

# National E-Cycle Programme Evaluation Report

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## Executive summary

### Overview

This document is a final evaluation report for the Government's National E-cycles Programme. The programme was funded and overseen by the Department for Transport (DfT) with support from Active Travel England (ATE), and with Cycling UK (CUK) as the delivery partner. The appointed national evaluator was Steer. This evaluation report was prepared in February 2024, shortly following closure of the pilot programme in December 2023.

### The interventions

The programme was delivered as a pilot, with the aim of gathering evidence to inform decisions on future funding. The objectives of the programme were to accelerate the uptake of e-cycles, and to encourage the replacement of motor vehicle journeys with e-cycle trips.

The programme was delivered in four urban locations across England, in three types of setting: branches of the cycling store *Evans*, community hubs, and workplace settings. The following interventions were offered:

- An **e-cycle loan**: participants were given a loan e-cycle for one month. During this period, they took ownership of the e-cycle, kept it in their own home, and used it as they wished;
- A **skills and confidence training session**: these were delivered in small groups by a trained instructor. Sessions covered a range of cycling skills including basic maintenance checks, best practice when preparing for a journey, and practical exercises; and
- **20 loans of adapted e-cycles**: these were offered by inclusive cycling charity *Wheels for All* from their Manchester hub, alongside a set of activity days and outreach events to increase awareness of the local hub and engagement with the local community.

### Evaluation methodology

Steer was commissioned to conduct a process, impact and value for money evaluation of the programme, responding to 21 research questions. The evaluation constituted a mixed-methods approach, encompassing both qualitative and quantitative methods. Findings were triangulated and synthesised to provide overall conclusions in response to each research question. In brief, the methods used for each part of the evaluation were as follows:

- **Process evaluation**: the process evaluation made use of surveys of beneficiaries to understand perspectives on the delivery of the scheme, satisfaction, and key demographic information. Qualitative research was used to triangulate these findings and delve into a more detailed understanding. The process evaluation also made use of CUK programme monitoring data to understand costs, delivery metrics, and lessons learnt;
- **Impact evaluation**: the impact evaluation made use of surveys with both beneficiaries and also a group of non-beneficiaries who had expressed an interest

in the scheme but had not gone on to participate. Surveys were used to understand reported changes in behaviour or intention to adopt new behaviours compared with those in the non-participant group. The surveys were supplemented with qualitative research which provided a deeper understanding of participant behaviours. In addition, telematics data was gathered from GPS trackers fitted to a subset of the loan e-cycles. These trackers collected data on journey distance and duration, providing an objective and quantified account of e-cycle usage during the intervention; and

- **Value for money evaluation:** the value for money evaluation made use of CUK monitoring data to understand scheme costs. Scheme benefits were modelled using a series of assumptions based on data gathered from the beneficiary surveys and GPS trackers. Assumptions around the extent of future e-cycle adoption (i.e. what proportion of participants would go on to purchase an e-cycle) and the extent of e-cycle usage (i.e. the distance likely to be travelled by those who went on to purchase e-cycles) were used alongside industry standard benchmarks to conduct the value for money analysis.

### Methodological limitations

The evaluation occurred concurrently with project delivery and concluded shortly after the closure of the pilot programme. As a result, it was not possible to observe change in cycling behaviour or cycle ownership amongst participants over an extended period. Instead, the evaluation focused on examining behaviours *during* the intervention period and stated attitudes/intentions in the period shortly after the loan. Notable limitations of the methodology were as follows:

- **Attrition in the survey sample and lack of 'follow-up' responses:** only 4% of loan participants completed the follow-up survey (which was distributed three months after the loan was completed). As a result, the evaluation collected only very limited information about longer-term behaviour change; and
- **Reliance on self-reporting:** the evaluation was dependent upon respondents' reported travel behaviours and intentions. This introduces inaccuracy and potential bias. Participants may not be able to recall or accurately report their travel behaviour; and stated intention to purchase an e-cycle may reflect many things (such as mood, recency of interaction, and other circumstances) and cannot be translated predictably into actual behaviour.

### Process evaluation findings

The programme officially commenced in March 2022, but was temporarily paused in July 2022. A re-designed programme, with a narrower scope and shorter delivery period, was launched in October 2022, and ran until December 2023. Over the delivery period, a total of 3,619 loans (88% of the agreed target) and 13,900 training sessions (121% of the agreed target) were completed. The final programme delivery cost was £4.5 million, of which CUK estimated that £302,000 was abortive work caused by the scheme re-design.

Overall, feedback from beneficiaries was very positive, with both loan and training participants rating the intervention highly. 78% of respondents rated their experience of taking part in the loan as 'very good' (the highest rating available).

A number of suggestions were made by surveyed participants regarding potential improvements to the scheme. These included a desire for longer loan periods, improved cycling equipment, and increased availability of specific e-cycle models. Suggested improvements from the qualitative research included better matching of e-cycles with participants, more comprehensive information provision at collection and drop-off, and a broader selection of cycling accessories. Some issues were uncovered regarding some of the e-cycle models offered. The research found that on the one hand, some of the more basic e-cycle models risked giving users a negative experience, especially in some of the hillier locations; while on the other hand, lending very expensive models could also be off-putting or unhelpful if these were outside of a participant's affordability range.

While participants generally enjoyed the loan and found it a useful opportunity to experience riding an e-cycle, many reported that they faced a 'cliff-edge' at the end of the loan period, with little information or encouragement towards future e-cycling behaviour.

### **Impact evaluation findings**

From telematics and survey data, it is clear that participants made frequent use of the e-cycles during the loan period, generally to make short trips for commuting or leisure activities or, most often, just for fun. Based on records from the GPS trackers, each participant made on average 26 trips during the loan period, with an average distance of 2.6km per trip, and spending approximately two hours cycling per week. Participants reported enjoying their experience using the e-cycles, including enjoying the opportunity to spend more time in fresh air, and mental health benefits (which participants had not all anticipated would be a benefit of the scheme).

Upon return of the loan e-cycle, 7% of survey respondents (n=782) reported that they were now the owner of an e-cycle (and had not been previously). Purchasing an e-cycle is a large investment and it is to be expected that many of those who intended to purchase an e-cycle did not do so immediately after the loan, and so would not have been captured within this figure. 33% of loan survey respondents reported that they were now more likely to purchase an e-cycle, and a number reported that they had begun to save, researched purchase options, or taken other steps towards future e-cycle usage.

Amongst training participants, 4% became the owner of an e-cycle after completing the training. The proportion of respondents stating they were 'likely' or 'very likely' to purchase an e-cycle increased from 58% to 72% after training.

By far the most common reason cited for why participants were unlikely to purchase or continue to use an e-cycle was the cost (73%). Other barriers mentioned included security concerns, storage issues, and whether there was fit-for-purpose cycling infrastructure in the local area. Some participants (23%) reporting being less likely to purchase an e-cycle following the loan. This may have been driven by a number of



different factors, such as a negative experience with the scheme (for example they did not like the e-cycle model they had been loaned), feeling less confident cycling on the road than they had expected, or being better informed about the cost of an e-cycle – many reported that had gone into the scheme with no understanding of the cost of an e-cycle.

### **Value for money findings**

The estimated cost of the programme, had it been rolled out in its final incarnation from the outset, was £4.2 million. This is the central cost used in the value for money analysis.

Programme benefits modelled in the value for money analysis include those arising from behaviour change during the loan itself, and those that are expected to accrue over the longer term. The value for money assessment includes monetised benefits in the following categories: health outcomes to e-cycle users; ‘journey quality benefits’ to e-cycle users; and benefits accrued to non-users thanks to a shift away from trips by car (or other modes) and therefore reductions in congestion, accidents etc. associated with those modes.

The estimated benefit cost ratio of the scheme is 0.5, which is considered ‘poor’ value for money according to DfT guidance. This result is primarily driven by the cost of the scheme when compared to low magnitudes of health benefits and non-user benefits, which occur due to relatively modest behaviour change effects, relatively short distances travelled by participants using the e-cycle loans, and the lower physical exertion required for an e-cycle compared to a regular cycle. The most significant benefit category is journey quality, however this is also the least robust and evidence-based.

A range of sensitivity tests were performed. Broadly speaking, the conclusions of the analysis were found to be robust to these sensitivity tests and the conclusion of ‘poor’ value for money tends to hold.

### **Conclusions and recommendations**

Overall, the evaluation found that the pilot was a success in many respects: take-up was strong, participants reported positive experiences, and the pilot offered many useful learnings for future policy. Nonetheless, it is important to recognise that the programme is only one component of the broader effort towards long-term adoption of e-cycles. The pilot found that that affordability of e-cycles is a major hurdle for most people, and the pilot does not address this challenge. The longer-term effects of the programme are also more uncertain, with some (limited) evidence suggesting that behaviour tended to revert towards pre-intervention rates over the longer term. Given the questions around long-term impact generated, and the cost of delivery, the value for money of the programme is challenging.

The evaluation made the following recommendations:

- **Consider interventions which address the affordability hurdle.** The affordability of e-cycles emerged from the research as a major hurdle to long-term behaviour

change. Without addressing this, it seems likely that a programme such as this acting in isolation is unlikely to generate substantial behaviour change benefits;

- **Make refinements to improve the functioning of the programme.** A number of operational adjustments were suggested which include, for example, improving the alignment between the loan and training sessions, offering a wider range of cycling accessories to loan participants, ensuring the e-cycle model offered to each participant is appropriate to their local area and style of riding, equipping participants with helpful information about local cycling routes, and checking-in with participants part-way through the loan to ensure they are having a positive experience;
- **Increase the programme's focus on long-term behaviour change.** The evaluation found that there were some missed opportunities for focusing on long-term e-cycle adoption. Participants in the evaluation reported that they did not receive information about options for longer-term e-cycle/cycle usage. Introducing (or strengthening) targeted communications (providing information around, for example, locally available e-cycle hire/lease schemes, e-cycle conversion kits, or information to assist with getting an existing cycle repaired) could be a helpful addition to address this gap;
- **Target the programme at those most conducive to behaviour change.** Some participants commented that the cycling infrastructure (cycle lanes) in their local area was not fit for purpose, and therefore they were unlikely to cycle again following the loan. Focusing on areas with mature cycling infrastructure would help to avoid this issue. Beyond this, there may also be benefit from a value for money perspective in reconsidering the targeting of the programme – for example restricting eligibility to only those who could feasibly go on to purchase an e-cycle or make long-term use of an e-cycle (for example via a lease scheme) would help to reduce programme costs and increase value for money. This raises challenging issues, however, around equity and accessibility. A combination with an intervention aimed at addressing barriers to affordability (as mentioned above) could help to alleviate this;
- **Conduct further research to gather more intelligence about the barriers to e-cycling,** and, specifically, to understand the extent of financial support which might be necessary to incentivise uptake; and
- **Consider tie-in with other schemes** such as the *Cycle to Work* scheme, links into the private sector, and introduction of other schemes that could help to address issues around safe storage of e-cycles, and the affordability of e-cycles (as described above).

# 1 Introduction

## Overview

The Government has a target for half of all journeys in towns and cities to be walked, cycled or wheeled by 2030. The plans underpinning this vision are set out in Gear Change<sup>1</sup>, the Government's plan to increase cycling and walking. One of the core commitments of this strategy was to establish a National E-cycles Support Programme.

This document is a final evaluation report for the Government's National E-cycles Programme. Throughout this report, electric cycles are referred to as 'e-cycles', non-powered cycles are referred to as 'cycles', and the National E-cycles Programme is referred to as 'the programme'. The programme was funded and overseen by the Department for Transport (DfT) and Active Travel England (ATE), with Cycling UK (CUK) as the delivery partner. The DfT appointed Steer and partner Qa Research to monitor and evaluate the National E-Cycles Programme in 'real time' alongside programme delivery. The evaluation was commissioned in January 2022, shortly before programme commencement, and an interim evaluation report was produced in August 2023. The pilot programme ceased activity in December 2023, and evaluation work concluded shortly after, in February 2024, with preparation of this final evaluation report.

## Introducing the interventions

The programme was delivered as a pilot, with the objective being to gather evidence to inform decisions on future funding. The objectives of the programme were to accelerate the uptake of e-cycles, and to encourage the replacement of motor vehicle journeys with e-cycle trips.

The programme was delivered in four urban locations across England (Leicester, Luton and Dunstable, Manchester, and Sheffield) in three different types of setting: branches of the cycling store Evans, community hubs (such as community centres, town halls and one mosque), and workplace and education (W&E) settings (including four hospitals and one industrial workplace). The following interventions were offered:

- An **e-cycle loan**: participants were given a loan e-cycle for one month. During this period, they took ownership of the e-cycle, kept it in their own home, and used it as they wished. At the end of the loan, they returned the e-cycle to the hub/store they had borrowed it from. Loans were available at all three of the setting types;

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<sup>1</sup> Department for Transport, 2020: Gear Change A Bold Vision for Cycling and Walking. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/904146/gear-change-a-bold-vision-for-cycling-and-walking.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/904146/gear-change-a-bold-vision-for-cycling-and-walking.pdf) (accessed February 2024)

- **A skills and confidence training session:** these were delivered in small groups by a trained instructor. Sessions covered a range of cycling skills including basic maintenance checks, best practice when preparing for a journey, and practical exercises. Training sessions were delivered in community hubs and W&E settings, but not Evans stores; and
- **20 loans of adapted e-cycles:** these were offered by inclusive cycling charity *Wheels for All* from their Manchester hub, alongside a set of activity days and outreach events to increase awareness of the local hub and engagement with the local community.

Individuals could opt to take part in both training and a loan, or to choose just one – according to their preference. There was no requirement to undertake training in order to take out a loan and, similarly, participating in the training did not lead on to enrolment in the loan. Interventions were completely free of charge, and there were no eligibility requirements aside from age (participants were required to be 16 years old as a minimum<sup>2</sup>).

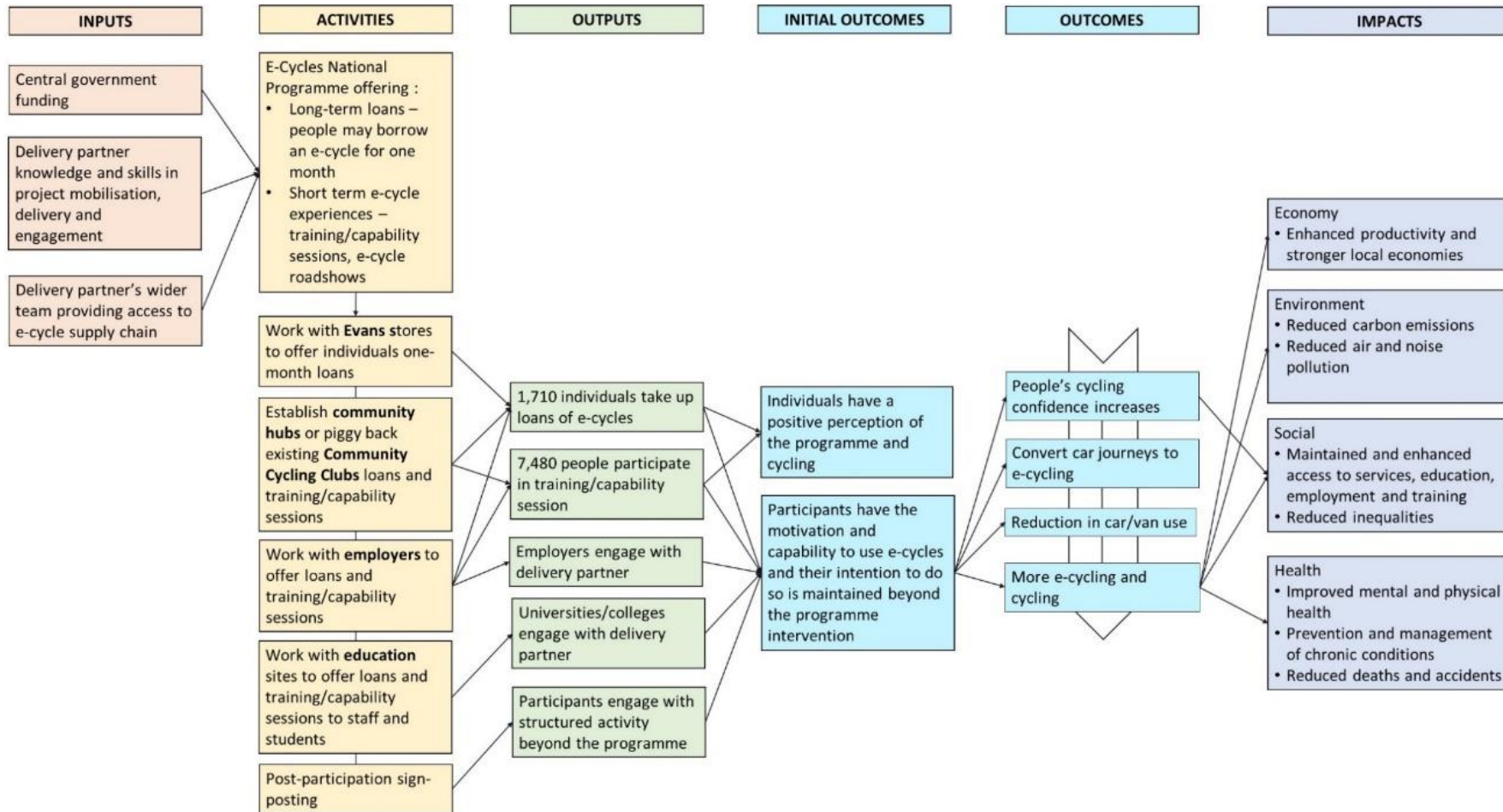
In addition to the above interventions, Evans made a commercial decision to offer a 15% discount voucher to scheme participants to encourage purchase of an e-cycle, cycle, or other cycling equipment. This was not part of the original scheme design, but since it was offered to all participants at Evans stores (which formed the majority of loan participants) and cannot easily be disentangled from the effects of the pilot, it is considered as part of the intervention being evaluated.

Further details about the scheme (including the participating settings, uptake levels, and roll-out timescales) are provided in Chapter 3 (process evaluation). Figure 1-1 overleaf sets out a Theory of Change for the programme, prepared by Steer for the purpose of this evaluation, illustrating the anticipated causal links from activities through to impacts. The evaluation has focused on providing evidence of ‘inputs’ through to ‘outcomes’ – gauging for example the extent to which cycling confidence has increased, car journeys have reduced, and e-cycle uptake has been stimulated. Impacts, which are harder to measure and likely to emerge over a longer time period (such as productivity impacts and long-term health impacts) were beyond the scope of this evaluation.

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<sup>2</sup> Loan participants in Evans stores were required to be 18 years as a minimum.

**Figure 1-1: National E-Cycles Programme Theory of Change**



Source: Steer

## Purpose of this evaluation

Steer was commissioned to conduct a process, impact and value for money evaluation of the programme, responding to 21 research questions. The full table of research questions is provided in Appendix A, Table A-1. In brief, the key themes covered by the research questions include the following:

- **Process evaluation:** the programme's performance against anticipated delivery metrics and timescales, the effectiveness of beneficiary engagement and programme delivery, any challenges to implementation experienced, and overall reflections and lessons learnt for the programme and the monitoring arrangements;
- **Impact evaluation:** the overall impact of the programme in terms of its success in helping to overcome barriers to e-cycles, encourage the purchase (or ongoing use) of an e-cycle, and any resultant changes in travel behaviour; and
- **Value for money evaluation:** the overall costs of delivery, the estimated monetised benefits of the programme and the relationship between these two elements.

It should be noted that because the evaluation occurred concurrently with project delivery, and concluded shortly after the closure of the programme, it was not possible to observe change in cycling behaviour or cycle ownership amongst participants over an extended period of time. Instead, the evaluation focused on examining behaviours *during* the intervention period and stated attitudes/intentions in the period shortly after the loan – to test for positive indications of future behaviour change.

## Structure of this report

The remainder of this report is structured as follows:

- Chapter 2 provides details on the methodologies adopted, and key methodological limitations;
- Chapter 3 provides process evaluation findings, centred around the delivery experience and lessons learned;
- Chapter 4 provides impact evaluation findings, commenting on the extent to which the interventions achieved the stated objectives around e-cycle use/ownership, e-cycle confidence, and changes in travel behaviour;
- Chapter 5 provides an analysis of the value for money of the scheme, including the benefit cost ratio for the scheme that was delivered as well as an estimate of the benefit cost ratio that could be expected for future roll-out of the scheme; and
- Chapter 6 concludes with overall conclusions and recommendations from the evaluation.

Additional detail regarding the process and impact evaluation findings can be found in Appendix A, and a technical account of the approach to value for money assessment can be found in Appendix B.

## 2 Methodology

### Introduction

This chapter sets out the methodologies adopted for the evaluation, key methodological considerations, and limitations of the analysis that should be borne in mind whilst interpreting the results presented within this report.

### Methods used in the evaluation

The evaluation constituted a mixed-methods approach, encompassing both qualitative and quantitative methods. Four different research methods were used by the evaluation: surveys of beneficiaries and non-beneficiaries, qualitative research with beneficiaries and stakeholders (via depth interviews and focus groups), gathering and analysis of quantitative e-cycle telematics data, and review and analysis of CUK programme monitoring data. A selection of these methods was used for each of the process, impact and value for money evaluations (as set out in Table 2-1,

Table 2-2Error! Reference source not found., and Table 2-3 respectively). Findings were then triangulated and synthesised to provide overall findings in response to each research question.

**Table 2-1 Summary of research methods used in the process evaluation**

Research method	How the research method was used, and rationale
Surveys of beneficiaries	To understand beneficiary perspectives on the delivery of the scheme, levels of satisfaction, and key demographic information. Surveys were chosen since they offer the opportunity for all participants to feed back on their experience of the intervention in a relatively time-effective manner.
Qualitative research with beneficiaries and stakeholders	To delve into a detailed understanding of feedback on the scheme from participants and those involved in delivery. Qualitative research was chosen as it allowed for exploration of themes in detail, drawing out nuances and lessons learnt.
Review and analysis of CUK programme monitoring data	As the scheme delivery body, CUK hold key information regarding delivery. Review of this information was used to understand scheme costs, performance against key metrics, and documented lessons learnt.

Source: Steer, 2024

**Table 2-2: Summary of research methods used in the impact evaluation**

Research method	How the research method was used, and rationale
Surveys of beneficiaries and non-beneficiaries	To understand reported behaviours and intention to adopt new behaviours. Surveys were chosen as a proportionate method for capturing behaviour at several points in time – allowing comparison between reported behaviours before and after the intervention. Surveys of non-beneficiaries were used as a supplementary comparator – to gain an understanding of the cycling behaviours and interest in e-cycling amongst individuals who had not received the intervention.
Qualitative research with beneficiaries and stakeholders	To delve into a detailed understanding of reported behaviour change during and after the intervention. Qualitative research was chosen as an appropriate method to explore effects on behaviour (immediate and longer-term) which might not have been reported through the survey, and also to explore drivers of behaviour change.
Gathering and analysis of e-cycle telematics data	To understand the extent to which the e-cycles were used during the intervention, and usage patterns. Telematics data allows for an objective and quantified account of the usage of e-cycles during the intervention, which is a valuable source for triangulating reported behaviour.

Source: Steer, 2024

**Table 2-3: Summary of research methods used in the value for money evaluation**

Research method	How the research method was used, and rationale
Review and analysis of CUK programme monitoring data	To understand scheme costs, a key factor in value for money analysis.
Surveys of beneficiaries	To develop quantitative assumptions around the extent and duration of expected behaviour change, for inclusion in cost-benefit analysis. Surveys provided a quantified estimate of behaviours from across a large portion of the participant population.
Gathering and analysis of e-cycle telematics data	To develop quantitative assumptions around the distances travelled by e-cycle amongst participants for inclusion in the cost-benefit analysis. Telematics data provides an objective and quantified account of travel behaviour, ensuring that assumptions are evidence-based.

Source: Steer, 2024



The section below sets out further details for each of the four research methods.

## Surveys

Scheme participants were asked to complete a detailed survey at key points of interaction with the interventions. CUK staff were briefed to encourage participants to complete the relevant surveys. All participants were asked to complete a 'before' survey prior to commencing their loan or training. Training participants then completed an 'after' survey upon completion of the session. Similarly, loan participants were asked to complete an 'after' survey upon completion of their one-month loan<sup>3</sup>. Participants of both intervention types were also then invited by email to complete a further 'follow up' survey three months after completion of the loan/training. This three-stage approach was intended to document a 'baseline' (in the 'before' survey), immediate change in attitudes and recollection of behaviour during the intervention (in the 'after' survey), and longer-term changes in attitudes and behaviours (in the 'follow up' surveys).

A randomisation approach to scheme delivery was originally considered, however this was later ruled out on grounds of deliverability. As a next best alternative, a comparator group approach was adopted. Though less robust than a randomisation approach, this was considerably more straightforward to deliver. Participants who reached CUK's booking page but were unable to secure a booking – due to loan slots being released in 'batches', leading to periods when no slots were available – were asked to join the Expression of Interest (EOI) list. These individuals were then asked to complete a survey which matched the 'before loan' survey. One month later, they were asked to complete an equivalent of the after survey. They were not asked to complete an equivalent of the follow up survey, since it was considered overly burdensome to request non-participants to complete three surveys, and likely to secure poor response rates. Of the initial group of individuals assigned to the EOI group, 20% went on to secure a booking for a loan or a skills and confidence session, and so their responses to the EOI survey, where they existed, were removed. As a result, it is likely that those in the EOI survey group were somewhat less motivated by the prospect of participating in the e-cycle interventions than scheme participants. This is because the more motivated individuals likely revisited the booking page and successfully secured a slot, thereby transitioning into the intervention group.

Table 2-4 and Table 2-5 provide details of the six surveys distributed amongst loan and training participants, and the total responses to each. Surveys included a mixture of open and closed questions and asked questions about demographics, travel behaviour, cycle ownership, cycling behaviour (including duration and trip purpose), and perceived benefits of (and barriers to) e-cycling. Surveys were open for the duration of

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<sup>3</sup> Loans and training each used a separate set of surveys, though they utilised the same question wording where relevant. Participants who completed training and a loan were asked to complete both sets of surveys. A separate transition survey was available for participants who took up a loan directly after training to reduce duplication and fatigue. This comprised a lighter-touch version of the 'before loan' survey, but with questions removed where they had already been answered as part of the 'before training' questionnaire.

the programme, and an incentive was provided in the form of a prize draw to encourage completion of the full set of surveys. Cognitive testing of survey questions was undertaken to ensure accessibility and clarity of survey language. In addition to these six surveys, two surveys were distributed to participants in the EOI list. A total of 2,330 email addresses were invited to participate in the initial EOI survey, receiving 120 responses (a 5% response rate). 518 email addresses were then invited to participate in the After survey, receiving 88 responses (a 17% response rate).

**Table 2-4: Details of ‘Loan Only’ survey respondents (n=3,585)**

Survey	Associated activity	Total survey completions and response rate (%) <sup>4</sup>
Before	Collecting the e-cycle to commence the loan	1,658 (46%)
After	Returning the e-cycle after completion of the loan	1,187 (33%)
Follow-up	3-months after returning the e-cycle	136 (4%)

Source: Steer, 2024

**Table 2-5: Details of ‘Training Only’ survey respondents (n=1,125)**

Survey	Associated activity	Total survey completions and response rate (%)
Before	Arriving for a training session	393 (35%)
After	Completing the training session	231 (21%)
Follow-up	3-months after completing the training	48 (4%)

Source: Steer, 2024

### Depth interviews and focus groups

Qa Research conducted a total of 95 one-to-one depth telephone interviews and four online focus groups during November and December 2023. The purpose of this qualitative research was to gather a rich and nuanced understanding of the programme. Depth interviews were conducted with 50 loan participants, 10 training participants, 10 participants who had participated in both loan and training, 10 participants who commenced the e-cycle loan but dropped out early, and 15 wider members of the delivery team such as employees and volunteers from the settings where the interventions were located. Three of the focus groups were held with ‘on the ground’ delivery staff, and a fourth with CUK programme team staff. Scheme

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<sup>4</sup> This is after cleaning data, removing partially completed surveys, and removing responses from duplicated email addresses. This occurred, for example, where two family members had used the same email address to register for the scheme.

beneficiaries received a monetary incentive for participating in the interview (staff and wider stakeholders did not).

### **E-cycle telematics data**

A subset<sup>5</sup> of the loan e-cycles was fitted with GPS sensors by cycling sensor provider *See.Sense*. These trackers provided data about the trips made by loan e-cycle such as journey length, speed, distance, number of active minutes, and trips made per day. The sensors do not collect information about the time of the day, surface quality, terrain profile, or start and end points of the journey. Each e-cycle was assigned a unique ID, allowing for linking of the sensor data to survey records.

### **Programme monitoring data provided by CUK**

To enable process evaluation, CUK provided inputs to the evaluation team covering key metrics such as programme cost information, uptake levels, delivery details (such as rollout timescales and locations), and internal lessons learnt logs.

### **Methodological limitations**

Key limitations associated with the methods used are noted below.

#### **Attrition in the survey sample and lack of ‘follow-up’ responses**

While response rates to the before survey were high (for example achieving a 46% response rate for loans, as shown in Table 2-4), there was some attrition from before to after, and very significant attrition from after to follow-up – with only 4% of loan participants completing the follow-up survey. This was caused by two factors – in some cases, participants had not reached the three-month threshold at the point that the evaluation closed, meaning that they had not yet been invited to complete the follow-up survey; and for some participants, they simply chose not to complete the follow-up survey<sup>6</sup>. Based on reports from both the qualitative work and the survey itself, it seems that the length and level of detail required for completing the survey was off-putting to some. This low level of ‘follow-up’ responses has several implications: first, while the survey data collected provides a good understanding of behaviours and attitudes upon completion of the loan/training it is difficult to draw any firm conclusions around longer-term change in behaviour amongst participants. Second, due to the small number of responses, it is not appropriate to break responses to the follow-up survey down by characteristics such as demographics or setting type, since this would result in very small sample sizes being used. As a result, conclusions around longer-term behaviour change are more limited, and should be regarded as indicative only.

#### **Risk of selection bias**

Although all participants were invited to complete the surveys, the response rate is significantly less than 100%. As a result, there is a risk that the participants who did

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<sup>5</sup> Tracker data was collected from 84 e-cycles, out of a total fleet of approximately 1,000.

<sup>6</sup> The latter is the more significant reason, with the response rate rising modestly to 6.5% if those not yet reaching the three-month threshold are excluded.

complete the survey may not be representative of the entire population of trial participants, meaning that the survey analysis may under- or over-estimate the true effects. This is particularly a concern amongst those who completed follow-up surveys, which was a much smaller proportion of the population. Amongst those who completed the after survey, there may be a bias towards those who had notable experiences of the intervention – either positive or negative – and felt a desire to share their feedback, meaning that process evaluation findings might show more extremes of experience (both positive and negative) than might be seen if the entire population had responded. Regarding impact, amongst those who completed the follow-up survey it seems likely that there is some bias towards those who had gone on to take follow-up action in the intervening time since completing the programme (for example one would imagine that those who had purchased an e-cycle in the months following the intervention would feel more compelled to complete the follow-up survey than those who had taken no action). The implication is that follow-up surveys may over-estimate the true effects of the intervention. As a result, this report makes cautious use of the follow-up surveys in drawing conclusions.

Overall, it seems likely that those who completed the survey were particularly interested or engaged in the programme or had interesting follow-up actions which they felt enthused to share – and therefore it seems more likely that the survey results will over-estimate the true impact of the scheme than under-estimate it.

### **Reliance on self-reporting**

The principal method used to collect data on outcomes for this study was self-reporting by participants, both through the survey and through qualitative work. Participants were asked to describe their cycle ownership, their travel patterns, their attitudes and sentiment around cycling, and their intention to purchase an e-cycle. The limitation of relying on self-reported data of this kind is that while some more objective questions (such as ‘do you currently own an e-cycle?’) can be answered with ease, many other questions are more subjective. Interpreting participants’ stated intention to purchase any e-cycle (which was rated on a scale from very likely to very unlikely) is not a straightforward exercise – and stated intentions rarely translate into actions in a predictable manner across all participants. Similarly, asking participants to report travel habits in a proportionate way (that is, without going into large amounts of detail or requesting travel diaries), means that only approximations of travel patterns can be provided, which may suffer from recall error or seasonality bias. To some extent, the sensor data adds an additional source of evidence which allows us to triangulate this information, however this is not without its limitations.

### **Issues with the sensor data**

Some issues emerged with the sensors during the course of the pilot. The sensor only records when the cycle’s lights are switched on. For some cycles, the lights (and therefore also the tracker) needed to be turned on manually by the user. For others, this was overridden to enable some e-cycles to automatically trigger the lights, and therefore the tracker, during use. As a result, it is likely that the sensor data only captured a subset of journeys for some users, especially for those who undertook their loan during the summer, when evenings are longer and cycle lights may have been

rarely used. It should also be noted that no sensors were installed on the adapted e-cycles.

### Concerns around the counterfactual

The EOI group is used in this report as a comparison group to indicate what may have happened to individuals had they not participated in the e-cycle loan. We note, however, that this group was not entirely ‘untreated’ since the process of signing up to the EOI list and completing the survey may have to some extent encouraged them to reflect on the idea of purchasing an e-cycle, and led to more proactive behaviour than if they had not expressed an interest. Indeed, 41% of EOI respondents reported that in the month since joining the EOI list, they had researched purchasing an e-cycle, whereas none reported having done this in the before survey. The group should also not be considered representative of the general population, since they showed an initial interest in participating in the e-cycle scheme, so likely had a higher baseline level of interest in cycling than might a randomly selected group from the general population.

### Difficulty disentangling the effects of the voucher

As previously discussed, the voucher offered by Evans was a commercial decision and offered to all loan participants at Evans stores. It was not possible to disentangle the effects of this voucher from other aspects of the scheme, and the implication of this is that some of the behavioural effects of the scheme may have been driven by a commercial element which is not included within the scheme’s programme costs. Therefore, future programmes may experience reduced behavioural effects compared to those reported within this study unless a comparable voucher element is included (and this may impose additional programme costs if the private sector is not willing to offer the voucher as part of future schemes).

### Phased roll-out and pilot evolution

Unsurprisingly for a pilot, there were a number of changes in scheme design during the pilot period, and a pause in July 2022 for programme re-design. The pilot evolved over this period, with changes made to the interventions on offer, and the settings participating. In order to respond to this challenge, this evaluation focused on the scheme in its final incarnation, from December 2022 to December 2023. Where possible, we adjusted programme cost estimates to account for the evolution of the scheme, and to provide an estimate of the value for money of the scheme in its final iteration, were it to be rolled out again.

### Reflections on the monitoring and evaluation approach

The challenges described above range from those which were known from the outset, and accepted limitations of the methodology, to those which arose during scheme delivery as new or unanticipated challenges:

- The reliance on self-reporting and imperfect counterfactual group were **methodological decisions made during the initial evaluation design stage**. Alternative approaches, such as building randomisation into scheme delivery, were considered but ruled out due to delivery constraints;

- The evolution of the pilot itself, the introduction by Evans of the discount voucher, and the technical challenges associated with the sensor data were all **issues which emerged during delivery**. None of these were anticipated at scheme commencement, and the evaluation approach had to be adjusted in response to these challenges; and
- Issues around self-selection bias and survey attrition were **known concerns from the outset of the evaluation**, however the eventual high levels of attrition experienced in the follow-up survey was greater than had been anticipated. This suggests that an alternative approach, such as follow-up by telephone survey, financial incentives offered for all completions (rather than a prize draw), or a reduction in survey length may have been preferable in order to encourage a higher response rate.

Overall, reflections on the monitoring and evaluation approach are as follows:

- If follow-up surveys are a priority (which is normally the case for a longer-term behaviour change intervention), it may be better to remove desirable but non-essential questions from the survey in order to minimise its length. Making the survey a straightforward process will help to maximise follow-up responses – the experience from this study was that financial incentives delivered via a prize draw were not enough alone to incentivise participation in a follow-up study;
- Conducting follow-up surveys by telephone may have been more effective at reaching audiences than distributing a survey by email; and
- Better calibrated and higher quality sensor data could have been used as a substitute for reported travel behaviour, providing a more accurate result and reducing the burden on stakeholders of reporting this via survey. It is therefore recommended that for future monitoring activities, effective telematics data (avoiding the significant challenge introduced by the link to cycle lights) be prioritised. This would help to reduce the dependence on self-reported travel behaviour.

Other concerns around monitoring and evaluation arrangements were also caused by issues around communication and alignment between the delivery body, funding body, and appointed evaluators. Stakeholders reported a lack of clarity around requirements for a comparator group and the extent of evaluation activities that might be required as part of the study. To a certain extent, such concerns are to be expected when delivering a large-scale pilot and evaluating an intervention such as this for the first time. However, some of these challenges could have been avoided through the preparation of an initial evaluation scoping study prior to implementation of the pilot, exploring options for evaluation and making recommendations as to the evaluation approach. This would have helped commissioners and delivery partners to have a clear and shared understanding of the evaluation requirements from the outset and may also have enabled a broader range of evaluation methods (such as randomisation) to be considered – since randomisation generally needs to be built into the scheme delivery plan prior to programme launch.

## 3 Process evaluation

### Key findings

- The programme officially commenced in March 2022, but was temporarily paused in July 2022. A re-designed programme, with a narrower scope and shorter one-year delivery period, was launched in October 2022.
- A total of 3,619 loans (88% of the agreed target) and 13,900 training sessions (121% of the agreed target) were completed.
- The final programme delivery cost was £4.5 million, of which CUK estimated that £302,000 was abortive work due to the scheme re-design.
- Overall, feedback from beneficiaries was very positive, with both loan and training participants rating the interventions highly.
- Survey responses highlighted a desire for longer loan periods (21%), improved cycling equipment (11%), and increased availability of specific e-cycle models (7%). Suggested improvements from the qualitative research included better matching of e-cycles with participants, comprehensive information provision at collection and drop-off, and a broader selection of cycling accessories.
- While participants generally enjoyed the loan and found it a useful opportunity to experience riding an e-cycle, many reported that they faced a ‘cliff-edge’ at the end of the loan period, with little information or encouragement for future e-cycling behaviour.

### Introduction

This chapter sets out key findings in response to the process evaluation questions, which centred around the programme’s performance against anticipated delivery metrics and timescales, the effectiveness of beneficiary engagement and programme delivery, any challenges to implementation experienced, and overall reflections and lessons learnt for the programme and the monitoring arrangements. The chapter is divided into two halves. The first half (*Programme description*) provides an account of the programme in terms of its launch, delivery, and key metrics. The second half (*Programme learnings*) focuses on satisfaction with the scheme and lessons learnt, drawing from internal CUK reflections and beneficiary feedback.

### Programme description

#### Description of the programme launch & re-design

A detailed programme delivery timeline is presented in Table 3-1. The programme officially commenced in March 2022. By May 2022, the first e-cycle loans were launched in the Manchester Evans store and by July 2022 the first community e-hub at Khizra Mosque (Manchester) was launched. During the initial mobilisation stage, CUK reported successes such as recruitment, fleet delivery, launch of booking systems and

commencement of marketing activities. However, in July 2022 the programme was paused, upon DfT's instruction, to allow for re-design of key elements in order to maximise the value for money of the scheme.

CUK's revised proposal aimed to streamline activities, increase long-term loans, reduce the cost per beneficiary and remove those interventions specifically targeted at disadvantaged groups. Key changes included the following:

- Reduction in scheme duration to a one-year delivery period;
- Removal of some scheme elements such as led rides and bike libraries;
- Increase in the size of the 'standard' e-cycle fleet and reduction in the size of the fleet of e-cycles from manufacturer *TIER*<sup>7</sup>;
- Removal of Hull from the programme; and
- Expansion to include pre-loan training sessions, meet and greet sessions at workplaces, informal sessions and walk-in sessions.

Delivery targets were also updated in line with the revised programme parameters. CUK reported that this delivery pause resulted in recruitment setbacks, marketing slowdowns (interest garnered during initial mobilisation was lost), and operational disruptions. Delivery stakeholders also reported that removal of some of the more resource-intensive engagement activities, while reducing costs, made opportunities to engage with the public more limited.

The programme re-mobilised in October 2022 (notably a point in time when the weather was less attractive for cycling), with launch of the loans across all Evans stores in Sheffield, Leicester, Luton and Dunstable by December 2022. The first Skills and Confidence training sessions were delivered in Wythenshawe Hospital (Manchester) and Khizra Mosque (Manchester) in February 2023. By March 2023, the first e-cycle loans at a W&E setting were launched. Simultaneously, the first Skills and Confidence training sessions became available in Sheffield and Leicester at Shipshape Community Hub and The Bike Park respectively. The rollout of loans was continuous from February 2023 to September 2023, when the final Evans store loan programme commenced in Burton-on-Trent.

In terms of the locations for programme delivery, the first year of the programme was expected to run as a pilot in Manchester, Luton and Dunstable, Sheffield and Leicester. The locations were originally selected by CUK, using a multi-criteria framework they developed known as the E-Cycling Aptness Tool (ECAT). The tool used a combination of information from DfT's Propensity to Cycle Tool and the Index of Multiple Deprivation, obesity data (sourced from the Census), existing DfT funding to the Local Authority, and the availability of delivery team partners in the area. An initial list of five locations was reduced to four, based on feedback on the proposed programme from the Department for Transport.

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<sup>7</sup> The TIER e-cycles could initially only be charged at workplaces, although later in the scheme, home charging was introduced.



**Table 3-1: Timeline of key events in programme delivery**

Date	Key Events
March 2022	Start of programme
May 2022	Loans commenced in Manchester Evans store
July 2022	Loans commenced in Khizra Mosque community hub (Manchester)
July 2022	Delivery pause and re-design of programme
October 2022	Programme mobilisation after delivery pause
December 2022	Loans commenced in Evans stores in Sheffield, Leicester and Luton & Dunstable
February 2023	Loans commenced in Shipshape community hub (Sheffield) and The Bike Park community hub (Leicester). Training commenced in Wythenshawe Hospital (Manchester) and Khizra Mosque community hub (Manchester)
March 2023	Evans store issue discount vouchers
March 2023	Loans commenced in Wythenshawe Hospital (Manchester) and Samworth Brothers (Leicester). Loans and training commenced in Stretford Public Hall community hub (Manchester), and Wheels for All community hub (Manchester). Training commenced in Shipshape community hub (Sheffield) and The Bike Park community hub (Leicester)
April 2023	Training and loans commenced in the Green Estate community hub (Sheffield) Loans commenced in NHS Hallamshire Hospital (Sheffield), University Hospital (Luton & Dunstable), and Inspire Luton Sports Village (Luton & Dunstable). Training commenced in Samworth Brothers (Leicester)
May 2023	Training commenced in NHS Hallamshire Hospital (Sheffield) and Inspire Luton Sports Village community hub (Luton & Dunstable)
June 2023	Loans commenced in Northern General Hospital (Sheffield). Training commenced in: Luton & Dunstable University Hospital, Crown Hill Community College (Leicester), Cycle Circuit (Leicester)
September 2023	Operational adjustments
December 2023	Programme closure

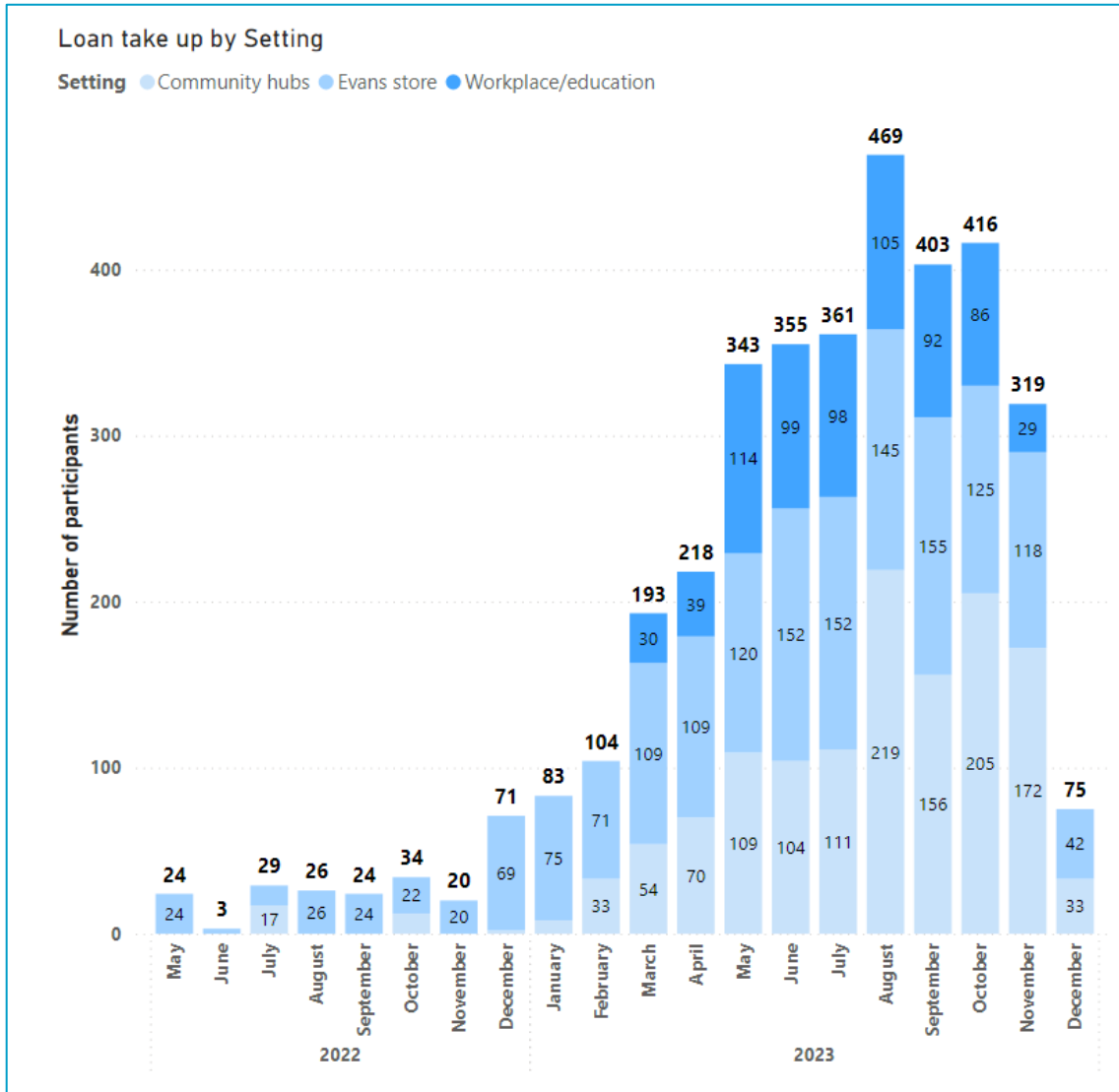
Source: Steer analysis of data provided by CUK, 2024

### Level of programme take-up

Final agreed targets for the scheme were to achieve 4,100 e-cycle loans and 11,500 training sessions, thus 15,600 interventions in total. A total of 3,619 loans were

completed (88% of the target) and 13,900 training sessions (121% of target), thus 17,519 interventions in total (112% of target). Figure 3-1 illustrates the take-up of loans across the three different setting types.

**Figure 3-1: Loan take up, by setting type**



Source: Steer analysis of CUK data, 2024

Overall, monthly take-up rates increased throughout 2023, with uptake particularly concentrated in the summer/early autumn period from June to October 2023. The planned delivery against actual delivery date by setting and intervention type is shown in Appendix A (Table A-2 through to Table A-6). Overall, most loans were launched in alignment with or slightly later than initially forecast, whereas the majority of training sessions were delivered later than anticipated.

In addition to the take-up quoted above, there were a total of 2,141 loan cancellations and 630 training cancellations. CUK reported that this level of cancellation rate is typical for a scheme such as this, especially where no deposit is taken. Some cancellations were due to individuals not meeting the project criteria (e.g. age,

location) or a mistake made in the booking (for example an individual had booked the wrong size cycle, and therefore cancelled the booking and re-booked using the correct size). Anecdotally from the CUK delivery team, another cause for bookings that were recorded as cancellations was participants attempting to book a second e-cycle trial, which was prohibited. There were also 15 loan drop-outs, where individuals terminated their loan early (these ranged from between four and 20 days early). From the qualitative research, interviewees reported that these were driven mostly by practical reasons rather than dissatisfaction – for example because they were due to be away on holiday during the latter part of the loan period.

### Summary of programme costs

The original planned costs for the programme were £7.9 million, which included an initial set-up phase followed by delivery of a four-year programme. However, as discussed above, the programme was paused between July and October 2022 for re-design of key elements. The final programme delivery cost was £4.5 million, of which CUK estimated that £302,000 was abortive work. It is estimated, therefore that had the scheme been delivered in its final incarnation from the outset, the total cost of delivering the scheme would have been £4.2 million. This is the central case cost used in the value for money evaluation (Chapter 5).

### Description of the beneficiary engagement process

The programme was promoted through targeted digital advertising, word-of-mouth referrals, and community engagement:

- **Targeted Facebook adverts:** these were used by CUK to reach potential beneficiaries, designed to attract interest and encourage participation in the programme. CUK staff report that these adverts led to a significant increase in loan bookings, and 34% of survey respondents stated that they had heard about the e-cycle loan via social media – this was second in popularity only to ‘word of mouth’ (44%);
- **Direct engagement with the community:** staff engaged directly with the community, disseminating information about the scheme via outreach efforts in parks and other community spaces, where staff organised sessions to showcase the benefits of the e-cycle scheme; and
- **Word-of-mouth referrals:** delivery staff reported that beneficiaries who had positive experiences with the scheme promoted it, of their own accord, through word-of-mouth referrals. This organic promotion bolstered awareness and uptake as beneficiaries shared their experiences with friends, family, and peers.

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“It's been very much word-of-mouth. You start with one person, they then speak to their friends, it's almost like a butterfly effect. With one person you could get 15-20 loans just out of that one person, especially if they've had a good experience” – on the ground delivery staff

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CUK reported that the promotion for the loan scheme was felt to have improved as the pilot progressed, with more targeted Facebook adverts and the impacts of word-

of-mouth promotion attracting greater numbers and a more diverse range of beneficiaries. Beneficiaries were generally positive about initial engagement and promotional material and felt that the materials answered most of their questions. In some cases, participants queried whether the scheme was legitimate, because they were surprised that the e-cycle loan was available at no cost, and with no eligibility constraints.

### Participant demographic profiles (loan participants)

Survey respondents were asked a series of demographic questions in the ‘before loan’ survey to help understand the characteristics of those participating in the interventions. Loan participants overall showed a slightly different profile to the average England and Wales population, suggesting some groups were more likely to take up the intervention than others. There were also differences between those taking part at the community hubs versus Evans stores. The following observations can be made regarding demographic characteristics of loan participants:

- Compared to the 2021 census<sup>8</sup>, loan participants were more likely to be male (55% vs 49% nationally), less likely to be from a white background (67% vs 81.7% nationally) and more likely to be aged between 25-34 (24% vs 14% nationally) and 35-44 (24% vs 13% nationally), which is younger than the average adult population profile;
- At community hubs, participants were slightly less likely to be male (56% community hubs vs 57% Evans stores) and were younger than those at Evans stores;
- A significantly higher number of Evans participants were from white ethnic groups compared to community hub participants (76% vs 63%). The next largest ethnicity among participants was Asian/Asian British which had significantly higher representation in the W&E settings (27%) compared to Evans stores (13%), at more than double the national share. Compared to local population data in

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<sup>8</sup> Population and household estimates, England & Wales: Census 2021, unrounded, February 2024  
<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimatesenglandandwales/census2021unroundeddata> and  
 Population, England & Wales: Census 2021, February 2024

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimatesenglandandwales/census2021> and

Ethnic group, England & Wales: Census 2021, February 2024

<https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/bulletins/ethnicgroupenglandandwales/census2021> and

Gender identity, England & Wales: Census 2021, February 2024

<https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/genderidentity/bulletins/genderidentityenglandandwales/census2021>

Age by single year, England & Wales: Census 2021, March 2023

<https://www.ons.gov.uk/datasets/TS007/editions/2021/versions/3/filter-outputs/144a9636-0ead-44d2-a578-6c0ee36c19fd-get-data>

- Leicester, Luton and Manchester, Evans store participants were more likely to be white (76% vs 41-57%) and less likely to be Asian/Asian British (13% vs 21%-43%);
- There was a broad distribution of income levels among participants, with the largest share represented by household incomes between £15,000 -£29,999 (23%), followed by household incomes over £60,000 (19%) and incomes between £30,000 - £44,999 (17%). The median household income in the UK was £32,300 in the financial year ending 2022<sup>9</sup>, compared to 33% of survey respondents who had household income less than £30,000;
  - Just over half of participants were working full time (51%). A further 26% were working part time or were self-employed, followed by 6% who were students. Overall, 19% were 'not working', with the largest share among these participants being retired (8%), followed by those who were unemployed (3%); and
  - 22% of community hub participants and 23% of Evans respondents were not working. A significantly larger share of Evans participants were retired (12%), while a larger share of community hub participants were unemployed (5%) compared to Evans participants (2%).

### Participant demographic profiles (training participants)

Those who participated in training sessions were asked demographic questions via the surveys. Training sessions were held from February 2023 to November 2023. The information below was taken from the 'after training' survey (which contained greater demographic detail than the 'before training' survey). As for loans, those who took part in the training interventions showed a slightly different profile to the national and local population. The following observations can be made regarding demographic characteristics of training participants:

- In comparison to the 2021 England & Wales Census<sup>10</sup>, the gender distribution of training participants is close to the population average, with 45% identifying as male and 52% identifying as female;
- Overall, participants were also slightly more ethnically diverse than the national population, however there was still a high proportion of individuals from a white background (62%) compared to those from other ethnic backgrounds (32%);

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<sup>9</sup>Average household income, UK: financial year ending 2022

<https://www.ons.gov.uk/peoplepopulationandcommunity/personalandhouseholdfinances/incomeandwealth/bulletins/householddisposableincomeandinequality/financialyearending2022>

<sup>10</sup> Population and household estimates, England & Wales: Census 2021, unrounded, February 2024

<https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/populationandhouseholdestimatesenglandandwales/census2021unroundeddata> and

Ethnic group, England & Wales: Census 2021, February 2024

<https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/ethnicity/bulletins/ethnicgroupenglandandwales/census2021>

Gender identity, England & Wales: Census 2021, February 2024

<https://www.ons.gov.uk/peoplepopulationandcommunity/culturalidentity/genderidentity/bulletins/genderidentityenglandandwales/census2021>

- The 55-64 age group was overrepresented (28%) and the youngest age group, 18-24, was underrepresented (6%) compared to national and local populations; and
- In terms of annual income, over half (53%) had a household income below £45,000. Over half were in full time or part time employment (58%), and of the remaining 34%, 20% were in retirement and 7% were unemployed.

The demographic characteristics from both loan and training sessions demonstrate that the interventions were successful at reaching a broad range of ages, ethnicities and income levels, and in particular were successful at reaching a more ethnically diverse group than the English and Welsh average population. Despite an ambition to reach more female cyclists, however, loan participants were disproportionately weighted towards males. It is also notable that a range of income levels and economic activity groups participated in the trial. This was a deliberate part of the pilot design and demonstrates that the approach was indeed inclusive to a wide population. However, this strategy might not be the most effective for reaching individuals who are most inclined to purchase an e-cycle, with affordability identified as a significant obstacle amongst participants (this is discussed further in Chapter 4).

## Programme learnings

### The programme delivery model

Overall, it seems that the respective roles of DfT, CUK and ATE were appropriate, and the three organisations worked effectively together to deliver the pilot. However, stakeholders raised the following challenges:

- As previously discussed, mid-pilot modifications led to larger costs for CUK than first anticipated, and, based on CUK lessons learnt logs, the evidence or rationale for these modifications do not seem to have been clearly communicated to CUK – which may have led to challenges around morale and organisational alignment;
- CUK reported some instances where expectations from DfT were not clearly stated at the outset, or where approval processes were delayed or disorderly – for example requirements around comparator groups, and branding requests – leading to delays in launch of some programme elements;
- Some felt that inclusion of DfT and ATE on the Board for the programme created a challenging environment for partners to raise issues, which suggests an alternative arrangement or Board composition may have been beneficial; and
- CUK experienced some performance issues from their marketing partner, which resulted in additional scheme costs and challenges. Ultimately, CUK decided to manage the social media and local engagement elements of the programme in-house.

### Satisfaction levels amongst beneficiaries

Overall, feedback from beneficiaries was very positive. Participants welcomed the opportunity to try an e-cycle for free and were positive about the one-month loan duration, which they felt provided ample time to experience the benefits of e-cycling. Beneficiaries also provided similarly positive feedback about the training sessions. They were particularly complimentary about the knowledgeable and friendly staff who ran these sessions. Moreover, beneficiaries appreciated the opportunity to try various

e-cycle models at the training sessions, enabling them to identify the model that best suited their needs. Beneficiaries also spoke highly about the opportunity to experience e-cycles on varied terrain, in particular on hills. Where training allowed participants to experience cycling up a hill using an e-cycle, they were able to see the e-cycle's 'power assist' function in action.

Participants were asked a series of questions about their satisfaction with the programme in both the 'after loan' and 'after training' surveys. Overall, the majority of respondents reported feeling very satisfied with the experience of taking part in the loan, with 78% of respondents rating it 'very good' (the highest rating available). Positive experiences of taking part in the loan were reflected across the three different setting types. In community settings, 82% of respondents rated their loan experience 'very good,' while 16% rated it 'good'. In W&E settings, 76% of respondents rated it 'very good,' while 21% rated it 'good.' This was similar in Evans stores with respondent ratings of 74% and 21% respectively. Notably, a significantly higher number of respondents from community settings rated their experience 'very good' compared to the Evans stores.

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**"I thought it would be interesting to try an e-bike and it was a great opportunity to potentially try before you might buy. It was free and then someone teaches you how to use it. It's just amazing. It's an absolute treat" – one month loan participant**

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Individuals were particularly satisfied with the following elements of the loan: the staff in store (86% very good), getting set up on the e-cycle (79% very good), and ease of sign-up/registration (76% very good). Somewhat lower satisfaction levels were reported for online resources (61% very good) and paper/physical materials (56% very good), although this was due to larger number of 'don't know/not sure' responses rather than negative responses.

### **Beneficiaries' suggested programme improvements**

Respondents were asked what aspects of the e-cycle loan worked well and what could be improved in open-ended questions. In terms of what worked well, just over a quarter of respondents referred to the ease of the collection/return process (27%), the experience of using the e-cycles (14%) and friendly staff (9%). A significantly higher number of respondents aged 65+ commented on the experience of using the e-cycles (29%) compared to those aged 25-34 (14%), 35-44 (12%) and 45-54 (12%). Improvement suggestions ranged from preferences for a longer loan period (21%), followed by upgrades in cycling equipment available (11%) and greater availability of certain e-cycle models (7%). A significantly higher number of respondents aged 65+ commented on the greater availability of e-cycle models (13%) compared to those aged 18-24 (1%).

In the qualitative research, key suggestions for improvements to the loan scheme included the following:

- Improving choice and having a more sophisticated process for matching beneficiaries with a particular e-cycle;
- Providing beneficiaries with more information to take away at point of collection – basic instructions and local cycling routes and secure places to leave the e-cycles locally;
- Providing beneficiaries with more information when returning the e-cycle – including providing information about possible avenues for purchase/hire and financial support;
- Offering a wider range of accessories (such as child seats, panniers, mud guards etc.) at point of collection, with demand captured at booking point; and
- A more sophisticated and informative booking system – to give wider information on expected waiting times, likely availability, and registering for waiting lists.

Survey respondents were similarly positive about training sessions, with 87% of respondents rating their experience of the session ‘very good.’ Highly positive responses were seen across both types of setting where training was offered, with 87% of participants in community settings rating the training ‘very good’ and 80% in W&E settings. For what worked well in training sessions, participants largely commented on the staff being supportive (36%), practical advice (24%) and the ability to try different e-cycles (23%). A significantly higher share of female respondents commented on trying different e-cycles (28%) compared to males (17%). Suggested improvements referred to more practice (17%) and more space available for the training (14%).

In the qualitative research, key suggestions for improvements to the training scheme included the following:

- Offering a wider variety of times and dates, for example evenings and weekends;
- Choosing locations which allow for trialling all aspects of the e-cycles, including the opportunity to ride on some hills and some quiet roads;
- Offering a wider range of e-cycles and accessories to try during the training session (including for example showcasing e-cycle conversion kits);
- Better promotion of the training; and
- A better connection between the training and the e-cycle loan – for example some interviewees were frustrated that the e-cycles available to try during the training were not the same models as those available for the loan.

### **Lessons regarding bookings and returns**

The booking system operated as intended with no major operational issues. However, there was some confusion amongst beneficiaries who attended training sessions, with mistakenly assuming that it included a booking for the e-cycle loan. Staff noted that it may not be immediately obvious to participants that the one-month loan needed to be booked separately. While most beneficiaries found the booking process straightforward, some expressed concern that the website required excessive navigation from the homepage to find the booking pages.

The Bike Rental Manager web portal was praised by delivery staff for streamlining the pick-up process, making it easy for staff to manage loan e-cycle bookings. However,



staff emphasised the need for a sufficient gap between each loan cycle to undertake maintenance, clean the e-cycles, and prepare for subsequent loans. Suggestions included asking beneficiaries to select designated time slots for pick-up to streamline the process further, particularly for busy locations like community hubs and workplaces. Some beneficiaries felt rushed during pick-up, highlighting the importance of setting aside sufficient time for the process.

The e-cycle return process was described as extremely busy for ‘on-the-ground’ staff. While most e-cycles were returned in reasonable condition, some required additional cleaning and maintenance checks. Some beneficiaries did not adhere to their return dates and times, necessitating considerable resources to follow up and retrieve the e-cycles. Overall, the return process was time and resource-intensive, particularly when beneficiaries did not return the e-cycles promptly.

### **Lessons learnt regarding the e-cycle models offered**

The e-cycle fleet comprised 30 models. CUK noted limitations in available stock meeting specific needs, although no major issues were reported with any particular model. Beneficiaries expressed preferences for certain makes and models over others, citing concerns about heavy and ‘clunky’ options like the TIER e-cycles available at various hospitals, and the Muddy Fox which was deemed too ‘cheap and basic’ by some delivery staff. The qualitative research found that on the one hand, cheaper e-cycle models risked giving users a negative experience, especially in some of the hillier locations; while on the other hand, lending very expensive models could also be off-putting or unhelpful if they were outside of a participant’s affordability range.

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“I rode it a couple of times but quickly realised that the model I had selected [Muddy Fox] was inappropriate for the Sheffield environment. The model had only one gear and so if the bike was ridden up even a moderate incline, the lack of power meant that I slowed down.” – loan drop out

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Offering a range of e-cycles within training sessions and the loan scheme was viewed positively. Beneficiaries appreciated the opportunity to try different e-cycles during training sessions, highlighting the importance of maximising choice and advice to match individual needs, although some faced limitations in hiring their preferred e-cycle due to availability constraints.

As described above, beneficiaries reported that they would welcome a wider range of accessories to enhance the e-cycle experience, especially for those using them for commuting or errands. Suggestions included offering mudguards, luggage racks, and panniers to accommodate various use cases effectively.

### **Lessons learnt regarding the need for follow-on support**

Stakeholders universally applauded the scheme’s rationale for promoting environmentally friendly travel behaviour. However, programme stakeholders emphasised the need for continued funding over several years in order to achieve

long-term behaviour change. Comments among scheme participants and stakeholders in the qualitative research highlighted that while trialling new modes of transport is beneficial, sustained behaviour change requires suitable infrastructure (such as cycle lanes) for continued use. Interviewees also recommended greater information be given at both the start of the loan period and also upon return of the e-cycle around potential purchase options, and other opportunities to use e-cycles such as local e-cycle hire schemes. A key finding of the qualitative research was that while participants generally enjoyed the loan and found it a useful opportunity to experience riding an e-cycle, they faced a 'cliff-edge' at the end of the loan period, with little information or encouragement for future e-cycling behaviour.

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“I don't think they were bothered if I found it amazing or found it rubbish. I don't think they were surprised but I don't think they really cared. They were just a facilitator. They were more than happy to take it back” – loan drop out

“I haven't looked into whether you can hire them long term, you know, not just for an afternoon or a day or something. If there's a sort of cheap hire scheme you could do, I'd definitely do it” – training and one month loan participant

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## Conclusions

This pilot was a challenging programme to deliver, with significant shifts in programme emphasis, scale and duration made part-way through delivery. Despite these challenges, overall levels of satisfaction were high and many elements of the programme were reported to run effectively and smoothly. Overall, the programme was successful at reaching a broad range of ages, ethnicities and income levels. In terms of recommendations for future programmes, the evaluation found the following:

- Some enhancements to the booking system were suggested, building in time for maintenance between loans and ensuring adequate resource for busy pick-up days. Including a deposit as part of the scheme design could also help to reduce cancellations and late drop-offs;
- Some of the e-cycle models offered caused issues, with some models considered too 'cheap and basic' to give a good impression of riding an e-cycle, especially in areas with steeper terrain. It is noted however that offering e-cycles outside of participants' affordability range is also not helpful. In addition, participants would have liked the opportunity to borrow cycle accessories alongside their e-cycle;
- While generally well-received, some suggested improvements were offered for the training sessions – such as offering a wider choice of time slots, and more opportunity to try the e-cycles on different terrains and environments. More importantly, the link between the loan and training programme appeared disjointed to some and would benefit from being more coherent; and finally

- There was little to no further information provided upon completion of the loan/training, which was a missed opportunity to promote further behaviour change – for example through providing information on local hire schemes, purchase options, or other ‘next steps’ that a user might be interested in.

## 4 Impact evaluation

### Key findings

- From telematics and survey data, it is clear that participants made frequent use of the e-cycles during the loan period, generally to make short trips for commuting or leisure.
- 55 survey respondents (7%) reported that immediately at the end of the loan period, they were now the owner of an e-cycle. Other reported actions towards future purchase included starting to save or researching purchasing an e-cycle.
- 33% of survey respondents reported being more likely to purchase an e-cycle following the loan. However, some individuals (23%) reported being less likely to purchase an e-cycle.
- For those completing the training, the proportion of respondents stating they were 'likely' or 'very likely' to purchase an e-cycle increased from 58% to 72% after training. However, this fell to 45% – lower than the pre-intervention levels – one month later.
- By far the most common reason cited for why participants were unlikely to purchase or continue to use an e-cycle was the cost (73%). Other barriers mentioned included security concerns, storage issues, and whether there was fit-for-purpose cycling infrastructure.
- A range of other benefits were reported from participation in the programme, most notably mental health benefits – which participants had not all anticipated would be a benefit of participation.

### Introduction

This chapter examines the impacts of the scheme, including the effects on travel behaviour during the loan, changes in attitudes and perceptions towards e-cycles, and participants' decisions whether to go on and purchase or continue to use an e-cycle. It also examines longer-term changes in travel behaviour (to the extent that this is possible) and other impacts of the scheme.

### Behaviour during the loan

From both telematics and survey data, it is clear that participants made frequent use of the e-cycles during the loan period – telematics data collected from the See.Sense trackers shows that users made an average of 26 trips in total during the one-month loan. The distance and duration of these trips was fairly short – on average each trip covered a distance of 2.6km and was 19 minutes in duration, equating to just under two hours cycling per week during the loan period. It should be noted that there are some concerns around the quality of this data – as previously stated, some trackers were only operational while the e-cycle lights were activated. It is also notable that the

trip speed recorded by the trackers was much slower than might be expected. Further examination of this data, in collaboration with See.Sense, could not point to a reason for this anomaly. However, it is promising that the See.Sense trip data does align with self-reported cycling behaviour from the survey – 78% of survey respondents reported that they cycled either 1-2 hours per week or 2+ hours per week during the loan period, which aligns with the trip data recorded by the trackers.

Telematics data cannot provide any insights on the purpose of e-cycle trips however the survey responses provide a good picture of journey purposes. Respondents were asked to report the purposes for which they travelled at least once per week. The most common reported was ‘just for exercise or fun’, followed by ‘commuting to work’ and ‘getting to leisure/social activities’. Participants were also asked to report purposes for which they made five or more journeys per week, and again ‘just for exercise or fun’ and ‘commuting to work’ were the most commonly cited.

Overall, the evidence collected suggests that during the one-month loan period, e-cycles were used frequently by participants, generally to make fairly short trips, and most often for the purpose of commuting or simply for fun. Respondents reported that around one to two trips per week, for each journey purpose (commuting, education, shopping etc.) were trips being made by e-cycle that were previously made by a different mode; and the number of respondents travelling by car/van and by public transport at least once per week was lower, at a statistically significant level, when describing the loan period compared to in the ‘before’ state.

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“My car usage went down a lot as I was cycling daily for fresh air and exercise. I enjoyed the cycling so much I preferred to be cycling instead of driving. But I still used the car for shopping due to carrying heavy loads and the lack of safe cycle storage areas.” – one month loan participant

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## Decisions to purchase or continue using an e-cycle

Survey respondents were asked whether they owned a cycle, e-cycle, e-scooter or similar prior to commencing the loan, and again in the after and follow-up surveys. Out of 782 responses, **55 respondents (7%) reported that at the end of the loan period, they were now the owner of an e-cycle (and had not previously been)**. A further 16 (2%) became the owner of a conventional cycle by the end of the loan period. For those who participated in training, 4% became the owner of an e-cycle after completing the training<sup>11</sup>. Amongst the EOI comparator group, 3% of respondents became the owner of an e-cycle after one month had elapsed. Therefore, trial participants displayed a higher propensity to purchase an e-cycle than non-participants. It should be noted, however, that due to the nature of the EOI group (individuals who had not pursued participation in the programme after initially being unable to find a slot, and therefore were likely to be less motivated to participate in

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<sup>11</sup> Due to limitations in the survey design, it is not clear to what extent there was crossover between these two groups.

the programme than those who had successfully found a slot) it is likely that the EOI group were not entirely comparable, and some of this difference may have been due to a lower level of motivation amongst the EOI group.

Purchasing an e-cycle is a large financial outlay and requires consideration of a range of factors (such as storage, financing, which make/model is most appropriate, whether to make use of a workplace *Cycle to Work* scheme etc.), and so it is to be expected that individuals may not make their purchase during or immediately after the loan period. Indeed, when combined with findings from the qualitative research, the fact that 7% of respondents had already purchased an e-cycle at the point when they returned their e-cycle loan provides an indication of the strength of interest and positive feeling experienced by these individuals. Follow-up surveys, which occurred three months later, are likely to give a much clearer indication of e-cycle purchase behaviour. Amongst those who completed both the follow-up and after surveys (n=75), 8% had purchased an e-cycle immediately after/during the loan, and a further 16% had purchased an e-cycle in the three months intervening.

In addition to purchasing an e-cycle, survey respondents also reported other behaviours that may be indicative of future behaviour change. Responses to the follow-up survey show that key follow-up actions taken by participants included researching buying an e-cycle (30%), starting to save for an e-cycle (18%), and trying another e-cycle (9%). Some also reported having an existing cycle repaired (15%) or starting to use a regular cycle they already own (15%). The responses demonstrate that multiple behaviours may have been prompted by participation in the trial beyond simply purchasing an e-cycle. It is interesting to note that some of these behaviours were also observed in the EOI group, with EOI respondents also reporting that they had researched purchasing an e-cycle (41%), had an existing cycle serviced (21%), were planning to save for an e-cycle (15%) or had started to use a cycle they already own (11%) in the one month since joining the EOI list.

Some respondents in the qualitative research reported that although they had not yet purchased an e-cycle, this is something they are considering for the future, and are waiting for, for example to save up sufficient funds, investigating a salary sacrifice scheme, or waiting for a key life event such as retirement or a birthday. Some also reported purchasing a convertor kit (to convert a regular cycle to an e-cycle) as an alternative to purchasing an e-cycle. This was also reported in the survey by nine respondents.

Amongst survey respondents, there was a change in reported likelihood to purchase an e-cycle, with 33% of loan participants selecting a higher likelihood of purchasing an e-cycle than prior to the loan. Most commonly, this was a 'one step' change in reported likelihood - i.e. a movement from 'quite likely' to 'very likely' or from 'very unlikely' to 'quite unlikely', and so on. It should also be noted that alongside this reported increase in likelihood, there was also a (smaller) subset of respondents whose reported likelihood to purchase an e-cycle *decreased* following the loan. For these respondents (23% of loan participants), there was generally a one step reduction (for example from 'very likely' to 'quite likely' or from 'quite unlikely' to 'very unlikely') in their reported likelihood to purchase an e-cycle. It is therefore important to

recognise that for some people, participation in the loan helped them to understand that an e-cycle is *not* for them. The remaining 44% of respondents showed no change in their likelihood to purchase an e-cycle, suggesting that for this group, the loan had no impact on their long-term e-cycle behaviour.

For those completing the training, the proportion of respondents stating they were 'likely' or 'very likely' to purchase an e-cycle increased from 58% to 72% after training. However, this fell to 45% - lower than the pre-intervention levels – one month later, indicating a lack of persistence to any effects elicited by the training. The qualitative research similarly found that while the training sessions gave individuals a helpful taster of e-cycling – helping to increase confidence, enthusiasm, and desire to investigate further – they were unlikely to stimulate further behaviour change in isolation.

Loan beneficiaries reported in the qualitative research that they were pleased to have had the opportunity to try an e-cycle. For those who went on to purchase an e-cycle, this was generally reported to have been linked to an existing interest, and the loan scheme helped to speed up the purchase decision and make it from a more informed position (for example with a better understanding of the makes and models on offer, requirements around storage, and how e-cycle usage might fit into their daily travel habits). There were also numerous examples amongst qualitative interviewees of how the loan scheme had helped participants to identify opportunities for changing their travel patterns by substituting journeys normally made by car or public transport with e-cycle trips.

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“The e-cycle loan scheme was instrumental in helping me to finally make up my mind and purchase my own e-cycle” – one month loan participant

“I loved it more than I thought I would. I think it's great because it's just really good to think about the practicalities of having an e-bike with, so you can see how it would fit in with your lifestyle and how you would use it” – one month loan participant

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## Overcoming barriers to e-cycling

### Confidence & Safety

Survey respondents were asked to report how safe and confident they felt when cycling, both before and after completing their loans/training sessions. Again, the responses from the 'before' survey were compared against those from the 'after' survey to see how participants' positions had shifted over the course of the intervention. Similar to e-cycle ownership, the findings suggest that following the programme, there was a shift in attitudes for a significant proportion of participants (39% for safety, and 35% for confidence), some of whom reported changes in a positive direction, and some of whom reported changes in a negative direction. The net effect was positive in both cases, with 7% of respondents (net) reporting improved

feelings of confidence, and 15% of respondents (net) reporting improved feelings of safety.

Interviewees from the qualitative research described feeling safer on an e-cycle compared with a regular cycle due to the sturdiness of the e-cycles and the ability to move faster through traffic, and out of the path of other road users when necessary. In this respect, the loan improved the confidence to cycle for many beneficiaries and resulted in people venturing out on windy days on e-cycles whereas they may normally avoid cycling in poor weather.

Amongst those who participated in the training, some qualitative interviewees reported that they were not regular cyclists, or had last cycled a decade or more ago. For these individuals, the training sessions helped to provide reassurance and confidence ahead of taking out an e-cycle.

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“Cycling on the road is something I don’t like with a regular push-bike, but with the assistance of the e-bike and the fast acceleration at the traffic lights and things like that, it makes it a lot less nerve racking because you know you can get off at the lights quickly” - one month loan & training participant

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### **Barriers to purchasing an e-cycle**

Amongst those who had not already purchased an e-cycle, the survey asked respondents what they considered to be the greatest barriers to purchasing or continuing to use an e-cycle. Regarding the purchase of an e-cycle, by far the most common reason cited was the cost (73%). Other responses cited issues with the design, for example finding e-cycles too heavy, slow, or otherwise unappealing (12%); security concerns (10%); and concerns around road safety (6%), which is likely related to cycling more generally rather than specifically an e-cycling issue. Regarding ongoing use of an e-cycle, affordability was again the most commonly cited reason (35%), shortly followed by security concerns (29%) and design (28%). The qualitative research corroborated these findings, with affordability mentioned frequently as a barrier to purchase of an e-cycle. It is also notable that many interviewees reported being surprised at the cost of an e-cycle – many had entered the scheme without any idea of the costs associated.

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“I was really sad after handing it back because I really like it but I can't afford to buy one” – one month loan & training participant

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### **Other barriers to e-cycling**

Aside from the price of purchase, other key barriers noted by participants were around security concerns, storage issues, and whether there was fit-for-purpose cycling infrastructure within their local area (again this is an issue related to cycling more



generally rather than an e-cycling specific issue). These issues appeared within both the survey responses and the qualitative interviews.

Regarding storage concerns, some reported that they did not have secure space outdoors to store the e-cycle. Whilst most were able to find ways around this during the loan, storage could be a challenge and a potential barrier when considering purchasing an e-cycle for the longer-term. It is also notable that few had considered issues around storage prior to taking up a loan.

Concerns around road safety and lack of cycling infrastructure were also cited by a small number of survey respondents as barriers to future e-cycle use. This was corroborated by the qualitative research, in which some interviewees mentioned lack of appropriate infrastructure and hazardous interactions with other drivers as being off-putting.

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“The price is the main barrier, if I could afford it, I think I would have bought one by now. The other issue is the storage as I live in a flat and ... I was always nervous whenever I locked it up somewhere, it’s an expensive looking and an expensive thing” – one month loan participant

“I would not ever use an e-cycle again. Only if I move to Amsterdam or a city like that, with good bike infrastructure would I consider getting a bike” – loan drop out

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### **Longer-term travel behaviour impacts**

Survey respondents were asked to report changes in cycling behaviour during the loan period and after. As described above, there is good data to suggest that the e-cycles were used frequently during the loan (and this was an increase in cycling compared to before the loan) and replaced journeys previously made by other modes. However, there is insufficient data to reliably report changes in cycling behaviour in the period after the loan. Amongst qualitative interviewees, despite positive experiences with e-cycles most interviewees reported that they reverted to their previous transport behaviour once the loan period concluded. As already discussed, purchase of an e-cycle was out of reach for many, and few had awareness of other options (such as rental schemes). This being said, those who did complete the follow-up survey demonstrated a shift in travel behaviour compared to their responses before and during the loan. In general, participants were more likely to report cycling for more than two hours per week, and less likely to report cycling for less than 30 minutes or not at all, in the three-month period following the loan compared to the period before the loan. This behaviour, three-months after the loan had been completed, showed lower cycling levels than during the loan, but nonetheless an increase compared to the before period – demonstrating positive signs of longer-term behaviour change. It is worth noting that seasonal factors may also have had an effect here – many of the loans took place between June and October, with warmer weather and longer daylight

hours, and this may also have contributed to the lower levels of cycling three-months later.

### **Mental and physical health impacts**

Aside from changes in cycling behaviour, participants were asked about benefits they had experienced during the trial as part of the ‘after’ surveys. A matched question about the perceived benefits was asked during the ‘before’ surveys, to track changes in perceptions of the benefits of e-cycling from before and after participating in the programme. By far, the most popular benefit selected by respondents was that cycling using an e-cycle requires lower effort when cycling up hills compared to using a regular cycle. This was a popular choice amongst many respondents, and even more so after they had experienced the loan. This finding is corroborated by the qualitative research, in which many respondents cited the ease and pleasure of using an e-cycle uphill was a key part of their positive experience. This is tempered, however, by some limitations related to specific models of e-cycle and some of the more challenging terrains – for some users, the e-cycle model they were offered was not well suited to the terrain of their local area (Sheffield, with notoriously steep inclines, was a case in point), and this caused frustration and in some cases loans to be returned early.

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#### **“Freedom, it was lovely to use on a sunny day going up a hill with ease” – one month loan participant**

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An additional impact quoted by many survey respondents was the impact of using an e-cycle on mental wellbeing. This was the third most cited benefit of using an e-cycle (after ‘less effort to cycle up hills’ and ‘fun and enjoyable’) and was particularly selected amongst those who had completed the loan. This demonstrates that while many may not have anticipated that e-cycling would have mental health benefits upon commencing the trial, after completion this was reported to be a key benefit. In contrast, improving fitness was selected by some individuals as an anticipated benefit prior to commencing the loan, but was less likely to be selected as a key benefit after completing the loan. These findings around the mental health benefits were corroborated by the qualitative research, in which respondents referred to mental health benefits (and, to some extent, physical health benefits). Respondents explained that the opportunity to spend more time outside in the fresh air had a positive impact on mental health, and this was particularly noticeable for those less physically fit, or with health conditions, who may otherwise struggle to use a regular cycle or who may find other forms of exercise more challenging.

The qualitative research also found some (limited) evidence of health disbenefits amongst some cyclists. A small number of existing cyclists reported feeling they had been less physically active during the trial, as a result of using the e-cycle rather than their regular cycle.

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“I suppose I felt like I was getting more exercise. But I think also some fresh air. I think that's what I really liked, being out and about.” – one month loan participant

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Other benefits cited by survey respondents from use of the e-cycles included reduced journey times and travel costs, helping to make journeys faster, and environmental benefits.

## Conclusions

Programme participants made frequent use of their loan e-cycles, making many short trips for fun or exercise, and often for commuting. In general, participants reported very much enjoying using the e-cycles during the loan period, and feeling sad to have to return the e-cycle at the end of the loan. The programme provided an opportunity for participants to experience what it is like to own and ride an e-cycle, including helping to understand potential uses, helping to improve their feeling of confidence and safety on the road, and also highlighting potential issues around storage, security, and their local cycling infrastructure. While these experiences were not all positive (and for a non-trivial proportion of participants, enthusiasm for e-cycles was dampened by the loan), on balance, the net effect of the loan was a positive impact on likeliness to purchase or use an e-cycle again in the future. Indeed, 7% of loan participants had already become an e-cycle owner upon completion of their loan.

Participants in the loan demonstrated some longer-term changes in behaviour, with frequency of cycling going down following the loan, but remaining higher than pre-intervention levels. For many, the major barrier to ongoing e-cycle use was the cost associated with purchase. Many had gone into the scheme with no understanding of the cost of an e-cycle, and found the cost prohibitive, and as a result are unlikely to see any future behaviour change.

A range of other benefits were reported from participation in the programme, most notably mental health benefits – which participants had not all anticipated would be a benefit of the scheme.

## 5 Value for money evaluation

### Key findings

- The estimated cost of the programme, had it been rolled out in its final incarnation from the outset, is £4.2 million. This is the central cost used in the value for money analysis.
- Programme benefits modelled in the value for money analysis include those arising from behaviour change during the loan itself, and those expected to accrue over the longer term.
- The value for money assessment includes monetised benefits in the following categories: health outcomes and ‘journey quality benefits’ to e-cycle users; and benefits to non-users arising from lower congestion, accidents, and other related factors.
- The estimated benefit cost ratio of the scheme is 0.5, which is considered ‘poor’ value for money according to DfT guidance.
- The poor value for money result is driven by the cost of the scheme when compared to low magnitudes of health benefits and non-user benefits: the distance travelled on e-cycles during the intervention period was relatively low, the number of e-cycle purchases at the end of the loan period was relatively low, and the reported change in expected likelihood to purchase an e-cycle in the future was also relatively modest.

### Introduction

This chapter sets out the approach to estimating the value for money of the programme. It briefly explains the methodological approach and underlying assumptions used, and then summarises the core value for money results. It also provides details of a range of sensitivity tests that were performed and discusses the impact of these sensitivity tests on the value for money estimates. A more comprehensive technical account of the value for money evaluation approach and results is provided in Appendix B.

### Programme costs

As noted in Chapter 3, the original planned costs for the programme (including all intervention types) were £7.9 million, which included an initial set-up phase followed by delivery of a four-year programme. However, due to the change in scope of the programme, this cost is not considered a suitable reference point for the value for money assessment (since the purpose of the evaluation is forward-looking – to understand what the value for money of the scheme *would be* if rolled out again in future). Instead, the assessment uses a programme cost of £4.2 million. This is CUK’s estimated cost if the programme had been rolled out in its ultimate version from the

beginning. For completeness, a benefit cost ratio using the full programme costs of £7.9 million has also been calculated within one of the sensitivity tests performed. This offers an estimate of the value for money of the actual scheme that was delivered through this pilot.

### Evans voucher

One element of the scheme which was not included within programme costs was the provision of a 15% discount voucher to all loan participants at Evans stores (representing 44% of all loan participants). As previously discussed, this was a commercial decision made by Evans, and the cost of it was also borne by Evans. The cost of providing this voucher was excluded from the appraisal, in accordance with DfT's Transport Analysis Guidance (TAG)<sup>12</sup>. It should be noted, however, that there is likely to have been some programme benefit induced by the voucher. This cannot be measured quantitatively (since it is not possible to disentangle the effects of the voucher from the other effects of the programme), however the qualitative research indicates that the discount likely provided an additional 'pull' factor which helped to encourage purchase of an e-cycle (or regular cycle) following completion of the loan. It is important to note, therefore, that future programmes may experience reduced behavioural effects compared to those reported within this study, unless a comparable voucher element is included (and this may impose additional programme costs if the private sector is not willing to offer the voucher as part of future schemes).

### Programme benefits

The benefits generated by the programme arise as a result of greater uptake of e-cycles, which is associated with benefits to both participants (for example health benefits from choosing a more physically active transport mode) and non-participants (who might benefit, for example, from fewer car journeys being made and therefore lower levels of congestion, accidents etc.). The programme benefits included within the appraisal arise over two periods of time:

- First, the benefits that were accrued **during the trial period itself** – which occur where trips made by loan e-cycles replace trips that would have been made by an alternative mode of transport (or not at all); and
- Second, benefits that will accrue **over the longer-term** as a result of longer-term behaviour change induced by the programme. This may occur due to participants choosing to purchase and use a cycle/e-cycle following the programme, or from participants choosing to make more frequent use of an existing cycle/e-cycle following their experience with the programme.

Note that the benefits accrued during the trial period itself are expected to be relatively small, and very unlikely alone to justify the cost of the scheme. Instead, it is the impact of the second category of benefits – those which occur as a result of

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<sup>12</sup> This guidance states that payments between private members of society (in this case, Evans and the loan participants) net out to zero in the present value of benefits.

longer-term behaviour change – which are anticipated to generate the majority of scheme benefits.

The value for money assessment includes monetised benefits in the following three categories:

- Those stemming from changes in **health outcomes** for participants. Following standard methodologies<sup>13</sup>, benefit estimation is centred around reduced absenteeism and reduced risk of premature death resulting from increased hours of exercise. An adjustment has been made to account for the relatively lower level of physical exertion required to ride an e-cycle compared to a regular cycle;
- Those experienced by **non-users**, who experience benefits such as reduced congestion, accidents, road damage and pollution thanks to scheme participants switching away from modes such as car travel towards e-cycles/cycles; and
- Those experienced by participants, stemming from a perceived improvement in **'journey quality'** arising from switching to e-cycles, which includes for example reduced journey times, a more enjoyable travel experience, and feelings of personal benefit such as contributing to the environmental consciousness, and potentially also mental health benefits.

Monetisation of each of these factors was driven by data on the distance travelled by e-cycle during the loan (both based on self-reported travelling patterns from the survey, and also trip data recorded via See.Sense telematics data). In order to ascertain the long-term behaviour change that could be expected, the analysis made use of responses to three survey questions from the before and after surveys – showing change in ownership of a cycle/e-cycle; change in the likelihood to purchase an e-cycle, and change in likelihood to use an e-cycle. The responses to these three questions were used to develop a 'future benefits scaling factor' that captured the extent to which future benefits from e-cycling could be expected to occur in the future.

Following the completion of the trial, it is reasonable to expect that the scale of behavioural change will dissipate over time, as it is difficult to generate meaningful change and habit formation over the long-term. To capture this diminishing effect, benefits were modelled at a reducing rate over time<sup>14</sup>.

### Central case findings

Using an eight-year appraisal period, the estimated Benefit Cost Ratio (BCR) of the scheme was calculated to be 0.5. Extending to a 20-year appraisal period (which is considered to be a less robust approach) gives a BCR of 0.8. Both estimates are

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<sup>13</sup> Monetisation of health outcomes follows the methodology outlined in TAG unit A5.1 and employed in DfT's Active Modes Appraisal Toolkit (AMAT).

<sup>14</sup> A decay rate of 7% per annum following the first year of the intervention was used, which is alignment with TAG/AMAT guidance. A lower decay rate of 3.5% per annum was also modelled in one of the sensitivity tests.

considered ‘poor value for money’ according to DfT’s guidance<sup>15</sup>. Note however that the 20-year appraisal is closer to a categorisation of ‘low’ (BCR between 1 and 1.5), and achieves that categorisation in some sensitivity tests.

There are three key drivers of relatively low modelled benefits, and therefore a poor BCR:

- First, due to the relatively modest amount of post-loan behaviour change induced. While 7% of loan participants had purchased an e-cycle at the end of the trial, many reported no change in their likelihood to purchase an e-cycle, and some a negative change. It is also important to take into account the fact that some may have gone on to purchase an e-cycle in any case, regardless of the loan;
- Second, while a switch to e-cycle use is associated with positive benefits for other road users (by avoiding pollution, collisions and congestion that would be associated with travel by other modes such as car), the actual mileage travelled by e-cycles during the loan period was relatively low – meaning that only a small proportion of a typical household’s car mileage was replaced by e-cycle use; and
- Third, while there are notable physical health benefits associated with regular cycling, these are lower for e-cycle usage due to the lower physical exertion required. Moreover, those switching from conventional cycles to e-cycles could face a small *reduction* in health outcomes. As a result, the overall modelled health benefits arising from the programme are relatively modest.

### Sensitivity tests

It is important to test the sensitivity of results to certain modelling inputs, where the appropriate value of the input is subjective, has limited evidence supporting an appropriate value, or is likely to be a significant determinant of results. Table B-6 (Appendix B) contains a list of the nine scenarios tested. These include, for example, adjusting the behavioural decay rate, including additional health benefits, and making alternative assumptions around behaviour impacts. Sensitivity tests were performed for both the eight year and 20-year appraisal periods.

Broad conclusions from the sensitivity testing exercise were as follows:

- Adjusting the ‘decay assumption’ (that is, the assumption around the extent to which behaviour change persists over the long-term) generated a larger change in BCR in the 20-year appraisal compared to the 8-year appraisal. This is intuitive given that the effects build up over time;
- Reducing the new trip distance demand response uniformly had a substantially negative impact on overall results across both appraisal lengths;
- Varying the set-up costs generated modest changes in BCR, in either direction; and
- Incorporating the full costs of the expanded scope – i.e. using the cost of the ‘delivered scheme’ had a substantially negative impact on the BCR (bringing it down to 0.3 or 0.5, for the eight year and 20-year appraisal periods respectively).

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<sup>15</sup> According to DfT’s BCR guidance, if an intervention can achieve a BCR of greater than 1.5 it is considered ‘medium’ VfM, with higher BCRs awarded greater status. Lower BCRs can achieve categorisations of ‘low’, ‘poor’ or ‘very poor’ VfM.

Broadly speaking, unless there is reason to believe that core assumptions are considerably misjudged, and that no assumptions are incorrect in the opposite direction, the sensitivity tests provide little evidence to support a fundamental change in the core findings.

## Conclusions

Three types of benefits were monetised and appraised for the value for money assessment: changes in health outcomes for participants, benefits to non-users thanks to a shift away from trips by car (or other modes), and benefits to participants in terms of a perceived improvement in 'journey quality'. These monetised benefits were compared against the scheme costs, both for the actual costs of delivery occurred (which was modelled as part of one of the sensitivity tests) and, to give a more realistic picture of future roll-out, based on CUK's estimates of the likely scheme costs that would be incurred had the scheme been rolled out in its final incarnation from the outset.

Results are provided for two different appraisal lengths; eight years and 20 years, reflecting the uncertainty surrounding the appropriate appraisal period for an intervention of this kind. In deciding which is the better reflection of reality, more weight should be given to the eight year appraisal period<sup>16</sup>. Both scenarios achieve a BCR lower than one, which qualifies for 'poor' value for money according to DfT guidance. This result is primarily driven by low magnitudes of health benefits and non-user benefits, which occur due to relatively modest behaviour change effects, relatively short distances travelled by participants using the e-cycle loans, and the lower physical exertion required for an e-cycle compared to for a regular cycle. The most significant benefit category is journey quality, however this is also the least robust and evidence-based.

Both the eight year and 20-year appraisal scenarios have been used as the basis for nine sensitivity tests, which explore the sensitivity of results to changes in key input assumptions. The sensitivity tests generally produce results of similar magnitude and direction in each scenario. Broadly speaking, the conclusions of the analysis are robust to the results of the sensitivity tests, and outside of a few select tests, the conclusion of 'poor' value for money tends to hold.

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<sup>16</sup> <https://assets.publishing.service.gov.uk/media/631744188fa8f50220e60d1a/active-model-appraisal-toolkit-user-guidance.pdf>



## 6 Conclusions & recommendations

### Overview

This chapter summarises the conclusions reported across the process, impact and value for money sections of the report. It then proceeds by providing a set of recommendations stemming from these conclusions.

### Conclusions

Overall, the evaluation found that the pilot was a success in many respects: take-up was strong, participants reported positive experiences, and the pilot offered many useful learnings for future policy. More specifically:

- **Take-up was strong.** Training sessions exceeded targets (achieving 121% of target). This followed a period of change to the format of these sessions, which became more informal over time. Meanwhile, loans came close to target (88% of target) and the overall number of interventions exceeded target (112%). This demonstrates that there was appetite amongst potential participants, and that the engagement efforts were effective;
- **Operational delivery was smooth and most participants were very satisfied with their experience:** 78% of those completing the ‘after loan’ survey rated the experience as ‘very good’ (the highest rating available). Similarly, 87% of those completing the ‘after training’ survey rated the experience as ‘very good’. Qualitative research similarly found high levels of satisfaction with the intervention and the way it had been run;
- **The majority of participants reported positive experiences using the e-cycles:** Both the qualitative research and the survey findings provided strong evidence to suggest that participants found the e-cycles a pleasure to ride – with delivery staff referring to ‘the e-cycle smile’, and participants citing benefits such as the ease of travelling up hills, mental and physical health benefits, and more generally the enjoyment associated with getting outside in the fresh air;
- **Participants made frequent use of their loan e-cycles.** Both telematics data and self-reported travel behaviour suggest that loan participants made many, regular, short journeys using their loan e-cycle, for a variety of different purposes (including for example leisure, commuting, shopping and social visits). It is also notable that this included some individuals who had not ridden a cycle for many years;
- **The pilot was effective at making participants better informed e-cycle consumers.** Participation in either the loan and/or the training sessions gave participants valuable information about e-cycles – including what models are available, what features might be important to them when investing in an e-cycle,

and what quality of e-cycle could be expected at a particular price point. It also helped to raise potential issues (for example around safety, storage, and local infrastructure) that are helpful to be aware of in advance of making an investment. It also gave participants the opportunity to understand how e-cycling could be built into their daily travel patterns and helped them to develop their safety and confidence when cycling. From both survey responses and qualitative research, it was clear that many participants completed the programme feeling better informed and more confident, stating that they were now more likely to invest in an e-cycle in the future, having experienced the benefits of e-cycles; and

- **The pilot provided valuable policy learnings.** Through an evolving policy delivery process and a comprehensive evaluation (including extensive qualitative research and three waves of surveys), the pilot has helped to contribute significantly to the evidence base around e-cycles, including demonstrating the potential for behaviour change, and the key barriers to longer-term take-up.

The successes described above represent considerable achievements for the pilot programme. Nonetheless, it is important to recognise that the programme is only one component of the broader effort towards long-term adoption of e-cycles. There are some limitations that warrant discussion:

- **Investing in an e-cycle is a significant decision.** An e-cycle is a major investment, and the majority of participants reported that they did not have access to an e-cycle through other means. Therefore, future ongoing e-cycling would require, for most people, investment in an e-cycle – at significant cost;
- **Affordability is the major hurdle for most people.** Across both the qualitative research and the survey results, there was strong evidence to suggest that the major factor preventing individuals from purchasing an e-cycle was the cost. For some this was a hurdle which was unlikely to be overcome, for others it meant that the journey to purchasing an e-cycle would take some time. Aside from cost, other barriers to future e-cycle use were around security and, for some, the design of e-cycles not being attractive;
- **The pilot helped to shift behaviour in the right direction, but its effect on long-term e-cycle use is more uncertain.** A minority of loan participants (7%) became an e-cycle owner during the course of their loan, and further participants purchased e-cycles during the three-month follow-up period. Overall, however, the follow-up survey found that reported travel behaviour tended to revert towards pre-intervention cycling rates (albeit remaining somewhat higher). This was corroborated by the qualitative research, which found that despite positive experiences with e-cycles, most interviewees reverted to their previous transport behaviour once the loan period concluded;
- **Given the above questions around long-term impact generated, and the cost of delivery, the value for money of the programme is challenging.** At £4.2 million in estimated adjusted costs (after accounting for the changes in scope), the cost of the programme was significant. The value for money analysis found that the programme did not represent value for money. This was driven by a number of factors – the distance travelled on e-cycles during the intervention period was relatively low; the number of e-cycle purchases at the end of the loan period was

relatively low; and the reported change in expected likelihood to purchase an e-cycle in the future was also relatively modest. There was some more positive indication of long-term behaviour change within the follow-up surveys however the small sample size and likely selection bias means that these findings should be interpreted with caution. The poor value for money finding begs the question of whether an alternative intervention style might have been more cost-effective. Some suggestions for further exploration are included in the recommendations section below.

## Recommendations

Going forward, the following is recommended:

- **Consider interventions which address the affordability hurdle.** The affordability of e-cycles emerged from the research as a major hurdle to long-term behaviour change. Without addressing this, it seems likely that a programme such as this acting in isolation is unlikely to generate substantial behaviour change benefits, and therefore is unlikely to represent value for money. France, for example, has recently introduced a subsidy towards purchase of an e-cycle<sup>17</sup>, which directly addresses the affordability hurdle;
- **Make refinements to improve the functioning of the programme.** A number of operational adjustments were suggested in Chapter 3. These include for example improving the alignment between the loan and training sessions and offering a wider range of cycling accessories to loan participants. The evaluation also found that a subset of participants (23%) reported that they were less likely to purchase an e-cycle after their experience with the programme. Based on evidence from the qualitative research, it seems that some of this change may have resulted from negative experiences that could have been avoided – for example an individual being provided with an e-cycle model which was not appropriate for their local area or style of riding; they struggled to find suitable local cycling routes; or they did not have the cycling accessories needed to get the best out of the loan. A check-in with participants part-way through the loan, and the flexibility to swap model or seek further information, could help to improve outcomes for those participants who had less positive experiences;
- **Increase the programme's focus on long-term behaviour change.** The evaluation found that there were some missed opportunities for focusing on long-term e-cycle adoption when interacting with participants during (and after) the programme. Participants in the evaluation reported that they did not receive information about options for longer-term e-cycle/cycle usage, and so targeted communications could be a helpful addition to address this gap. This could include providing participants with information about locally available e-cycle hire/lease schemes, promotional material for local e-cycle stockists, information about conversion kits (to convert an existing cycle into an e-cycle), or information to assist with getting an existing cycle repaired. These communications would be

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<sup>17</sup> See, for example, the following news article reporting this: <https://www.thetimes.co.uk/article/on-your-ebike-and-heres-4-000-for-it-says-macron-z8sb80629>

valuable during the training, at the beginning of the loan, and also again when returning the loan e-cycle. There may also be value in following up with some of this information several months later, for example via a 'mailshot';

- **Target the programme at those most conducive to behaviour change.** Some participants commented that the cycling infrastructure (cycle lanes) in their local area was not fit for purpose, and therefore they were unlikely to cycle again following the loan. Focusing on areas with mature cycling infrastructure would help to avoid this issue. Beyond this, there may also be benefit from a value for money perspective in reconsidering the targeting of the programme – for example restricting eligibility to only those who could feasibly go on to purchase an e-cycle or make long-term use of an e-cycle (for example via a lease scheme) would help to reduce programme costs and increase value for money. Practical considerations, such as whether participants have a safe space to store an e-cycle, would also be worth taking into account – since these were found to be another driver of long-term behaviour change. This raises challenging issues, however, around equity and accessibility. A combination with an intervention aimed at addressing barriers to affordability (as mentioned above) could help to alleviate this;
- **Conduct further research to gather more intelligence about the barriers to e-cycling,** and, specifically, to understand the extent of financial support which might be necessary to incentivise uptake; and
- **Consider tie-in with other schemes** such as the *Cycle to Work* scheme, links into the private sector (building on Evans' decision to offer a voucher towards purchase of an e-cycle), and introduction of other schemes that could help to address issues around safe storage of e-cycles, and the affordability of e-cycles (as described above).

The overall learning from this evaluation is that while e-cycle use was a positive addition to the lives of many programme participants, and many would welcome the opportunity to make greater use of e-cycles, this positive experience was not sufficient to generate high value for money. The intervention was a costly investment and only a relatively small proportion of participants reported making long-term changes to travel behaviour in response. Affordability is a major barrier that needs to be overcome in order for a scheme such as this to be effective. Therefore, development of a comprehensive package of measures, encompassing 'try before you buy' amongst a suite of other interventions, is recommended for future schemes.

# A Further information

## Research questions

Table A-1: Study research questions

RQ	Type	Question
RQ1	Process	Delivery metrics including: <ul style="list-style-type: none"> <li>• Actual spend in comparison to planned spend</li> <li>• Number and duration of loans</li> <li>• Number of Cycle Confident roadshows delivered and participants coming through the roadshows</li> <li>• Number of training/capability sessions delivered and number of beneficiaries</li> </ul>
RQ2	Process	What were the actual timescales in comparison to the planned timescales?
RQ3	Process	What are the demographic characteristics of programme beneficiaries?
RQ4	Process	What was the drop-out rate among participants started and why did they drop out? (Where 'drop-outs' include e.g., people who were allocated a loan e-cycle but did not collect it, and people who start a loan but return the e-cycle early.)
RQ5	Process	What lessons can be learned from the year 1 pilots for implementation of future years?
RQ6	Process	Where was the programme delivered in comparison to the original proposed locations and what were the reasons for choosing the locations over others?
RQ7	Process	What were the challenges to implementation and what worked well?
RQ8	Process	Effectiveness of the delivery mechanism with DfT funding and Active Travel England emerging, with implementation via CUK's team including subcontractors?
RQ9	Process	How easy / difficult did participants find taking part in the trial? And what were their levels of satisfaction among participants about the interventions on offer (duration, type of cycles, quality of staff)?
RQ10	Process	What has been the effectiveness of the monitoring arrangements to capture data about the programme?

RQ11	Process	How effective was the engagement activity across the engagement models? For example, are loan e-cycles more oversubscribed via Evans or through the community, employer or education routes?
RQ12	Process	Have there been any unintended consequences?
RQ13	Impact	What did beneficiaries do after participating in the programme, e.g. did they buy or rent an e-cycle or conventional cycle, or use an existing cycle more, or revert to previous behaviours?
RQ14	Impact	What role has participation in the programme played in participants' decisions to purchase an e-cycle or access an e-cycle in another way?
RQ15	Impact	How do participants feel that participation in the intervention(s) has enabled them to overcome barriers to e-cycling? (Where barriers include cost of purchase, lack of information or awareness, uncertainty about how e-cycle would fit with lifestyle/habits)
RQ16	Impact	<p>What effect has participation in the programme had on beneficiaries' travel behaviour?</p> <ul style="list-style-type: none"> <li>• To what extent has the loan enabled participants to replace car or van journeys?</li> <li>• Has the e-cycle loan enabled participants to cycle more frequently than they did before the intervention?</li> <li>• What types of journeys are participants using e-cycles for?</li> <li>• Are participants cycling more (more often and longer trips) than before? And more than those in the comparison group (i.e. the expression of interest (EOI) list for Evans stores)?</li> <li>• Do the outcomes differ by demographic characteristics?</li> <li>• Do the outcomes differ by whether a participant was already a cyclist before participating?</li> </ul>
RQ17	Impact	What effect has using an e-cycle had on participants' sense of confidence and safety while riding and their sense of wellbeing more generally?
RQ18	Value for money	Has the programme reached 'hard to reach' <sup>18</sup> groups (i.e. without specific or costly targeting)?
RQ19	Value for money	<p>What were the average costs per participant:</p> <ul style="list-style-type: none"> <li>• Overall?</li> <li>• By intervention type?</li> <li>• By location?</li> </ul>

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<sup>18</sup> Where hard to reach means people with characteristics typically underrepresented in cycling e.g. ethnic minorities and women.

RQ20	Value for money	What were the monetised benefits overall, by intervention type and by location?
RQ21	Value for money	Were there any significant non-monetisable impacts?

**Table A-2: Comparison of planned dates vs actual delivery dates of loans: Evans Stores**

Interventions	Location	Planned delivery	Actual delivery	Target met?
Manchester	Manchester	May 2022	May 2022	Met
Sheffield	Sheffield	Nov 2022	Dec 2022	Slight delay
Leicester	Leicester	Nov 2022	Dec 2022	Slight delay
Luton & Dunstable	Luton & Dunstable	Nov 2022	Dec 2022	Slight delay
Manchester Trafford	Manchester	N/A	Aug 2023	N/A
Burton on Trent	Leicester	N/A	Sep 2023	N/A

**Table A-3: Comparison of planned dates vs actual delivery dates of loans: workplace and education settings**

Interventions	Location	Planned delivery	Actual delivery	Target met?
NHS Wythenshawe Hospital	Manchester	Jan 2023	Feb 2023	Slight delay
NHS Hallamshire Hospital	Sheffield	Jan 2023	April 2023	Slight delay
Samworth Brothers	Leicester	Jan 2023	March 2023	Slight delay
Luton & Dunstable University Hospital	Luton & Dunstable	Jan 2023	March 2023	Slight delay
Sheffield – Northern General Hospital	Sheffield	N/A	June 2023	N/A

**Table A-4: Comparison of planned dates vs actual delivery dates of loans: community hubs**

Interventions	Location	Planned delivery	Actual delivery	Target met?
Khizra Mosque	Manchester	July 2022	July 2022	Met
Stretford Public Hall	Manchester	Nov 2022	March 2023	Significant delay
Wheels for All	Manchester	Nov 2022	March 2023	Significant delay
Shipshape Community Hub	Sheffield	Dec 2022	Feb 2023	Slight delay
The Green Estate	Sheffield	Dec 2022	March 2023	Slight delay
The Bike Park	Leicester	Jan 2023	Feb 2023	Slight delay
Inspire: Luton Sports Village	Luton & Dunstable	Jan 2023	April 2023	Slight delay

**Table A-5: Comparison of planned dates vs actual delivery dates of training sessions: workplace and education settings**

Interventions	Location	Planned delivery	Actual delivery	Target met?
NHS Wythenshawe Hospital	Manchester	Jan 2023	Feb 2023	Slight delay
NHS Hallamshire Hospital	Sheffield	Jan 2023	May 2023	Significant delay
Samworth Brothers	Leicester	Jan 2023	April 2023	Slight delay
Luton & Dunstable University Hospital <sup>19</sup>	Luton & Dunstable	Jan 2023	June 2023	Significant delay

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<sup>19</sup> Prior to the official launch, an introductory skills and confidence session was delivered on 2 May 2023.



**Table A-6: Comparison of planned dates vs actual delivery dates of training sessions: community hubs**

Interventions	Location	Planned delivery	Actual delivery	Target met?
Khizra Mosque	Manchester	Feb 2023	Feb 2023	Met
Stretford Public Hall	Manchester	Nov 2022	March 2023	Significant delay
Wheels for All	Manchester	Nov 2022	March 2023	Significant delay
Shipshape Community Hub	Sheffield	Nov 2022	March 2023	Significant delay
The Green Estate	Sheffield	Nov 2022	April 2023	Significant delay
The Bike Park	Leicester	Nov 2022	March 2023	Significant delay
Cycle Circuit	Leicester	Nov 2022	June 2023	Significant delay
Inspire: Luton Sports Village	Luton & Dunstable	Nov 2022	May 2023	Significant delay
Leicester – Crown Hill Community College	Leicester	Nov 2022	June 2023	Significant delay

## B Value for money evaluation: technical note

### Context and motivation

#### What is a value for money evaluation?

The intention of the value for money (VfM) evaluation is to estimate the VfM potential of the intervention based on the findings of the impact evaluation, namely the extent to which the loan drove an increase in cycling trips, and triggered a long-term behavioural response. The VfM evaluation is informed by the same quantitative data as underpins the impact evaluation, supplemented with qualitative analysis. The key sources of data are:

- 'Input' data on intervention scope (activities) and costs;
- Evidence on e-cycle take up and behaviour based on survey data, which underpin the benefits of the intervention; and
- The observed outturn costs and benefits.

Ordinarily, economic evaluation would be undertaken to compare the forecast economic performance (at the appraisal stage) with the actual economic performance (evaluation). The embryonic nature of e-cycles as a 'mode' means that there is relatively little precedent and guidance on the potential appeal, usage and benefits of e-cycles. This evidence 'gap' is precisely what the pilot sought to address.

The initial economic analysis, developed by DfT, that underpinned the decision to proceed with the pilot was based on a 'cost effectiveness' metric, based on the expected number of e-cycle participants divided by the forecast cost of the pilot to derive a 'cost per participant'.

The survey and evaluation programme that accompanied the pilot has provided a rich and detailed picture of the way in which different users responded to the interventions, which has been used to support detailed analysis based on the principles and guidance that form part of the DfT's Transport Appraisal Guidance (TAG).

### Scheme definition and costs

#### Scheme definition

As noted in Chapter 1, the programme involved two key components, delivered from several different 'hubs':

- **An e-cycle loan:** participants were given a loan e-cycle for one month. During this period, they took ownership of the e-cycle, kept it in their own home, and used it as they wished;
- **A one-hour skills and confidence training session**, delivered in small groups by a trained instructor. Sessions covered a range of cycling skills including basic maintenance checks, best practice when preparing for a journey, and practical exercises; and
- **20 loans of adapted e-cycles were offered by inclusive cycling charity Wheels for All** from their Manchester hub, alongside a set of activity days and outreach events to increase awareness of the local hub and engagement with the local community.

The main motivation of the programme was to induce a ‘behavioural response’ among participants, meaning that in the years following, loan participants had a higher propensity for e-cycle usage and ownership than prior to the loan. For the purposes of this VfM evaluation, the focus was all participants who undertook a standard (i.e. not adapted) **e-cycle loan**, meaning any impact of the training sessions was not captured. This was for two key, mainly practical, reasons:

- The sample size of the adapted e-cycle offering was unfortunately too small to establish any meaningful effect; and
- A one-month loan was likely to generate a higher behavioural response than a one-hour training session, and was more likely to be discernible in the survey responses, despite the larger sample size of the training participants.

### Changes to scope and delivery model

The original scheme that was set-up and began to deliver in 2022 was intended to span four years and encompass five geographical areas. The programme was set up to reflect this broad scope, including the original team structure, the booking and customer management system, the fleet composition, storage and maintenance arrangements, contractual agreements with delivery partners, legal arrangements and the size, number, and location of hubs.

In 2022 the scheme was paused and, following instruction from DfT, CUK made significant changes to the programme designed to maximise the number of participants, within a shortened programme of just one year. These changes mean that a lot of the initial set-up costs were ‘too large’ for the scheme as delivered, and had the delivered scope been planned from the start, the set-up costs would have been lower.

The primary purpose of an economic evaluation of any pilot scheme is forward-looking – to help decision-makers decide whether, how and where interventions that form part of the e-cycle programme should be rolled-out in a way that is most likely to deliver VfM and wider impacts. Given this, the appraisal has been designed in a way that captures the representative costs and benefits of rolling out a similarly scoped and costed scheme again, **not a scheme of the scope that was initially planned** (although a scenario based on the actual costs of delivery was included within the sensitivity testing).

## Treatment of costs in appraisal

TAG best practice<sup>20</sup> suggests that all costs to the broad transport budget (the budget that the DfT and various devolved/local bodies have available to spend on transport) are included in the present value of costs (PVC), a core appraisal output. All other costs should be included as negative benefits in the present value of benefits (PVB).

### Proportional set-up costs

As noted above, the intention was for the VfM evaluation to capture the likely costs of replicating the programme as was delivered. Given this, a concerted effort was made to provide an assessment of cost that took account of the changes to scope and delivery model that were decided once a significant proportion of the costs, including most of the set-up costs, had already been 'sunk'.

For the central case, a set of proportional set-up and delivery costs were estimated that aimed to capture the likely costs of delivering the final scope of the programme, had such a scope been the intention from the outset. This resulted in a scaling down of costs from ~£8 million to ~£5 million, considered proportionate and appropriate for the purposes of this analysis.

There is a risk that the apportioning of costs was not done correctly, and the sensitivity of results to this methodology was tested in sensitivity tests 7 and 8. Additionally, sensitivity 9 includes **all costs**, including those 'sunk' to pay for the original larger scope.

### Evans voucher

Alongside its role as a distribution hub for e-cycles during the trial, Evans cycles offered a 15% discount voucher to loan participants who took out the loan between July and December 2023. The voucher is likely to have generated a behavioural response that cannot be disentangled from the behavioural response associated with the core scheme.

TAG treatment of private sector costs would consider payment between two private members of society induced by an intervention to be a transfer of resources independent of the intervention, and thus not to be considered in the cost-benefit calculus, so the cost of providing the vouchers was not incorporated. However, it's worth noting that the measured behavioural responses associated with future schemes may be lower unless a similar voucher component is offered.

### Residual

A proportion (estimated to be 40%) of the set-up costs of the programme was spent on procuring a fleet of e-cycles which, aside from a modest amount of depreciation, will still have a substantial usable life following the conclusion of the programme (also known as the residual value). TAG (A1.1 paragraphs 2.3.9 – 2.3.10) is relatively light on

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<sup>20</sup> TAG A1.1, paragraphs 2.86 – 2.87 -

<https://assets.publishing.service.gov.uk/media/659d13ddd7737c000df335ac/tag-unit-a1.1-cost-benefit-analysis.pdf>

guidance surrounding residual values of assets, so a relatively prudent approach was taken to capture this.

### High-level methodology: behavioural responses

Provided that appropriate steps were taken to scale down set-up costs to a level that reflects the scope of the delivered scheme, estimating the cost side of the cost-benefit trade-off is relatively straightforward. However, given that many of the benefits potentially associated with scheme were yet to be realised, the benefits-side of the trade-off was slightly more difficult to conceptualise and monetise. This section outlines the approach taken to understand the likely benefits of the scheme.

#### Intention of the loan

Broadly speaking, the intention of the loan was to:

- Provide participants with an opportunity to ride and become accustomed to riding e-cycles, where they hadn't previously been given the opportunity; and
- Stimulate a change in behaviour, increasing the likelihood of participants to:
  - Purchase an e-cycle sometime in the future
  - Increase their use of e-cycles, even if they don't purchase an e-cycle, at some point in the future

When participants change their behaviour **during the month-long loan period**, changing the number of trips they undertake using e-cycles, and reducing the number of trips they undertake using other modes, will provide some benefit. However, it is expected that the loan scheme will only be considered effective if it triggers a long-term behavioural response among participants, otherwise the benefits during the loan period would not be sufficient to offset the costs.

Delivering one-month of benefits through the loan period is marginal, and very unlikely to justify the cost of the scheme, compared to a flow of benefits in the future. Given this, understanding the magnitude of medium to longer-term behavioural responses was crucial to providing a robust picture of the balance of costs and benefits over the long term.

#### During the loan

One thing that almost all loan participants have in common is that, prior to joining the scheme, they had very little experience riding e-cycles. However, the participants have a diversity of prior behaviour with other modes, the most important of which for the VfM analysis is conventional cycles.

The 'before' survey sought to understand the types of travel behaviours of loan participants prior to joining the loan scheme, including the frequency and length of conventional cycling trips. Given this 'prior' cycling behaviour, we distinguished between two types of e-cycling trips observed in the 'after loan' survey (completed by loan participants following completion of the loan) and telematics data (recording trip data during the loan period):

- Trips generated by a ‘switching response’ from conventional cycling trips – trips that, in absence of the loan, would have otherwise been undertaken using conventional cycles;
- Trips generated by a ‘demand response’ (modal shift) – trips that, in absence of the loan, would have otherwise been undertaken on foot, by non-active mode such as car, rail or bus; and
- Trips generated by a ‘demand response’ (entirely new trips) – trips that, in absence of the loan, would not have been undertaken at all.

#### *Switching response vs. demand response*

Different participants will have had different scales of switching responses and demand responses, depending on their aptitude and propensity for conventional cycling prior to joining the loan scheme. Some participants, such as cycling enthusiasts or those who commute via conventional cycles, will have had a high proportion of their e-cycling trips be switching trips. Others, such as those with very little prior cycling experience, will have had very few switching trips at all.

The incremental benefit generated by an e-cycle trip varied depending on whether the trip was generated through a switching response or a demand response, so being able to effectively distinguish between the types of trips was important for appropriately identifying and monetising benefits.

Unlike the impact evaluation, the VfM evaluation was relatively agnostic on the diversity of outcomes among different participants, and instead focused more on the aggregate outcomes achieved by the whole population of participants in the loan scheme. For example, the incremental health impacts could vary significantly depending on the physical fitness starting point of the participant, but that level of detail is beyond the scope of typical methodologies.

The surveys provided information on the average distance (km) of cycling trips undertaken by participants prior to and during the loan period, which was aggregated to provide inputs to the cost-benefit appraisal model, as seen in Table B-1.

**Table B-1: Passenger km per month over the loan period, per participant and across all participants**

<b>Trip km</b>	<b>Per participant: Commute</b>	<b>Per participant: Leisure</b>	<b>All participants: Commute</b>	<b>All participants: Leisure</b>
Switching response, from conventional cycle	23.8	40.7	111,842	191,093
Demand response, diverted from non-cycling modes	7.2	18.0	33,570	84,538
Demand response, entirely new trips	3.4	10.4	15,999	48,970

## **After the loan**

### *Behavioural change*

As noted, the strength of behavioural change spurred by the loan scheme was the primary determinant of long-term benefits. The 'before' and 'after' surveys asked three questions relating to the core e-cycling behaviours of participants, which were used in the appraisal to generate an (imperfect) estimate of the scale of behavioural change inspired by the loan scheme.

Participants were asked about their cycle (conventional, e-cycle or other) ownership status in both surveys, to which they could respond 'own an e-cycle', 'own a non-e-cycle', 'own an 'other' cycle', or none of the above.

Participants were also asked the following two questions, with answers provided using a five-point scale between 'very unlikely' and 'very likely':

- How likely are you to buy an electric cycle?
- How likely are you to use an electric cycle again?

As participants were asked the same two questions in the before and after surveys, it was possible to calculate the change in participant responses to the questions before and after the loan period, and measure the change in self-reported ownership (see Table B-2), propensity (see

Table B-3), and intensity (see Table B-4) of e-cycle use. The responses to these three questions were used to develop a 'future benefits scaling factor' that captures the extent to which behavioural responses were likely to generate benefits in the future.

**Table B-2: Cycle ownership rates, before after and change**

<b>Rate of ownership</b>	<b>Before</b>	<b>After</b>	<b>Change (ppt)</b>
Of e-cycles	3.0%	9.8%	+6.7%
Of other types of cycles	72.5%	64.9%	-7.6%
Of neither	24.5%	25.3%	+0.9%



**Table B-3: Change in reported likelihood of e-cycle purchase: comparison of before survey and after survey responses**

	Before survey: Very likely	Before survey: Quite likely	Before survey: Neither likely nor unlikely	Before survey: Quite unlikely	Before survey: Very unlikely
After survey: Very likely	64%	33%	14%	3%	14%
After survey: Quite likely	24%	46%	33%	35%	-
After survey: Neither likely nor unlikely	7%	12%	29%	35%	29%
After survey: Quite unlikely	1%	4%	14%	26%	21%
After survey: Very unlikely	4%	4%	10%	-	36%
<b>Total</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

**Table B-4: Change in reported likelihood of e-cycle use: comparison of before survey and after survey responses**

	Before survey: Very likely	Before survey: Quite likely	Before survey: Neither likely nor unlikely	Before survey: Quite unlikely	Before survey: Very unlikely
After survey: Very likely	73%	54%	18%	33%	100%
After survey: Quite likely	18%	38%	45%	44%	-
After survey: Neither likely nor unlikely	5%	5%	21%	-	-
After survey: Quite unlikely	2%	1%	8%	11%	-
After survey: Very unlikely	2%	2%	8%	11%	-

## Benefits

In the short term, the benefits associated with the trial stem from the behavioural changes observed over the loan period, the extent to which participants switched existing cycling trips to e-cycling trips, and how effective the loans were in encouraging participants to use e-cycles for new trips that they wouldn't otherwise have taken, or would have taken using non-active modes.

Over the long term, the benefits of the trial are driven by the strength of the behavioural change effect induced by the loan; namely the extent to which participants are encouraged to purchase e-cycles in the future, and the formation of habits that persist into the future.

The benefits appraised in this VfM, during the loan period and forecast into the future, were primarily associated with the transfer of trips to e-cycle or additional km of e-cycling trips undertaken by loan participants, compared to the alternatives (walking, conventional cycles, non-active modes or not travelling at all). Monetised benefits fell into one of three categories:

- Those stemming from changes in health outcomes for participants;
- Those incurred on non-users, stemming from a reduction in trip km undertaken by alternative modes; and
- Those stemming from a perceived improvement in 'journey quality'.

### Health benefits

The monetisation of health benefits followed the methodology outlined in TAG unit A5.1<sup>21</sup>, and employed in DfT's Active Modes Appraisal Toolkit (AMAT)<sup>22</sup>. This methodology splits benefits associated with improvements in health outcomes into:

- Gains in output felt as participants take fewer days absent from work as a result of the health gains achieved through regular exercise; and
- Reduced risk of premature death stemming from increased hours of exercise.

#### *Absenteeism*

The AMAT methodology estimated a reduction of 0.7 days in the average number of sick days for the **new commuting trips generated, that were not diverted from existing cycling trips**. Reductions in short-term absence from work are expected to generate improvements in output that can be monetised as a benefit to the general population using the average value of output for an average worker in the UK economy.

#### *Reduced risk of premature death*

There is strong evidence that regular physical activity can reduce the risk of premature death that results from adverse health conditions such as coronary heart disease, type 2 diabetes and various cancers. The approach recommended by TAG is to estimate the change in metabolically equivalent task (MET) hours per week induced by the scheme and, using this input to calculate the change in average numbers of deaths, and total

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<sup>21</sup> TAG unit A5.1 – Active mode appraisal - [https://assets.publishing.service.gov.uk/media/63a32b698fa8f53911cfd36/TAG\\_Unit\\_A5.1\\_Active\\_Mode\\_Appraisal\\_Nov\\_2022\\_Accessible\\_v1.0.pdf.pdf](https://assets.publishing.service.gov.uk/media/63a32b698fa8f53911cfd36/TAG_Unit_A5.1_Active_Mode_Appraisal_Nov_2022_Accessible_v1.0.pdf.pdf)

<sup>22</sup> Active Mode Appraisal Toolkit User Guide - <https://assets.publishing.service.gov.uk/media/631744188fa8f50220e60d1a/active-model-appraisal-toolkit-user-guidance.pdf>

number of quality-adjusted life years (QALYs). This output was monetised using the average statistical value of a life-year in HMT's Green Book<sup>23</sup>.

The only deviation from the standard physical impacts methodology used in AMAT was to scale down the average MET hours associated with an hour of cycling to an equivalent value for an hour of e-cycling, reflecting the reduced metabolic requirement of powering an e-cycle compared to a conventional one<sup>24</sup>.

Given this adjustment, for those e-cycle trips that are 'switched' from conventional cycling trips there is a minor incremental health disbenefit that represents the trade-off between physical intensity and journey quality. For those trips that replace trips via less physically demanding modes of travel, there was an incremental positive health benefit. The scale of the net health impacts is articulated in the results section.

The TAG appraisal approach values the benefits of reduced premature mortality but does not capture the impacts on the quality of life (morbidity). Research<sup>25</sup> has suggested that adding morbidity to mortality benefits could represent a 47% uplift to mortality benefits, which is incorporated in sensitivity test 2.

### **Marginal external costs**

Marginal external costs (MECs, also known as externalities) are what users of some modes of travel impose on non-users through congestion, accidents, road damage and various types of pollution. Some modes generate high volumes of MECs, while others generate very few at all (assumed to be negligible for appraisal purposes). Given this, switching to e-cycles from high MEC generating modes is expected to deliver a modest benefit to non-users of e-cycles, i.e. wider society.

The calculation of MEC benefits followed the standard methodology outlined in TAG unit A5.4<sup>26</sup>, using standard MECs values, traffic proportions and diversion factors. Location splits were based on the collection location of the participants in lieu of more detailed tracking data. MECs inputs are provided in TAG for every five years (2025, 2030, 2035 etc.). Values for intermediate years were calculated using interpolation.

### **Journey quality benefits**

Journey quality benefits accrue to participants where they replace previous trips with trips made by e-cycle. As noted previously, these trips could either be thought of as existing cycling trips (switching response) or new cycling trips (demand response). In

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<sup>23</sup> HMT Green Book, paragraphs 6.36 – 6.42, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1063330/Green\\_Book\\_2022.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063330/Green_Book_2022.pdf)

<sup>24</sup> The recommended MET rate for a conventional cycle is 6.8 hours, which was scaled down by 25% to 5.1 hours for the e-cycle estimate.

<sup>25</sup> Woodcock, J. (2014) -. Takes median uplift from UK, cycling-specific studies reported in Woodcock (2014)

<sup>26</sup> TAG unit A5.4 – Marginal External Costs - <https://assets.publishing.service.gov.uk/media/64943365831311000c296183/tag-unit-A5.4-marginal-external-costs.pdf>

either case, participants undertaking more trips via e-cycle could be considered a ‘revealed preference’ response that provided evidence that the e-cycle trip was preferred to the alternative, at least for some journeys. The extent to which this was the case, and reasons for this preference vary from participant to participant, but could include one or more of:

- Reduced journey time;
- Better journey quality;
- Personal health benefit;<sup>27</sup>
- Removal of barrier to e-cycle usage;
- Increased perceived safety; and
- Environmental consciousness, or another personal motivation.

#### *Generalised journey time*

The logic outlined above is consistent with the theory around user benefits and generalised journey time (GJT) presented in TAG, unit A1.3, section 228. The idea of GJT is that some trips provide disutility to users greater than the door-to-door journey time it takes to carry out the trip. In the case of rail travel for example, studies have been undertaken to generate ‘multipliers’ of in-vehicle-time (IVT) that capture the extent to which passengers dislike waiting, interchange, or crowded condition, in relative terms.

Analogously, it’s plausible that the safety risks or required physical exertion associated with conventional cycling create GJT ‘penalties’, or multipliers greater than 1 for journey time. Evidence of a demand response to e-cycling (cycling journeys are replaced by a factor of more than one) is consistent with the GJT theory of travel cost and demand, suggesting that participants perceive a reduction in GJT of some kind.

#### *Demand response*

In the context of rail appraisal, timetabled changes in GJT are used to forecast changes in demand using GJT elasticities, which vary according to journey purpose. Because of the evidence underpinning GJT multipliers and elasticities, and certainty surrounding journey times from timetables, such an approach is typically considered robust.

In contrast, evidence on appropriate GJT multipliers in the context of e-cycles is scarce, though in undertaking this analysis evidence was available regarding:

- Average raw journey times for conventional cycles and e-cycles, from the National Travel Survey (NTS) and e-cycle telematics data<sup>29</sup> (See.Sense);

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<sup>27</sup> It should be noted that there may be a small degree of double counting with the health benefits (reduced risk of premature death) also captured. Given the multitude of other potential journey quality improvements, it wasn’t considered proportionate to attempt to adjust results to capture this.

<sup>28</sup> TAG A1.3, section 2 -

<https://assets.publishing.service.gov.uk/media/63174538d3bf7f792bcfb1a6/tag-unit-a1.3-user-and-provider-impacts.pdf>

<sup>29</sup> Telematics data from See.Sense has been used with caution, often being used to scale and validate other results, given the small sample.

- Average trip distance for conventional cycles and e-cycles, from NTS and See.Sense; and
- The change in cycling trips over the course of the loan period.

Given this, an alternative approach was undertaken to estimate the change in GJT for participants based on a prudent elasticity assumption and the measured change in cycling trips. Such an approach is less robust, given the limited evidence surrounding input parameters, but is consistent with theory underpinned calculation of GJT benefits outlined in TAG.

#### *Value of travel time saving*

Due to concerns about biased self-reported changes in trips, a prudent approach was taken with regards to GJT multipliers (a value of 1, implying no additional penalty), though an alternative multiplier was modelled in sensitivity test 5. TAG best practice is to value changes in GJT using measured value of travel time savings, split according to journey purpose, which was the approach taken for this analysis.

## Appraisal

### Appraisal period and discounting

Starting from a base year of 2022, the costs and benefits of the programme were appraised over both a 20-year appraisal period and an 8-year appraisal period, due to uncertainty surrounding an appropriate appraisal length for a scheme with uncertain longevity potential and no fixed infrastructure. Sensitivity tests were produced which pivot from each of the two central case scenarios.

All costs and benefits were converted into a common unit of account, in keeping with HMT Green Book and TAG best practice:

- Monetised values were converted to 2010 market prices using the GDP deflator index and market price adjustment, where appropriate;
- Monetised values (not including health benefits) were converted to a 2010 perspective using a 3.5% discount rate; and
- Health benefits (reduced risk of premature death) were converted to a 2010 perspective using a 1.5% discount rate.

### Scaling and decay

All modelled benefits were estimated to provide a value for a representative modelled year of operation. In practice, each participant only had the loan for a period of one month, so modelled benefits were scaled down to 8.3% (representing the average month as a proportion of one year).

96.6% of loans were provided in 2023, with 3.4% occurring in 2022. Timing in the year was allocated on a weighted average basis, based on month of collection, and following the loan period, scaling factors were calculated to estimate what proportion of participants were in the 'post-loan period', where the behavioural response would be realised.

As noted in above, survey questions measured participants' self-reported e-cycle ownership rates, alongside the stated likelihood of future e-cycle purchase and use. Changes in the responses to these questions were used to calculate a scaling factor that captured the scale of the increased likelihood of e-cycle purchase (behavioural response) – 11.1%.

This can be interpreted as follows: in the first year following the end of the trial, realisable benefits are likely to be in the order of 11% of what they would have been were the trial to last for a full year for all participants. An alternative formulation was modelled (in sensitivity test 3), which led to a scaling factor of 9.1%.

Following the completion of the programme, it was considered reasonable to expect that the scale of behavioural change would dissipate over time, as it is difficult to generate meaningful change and habit formation over the long-term. To capture this, benefits were decayed at a rate of 7% per annum following the first year of the intervention, based on TAG/AMAT guidance. A lower decay rate of 3.5% per annum was modelled in sensitivity test 1.

## Central case results

### Present values and benefit-cost ratios

DfT's VfM framework<sup>30</sup> outlines the core model outputs that are useful for determining VfM.

- **The present value of benefits (PVB)** is a discounted sum of all the monetised benefits (and disbenefits) expected to be realised during the appraisal period;
- **The presented value of costs (PVC)** is a discounted sum of all the costs to the broad transport budget that are expected to be incurred by DfT during the appraisal period;
- **The net present value (NPV = PVB - PVC)** represents the total net present value of costs and benefits monetised during the appraisal period. A NPV of greater than zero implies the benefits outweigh the costs, and vice versa; and
- **The benefit-cost ratio (BCR = PVB/PVC)** represents the average amount of present value benefit provided by £1 of present value cost. A BCR of greater than one implies a positive NPV, and a BCR of less than one implies a negative NPV.

While output metrics like the BCR and NPV are unable to capture *all* of the potential benefits of a given intervention, they provide a useful signpost to give an indication as to whether an intervention has provided, or is likely to provide, good VfM. DfT's VfM framework (Box 5.1, page 25) provides a set of VfM categories tied to BCR thresholds.

Broadly speaking, if an intervention can achieve a BCR of greater than 1.5 it is considered 'medium' VfM, with higher BCRs awarded greater status. Lower BCRs can achieve categorisations of 'low', 'poor' or 'very poor' VfM.

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<sup>30</sup> Value for money Framework, DfT -

<https://assets.publishing.service.gov.uk/media/5f6237408fa8f5106d15640c/value-for-money-framework.pdf>

## Core results

Table B-5 provides central case appraisal results with a detailed breakdown of types of benefit and cost. The 8-year appraisal achieved a BCR of 0.5, and the 20-year appraisal a BCR of 0.8, both of which are awarded 'poor' VfM according to DfT's VfM categories. The 20-year appraisal was closer to a categorisation of 'low' VfM and achieved that categorisation in some sensitivity tests (see Table B-8).

For both appraisal lengths, the largest contributor to the PVB was journey quality benefits, primarily driven by the large benefits that accrue to existing cyclists that perceive a substantial journey quality impact on their existing trips. The potential for health benefits was limited by the decremental impact of participants shifting their behaviour from conventional cycles to e-cycles, where the required level of metabolic exertion is lower. Lastly, the modelled level of marginal external impacts was very low due to the low levels of total trip km compared to overall car mileage.

**Table B-5: Central case results, 8-year and 20-year appraisal scenarios**

£, 2010 present values	Central Case (8-year appraisal)	Central Case (20-year appraisal)
Total health benefits	£0.2m	£0.2m
Absenteeism	£0.0m	£0.0m
New trips – mortality	£0.4m	£0.7m
New trips – morbidity	£0.0m	£0.0m
Existing trips – mortality	-£0.3m	-£0.4m
Existing trips – morbidity	£0.0m	£0.0m
Total MECs benefits	£0.0m	£0.0m
Congestion	£0.0m	£0.0m
Infrastructure	£0.0m	£0.0m
Accident	£0.0m	£0.0m
Local Air Quality	£0.0m	£0.0m
Noise	£0.0m	£0.0m
Greenhouse Gases	£0.0m	£0.0m
Indirect Taxation	£0.0m	£0.0m
Total journey quality benefits	£1.0m	£1.6m
Existing – commute	£0.4m	£0.7m
Existing – other	£0.3m	£0.6m
New – commute	£0.1m	£0.2m
New – other	£0.1m	£0.2m
<b>Present value of benefits (PVB)</b>	<b>£1.1m</b>	<b>£1.9m</b>
Set-up costs	£1.1m	£1.1m
Operational cost	£1.3m	£1.3m
Pause cost	£0.0m	£0.0m
Residual value	-£0.4m	-£0.4m

<b>Present value of costs (PVC)</b>	<b>£2.0m</b>	<b>£2.0m</b>
<b>Net present value (NPV = PVB - PVC)</b>	<b>-£0.9m</b>	<b>-£0.2m</b>
<b>Benefit-cost ratio (BCR = PVB/PVC)</b>	<b>0.6</b>	<b>0.9</b>

## Sensitivity tests

### Motivation

It is important to test the sensitivity of results to certain modelling inputs, where the appropriate value of the input is subjective, has limited evidence supporting an appropriate value, or is likely to be a significant determinant of results. In selecting sensitivity tests for this appraisal, focus was placed on identifying the parts of the methodology where there was least historical precedent, guidance or supporting literature, namely the quantification of journey time benefits and the adjustment of health benefits to account for the lower levels of physical exertion required for e-cycles compared to conventional cycles.

It was considered appropriate to also test the sensitivity of results to the pro-rating assumptions required to calculate set-up costs that would have likely been incurred if the delivered scheme scope had been agreed upon prior to delivery. Table B-6 outlines the sensitivity scenarios tested and the key assumptions changed to produce outputs.

**Table B-6: Sensitivity scenarios and descriptions**

<b>Scenario</b>	<b>Description</b>	<b>Relevant section</b>
Central case	Central case	-
S1	Reduced decay rate	Scaling and decay
S2	Including morbidity benefits	Health benefits
S3	Alternative probability transformation	Behavioural change
S4	More elastic GJTs	Journey quality benefits
S5	Increase JT to GJT uplift	Journey quality benefits
S6	Reduced new trip km demand response	Journey quality benefits
S7	Increased proportional set-up costs	Scheme definition and costs
S8	Decreased proportional set-up costs	Scheme definition and costs
S9	All costs included	Scheme definition and costs

### Results

Table B-7 and



Table B-8 outline the results of sensitivity tests compared to the central case, for both 8-year and 20-year appraisal lengths.

Figure B-1 and Figure B-2 show graphically the percentage change in BCR achieved for each sensitivity test, measured against the 8-year and 20-year central cases.

Some broad conclusions are as follows:

- Adjusting the decay rate (S1) generated a larger change in BCR in the 20-year appraisal compared to the 8-year appraisal. This is intuitive given that changes in the decay compound over time;
- Reducing the new trip km demand response (S7) had a uniformly substantially negative impact on overall results across both appraisal lengths;
- Scenarios 3, 4 and 5 had a modest impact on BCR achieved across both appraisal lengths;
- Including a GJT uplift parameter (S6) had the largest positive impact on BCR of all the sensitivity tests, across both appraisal lengths. Intuitively, combining S6 and S7 together would cancel out and generate BCRs very similar to the central case results;
- Manipulating the set-up costs (S7, S8) generated modest changes in BCR, in either direction. This was due to a) the existence of the inclusion of residual asset values, which scale in the opposite direction, and b) operating costs also being a substantial proportion of the PVC; and
- Incorporating the full costs of the expanded scope (S9) had a substantially negative impact on the BCR.

Broadly speaking, unless there is reason to believe that core assumptions for the decay rate or GJT uplift are wildly off-base, **and that no assumptions are incorrect in the opposite direction**, the sensitivity tests provided little evidence to support a fundamental change in the core findings.

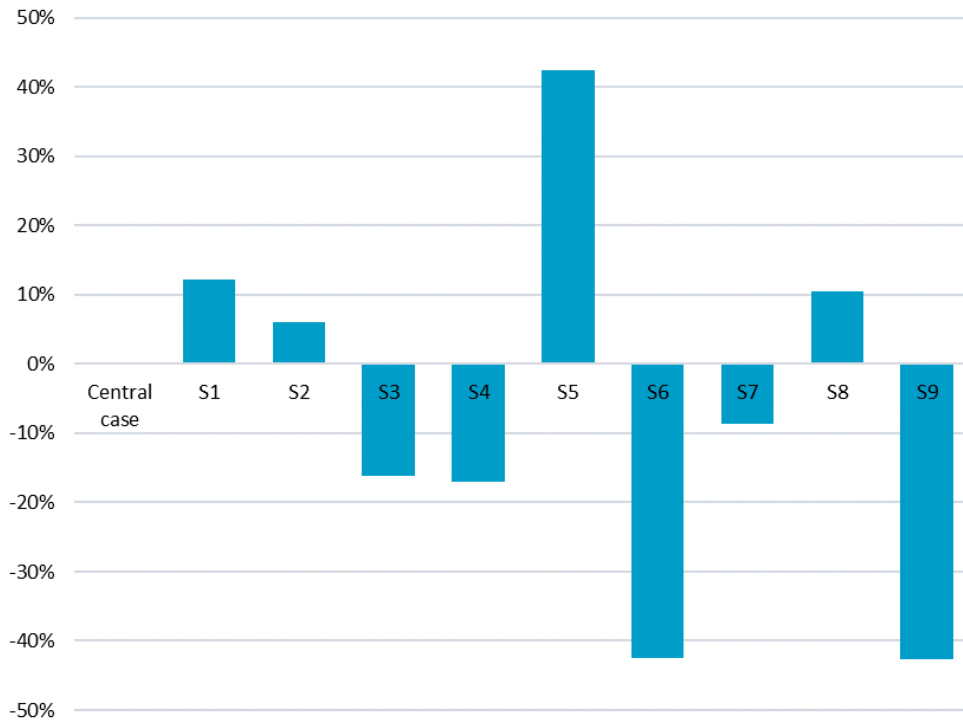
**Table B-7: Results – Sensitivity tests (8-year appraisal)**

£, 2010 present values	Central case	S1	S2	S3	S4	S5	S6	S7	S8	S9
Total health benefits	£0.2m	£0.2m	£0.2m	£0.1m	£0.2m	£0.2m	£0.2m	£0.2m	£0.2m	£0.2m
Total MECs benefits	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m
Total journey quality benefits	£1.0m	£1.1m	£1.0m	£0.8m	£0.8m	£1.5m	£0.5m	£1.0m	£1.0m	£1.0m
<b>PVB</b>	<b>£1.1m</b>	<b>£1.3m</b>	<b>£1.2m</b>	<b>£1.0m</b>	<b>£0.9m</b>	<b>£1.6m</b>	<b>£0.7m</b>	<b>£1.1m</b>	<b>£1.1m</b>	<b>£1.1m</b>
Set-up costs	£1.1m	£1.1m	£1.1m	£1.1m	£1.1m	£1.1m	£1.1m	£1.4m	£0.7m	£1.9m
Operational cost	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£2.4m
Pause cost	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.2m
Residual value	-£0.4m	-£0.4m	-£0.4m	-£0.4m	-£0.4m	-£0.4m	-£0.4m	-£0.5m	-£0.3m	-£0.7m
<b>PVC</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.3m</b>	<b>£1.8m</b>	<b>£3.9m</b>
<b>NPV</b>	<b>-£0.9m</b>	<b>-£0.8m</b>	<b>-£0.8m</b>	<b>-£1.1m</b>	<b>-£1.1m</b>	<b>-£0.4m</b>	<b>-£1.4m</b>	<b>-£1.1m</b>	<b>-£0.7m</b>	<b>-£2.7m</b>
<b>BCR</b>	<b>0.6</b>	<b>0.6</b>	<b>0.6</b>	<b>0.5</b>	<b>0.5</b>	<b>0.8</b>	<b>0.3</b>	<b>0.5</b>	<b>0.6</b>	<b>0.3</b>
<b>Change in BCR</b>	-	<b>+12%</b>	<b>+6%</b>	<b>-16%</b>	<b>-17%</b>	<b>+43%</b>	<b>-43%</b>	<b>-9%</b>	<b>+11%</b>	<b>-47%</b>

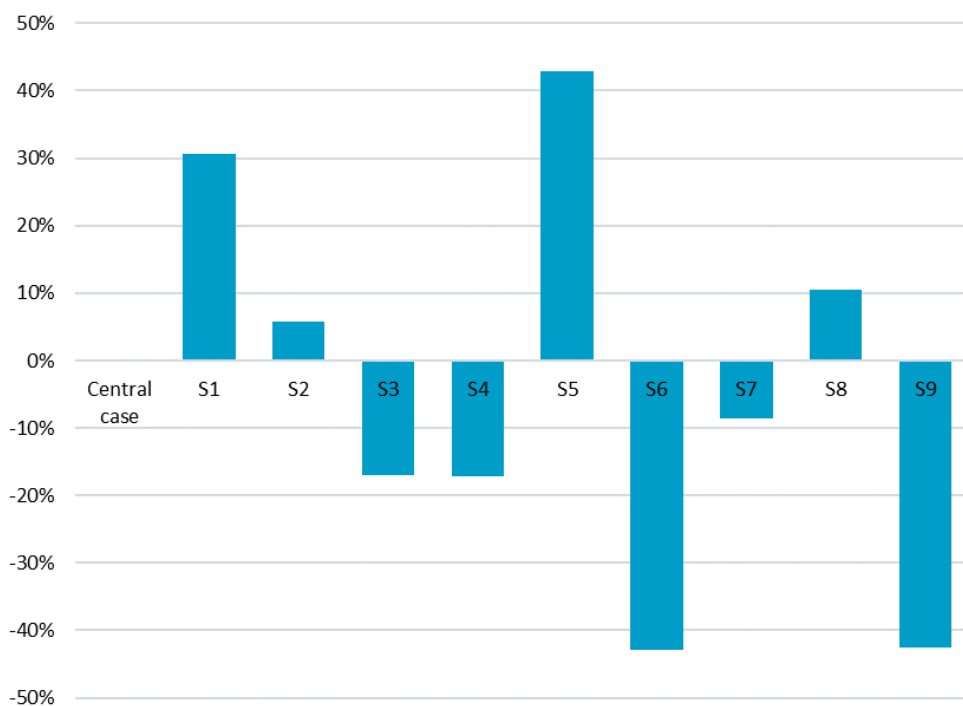
**Table B-8: Results – Sensitivity tests (20-year appraisal)**

£, 2010 present values	Central case	S1	S2	S3	S4	S5	S6	S7	S8	S9
Total health benefits	£0.2m	£0.3m	£0.3m	£0.2m	£0.2m	£0.2m	£0.2m	£0.2m	£0.2m	£0.2m
Total MECs benefits	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m
Total journey quality benefits	£1.6m	£2.1m	£1.6m	£1.3m	£1.3m	£2.4m	£0.8m	£1.6m	£1.6m	£1.6m
<b>PVB</b>	<b>£1.9m</b>	<b>£2.4m</b>	<b>£2.0m</b>	<b>£1.5m</b>	<b>£1.5m</b>	<b>£2.7m</b>	<b>£1.1m</b>	<b>£1.9m</b>	<b>£1.9m</b>	<b>£1.9m</b>
Set-up costs	£1.1m	£1.1m	£1.1m	£1.1m	£1.1m	£1.1m	£1.1m	£1.4m	£0.7m	£1.9m
Operational cost	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£1.3m	£2.4m
Pause cost	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.0m	£0.2m
Residual value	-£0.4m	-£0.4m	-£0.4m	-£0.4m	-£0.4m	-£0.4m	-£0.4m	-£0.5m	-£0.3m	-£0.7m
<b>PVC</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.0m</b>	<b>£2.3m</b>	<b>£1.8m</b>	<b>£3.9m</b>
<b>NPV</b>	<b>-£0.2m</b>	<b>£0.4m</b>	<b>-£0.1m</b>	<b>-£0.5m</b>	<b>-£0.5m</b>	<b>£0.6m</b>	<b>-£1.0m</b>	<b>-£0.4m</b>	<b>£0.0m</b>	<b>-£2.0m</b>
<b>BCR</b>	<b>0.9</b>	<b>1.2</b>	<b>1.0</b>	<b>0.8</b>	<b>0.8</b>	<b>1.3</b>	<b>0.5</b>	<b>0.8</b>	<b>1.0</b>	<b>0.5</b>
<b>Change in BCR</b>	<b>0%</b>	<b>+31%</b>	<b>+6%</b>	<b>-17%</b>	<b>-17%</b>	<b>+43%</b>	<b>-43%</b>	<b>-9%</b>	<b>+11%</b>	<b>-47%</b>

**Figure B-1: Percentage change in BCR from the central case: 8-year appraisal**



**Figure B-2: Percentage change in BCR from the central case: 20-year appraisal**



## Conclusions

The VfM component of the evaluation was underpinned by a cost-benefit appraisal of the e-cycles loan component of the scheme. The key inputs for this appraisal came from a comparison of surveys conducted before and after the intervention, alongside telematics tracking data provided for a subset of participants. These outputs enabled the estimation of:

- Participants' cycling habits prior to the loan period;
- Participants' cycling habits during the loan period, mostly diverted from conventional cycles; and
- What proportion of new trips undertaken during the loan period were purely 'new' trips, and what proportion from other non-cycling modes.

The appraisal considered separate flows of benefit:

- Those benefits that accrued during the loan periods (2022 – 2024); and
- Uncertain future benefits expected to stem from behavioural change.

There are three types of benefits that were monetised and appraised:

- Changes in health outcomes for participants, and changes in output resulting from fewer days of work missed;
- Benefits to non-users, stemming from a reduction in trip km undertaken by alternative modes; and
- Benefits arising from a perceived improvement in 'journey quality'.

Results are provided for two different appraisal lengths; 8 years and 20 years, reflecting the uncertainty surrounding the appropriate value for a non-infrastructure intervention. In deciding which is the better reflection of reality, more weight should be given to the 8-year appraisal period given the limited guidance available<sup>31</sup>. Both scenarios achieved a BCR lower than 1, which qualifies for 'poor' VfM according to the VfM categories defined by DfT. This result was primarily driven by low magnitudes of health benefits and MEC benefits. The strongest benefit category was journey quality, which is also the least robust and evidence-based.

After the scheme had been designed and roll-out had begun, but prior to the majority of loans being delivered, the scheme scope and delivery mechanism was altered, leading to a pause period and the scheme length being reduced from four years to one year. The scheme delivery costs provided were adjusted to reflect these changes, and provide a realistic picture of what it would have cost to deliver the scheme had the final delivery model been scoped ex-ante.

These aforementioned costs were used for the two central case scenarios, and most of the sensitivity tests that pivoted from them. However, an 8-year and a 20-year appraisal scenario were tested, using the full delivery costs including the costs of

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<sup>31</sup> <https://assets.publishing.service.gov.uk/media/631744188fa8f50220e60d1a/active-model-appraisal-toolkit-user-guidance.pdf>

pausing delivery in July 2022. These scenarios, labelled sensitivity 9, intuitively provide a worst assessment of VfM, generating BCRs of 0.3 and 0.5 respectively. These results should be best interpreted as the VfM of the 'delivered scheme', while the core results should be interpreted as the potential VfM of replicating the scheme in the future.

Both the 8-year and 20-year appraisal scenarios were used as the basis for nine sensitivity tests, which explored the sensitivity of results to changes in key input assumptions. With the exception of S2, which flexed the decay assumption, the sensitivity tests produced results of similar magnitude and direction in each scenario. Broadly speaking, the conclusions of the analysis were robust to the results of the sensitivity tests, and outside of a few select tests, the conclusion of 'poor' VfM tends to hold.

**Table B-9: Summarised appraisal results**

<b>£, 2010 present values</b>	<b>Central Case: 8-year appraisal</b>	<b>Central Case: 20-year appraisal</b>
Total health benefits	£0.2m	£0.2m
Total MECs benefits	£0.0m	£0.0m
Total journey quality benefits	£1.0m	£1.6m
<b>Present value of benefits (PVB)</b>	<b>£1.1m</b>	<b>£1.9m</b>
Set-up costs	£1.1m	£1.1m
Operational cost	£1.3m	£1.3m
Pause cost	£0.0m	£0.0m
Residual value	-£0.4m	-£0.4m
<b>Present value of costs (PVC)</b>	<b>£2.0m</b>	<b>£2.0m</b>
<b>Net present value (NPV = PVB - PVC)</b>	<b>-£0.9m</b>	<b>-£0.2m</b>
<b>Benefit-cost ratio (BCR = PVB/PVC)</b>	<b>0.6</b>	<b>0.9</b>

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