
BIKEFY TRIAL
04.09.–02.10.2017
Vantaa
HSL
HRT
HSY

This report presents the findings from the Bikefy trial that took place in the Helsinki metropolitan area in September 2017.

The trial was funded jointly by the Helsinki Region Environmental Services Authority HSY, Helsinki Regional Transport Authority HSL and the City of Vantaa.

First the concept behind Bikefy and its background are outlined in section one.

Following that the trial setup and its goals are described in section two.

The findings from the four week trial phase are presented in section three.

Conclusions based on those findings are drawn in section four.

Helsinki, 11.12.2017

EXECUTIVE SUMMARY

In spring 2017 the three Aalto University masters students in Creative Sustainability Manuel Arias Barrantes, Nicolas Dolce and Norbert Schmidt developed the Bikefy concept of combining public transport with electric folding bikes in a project with the Helsinki Region Environmental Services Authority HSY and the City of Vantaa.

The goal is to offer an attractive alternative for door-to-door commuting without having to rely on cars.

This concept was successfully tested in a small scale trial in the Helsinki metropolitan area during 4. September and 2. October 2017. This trial was jointly funded by the Helsinki Region Environmental Services Authority HSY, the Helsinki Regional Transport Authority HSL and the City of Vantaa.

Trial participants were mostly happy with the combination of electric folding bikes and public transport and would welcome the introduction of a bundle offer consisting of a monthly public transport ticket and an electric folding bike.

However, due to the high price sensitivity of individual customers it appears advisable at the current stage to develop this service further with a focus on (larger) employers. For that target audience a higher monthly price point that is currently required to cover costs could be less of an obstacle, as the service offers clear benefits. Increased employee health and fewer sick days resulting from those promise cost savings as well as productivity benefits. Additionally costs that are currently related to car parking and car operating could be decreased.

A larger scale pilot should be carried out following this explorative trial phase to further investigate these assumptions and to create a better understanding for the actual service operation costs. This limited trial was not designed to answer the latter question.

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01. CONCEPT

Bikefy

The core idea behind the Bikefy concept is to combine public transport and electric folding bikes by offering the bike at a monthly fee on top of the public transport ticket.

Combining public transport and cycling in that way would alleviate many issues that are currently preventing potential users from choosing to combine public transport and cycling. Some of these issues keeping people from combining cycling and public transport include missing parking spaces for bikes (especially at bus and tram stops), safety concerns when leaving an own bike parked at a station/stop, long distances to the nearest stop (depending on the time of day) or connections including frequent changes or long waiting times in between. Additionally, cycling longer ways during the commute has many commuters worrying about arriving at work or to meetings sweating too much.

The Bikefy concept of integrating electric folding bikes with existing public transport offerings would address these issues.

In the Helsinki metropolitan area folding bikes are allowed to be taken on any currently existing means of public transportation, be it trains, metros, ferries, trams or even busses. This allows for great flexibility when choosing routes and opening up new opportunities with regard to choosing the most convenient or fastest route as the electric folding bike increases the radius in which to chose stations or stops from close to the points of origin or destination.

Allowing for the bike to be taken onto any means of public transportation also decreases the need for secure bike parking spaces at stops or stations and eliminates the worry of having the bike stolen while leaving it locked at unsafe places.

The additional benefit of an electric folding bike would be that even longer distances or hilly terrain can be overcome without sweating, making this mode of transport also attractive to commuters who cannot or do not want to change clothes when using a bike during their commute or when going to meetings.

Background

The Bikefy concept was developed by the three Aalto University masters students in Creative Sustainability Manuel Arias Barrantes, Nicolas Dolce and Norbert Schmidt during the course Capstone in Creative Sustainability in spring 2017.

In this course the Helsinki Region Environmental Services Authority HSY together with the City of Vantaa presented the students with the challenge to develop ideas regarding the creation of low carbon station areas.

Throughout the project the focus was put on the transport chain and how people get to said station areas, at which point the Helsinki Regional Transport Authority HSL also became involved with the project.

From there on the concept of Bikefy was concretised and presented in the final presentation on 5. April 2017.

Following this course work Norbert Schmidt has worked with HSY, HSL and the City of Vantaa to further develop the concept and carry out the trial which is the topic of this report.


02. TRIAL

Overview

The trial took place from 4. September to 2. October 2017 in the Helsinki metropolitan area (Helsinki, Espoo, Vantaa). A Kick-off workshop taking place on 24. August 2017 preceded the actual trial phase.

During those four weeks six participants tried out seven different bikes in combination with public transportation. Every participant got to try both an electric as well as a conventional folding bike, each for two weeks in total.

In addition to the bikes, the participants were provided with a regional public transport ticket covering Helsinki, Espoo and Vantaa free of charge for the duration of the trial. They were also provided with locks and helmets.

The participants got to keep the helmets at the end of the trial as they could not be reused for hygienic reasons. The locks were returned together with the bikes.

This trial was jointly funded by the Helsinki Region Environmental Services Authority HSY, the Helsinki Regional Transport Authority HSL and the City of Vantaa. It was carried out by Norbert Schmidt in cooperation with HSY, HSL and the City of Vantaa. The bikes were rented from Kultaiset Pojat Oy.

Goals

The main goal of this trial was to test the Bikefy concept developed during the Aalto University course Capstone in Creative Sustainability in spring 2017 and gather real world insights to find answers to the following questions:

1. To which extend can combining public transportation with (electric) folding bikes be an attractive offer to commuters currently mainly commuting by car?
2. What would be a price that users might be willing to pay for such an offer?
3. Would electric folding bikes be preferable over conventional folding bikes for such an offer?
4. Which issues need to be investigated further?

Due to the limited scope of this trial described in the following sections this trial was an explorative study to gather insights that would help determine whether moving on with developing the concept of combining (electric) folding bikes and public transport in a bundled offering appears meaningful.

Sample

There were a total of six trial participants who took part in the four week long trial.

The participants were aged 45 - 59 and out of the six participants three were male and three female.

The participants' places of residency were spread across Helsinki, Espoo and Vantaa, with two participants, one male and one female, living in each of these cities.

Five out of the six participants were regular car commuters, only occasionally using public transport

One female participant living in the Helsinki city centre was an avid cyclist and stated that she usually commutes to work and back, approximately 18 km per route, with her own single speed bike.

Recruitment

The participants were recruited by the City of Vantaa among employees working at different companies located at the business parks Plaza and Gate8 at Äyritie 8-24, 01510 Vantaa.

As the call for participation first happened via email during the summer holiday season, with the deadline for applications on the 14. August, initial response unfortunately was quite low.

Eventually direct marketing efforts at the business parks in mid August resulted in more signups than places available. This however led to decreased choice of participants as time pressure eventually resulted in a first come first serve confirmation practice.

The even gender distribution, especially across places of residency is thus a lucky coincidence.

Bikes

All in all a total of seven bikes were tested by the trial participants. Initially the trial was to include only six bikes, but due to a delay in the delivery of the Vello Bike+ and the need for a bike with a slightly higher weight limit a seventh bike, the electric Beixo Compact-E was added to the bike selection. This one was then only used by one male participant as its weight is significantly higher than that of the other bikes.

In order to still get feedback on the Vello Bike+ from both a female and a male user it was given to an additional person for four days of week two.

Each regular trial participant used one conventional folding bike and one electric folding bike, each for two weeks.

Except for the aforementioned Beixo Compact-E all bikes came in at roughly 12-13 kg.

For an overview of the bikes' features see Table 1 on page 18.

The bikes differed in wheel size, drivetrain and folding mechanism and retail at between 850,00€ and 2300,00€.

The idea behind testing so many different bikes was to identify features that would be especially useful but might only be available in certain bikes.

While the chain is currently the most common drivetrain option the trial aimed at including bikes that offer belt drives as well. With a belt drive the chain is replaced by a carbon belt that does not need any greasing and is said to be much more durable than standard chains. Besides lower maintenance needs it also promises to be cleaner due to the lack of oil/grease.

The cardan drive promises similar advantages over a regular chain drive as it is a closed system where no oil or grease gets onto the user's clothes. However, compared to regular chain drives or increasingly common belt drives this system comes with

a significant weight disadvantage. It could thus only be found on the heavier Beixo Compact-E.

Most electric bikes would assist the rider up to a speed of 25 km/h after which all power needs to be put forward by the rider. This is conforming with EU regulations. Only the Ahooga was an exception in that regard as it only assists until 20 km/h which means the rider will need to use more own power. According to the manufacturer the intention is that the electric assist is mostly used for steeper climbs while it otherwise acts like a regular bike with its seven derailleur gears.

In order to save weight the lightweight electric bikes usually have a range of around 30 km per charge. The heavier Beixo Compact-E would offer a 70 km range, but at the cost of a larger and thus much heavier battery.

An exception to this is the special engine system of the Vello Bike+. This bike claims to offer unlimited range without recharging. The way it tries to achieve this is by a special software setting of the engine that recuperates energy when going downhill or above a certain speed.

Both the Uma and the Vello Bike+ come with an app that can be installed on the user's smartphone to change the electric support settings. While the Uma offered two different levels of support and the option of switching off the support completely, the Vello Bike+ offered six different levels of support. With the "turbo" mode a range of roughly 30 km should be possible on a single charge while the other settings offer increasingly more range at the cost of less support or more drastic recuperation. Changing the support settings of these two bikes is not possible without the smartphone app.

The Ahooga and the Beixo Compact-E have different versions of control panels on the handlebars which allow for changing the level of support easily, even while riding. Both offer five different levels of support and an option of zero support. The Beixo Compact-E displays other trip data as well such as speed,

km driven etc. while the Ahooga only displays the support level.

All electric bikes but the Vello Bike+ had a battery that was detachable from the bike. In the Vello Bike+ the battery and motor are combined in the back wheel. Therefore the whole bike always needs to be brought close to a power outlet to be charged.

The batteries on the Uma and the Beixo Compact-E featured a lock to prevent them from being stolen. The battery on the Ahooga has no lock but the connector cable needs to be unscrewed. This offers an increased risk for battery theft while also making it somewhat harder to detach the battery from the bike for charging it independently from the bike.

TRIAL

Ahooga

Uma

Beixo Crosstown

Brompton H6L

	Weight	Size Folded (lengt x height x width)	Wheel Size	Gears
Electric				
Ahooga	13,0 kg	85cm x 74cm x 30cm	20″	7, derailleur
Uma	13,5 kg	87cm x 67cm x 38cm	16″	1
Vello Bike+	12,5 kg	72cm x 53cm x 23cm	20″	1
Beixo Compact-E	20,5 kg	82cm x 65cm x 40cm	20″	7, hub
Non-Electric				
Beixo Crosstown	12,2 kg	74cm x 65cm x 35cm	16″	3, hub
Brompton H6L	12,3 kg	59cm x 57cm x27cm	16″	6, hub
Tern C7i	13,4 kg	85cm x 60cm x 35cm	20″	7, hub

Vello Bike+

Beixo Compact-E

Tern C7i

Table 1: Bike specifications

	Drivetrain	Retail Price	E-Assist Speed	E-Assist Range	Motor position
Electric					
Ahooga	Chain	2.300,00 €	20 km/h	30 km	rear
Uma	Chain	1.350,00 €	25 km/h	30 km	rear
Vello Bike+	Belt	2.300,00 €	25 km/h	30 km - ∞	rear
Beixo Compact-E	Cardan	2.000,00 €	25 km/h	70 km	front
Non-Electric					
Beixo Crosstown	Belt	800,00 €	—	—	—
Brompton H6L	Chain	1.400,00 €	—	—	—
Tern C7i	Chain	850,00 €	—	—	—

Locks

The locks used during the trial were foldable ABUS Bordo Lite 6050 models. They were chosen due to their relatively low weight of 650g at a relatively small size compared to the promised level of protection. Heavier, bigger locks would of course be more secure, but defeat the purpose of lightweight (electric) folding bikes. These locks rank at level 7/15 on ABUS' own security scale.

The retail price of these locks is about 50,00€ per piece.

The locks were provided to the participants for free for the duration of the trial and had to be returned at the end of the trial.

Helmets

The participants were provided with nutcase helmets from the Street line free of charge. They could choose their preferred size and colour in advance.

These helmets retail at around 80,00€.

Due to hygienic and safety reasons it would not have been possible to reuse the helmets after the trial. Therefore the participants got to keep the helmets to themselves.

Data Collection

Data collection during the trial happened in different forms and at multiple times during the trial.

The trial started with a Kick-Off workshop whose results were document on flip charts.

During the trial a total of three interviews were conducted with every participant.

Additionally weekly feedback was gathered through online surveys.

After the trial had ended, participants were asked to evaluate the whole process through a final online survey.

Kick-off Workshop

The Kick-off workshop happened on the 24. August 2017 at the Plaza business park in Vantaa and took two hours.

The goal of the workshop was to get an initial understanding of the participants' commuting routines and their hopes and expectations toward the trial. It also aimed at clearly communicating the process of the trial as well as outlining the role of the participants' feedback.

Therefore the workshop was split into three main parts. In a shorter informative session in the beginning Pia Tynys (HSY) outlined the motivations behind the trial and the different actors' involvement and Norbert Schmidt presented the core idea of the Bikefy concept.

The second part of the workshop was an interactive one. Through group work on three different questions the participants addressed the following topics:

1. How does your current commute impact your daily schedule?
2. What were your motivations to take part in this trial?
3. Which expectations do you personally have regarding your commute during the trial?

The workshop was concluded by Tarja Jääskeläinen (HSL) giving an overview on cycling in the Helsinki metropolitan area in general and how to combine it with HSL's other modes of transportation in specific.

Interviews

During the course of the trial there were three scheduled meetings with the six participants in order to hand out and/or collect the bikes. At each of these meetings interviews were conducted to document the participants' initial reactions to the bikes, feedback and general comments.

Those interviews thus took place during the bike handouts at 4. September, the switching of the bikes on 18. September and when eventually collecting the bikes on 2. October.

All meetings were scheduled for 30 minutes. During the bike handouts and the switching of the bikes the interviews happened simultaneously to showing the bikes and explaining their features.

Interview guides were prepared for all three meetings to carry out the interviews as semi-structured interviews. As the initial bike handout and the switching of bikes were accompanied by instructions on how to fold and unfold the bike and those meetings thus happened together with the collaborating bike shop owner who demonstrated the bikes, those interviews ended up being a rather free discussion of the participants' thoughts and experiences regarding the bikes and their commutes. While the relatively short time frame of 30 minutes did not allow to cover

all questions of the interview guides in all interviews it allowed for interesting insights to be shared by the participants and exploring of topics that might otherwise not have come up.

The final interview happened when the participant's returned the bikes and was carried out as a semi-structured interview based on an interview guide as well. The time frame for each meeting was again 30 minutes, though some interviews would carry on for slightly longer as time permitted. In this setting, the participants would actually sit down with the interviewer to discuss their experiences during the trial without the focus lying on the bike. This final interview focussed on the participants' reception of the general concept behind Bikefy including for example pricing and whether it could be bundled with different other services such as health care packages.

The guide lines for the three interviews can be found in the Appendix (pages 64ff).

Online Surveys

Two different kind of online surveys were carried out during and after the trial phase to collect both weekly feedback at the end of every trial week as well as concluding feedback after the trial phase was over.

Weekly Surveys

The weekly feedback was called for every Friday by sending out a link to the feedback form to the participants via email. The participants would fill this form on Friday evening or in the beginning of the following week, allowing for a continuous monitoring of the progress of the trial and potential problems arising.

The largest part of the weekly feedback forms addressed the modal choices for the commute for each day for mornings and evenings separately.

Additionally the participants were asked to rate certain characteristics of the bike they were using at the time regarding weight, size and overall handling.

Open questions allowed for feedback on outstanding positive or negative experiences during the week, comments on using the bike for non-commuting purposes as well as general comments or concerns.

Even though answering these open questions was not mandatory, many participants would make use of them, mostly reporting positive experiences.

Answering this survey usually took the participants no longer than five minutes.

For a detailed overview of the weekly feedback survey see pages 68ff.

Final Evaluation

A final online survey covered the participants' feedback on the trial in general and which bikes

For a detailed overview of the final evaluation see pages 72ff.

Facebook Group

As an additional channel for the participants to connect with each other and share tips and tricks a closed Facebook group was established.

Additional Data

In addition to the six participants who took part in the four week trial there were two participants, one female and one male, who did some testing of one bike each.

The additional female participant used the electric Vello Bike+ for parts of the second week of the trial. It was handed to her on the afternoon of Tuesday, 12. September, and collected from her in the evening of Friday, 15. September.

The bike had to be collected from her on Friday evening in order to appear on a TV show interview regarding the trial the following Monday morning. This left her with six commutes to use the bike for as well as some time to try the bike for non-commuting related riding. She was interviewed regarding her experiences with the bike as well as her thoughts on the Bikefy concept in general. Additionally she filled in the weekly feedback form for week two.

Having her join the trial for this limited amount of time resulted from two things: One trial participant exceeded the maximum allowed weight for the three lightweight electric bikes of the trial. It had therefore been agreed with him in beforehand that he would get to use an electric folding bike with a slightly higher maximum driver's weight at the cost of it weighing 20,5 kg. The second reason was a delayed delivery of the Vello Bike+ to Finland which made it impossible to have it in the trial right from the start. In order to still get feedback on the bike by both a female and a male user it was decided to have an additional user test the bike for the limited time left in week two.

The additional male participant was the husband of one of the trial participants. He used the conventional folding bike given to her during week four as she was on an extended business trip for the whole week and could therefore not do any testing of the bike herself. He also filled in the weekly feedback form for week four on her behalf.

Additional feedback on the concept and an electric was collected in short test ride sessions on 16. and 17. September as well as in the morning of 12. September. In these short test rides a total of six female and two male people would provide feedback on the bike and the concept.

Furthermore a two hour long event was held at the Plaza business park in Vantaa on Monday 18. September to mark the beginning of the European Mobility Week by showcasing different alternative mobility solutions. All bikes were available during this event for everyone interested to test out, but no recordings or notes were made.

Media Coverage

There were media reports at three occasions during and after the trial.

Most notable is an appearance on MTV3's live morning TV show Huomenta Suomi on Monday, 18. September between 07:09 and 07:15.[1]

Additionally Vantaan Sanomat covered the trial with two articles, one published on 20. September 2017[2] after the European Mobility Event in Vantaa on 18. September and a second one published on 17. October 2017[3] after the trial phase had ended.

In addition to external media coverage the trial was also advertised through own social media channels on Facebook, Twitter and Instagram and by news posts to the website www.bikefy.eu. Posts on Twitter were shared by accounts from HSY, HSL and the City of Vantaa.

1 Huomenta Suomi - Maanantai 18.9. klo 6:25. (2017, September 18). Huomenta Suomi. Helsinki: MTV3. Retrieved from https://www.katsomo.fi/#!/jakso/33001003/huomenta-suomi/802494/maanantai-18-9-klo-625

2 Massinen, T. (2017, September 20). Työmatkalainen jätti autonsa kotiin ja hyppäsi sähköpyörän satulaan: 'Silmiä avaava kokemus'. Vantaan Sanomat. Retrieved from http://www.vantaansanomat.fi/artikkeli/561593-tyomatkalainen-jatti-autonsa-kotiin-ja-hyppasi-sahkopyoran-satulaan-silmia-avaava

3 Massinen, T. (2017, October 17). Kokeilu osoitti: Joukkoliikenteen ja pyörän yhdistelmä voi korvata auton työmatkailussa. Vantaan Sanomat. Retrieved from http://www.vantaansanomat.fi/artikkeli/570434-kokeilu-osoitti-joukkoliikenteen-ja-pyoran-yhdistelma-voi-korvata-auton

Limitations

As described above, the sample size was rather small and the trial lasted only four weeks. During that time a maximum of two trial participants was able to test each individual bike, which limits the comparability of the bike ratings.

All the participants were furthermore intrinsically motivated to test out something new, as in this case electric folding bikes combined with public transportation. It might thus be assumed that the trial participants could be somewhat more open to the idea than other people.

While the sample was diverse regarding gender and municipality of residence the age range was not as diverse as initially hoped for, including neither participants below the age of 45 nor above the age of 59.

As the feedback of one additional participant indicates the effect of such a combination could also be quite different based on the area the workplace is located in.

However, as mentioned above, this trial was an explorative first step and the insights gathered can still serve as a basis to consider further development of the concept.

This was apparently the first trial specifically exploring the combination of public transportation and electric folding bikes.

A larger scale pilot would be necessary to determine the scalability of this concept.

03. FINDINGS

Kick-off Workshop

Due to business trips not all six participants were able to attend as the workshop took place on Thursday, 24. August 2017 between 09:00 and 11:00. Only three participants were able to join in person. However, the remaining three participants contributed their answers to the questions discussed during the workshop via an online survey.

The three questions addressed were:

1. How does your current commute impact your daily schedule?
2. What were your motivations to take part in this trial?
3. Which expectations do you personally have regarding your commute during the trial?

Daily Schedule

As all the trial participants present at the workshop were mainly using the car to commute they discussed issues that had so far kept them from choosing public transport or cycling as alternatives.

The reasons brought up were

- weather conditions,
- running errands on the way,
- hobbies,
- dropping off children,
- inflexible working hours,
- varying locations that are difficult to access,
- amount of changes necessary.

With regard to hobbies equipment intensive activities like Ice Hockey were mentioned in which case the car would also serve as a storage space during the day as there would be no time to get home between work and trainings.

Dropping of children was a major motivation for relying on a car as schools or day cares could be spread quite far and not easily reachable in

time during the commute otherwise. The majority of trial participants said that they were open to exploring new alternatives for their commute now that they would not have to drop off children on a regular basis anymore. This could explain the somewhat higher age of the sample group as no participant was under 45.

While the car was appreciated for not having to care about the weather, it did require additional route planning for some to avoid congestion for which weather could also be a reason.

Public transport was especially unpopular when connections would require multiple changes with waiting time in between, especially when working hours would not allow for adapting the commute to better (e.g. later or earlier) connections.

Another reason for choosing the car was the necessity of getting to various different places throughout the day, especially when those would be more difficult to reach during off-peak hours.

Motivations

The main motivations brought up for joining the trial were:

- fun,
- curiosity (for electric bikes),
- reducing the environmental footprint,
- health benefits,
- saving money compared to commuting by car,
- gaining flexibility also throughout the day to get to meetings.

By far the most frequently mentioned motivation was a general interest in trying something new, which was very closely related to an interest in electric bikes. Most of the participants had previously heard about electric bikes and wanted to experience whether they could actually be a suitable alternative for them and whether worries about the range, battery technology etc. were justified or not.

There was an awareness among the participants that this kind of combination could be beneficial to their individual health while simultaneously saving money compared to commuting by car and also doing something good for the environment.

Expectiations

Very closely connected to the individual motivations for joining the trial were the expectations the participants brought up:

- fun,
- increasing personal health,
- saving money,
- lowering emissions,
- reducing the need for having a car,
- saving time compared to using public transport alone,
- cycling the whole way with electric assistance,
- increased flexibility,
- increased need for planning according to weather,
- having to get up earlier and a need for reorganising the morning schedule.

While most of these were positive and largely identical to the reasons for joining the trial, the participants also anticipated that they would need some time to get used to this, to them, new way of commuting. They expected it to last longer than commuting by car only and were therefore slightly concerned that they would have to get up earlier and spend more time preparing for the next morning's commute especially with regard to changes in the weather.

Question 1
- no kids to kindergarten
- lazyness reason to drive car
- route (smallest road) chosen to avoid congestion
- weather conditions encourage to use car
- the shopping mall is easy to drop by car
- no actual reason to use car
- when both working, the one using car took children to the kindergarten, the other one used PT
- OR one drops off and one pics up the kids
- tight working hours would affect a lot

- Flexible
- Child to kindergarden
  - 30 km
  - 1 car
  - working during commute
  - daily planning needed to fit for family
  - TIME! critical
  - Stops in 100m only
  - Location,
  - 50 km
  - 2 cars
  - 100-200 km/daily
  - child to school
  - ice hockey! Train 1/h

3. Expectations
- enjoining the trip: just sit and relax, read
- also worries about if the PT/trains have disruptions
- becoming more experienced cyclist > could cycle even longer routes
- easy and fluent
- practical equipments in the bike? e.g. front basket to carry things?
- new flexible connections during the work day
- how e.g. weather affects to clothing?
- how much electricity ease the cycling?

Expectations on commute during trial?

Pros:
- Fun! Different.
- Fresh air
- Potential to cycle the whole way
  - health
  - environment
- Novelty of folding bike, cool (opportunity and a reward)
- Mix-and-Match commute: can use eg. Tikkurila as well, if feels like it.

Cons:
- Need to consider weather
- Need to get up earlier
- Need to re-organize morning routine
- Need to know the weather in the afternoon as well.

Question 2 Motivation to join
- for the fun!
- environmental reasons
- healthy reasons
- earlier thoughts about e-bikes: worries about thefths, durabilaty of batteries
- nice to try out something new
- no economical reasons
- free PT-ticket encourages to try/use more PT
- sceptical thoughts about foulding bikes

Motivation for joining the trial?

- willingness to try new things.
- practical if Länsimetro opens during trial
- opportunity to stop using the bus
- interest in e-bikes and trials
- practical during work day: traveling from meeting to meeting

IF I took part in the trial...
- time for other things during commute → practical

Modal Choices

The bikes as well as the public transport tickets were handed out to the participants on Monday, 4. September 2017, and collected four weeks later on Monday, 2. October 2017. This meant that the users had to get to their work, where they would receive the bikes, without the bike and also return from their without it four weeks later. All in all a total of 240 commutes would have been possible with the bike during those four weeks. Data on the commutes however was collected for the 20 days from Monday morning, 4. September, through Friday evening, 29. September. Out of the 240 commutes during that time frame, a total of 198 commutes were made. The remaining 42 commutes were not made because of business trips or individual days off.

As the visualisation of the modal choices on pages 38 and 39 shows, the vast majority of commutes during the trial period has been made including the bike, indicating that all trial participants were committed to the trial. Participant 5 already commuted to work by bike regularly before the trial and does not have a car.

From the data it appears that using only a bike for either going to work or back was much more popular with female participants (26 commutes by bike only) than with male participants (3 commutes by bike only). Additionally commuting by bike only was much more popular on the way back from work than on the way to work for those who did it.

During this limited trial phase the weather does not appear to have had a big impact on the modal choice for the commute.

Combinability

During the four weeks of the trial all the participants combined the bikes with a total of five other modes of transport, namely commuter trains, cars, buses, the metro and trams.

None of the participants took it onto ferries or long distance trains.

The commuter trains were the most common means of transportation to combine the bike with. The two participants from Helsinki did not combine it with any other means of transportation while the participants who also took the bikes onto buses came from Vantaa and Espoo.

It can be said that the best combinability is given with commuter trains and metros as they are spacious and it is easy to take the bike on there.

However, while combining the bikes with commuter trains was the most common use case, the option of having alternatives was appreciated as the following statements illustrate:

"One day I took the bike with car, and used it in the middle of the day - handy for that purpose."

"On a warm and beautiful day, I would use the bike more and shorten the use of public t-p, but keep that in mind and a possibility to hop in p-t if needed."

(Participant 4)

"I knew from the beginning that the folding bike does not bring much value added to daily commuting (sometimes actually more work) but nice to use between meetings in different places. Also makes more mass transit options available since you can easily go to bus stops etc. that are further away."

(Participant 2)

"I commuted between Leppävaara and Pasila to Kumpula and back using the bike+train combination. As I commuted during the rush hours, the folding option of the bike was very useful. The car was full of people, so folding the bile was a necessity."

(Participant 8 - extra)

The most challenging combination was with buses. Though the bike would fit well in the compartment with space

for prams and wheelchairs, getting there by entering through the front door was cumbersome. It also became quite crowded as soon as people with prams would enter the bus as well.

"Travelling during daytime in a bus I felt a bit bad when there were 3 childrens' prams in the same bus and I took some extra space. We managed."

(Participant 2)

"If more buses would be like line 550 (where you can enter from the mid door) it would be perfect."

(Participant 2)

"Buses I used could be quite full especially in the afternoons, so often I gave space for baby buggies and had very little room for myself."

(Participant 3)

One of the participants was very happy about spontaneously being able to change plans, e.g. after arriving to a meeting by bike and metro he was able to put the bike in the trunk of a coworker's car on the way back, giving him some extra time to discuss with his colleague.

Even when folding was not necessary the compact size of the folding bike was seen as positive as one participant's answer to the question what she liked illustrates:

	Trial Participants						Extras		
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Ø**
Commuter Train	5,00	4,33	4,75	4,75	4,75	4,75	5,00	4,00	**4,71**
Car	4,00	4,00	5,00	4,00	—	—	—	—	**4,31**
Metro	—	4,00	—	—	—	—	—	—	**4,00**
Tram	—	3,67	—	—	—	—	—	—	**3,67**
Bus	—	3,00	2,75	3,75	—	—	—	—	**3,17**

Table 2: Average ratings of combinability on a scale of 1 (very bad) - 5 (very good)

"Size of the bike - no need to fold in most of the places (train, escalators, lift). Easy to take into restaurants, working place etc."

(Participant 1)

When comparing regular electric bikes with electric folding bikes the latter do have a weight advantage as many full size electric bikes weight around 20 kg or even more.

In the final evaluation online survey, the six trial participants were asked whether they considered public transport more attractive in combination with the bike and the majority of them agreed. (Figure 1)

All participants agreed that renting a bike on top of a monthly ticket would be a great option. (Figure 2) When asked whether they would consider buying any kind of bike for their commute if this service would not become a reality the participants preferred the rental option.

"I'm probably never going to buy a folding bike or an e-bike. I would rent one, seasonally."

(Participant 2)

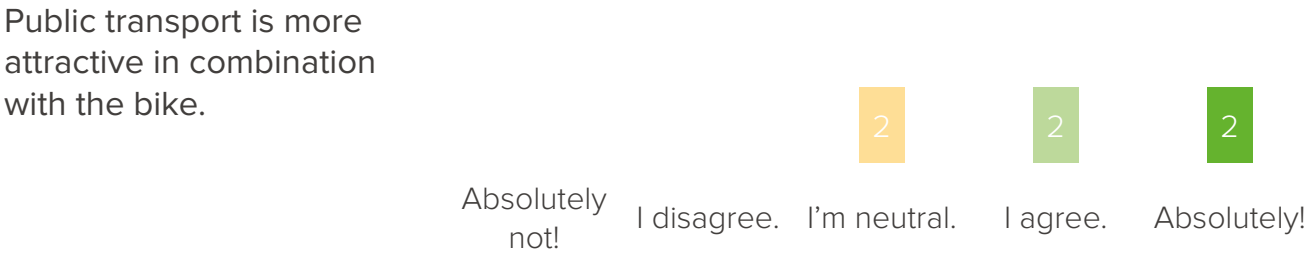


Figure 1: Attractiveness of public transport combined with folding bikes

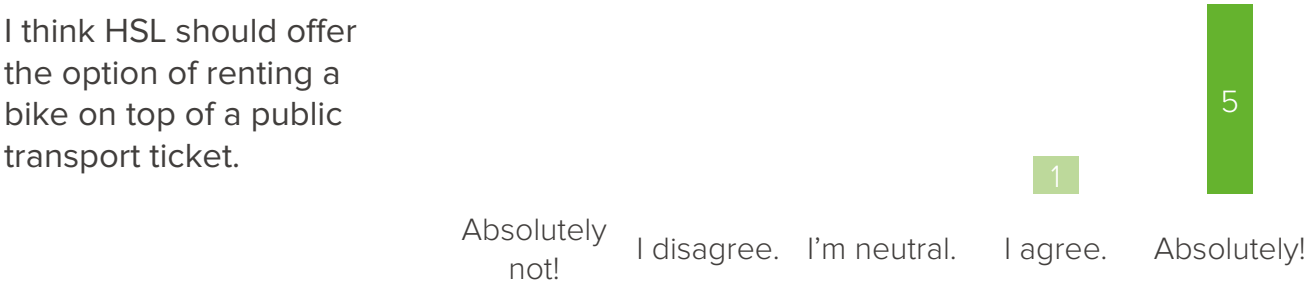


Figure 2: Should a combination of public transport and bikes be offered

FINDINGS

Modal Choices

Transport Mode

- Bike only
- Bike + Public Transport
- Public Transport
- Car only
- Car + Bike
- No commute

Bike Type

- Electric
- Conventional

Direction

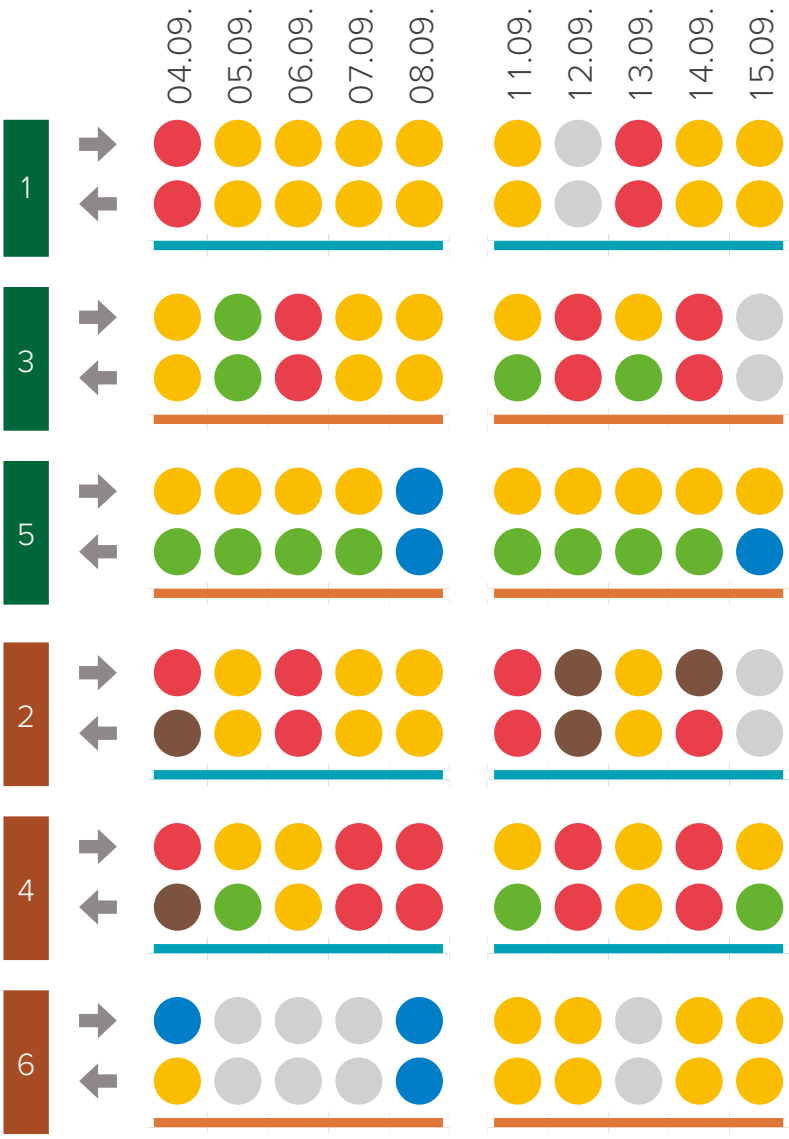
- To work
- From work

Gender

- Female
- Male

Participants

1–6 Participant ID



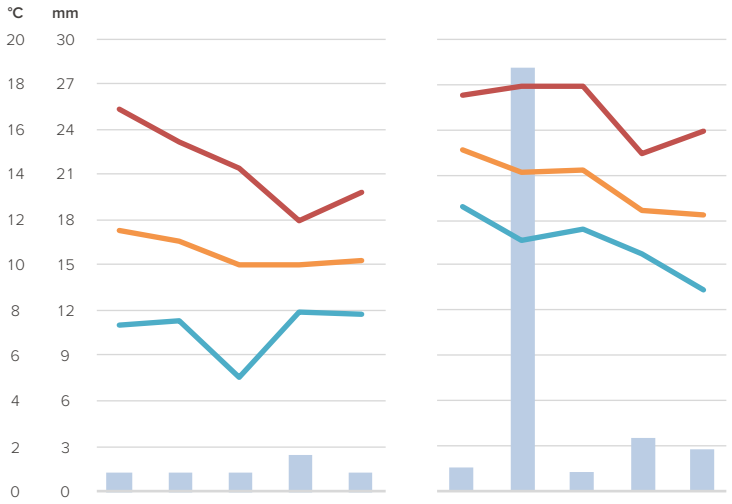
Weather in Vantaa

Temperature

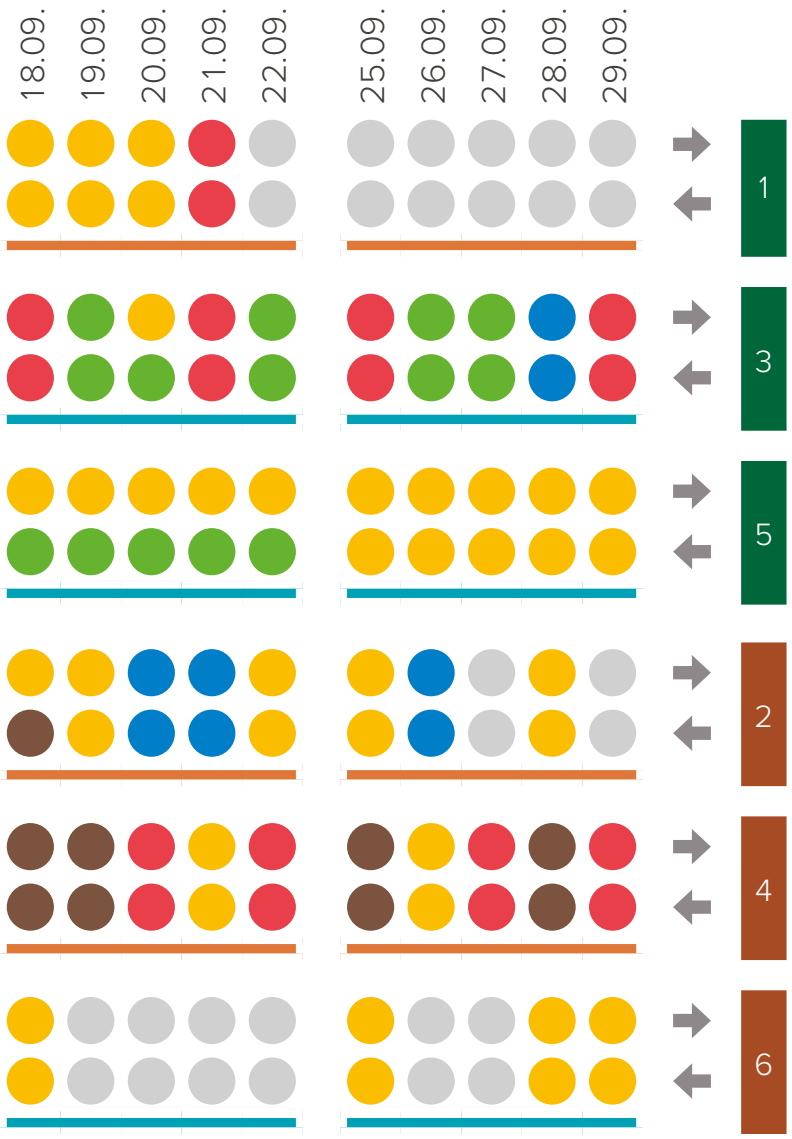
- Maximum
- Median
- Minimum

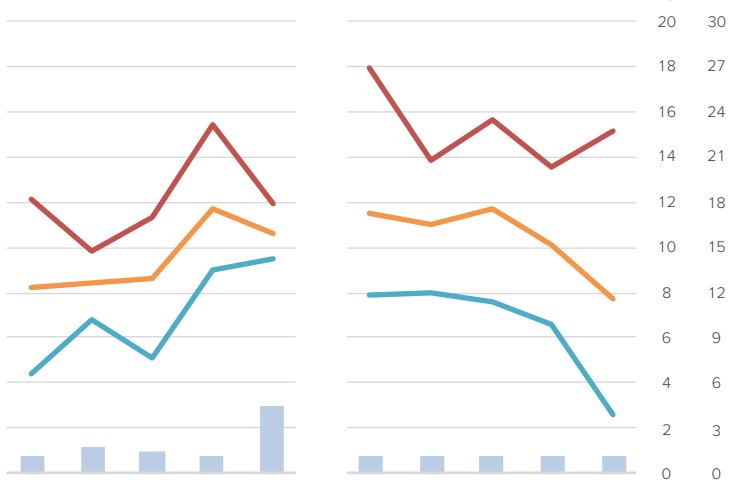
Precipitation

- Sum in mm

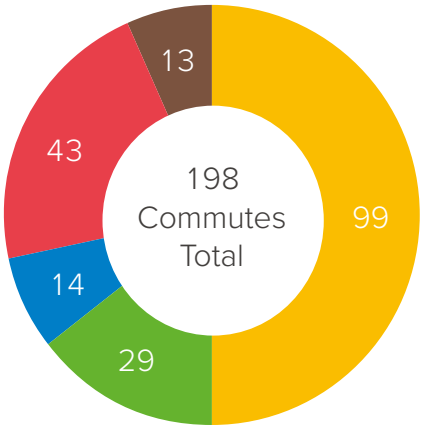


Source: Finnish Meteorological Institute

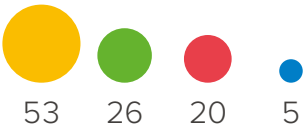




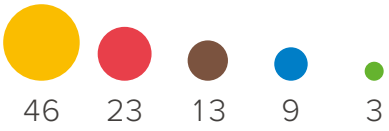
Commutes



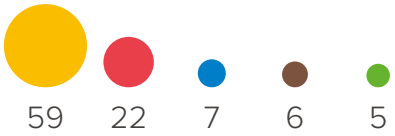
Female: 104



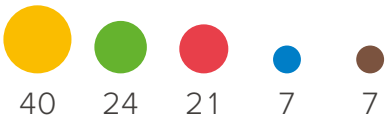
Male: 94



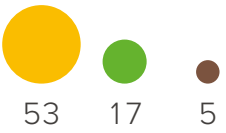
To Work: 99



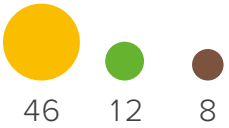
From Work: 99



With Electric Bike: 75



With Conventional Bike: 66



Bikes

All seven bikes included in the trial worked well during the four weeks and no major problems occurred.

The users were asked to rate the bikes with regard to different characteristics and resulting from that the electric Vello Bike+ got the best overall rating (Table 3). The runner up is the non-electric Beixo Crosstown. Interestingly, these were the two bikes in the test that featured a belt drive. The Brompton, which is widely regarded as one of the best folding bikes in the market, came in third.

Even though all bikes except for the electric Beixo Compact-E were rather similar in weight the ratings of their weight varied quite a bit. The three bikes coming in a bit below 13 kg got better ratings than the three that weigh slightly over 13 kg.

While it can be assumed that the lighter the bike the better, the size of the bike when folded and the weight

	Weight	Size unfolded	Size folded	Riding Comfort	Feeling safe on the bike
Vello Bike+	5,00	5,00	4,50	5,00	4,50
Beixo Crosstown	4,00	4,50	4,75	4,00	4,25
Brompton H6L	4,50	4,00	4,50	4,00	4,50
Ahooga	3,33	3,33	3,00	4,00	4,00
Beixo Compact-E	2,00	4,00	3,00	3,00	3,00
Tern Link C7i	2,75	4,00	3,00	3,50	4,00
Uma	2,50	4,00	5,00	3,00	2,50

Table 3: Average ratings of bike characteristics on a scale of 1 (very bad) - 5 (very good), ordered by total

distribution play a key role as well. For example, the weight difference between the Vello Bike+ and the Ahooga is only about 500g, but the Vello Bike+ folds into a smaller package which could make it easier to handle in comparison.

Maintenance

During the four week trial no maintenance was necessary.

The participants reported only minor issues, such as a quick release lever for a seat post that needed some tightening, but no instances in which more intensive fixing was necessary.

The quick release lever was eventually fixed by the participant herself by tightening the screw attached to it after being in contact via email.

Due to the limited duration of the trial and presumably rather caring participants this however does not provide any basis for estimating the required maintenance level for a larger scale operation.

	Ease of the folding mechanism	Electric support while riding	Ease of charging the bike	Total
Vello Bike+	4,00	5,00	5,00	**4,75**
Beixo Crosstown	4,50	—	—	**4,33**
Brompton H6L	4,00	—	—	**4,25**
Ahooga	4,00	3,67	5,00	**3,79**
Beixo Compact-E	4,00	5,00	4,00	**3,50**
Tern Link C7i	3,00	—	—	**3,38**
Uma	2,00	3,50	3,50	**3,21**

Electric vs. Non-electric

While four out of six participants said they preferred the electric bike over the non-electric one out of the two bikes that were given to them during the trial (Figure 3) half of them answered they would generally prefer an electric bike and the other half indicated to prefer a non-electric one (Figure 4).

However, it is crucial to understand the background these preferences were indicated based upon.

One of the participants who indicated to generally prefer a non-electric bike for example already commutes to work by bike on a regular basis and with regard to riding the electric bike for her roughly 18 km commute she stated:

"Yeah, it's light and easy and so on. But then you don't really get the feeling of cycling and if you want to, like, get a benefit from your commute, like it would be exercise, then, I mean, that electric thing is just too easy."

(Participant 5)

"I didn't even get sweaty or anything. I didn't get the exercise feeling of that. Of course I drove the 18 km, but it was like 'ok, whatever'."

(Participant 5)

The other two participants who chose the non-electric bike would also indicate that they are otherwise quite active, for example going to the gym regularly. One of them also said that an electric bike wasn't necessary for

Figure 3: Trial bike preference

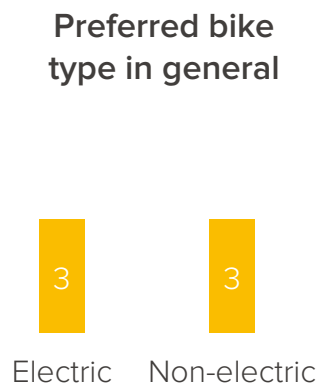


Figure 4: Bike type preference

him due to the rather short distances in both ends of the commute. On the other hand he mentioned that having the electric bike enabled him to quickly deliver an item in the city centre which would have taken much longer using the car or going by tram.

The users who indicated that they preferred an electric bike in general would otherwise not consider cycling even for parts of their commute, one main reason being that one doesn't get sweaty:

> *"Electric bike is light and easy and fits well to work commuting whilst non-electric is more for fitness purposes. For work commuting I would choose electric as you can jump directly to a meeting without having a shower and changing clothes in between."*
>
> *(Participant 1)*

> *"Non-electric is ok for shorter distances (and no need to take care of the battery). Many people probably want to not change their work clothes while commuting bus+bike so with ebike you can go more easily longer distances with hills without a sweat. At least the bike I tested only assisted in the hills (due to speed limitation) and was perfect for that."*
>
> *(Participant 2)*

> *"An electric bike would be the best choice for this purpose - short(ish) trips. The easyness of movement, and the folding possibility, not needed maybe with trains, but with bus, it's a must."*
>
> *(Participant 4)*

As neither the weight nor the size are significantly lower in the non-electric bikes there appear to be no major downsides to using an electric bike. Instead it seems to encourage people who would not otherwise consider cycling as an option for (parts of) their commute to consider leaving the car behind on work commutes.

Accessories

Helmet

The provided helmet model, nutcase Street, got very good feedback from the participants. The overall rating across all six users was 4,5 out of 5.

All participants stated that they felt safe using this helmet and that they thought it was a good choice for commuting. They indicated

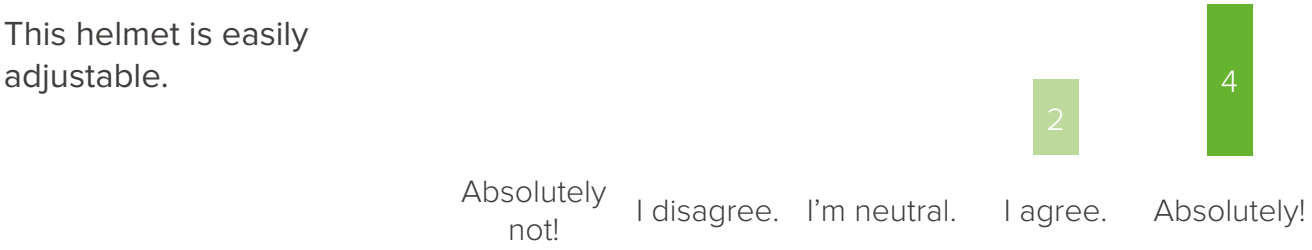


Figure 5: Adjustability of the helmet

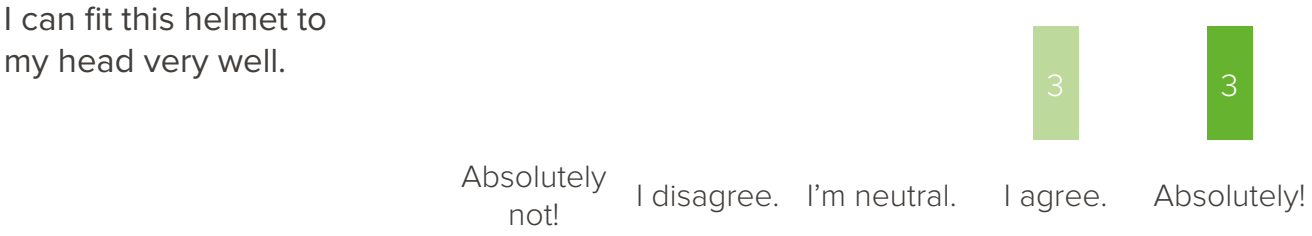


Figure 6: Fit of the helmet

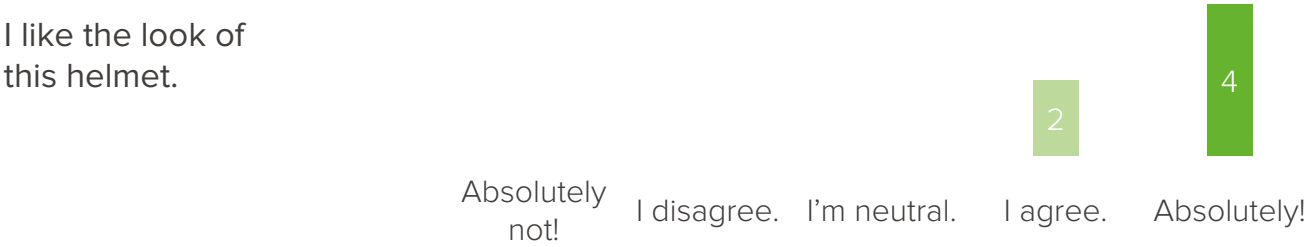


Figure 7: Look of the helmet

to like the look and that it was easily adjustable to their heads.

Except for one participant, all trial users do want to use a helmet. The one participant who would prefer to rather not use a helmet at all was the female participant who already commutes by bike on a mostly daily basis.

It can thus be assumed that ideally a solution should be found how to also offer a helmet with a service like this.

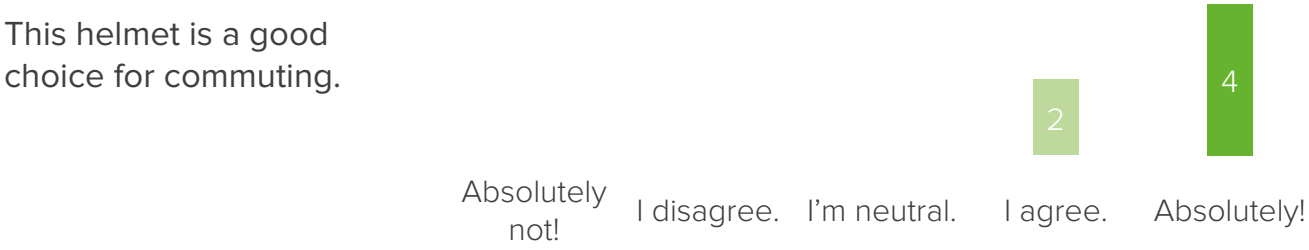


Figure 8: The helmet's suitability for commuting

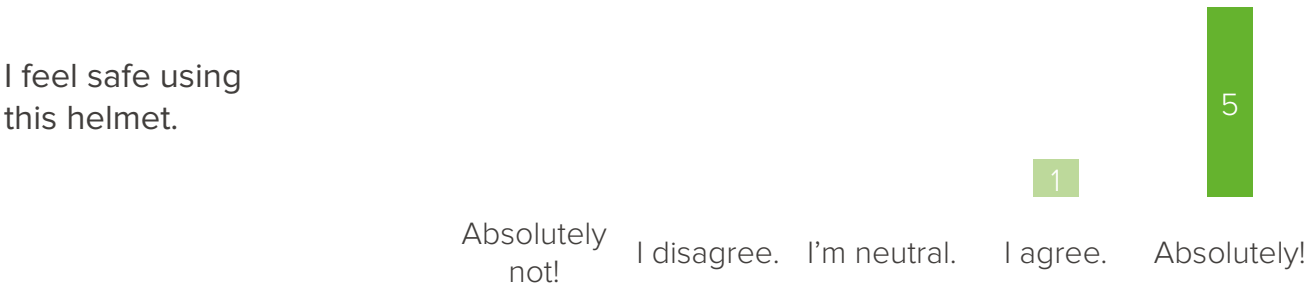


Figure 9: Perceived safetiness of the helmet

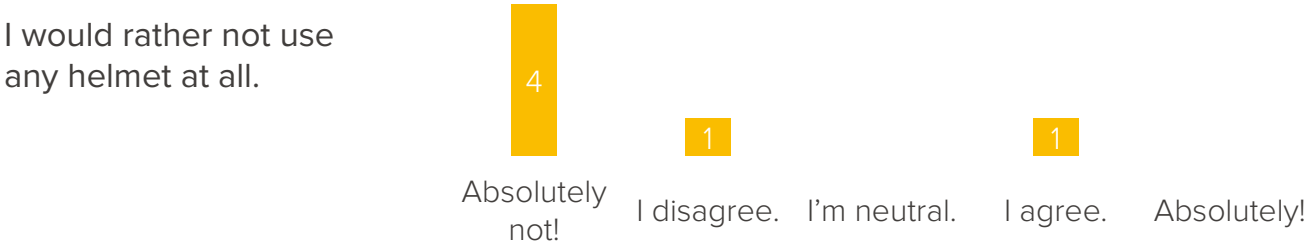


Figure 10: Preference of wearing a helmet at all

FINDINGS

Lock

The provided lock, ABUS Bordo Lite 6050, got good feedback from the participants. It scored an overall average rating of 4,17 on a scale from 1 to 5 stars.

The locks were provided to the participants as brand new in packaging and no further explanation on their use was given during the instructions

When switching bikes one user reported that she had not been able to use the lock as she could not figure out how to open it. After investigating the matter together no further issues

I liked the look of this lock.

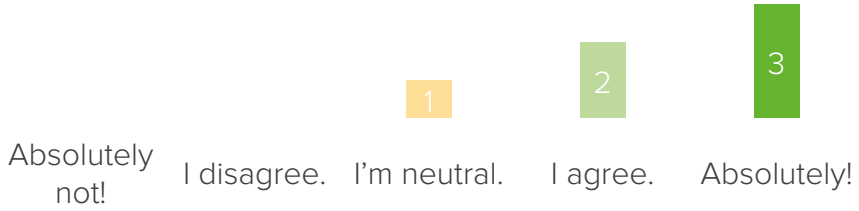


Figure 11: Look of the lock

This lock seemed secure.

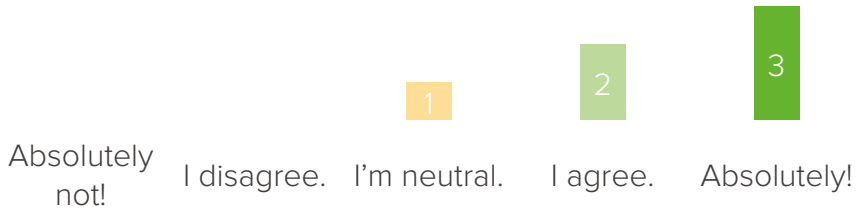


Figure 12: Perceived security of the lock

It was easy to take this lock with me.

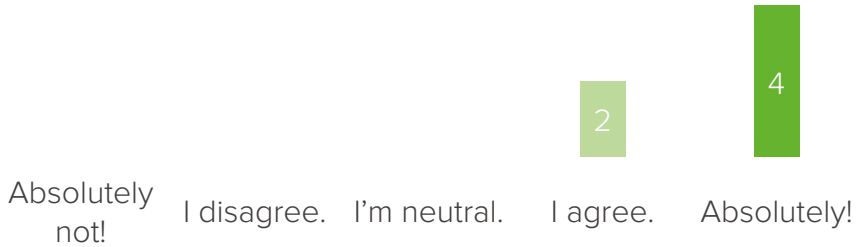


Figure 13: Ease of taking the lock along

were reported. It appeared that the lock just needed a little extra force on the first try since it was brand new.

Due to their relatively small sizes, most participants would take the bikes with them inside their office and leave them their during the day without any need of locking them at all.

All in all the locks were used, but not that much. Therefore the rating of the lock can only provide a very limited insight into whether this lock is well suited. Additionally, all users were given the same type of lock for the duration of the trial which means no comparability is given.

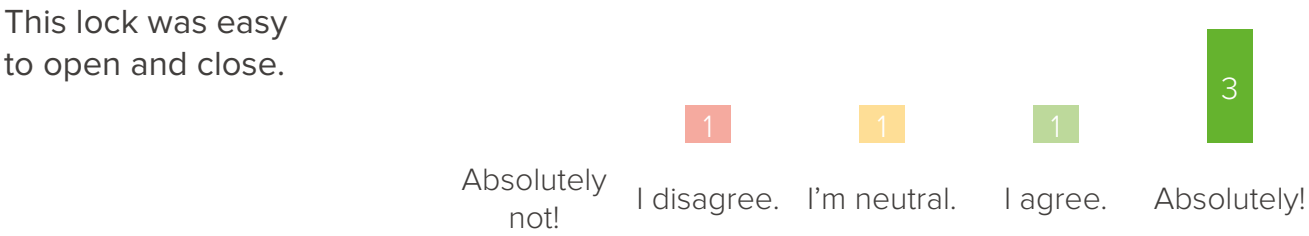


Figure 14: Ease of opening and closing the lock

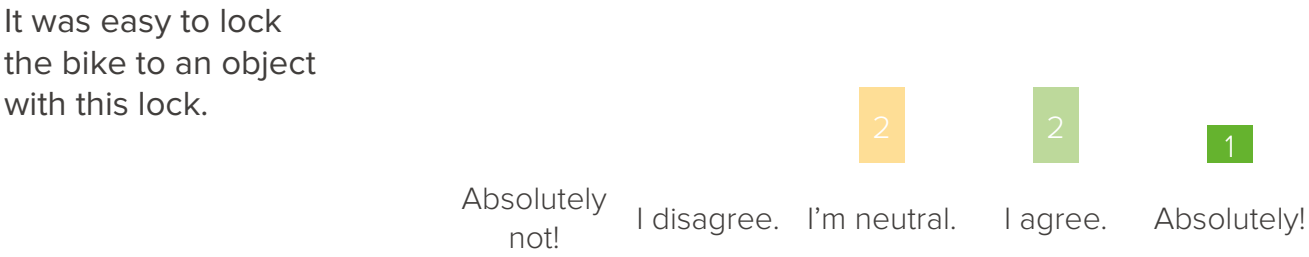


Figure 15: Ease of locking the bike to an object with this lock

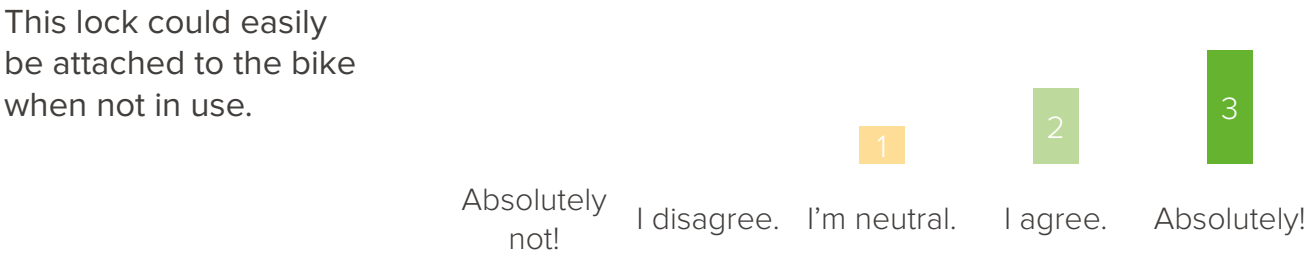


Figure 16: Attachability of the lock to the bike

Commuting Time

Whether one can save time on the commute by combining public transport and (electric) folding bikes depends a lot on the individual commute. While none of the trial participants agreed with the statement that a combination of bike and public transport would save them time compared to commuting by car (Figure 17 & Figure 18) they responded that it would save time in comparison to just using public transport. (Figure 19 & Figure 20) One major reason for that is that alternative routes become available.

> *"I do have to use three different connections. However, there is a chance to try to change that and I tried alternative options."*
>
> *(Participant 2)*

Still, depending on where you live and work the connections might be disadvantageous compared to going straight on the highway by car:

> *"I had to use the car for a couple of days for time reasons (car takes 30min to work, with public transportation+bike 1h 20min)."*
>
> *(Participant 2)*

Since the business park that all main trial participants' offices were located at is close to a highway, those might be true especially for commuters from Espoo and Vantaa who do not need to deal with inner city traffic jams as much.

One of the extra participants however described a very different experience:

> *"I commuted between Leppävaara and Pasila to Kumpula and back using the bike+train combination. [...] This mode of transportation (bike+train) was a few minutes faster than by car or by a scooter. I suppose I could have spared some extra few minutes by using an electric bike."*
>
> *(Participant 8 - extra)*

One participant from Vantaa reported that it took him about 35 minutes for the whole 14 km commute using only the electric folding bike. Combining it with the commuter train he saved

Combining an ***electric*** folding bike and public transport saved time compared to commuting by car.

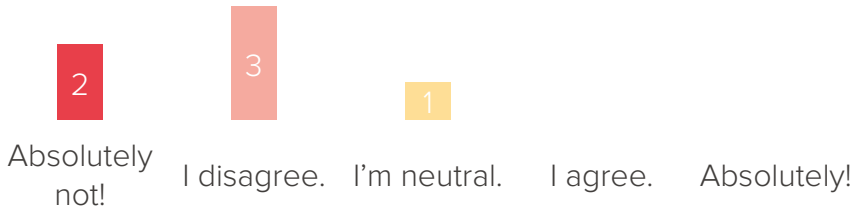


Figure 17: Commuting time: Electric bike & public transport vs. car

Combining a ***non-electric*** folding bike and public transport saved time compared to commuting by car.

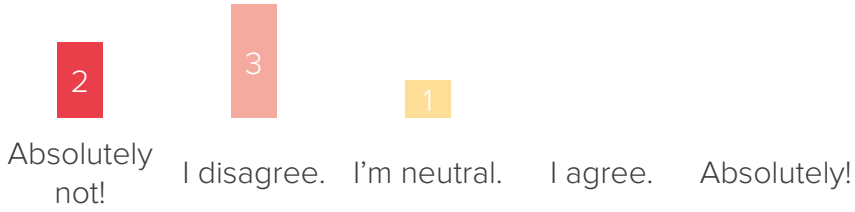


Figure 18: Commuting time: Non-electric bike & public transport vs. car

Combining an ***electric*** folding bike and public transport saved time compared to commuting by public transport only.

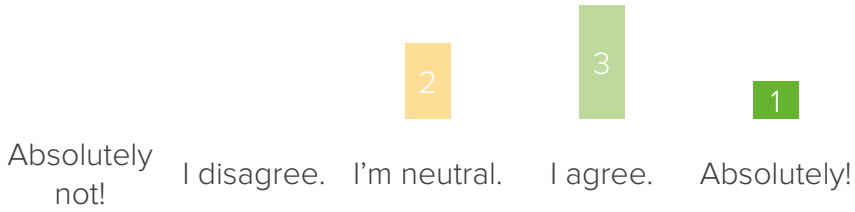


Figure 19: Commuting time: Electric bike & public transport vs. public transport alone

Combining a ***non-electric*** folding bike and public transport saved time compared to commuting by public transport only.

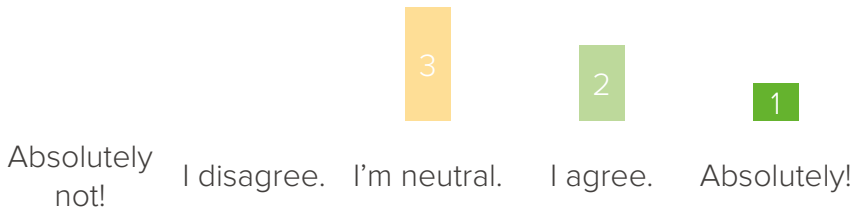


Figure 20: Commuting time: Non-electric bike & public transport vs. public transport alone

10 minutes, making it a roughly 25 minutes commute. In comparison he said it would take him 15-20 minutes commuting by car only.

Though for this specific group of participants, with their offices located in the business park in Vantaa, the bike and public transport option did not save time on the daily commute, two participants reported that having the bike accessible during the day, especially the electric one, made going to meetings easier and possibly faster. This would especially apply to days with many meetings e.g. in the Helsinki city centre, or around different office locations in Vantaa.

Wellbeing

While saving time compared to commuting by car was not a benefit for the main trial participants, using the bike for (parts of) their commute appeared to have positive effects on the wellbeing of all five of the participants who previously commuted by car only:

"Yes, I did! Yeah, and I was in the mornings, especially with the electric one, I was really excited! And when I was supposed to be going to work I left earlier than in any other morning with my car. And that was strange, because 7:10 I was like 'Hush, let's go!' and then I always caught the earlier train."

(Participant 1)

"Perhaps a little bit. Because you can do some light exercise also during the day. Because I used the bike more during the work day than during commuting. [...] Yes it did. That I did feel more energetic, because I think you have more oxygen at the meeting, when you have just cycled 5km."

(Participant 2)

"It was very good. I felt like physically and emotionally so much better that I got to exercise and not just to sit in the car and, you know... Being passive and that had been annoying already for a long time, but this sort of

gave me sort of like a push to maybe start cycling a little bit more."

(Participant 3)

"So then it didn't become like a too difficult task to cycle more to work. Because if I had to cycle the whole way every day or several times a week that would have been quite... maybe even uncomfortable. But then, once you have a chance to do part of the trip by bus it felt good."

(Participant 3)

"Yeah, it's nice, It's good! But it doesn't make me too energetic or jumping around."

(Participant 4)

"Yes, definitely! Definitely, definitely. I was more energic. [...] Absolutely you're more fresh."

(Participant 6)

This was also reflected in their answers during the final online survey. (Figure 21 & Figure 22)

The participants also described not commuting by car as a potentially more relaxed way of starting the day. While the commute itself would take longer for most of the trial users, using the time on trains, buses etc. was being used for reading

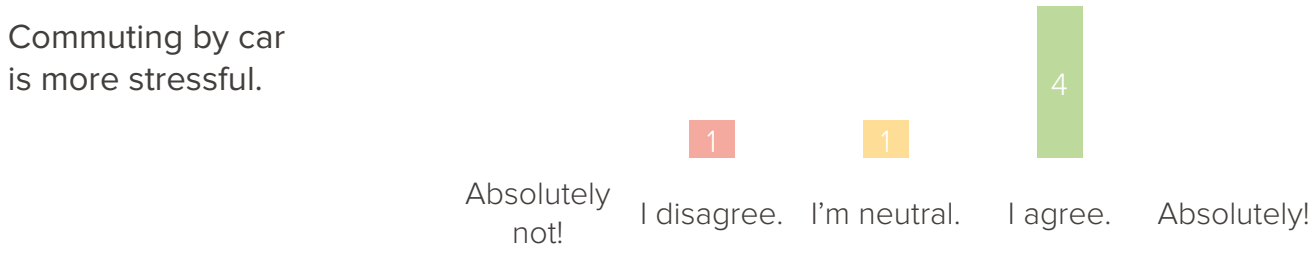


Figure 21: Car commuting and stress

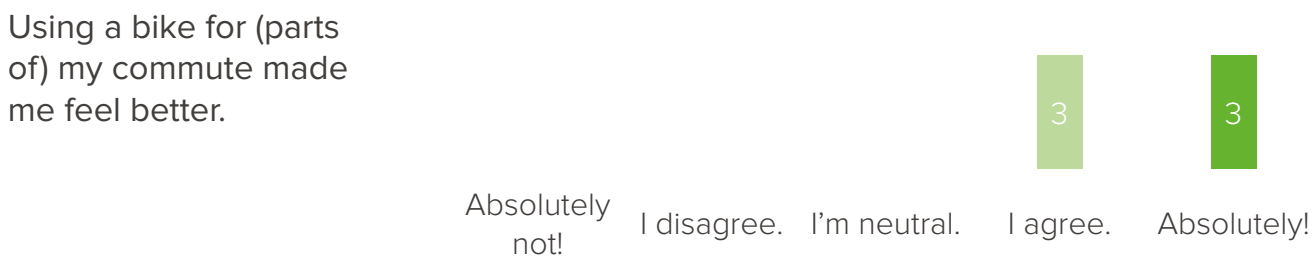


Figure 22: Bike usage and well-being

newspapers or sometimes even some light work such as checking emails.

"There was always plenty of place and then the traveling by train was easy and relaxing. No need to check out the traffic and traffic lights and so forth. So I was able to utilise that time just for relaxing or reading something, whatever. Or working. […] it's a quite easy and relaxed way to commute. It takes a little bit more time, but on the other hand the way it goes and the way I can relax and have 'free time' so to speak, that will, let's say, 'cover up' the extra time, the extra 15 minutes that I need to take to have this bike/train combination."

(Participant 6)

Pricing

During the final interview, after the four week trial period, the six trial participants were asked what they would consider a reasonable pricing for a combination of a monthly public transport ticket and a rental bike.

At the time of the trial a 30 day regional ticket (covering Helsinki, Espoo and Vantaa) cost 106,50€ while a 30 day ticket for either one of these cities alone cost 54,70€

What was considered a reasonable price varied quite a bit from 0,00€ to 150,00€ for the bike alone:

"I wouldn't go above 150,00€ as a total." [For regional ticket and bike combined]

(Participant 1)

"I think it would be difficult to get much over 50,00€."

(Participant 2)

"Yeah, I was thinking about, maybe like 150,00€, that's reasonable. Yes." [For the bike alone.]

(Participant 3)

"Added for this ticket, something like 100,00€. […] 100,00€ for the bike. And then it would be something that is maybe thinkable."

(Participant 4)

"I don't know... Just paying the whatever the Seutulippu [regional ticket] is and that's it, but then that wouldn't work."

(Participant 5)

"I could think that if it could be like 40/50,00€ per month, I guess it would be ideal." [For the bike alone.]

(Participant 6)

Based on those answers it can be assumed that 50,00€ per month for the bike on top of the public transport ticket appears to be acceptable for individual users. However, continuing the discussion during the interviews, all participants stated high interest in this option if it was offered to them through their employers, for example as an alternative to company cars or combined for example with health care packages.

"It's much cheaper than the car, both for the employer and privately. [...] To offer this kind of incentive that they pay for example half of this company-combined-ticket or the whole ticket, it would be even more feasible and the company would easily justify because of the health and image benefits that they could get from it."

(Participant 2)

"Cause it's companies interest that people are refreshed, people are healthy, they exercise more, whatever. If the company would offer this, but instead of a leasing car, but a leasing bike. And the will give the substitutes to the employee and then encouraging them to take this kind of option and then it could be, like, for the person itself it could be like 50,00€, even though the company pays another 50,00€."

(Participant 6)

04. CONCLUSIONS

CONCLUSIONS

Overall it can be concluded that the trial went quite successfully providing meaningful insights to the questions asked. Additionally all trial participants were very positive about their participation in the trial and would like to see this concept take shape.

The following subsections will revisit the questions this trial aimed to answer based on the findings presented above.

Attractiveness Of The Offer

All trial participants found value in the combination of public transport and (electric) folding bikes and would welcome such an offer from HSL. However, they also indicated that the attractiveness of such an offer would depend a lot on the pricing.

Even in cases were the commute itself was not immediately improved by using an electric folding bike, the option of having one available during the day to easily and quickly get to meetings in different places was perceived as quite positive.

All in all this concept appears to be a suitable offer to reach decreased car usage. This would be very helpful with regard to lowering overall emissions caused by work related mobility and reaching climate change mitigation goals.

Acceptable Price

The findings indicate the pricing will be a challenging issue, as the individual customer might only be willing to pay a maximum of 50,00€ per month on top of the monthly public transport ticket. At this price such a service can hardly be financially viable and would need high subsidisation.

However, as the service promises potential cost savings, health benefits and resulting productivity benefits, it might be feasible to offer this service primarily to employers as an alternative to company cars. In such a system the individual user could potentially pay a smaller share of the overall service cost while the employer would still offset the remaining share for the service by costs saved related to the operation of company cars.

Preferable Bike Type

The feedback suggests that there do not seem to be any major downsides for potential customers when using electric bikes. Quite to the contrary offering electric bikes appears to indeed increase the attractiveness of such an offer for people who would otherwise not consider making the change away from commuting by car.

However, none of the bikes tested during this trial was perfect. Each of them had its individual pros and cons. It would thus be necessary to cooperate with the manufacturers to make some changes to better equip the bikes for the intended purpose.

Issues To Be Investigated

The main question this trial cannot answer is that of scalability.

On the one hand this refers to the costs of such a service with regard to maintenance and storage.

On the other hand, the question is whether the offer could become so popular that capacity problems would occur.

This might not be an immediate concern regarding the combinability with commuter trains and metros as they offer quite a lot of space. It also might be less of an issue with trams as they are somewhat more spacious and tend to operate in areas where one might anyway be faster riding the bike instead of taking it on a tram. It might become an issue with buses though, as space there tends to be rather limited especially during peak hours.

Then again, having an electric bike available also opens up new connections and potentially draws commuters to choosing trains and metros over buses where somehow accessible by bike.

It might also be an option to have certain bus lines where storage space for luggage is available that could be used to store the relatively small bikes such as on the previous airport route 615.

Next Steps

Since this concept seems to be feasible and pricing issues could potentially be solved by not focussing on individuals but rather employers seeking to offer alternatives to company cars the next step should be a larger scale pilot covering a whole year of operations with all seasons.

During this pilot, customers should actually have to pay for the service to gather insights on the financial viability.

In order to get a better understanding for the maintenance and operating costs a larger scale pilot should consist of at least 50 bikes, ideally of the same make so that all aspects of the concept, including maintenance and replacement of bikes, can be explored to better estimate the feasibility of this offer.

05. APPENDIX

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APPENDIX

Interview Guides

Interview 1: Bike Handout

1. Could you briefly describe your daily commute?
2. What do you like most about your commute?
3. What do you dislike most about your commute?
4. What was the main reason for you to buy your car?
5. To which extent does Public Transport not work for you?
6. Why are you not using a bike to commute to work or the nearest station/stop?
7. What was your initial impression of folding (e-) bikes?
8. How do you think the folding bike will improve your commute?

Interview 2: Bike Switch

1. How have you been using the bike during the past two weeks?
2. How did you experience your commute with bike and public transport?
    a. Ease of transportation
    b. Flexibility
    c. Parking
3. How do you feel now that you are cycling more?
    a. Healthier?
    b. Happier?
    c. Less stressed?
    d. Fitter?
4. What kind of feedback did you experience from colleagues/friends/family?
5. What did you not like about this particular bike?
6. What did you like about this particular bike?
7. Did you use the bike for other trips than just on your commute?
8. What are your expectations regarding the next two weeks?

APPENDIX

Interview 3: Bike Collection

1. How did you experience your commute with bike and public transport in comparison to your commute by car?
2. How do you feel now that you are cycling more? (Healthier? Happier? Less stressed? Fitter?)
3. What kind of feedback did you experience from colleagues/friends/family?
4. How much do you spend on commuting by car per month?
5. You have the option of getting a bike on top of your transport ticket for a monthly fee.
   The bike costs 2300,00€, [Describe Service], a lock is included.
   You can take the bike wherever you like (in Finland) like Summer cottage etc.
   (HSL Tickets: 1 Municipality 54,70, Region 106,50 per 30 days)
   Would you be interested?
   a. No:
      i. Why?
      ii. Would you be interested in it without the Public Transport ticket?
      iii. On which conditions?
   b. Yes:
      i. How important would it be that it was electric?
      ii. How much would you be willing to pay for that? (200, 175, 150, 125, 100, 75, 50, 25)
6. What would be your preffered rental lenght? (Monthly/seasonal)
7. Which time of the year would you find this most useful for?
8. Would a helmet need to be included in the service?

9. What do you think about the name “Bikefy”?
10. Would you consider buying:
    a. a folding bike?
    b. an e-bike?
    c. an electric folding bike?

APPENDIX

Online Surveys

Weekly Feedback

Welcome to the first short weekly feedback survey. Please let us know how your first week went.

Section A: Name

A1. **Firstname**

A2. **Lastname**

Section B: Modal choices for your commute

Here we would like to know how you got to work and back from work.

B1. **How did you commute to work during the week?**

	Bike + Public Transport	Bike only	Public Transport only	Car only	Car + Bike	Car + Public Transport	Car + Public Transport + Bike	Not at all
Monday	☐	☐	☐	☐	☐	☐	☐	☐
Tuesday	☐	☐	☐	☐	☐	☐	☐	☐
Wednesday	☐	☐	☐	☐	☐	☐	☐	☐
Thursday	☐	☐	☐	☐	☐	☐	☐	☐
Friday	☐	☐	☐	☐	☐	☐	☐	☐

B2. **Hod did you commute back from work?**

	Bike + Public Transport	Bike only	Public Transport only	Car only	Car + Bike	Car + Public Transport	Car + Public Transport + Bike	Not at all
Monday	☐	☐	☐	☐	☐	☐	☐	☐
Tuesday	☐	☐	☐	☐	☐	☐	☐	☐
Wednesday	☐	☐	☐	☐	☐	☐	☐	☐
Thursday	☐	☐	☐	☐	☐	☐	☐	☐
Friday	☐	☐	☐	☐	☐	☐	☐	☐

Section C: Feedback on the bike

Here we would like to know what you thought about the bike that you got.

C1. How would you rate the following criteria of your bike?

	Very bad!	Bad	OK	Good	Very good!	Not applicable./No Idea.
Weight	☐	☐	☐	☐	☐	☐
Size unfolded	☐	☐	☐	☐	☐	☐
Size folded	☐	☐	☐	☐	☐	☐
Ease of the folding mechanism	☐	☐	☐	☐	☐	☐
Riding Comfort	☐	☐	☐	☐	☐	☐
Feeling safe on the bike	☐	☐	☐	☐	☐	☐
Electric Support while riding	☐	☐	☐	☐	☐	☐
Ease of charging the bike	☐	☐	☐	☐	☐	☐

C2. How was it to combine the bike with other modes of transportation?

	Very bad!	Bad	OK	Good	Very Good!	Not applicable./No Idea.
Commuter Train	☐	☐	☐	☐	☐	☐
Metro	☐	☐	☐	☐	☐	☐
Bus	☐	☐	☐	☐	☐	☐
Tram	☐	☐	☐	☐	☐	☐
Ferry	☐	☐	☐	☐	☐	☐
Long Distance Train	☐	☐	☐	☐	☐	☐
Car	☐	☐	☐	☐	☐	☐

APPENDIX

Section D: General feedback

D1. **What did you like during this first week of the trial?**

D2. **What did you not like during this first week of the trial?**

Were there problems or other things that you experienced as negative?

D3. **Did you use the bike for other trips than commuting and if so, what was the experience like?**

D4. **Do you have any further comments?**

Thank you for your feedback! I hope you have a continued good trial. If you have any further comments or questions don't hesitate to be in touch with me via norbert@bikefy.eu or +358465764637. Best, Norbert

APPENDIX

APPENDIX

Final Evaluation

Section A: Name

A1. Name

First Name

Last Name

Section B: Electric vs. Non-electric Folding bike

B1. Which of the two bikes that you had did you prefer?

Electric bike ☐

Non-electric bike ☐

B2. Independently from the two bikes that you got to try, which type of bike would you prefer?

Electric bike ☐

Non-electric bike ☐

B3. Do you have further comments regarding electric vs. non-electric bikes?

Section C: Combining (electric) folding bikes and public Transport

C1. To which extent do you agree with the following statements regarding the combination of (electric) folding bikes and public transport?

	Absolutely not!	I disagree.	I'm neutral.	I agree.	Absolutely!
Combining an electric folding bike and public transport saved time compared to commuting by car.	☐	☐	☐	☐	☐
Combining a non-electric folding bike and public transport saved time compared to commuting by car.	☐	☐	☐	☐	☐
Combining an electric folding bike and public transport saved time compared to commuting by public transport only.	☐	☐	☐	☐	☐
Combining a non-electric folding bike and public transport saved time compared to commuting by public transport only.	☐	☐	☐	☐	☐
Commuting by car is more stressful.	☐	☐	☐	☐	☐

	Absolutely not!	I disagree.	I'm neutral.	I agree.	Absolutely!
Using a bike for (parts of) my commute made me feel better.	☐	☐	☐	☐	☐
Public transport is more attractive in combination with the bike.	☐	☐	☐	☐	☐
I think HSL should offer the option of renting a bike on top of a public transport ticket.	☐	☐	☐	☐	☐

C2. How do you like the idea of combining (electric) folding bikes and public transport in general?

More stars = better.

1 ☐
2 ☐
3 ☐
4 ☐
5 ☐

C3. Is there anything else you would like us to know about combining public transport and (electric) folding bikes?

Section D: Helmet

D1. To which extent do you agree with the following statements regarding the helmet you got?

	Absolutely not!	I disagree.	I'm neutral.	I agree.	Absolutely!
This helmet is easily adjustable.	☐	☐	☐	☐	☐
I can fit this helmet to my head very well.	☐	☐	☐	☐	☐
I feel safe using this helmet.	☐	☐	☐	☐	☐
This helmet is a good choice for commuting.	☐	☐	☐	☐	☐
I like the look of this helmet.	☐	☐	☐	☐	☐
I would rather not use any helmet at all.	☐	☐	☐	☐	☐

APPENDIX

D2. **What's your overall rating of this helmet?**

More stars = better.

1 ☐
2 ☐
3 ☐
4 ☐
5 ☐

D3. **Is there something else you would like us to know about this helmet?**

Section E: Lock

E1. **To which extent do you agree with the following statements regarding the lock you were provided with?**

	Absolutely not!	I disagree.	I'm neutral.	I agree.	Absolutely!
This lock seemed secure.	☐	☐	☐	☐	☐
This lock was easy to open and close.	☐	☐	☐	☐	☐
It was easy to lock the bike to an object with this lock.	☐	☐	☐	☐	☐
It was easy to take this lock with me.	☐	☐	☐	☐	☐
This lock could easily be attached to the bike when not in use.	☐	☐	☐	☐	☐
I liked the look of this lock.	☐	☐	☐	☐	☐

E2. **What's your overall rating of the lock you were provided with?**

More stars = better.

1 ☐
2 ☐
3 ☐
4 ☐
5 ☐

E3. **Is there something else you would like us to know about the lock you were provided with?**

Section F: Instructions on folding and unfolding the bikes

F1. **To which extent do you agree with the following statements regarding the instructions?**

	Absolutely not!	I disagree.	I'm neutral.	I agree.	Absolutely!
The instructions were easy to understand.	☐	☐	☐	☐	☐
I felt that I got sufficient help trying to fold and unfold the bike.	☐	☐	☐	☐	☐
After receiving the instructions I felt able to fold and unfold the bike myself later on.	☐	☐	☐	☐	☐

F2. **How would you rate the instructions process in general?**

More stars = better.

1 ☐
2 ☐
3 ☐
4 ☐
5 ☐

F3. **Would you like to give any further comments on the instructions?**

APPENDIX

Section G: The Kick-off workshop

If you participated in the Kick-off workshop, please let us know what you thought about it.

G1. To which extent do you agree with the following statements regarding the Kick-Off workshop?

	Absolutely not!	I disagree.	I'm neutral.	I agree.	Absolutely!
The workshop was a good way to start the trial.	☐	☐	☐	☐	☐
The content of the workshop was relevant.	☐	☐	☐	☐	☐
It was interesting getting to know other trial participants.	☐	☐	☐	☐	☐
The exchange with the other workshop participants was inspiring.	☐	☐	☐	☐	☐
The workshop should have taken place after working hours.	☐	☐	☐	☐	☐
The workshop was a waste of time.	☐	☐	☐	☐	☐

G2. How would you rate the workshop in general?

More stars = better.

1 ☐
2 ☐
3 ☐
4 ☐
5 ☐

G3. Do you have any further comments on the workshop?

Section H: The trial in general

H1. To which extent do you agree with the following statements regarding the trial?

	Absolutely not!	I disagree.	I'm neutral.	I agree.	Absolutely!
I feel that I contributed to a meaningful trial.	☐	☐	☐	☐	☐
I felt sufficiently informed about the process during the trial.	☐	☐	☐	☐	☐

	Absolutely not!	I disagree.	I'm neutral.	I agree.	Absolutely!
I felt that I could always get help if needed.	☐	☐	☐	☐	☐
The communication during the trial was friendly.	☐	☐	☐	☐	☐
The communication during the trial was professional.	☐	☐	☐	☐	☐
I think the trial was too long.	☐	☐	☐	☐	☐
I think the trial was too short.	☐	☐	☐	☐	☐
I am happy that I took part in the trial.	☐	☐	☐	☐	☐
I think HSL should offer the option of renting a bike on top of a public transport ticket.	☐	☐	☐	☐	☐

H2. How would you rate the trial in general?

More stars = better.

1 ☐
2 ☐
3 ☐
4 ☐
5 ☐

H3. Do you have any further comments on the trial in general?

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BIKEFY TRIAL

HSY

HSL HRT

Vantaa