



HOE KI ANGITŪ – INNOVATION FUND: INCENTIVISING E-BIKE USE IN LOWER INCOME COMMUNITIES

The Māngere E-bike Library

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10 MAY 2024



Executive summary

Introduction

The Māngere Community e-bike library was funded \$60,000 from by Waka Kotahi's Hoe ki angitū – Innovation Fund to develop and test an incentive scheme to achieve permanent e-bike use in South Auckland. The funding was awarded under the fund's challenge to provide under-served communities with greater access to transport. The trial was delivered by Time to Thrive (TTT), a Charitable Trust and community bike champion in Māngere, South Auckland. It builds on two earlier e-bike initiatives run by TTT, in partnership with the report authors, Mackie Research and Massey University. These 'Stage 1' and 'Stage 2' e-bike trials established a strong interest in further e-bike use but also identified substantial financial barriers to individual ownership. There was also interest in exploring pathways to permanent e-bike access for residents.

Objectives of the project

- Generate data on existing e-bike incentive schemes.
- Deploy e-bike incentive scheme/s in a low-income community.
- Test the viability and efficacy of chosen e-bike incentive schemes.
- Create a 'pathway to permanence' and continue mode-shift momentum within Māngere.

Methodology

After a review of e-bike incentives, and co-design hui with locals, an e-bike library was chosen as the preferred incentive for trialling. The e-bike library trial employed a collaborative co-design approach, drawing on lessons from previous trials.

The TTT bike hub in Mangere implemented the trial by making 20 e-bikes available. There was a range of types on offer, including smaller and larger, step-through and crossbar frames, mid-drive and hub motors, and higher-power (48v) e-bikes. In line with their kaupapa, prospective borrowers were not required to pay a deposit or make any payment related to loaning an e-bike from TTT. Participants of the earlier trial stages were approached to participate in the library first and were eligible for loans of up to three months. Then a fuller implementation of the library followed where new borrowers were required to attend three TTT group rides before loaning a bike.

The e-bike library was promoted and advertised through word of mouth, TTT's community events, and the TTT Facebook page. We intended to collect the following information during the trial: participant demographics, loan reasons, distance travelled during each loan, prior e-bike experience, and support provided by TTT. **However, it was difficult to collect this data in practice and the data we did collect was insufficient for analysis.** Interviews with staff and participants were conducted at the conclusion of the trial by Mackie Research and Massey University.

Key Findings

- Following a brief review of e-bike incentives from the literature, a hui held with the participants of the earlier trials indicated that the community would prefer a point-of-sale discount voucher scheme and a community e-bike library. Loan-to-own and a monthly lease

with maintenance included were less popular options, mostly because of the requirement to commit to longer-term payments.

- A community e-bike library was chosen for the trial as it could be delivered within the project timeframe and would have broader applicability than a discount voucher, which would also require investment (and time to accumulate funds) by potential owners. It also aligned with e-bike library trials being held concurrently in other places around Aotearoa New Zealand.
- TTT run a bike hub in the heart of Māngere. They are well known and respected in the community for the relational way they run the hub and their ethic of care for people and equipment. These same principles and their enduring goal of empowering the Māngere community to enjoy cycling underpin their approach to the e-bike library.
- TTT took a cautious approach to launching the e-bike library. Participants of the earlier trial stages who had established a trusting relationship with TTT were approached to participate in the library first. Following this 'soft launch' period and as interest in accessing an e-bike from the library grew, it became clear that a more systematic approach would be required. An online system was set up to register new e-bike users and track loans.
- In line with their kaupapa, prospective borrowers were not required to pay a deposit or make any payment related to loaning an e-bike from TTT. However, new borrowers were required to attend TTT group rides before borrowing a bike. The group rides provided an opportunity to impart e-bike skills and safe routes knowledge and build a relationship with TTT and gain eligibility to borrow an e-bike.
- 34 people loaned an e-bike from the library over the four-month trial period for durations ranging from one day (15) to over three months (6).
- Several library users have purchased an e-bike after borrowing an e-bike from TTT. For others, the up-front purchase cost of an e-bike is prohibitive, so TTT is concerned with ensuring the sustainability of the e-bike library and maintaining a fleet of e-bikes in the Māngere community for the longer term.
- The co-design process and the trial highlighted and helped to manage known and unknown barriers of using e-bikes that can arise in lower income communities. It confirmed that cost is prohibitive for many but for some this barrier could be overcome only after using a bike and experiencing having one in their lives without any cost. TTT managed to help people overcome other less known concerns, such as, fear of a bike being stolen or a feeling that e-bikes were simply out of reach as a luxury item, with their relational approach and group rides. Through the series of trials TTT has begun a slow process of normalising the use of e-bikes in the community as more and more people enjoy the e-bikes and use them as a cheaper and convenient transport option for shopping, commuting and recreation.

Next steps

The Māngere e-bike library shows promise. However, the assumption currently is that the bikes are free. Future trial programmes and policies need to consider the costs, benefits and sustainability of an e-bike library. With the conclusion of the Māngere e-bike library trial, attention now turns to national policy development, integrating insights from across Aotearoa to shape the future of e-bike initiatives.

1) Introduction

E-bikes offer a potential solution to the challenges posed by high car dependency, low rates of active travel, and transport-related health issues in many communities. While e-bikes are a healthy and sustainable transport option growing in popularity, cost remains a significant barrier to equitable access. To examine alternative models for e-bike access in lower-income communities, we trialled running an e-bike library in Māngere, a suburb of Tāmaki Makaurau. This report describes the partnership and co-design process, the characteristics of the library, and an analysis of the initial outcomes from the perspectives of the provider and participants.

Our previous trials indicated an unmet potential for e-bike uptake in these communities, but evidence¹ suggests that incentive schemes would be needed to stimulate change. The Māngere community e-bike library is an innovation designed to inform solutions to accelerate mode shift in communities where e-bike access is currently limited.

This project was delivered through collaboration between Mackie Research, Massey University and Time-to-Thrive (TTT) – a Charitable Trust and community bike champion in Māngere, South Auckland. The team has a partnership through the Te Ara Mua Future Streets project (past 10 years) and two e-bike trials. The initial "Give-it-a-go" trial in 2021 involved 18-20 participants gaining skills and confidence through evening workshops using e-bikes loaned by ride-share companies. Participants expressed interest in longer-term e-bike access, highlighting the perceived high cost as a major barrier. Building on this, the "E-bikes in daily life" trial, funded by Ngā Tiriti Ngāngahau – Auckland Council Climate Fund (and administered by Auckland Transport), incorporated 22 e-bikes and various accessories (helmets, panniers, bike locks, covers, mirrors), aiming to integrate e-bikes into daily travel patterns in Māngere. TTT specified the types of e-bikes they wanted.

The majority of the e-bikes were rear hub motor step-throughs with small and medium size frames, and there were two mid-drive motors with five higher powered (48v) rear hub motors with crossbar frames, along with two cargo e-bikes (a front bucket and rear bench model). The e-bikes were branded with vibrant straplines to emphasise their community identity.

These trials gave a limited number of participants a chance to try out using an e-bike on a longer-term basis (over several months). The feedback from the trial was positive, demonstrated some clear financial and other benefits, and established a strong interest in further e-bike use, but it also highlighted substantial financial barriers to individual ownership.

Building on earlier trials, \$60,000 of funding from Waka Kotahi's Hoe ki angitū – Innovation Fund enabled the team to seek a 'pathway to permanence' for e-bike access in lower-income communities. The funding was awarded under the fund's challenge to **provide under-served communities with greater access to transport**. Auckland Transport extended TTT's access to the bikes purchased for Stage 2 for use in the e-bike library trial. 20 of the e-bikes were available for loan (with the two cargo e-bikes retained by TTT for transport and other activities).

2) Objectives of the project

The agreed objectives of the project are outlined below. Accordingly, they are reflected in the approach and overall findings.

- Generate data on existing e-bike incentive schemes.

¹ <http://www.bicycleassociation.org.uk/wp-content/uploads/2019/07/The-Case-for-a-UK-Incentive-for-E-bikes-FINAL.pdf>

- Deploy an e-bike incentive scheme/s in a low-income community over four months in 2023.
- Test the viability and efficacy of chosen e-bike incentive schemes.
- Create a 'pathway to permanence' and continue mode-shift momentum within Māngere.
- Inform national-level policy to pursue a socially-just transformation towards a low-emissions future.

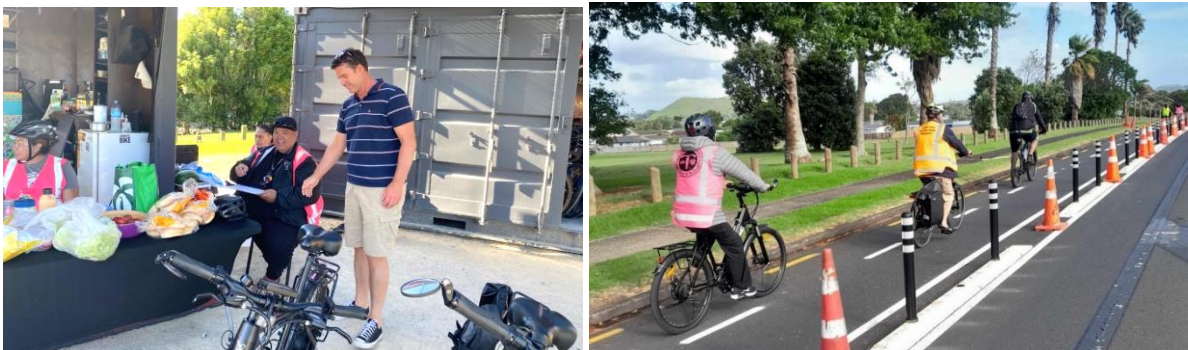
3) Methodology

The key method steps reflected the objectives above. Firstly, a brief review of e-bike incentive schemes was carried out (see Appendix 1), and then a co-design hui was carried out with six locals who were involved with the Stage 1 trial. The hui firstly introduced incentive scheme possibilities and then explored the advantages and disadvantages within a Māngere context. Schemes were then ranked by order of preference.

The e-bike library trial, which was eventually favoured, followed a co-design approach. Some principles for the co-design approach were researched and are listed in Appendix 2. TTT's mission is to enable bike and e-bike access within the Māngere community, so while initially an e-bike library was not TTT's favoured option for an e-bike incentive scheme, when the opportunity arose, they were eager to develop a model that worked for their community. Lessons learnt by TTT and the research team through the Stage 1 Give-it-a-go e-bike trial and Stage 2 E-bikes in Everyday Life trial were informative in co-designing the e-bike library trial. It was recognised that building a relationship between TTT and potential library users would be a key to success. Participation in TTT's guided community rides would foster relationships and ensure people gained e-bike knowledge and riding skills, became familiar with safe routes and understood the support offered by TTT (e.g., encouragement and maintenance). Encouragement was important to overcome a cultural reticence to see oneself as entitled to participate in a free loan scheme, and temper fears around security and potential damage to the e-bike.

The TTT bike hub in Mangere implemented the trial by making 20 e-bikes available. There was a range of types on offer, including smaller and larger, step-through and crossbar frames, mid-drive and hub motors, and higher-power (48v) e-bikes. There were various accessories made available that had been provided as part of the earlier trial including helmets, panniers, bike locks, covers, mirrors.

In line with their kaupapa, prospective borrowers were not required to pay a deposit or make any payment related to loaning an e-bike from TTT. Participants of the earlier trial stages were



approached to participate in the library first and were eligible for loans of up to three months. Then a fuller implementation of the library followed where new borrowers were required to attend three TTT group rides before loaning a bike.

The e-bike library was promoted and advertised through word of mouth, TTT's community events, and the TTT Facebook page.

Agreeing on the data sought and reviewing the data recorded was another aspect of the co-design process. The research team provided TTT with forms to fill out for each participant who borrowed an e-bike from the library. The form was intended to collect basic demographic information and reasons for the loan, odometer reading at the start and end of the loan period, prior e-bike experience, the primary use of the e-bike and any TTT support provided. Several progress reviews between TTT and the research team were undertaken to identify where adjustments were needed to the library protocols and data collection methods.

During the trial period, TTT attempted to introduce an online 'app-based' registration process using Jotform. The research team provided feedback on key data they would like to collect about each library loan to complete the research component. At the conclusion of the trial period, a formal interview with TTT staff, Teau Aiturau and Sokko Seeto, was conducted that focussed on the operational aspects of running the e-bike library. Interviews were also conducted with two e-bike library participants, with questions on how they found out about the library, why they were interested in using an e-bike, what they used the e-bike for, what the experience was like, and their intentions following the loan.

4) Project outcomes

The key outcomes that were delivered through the project included:

- Completion of a review of comparable potentially viable e-bike incentive schemes (see Appendix 1)
- Successful co-design of incentive mechanisms for e-bike access with programme partners.
- The deployment of an e-bike library in Māngere with 20 e-bikes available for loan.
- Limited data collected from library participants, with difficulties as discussed below.
- Insights on operating an e-bike library in Māngere from the community partner.
- Findings on how e-bike libraries can serve as incentives for permanent e-bike access, accompanied by recommendations for delivering longer-term e-bike library initiatives or supporting individuals in purchasing or owning e-bikes.

5) Key Findings

The community hui determined that a purchase discount scheme and an e-bike library were of most interest. The hui was organised between the research team, TTT and the participants of the previous e-bike trials to determine which incentive scheme for e-bike access would be most popular with the participants and might be most suitable for the Māngere community. The participants were presented with four broad e-bike access models, followed by a facilitated discussion. Four broad loan/purchase models were presented to the participants:

- Purchase discount
- Loan-to-own
- Monthly e-bike rental
- Community e-bike library

The most favoured models were the purchase discount and a community e-bike library. The purchase discount enabled ownership, which was important to several of the participants due to their interest in using them for commuting. However, it became clear that even with a 50% discount on the purchase price, most of the participants predicted it would take over a year to save enough to pay the balance.

A Community E-bike Library was also well supported as it would allow more people in Māngere to access e-bikes without the responsibilities of ownership, such as maintenance and servicing, which would remain with the community partner (TTT). It was also attractive as it could provide various e-bike types for library users to try and could be linked to wrap-around services, such as education and community rides. This option was favoured most by recreational riders.

The Loan-to-Own had merit but would have to be ‘interest-free’ to make it viable. There were also concerns it resembled a ‘hire purchase’ scheme that would require financial discipline to avoid feeling ‘trapped’ into owing money. The Monthly E-bike Rental model was considered unlikely to be affordable or attractive to many people in Māngere.

Following community discussions, project partners decided to implement a community e-bike library model due to its feasibility within the project's timeframe and potential applicability to other communities. With funding secured, TTT collaborated with the project team to launch the e-bike library trial in Māngere following a review of similar initiatives.

TTT has developed an e-bike library model that reflects their own mahi and kaupapa. TTT's rollout of the e-bike library has purposefully been cautious and gradual. The project partners have all realised the significant time and effort needed to make an e-bike library work in Māngere. Protecting and sustaining the library e-bikes for community use has been paramount to TTT's approach. Insurance for the e-bikes was investigated during Stage 2, but no viable arrangements were found. Hence, TTT's cautious approach, since a lost e-bike would not be replaceable. Sokko emphasised that expanding the e-bike library in Māngere will work, but it will take time: *“It will work in the larger scale, but gradually”*.



Protocols for the e-bike library drew from the experiences of running the earlier trials, namely the importance of opportunities for participants to build riding skills and confidence through group guided rides, the need to minimise participant cost and stress relating to e-bike use and maintenance, and to address concerns about the security of the e-bike while on loan – from the borrower and TTT perspectives.

Building relationships has been key to the TTT e-bike library approach. The registration process to borrow an e-bike involves locals contacting TTT, mostly face-to-face at TTT's hub in Māngere town centre. The individual registers their interest by filling out a form either on paper or digitally through an app. To borrow an e-bike for individual use, a participant must first take part in several group rides. TTT explain that the e-bike library is available to *“those that have shown a genuine wish to use an e-bike through the library by coming along on our regular ... rides”*. The group ride is *“the entry point”* for people interested in borrowing an e-bike. This requirement

for borrowers to build a relationship with TTT prior to becoming eligible to borrow an e-bike has meant the library has opened up slowly. The community ride attendance requirement serves a dual purpose. It ensures an e-bike library member can safely use the equipment, but it also brings that person into the fold, into the TTT community, and allows them to appreciate the group's kaupapa and their mahi. **This approach is not transactional, it is relational and necessitates a longer time to build trust and respect** between participants and TTT.

The library is now the primary pathway through which TTT provide access to e-bikes for their community. Most people have found out about the library by word of mouth through shared contacts, workplaces, other groups in the community and the TTT Facebook site. TTT attends many local community events with their e-bikes, and if someone shows interest, Teau says his response is *"come to the hub"* to chat with us. Sokko says they've got good hours at the hub, *"it's consistent ... someone's always here"* to help them. Interest in the e-bike library has snowballed. People loan an e-bike from TTT, share their experiences with friends and whānau, and in their workplaces. Also, displaying a fleet of e-bikes at the TTT Hub, which is located in a prominent position by the Māngere town centre, has generated local interest. Teau says: *"you have your locals ... they come by, they come past enquiring ... a lot of them say 'oh can we try an e-bike' and then we go 'yeah, come for the rides, this is the process'"*.

Borrowing an e-bike can fulfil different requirements. The e-bikes have been borrowed for recreational use, for participating in community projects and for commuting purposes. Sokko also explains that some people are trialling an e-bike *"because the only other option is catching public transport or walking"*. In some cases, access to a car might be difficult or unreliable. Sometimes it's because the public transport route doesn't work well for them or even if it's a relatively short distance, it's too far or too difficult to walk.

Creating an e-bike library tailored to community needs and available budget. Despite some initial doubts, TTT has adapted the e-bike library model and *"turned it to what works for our community"*. The full costs of running the Māngere e-bike library is hard to estimate as the library costs overlap with the existing TTT bike hub costs. The main additional costs associated with setting up and running the library, beyond the hub and existing bikes, are related to purchasing an online system for registering borrowers and tracking loans and staff costs for providing riding skills training, hosting group rides and maintaining and repairing the fleet. The library benefits from the use of TTT's pre-existing facilities and programmes, such as the hub, bikes, bike storage and a skilled local crew.

A key challenge in operating the e-bike library: setting up an efficient and accountable lending process. Early on, it became clear that relying on physical paperwork to manage borrower registrations and loans led to inconsistencies and posed a risk of losing e-bikes. To streamline operations, TTT has set up a digital registration process using Jotform, a digital platform costing \$500 annually. The expectation is that an online process will increase the efficiency and accountability of library registration. A new participant can access an interactive digital registration page by scanning a QR code. If the individual doesn't have a smartphone, a TTT team member can assist them. TTT reports that the shift to digital has reduced the need for supervision during registrations. However, at the close of the trial physical paperwork seems to remain a frequent part of the registration process, with the online platform being used as a database.

Building the support base and efficiency of the e-bike library. One pathway being considered to increase the reach and efficiency of the library is through collaboration with other local groups and agencies (such as Churches, Marae, and Māngere East Family Services) to undertake components of the e-bike library service. Sokko can see the library *"morphing into something more collaborative"* and embedded into TTT's other activities. This may involve delegating

vetting authority to a trusted individual in those other groups and agencies that will allow them to manage e-bikes loaned to them over longer periods.

Barriers to e-bike access remain for people in Māngere. Even though borrowing an e-bike from TTT is free, people can feel “*shy*” about being seen riding e-bikes, because they’re seen as a high-cost luxury item. TTT emphasise there are barriers beyond cost in lower-income communities: “*it’s a cultural thing*” and “*also a mental and confidence barrier*”. People may aspire to ride an e-bike but “*never think it’s within their reach or it’s for them*” and so “*instead of asking, people just don’t*”. **Give-it-a-go** is at the heart of the TTT model of bike promotion. This approach has also underpinned how TTT are promoting the e-bike library.

Security of the e-bike fleet. Fear of theft impacted several earlier trial participants' confidence to ride e-bikes to certain destinations in Māngere. For example, several participants stated they avoided using their e-bike for shopping because they didn’t want to leave it unattended and out of sight. Teau told us that this fear is also impacting people accessing the e-bike library: “*some of them, it’s just the security of it ... they feel responsible for it ... [and worry about] getting it stolen*”. Sokko believes this is why borrowing e-bikes for group rides or for only a few hours has been more popular in Māngere: “*so for them, for security ... not wanting to be liable ... they’d rather have it [at the bike hub] ... and then they just come and use it and then bring it back ... that’s why it’ll be different to other e-bike models*”.

E-bike library model is working for TTT and for Māngere. Sokko explains that this approach has “*really worked the way we had envisaged it*”. TTT has now lent a fleet of e-bikes to community members, as part of the previous e-bike trials and current e-bike library, for 18 months without a single loss. Sokko reports that “*because we’ve had such a stringent entry into [lending e-bikes] ... we haven’t had any problem of retrieving any of the e-bikes*”. She is clear on why this has been the case “*it comes with trust*”.

The e-bike library has been a platform through which TTT has expanded their community reach. Over many years, TTT has built up a strong network of local volunteers and others who regularly attend events and community rides. The e-bike library has been a catalyst for TTT to expand access to e-bikes across the wider Māngere community. The e-bike library has seen relative ‘outsiders’ to the community get involved and build up a relationship with TTT through attending group rides and then borrowing an e-bike for individual use. Sokko says: “*Tina [name changed to protect privacy] is an example of that, she came in and wanted to try [an e-bike] ... and then after a few rides she qualified, filled out the registration for it, used it for a couple of months ... and then sourced what she needed to purchase [her own e-bike]*”. Teau, known affectionately by his moniker ‘Mr Tee’, is a well-known and respected local figure, particularly for his work in enabling and motivating school children to ride bikes. This familiarity encourages people to approach TTT to enquire about their e-bikes. As Sokko explains, people “*are not ashamed to come over and say ‘can we borrow a bike’. Cus I don’t think they’d go and do that to [some other] hub ... relationships is what has made this thrive*”.

Library participants use the e-bikes for a variety of purposes. TTT inspired confidence by providing a local point of contact for any concerns or problems. The following excerpts are from short interviews conducted with two e-bike library participants. Both interviewees borrowed the e-bike to learn how it could work for them as an alternative transport option. They both used it for commuting as well as for errands and recreational riding and were impressed by the timesaving it offered. Both interviewees also expressed their gratitude for the opportunity to borrow an e-bike and valued having TTT as a local community-based point of contact if they had any problems.

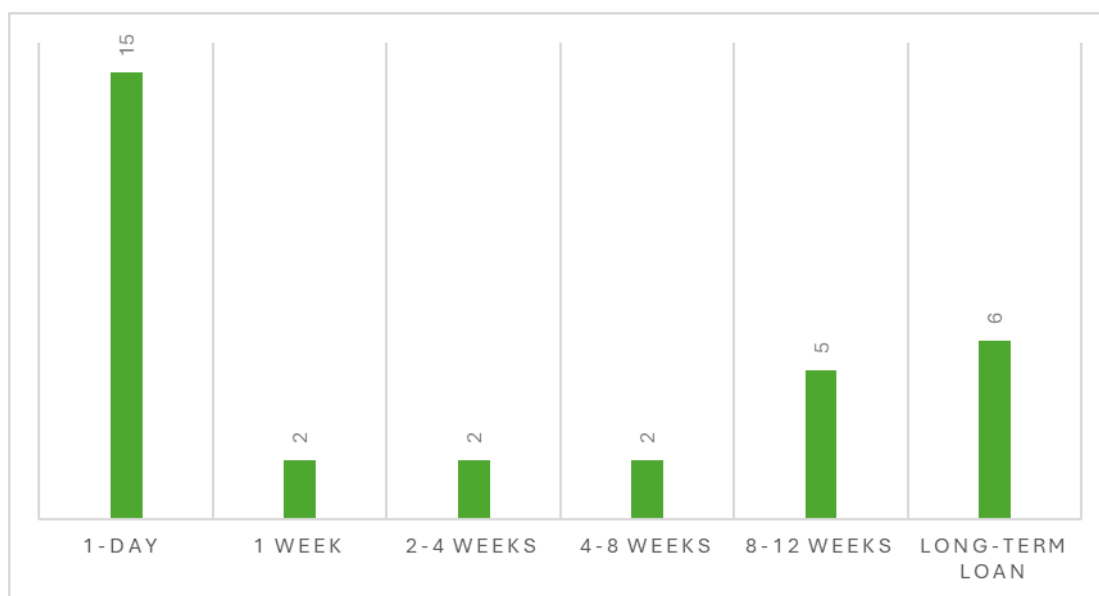
E-bike Library Participant 1

“I wanted to borrow it for a term and try it out how it changes my commute ... how much time it saves ... [it] actually halves my commute ... [it’s good] for small shops, the weekly big shop goes in the car ... [but] it does allow me to do things by bike that I’d normally use the car for, like go down to Manukau or something ... I trust Mr Tee and his team to only give bikes out if they’re safe, if they’re maintained properly, and I know that if anything goes wrong ... I can just pop in and say ‘hey can you help out’ ... it’s a great opportunity, it takes away the risk of buying an e-bike ... it gives you the security that it works for [you] ... that it’s worth investing in one.”

E-bike Library Participant 2

“I knew that Mr Tee was down at the hub in Māngere town centre, and I thought I’d just pop in to have a look and see what he could offer ... I went for my first ride ... a Wednesday night and ... I loved it ... [Mr Tee] invited me to come back again the next week ... so I was biking around with them every Wednesday ... Once I went for the second bike ride, we went a little bit further and he said to ‘oh you can take it home’, which really shocked me ... I jumped on that opportunity ... I really want one ... I realised this guy’s for real, we can actually use it like a library card, when we’re finished we just return it ... [now] I go for local bike rides maybe for about an hour ... I take my bike to work every day because I don’t have transportation ... the e-bike is the next best thing for me.”

The total number of e-bike loans grouped by loan period are presented below. As discussed, many participants opted for the use of the e-bike for the day, but then preferred to leave it with TTT for security and convenience purposes. There is also a growing group of longer-term users, and we understand 4-5 participants across the three stages of the e-bike trails (and 2 from the e-bike library stage) have moved on to purchase their own e-bikes. This reflects our understanding of how e-bike ownership can be facilitated – by experiencing the benefits of e-bikes, the cost *effectiveness* grows and hence becomes a more attractive proposition. Presumably, benefits such as saving transport costs, the convenience, not being congested in traffic, the freedom, fun, and mental health benefits build a case for investment.



6) Insights

What worked well?

Drawing on the knowledge and experience developed through the previous e-bike trial stages helped set this trial in good stead. In particular, the relationship the research team built with TTT through the previous projects helped create an atmosphere of trust, mutual respect and understanding, and shared aspirations.

Based on experiences of previous trials elsewhere, the research team had expected the loss of some e-bikes during the first trial. However, TTT continues to operate the entire fleet of e-bikes provided to them without a single loss to theft or damage. TTT was very clear that they believe their relational approach based on trust is why it has been so successful in maintaining its fleet of e-bikes.

The relational and trust-based approach also helped to remove other barriers, such as, fear of a bike being stolen or a feeling that e-bikes were simply out of reach as a luxury item. TTT has begun a slow process of normalising the use of e-bikes in the community as more and more people enjoy them and use them as a cheaper and convenient transport option for shopping, commuting and recreation.

While the intent was not to set up a try-before-you-buy e-bike library, several (5-6 library users) have gone on to purchase an e-bike after seeking advice on appropriate models from TTT. For others, the up-front purchase cost of an e-bike is prohibitive, so TTT is concerned with ensuring the sustainability of the e-bike library and maintain a fleet of e-bikes in the Māngere community for the longer term.

What didn't work well?

Data collection was more difficult than anticipated. In previous stages, the research team took the lead with data collection and, for example, conducted a pre and post-survey of mode use to destinations. However, with the e-bike library being operated by TTT, the long-term sustainability of any data collection system was paramount. Hence, the research team relied on TTT to collect use data from the participants. We provided TTT with forms for participants to fill out with questions on the reason for the loan, odometer readings/km travelled, and trip substitution. However, the data collected from participants was patchy. Some staff were more diligent than others, and the paper records of registration used in the early days of the library proved to be hard to keep track of in the open-air hub space. While this improved with the setting up of an online registration system, we lacked quantitative data we intended to collect on participant demographics, length of trips taken, trip substitution and purpose of the loan. We felt it reasonable to ask TTT to collect this data in a combined form for the loan registration and at the end of a loan period. However, it was an ongoing challenge across their staff/volunteers.

It's understandable that as TTT focussed on tracking e-bike loans, the additional data we requested was not a priority and was, therefore, not consistently collected during the trial. This does raise an interesting question of what is important to whom, particularly in arrangements where government funded programmes (with a focus on reporting) interface with community-based activities (which may focus more on the mahi and the relationships). Future

arrangements between government agencies and community agencies like this, might consider this.

We note that our Stage 2 trial did include pre- and post-loan survey data collected by the research team, which included distance travelled and trip substitution data (report available at: <https://www.futurestreets.org.nz/wp-content/uploads/E-bike-trial-Stage-2-Report-Final.pdf>).

The research team also hoped for more participants in the e-bike library during the trial period. However, as mentioned above, TTT purposefully followed a cautious and gradual approach, which, although limited the number of library loans during the trial period, has continued to safeguard their fleet of e-bikes for community use.

What were some of the challenges you faced?

Operating an e-bike library in a tight fiscal environment in a low-income community like Māngere is challenging. Money is a significant barrier to accessing expensive items such as e-bikes. Options for deposits and loan fees are likely to restrict who can access an e-bike library service, and therefore the piloted library doesn't necessarily emulate a sustainable ongoing model. The TTT e-bike library is expected to require external funding to continue to operate. However, the fact that several library participants have subsequently purchased their own e-bike demonstrates that if people are given the opportunity to trial the use of an e-bike and experience its benefit, some will see the value in making that significant investment needed for e-bike ownership.

7) Recommendations

The community e-bike library model has been picked up by TTT and incorporated into their mahi. In many ways, the outcomes the participants of the community hui were looking for at the start of the trial were achieved by TTT's library. As expected, several hui participants used the library to access an e-bike (with long-term loans as 'VIP' members). With several library participants also having subsequently purchased an e-bike of their own, it is possible that a purchase discount could have been a more straightforward approach to supporting access to e-bikes. This is likely true for some people involved in the trials (particularly those with full-time employment). However, we know that most people who access the e-bikes through day loans do so to take part in TTT's group rides. We believe that this remains a popular option for people wishing to enjoy access to e-bikes without the concerns of being responsible for the security and maintenance of an e-bike.

The longer-term viability of the e-bike library is dependent on TTT's long-term survival. A modest level of additional funding will be necessary to continue the e-bike library. Options for funding are limited, and local government and philanthropic organisations are the most likely sources of support.

We therefore recommend that the model adopted by TTT is acknowledged and supported. Secondly, we recommend that further work seeks to find and establish a sustainable funding model so the e-bike library can continue.

8) Next steps

Has our support led to further opportunities?

Approaching philanthropic funders to support e-bike access. It is possible to seek discounts from e-bike retailers through bulk purchases and partnerships with TTT. However, the importance of TTT as a hub in Māngere for local cycling support e-bike access cannot be understated.

The project team has been involved in several activities that stemmed from the trial. Firstly, the findings from the trial were presented alongside eight other e-bike trials at an E-bike Symposium held in Wellington in March 2024. The symposium provided an opportunity to network and share learnings from the trials and consider the opportunities available to continue the work and objectives of the trials. Secondly, a video was produced that tells the story of TTT and the e-bike library trial through interviews with the project team. The video is intended to be shared with local and central government. We hope that the appropriate agencies will use these to develop cases for further investment.

As a project team we've also been involved in conversations to broker early conversations with other funding agencies, such as Foundation North. Further exploration of this is an ongoing matter between TTT and Foundation North.

How will you accelerate your innovation from here (next steps)?

The Māngere e-bike library shows promise. However, the assumption currently is that the bikes are free. We suggest this might be an appropriate future model in lower-income communities to enable people to experience alternative transport possibilities and even facilitate ownership for some.

TTT is also exploring collaboration with other local groups and agencies to expand the reach of the Mangere library by enabling trusted individuals in local Churches, Marae, and agencies such as the Māngere East Family Services to vet possible longer-term borrowers.

To 'accelerate' this innovation, the community-based e-bike library model should be expanded to other communities. Knowledge of how to set up and run effective e-bike libraries in different types of communities was shared at the E-bike Symposium. Collaboration and knowledge sharing between communities have the potential to accelerate innovation. However, some external funding is likely required in lower-income communities to support organisations such as TTT in running a library. Future trial programmes and policies might consider the costs, benefits, and sustainability of an e-bike library as described. To do this confidently, a more established understanding of e-bike library success and possibly data from a range of schemes nationally would be needed. It may be beneficial to carry out cost/benefit analyses if it helps government or funding agencies to better understand the value proposition.

Conclusion

This trial has explored how an alternative model to access e-bikes through a community library could help increase e-bike access to e-bikes in lower-income communities.

While initially hesitant about how to operate an e-bike library in Māngere, TTT has made the community e-bike library model work for them. They were unsure of how a library would work in Māngere and were concerned about the potential loss of the e-bikes. Charging a rental fee was not attractive to the team as this did not fit their kaupapa as a community group and would be a barrier to participation for many in Māngere. It was also felt that security requirements, such as using a credit card and paying a deposit, were unlikely to work for them.



Instead of a transactional approach, TTT focussed on building relationships with participants, inviting them to be part of their community and understand their kaupapa. Through this approach, they have reimagined what an e-bike library is, turning it into something that is distinctly TTT.

In a community where e-bikes are a relatively unfamiliar high-cost luxury item, TTT have deployed a fleet of e-bikes for access by the community in a manner that is grounded in their community and has ensured the e-bikes are valued and seen as belonging to the community. This has been achieved not only through marking the e-bikes with clear signifiers of their community – using highly visible stickers presenting locally flavoured straplines, but also through clearly linking the e-bikes and their use to the well-known and respected work of Mr Tee himself and the TTT organisation. While the TTT e-bike library model has meant the number of library users has grown slowly, TTT has successfully expanded access to their e-bikes, and some individuals are going on to purchase their own.

Based on experiences of previous trials elsewhere, the research team expected the loss of some e-bikes during the earlier stages and current library trial. It is to the credit of TTT and their approach that the entire fleet of e-bikes continue to be an asset available to the Māngere community.

The conclusion of the Māngere e-bike library trial brings a three-stage e-bike discovery journey to a close. TTT, the bikes, and the community remain however, and e-bike library usage will continue. It seems fitting that policy focus now shifts to what is needed nationally, bringing together lessons from around Aotearoa.

9) References

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Appendix 1: Summary of Existing E-bike Incentive Schemes for Low-Income Communities (italicised entries indicate the scheme is approved but not yet operational)

| <i>Scheme Type</i> | <i>Location</i> | <i>Administrator</i> | <i>Key Details/Success</i> | <i>Suitability for Māngere</i> |
|--------------------------------|-----------------------|---|---|--|
| Partial Purchase Rebate | Saanich, BC, Canada | Local Government | Over 380 residents purchased an e-bike, over 100 in each of the three income-based incentive tiers. ² | Upfront cost may mean this is more suitable for those who have already experienced regular e-bike use, are competent riders, and can confidently integrate e-bikes into their daily travel patterns to justify the cost. This option may not be suitable for those who are not able to afford the entire cost of an e-bike upfront or are still needing familiarity with an e-bike, and thus may not be able to justify the initial cost. |
| | Alameda, CA, USA | Power Company (Alameda Municipal Power) | | |
| | Contra Costa, CA, USA | Local Government | | |
| | Rhode Island, USA | State Government | Launched October 2022, 46 income-qualified rebates claimed, and 64 standard rebates. ³ | |
| Point-of-Sale Discount | Banff, AB, Canada | Local Government | In its first year \$40,000 worth of rebates were fully used up within two weeks of the program going live, equating to the purchase of 60 e-bikes. ⁴ (Post-purchase rebates also available). | Can assist in making e-bikes more affordable and a feasible purchase as the upfront cost is reduced. Further work with interested scheme participants can be done to determine the appropriate discount amount. May be more suitable for those who have already experienced regular e-bike use, or are competent riders, and can |

² <https://www.saanich.ca/EN/main/community/sustainable-saanich/climate-change/programs-rebates/e-bike-incentives.html#:~:text=The%20District%20of%20Saanich's%20Community,e%2Dbikes%20for%20personal%20transportation.>

³ <https://drive.ri.gov/e-bike-program-statistics>

⁴ <https://banff.ca/CivicAlerts.aspx?AID=1512>

| | | | | |
|-------------------------|---------------------------------|------------------|--|---|
| | Denver, CO, USA | Local Government | 4,734 e-bike vouchers have been redeemed (as of December 30, 2022). ⁵ | confidently integrate e-bikes into their daily travel patterns to justify a financial commitment. |
| Vehicle Trade-In | San Francisco Bay Area, CA, USA | Local Government | Grants to low-income residents to replace an old polluting car (2005 or older, operational and under 10,000 pounds) with a fleet of clean e-bikes for the whole family (plus accessories and local public transit funds). ⁶ | 'Give-it-a-go' workshop participants indicated that e-bikes were not seen as a replacement for cars in Māngere, particularly for work commutes, carpooling to church, and grocery trips (Raja et al. 2021). This may limit the likelihood of an uptake of a vehicle trade-in scheme at scale. |
| | France | Government | Offers up to €4000 to people who trade in their car for an e-bike. ⁷ Also gives incentives for citizens who are unwilling to give up their cars altogether but intend to use e-bikes for daily commuting. ⁸ | |
| Loan-To-Own | San Diego, CA, USA | Local Government | <i>E-bikes loaned while participants complete a 2-year programme requiring minimum monthly miles travelled and a trip diary. 400 bicycles distributed to people who successfully completed the</i> | A loan-to-own programme can reduce the cost burden of e-bike ownership and allow for a path to ownership that is suitable for the individual. While not an e-bike incentive scheme, the BuyCycles programme in Christchurch offered minimum weekly repayments for bicycle ownership for those experiencing financial |

⁵ <https://www.denvergov.org/Government/Agencies-Departments-Offices/Agencies-Departments-Offices-Directory/Climate-Action-Sustainability-Resiliency/Sustainable-Transportation/Electric-Bikes-E-Bikes-Rebates>

⁶ <https://www.climateaction.center/e-bike-programs-baaqmd-grant>

⁷ <https://www.eltis.org/in-brief/news/french-government-offering-eu4000-exchange-car-e-bike>

⁸ <https://balkangreenenergynews.com/france-offers-citizens-eur-4000-grants-to-switch-from-cars-to-bikes/#:~:text=The%20country%20aims%20to%20boost,to%20classic%20two%2Dwheeled%20bikes.>

| | | | | |
|-----------------------|---------------------------------------|--|--|--|
| | | | <i>programme (and purchased bicycle insurance), equating to 225,000 bicycle miles travelled.⁹</i> | hardship. This scheme reported successful uptake, trip replacement and health benefits (Canterbury District Health Board, 2018) |
| E-bike Library | Buffalo/ Niagara Falls, NY, USA | Non-profit organisation (Shared Mobility Inc.) | A network of libraries, each with 50-100 bikes. Bikes are leant out for as long as nine months. The programme offers training, helmets, locks, and access to mechanics. In Buffalo, nine out of twenty riders surveyed expressed that they planned on using the e-bike to replace another mode of transportation (Bensedrine, 2022). | This option would be suitable for new or inexperienced riders looking to gain familiarity with e-bikes without requiring an immediate financial commitment. In Māngere, an e-bike library would also leverage the strengths of Time-to-Thrive as a strong community champion with existing infrastructure (e.g. bike hub, workshop) in place to facilitate an e-bike library. |
| | <i>Oakland, CA, USA</i> | <i>Local Government</i> | <i>A library with 500 e-bikes, cargo bikes, and adaptive bikes (for people with disabilities). In addition, a community-run bike shop provides maintenance and education for users.¹⁰</i> | |

⁹ Note, this was a successful pilot. Planning for further cycles of the programme is in progress.
<https://ww2.arb.ca.gov/news/nonprofit-administrator-selected-implement-new-statewide-income-based-electric-bicycle>

¹⁰ <https://ww2.arb.ca.gov/lcti-oakland-e-bike-library>

Appendix 2: What are some key principles or ideas that could inform the co-design process of an incentive scheme for low-income communities in New Zealand?

An e-bike incentive scheme for low-income communities will be co-designed to ensure that end users are fully engaged in the development process. Prioritising the voices of community members will ensure that an incentive scheme is appropriate, equitable, and fit-for-purpose.

Affordability

Previous research has suggested that enabling people to purchase a subsidised e-bike and repay the remaining cost through very small weekly payments would be effective at incentivising low-income New Zealanders to purchase an e-bike (Hawley et al., 2020). This would circumvent the issue of requiring an upfront payment. The research also suggested that the provision of accessories to low-income populations at a subsidised cost may be necessary (including helmets, pannier bags, locks, and all-weather cycling clothing).

Ease of access

A discussion of what makes an e-bike incentive scheme good addressed the technical issue of providing a monetary incentive through a discount, rebate etc.¹¹ The author noted that pre-paid vouchers or debit cards mean that the subsidy can be applied at the point-of-sale, thus not requiring an upfront investment of the entire cost (i.e., how rebate schemes work). This also makes it easy for the retailer as they can easily process the sale and are not required to manage any data.

Community

It has been established that working within communities is invaluable for implementing a successful e-bike incentive scheme. To ensure that a subsidy scheme is appropriate, low-income communities and their supporting organisations must be consulted (Hawley et al., 2020). Involving workplaces, education institutions, marae, and community organisations, and engaging community leaders who can champion the process can help people to establish a routine, role model behaviour, identify routes, and problem-solve (Wild & Woodward, 2018). Similarly, partnering with bike retailers or clubs within the community can support the local economy and create a hub where new riders can learn how to ride and maintain their new e-bike.¹¹

Local programmes supporting low-income people to find housing and employment etc. (e.g. Work and Income) could take the lead on administrative duties such as an income verification process. By incorporating familiar organisations and processes into an incentive scheme, the scheme is made much easier to access and apply for.¹¹ Engaging established community organisations can also build support and confidence in a scheme that implements any type of verification process that requires personal details.

¹¹ <https://www.peopleforbikes.org/news/what-makes-a-good-electric-bike-incentive-program>

Options for scheme types

Engaging low-income people in an e-bike scheme may require highly tailored tactics that are customised to individuals' needs (Hawley et al., 2020). Options could include a salary sacrifice scheme (suggested by Jackson, 2014), although there have been concerns that such schemes may result in a disproportionately lower subsidy for low-income participants (Caulfield & Leahy, 2011).

It has been suggested that a combined approach may be particularly suitable for New Zealand. Hawley et al. (2020) suggested that alongside a flat subsidy for anyone interested, a targeted approach for low income/vulnerable groups should be employed. Examples of such an approach include higher subsidies for people referred to an incentive scheme, gradual payments, and wrap-around support to facilitate the use of e-bikes. These suggestions begin to address some of the concerns with generic e-bike schemes (regardless of income) discussed in this report.

Other considerations

Successful implementation of an e-bike incentivisation scheme will require data collection that can be used to measure its success and guide future development. Suggested measures of success (some based on case studies in **Error! Reference source not found.**) could include the number of: e-bikes bought through the scheme (e.g. vouchers/rebates claimed), kilometres ridden, and polluting vehicles or trips replaced.