trips in the question above you are now making in a typical 7-day week by electric bike and that would have previously been made by petrol or diesel car, how many kilometres would these trips add up to in total?
- Not sure [go to Q57]
 - Please write the number of kilometres [Open-ended text box]
11. Why are you now travelling these kilometres by electric bike and not by petrol or diesel car? Tick all that apply.
- Trips are quicker [go to Q57]
 - Trips are easier/more convenient [go to Q57]
 - Trips are less stressful [go to Q57]
 - Trips are safer/feel safer [go to Q57]
 - Trips are enjoyable [go to Q57]
 - Trips are cheaper [go to Q57]
 - Can now bike in work clothes [go to Q57]
 - Trips require less exertion [go to Q57]
 - Trips provide exercise [go to Q57]
 - Trips do not emit greenhouse gases [go to Q57]
 - Trip distances are now achievable [go to Q57]
 - Other (please specify) [Open-ended text box] [go to Q57]

Using your electric bike

These questions are about trips you are now making by the electric bike you purchased or that someone else purchased on your behalf.

In this survey, a 'trip' is defined as a one-way movement between a start point (origin) and a destination using the same mode of travel. For example, if you travel from home to the bus station by electric bike, this would be one trip. If you then travel from the bus station to work by bus, this would be another trip. If you travel to the shops by bike and then continue on to football practice, this would be two trips.

12. Currently, in a typical 7-day week, do you ride your electric bike for any purpose?
- Yes
 - No [go to Q18]
13. For what purpose do you ride your electric bike? Tick all that apply.
- To travel to/from work
 - To travel to/from shops and services (eg, mall, bank, post office)
 - To travel to/from social activities (eg, seeing friends, going to the pub)
 - To travel to/from school or day-care (ie, for the 'school drop-off')

- For the purpose of sport, recreation, or leisure (eg, riding in the park or on a trail)
 - Other purpose (please specify)
14. Please record how many of each trip type you currently make in a typical 7-day week using your electric bike. Remember for this question, a trip is a one-way movement between a start point and a destination that you make using your electric bike.
- Travel to/from work
 - Travel to/from shops and services
 - Travel to/from social activities
 - Travel to/from school or day-care
 - For sport, recreation, or leisure
 - Other trip types
15. How many of the trips above would you have previously made by petrol or diesel car? By 'previously' we mean before you got your electric bike.
- Travel to/from work
 - Travel to/from shops and services
 - Travel to/from social activities
 - Travel to/from school or day-care
 - For sport, recreation, or leisure
 - Other trip types
16. Thinking of all the trips in the question above you are now making in a typical 7-day week by electric bike and that would have previously been made by petrol or diesel car, how many kilometres would these trips add up to in total?
- Not sure [go to Q18]
 - Please write the number of kilometres [Open-ended text box]
17. Why are you now travelling these kilometres by electric bike and not by petrol or diesel car? Tick all that apply.
- Trips are quicker
 - Trips are easier/more convenient
 - Trips are less stressful
 - Trips are safer/feel safer
 - Trips are enjoyable
 - Trips are cheaper
 - Can now bike in work clothes
 - Trips require less exertion
 - Trips provide exercise
 - Trips do not emit greenhouse gases
 - Trip distances are now achievable
 - Other (please specify) [Open-ended text box]

Other impacts on travel

18. Please tell us about any other impacts your electric bike has had on your travel. For example, when, where, and how far you travel, who you travel with (eg, children), and the types of trips you make (eg, for shopping). [Open-ended text box]

Influences on purchase decision

These next questions are about employer bike purchase support schemes.

19. How much influence did the following factors have in the decision to purchase your electric bike through a purchase support scheme? [0 = No influence, 5 = Significant influence, NA = Not applicable]

- Opportunity to trial an electric bike before purchase
- Availability of wage advance
- Availability of employee loan
- Availability of price discounts
- Availability of interest-free finance through the retailer
- Access to pre-purchase information or advice (eg, range, pricing, best bike for your needs)
- Access to cycling skills training or safe riding advice
- Wanting a sustainable mode of transport
- Wanting a healthy mode of transport
- Wanting an easier mode of transport (eg, quicker, less stressful)
- Wanting a cheaper mode of transport

20. Please tell us about anything else that influenced the decision to purchase your electric bike through a purchase support scheme. [Open-ended text box]

21. How likely or unlikely is it you would have purchased an electric bike if a purchase support scheme had not been available?

- Very likely
- Likely
- Neither likely nor unlikely
- Unlikely
- Very unlikely
- Not sure

22. Please tell us more about your answer. [Open-ended text box]

Other impacts

23. Thinking back to a typical 7-day week before you got your electric bike, on how many days did you do 30 minutes or more of physical activity that was enough to raise your breathing rate?

- 0 days
- 1 day
- 2 days

- 3 days
- 4 days
- 5 days
- 6 days
- 7 days
- Not sure

24. Thinking now about a typical 7-day week since you got your electric bike, on how many days did you do 30 minutes or more of physical activity that was enough to raise your breathing rate?

- 0 days
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- 6 days
- 7 days
- Not sure

25. As a result of getting your electric bike, is it now more likely, less likely, or is there no change in likelihood you would reduce (eg, sell one) or not increase (eg, not buy one) the number of cars in your household?

- More likely [go to Q56]
- Less likely [go to Q56]
- No change in likelihood [go to Q56]
- We have reduced the number of cars in our household [go to Q56]
- Not sure [go to Q56]

Background (non-electric bike)

26. How long have you had your non-electric bike for?

- Less than 1 month
- 1–3 months
- 4–6 months
- 7–9 months
- 10–12 months
- More than 12 months
- Not sure

Using your non-electric bike

These next questions are about the trips you are now making by the non-electric bike you purchased or that someone else purchased on your behalf.

In this survey, a 'trip' is defined as a one-way movement between a start point (origin) and a destination using the same mode of travel. For example, if you travel from home to the bus station by bike, this would be one trip. If you then travel from the bus station to work by bus, this would be another trip. If you travel to the shops by bike and then continue on to football practice, this would be two trips.

27. Currently, in a typical 7-day week, do you ride your non-electric bike for any purpose?

- Yes
- No [go to Q33]

28. For what purpose do you ride your non-electric bike? Tick all that apply.

- To travel to/from work
- To travel to/from shops and services (eg, mall, bank, post office)
- To travel to/from social activities (eg, seeing friends, going to the pub)
- For the purpose of sport, recreation, or leisure (eg, riding in the park or on a trail)
- Other purpose (please specify)

29. Please record how many of each trip type you currently make in a typical 7-day week using your non-electric bike. Remember for this question, a trip is a one-way movement between a start point and a destination that you make using your electric bike.

- Travel to/from work
- Travel to/from shops and services
- Travel to/from social activities
- For sport, recreation, or leisure
- Other trip types

30. How many of the trips above would you have previously made by petrol or diesel car? By 'previously' we mean before you got your non-electric bike.

- Travel to/from work
- Travel to/from shops and services
- Travel to/from social activities
- For sport, recreation, or leisure
- Other trip types

31. Think of all the trips in the question above you are now making in a typical 7-day week by non-electric bike and that would have previously been made by petrol or diesel car. How many kilometres would these trips add up to in total?

- Not sure [go to Q33]
- Please write the number of kilometres [Open-ended text box]

32. Why are you now travelling these kilometres by non-electric bike and not by petrol or diesel car? Tick all that apply.

- Trips are quicker
- Trips are easier/more convenient
- Trips are less stressful

- Trips are safer/feel safer
- Trips are enjoyable
- Trips are cheaper
- Trips provide exercise
- Trips do not emit greenhouse gases
- Other (please specify) [Open-ended text box]

Other impacts on travel

33. Please tell us about any other impacts your non-electric bike has had on your travel. Please consider when, where, and how far you travel, who you travel with (eg, children), and the types of trips you make (eg, for shopping). [Open-ended text box]

Influences on purchase decision

These next questions are about employer bike purchase support schemes.

34. How much influence did the following factors have in the decision to purchase your non-electric bike through a purchase support scheme? [0 = No influence, 5 = Significant influence, NA = Not applicable]

- Opportunity to trial a non-electric bike before purchase
- Availability of wage advance
- Availability of employee loan
- Availability of price discounts
- Availability of interest-free finance through the retailer
- Access to pre-purchase information or advice (eg, range, pricing, best bike for your needs)
- Access to cycling skills training or safe riding advice
- Wanting a sustainable mode of transport
- Wanting a healthy mode of transport
- Wanting an easier mode of transport (eg, quicker, less stressful)
- Wanting a cheaper mode of transport

35. Please tell us about anything else that influenced the decision to purchase your non-electric bike through a purchase support scheme. [Open-ended text box]

36. How likely or unlikely is it you would have purchased a non-electric bike if a purchase support scheme had not been unavailable?

- Very likely
- Likely
- Neither likely or unlikely
- Unlikely
- Very unlikely
- Not sure

37. Please tell us more about your answer. [Open-ended text box]

Other impacts

38. Thinking back to a typical 7-day week before you got your non-electric bike, on how many days did you do 30 minutes or more of physical activity that was enough to raise your breathing rate?
- 0 days
 - 1 day
 - 2 days
 - 3 days
 - 4 days
 - 5 days
 - 6 days
 - 7 days
 - Not sure
39. Thinking back to a typical 7-day week since you got your non-electric bike, on how many days did you do 30 minutes or more of physical activity that was enough to raise your breathing rate?
- 0 days
 - 1 day
 - 2 days
 - 3 days
 - 4 days
 - 5 days
 - 6 days
 - 7 days
 - Not sure
40. As a result of getting your non-electric bike, is it now more likely, less likely, or is there no change in likelihood you would reduce (eg, sell one) or not increase (eg, not buy one) the number of cars in your household?
- More likely [go to Q56]
 - Less likely [go to Q56]
 - No change in likelihood [go to Q56]
 - We have reduced the number of cars in our household [go to Q56]
 - Not sure [go to Q56]

Background (electric scooter)

41. How long have you had your electric scooter for?
- Less than 1 month
 - 1–3 months
 - 4–6 months
 - 7–9 months

- 10–12 months
- More than 12 months
- Not sure

Using your electric scooter

These next questions are about the trips you are now making by the electric scooter you purchased or that someone else purchased on your behalf.

In this survey, a 'trip' is defined as a one-way movement between a start point (origin) and a destination using the same mode of travel. For example, if you travel from home to the bus station by electric scooter, this would be one trip. If you then travel from the bus station to work by bus, this would be another trip. If you travel to the shops by scooter and then continue on to football practice, this would be two trips.

42. Currently, in a typical 7-day week, do you ride your electric scooter for any purpose?

- Yes
- No [go to Q48]

43. For what purpose do you ride your electric scooter? Tick all that apply.

- To travel to/from work
- To travel to/from shops and services (eg, mall, bank, post office)
- To travel to/from social activities (eg, seeing friends, going to the pub)
- For the purpose of sport, recreation, or leisure (eg, riding in the park or on a trail)
- Other purpose (please specify)

44. Please record how many of each trip type you currently make in a typical 7-day week using your electric scooter. Remember for this question, a trip is a one-way movement between a start point and a destination that you make using your electric scooter.

- Travel to/from work
- Travel to/from shops and services
- Travel to/from social activities
- For sport, recreation, or leisure
- Other trip types

45. How many of the trips above would you have previously made by petrol or diesel car? By 'previously' we mean before you got your electric scooter.

- Travel to/from work
- Travel to/from shops and services
- Travel to/from social activities
- For sport, recreation, or leisure
- Other trip types

46. Thinking of all the trips in the question above you are now making in a typical 7-day week by electric scooter and that would have previously been made by petrol or diesel car, how many kilometres would these trips add up to in total?

- Not sure [go to Q48]

- Please write the number of kilometres [Open-ended text box]
47. Why are you now travelling these kilometres by electric scooter and not by petrol or diesel car? Tick all that apply.
- Trips are quicker
 - Trips are easier/more convenient
 - Trips are less stressful
 - Trips are safer/feel safer
 - Trips are enjoyable
 - Trips are cheaper
 - Can now scooter in work clothes
 - Trips require less exertion
 - Trips provide exercise
 - Trips do not emit greenhouse gases
 - Trip distances are now achievable
 - Other (please specify) [Open-ended text box]

Other impacts on travel

48. Please tell us about any other impacts your electric scooter has had on your travel. Please consider when, where, and how far you travel, who you travel with (eg, children), and the types of trips you make (eg, for shopping). [Open-ended text box]

Influences on purchase decision

49. How much influence did the following factors have in the decision to purchase your electric scooter through a purchase support scheme? [0 = No influence, 5 = Significant influence, NA = Not applicable]
- Opportunity to trial a scooter before purchase (eg, through a demonstration event)
 - Availability of wage advance
 - Availability of employee loan
 - Availability of price discounts
 - Availability of interest-free finance through the scooter or bike retailer
 - Access to pre-purchase information or advice (eg, range, pricing, best product for your needs)
 - Access to cycling skills training or safe riding advice
 - Wanting a sustainable mode of transport
 - Wanting a healthy mode of transport
 - Wanting an easier mode of transport (eg, quicker, less stressful)
 - Wanting a cheaper mode of transport
50. Please tell us about anything else that influenced the decision to purchase your electric scooter through a purchase support scheme. [Open-ended text box]

51. How likely or unlikely is it you would have purchased an electric scooter if a purchase support scheme had not been unavailable?

- Very likely
- Likely
- Neither likely or unlikely
- Unlikely
- Very unlikely
- Not sure

52. Please tell us more about your answer. [Open-ended text box]

Other impacts

53. Thinking back to a typical 7-day week before you got your electric scooter, on how many days did you do 30 minutes or more of physical activity that was enough to raise your breathing rate?

- 0 days
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- 6 days
- 7 days
- Not sure

54. Thinking back to a typical 7-day week since you got your electric scooter, on how many days did you do 30 minutes or more of physical activity that was enough to raise your breathing rate?

- 0 days
- 1 day
- 2 days
- 3 days
- 4 days
- 5 days
- 6 days
- 7 days
- Not sure

55. As a result of getting your electric scooter, is it now more likely, less likely, or is there no change in likelihood you would reduce (eg, sell one) or not increase (eg, not buy one) the number of cars in your household?

- More likely
- Less likely

- No change in likelihood
- We have reduced the number of cars in our household
- Not sure

56. Please tell us about any impacts your employer's scheme had on you or others (eg, interest in buying an electric bike later, other influences on your travel).

Scheme improvement

57. Please tell us how electric bike purchase support schemes offered to staff could be improved. [Open-ended text box]

About you

These final questions will give us some understanding about you. Responses are voluntary and anonymous.

58. Who is your employer? [Open-ended text box]

59. What is your gender?

- Male
- Female
- Gender diverse
- Prefer not to answer

60. What is your age?

- Under 16 years
- 16–20 years
- 21–25 years
- 26–30 years
- 31–40 years
- 41–50 years
- 51–60 years
- 61–70 years
- 71 years or older
- Prefer not to answer

61. Which ethnic group/s do you belong to? Tick all that apply.

- New Zealand European
- Māori
- Samoan
- Cook Islands Māori
- Tongan
- Niuean
- Chinese

- Indian
- Prefer not to answer
- Other (please specify) [Open-ended text box]

62. What was your total household income before taxes during the past 12 months?

- Less than \$25,000
- \$25,000 to \$34,999
- \$35,000 to \$49,999
- \$50,000 to \$74,999
- \$75,000 to \$99,999
- \$100,000 to \$149,999
- \$150,000 to \$199,999
- \$200,000 or more
- Not sure
- Prefer not to answer

Entry into prize draw

63. Thank you for completing this survey. If you would like to go into the draw to win one of five \$200 cycling clothes/gear vouchers from Ground Effect, please provide your name and phone number below. The information you provide will be kept confidential and will only be used to administer the prize draw and to contact the prize winners.

- Name [Open-ended text box]
- Phone number [Open-ended text box]

End of survey

This is the end of the survey. Thank you again for your valuable participation. If you have any questions, please contact Claire Pascoe at Waka Kotahi, Claire.Pascoe@nzta.govt.nz

Appendix G: Process evaluation executive summary

Background

Waka Kotahi launched the public sector e-bike employer purchase support initiative ('national initiative') in late 2019 to lead by example in promoting the uptake of e-bikes by supporting government agencies to make them more affordable for employees. Under the initiative, participating organisations establish schemes in partnership with approved e-bike suppliers to reduce the upfront cost barrier to purchasing an e-bike. Financial mechanisms and incentives employed by schemes can include wage advance or loan facilities, discounts on bikes and accessories, and interest-free finance terms available through the retailer. Participating e-bike suppliers provide pre-purchase supports such as demonstration events, education, and advice.

A process evaluation was conducted to assess the design and implementation of the national initiative to date. The evaluation will advance understanding of key success factors and how e-bike support schemes will work best within New Zealand. The methods used were a literature review to identify characteristics and success factors of similar initiatives overseas, a survey of organisations having registered interest in the national initiative, and in-depth interviews with key stakeholders. Interviews were conducted with the coordinators of schemes established by organisations ($n = 8$), e-bike suppliers approved to participate in the national initiative ($n = 5$), and employees who had purchased an e-bike through schemes ($n = 7$).

Direction to further development of the national initiative was derived from an assessment performance to date against a framework of criteria for an effective e-bike purchase support scheme. The framework will develop further as understanding of effectiveness within New Zealand also develops.

An outcome evaluation of the national initiative may be undertaken in the future with the decision on whether to proceed with this in part dependent upon an assessment of the impact that COVID-19 has had on the implementation of the initiative to date.

Implementation to date

At the time of the evaluation, 112 public sector organisations had registered interest in the national initiative. As the initiative has so far only sought to engage a limited number of organisations in the initiative, the number of registering organisations suggests strong interest within the public sector.

All registering organisations were invited to complete a survey about their involvement in the national initiative and their progress in establishing schemes. Surveys were received from 58 organisations, providing a 52% response rate.

The survey findings also indicated strong interest in the national initiative. At the time of the survey, 22 organisations had established a scheme and 13 were establishing schemes. However, over half (60%) the respondents also reported COVID-19 had impacted their response or progress so far, and over two-thirds (69%) reported their organisation was likely to undertake further actions under the initiative in the future. These findings further indicate unrealised potential under the initiative.

Scheme coordinators and employees interviewed were also positive about schemes and the potential of executing schemes again in the future. Coordinators that had previously executed schemes felt that future schemes would benefit from lessons learnt as well as the fact that employees were now becoming more familiar with schemes and what they provided.

Relevance

Scheme coordinators reported that e-bike purchase support schemes were relevant, attractive, and of high interest to their organisations. There was alignment between the objectives or areas of interest of organisations and the objectives of the initiative. Areas of alignment included the health and well-being of staff, providing staff with sustainable and healthy transport options, and environmental goals.

Coordinators identified the health and well-being of staff as a key reason for their organisation's interest in the initiative. Ensuring that schemes supported a range of bikes and types of biking was therefore important to them. These findings suggest the initiative will need to balance specific cycling for transport objectives with broader objectives of increasing access to bikes and biking more generally.

The evaluation showed that e-bike schemes can attract the support and endorsement of senior leaders within public sector organisations. However, leadership drive, including the commitment of resources needed to execute schemes effectively, can vary. Promoting the longer-term cost savings of e-bikes (despite the upfront cost) and the longer-term benefits of schemes (eg, improved health of employees) may help to strengthen senior leadership support and the willingness of leaders to allocate necessary resourcing.

There is also alignment between the objectives of the national initiative and the objectives of e-bike suppliers. However, most suppliers interviewed were yet to experience a positive return on their investment in the initiative. Some doubted the initiative in its current form would ever fully deliver on its potential due to misalignment between its design and business models within the bike sector. Suppliers noted that heavy discounting was generally not standard nor a sustainable practice in the sector. Further, bulk purchasing was the core condition for achieving quantity-based discounting and required an upfront bulk purchase. While bulk purchasing was promoted under the initiative as a key discounting mechanism, suppliers described the potential for this as limited under the initiative. For example, once a commitment to purchase was made, customers generally wanted immediate access to their bike (rather than wait until the end of a scheme and the placement of a bulk order). Purchases through schemes also generally occurred at different times, making it further difficult for suppliers to commit to an upfront bulk purchase.

The evaluation identified multiple reasons why coordinators, employees, and e-bike suppliers believed that schemes should offer a range of bikes and not just commuting e-bikes. If a wide range of bikes continues to be offered, current success measures³¹ for the initiative may need revisiting.

Feedback from coordinators showed that organisational satisfaction with e-bike suppliers could vary. While most were very satisfied, some were dissatisfied due to a lack of responsiveness, poor customer service, and not feeling valued as scheme partners.

The process evaluation findings indicate the following next steps:

1. Continue to explore the potential for workplace e-bike purchase support schemes within the public sector.
2. Examine further strategies to ensure schemes receive the level of executive-level leadership and organisational resourcing needed for effective execution.
3. Improve alignment between the design and objectives of the national initiative and the motivations and objectives of public sector organisations and e-bike supplier partners.
4. Further consider the appropriate balance between a targeted e-bike scheme to meet cycling for transport objectives and a broader scheme supporting greater access to bikes and biking generally.

³¹ Currently, 'Uptake of e-bikes' and 'Evidence of trip transfer from private cars to e-bikes'.

Awareness and access

Coordinators reported it was relatively easy for organisations to understand what the national initiative offered and how to take part. Information and support services available were mostly useful to those who had used these. Coordinators did, however, seek greater access to personalised and timely support when required. This support may be particularly important for organisations with less experience developing cycling initiatives.

Employees interviewed also agreed it was relatively easy to access and understand their employer's scheme. Employees valued having schemes 'brought to them', having easy access to information, and having the opportunity to trial bikes.

The evaluation finds evidence that uncertainty about the legality of schemes has been a barrier to some organisations establishing schemes. Legal issues applying to wage advance, employee loan facilities, and health and safety responsibilities are discussed in section 4.2.2 of the final evaluation report.

The process evaluation findings indicate the following next steps:

1. Ensure that organisations and e-bike suppliers can access information and advice in a timely manner when sought. Organisations with less experience developing cycling initiatives may need additional support.
2. Consider the appointment of dedicated staff to enable the level of service described above.
3. Continue to explore ways of removing legal barriers to public sector organisations offering wage advance and employee loan facilities.

Efficiency and ease

Coordinators indicated it was relatively easy for organisations to participate in the initiative in its current form. Employees reported the same in terms of their employer's scheme.

Coordinators valued the efficiencies of having a single national supplier panel and access to resource templates. Once established, schemes were generally easy to manage. However, effective schemes also needed to generate 'buzz', conversation, and momentum. This required leadership drive, resourcing, and comprehensive engagement and communication.

Coordinators reported the main cost to organisations when establishing schemes was staff time. Wage advance was the most time consuming and potentially challenging to establish, indicating that organisations should be advised to carefully assess demand before establishing the facility.

It has also been relatively easy for e-bike suppliers to participate in the initiative. Suppliers were satisfied with the request for proposal (RFP) process and valued the efficiency of having a single national panel. The supplier criteria were considered fair and appropriate. Business operations under the initiative had, to date, largely fitted within existing systems and capacity.

One supplier raised concerns about the management of the RFP process and supplier practices once on the panel, including compliance with supplier criteria. Whether there is sufficient monitoring of supplier practices may need to be examined further.

Suppliers observed that in the absence of wage advance, discounting became the primary incentive, with the responsibility and cost of this fully on the supplier. Some saw this as inequitable and a design feature that raised questions for them about the longer-term sustainability of the initiative.

The process evaluation findings indicate the following next steps:

1. For organisations able to offer wage advance or employee loans, consider what further supports can be provided to make the establishment of these facilities easier.
2. In cases of low uptake of wage advance, further examine the reasons for this and appropriate mitigation. To be motivating, wage advance may need to be at least as attractive as interest-free repayment terms when this facility is also available through the retailer.
3. Review the current monitoring of supplier practices and compliance under the supplier criteria and strengthen if required.
4. Examine what other financial mechanisms and incentives would act to distribute the investment risk more equitably across stakeholders.

Effectiveness

The proportion of organisations that had schemes or were establishing schemes indicates that current supports are relatively effective in supporting participation. Further, a high proportion of survey respondents rated supports as 'Very useful' or 'Useful'.

Employees interviewed were also generally satisfied with pre-purchase supports received. Demonstration days enabled trials and provided access to information and advice. These inputs are important for helping employees to decide whether an e-bike was an appropriate option and what type or style of bike would suit them. Demonstration events could also be an enjoyable and social staff activity. Retail staff were helpful and focused on ensuring appropriate bikes were purchased.

Some employees were not aware of any additional support, education, or trial opportunities as part of their employer's scheme (ie, the scheme was primarily experienced as a discount offering).

The evaluation findings suggest the incentive and effectiveness of wage advance or employee loans may be influenced by a range of local factors (eg, employee income, whether competitive interest-free terms are also available through the retailer, the willingness and need for employees to enter two debt commitments). Reflecting this, stakeholders had different perspectives and experiences regarding the value of such facilities. Those having experienced low uptake questioned the cost effectiveness of establishment, given the time and resources required. Suggested explanations for low uptake included that interest-free terms through the retailer could be more attractive and staff could be reluctant to take on two debt commitments.³²

However, there was also a view that wage advance or loan facilities were critical if schemes were to provide an incentivising 'offer' beyond just discounting. Such facilities had value as a clear signal of the employer's commitment and support. Further, lower-income employees were considered as less likely to be reached without such facilities; that is, discounting alone would not overcome the price barrier.³³ Lower-income employees in general may require additional supports.

The evaluation findings reinforced the importance of workplace demonstration days and ensuring that employees can trial bikes. Easy access to pre-purchase information and advice was also confirmed as important. Identified barriers to effectively engaging staff in schemes included insufficient internal

³² Limits on the amount of salary that can be advanced means that purchasing a more expensive bike may also require employees to enter into an additional interest-free repayment contract through the retailer.

³³ Whether lower-income employees may be more or less willing to enter into salary advance or loan agreements was not examined in the evaluation.

communications, constraints on the ability of staff to attend demonstration events (including not feeling mandated to do so during work hours), and that discounting alone may not be sufficiently incentivising.

Uptake may also be supported through schemes offering additional supports beyond one-off demonstration events. More tailored support could help to address specific or more personal barriers such as body consciousness, safety concerns, and general confidence. Extended trial periods, allowing 'real life' trialling over time, are also indicated to have value. Further communications to help both employers and employees 'reinterpret' the upfront cost of purchase may also be useful. An important message is that the upfront capital cost of an e-bike is offset over time by minimal ongoing operational costs.³⁴

E-bike suppliers also confirmed that effective schemes required considerable input from participating organisations, particularly commitment, senior leadership, resourcing, and skills in areas such as marketing and project execution. Given this, and their low power in determining organisational inputs, suppliers had, to date, experienced schemes of variable quality, uptake, and yield. A degree of business risk was therefore inevitable. This risk could be accentuated when the wage advance or employee loan was not available because this meant that the successful execution of other elements of schemes became even more critical to success (eg, the effective communication of schemes, ensuring staff could easily attend demonstration events). However, as discussed, performance on these dimensions could be variable. Suppliers reported a number of responses to minimise the business risk; the findings suggested this may include scaling back sales supports.

Some suppliers were concerned they could face further competitive pressures to reduce pricing and margins if discounting is the only mechanism available in schemes. Smaller suppliers noted a low- margin, high-volume approach was only likely to be viable for larger suppliers and if minimal sales support was provided. This was a concern for those who emphasised the importance of pre- and post-sales support for e-bikes.

The finding above, as well as the risk that discounting alone may not be sufficiently incentivising, indicates the need to continue to explore how the legal restrictions on the wage advance and employee loan can be addressed. The need to explore further financial mechanisms, such as government subsidies, is also indicated.

One supplier believed that current schemes were realising about 20% of potential and were unlikely to reach new riders. In their experience, barriers to executing effective schemes were more pronounced in larger organisations, when schemes were not sufficiently resourced, and when the full package of levers³⁵ was not available.

Survey respondents collectively estimated that a total of 37,870 employees were eligible to take part in schemes that had been established at the time of the survey. These respondents collectively reported that a total of 236 e-bikes had been purchased to date (ie, a purchase rate of 0.6%). Note: It is not known how many respondents had access to accurate sales data and how many provided estimates only. It is also difficult to interpret the significance of the reported number of sales for a number of reasons (eg, purchase targets were not established, the initiative is still in an early stage of implementation, the impact of COVID-19, and unrealised potential within the initiative indicated by the evaluation findings). Note also that the number of sales reported is only from those organisations that responded to the survey. Clearly, there are also other barriers to the uptake of e-bikes that are not directly addressed by the national initiative. Safety

³⁴ Assuming sufficient level of use.

³⁵ For example, senior leadership drive and support, salary advance, comprehensive marketing, other supporting behaviour change strategy.

concerns and seasonal factors were identified in the evaluation as barriers; concern about theft and parking constraints were identified as constraints on utilitarian use.

Interviews with employees showed schemes could accelerate the decision to purchase an e-bike or could move pre-contemplators to contemplation. The product discount, combined in cases with payment over time, made it attractive to buy it 'now'. However, pricing was not the only driver; examples were identified where the discount enabled a higher 'spec' e-bike or additional accessories to be purchased. Other factors that supported the purchase decision included easy access to e-bikes and the opportunity to trial e-bikes through demonstration events, the general ease of taking part in schemes, and the heightened awareness and interest generated by schemes.

Employees commonly weighed-up the purchase cost of the e-bike against their anticipated use of the bike. Higher anticipated use was generally associated with greater comfort with the purchase. Assurance the e-bike would meet its intended use was therefore also important in decision making.

Six of seven employees interviewed purchased a commuter style e-bike, as commuting was the primary intended use. E-bikes were being used for a range of trip types, including commuting, utilitarian, and leisure. Reported mode shift from motorised vehicles included commuting trips.

E-bikes were reported to support commuting in a number of ways, including reduced travel time and greater travel time reliability (both meaning the commute had less impact on other commitments), ability to avoid parking issues and costs, ability to avoid the congestion of public travel, ability to bike in work clothes (eg, not requiring an end-of-journey change of clothes), and greater ability to cope with the physical demands of the commute and to counter other barriers (eg, high wind). Employees described high use of their e-bikes during the COVID-19 lockdown, with low traffic volumes making riding even more enjoyable.

The process evaluation findings indicate the following next steps:

1. Examine whether more comprehensive behaviour change strategy can be achieved within or in complement to the national initiative and who should deliver this.
2. Examine how longer pre-purchase e-bike trial periods could be included; options might include using workplace fleet e-bikes for this purpose.
3. Examine other financial mechanisms and incentives that could be added to the initiative (eg, government subsidies), particularly in situations where wage advance or employee loan is not available to employers.
4. Further examine what other factors influence uptake and implications for targeting. For example, is uptake stronger in workplaces in proximity to safe infrastructure?

Sustainability

Findings from the organisation survey indicated unrealised potential under the national initiative, particularly due to COVID-19 disruptions. There was also a common view that it was most appropriate to execute schemes over spring and summer. This factor helped to explain the high number of survey respondents who indicated they were likely to take further action under the initiative in coming months.

Employees reported that the social benefits of e-bikes also encouraged use (eg, new recreation opportunities, interacting with colleagues also commuting by bike). They affirmed that bike storage and other workplace facilities (eg, showers) supported commuting. Addressing safety concerns, including ongoing development of safe cycling infrastructure, was reinforced as essential.

Four of seven employees interviewed had significantly reduced or stopped their e-bike commute during winter. Limited daylight hours and cold weather were factors. Visibility was less of an issue for those mainly using off-road paths.

All employees interviewed supported the continuation of schemes. Offering schemes on a regular basis (eg, every year) was considered important for targeting new staff and in ensuring that employees had ongoing opportunities to purchase (eg, as circumstances and readiness to purchase evolved).

Two employees indicated their e-bikes had or could reduce their future reliance on motorised transport. One believed becoming a 'one-car family' was a possibility once older children had left home. For another, having two e-bikes in the household meant they could continue their commitment to only having one car. Barriers to e-bikes reducing reliance on cars identified by other employees included limited weather, time pressures, and seasonal restrictions on riding.

All the e-bike suppliers interviewed supported ongoing leadership and advocacy from government in the area of purchase support schemes. Most recommendations made for improving the current initiative involved greater input from government – to reduce duplicated effort and inputs, to ensure that schemes were more effectively executed, and to achieve a more comprehensive, complementary behaviour change strategy.

Only one larger supplier predicted the initiative in its current form would have a significant future positive impact on their business. Two believed the initiative would be more effective, and the investment risk more equitably distributed, with the addition of government subsidies to the mix of financial incentives offered.

Suppliers indicated they would continue under the national initiative if it continued in its current form; however, in cases, only under conditions or with reservations about its future potential. Regardless of the national initiative, many suppliers also reported they would continue to work directly with motivated organisations through their existing schemes.

The process evaluation findings indicate the following next steps:

1. Consider the range of improvements suggested by participants for improving the current initiative. Improvements should be executed to maximise the potential that exists under the initiative during the upcoming spring and summer.
2. Examine other financial incentives that could be added to the initiative that would ensure that investment risk is more equitably distributed across stakeholders (eg, government subsidies).

Equity

Many of the equity criteria will be examined if the outcome evaluation phase is undertaken.

Most e-bike suppliers interviewed reported that, to date, the national initiative had imposed greater costs than delivered benefits and/or had not yet delivered projected returns. Due to design issues (as discussed), some suppliers did not see that returns from the initiative would increase substantially, regardless of how many organisations established schemes. In general, suppliers did not consider that benefits under the initiative were being equitably distributed across stakeholders.

Suppliers recognised that when wage advance or employee loans could be executed, the investment risk under schemes primarily fell on them in the form of product discounts. It was observed that the willingness of suppliers to continue to offer discounts (or similar levels of discounts) was not assured, particularly as COVID-19 had increased worldwide demand for bikes and caused disruptions in supply.

Participants' reports of the types of employees who have purchased e-bikes so far through schemes suggested these tended to be higher-income professionals. These reports will be examined further if the

outcome evaluation survey of staff who have purchased e-bikes is undertaken (eg, by collecting income data). However, these initial reports suggest the initiative would need further design if it was in the future to reach beyond core public sector organisations (eg, to lower-income or potentially less stable employment contexts).

The process evaluation findings indicate the following next steps:

1. Examine other financial incentives that could be added to the initiative that would ensure that investment risk is more equitably distributed across stakeholders (eg, government subsidies).