Cornwall E-Cycle Pilot Evaluation

On behalf of the Department for Transport

transport for quality of life

UNIVERSITY OF WESTMINSTER

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EXECUTIVE SUMMARY

The pilot scheme

The Cornwall e-cycle pilot scheme gave members of the public the opportunity to try an e-cycle without having to purchase one. The aim was to increase the uptake and use of e-cycles. It was funded by the Department for Transport (DfT) and delivered between August 2021 and September 2022 by Cornwall Council in partnership with Wheels 2 Work South West and Wheels 2 Work Cornwall. There were three interventions:

- A series of **roadshow** events which gave the public the chance to ride an e-cycle, and to compare different types and models of e-cycle.
- Longer-term **Opportunity to Try (OTT)** e-cycle loans to employers, including businesses and public sector bodies.
- Longer-term **Wheels 2 Work electric (W2We)** loans to individuals who wanted to use an e-cycle to access employment, training or education, or to try an e-cycle before potentially purchasing their own.

The evaluation covered the whole scheme period and included project monitoring, process evaluation and impact evaluation (involving surveys and interviews of participants). Each of the three interventions was evaluated independently, and interactions between them were investigated. Of interest was whether the interventions had contributed to any increase in purchases of e-cycles, or growth in the use of cycles (whether conventional cycles or e-cycles).

A large fleet of e-cycles enabled the pilot to deliver all three intervention activities at considerable scale by the end of the pilot in September 2022. 107 e-cycles were procured. There were, however, challenges in the procurement processes and delays in achieving the full fleet.

20 roadshows were held at a variety of public-facing events and closed, site-specific locations across Cornwall. An estimated 700 people tried out an e-cycle at the roadshows. 62 e-cycles were lent to 20 employers (businesses, public sector bodies, charities) and used by an estimated 121 employees. 127 W2We personal loans were arranged during the pilot.

Results

The Cornwall pilot engaged a diverse cross-section of the public. Representation by age was in line with, or greater than, the proportions in the Cornwall population for ages up to 60. There was a lower representation of people aged over 60. A previous study showed 40% of e-cycle users in the UK are aged over 60 and 44% aged 41-60 years. **Hence the Cornwall pilot was successful in attracting interest from a younger profile of people than are currently e-cycle users.**

One objective of the pilot was to reach people who would not normally consider cycling. This included women, disabled people and people from lower income

groups. The pilot succeeded in securing a similar level of participation among women and men. **Roadshows, OTT and W2We schemes are hence promising approaches to address the gender gap in cycling.** A reasonable number of participants had long-term health conditions. The median household income of pilot participants was slightly lower than that of Cornwall in general and the interventions engaged people across the income spectrum. The W2We loan scheme attracted the highest percentage of low-income respondents showing it had success in targeting people struggling with a lack of affordable transport to get to work, training or education.

Most pilot participants relied on the car for their daily mobility, and most participants had a conventional cycle and were confident about cycling, even if they cycled infrequently. **A quarter of participants reported never cycling and a lack of confidence cycling. For this group, trying an e-cycle may set them on the path to cycling.**

Curiosity with no plans to buy was the most common motivation for roadshow participants to try out an e-cycle, with one in four saying they were considering buying an e-cycle. Motivations for those using the loan schemes included getting exercise, protecting the environment and the ability to make particular journeys. Phone interviews probed this further and revealed common themes related to wanting to use e-cycles for travel to work, making cycling possible in the face of health issues, saving money and helping with the hills of Cornwall. Future e-cycle schemes can be promoted taking these themes into account.

Loan durations were most commonly reported to be three months but many participants asked for extensions, which were often granted. **Nearly all OTT and W2We participants used the e-cycle available to them at least once per week, and half of them used the e-cycle at least three or four days a week.** E-cycle journeys replaced car journeys for 33 out of 37 loan participants, hence meeting the pilot objective of replacing car trips.

The W2We loan scheme was intended to help individuals to access employment, education and training. Phone interviews with W2We participants confirmed using the e-cycle to get to work was a main reason for their participation. **In particular, e-cycles overcame the problem of commutes too long for conventional cycles, and saved money compared to using a van, car or motorcycle. In addition, the e-cycle allowed some participants, who were otherwise limited in their mobility by a health condition, to get out more.**

Participants can be categorised in four ways in relation to post-pilot e-cycle purchase decision making:

1. Made a decision to buy an e-cycle.
2. Still in the process of making a decision to buy an e-cycle.
3. Would like to buy an e-cycle but the cost makes this prohibitive.
4. Found an e-cycle was not appropriate for their needs.

About one in five pilot participants reported buying an e-cycle afterwards, with some of these participants replacing or supplementing an existing e-cycle. Most e-cycle purchasers were roadshow participants who added to existing cycles they owned.

Roadshows were hence effective at encouraging people who were already considering buying an e-cycle to buy their own e-cycle.

Roadshow participants reported the greatest increases in post-intervention cycling frequency. During the OTT and W2We loan periods, participants made trips using their e-cycle which they had previously driven by car, but afterwards returned to car use. Roadshows were therefore more successful than loans in bringing about e-cycle purchases and e-cycle use in the immediate period following the interventions. Many loan participants said they would need financial assistance to purchase their own e-cycle.

Lessons for future e-cycle schemes

The pilot was effective at engaging car users (who have the greatest potential to reduce carbon emissions). Participants said they found it helpful to try different types of e-cycles without obligation – so they could decide which type was most appropriate for their needs. **Hence, offering a variety of e-cycles broadens the appeal beyond those interested only in a standard e-cycle.**

The phone interviews revealed some pilot participants recommended the scheme to their family and friends, who subsequently became interested in e-cycles. **This suggests word of mouth and participant 'ambassadors' are promising ways of promoting e-cycle schemes and broadening the appeal of e-cycles.** E-cycle schemes should provide relevant equipment and support people new to cycling to enable them to build their skills and confidence. This could be through additional elements of a scheme, or through joint working with other cycling initiatives.

Follow-up surveys were carried out shortly after roadshow events or loan periods, and so it is not possible to be definitive about long-term effects. The surveys showed some roadshow participants went on to buy e-cycles afterwards and increased their cycle use and reduced their car use. While loan participants made frequent use of their e-cycles during the loan periods, there is little evidence that they followed this by acquiring their own e-cycles and sustaining cycle use. This suggests:

- Roadshows are effective at helping those with curiosity or a prior interest in e-cycles to take their interest further and go on to purchase e-cycles.
- E-cycle loan periods need to be accompanied by post-loan support for purchasing e-cycles, particularly for those where affordability is an issue, or mechanisms for running longer-term loan schemes need to be developed.
- Special attention is needed to engage those with low-incomes and limited/no car availability, with personal e-cycle loans showing the most promise.

There are lessons for monitoring the impacts of future e-cycle trials. Without a control group, it is difficult to assess the impacts of a trial. It is extremely challenging to obtain comparative data from people similar to those who participate in a pilot scheme and hence effort should be concentrated on obtaining informative data from participants. Trial participants who complete a baseline questionnaire should be incentivised to complete follow-up surveys, including a follow-up at least six months after their participation, to assess long-term impacts.

1. INTRODUCTION

This report documents findings from an evaluation of the Cornwall e-cycle[1] pilot scheme which gave members of the public the opportunity to try an e-cycle without having to purchase one. The pilot scheme was funded by the Department for Transport (DfT) and delivered by a partnership of Cornwall Council (CC), Wheels 2 Work Southwest (W2WSW) and Wheels 2 Work Cornwall (W2WC). The scheme ran from late summer 2021 to September 2022.

The aims of this report are to:

a. Evaluate the effectiveness of this pilot in relation to its objectives.

b. Provide insight to help inform and shape the national e-cycle programme being delivered from 2022, as well as other e-cycle initiatives.

Before introducing the Cornwall e-cycle pilot, existing knowledge about the impacts of e-cycle pilots, or what are commonly referred to as e-cycle trials[2], is summarised below.

1.1. Evidence from past e-cycle trials

Evidence on the impact of e-cycle trials was available from a rapid literature review undertaken in March-April 2021.[3] The review found literature on 18 trials worldwide.

The review noted participants in trials had self-selected to be involved and hence were likely to be predisposed to the use and potential purchase of an e-cycle. It was found e-cycle use increased with the duration of trials, indicating a learning effect among users where they needed time to get used to the e-cycle.[4] It was generally found that when provided with an e-cycle to use in a trial, most people did use them.

Commuting was the target for many of the trials, although in most instances participants were permitted to use the e-cycle for any purpose. The choice of commuting for trials may reflect the perceived importance of commuting behaviour in wider transport planning, or it may be convenience, in that it potentially offers a destination that can support e-cycle use (i.e. workplace with secure parking and charging facilities) and a simplified recruitment process via employers willing to support the trial.

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[1] The term e-cycle is used throughout this report to refer to pedal cycles equipped with electrical motors and batteries which operate in an assistance mode. The terms e-cycle and e-bike are often seen as interchangeable, but this report only uses the former to avoid any confusion over meaning.

[2] Trial is the term most commonly used when referring to an initiative where members of the public are given the opportunity to try out or borrow an e-cycle without having to purchase one.

[3] Shergold, I. & Chatterjee, K. (2021). *Behavioural Impacts of E-cycle Trials: A Rapid Evidence Assessment*. Report to Department for Transport.

[4] Fyhri, A. & Fearnley, N. (2015). *Effects of e-bikes on bicycle use and mode share*. Transportation Research Part D, 36, 45-52.

Surveys conducted at the end of e-cycle trials reported intentions to cycle more, whether using a conventional cycle or an e-cycle. Two studies that went back to participants after the trials found 13%[5] and 44%[6] of participants purchased an e-cycle. It was found that those people cycling frequently prior to participation in a trial were less interested in purchasing an e-cycle than those cycling less frequently, indicating that e-cycles could help increase cycling frequency.[7]

Cost and security were identified as two important barriers to the use of e-cycles, alongside well-established barriers to cycling such as lack of safe cycle infrastructure. A number of studies used incentives of one form or another to try and overcome cost concerns. In particular, one trial from the Netherlands[8] showed how e-cycle use can be incentivised with rewards for distance travelled by e-cycle, whilst a trial providing a discount against purchase had a positive impact in encouraging e-cycle purchases after the trial.[9]

There are some gaps in knowledge on the role of e-cycle trials. The first is understanding how to scale up trials to achieve broader participation, moving beyond those who are already interested. Secondly, there is a need for follow-up studies of the impact on transport mode use after the trials. In general, the last data collection point in most of the studies reviewed was when people returned their loan e-cycle. Longitudinal studies exploring what proportion of trial users went on to purchase an e-cycle, and what they then used it for, would be helpful in understanding the long-term impacts of trial interventions.

Many of the studies targeted commuters, and whilst commuting is an important travel purpose, it makes a relatively small contribution to overall travel.[10] It would be helpful to understand whether other groups in society (such as the retired population, who have been significant purchasers of e-cycles in the UK) or other journey purposes (i.e. shopping, leisure, social) could equally be targeted through trials.

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[5] Carplus Bikeplus (2016). *Shared Electric Bike Programme Report 2016: Findings and recommendations from eleven shared electric bike projects*.

[6] Moser, C., Blumer, Y. & Hille, S.L. (2018). *E-bike trials' potential to promote sustained changes in car owner's mobility habits.* Environmental Research Letters, 13(4), 44025.

[7] Fyhri, A., Heinen, E., Fearnley, N. & Sundfør, H.B. (2017). *A push to cycling—exploring the e-bike's role in overcoming barriers to bicycle use with a survey and an intervention study*. International Journal of Sustainable Transportation, 11(9), 681-695.

[8] De Kruijf, J., Ettema, D., Kamphuis, C.B. & Dijst, M. (2018). *Evaluation of an incentive program to stimulate the shift from car commuting to e-cycling in the Netherlands*. Journal of Transport & Health, 10, 74-83.

[9] Moser, C., Blumer, Y. & Hille, S.L. (2018). *E-bike trials' potential to promote sustained changes in car owner's mobility habits.* Environmental Research Letters, 13(4), 44025.

[10] 15% of trips according to National Travel Survey results for each year between 2015 and 2019.

1.2. The Cornwall e-cycle pilot scheme

The Cornwall e-cycle pilot scheme was initiated by DfT as an opportunity to test different approaches to support e-cycle take-up and use. The Cornwall pilot complemented e-cycle promotion and deployment activities being undertaken in nine other local authorities. The Cornwall pilot was designed to provide knowledge and experience to assist with the development of a national e-cycle programme launched in 2022. The national programme contains elements in common with the Cornwall pilot and shares similar objectives.

The Cornwall pilot began in late summer of 2021 but experienced some delays and obstacles – as documented in Section 4 of this report. These issues affected delivery timescales and the associated monitoring and evaluation activities. The pilot was able to operate more effectively from spring 2022, with all three of its planned interventions in operation. The earlier delays meant that much of the data collection took place later in the project than initially planned, although this then coincided with weather that was more amenable to cycling across late spring and summer 2022.

Scheme interventions

The Cornwall e-cycle pilot scheme had the following objectives:

1. To get more people to cycle and to accelerate the uptake of e-cycles (in particular, those who would not normally consider cycling, such as disabled people, BAME groups, women and lower income groups).
2. To accelerate the number of trips by e-cycle as a replacement for motor vehicle journeys.
3. To increase public awareness and understanding of the benefits of e-cycles.

The pilot scheme comprised three different interventions which were collectively aimed at achieving the above objectives:

1. A series of **roadshow** events which offered the public a chance to ride an e-cycle, some for the first time. Roadshows were delivered by project partners in Cornwall, primarily W2WSW and CC, at events hosted by a range of organisations in the county.
2. Three-month **Opportunity to Try** (OTT) e-cycle loans to employers, such as businesses or public sector bodies.
3. Three-month e-cycle loans to individuals to access employment, training or education. Loanees paid a £10-£15 per week fee for the loan. These were delivered under the branding of **Wheels 2 Work electric** (W2We).

Both loan schemes were delivered by W2WSW with support from W2WC.

Across the three interventions, the Cornwall pilot deployed a fleet of 107 e-cycles. This included a range of different categories of bike, including hybrid, mountain, folding, and an e-trike. Of these:

- 12 were deployed for use at the roadshows.
- 26 were used for the OTT loans and 59 for W2We loans.

- 6 W2We branded bikes were loaned to Devon and Cornwall Police.
- 4 were used for a social prescribing scheme.

1.3. The evaluation and structure of this report

The evaluation of the Cornwall pilot ran through the entire period of the scheme (from the summer of 2021 to December 2022). Each of the three interventions was evaluated independently, and interactions between them were investigated. Of particular interest was whether the interventions had contributed to any increase in purchases of e-cycles, or growth in the use of cycles (whether conventional cycles or e-cycles).

Evaluation activity comprised the following:

- Project monitoring
- Process evaluation
- Impact evaluation

After this introduction, Section 2 of this report explains the methodology for collecting and analysing data. Section 3 reports results from project monitoring followed by Section 4 summarising findings from the process evaluation. Section 5 reports the main results from the impact evaluation. Section 6 discusses the findings across all evaluation activities and draws conclusions on what has been learnt from the Cornwall e-cycle pilot.

There are two companion documents to this final report, which provide more detailed results from the process evaluation and impact evaluation:

1. *Cornwall E-Cycle Pilot: Learning for Practitioners*[11] – contains full findings of the process evaluation including 15 lessons learnt.
2. *Cornwall E-Cycle Pilot Evaluation: Social Research Appendices*[12] – contains full results of the impact evaluation (Appendix A), as well as information about research participants (Appendix B) and data collection instruments (Appendix C).

[11] Hiblin B., Chatterjee K., Shergold I. & Pantelaki, E. (2023). *Cornwall E-Cycle Pilot: Learning for Practitioners*. Report to Department for Transport.

[12] Shergold, I., Chatterjee, K., Pantelaki, E., Hiblin, B. & Cairns, S. (2023). *Cornwall E-Cycle Pilot Evaluation: Social Research Appendices*. Report to Department for Transport.

2. METHODOLOGY

The evaluation monitored the activities undertaken across the three interventions and evaluated their impacts. It also sought to identify lessons learnt from the implementation and delivery of the pilot scheme. Data was collected from samples of participants in the pilot interventions, as well as from delivery partners and stakeholders in the interventions.

2.1. Research questions

The evaluation looked to answer the following questions:

1. **Process evaluation questions**
    - How have activities across the programme been delivered, what worked and what didn't?
    - Did the programme reach the communities and groups intended by DfT and local partners?
    - Is it possible to identify any integration or interaction between the different activities being delivered in the pilot?
2. **Impact evaluation questions**
    - What is the profile of participants (i.e. in terms of socio-demographics and travel behaviour characteristics)?
    - Why are people taking part in the pilot, especially those borrowing a loan e-cycle?
    - How were e-cycles used during loan periods?
    - What levels of cycle ownership and cycling are present pre- and post-intervention?
    - What has been the impact of the Cornwall pilot on access to work/education/training, physical and mental health and perceptions of cycling?
    - Is it possible to determine longitudinal impacts and effects of the trial?
3. **Overall question**
    - What are the key lessons learnt in terms of the wider programme delivery which might inform the national e-cycle programme?

2.2. Research methods

All the pilot activity took place within Cornwall. Data collection was carried out either by project partners locally, or online by the evaluation team. Much of the data collection was carried out using online surveys or online video or phone interviews (both discussed below).

The three main research elements were:

1. **Project monitoring** – logging of activity at each 20 roadshow events and in the loan schemes (manually recorded by W2WSW).
2. **Process evaluation** – online interviews with delivery partners and other stakeholders (e.g. OTT hosts/employers). Three interviews with delivery partners and eight interviews with OTT and roadshow hosts were conducted. Logging was also carried out of issues and lessons noted in project meetings involving DfT officials and delivery partners, which a researcher attended on an on-going basis, as an observer**.**
3. **Impact evaluation** – participants in the three interventions were asked to complete a survey before they tried an e-cycle and afterwards. Phone interviews were carried out with a selection of survey respondents.

The number of participants in the impact evaluation are detailed in Table 1. The evaluation engaged with a high percentage of those on the two loan schemes (64% of W2We and 48% of OTT loanees) and a slightly lower percentage of those estimated to have engaged with the roadshow events (around 30%). Smaller numbers followed through with the research, choosing to opt in to the follow-up surveys and interviews.

Table 1. Number of participants taking part in the impact evaluation

	Participants	Baseline surveys complete	Opted in to follow-up surveys	Follow-up surveys complete	Opted in to interview	Follow-up interviews complete
Roadshows	700 (est.)	210	57	35	7	4
OTT	88	42	28	17	9	4
W2We	127	81	57	22	14	7

Intervention logging

An event log was developed to monitor the roadshows. W2WSW recorded information about each roadshow event in this log – such as the number of people trying an e-cycle, the location and the weather. Data was also collected on the number of participants involved in the two loan schemes, length of loans, and, in the case of OTT loans, the number of e-cycles lent to an organisation.

Questionnaire surveys

Online surveys were set up to monitor the impact of the interventions. For each intervention, participants were asked to complete a baseline questionnaire before trying an e-cycle, as well as a follow-up questionnaire afterwards. An overview of

questionnaire content can be found in Appendix C of the *Cornwall E-Cycle Pilot Evaluation: Social Research Appendices*.[13]

The questionnaires were bespoke to each of the three interventions and sought information on:

- Socio-demographic characteristics of the participant.
- Motivations to try an e-cycle.
- Cycling behaviour during e-cycle loans.
- Cycling ownership, behaviour and perceptions before and after trying an e-cycle.
- Broader travel behaviour and physical activity before and after trying an e-cycle.

Each survey contained some questions common to all interventions and some questions specific to an intervention. For those involved in the loans (OTT or W2We), questions were asked in the baseline surveys about potential use of the e-cycle and in the follow-up surveys about use they had actually made of the e-cycle. Surveys all included a question asking respondents to indicate willingness to participate in further research and to provide an email address if they were willing to do so.

Invitations to complete follow-up surveys were sent to those people who had opted in to further research. The follow-up surveys only sought socio-demographic information where it was possible that a material change might have occurred, such as to car availability, income or health. They included questions relating to the experience of trying an e-cycle and what happened after the intervention.

The intention was to invite participants to complete the follow-up questionnaire three months after the roadshow they attended or three months after their loan period ended. This was more easily achieved for roadshow participants when it could be safely assumed that the day they completed the baseline survey was the day of the roadshow event they attended. It could be assumed that the day the baseline survey was completed for loan participants was about the time they gained access to an e-cycle personally or through their employer. What was less clear was the length of time they had access to the e-cycle, with loan periods varying around a notional standard three-month period but sometimes being extended on the request of participants. This meant follow-up questionnaires could have been requested less than three months after loan periods ended.

Table 2 sets out the time periods when survey responses were received from pilot participants.

[13] Shergold, I., Chatterjee, K., Pantelaki, E., Hiblin, B. & Cairns, S. (2023). *Cornwall E-Cycle Pilot Evaluation: Social Research Appendices*. Report to Department for Transport.

Table 2. Time periods when surveys were completed

	Baseline survey	Follow-up survey
Roadshows	2021: September & November 2022: March-June	2022: April, July, August, October
OTT	2022: March-June	2022: July, August, October
W2We	2022 April-July	2022: July-October

Interviews

Interviews were conducted for two elements of the evaluation, the process evaluation and impact evaluation. Process evaluation interviews were held (using video-conferencing software) at two time points in the pilot with staff at CC and W2WSW. These are described in the separate process evaluation report[14]. Summary findings from this included in Section 4 of this report.

Interviews were also conducted (using video-conferencing software) with representatives of eight organisations who had received OTT loans or hosted roadshows. Case studies were written up based on their experiences. These can be read in the separate process evaluation report.

Semi-structured phone interviews of 20-25 minutes were undertaken with a selection of participants from each of the three interventions (roadshows, OTT and W2We) in order for the research team to develop a more in-depth understanding of their experiences.[15] In total 15 participants took part in these. In each case, the interviewee had completed a baseline survey on entry into the pilot and a follow-up survey after their participation. The selection of interviewees was purposive, based on features of particular interest to the evaluation, such as whether they had gone on to buy an e-cycle after trying one (for roadshow and OTT participants) or motivation to loan an e-cycle (for W2We participants). Appendix B of the *Cornwall E-Cycle Pilot Evaluation: Social Research Appendices*[16] details the interview participants and their characteristics. Appendix C contains the interview guide used for W2We participants.

2.3. Assessing behavioural change

The follow-up surveys allowed the evaluation team to compare behaviours and perceptions of the same participants before and after their exposure to an intervention. Whilst completing a baseline questionnaire was an expectation for

[14] Hiblin B., Chatterjee K., Shergold I. & Pantelaki, E. (2023). *Cornwall E-Cycle Pilot: Learning for Practitioners*. Report to Department for Transport.

[15] The interview guide for W2We participants is included in Appendix 3.

[16] Shergold, I., Chatterjee, K., Pantelaki, E., Hiblin, B. & Cairns, S. (2023). *Cornwall E-Cycle Pilot Evaluation: Social Research Appendices*. Report to Department for Transport.

those trying an e-cycle at a roadshow and a pre-condition for entering one of the two loan schemes, invitations to complete the follow-up questionnaires were only sent to those that had opted in to further research in the baseline questionnaire. Of this group, not all completed the follow-up, even after receiving reminders. Consequently, around half of OTT participants, around a quarter of W2We loanees, and under a fifth of roadshow baseline survey participants completed follow-up questionnaires.

The data collected from the baseline and follow-up surveys has allowed analysis of changes in cycle ownership, use and perceptions. For the loan participants, the follow-up surveys asked about cycling behaviour during the loan, so that, even if a participant returned to their previous travel behaviour afterwards, this gives an indication of the potential for change.

There is the possibility of a small seasonality effect for results comparing baseline and follow-up cycling due to more follow-up survey responses being received in July and August (see Table 2).

It is important to be aware that survey respondents self-selected to participate in both the interventions and the surveys – so they are not representative of the wider Cornwall population. About 900 people were estimated to take part in the pilot's interventions, with 700 of these trying an e-cycle at a roadshow. 333 people completed baseline surveys (36% of participants) but only 78 completed follow-up surveys (9% of participants).

As a relatively high response rate was achieved for the baseline surveys (especially for W2We), there is reasonable confidence that baseline survey results (for example, on socio-demographics) are representative of participants in the three interventions. However, the more modest response rates for follow-up surveys mean there is uncertainty over whether the results from these are representative of the outcomes and experiences of all those who took part in the pilot. Overall, the results can be considered to provide indications of the responses that might be seen in a wider implementation of these sorts of interventions, and the type(s) of person who might be most receptive to them.

3. PROJECT MONITORING

This section reports on the pilot scheme's activities. Table 3 summarises the scale of the three interventions.

Table 3. The interventions in numbers

	Events / organisations	Participants
Roadshows	20 events held	700 participants (estimated)
OTT	20 organisations took part	121 loanees
W2We	-	127 loanees

The event log was used to provide a record of the roadshows. They provide an indication of the scale and reach of this activity. Similar data was collected in respect of the two loan schemes, and in combination this provides an opportunity to understand the overall scale of the Cornwall e-cycle pilot, and how the project has performed against the objectives set for it.

3.1. Roadshow events

Some initial challenges were encountered with respect to roadshow delivery. These are discussed in more detail in the process evaluation report and summarised in Chapter 4. Once these had been addressed, and sufficient e-cycles and support logistics were in place, the roadshows settled into a regular pattern of activity with a package that was repeatable and effective at engaging with participants at events. The roadshows held in 2021 had fewer e-cycles available and a more restricted range of e-cycle types. In 2022, the number of available e-cycles increased to 12 (the maximum that could be transported by the team) and covered a greater range of types of e-cycle.[17]

The numbers attending each event varied, with more people attending public-facing events compared to closed, site-specific roadshows. On average, 35 people tried an e-cycle at each event, although many more had the opportunity to look at the e-cycles on the stand or ask questions of the support team. Around one-third of those who tried an e-cycle (210 out of estimated 700) also completed a baseline questionnaire for the evaluation.[18]

[17] Neomouv Ticket (commuter), MiRider (folding), Jorvik Trike (tricycle), Liv Amiti (female-specific all-purpose), Giant Explore E+2 (all-purpose mid-step and all-purpose high-step), Giant Explore (mountain), Wisper Wayfarer (mountain), HaiBike Trekking (all-purpose mid-step and all-purpose high-step), EZEGO Trail Destroyer (mountain).

[18] Poor internet connectivity meant that online surveys were difficult to complete on the project tablets or phones at some locations, and the numbers of people trying an e-cycle at times meant that it was

Table 4. Cornwall e-cycle pilot roadshow events

Date	Event	Target audience
5/9/21	Tour of Britain Roadshow, Marazion	Open to public
5/11/21	Penwith College, Penzance	College staff & students
5/11/21	Truro College, Truro	College staff & students
18/11/21	Royal Cornwall Hospital, Truro	Hospital staff
27/11/21	People's Carbon Festival, Cornwall College, St Austell	Open to public
4/3/22	Staff Development Day, Penwith College, Penzance	College staff
4/3/22	Staff Development Day, Truro College, Truro	College staff
25/3/22	Green Week, Falmouth Campus, Falmouth University, Falmouth	University staff & students
1/4/22	Generation EXPO, Cornwall College, Redruth	College students
5/4/22	Planet A - Decarbonisation Roadshow, Alverton Manor Hotel, Truro	Open to public
5/4/22	Camborne Community Centre	Open to public
6/4/22	Pendennis Cycle to Work/ Active Travel Roadshow, Pendennis Shipyard, Falmouth	Open to public
7/4/22	Stithians Centre Community Event, Stithians	Open to public
8/4/22	Chacewater Community Event, Chacewater	Open to public
12/4/22	Visit of the transport minister, Falmouth	Open to public
30/4/22	Trevithick Day, Camborne	Open to public
26/5/22	Tevi Funding Roadshow, Truro Cricket Club, Truro	Open to public
28/5/22	Teagle Machinery Open Day, Blackwater	Open to public
9-11/6/22	Royal Cornwall Show, Wadebridge	Open to public
11/6/22	Falmouth Bike Week, Prince of Wales Pier, Falmouth	Open to public

Note: All events from April 2022 onwards offered a variety of e-cycle types, including an e-trike.

not always possible for the team to ensure a baseline survey had been completed before somebody tested out an e-cycle.

Roadshows were held across Cornwall (see Table 4 below), primarily facilitated by W2WSW and aided in some instances by W2WC and CC. The events were either public-facing, such as the *People's Carbon Festival* in St Austell, or closed events at locations such as hospitals or educational institutions, where the target was the staff population working at that location. Normally the events would be either part or full day, whilst the Royal Cornwall show spanned three days. Once the loan schemes were functioning (in Spring 2022), the roadshows also became a medium for advertising and promoting OTT and W2We. Some of the 15 OTT and W2We interviewees noted that they had initially tried an e-cycle at a roadshow event.

3.2. Opportunity to Try loans

The OTT scheme reached 20 businesses or organisations, providing 62 e-cycle loans, which were used by 121 participants in total. The workplaces that took part in this loan scheme are detailed in Table 5.

Table 5. Types of businesses and organisations receiving OTT loans

Workplace type	E-cycles loaned	Staff participants
Architect firm	2	6
Bed and breakfast	1	1
Building contractor	2	2
Conservation charity	3	9
Domiciliary care company	3	4
Estate agents	1	7
GP surgery	4	5
GP surgery	3	8
GP surgery	1	1
GP surgery	3	12
Holiday accommodation	2	2
Ice cream shop	3	12
Insurance company	3	5
Library	3	4
Outdoor/wilderness training	1	1
Pasty shop	3	3
Public order and safety	6 (+12 directly from supplier)	25
Recycling centre	2	2
Technology company	1	6
Wedding company	3	6
Total	**62**	**121**

The OTT scheme was publicised via networking meetings and word of mouth. Any organisation registered in Cornwall who agreed to use loan e-cycle(s) for business use were eligible. Loans were arranged on a first-come first-served basis. The businesses and organisations taking up OTT loans included private sector businesses, public sector organisations and a charity. The public order and safety organisation borrowed the most e-cycles from the pilot (18 in total) and used them in various locations during the trial.

3.3. Wheels 2 Work electric loans

The W2We scheme was publicised via social media, flyers, word of mouth, radio and television. It was available to anyone living in Cornwall. Loans were again arranged on a first-come first-served basis. Loans were initially of three-month duration but some were extended for up to six months. Participants paid £10 per week for the loan (with the fee rising to £15 per week after September 2022, when some participants were able to extend their loans beyond the DfT-funded pilot). Across the pilot a total of 127 W2We loans were arranged. 75 of these were facilitated through W2WSW and 52 through W2WC.

3.4. Project monitoring summary

Key achievements of the pilot, compared to original expectations were:

- A total of 107 e-cycles were procured, against an original expectation of approximately 80 e-cycles.
- A total of 20 roadshows were held, with an estimated 700 people trying out an e-cycle, against an original expectation of 24 roadshows.
- A total of 62 e-cycles were lent out to a total of 20 employers and used by an estimated 121 employees, against an original expectation of six employers.
- A total of 127 W2We loans were arranged, against an original expectation of 20 loans.

4. PROCESS EVALUATION

This section presents the key lessons learnt for delivery of future e-cycle initiatives from the process evaluation of the Cornwall pilot. It then discusses four overarching issues which affected the delivery and impact of the pilot:

1. **Procurement of e-cycles** – due to the volume of e-cycles required, procurement was complex and time-consuming.
2. **Insuring e-cycles and users** – it was difficult to find an insurance policy covering riders, e-cycles and third parties.
3. **Wider appeal of e-cycle loans** – while the pilot aimed to get more people on low-incomes to use e-cycles, people from all income brackets appear to have been attracted to e-cycle loans.
4. **Linking cycling behaviour change initiatives** – there were helpful synergies between the pilot's initiatives but links to schemes which support users to build basic cycling skills and confidence, or to purchase an e-cycle, were missing.

4.1. Learning for practitioners

The full findings of the process evaluation are contained in *Cornwall E-Cycle Pilot: Learning for Practitioners*[19], a companion document to this report.

For each of the pilot's three interventions, *Learning for Practitioners* describes the service on offer in detail; outlines the key lessons learnt from setting up and delivering the intervention; and presents an illustrative case study. It also outlines lessons learnt about four cross-cutting issues which were found to be relevant to all three interventions: procuring e-cycles, insurance, maintaining use of e-cycles and monitoring.

In total *Learning for Practitioners* discusses 15 lessons learnt, which should be used by practitioners developing future e-cycle initiatives, to help maximise the efficiency and efficacy of their projects. These lessons are:

Lessons for roadshows

1. Where possible, visit roadshow locations in advance and include hilly terrain in the trial route.
2. It is good to cater to people's different needs and price points by having a variety of e-cycles for them to try at roadshows.
3. Specific measures may be needed to ensure the safety and security of riders and e-cycles at roadshows.

[19] Hiblin B., Chatterjee K., Shergold I. & Pantelaki, E. (2023). *Cornwall E-Cycle Pilot: Learning for Practitioners*. Report to Department for Transport.

4. Roadshows should be held when the weather is likely to be more favourable for cycling. A contingency plan is needed for bad weather.
5. Using existing contacts and targeting themed events can help locate roadshows where they are most likely to reach their target audience.

Lessons for e-cycle loans

6. An integrated and proportionate fee structure is needed to ensure that individuals and organisations sign up to the most appropriate initiative.
7. Organisations and employees who are new to cycling need a package of support if they are to make good use of an e-cycle.
8. Providing a range of types of e-cycles and accessories will maximise the number of people and organisations to which an e-cycle loan will appeal.
9. Consider the demographics of the target audience and the reasons people will be borrowing an e-cycle when deciding a price point for loans.
10. Consider how to deal with the logistics of transporting and storing large numbers of e-cycles in the context of local geography.
11. Word of mouth advertising is key for small initiatives – so encourage and enable happy customers to be e-cycle advocates.

Lessons about cross-cutting issues

12. Procurement can be time-consuming. Consider options early – aiming to both reduce risk and secure a range of e-cycles.
13. Riders should be covered by comprehensive insurance, including for third party liability in the case of injury or damage. Suitable insurance policies are scarce.
14. It is essential to have an exit pathway for the end of loans – to help maintain momentum and move people and organisations on to long-term use of e-cycles.
15. Make data collection a defined step in the participation process for individual initiatives (with no data meaning no e-cycle); and ensure staff are well-trained in the data collection methodology and participants are incentivised to contribute to it.

4.2. Key issues affecting the pilot

Due to the project being a pilot, it was imperative to maximise the amount of time interventions were operational, so that they could reach their full potential, and as much learning as possible could be drawn from them. However, the short timeframe of the pilot made this difficult, as it took time to set up interventions and this development time had to be extended when problems occurred. It was therefore helpful that the timeline for the pilot was extended by three months. The two critical practical issues which delayed the launch of the loan initiatives were procuring and insuring a large fleet of e-cycles. They are discussed in more detail below.

The lessons outlined above cover a number of areas where the pilot was able to exploit opportunities, or where it missed opportunities, which practitioners designing future e-cycle schemes may want to consider. One key *opportunity* was that the pilot found that e-cycle loans are attractive to a wider audience than traditional Wheels 2 Work moped loans – giving them a wider pool of people with which to engage. Conversely one key *missed opportunity* was that the pilot focused solely on providing e-cycle equipment, and did not provide, nor link to, services addressing other barriers to e-cycle use, such as lack of cycle skills, confidence or knowledge of cycle routes. These two issues are also discussed in more detail below.

Procurement of e-cycles

The initial logistical issue faced by the pilot was the difficulty of quickly procuring a large number of e-cycles. Without a framework contract already in place, due to the number of e-cycles required and their total value, CC had to undertake a complex tender process to appoint a single supplier. This not only delayed the start of the pilot interventions but also proved inflexible when the partners wanted, in the delivery stage of the pilot, to purchase additional accessories or types of e-cycle, in response to the emerging needs and preferences of participants.

Larger suppliers (who are naturally predisposed to respond to larger contract opportunities) appeared less able to serve the pilot's requirement for a range of e-cycle types and price points. Had time been available, setting up a framework contract might have helped to provide access to multiple suppliers. This could have provided more flexible access to a wider range of e-cycles and accessories, while spreading the exigencies of supplying large numbers of e-cycles across multiple supply chains.

Smaller local suppliers also appeared to have more expertise in the e-cycles most suited to the geography and socio-economics of the local area. They were also easier to access for replacements, spare parts and repairs.

This issue is discussed in detail in Lesson 12 of *Learning for Practitioners*.

Insuring e-cycles and users

The second logistical issue, which in particular delayed the start of both the OTT and W2We loans, was sourcing fully comprehensive insurance which would cover riders for liability in the case of accidental injury or damage to third parties and/or their property.

As long-term e-cycle loan is a relatively new concept, the pilot found that there were limited opportunities to secure suitable insurance. A piecemeal approach was initially taken, with:

a. All liability for personal injury transferred to the rider as part of the loan contract.

b. W2We riders and hosts made liable for damage to, or theft of, their e-cycles as part of the loan contract.

c. W2We riders and employees of OTT hosts using the e-cycles required to take out membership of a national cycling charity, which includes third party cover.

While appropriate fully comprehensive insurance was ultimately secured from a specialist cycling and micro-mobility insurance broker, researching and resolving this issue took considerable time, resource and budget, and delayed the start of loans.

This issue is discussed in detail in Lesson 13 of *Learning for Practitioners*.

Wider appeal of e-cycle loans

It was notable that W2WSW reported seeing greater diversity in the types of people applying for a W2We loan than they typically see for their existing Wheels 2 Work moped loans.

The Wheels 2 Work service is traditionally offered to people without access to a motorised vehicle or public transport, who need affordable transportation in order to access their place of work, training or learning. Service users may typically be from lower income households and/or households with lower levels of car ownership.

W2WSW marketed the W2We loan opportunity to their existing customer base of people seeking affordable transport to access work and training, as well as via a return to work programme. They also advertised it more broadly to anyone keen to try out an e-cycle for an extended period. W2WSW felt that a significant proportion of people applying for W2We loans were from more affluent households and were utilising the scheme in order to see whether, before investing in purchasing one, they liked and would make good use of an e-cycle for commuting and/or leisure purposes.

This anecdotal evidence is supported by findings from the W2We baseline survey. Of the respondents stating their household income, approximately a third were from households with an annual household income lower than £20,000, a third came from households within an income between £20,000 and £39,999 and a third were from households with an income of £40,000 or more (see Section 5.1 for more details). Furthermore, nearly half of W2We baseline survey respondents were from households with access to two vehicles, and 16% were from households with access to three or more.

If e-cycle loans are attractive to a broader audience than a typical Wheels 2 Work scheme, this could have positive implications for the breadth of people who are open to discovering the benefits of e-cycles and the number and types of journeys which they could be used for. To capitalise on this, future initiatives will need to factor this into their design and delivery models. For example, when defining their target audiences, setting qualification criteria and loan charges, and determining the best marketing channels and messages for advertising their scheme.

Linking cycling behaviour change initiatives

The pilot's delivery partners found that it was helpful to have the different e-cycle interventions happening in parallel, as they could exploit the synergies between them. For example, people who tried out e-cycles at roadshows were often referred on to the OTT or W2We initiatives. This evaluation found multiple examples of participants who moved on to a W2We loan after using an e-cycle as part of an OTT loan, or after trying one out at a roadshow.

However, failing to include an initiative to support the cost-effective purchase of e-cycles, or at least loans of indefinite periods, has emerged as a missed opportunity.

A significant proportion of W2We riders and OTT loan hosts would have liked to have loaned their e-cycle(s) for longer, or were very interested in purchasing one, had they been able to find a suitable model at an affordable price.

Also, the process evaluation found that there were missed opportunities with regards to supporting less experienced cyclists and hosts to maximise use of their e-cycles. For example, by addressing barriers such as lack of cycle skills and confidence, or knowledge of local routes – either as part of the pilot or by referral to complementary local initiatives or resources.

It is therefore important for future e-cycle projects to consider how they can address as many barriers as possible to e-cycle use and purchase – from initial awareness raising, through e-cycle experiences and confidence building, to supporting their purchase and long-term use. This could be done either by building in complementary elements to their own activities, or through joint working with pre-existing local cycling initiatives.

These issues and opportunities are discussed further as part of Lessons 7 and 14 in *Learning for Practitioners*.

5. IMPACT EVALUATION

This section presents results of the impact evaluation. The data sources are the surveys and phone interviews. A full presentation of the results is provided in Appendix A of the *Cornwall E-Cycle Pilot Evaluation: Social Research Appendices.*[20]

Key findings from the impact evaluation are:

- **Pilot participants** – there was balanced gender and age representation but under-representation of those with low-incomes and low car availability. About one-quarter of participants reported never cycling and lack of confidence cycling.
- **Motivations to participate** – for roadshow participants the main motivation to try out an e-cycle was curiosity but one in four said they were considering buying an e-cycle. Loan participants mentioned exercise, protecting the environment and the ability to make particular journeys.
- **Use of e-cycles during loans** – usage was very high, with nine out of ten participants using them at least once per week, and half using them on at least three or four days a week. E-cycle journeys predominantly replaced car trips.
- **Changes in cycle ownership, use and perception** – one in five pilot participants reported buying an e-cycle afterwards. The greatest increases in cycling frequency post-pilot were seen with roadshow participants.
- **Wider impacts** – loan e-cycles helped participants to make journeys to work too long for a conventional cycle, and to save money compared to using a van, car or motorcycle.

5.1. The pilot participants

Socio-demographic profile

Table 6 summarises the socio-demographic profile of participants in the Cornwall pilot. The results are based on 333 responses received to the baseline surveys (which represents about a third of the estimated 900 participants).

[20] Shergold, I., Chatterjee, K., Pantelaki, E., Hiblin, B. & Cairns, S. (2023). *Cornwall E-Cycle Pilot Evaluation: Social Research Appendices*. Report to Department for Transport.

Table 6. Socio-demographic characteristics of pilot participants

	Category	Roadshows (No.)	OTT (No.)	W2We (No.)	Total (No.)	Total (%)
Gender	Male	128	17	31	176	53
	Female	81	24	45	150	45
Age	Aged 18-29	49	5	11	65	20
	Aged 30-39	28	4	12	44	13
	Aged 40-59	87	28	44	159	49
	Aged 60+	43	5	11	59	18
Ethnicity	White	181	36	73	290	88
	Asian, Black or mixed	9	2	2	13	4
Employment	In employment	156	38	68	262	79
	Unemployed	12	0	1	13	4
	Retired	18	2	2	22	7
	Full-time student	19	0	2	21	6
Annual household income	Less than £20k	30	8	23	61	18
	£20k - £39.9k	59	14	25	98	30
	At least £40k	71	17	21	109	33
Long-term health condition	Yes	29	11	13	53	16
	No	163	28	58	249	77

Note: Not all categories of responses are shown and not all participants answered all questions, hence totals do not add up to 333 and percentages do not add up to 100%.

Gender[21]

53% of baseline survey respondents were male (176 out of 330) and 45% female (150 of 330), while 1% (3 of 330) responded ‘other’ or ‘prefer not to say’. For

[21] Baseline survey question: What best describes your gender?

comparison, the gender breakdown for Cornwall is 48.5% male and 51.5% female.[22] There were more male respondents to the baseline roadshow survey than female responses, whereas the loan schemes saw more female responses than male responses.

Age[23]

Compared with the age profile of the Cornish population[24], a higher proportion of participants were in the 40-59 age band, a lower proportion aged 70 and above, and similar proportions in the 20-39 age band and 60-69 age band. The roadshows attracted a younger profile of participants, with 38% under 40 years of age compared to 23% and 30% of OTT and W2We participants respectively. The full age band breakdown for all the participants is provided in Appendix A.

Ethnicity[25]

Most baseline survey respondents identified as having white UK ethnicity (88%, 290 of 329). 1% (10 of 329) identified as having other white ethnicity, 3% (10 of 329) as Asian or Black ethnicity and 1% (3 of 329) as mixed ethnicity. Over half of those who answered 'other ethnic group' indicated this to be Cornish.

In the 2021 Census, 94% of Cornwall residents identified as having white UK ethnicity, 3% as other white ethnicity, 1% as Asian or Black ethnicity, 1% as mixed ethnicity and 1% as other ethnicity. The ethnicity profile of the e-cycle pilot sample is in line with the Census data.[26]

Residence[27]

Almost all participants stated that Cornwall was their main place of residence with 5% (15 of 329) citing elsewhere in the UK and 1% (3 of 329) that their residence was overseas, or they did not answer.

Employment[28]

79% of respondents were in employment (262 of 330) with 18% (59 of 330) in non-working categories (unemployed, retired, looking after the home or family,

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[22] Gender and Age data for Cornwall: *Population and household estimates, England and Wales: Census 2021.* Population and household estimates, England and Wales: Census 2021 - Office for National Statistics (ons.gov.uk)

[23] Baseline survey question: Which year were you born?

[24] Gender and Age data for Cornwall: *Population and household estimates, England and Wales: Census 2021.* Population and household estimates, England and Wales: Census 2021 - Office for National Statistics (ons.gov.uk) Note: ONS data did not provide age data for age 18-19 for Cornwall as a category so it is not reported here. Approximately 20% of the Cornish population is aged under 20.

[25] Baseline survey question: How would you describe your ethnic group?

[26] Ethnic group results from 2021 census are available from https://www.nomisweb.co.uk via TS021 - ethnic group dataset.

[27] Baseline survey question: Where is your main place of residence?

[28] Baseline survey question: Which of the following would you say best describes your current employment status?

permanently sick or disabled or full-time student). The unemployed comprised 4% of participants.

Statistics for Cornwall and Islands of Scilly for June 2022[29] show that the rate of economically active people is 78.2%, a similar rate to the national UK level (78.4%). The unemployment rate for Cornwall and Islands of Scilly is 2.5%, a lower rate compared to the national UK level (3.9%). Hence the representation of unemployed, and non-working people in the Cornwall e-cycle pilot was similar to that in the wider Cornwall population.

Household income[30]

Pilot participants were asked their annual household income before deductions. 59% of baseline survey respondents (who supplied a figure) reported an annual household income of less than £40,000 and 41% reported an income of £40,000 or more. It is estimated that the median gross household income before deductions in Cornwall is approximately £40,000 (see Appendix A). This suggests the median household income of pilot participants was slightly lower than the county in general.

The W2We loan scheme attracted the highest percentage of low-income respondents, with 33% of W2We participants (23 of 69 who supplied a figure) reporting an annual household income of less than £20,000. There was some targeting of the W2We scheme at people struggling with a lack of affordable transport to get to work, a training course or further education, hence this result shows it had some success in achieving this.

Health[31]

The baseline survey asked participants about their health status. Adverse health could be a reason not to participate in the pilot but it could also be a reason an e-cycle is helpful for personal mobility. 16% of participants (53 of 324) reported having health issues (physical or mental) expected to last 12 months or more. Health issues were most common amongst OTT participants (OTT 27%, 11 of 41; W2We 17%, 13 of 78; roadshows 14%, 29 of 205).

Chatterjee et al. (2019) found that 36% of the population in England reported having a long-standing physical or mental impairment, illness or disability.[32] While the equivalent figure for Cornwall is unknown, it is likely that representation of people

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[29] Cornwall Council (2022). *Economy Monitoring Quarterly Update (EMQU) October 2022.* https://www.cornwall.gov.uk/media/vjxd0k0w/emqu-q3-22-fin.pdf

[30] Baseline survey question: What is your household's estimated annual income? i.e. the total before deducting tax or National Insurance.

[31] Baseline survey question: Do you have any physical or mental health conditions or illnesses lasting or expected to last 12 months or more?

[32] Chatterjee, K., Clark, B. Nguyen, A., Wishart, R., Gallop, K., Smith, N., Tipping, S. (2019) *Access to Transport and Life Opportunities.* Department for Transport. https://www.gov.uk/government/publications/access-to-transport-and-life-opportunities. The specific question asked was: Do you have any long-standing physical or mental impairment, illness or disability? I mean anything that has troubled you over a period of at least 12 months or that is likely to trouble you over a period of at least 12 months.

with adverse health in the Cornwall e-cycle pilot was lower than in wider Cornwall. This is unsurprising given the relatively low participation of older people in the pilot but the 16% representation shows the pilot did not exclude those with health issues.

For those reporting physical or mental impairment, illness or disability, a follow-up question was asked whether the condition or illness reduced their ability to carry out day-to-day activities. 48% of roadshow participants (11 of 29) said they had conditions or illnesses which reduce their ability to carry out day-to-day activities a lot. Subsequently, the phone interviews indicated that some participants were motivated to use an e-cycle to enhance mobility issues related to their health conditions. This is discussed further in Section 5.2.

Travel behaviour profile

Table 7 summarises the travel behaviour profile of participants in the Cornwall pilot.

Table 7. Travel behaviour characteristics of pilot participants

	Category	Roadshows (No.)	OTT (No.)	W2We (No.)	Total (No.)	Total (%)
Household car ownership	No car	14	0	3	17	5
	One car	71	13	27	111	34
	Two cars or more	119	28	47	194	59
Cycle ownership	Conventional cycle	160	30	55	245	74
	E-cycle	39	1	2	42	13
	No cycle	28	10	24	62	19
Cycling frequency	At least 3-4 days/wk	45	14	14	73	22
	At least 1 day/wk	39	8	7	54	16
	Less than 1 day/wk	77	10	30	117	33
	Never cycle	49	10	30	89	27
Cycle safety perceptions	Feel safe	85	27	46	158	60
	Feel not safe	44	14	22	80	31
Cycle confidence perceptions	Feel confident	104	32	59	195	74
	Feel not confident	34	10	14	58	22

Note: Not all categories of responses are shown and not all participants answered all questions, hence totals do not add up to 333 and percentages do not add up to 100%. For the cycle ownership question, e-cycle owners may also have owned a conventional cycle, hence total adds up to more than 333 and percentages add up to more than 100%.

Household car ownership[33]

Most baseline survey respondents had two or more cars/vans in their household (roadshows 57%, 119 of 208; OTT 68%, 28 of 41; W2We 60%, 47 of 78). Only 5% of pilot participants had no car or van (roadshows 7%, 14 of 208; OTT 0%, 0 of 41; W2We 4%, 3 of 78).

Car ownership is relatively high in Cornwall compared to the rest of the UK, with 15% of households in Cornwall in the 2021 Census reporting not having a car, compared to 23.5% in England.[34] Therefore, the representation of people in households without a car or van is lower amongst pilot participants than the wider Cornwall population.

Cycle ownership[35]

Across the three interventions, 74% (245 of 333) of respondents owned or had access to a conventional cycle. 19% (39 of 210) of people trying an e-cycle at roadshows already owned or had access to an e-cycle. Existing e-cycle ownership was almost non-existent for the loan schemes (OTT 2%, 1 of 42; W2We 2%, 2 of 81). Meanwhile, 19% of participants did not have access to a cycle – indicating that the pilot was successful in engaging with non-cyclists.

Use of transport modes[36]

Only participants in the loan schemes were asked in the baseline surveys to report their frequency of using different transport modes. There was a high number of non-responses by OTT participants to these questions.[37]

Given the high car ownership levels reported above, it is not surprising that car use dominated the daily mobility of pilot participants. 60% of OTT participants (9 of 15) and 51% of W2We participants (40 of 78) used a car as a driver five or more times a week. Walking five or more days a week was reported by 27% of OTT participants (4 of 15) and 28% of W2We participants (22 of 78). The use of other transport modes, including cycling, was more limited.

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[33] Baseline survey question: In total, how many cars or vans are owned, or available for use, by members of your household?

[34] Dataset: TS045 - Car or van availability available at https://www.nomisweb.co.uk/datasets/c2021ts045

[35] Baseline survey question: Do you own or have use of any of the following? This could include vehicles that you own, loan, hire or use that belong to someone else e.g. a family member or friend.

[36] Baseline survey question: On average, how often would you say that you currently travel using each of the following (please answer for each mode of travel): car or van (as the driver), car or van (as passenger), bus/minibus/coach, underground/ metro/light rail/tram, train, taxi/minicab, motorcycle/scooter/moped, bicycle/e-cycle/adapted cycle, walk for at least 10 minutes as part of your journey.

[37] Out of 42 OTT participants, only 15 responded to this question as it was not a mandatory question in the baseline survey. 78 out of 81 W2We participants responded to this question.

Cycling frequency[38]

38% of participants (127 of 333) reported riding at least once per week, with 33 people (10%) riding at least five days a week. 27% (89 of 333) reported never cycling, whilst 35% were people who cycled less than once a week.

The latest data for 2020-21 from the Active Lives Survey[39] reports that 4.3% of people in Cornwall and Isles of Scilly cycled at least twice in the last 28 days (compared to 5.6% for England as a whole) which suggests that a higher proportion of the pilot participants were active cyclists than the population of Cornwall in general. It is worth pointing out however that over half the participants were infrequent or non-cyclists.

Cycling journey purpose[40]

Pilot participants were asked for which journey purposes they used a cycle. Exercise or recreation was the most common purpose for which pilot participants were cycling prior to their participation in the intervention (roadshows 30%, 62 of 210; OTT 50%, 21 of 42; W2We 41%, 33 of 81). Leisure and social journeys were identified by 24% of roadshow participants (51 of 210), 26% of OTT participants (11 of 42) and 17% of W2We participants (14 of 81). Getting to work was identified by 22% of roadshow participants (46 of 210), 43% of OTT participants (18 of 42) and 25% of W2We participants (20 of 81).

Cycling perceptions[41]

60% of baseline survey participants (158 of 262) reported feeling safe or very safe cycling on the roads of their local areas. 30% (80 of 262) reported feeling not very safe or not at all safe. 74% of participants (195 of 263) said they feel confident cycling on the roads of their local areas, and 22% were not confident (58 of 263). Few pilot participants were frequent cyclists prior to their participation but these results suggest the majority of pilot participants felt safe and confident to cycle. One implication of this is that if pilot participants have a positive experience in trying an e-cycle (whether at a roadshow or as part of a loan) they are unlikely to be dissuaded by safety concerns from acquiring and using their own e-cycle.

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[38] Baseline survey question: On average, how often would you say that you currently travel using a bicycle, e-cycle, adapted cycle?

[39] The Active Lives Survey is conducted annually by Sport England, a non-departmental public body under the Department for Digital, Culture, Media and Sport. It is conducted as a 'push-to-web' survey in which an overall sample size of around 198,250 people aged 16 and over are randomly selected across England and invited to report their involvement in sport and physical activity.

[40] Baseline survey question: Do you travel by bicycle (of any type) for any of the following reasons?

[41] Baseline survey questions for roadshow participants: 1) Before today's activity/event, how safe did you feel cycling on roads in your local area?' 2) Before today's activity/event, how confident did you feel about cycling on roads in your local area?

Baseline survey questions for OTT and W2We participants: 1) How safe did you feel cycling on roads in your local area? 2) How confident did you feel about cycling on roads in your local area?

5.2. Motivations to participate in the pilot interventions

Roadshow participants were asked about their motivation for trying an e-cycle at the event when signing up to try an e-cycle, while OTT and W2We participants were asked why they wanted to borrow an e-cycle.

Roadshows[42]

The most common motivation for roadshow participants was 'curiosity with no plans to buy an e-cycle' (44%, - 92 of 210). The second most popular motivation was 'considering buying an e-cycle' (25%, 53 of 210), with many of these respondents also indicating 'I am thinking about getting an e-cycle for exercise'.

Using an 'e-cycle to replace other modes of transport' was cited by 28 participants (13%) and 'an e-cycle might help me to cycle again' was cited by 23 participants (11%).

OTT and W2We loan schemes[43]

Four options attracted broadly similar popularity from the 42 OTT and 81 W2We respondents: ability to make particular journeys (79% and 72% respectively); considering buying an e-cycle (69% and 65%); environmental reasons (67% and 64%); and exercise benefits (64% and 65%). The high number of responses for each of these four options suggests most loan participants had multiple reasons for taking part in the scheme.

The phone interviews provided additional insights into the motivations of pilot participants. Several common themes emerged. These are summarised below and fuller details, with quotes and case studies, are provided in Appendix A.

- **Travel to work** – although interviewees mentioned wanting to use an e-cycle for different travel purposes, getting to work was prominent.
- **Making cycling possible for those with health issues** – several interviewees were interested to see whether an e-cycle would help them get back to cycling or increase their cycling and overcome health constraints.
- **Saving money** – a number of interviewees mentioned that riding an e-cycle could potentially save them money in terms of fuel, parking costs and/or avoiding the need for a second car.
- **Helping with the hills of Cornwall** – many people talked about the hills in Cornwall and how an e-cycle could help them cycle despite the terrain generally being a deterrent to this. Some interviewees had moved to Cornwall as a cyclist (from both cities and rural areas) but then reduced or stopped cycling because of the hilly terrain.

[42] Baseline survey question: What motivated you to try out an e-cycle today?

[43] Baseline survey question: Why were you interested in borrowing an e-cycle from the scheme?

5.3. Use of e-cycles during loan periods

This section reports on how e-cycles were used during OTT and W2We loan periods. It first identifies the duration of loans and then reports on the frequency of use of e-cycles in loan periods, the transport modes that were replaced and the purposes for which the e-cycles were used. It draws upon 17 responses by OTT participants and 22 responses from W2We participants to the relevant follow-up surveys. This sample is a small subset of the baseline survey respondents and hence the results can only be indicative of outcomes across all participants. It can be hypothesized that those participants who were more positive about their experience, and for whom it made more of a difference, were more likely to respond to the follow-up surveys and hence the results will represent an upper bound for positive outcomes of the pilot.

Duration of loans[44]

Three months was the most common loan period both for OTT participants (76%) and W2We participants (59%) with some loans extending to six months. There was also one OTT participant who borrowed an e-cycle for one day and one W2We participant for one month.

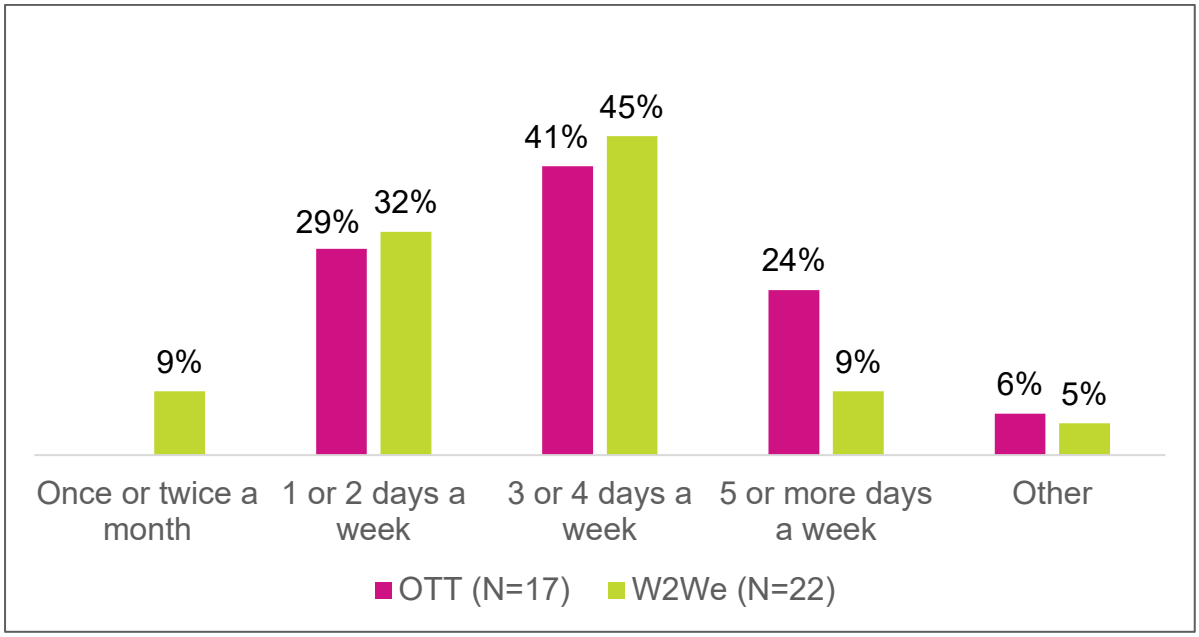
OTT participants were asked to indicate how much time is needed to develop a proper feel for an e-cycle in both the baseline and follow-up survey. Responses were fairly evenly distributed between 3-4 weeks, 1-2 months and 3-6 months at follow-up. This suggests the OTT loan periods of 3-6 months should have been adequate to enable the participants to familiarise themselves with their e-cycle and, where relevant, decide whether they would like to purchase their own one.

Frequency of use of e-cycle

Nearly all OTT and W2We participants used the e-cycle available to them more than once per week, with three or four days a week the most common response for both types of loans (OTT 7 of 17; W2We 10 of 22).

[44] Follow-up survey question for OTT participants: How long did your organisation or business borrow an e-cycle or e-cycles for? Follow-up survey question for W2We participants: How long did you borrow an e-cycle for?

Figure 1. Frequency of use of e-cycle during loan[45]



Transport modes replaced[46]

It was shown in Section 5.1 that e-cycle loan participants relied heavily on cars for their daily mobility needs prior to their participation in the pilot. They were asked in the baseline survey about their expectations for how e-cycle use would replace other transport modes and then asked in the follow-up survey what happened in reality.

Overall, 89% (33 of 37) loan participants said they replaced car driver trips and 37% (14 of 37) said they replaced walk trips. This was very similar to the expectations of the loan participants before participating in the pilots. Only four participants (11%) said they used the e-cycle instead of another cycle. Six participants (16%) said they made a journey they would not have made otherwise, which implies the e-cycle expanded their travel opportunities. The results should be treated as indicative, considering this analysis is based only on participants completing both baseline and follow-up surveys and the number of responses was relatively small.

Journey purposes for which e-cycle used[47]

E-cycle loan participants were asked in the baseline survey about the journey purposes for which they expected to use the e-cycle available to them. In the follow-

[45] Follow-up survey question: How frequently did you personally use an e-cycle borrowed through the scheme?

[46] Baseline survey question: What mode(s) of transport will your new e-cycle journeys replace?

Follow-up survey question: When you made journeys on the loan e-cycle what other modes of transport did it replace?

[47] Baseline survey question: What type of journeys do you intend to use the loan e-cycle for?

Follow-up survey question after: What type of journeys did you use the loan e-cycle for?

up survey they were asked for what journey purposes they had used the e-cycle. Results are reported separately for each type of loan.

OTT loans

The most common journey purpose that the 17 OTT participants expected to use the e-cycle for was exercise or recreation (94%) followed by getting to work (76%). However, during the loan period the most common journey purpose was getting to work (82%). The high level of use of OTT e-cycles for travel to work is not surprising given the e-cycles were loaned to employers for business use.

W2We loans

Most of the 22 participants expected to use the e-cycle for multiple purposes, including getting to work (82%), exercise/recreation (82%), visiting family and friends (73%) and leisure and social reasons (68%). Actual use for exercise and recreation (78%) exceeded use for going to work (68%).

5.4. Changes in cycle ownership, use and perceptions

This section assesses changes in cycle ownership, use and perceptions based on pilot participants who completed both baseline and follow-up surveys. The number of participants who completed follow-up surveys is a small subset of the baseline survey respondents (35 roadshow participants, 17 OTT participants and 22 W2We participants) and hence the results can only be indicative of outcomes across all participants. It can be hypothesized that those participants who were more positive about their experience, and for whom it made more of a difference, were more likely to respond to the follow-up surveys and hence the results will represent an upper bound for positive outcomes of the pilot. This section also includes an analysis of what participants said in phone interviews about their interest in buying an e-cycle.

Cycle ownership

Of particular interest is whether the pilot interventions led to participants acquiring their own e-cycle. There were different sources of data on this. Firstly, a question was directly asked in the follow-up surveys about what had happened since the intervention. Secondly, there was also a repeated question about cycle ownership in both baseline and follow-up survey. Thirdly, there was the opportunity to explore this further in the phone interviews.

Acquisition of e-cycle after intervention

Roadshow participants who completed the follow-up questionnaire were asked if they had acquired an e-cycle or conventional cycle since the roadshow.[48]

Over half had done so. Specifically, ten out of 35 participants (29%) said they had purchased, obtained or upgraded an e-cycle and four participants said they had purchased or upgraded a conventional cycle. Five participants said they had gone on

[48] Follow-up survey question: Since the e-cycle try-out event, have you…?

to borrow or hire an e-cycle for an extended period, with most of these cases thought to be through the W2We loan scheme. This highlights the synergy between the opportunity to ride an e-cycle at a roadshow event and the longer-term W2We loan scheme.

OTT loan participants were asked what they and their organisation had done after the loan.[49] Three out of 17 participants (18%) said they had bought a personal e-cycle afterwards. Only two participants reported that their organisation is considering obtaining e-cycles in the future.

W2We participants were asked if they had purchased an e-cycle since the loan. Two out of 17 participants (12%) had purchased an e-cycle for personal use. Most participants returned to using the modes of transport they used before the loan – which were the car for ten out of 14 participants and walking, public transport or a combination of modes for the other four participants. Phone interviews revealed a number of W2We participants regretted that the cost of buying an e-cycle was a barrier to continued e-cycle use, as illustrated by this quote: *"Now I've had it for this amount of time, I think I'd find it hard to do without it. So I think I will, once I thread money together, have to do my best to get one of my own".*

Cycle ownership before and after intervention

All pilot participants were asked whether they had a cycle, e-cycle and adapted cycle in the baseline survey and in the follow-up survey. Figure 2 shows there was an increase from 14% (5 of 35) to 29% (10 of 35) of roadshow participants having their own e-cycle. This corroborates the previously reported result that a number of roadshow participants went on to acquire an e-cycle. There was an increase from zero to 6% (one of 17) OTT participants having their own e-cycle but no W2We participants reported having an e-cycle before or after the loan period.

The same data can be analysed to look at individual-level change in cycle ownership using transition tables. This largely confirms the results above but reveals the nature of changes made by individuals. Further details are provided in Appendix A.

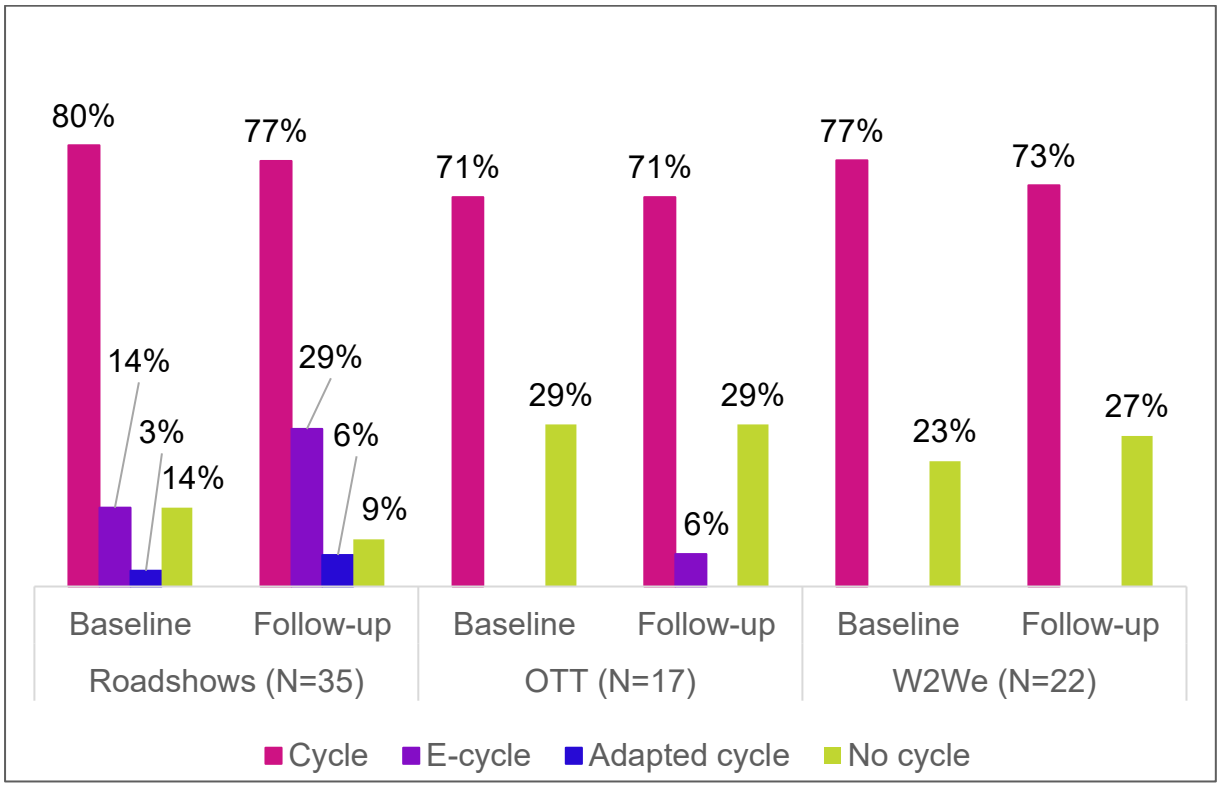
The phone interviews explored whether participants had gone on to buy their own e-cycle or were considering it. The participants can be grouped into four categories on this basis:

1. Made a decision to buy and e-cycle.
2. Still in the process of making a decision to buy and e-cycle.
3. Would like to buy and e-cycle but the cost makes this prohibitive.
4. Found an e-cycle was not appropriate for their needs.

Further details are provided in Appendix A.

[49] Follow-up survey question: What has happened since the e-cycle loan?

Figure 2. Comparison of cycle ownership at baseline and follow-up (multiple responses allowed)[50]



Cycle use

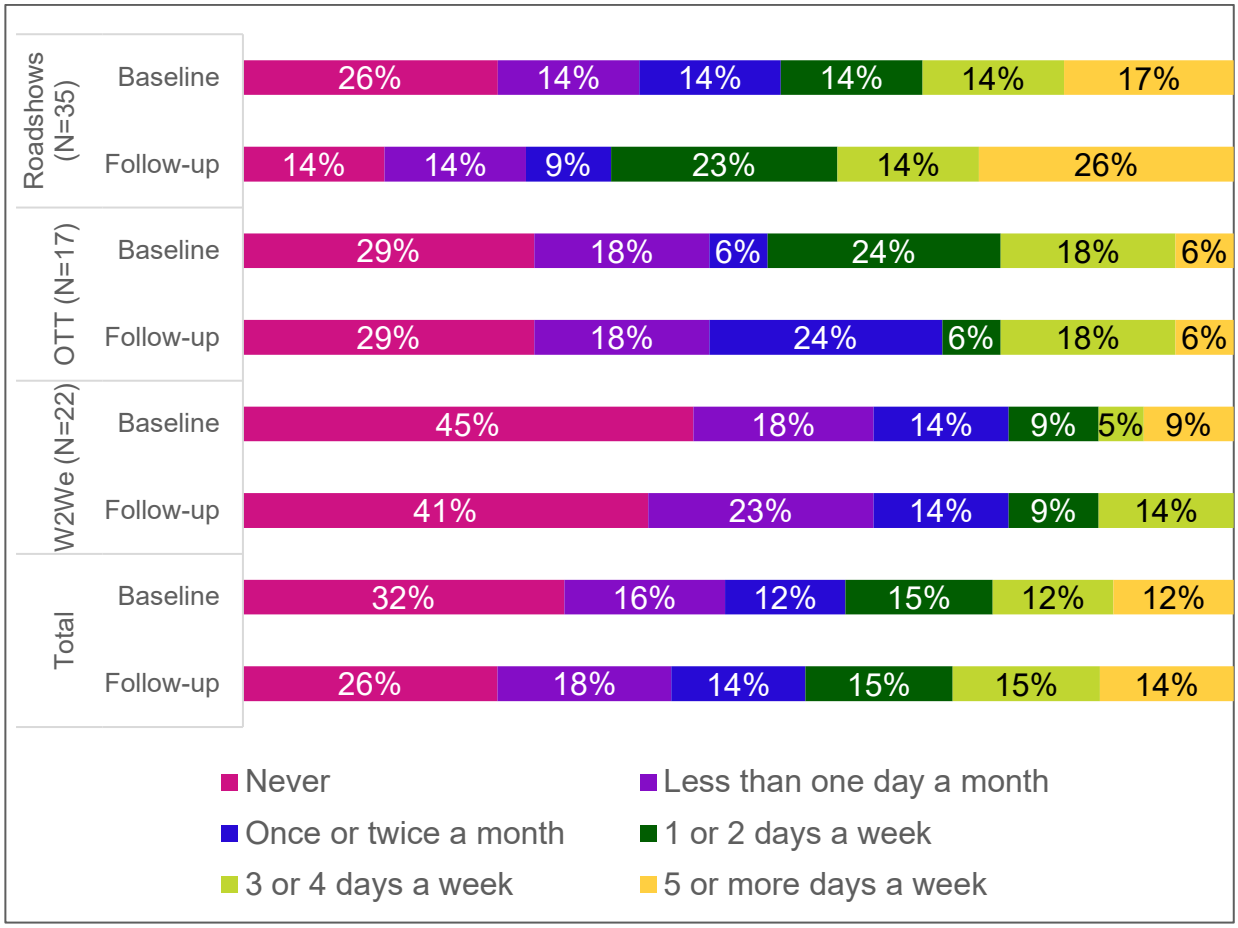
All pilot participants were asked about cycling frequency in the baseline and follow-up surveys. Figure 3 shows at baseline 39% of participants (29 of 74) can be characterised as frequent cyclists (riding at least weekly), 28% as occasional cyclists (less than weekly) (21 of 74) and 32% as non-cyclists (24 of 74). At follow-up, frequent cyclists increased to 43% of participants (32 of 74), occasional cyclists increased to 31% (23 of 74) and non-cyclists decreased to 26% (19 of 74).

46% (16 of 35) of roadshow participants were frequent cyclists at baseline and this increased to 63% (22 of 35) at follow-up. 13 participants increased their cycling, six decreased it and 16 did not change their frequency. Six of those increasing their cycling had not been cycling at all prior to the roadshow.

[50] Baseline survey question roadshows, OTT, W2We and follow-up roadshows: Do you own or have use of any of the following? This could include vehicles that you own, loan, hire or use that belong to someone else [e.g. a family member or friend].

Follow-up survey question OTT and W2We: Outside of the e-cycle loan scheme, do you own or have use of any of the following? This could include vehicles that you own, loan, hire or use that belong to someone else [e.g. a family member or friend].

Figure 3. Comparison of cycling frequency at baseline and follow-up[51]



Journey purposes for cycling[52]

Cycling journey purpose can be compared at baseline and follow-up for 21 roadshow participants. At baseline, 57% cycled for leisure and social purposes and 57% for exercise and recreation. Cycling for exercise / recreation increased substantially at the follow-up to 90%. This result may have been influenced by many of the roadshow survey responses having been received in the months of July and August, when the weather is generally more amenable to cycling and many people are on holiday. Cycling to visit friends and family also increased. It was the second most popular purpose at follow-up. These results contrast with the use of e-cycles during the loan schemes, when getting to work was the most common journey purpose.

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[51] Baseline survey question: On average, how often would you say that you currently travel using a bicycle, e-cycle, or adapted cycle?

Follow-up survey question roadshows: On average, how often would you say that you currently travel using a bicycle, e-cycle, or adapted cycle?

Follow-up survey question OTT and W2We: Aside from trips on the loan e-cycle, on average how often would you say that you currently travel on any type of bicycle?

[52] Baseline survey question: Do you travel by bicycle (of any type) for any of the following reasons?

Cycling perceptions[53]

The percentage of participants feeling safe cycling on roads decreased from 60% (38 of 63) to 57% (36 of 63) across all interventions. While the reason for this is not known, one W2We participant interviewed mentioned avoiding main the roads they used when driving to work and choosing a longer but safer route (see Case Study A in Appendix A). This raises the possibility that the experience of cycling may be less positive in reality than expected. Having said that, the percentage of participants feeling confident cycling on roads increased from 79% (50 of 63) to 83% (52 of 63), indicating there was no clear overall change in cycling perceptions.

5.5. Wider impacts

This section reports how e-cycles influenced access to opportunities, physical activity levels and transport modes used. The results are based on participants who completed baseline and follow-up surveys (35 roadshow participants, 17 OTT participants and 22 W2We participants). As stated previously, those participants responding to the follow-up survey may be more positive about their e-cycle experience and it may have made more of a difference to them, hence the results should be considered as an upper bound for positive outcomes of the pilot.

Access to employment, education and training[54]

W2We participants were asked in the follow-up survey whether their e-cycle loan was for the purpose of helping to access to employment, education or training, or for another reason. 16 participants (73%) indicated the purpose was access to employment and one participant indicated access to education and training. 'Other' responses included improving health and fitness, reducing reliance on car travel and saving money on fuel. Of the 16 participants who stated the reason was access to employment, one had gone on to purchase a car, two had purchased an e-cycle for personal use, and ten had returned to using the modes of transport they were using before the W2We loan.

W2We participants were also asked how the e-cycle helped them make journeys for the purpose mentioned in the previous question. The two most frequent responses were not being able to afford to purchase an e-cycle (19 participants) and the e-cycle being a more environmentally friendly way of travelling (19 participants). A lack of public transport was mentioned by six participants, and avoiding walking long distances by four. One referred to riding a conventional bike exacerbating a chronic health condition, while another said *"it has allowed me to get out and about more"*.

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[53] Baseline and follow-up survey question roadshows: Before today's activity/event, how confident did you feel cycling on roads in your local area?

Baseline and follow-up survey question OTT and W2We: How confident did you feel cycling on roads in your local area?

[54] Follow-up survey question: What was the reason for your W2We loan?

In phone interviews with two participants in their 60s who were not car drivers, the loan e-cycles made clear contributions to their access to employment and other opportunities. One OTT participant used his e-cycle to obtain a part-time job which was too far to walk to and inaccessible by public transport. After the loan, he bought a motorcycle because it was a *"better deal"* than an e-cycle, as it allowed him to travel longer distances. More detail is provided in Case Study D in Appendix A.

One W2We participant had stopped driving in 2020 and mostly walked, as well as used lifts and buses. He has health constraints and a low-income. He said that the e-cycle expanded his circle of travel significantly, and opened up work and social opportunities. He is now seeking ways of continuing his access to an e-cycle, potentially through a forthcoming social prescribing initiative.

Physical activity levels[55]

There were no changes in patterns of pre- and post-intervention physical activity. The percentage reporting at least 2½ hours or more moderate or vigorous activity in the last seven days changed from 55% (39 of 71) to 54% (38 of 71). Those reporting 30 minutes to 2½ hours of activity increased from 38% (27 of 71) to 41% (29 of 71).

Transport mode use

In the baseline survey, 45% of roadshow participants (8 of 18) expected to replace car trips with e-cycle trips. In the follow-up survey this increased to 78% (14 of 18).[56] Some roadshow participants are known to have purchased e-cycles or participated in loan schemes. Hence, these responses are not just stated intentions, but actual changes in behaviour. Participants are replacing more car trips with e-cycle trips than they expected they would. This indicates potential for e-cycles to replace some car trips. Further evidence is needed to understand whether change is sustained.

OTT and W2We participants were asked at baseline and follow-up about modes of transport used.[57] As only five OTT participants responded to both surveys, no clear pattern can be discerned for OTT. Among W2We participants, in the baseline survey, 81% drove a car or van at least once a week (17 of 21) and 62% (13 of 21) were car or van passengers. 62% (13 of 21) walked at least once a week and 20% (4 of 21) used a bicycle, e-cycle or adapted cycle. At follow-up, there was little change in car or van driving (86%), car or van passengers (67%) and walking (62%). There was however a substantial increase in bicycle, e-cycle or adapted cycle use at least once a week (57%). Caution is needed in interpreting these results as this is contradictory to the reported lack of increase in cycling frequency in Section 5.4.

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[55] Baseline and follow-up survey question: In the past week, how much moderate or vigorous physical activity have you undertaken in total? i.e. any activity which made you breathe faster.

[56] Baseline and follow-up survey question: If you owned an e-bike, or had one available to use, do you think you would cycle for any trips that you currently make by car?

[57] On average, how often would you say that you currently travel using each of the following? (Please answer for each mode of travel: car or van (as the driver), car or van (as passenger), bus/minibus/coach, underground/ metro/light rail/tram, train, taxi/minicab, motorcycle/scooter/moped, bicycle/e-cycle/adapted cycle, walk for at least 10 minutes as part of your journey.

6. DISCUSSION

This chapter brings together the findings of the evaluation of the Cornwall e-cycle pilot by answering the research questions identified in Section 2.1. It draws on the results reported in the previous chapters and discusses the significance of these results in the context of what is known from other e-cycle studies. It finishes with recommendations for future e-cycle schemes and programmes.

6.1. Delivering the pilot interventions

How have activities across the programme been delivered, what worked and what didn't?

The Cornwall pilot began in late summer 2021 but experienced some obstacles which affected delivery timescales. The pilot was extended by three months to finish in September 2022. The two critical practical issues which delayed the launch of the roadshow events and loan schemes were procuring and insuring a large fleet of e-cycles. Despite these initial difficulties, the pilot delivered the following activities:

- Roadshows – a total of 20 roadshows were held with an estimated 700 people trying out an e-cycle, against an original expectation of 24 roadshows.
- Opportunity to Try loans – a total of 62 e-cycles were lent out to 20 employers and used by an estimated 121 employees. The original expectation was to loan e-cycles to six employers.
- Wheels 2 Work electric loans – a total of 127 W2We loans were arranged during the pilot, against an original expectation of 20 loans.

Did the programme reach the communities and groups intended by the DfT and local partners?

The Cornwall pilot aimed to increase cycling by those who would not normally consider cycling and provide e-cycles to help unemployed people with transport to access education, employment and training.

The delivery partners held roadshow events at a variety of locations across Cornwall and loaned e-cycles to a diverse set of employers. Roadshow events were held at public-facing events and closed, site-specific locations. The OTT loan scheme was taken up by employers representing a wide range of sectors (including construction, accommodation and food services, public administration and health and social work). The socio-demographic profile of pilot participants is summarised in Section 6.2 and shows the pilot was generally successful in achieving participation of a broad range of residents of Cornwall.

The Wheels 2 Work service is traditionally offered to people struggling with a lack of affordable transport to get to work, training or education. Typically, a motorbike scooter (moped) is lent to beneficiaries for a period of up to six months. W2WSW marketed the W2We loan opportunity to their existing customer base of people seeking affordable transport to access work and training, as well as via a return to work programme. They also advertised it more broadly to anyone keen to try out an

e-cycle for an extended period. W2WSW felt the majority of people applying for W2We loans were from relatively affluent households who were utilising the scheme in order to see whether they liked and would make good use of an e-cycle for commuting and/or leisure purposes before investing in purchasing one. This is borne out by the low percentage of W2We participants reporting an annual household income lower than £20,000 (33%), although this was a higher percentage than for roadshow and OTT participants.

Is it possible to identify any integration or interaction between the different activities being delivered in the pilot?

The pilot's delivery partners found that it was helpful to have the different e-cycle interventions happening in parallel, as they could exploit the synergies between them. For example, people who tried out e-cycles at roadshows were often referred on to the OTT or W2We loan schemes. This evaluation found multiple examples of participants who moved on to a W2We loan after using an e-cycle as part of an OTT loan, or after trying one out at a roadshow.

However, the omission of initiatives to support the cost-effective purchase of e-cycles, or at least loans of indefinite periods, has emerged as a missed opportunity. Significant numbers of W2We riders and OTT loan hosts would have liked to have loaned their e-cycle(s) for longer, or were very interested in purchasing one, had they been able to find a suitable model at an affordable price.

6.2. Impacts of the pilot interventions

What is the profile of participants (i.e. in terms of socio-demographic and travel behaviour characteristics)?

The general experience in other e-cycle trials has been that participants are disproportionately male, aged 30-50, better educated and more affluent.[58] This is partly a consequence of many of the trials targeting car commuters. 333 out of an estimated 900 participants in the Cornwall e-cycle pilot completed a baseline questionnaire before trying an e-cycle and this sample of responses was used to build a profile of the participants.

Nearly half (45%) of the baseline survey respondents identified as female, with this proportion higher for the loan schemes than roadshows. A previous survey of e-cycle users in the UK by Melia and Bartle (2022) found 30% of current and potential users were female, so this indicates the Cornwall pilot was successful in engaging with women.[59] Also, a higher proportion of men (15%) use bicycles in general (at least

[58] Shergold, I. & Chatterjee, K. (2021). *Behavioural Impacts of E-cycle Trials: A Rapid Evidence Assessment.* Report to Department for Transport.

[59] Melia and Bartle (2022) carried out a survey of users and potential users of e-cycles (the survey was aimed at people living in the UK who had who had 'ever used or considered using an e-bike', 58% of the sample of 2.092 were current e-cycle users, 6% were previously e-cycle users and 36% were currently considering buying or hiring an e-cycle) in 2019 to find out about their characteristics, motivations and travel behaviour. This could not be identified from the National Travel Survey or other

once a week) than women (6%) in England[60], so the pilot scheme is a promising approach to address this gender gap.

When comparing the age profile of pilot participants to the Cornwall population, there was a higher proportion of participants in the 40-59 age band, a lower proportion aged 70 and above, and similar proportions in the 20-39 and 60-69 age bands. Melia and Bartle (2022) found e-cycle users and potential users strongly weighted to older people (40% over 60 and 44% aged 41-60). Hence the Cornwall pilot attracted interest from a younger profile of people than are currently e-cycle users.

Few of the pilot participants identified as having Asian, Black or mixed ethnicity (4%), but this is higher than the percentage in Cornwall (2%). Hence the pilot had some success in this area.

A relatively low percentage of pilot participants (18%) were in non-working categories – a slightly lower percentage than in Cornwall generally (where the economically inactive rate is 21.8%). This mainly reflects the low participation of retired people in the pilot, which is partly a consequence of one of the pilot interventions being e-cycle loans to employers. 4% of participants reported being unemployed which is slightly higher than the unemployment rate for Cornwall (2.5%).

In Cornwall the median gross household income before deductions is approximately £40,000. 59% of participants reported an annual household income of less than £40,000, suggesting the median household income of pilot participants was slightly lower than the county in general. As mentioned above, the W2We loan scheme attracted the highest percentage of low-income respondents.

The pilot interventions succeeded in engaging with those with long-term health conditions, with 16% of baseline survey respondents saying they had a physical or mental health condition or illness lasting or expected to last 12 months or more.

While 15% of households in Cornwall reported not having a car in Census 2021, only 5% of pilot participants were in households without a car or van. It is notable however that bicycle use in general is greater amongst those in England without car availability.[61] Hence it will be important to consider how to reach people without car access in future e-cycle schemes.

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large-scale national surveys as they do not identify e-cycles as a separate category from other cycles. Given the absence of any register of e-cycle owners or users, the survey was promoted to networks likely to include e-cycle users and the response survey cannot be said to be representative of all e-cycle users, but it is viewed as likely to indicate distinctive characteristics of the prevailing e-cycle user population.

Reference: Melia, S. & Bartle, C. (2022). *Who uses e-cycles in the UK and why?* International Journal of Sustainable Transportation, 16:11, 965-977.

[60] Chatterjee, K., Clark, B., Nguyen, A., Wishart, R., Gallop, K., Smith, N. & Tipping, S. (2019). *Access to Transport and Life Opportunities*. Project report for Department for Transport. https://www.gov.uk/government/publications/access-to-transport-and-life-opportunities

[61] Chatterjee, K., Clark, B., Nguyen, A., Wishart, R., Gallop, K., Smith, N. & Tipping, S. (2019). *Access to Transport and Life Opportunities*. Project report for Department for Transport. https://www.gov.uk/government/publications/access-to-transport-and-life-opportunities

Three-quarters (74%) of pilot participants owned or had access to a conventional cycle prior to trying out an e-cycle at a roadshow or via one of the loan schemes. 13% of pilot participants owned or had access to an e-cycle, with this especially prevalent amongst roadshow participants, who were presumably interested in trying out a newer model. Overall, 19% of pilot participants did not have access to any cycle, indicating the pilot was successful in engaging with non-cyclists.

Participants in the two loan schemes were asked about their use of different transport modes prior to starting the loan period. Driving a car was by far the most popular option, with walking the next most popular means of transport.

38% of pilot participants reported that they cycled at least once per week, 35% reported cycling less than once a week and 27% reporting never cycling. Exercise or recreation was the most commonly mentioned purpose for cycle trips, with getting to work and leisure and social use the next most frequently mentioned. Only 4.3% of adult residents of Cornwall report cycling two times or more in the last 28 days in the latest Active Lives Survey, so the pilot participants were more active cyclists than the general population. Overall, 60% of the pilot participants reported feeling safe or very safe cycling on the roads of their local area and 74% reported feeling confident cycling on the roads of their local areas.

Why are people taking part in the pilot, especially those borrowing a loan e-cycle?

'Curiosity with no plans to buy' was the most frequently mentioned motivation to try out an e-cycle by roadshow participants (44%). Considering buying an e-cycle was also mentioned by a quarter of roadshow participants. Four motivations were equally popular amongst OTT and W2We loan scheme participants: ability to make particular journeys; considering buying an e-cycle; environmental reasons; and exercise benefits. As with roadshow participants, a high proportion believed that trying an e-cycle would help with their deliberations over buying one. Phone interviews provided additional insights into the motivations of the pilot participants with four themes emerging: travel to work; making cycling possible for those with health issues; saving money; and helping with the hills of Cornwall.

A previous programme of e-cycle interventions in the UK noted a core group who participated were retired people interested in having their own e-cycles but wanting to test them out before committing to a purchase.[62] In the Cornwall e-cycle pilot, there were few retired participants, but it was certainly the case that a substantial number of participants said their participation was motivated by an interest in buying their own e-cycle.

How were e-cycles used during loan periods?

Information on how e-cycles were used during OTT and W2We loan periods was available from responses made to the follow-up surveys by 17 OTT participants and 22 W2We participants. Loan durations were most commonly reported to be three

[62] Carplus Bikeplus. (2016). *Shared Electric Bike Programme Report 2016: Findings and recommendations from eleven shared electric bike projects*.

months (26 of 39 participants), with nine participants reporting four to six month loan periods, highlighting that many participants were keen to use the e-cycle for as long as possible.

Nearly all OTT and W2We participants (35 of 39) used the e-cycle available to them at least once per week, and half the participants used them at least three or four days a week. Most said they replaced car driver trips (33 of 37) and very few (4 of 37) said they used the e-cycle instead of a conventional cycle. Six participants said they made a journey they would not have made otherwise. These results show the objective of e-cycles replacing car trips was achieved during the loan periods for both OTT and W2We schemes. However, the results should be treated as indicative, considering this analysis is based only on participants completing both baseline and follow-up surveys and the number of responses was relatively small.

What levels of cycle ownership and cycling are present pre- and post-intervention?

Changes in cycle ownership and use were assessed based on pilot participants who completed both the baseline and follow-up surveys (35 roadshow participants, 17 OTT participants and 22 W2We participants). This is a small subset of all pilot participants and it is possible these are more likely to have been positive about their experience and hence the results are likely to represent an upper bound for the positive outcomes of the pilot. Phone interviews provided supplementary insights about how interest in buying an e-cycle varied across pilot participants.

When directly asked, about one in five pilot participants (15 of 69) reported buying an e-cycle after participation in the pilot schemes. Some of these had replaced or supplemented an existing e-cycle. When looking at individual-level change in cycle ownership, reported at baseline and follow-up, it was observed that seven people out of 74 who did not have an e-cycle prior to participating in the pilot had gained an e-cycle afterwards. These supplemented existing personal cycles in all but one case. Five out of these seven people said they were considering buying an e-cycle at baseline and hence their participation appears to have tipped them towards buying their own e-cycle. Six out of the seven cases were roadshow participants which suggests the roadshows were effective at encouraging people who were already considering buying an e-cycle to do so.

Phone interviews gave further insights into how participation in the pilot affected interest in acquiring a personal e-cycle. Participants fell into four categories:

- Made a decision to buy an e-cycle.
- Still in the process of making a decision to buy an e-cycle.
- Would like to buy an e-cycle but the cost makes this prohibitive.
- Found an e-cycle was not appropriate for their needs.

The follow-up surveys for OTT and W2We loans took place quite soon after the loan periods for some participants, which might not have given them time to look into buying their own e-cycle. Where post-trial monitoring has taken place in other e-cycle trials, it has shown promising outcomes, with 13% of regular riders during a

programme of 11 interventions in the UK going on to purchase an e-cycle[63] and 44% of participants in a trial in Switzerland reporting they had bought an e-cycle a year later.[64] The results for the Cornwall pilot are in line with these outcomes.

At the time of the follow-up survey, the percentage of frequent cyclists (cycling at least once a week) had increased slightly from 39% (29 of 74) to 43% (32 of 74). Eight participants had previously not been cycling at all and reported cycling afterwards. As with cycle ownership, the greatest increases in cycling frequency were seen with roadshow participants. Roadshow participants reported a notable increase in cycling for exercise and recreation.

What has been the impact of the Cornwall pilot on access to work/education/training, physical and mental health and perceptions of cycling?

Participation in the e-cycle pilot interventions had the potential to influence several aspects of the daily lives of the participants. The W2We loan scheme was intended to help individuals to access employment, education and training. Participants were asked in the follow-up survey about the reason they had participated. Access to employment was indicated by 16 out of 22 respondents (73%) and access to education and training by one participant each.

The contribution of the loan e-cycles to accessing employment was confirmed in the phone interviews, particularly with respect to being able to make journeys too long for a conventional cycle and to save money compared to using a van, car or motorcycle. However, the cost of an e-cycle meant only two W2We participants went on to purchase an e-cycle for personal use, with most returning to their previously used modes of transport. Hence, it appears that while the W2We loan scheme delivered on its original objective, its long-term legacy appears to be limited without participants receiving any support to subsequently purchase an e-cycle.

A comparison of self-reported pre- and post-intervention levels of moderate or vigorous physical activity for participants in all three schemes showed very little aggregate change. No other assessment of physical or mental health impacts was possible.

There was also little aggregate change in participants' perceptions of feeling safe and confident in cycling on roads of their local areas. It appears participants had positive views of cycling in their local areas and this was not affected by participating in the pilot.

Is it possible to determine longitudinal impacts and effects of the trial?

The expectation of replacing car trips with e-cycle trips increased for roadshow participants after they had participated in the roadshows. Some roadshow

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[63] Carplus Bikeplus. (2016). *Shared Electric Bike Programme Report 2016: Findings and recommendations from eleven shared electric bike projects*

[64] Moser, C., Blumer, Y. & Hille, S.L. (2018), *E-bike trials' potential to promote sustained changes in car owner's mobility habits.* Environmental Research Letters, 13(4), 44025.

participants went on to purchase e-cycles or participate in the loan schemes, hence these follow-up responses not only represent stated intentions but actual changes in behaviour in these cases.

During the loan periods, nearly all OTT and W2We participants reported replacing car driver trips. However, a comparison of baseline and follow-up transport mode use did not reveal any change in frequency of car travel. Hence, no long-term change in car use is evident from the loan interventions.

Other studies have shown that at the end of e-cycle trials participants have expressed an intention to continue cycling using both conventional cycling and e-cycles.[65] There has been limited long-term monitoring after e-cycle trials but two studies have demonstrated long-term reductions in car use.[66, 67] The results from the Cornwall e-cycle pilot provide some indications this happened but the scale of impact in the long-term is unclear. With surveys carried out only about three months after the roadshow events or loan periods, and with small sample sizes, it is not possible to be definitive about long-term effects. Further follow-up data collection would be required to assess these.

6.3. Recommendations

The findings from the process evaluation and impact evaluation enable a number of recommendations to be put forward for future e-cycle schemes and programmes.

What are the key lessons learnt in terms of the wider programme delivery which might inform the national e-cycle programme?

It has been highlighted that difficulties in procuring and insuring a large fleet of e-cycles delayed the pilot activities. When faced with a similar task in future, it is recommended setting up a framework contract to get access to multiple suppliers and a wider range of e-cycles and accessories. After some effort, fully comprehensive insurance was secured from a specialist cycling and micro-mobility insurance broker and this would be a good solution for future e-cycle schemes.

The experience with the W2We loan scheme (and the OTT loan scheme) is that e-cycle loans are attractive to a broader audience than a typical Wheels 2 Work scheme. This could have positive implications for the breadth of people who are open to discovering the benefits of e-cycles, as well as for the number and types of journeys which they could be used for. To capitalise on this, future initiatives will need to factor this into their design and delivery models. For example, when defining

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[65] Cairns, S., Behrendt, F., Raffo, D., Beaumont, C. & Kiefer, C. (2017). *Electrically-assisted bikes: Potential impacts on travel behaviour.* Transportation Research Part A: Policy and Practice, 103, 327-342.

[66] Fyhri, A. & Fearnley, N. (2015). *Effects of e-bikes on bicycle use and mode share.* Transportation Research Part D: Transport and Environment. 36 (0), 45–52.

[67] Moser, C., Blumer, Y. & Hille, S.L. (2017;2018). *E-cycle trials' potential to promote sustained changes in car owner's mobility habits.* Environmental research letters, vol. 13, no. 4, pp. 44025.

their target audiences, setting qualification criteria and loan charges, and determining the most appropriate marketing channels and messages for advertising their scheme.

The profile of pilot participants indicates the pilot was effective in reaching car users (for whom there is greatest potential to reduce car travel and carbon emissions) but it raises the question of how to engage those with more limited transport options. Offering a variety of different e-cycles to try will broaden appeal beyond those content to try a standard e-cycle. Pilot participants said they found it helpful to be able to try different types of e-cycles and decide which was most appropriate for their needs without feeling obliged to buy one.

The phone interviews revealed that some pilot participants recommended the scheme to their family and friends, which led to them also being interested in e-cycles. This suggests word of mouth and participant 'ambassadors' are promising ways of promoting e-cycle schemes and broadening the appeal of e-cycles. It is also important in e-cycle schemes to provide relevant equipment (e.g. panniers) and to support people new to cycling, to enable them to build their skills and confidence. For example, building in additional elements to a scheme or joint working with pre-existing local cycling initiatives to offer support like led rides and cycle training.

As highlighted above, many OTT and W2We loan participants would have liked to have loaned their e-cycle for longer, or were very interested in purchasing one, had they been able to find a suitable model at an affordable price. With the loans, it appears to be necessary to provide further assistance to help participants purchase an e-cycle, or to otherwise provide longer-term access.

There are some methodological lessons from the evaluation. Without a control group, it is difficult to assess the impacts of a trial. It is extremely challenging to obtain comparative data from people similar to those who participate in a pilot scheme and hence effort should be concentrated on obtaining informative data from participants. Steps are needed to ensure trial participants complete a baseline questionnaire and are incentivised to complete follow-ups, including a follow-up at least six months after their participation if long-term impacts are to be understood.