SUNSET

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"Reference Living Lab Report Gothenburg"

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The SUNSET project

SUNSET (http://www.sunset-project.eu) is a three-year research & development project part of the European Commission's Seventh Framework programme Smart Cities & Sustainability under DG Connect (http://ec.europa.eu/dgs/connect/en/content/smart-cities). SUNSET started in February 2011 and has ended February 2014.

SUNSET develops and evaluates a set of innovative services that use Smartphone technology, social networks and incentives to encourage people to travel more sustainably in urban environments. The project's objective is to increase personal mobility and at the same time reduce congestion, increase safety, and protect the environment.

The SUNSET project uses a human-centred approach to achieve its objectives stimulating people to change their individual travelling behaviour. To influence behaviour, we developed and exploited a Smartphone application named tripzoom featuring challenges and rewards to move smarter. Moreover, we tailor and personalise these incentives by means of automatically measuring actual travel behaviour of the Smartphone user.. This is a personalised, multimodal coaching approach to traffic and mobility management, based on rewarding good behaviour.

SUNSET is an initiative of a consortium of nine public and private partners from four different European countries with a total budget of 4.1 million euro. SUNSET combines technical with social research creating new services for sustainable travel and evaluation of these services in real life settings of the cities Enschede (NL), Gothenburg (SE) and Leeds (UK).

Summary

This deliverable presents the Gothenburg Reference Living Lab viewed as a process. Starting point is an overall approach adopted to run and manage the three SUNSET Living Labs . The approach consists of three-phase operation model which was used to design, establish and operate the Gothenburg Reference Living Lab (GOT Reference Living Lab) and the experiments that were performed in the GOT Living Lab during 2013.

The activities in the GOT Living Lab are presented together with an extensive description of the recruitment work done to attract and retain users into the GOT Living Lab. The results from the experiments are presented in D7.5.

As a consequence that this deliverable D7.4 can be read as a stand-alone document, part of the beginning and end of this document is in overlap with the Living Lab reports of Enschede (D7.2) and Leeds (D7.3. This concerns the chapters on the overall approach and the overall learnings and good practice.

The main theme in Gothenburg was to test how congestion can be reduced using tripzoom as a tool to distribute challenges and rewards to user using mobile devices. The three experiments performed in this context are described from a process perspective. Based on the description of the different activities performed, lessons learned and good practice is reported throughout the report. The report is concluded by a SWOT analysis were the operation of the Living Lab in Gothenburg is analysed from the Living Lab Co-ordinators perspective, and an elaboration of similarities and differences between the three labs.

Strengths	**Weaknesses**
• Management model for Living Lab Operations • New re-usable experimental design tool • Build up a user base for experimental analysis within SUNSET • Proven recruitment method • Living lab user base for future projects • 19.746 trips recorded in Gothenburg • Lot of feedback and user input regarding tripzoom • Reactive and proactive tools to retain users • Management tools for the Living Lab co-ordinator • Privacy and data management protocol • Consistent results (see D7.5) providing the basis for a proof of concept • A systematic account of how much recruitment and retaining users costs in money and efforts	• Tension between research objectives and clear message to users • Lack of attractive core message • Difficulty to communicate vale for system and living lab participation to users • Living lab experiment are lengthy processes • Technical flaws in the system • High hurdle to register and start using the system • Connecting to Facebook is hard • No exact CO_2 and calorie measurements • No flexible challenges during experiments • A trustworthy experiment requires knowledge about the strengths in the system
Opportunities	**Threats**
• Proved SUNSET concept • Positive user testimonies (see D7.5) • Lots of rigours data for benchmark and future research • Management tools for Living Lab Co-ordinators • Transfer Living Lab management model to future projects • City Dashboard use in future projects • Broaden recruitment scope utilizing proxy organisations • Connect tripzoom to open data resources available in a city/region	• Social media require constant monitoring to avoid negative publicity since the first user impression counts disproportional; • Unreflected belief that a mobile service will generate huge impact amongst travellers • Conflicting stakes of a recruitment proxy organisation can hamper the recruitment effort. • Relaying on external data outside the project might have negative impact on project and projects image. • An underestimation of the work load required to set up and run a living lab.

Document Information

Authors

Name	Partner	Email
Anders Hjalmarsson	Viktoria Swedish ICT	Anders.hjalmarsson@viktoria.se
Mathias Karlsson	Viktoria Swedish ICT	Mathias.karlsson@viktoria.se
Dirk van Amelsfort	Viktoria Swedish ICT	Dirk.van.amelsfort@viktoria.se

Main Author

Name	Anders Hjalmarsson
Partner	Viktoria Swedish ICT
Address	Lindholmspiren 3A
Phone	+46707567870
Fax	
Email	Anders.hjalmarsson@viktoria.se

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Table of Contents

1. Introduction

The Gothenburg Reference Living Lab reports management aspects of the Living Lab in Gothenburg. The focus in the deliverable is on the user process (recruitment and interaction) and the management of the experiments performed in the Gothenburg Reference Living Lab. All operational aspects are also covered in the document, whereas the evaluation towards behavioural change is documented in D7.5: Living Lab Evaluation.

1.1 Goals

The goals of this deliverable are to:

- Document the recruitment action taken in the Gothenburg Reference Living Lab;
- Report the lessons learnt from the recruitment of users;
- Report on the different experiments which took place in the Reference Living Lab;
- Give insights in the effort which was spent on retention of the users;
- Give a structured insight in the do's and don'ts of running a Living Lab;
- Present a management model for Living Lab operations.

The work in this deliverable is related to the following other parts of the project:

- D7.1 – Within this deliverable, the plan for the Living Lab is drafted. In this deliverable, most of the other SUNSET work is brought together towards the Living Lab operation;
- WP3 – The work on different types of incentives is the bases on which the experiments are build;
- WP2, WP4, WP5 – The implemented technical system is the starting point for the actual work which could be done in the Living Lab;
- WP6 – The evaluation framework designed within Work package 6 form the basis for the evaluation of the experiments which are designed in the Living Lab;
- D7.2 and D7.3 – The Living Lab reports of the reference Living Labs run in parallel with the work in Gothenburg;
- D7.5 – The evaluation of the work in the Living Labs towards the SUNSET goals is done in this deliverable for all Living Labs.

1.2 Main Results and Innovations

One of the key aspects of the success of SUNSET is the use of Living Labs. This deliverable describes the experiences of the Gothenburg Living Lab. Interaction with and recruitment of users as well as the role of the Living Lab Co-ordinator are the main fields on which this deliverable describes the results of the Living Lab operation.

Table 1-1: Contributions of this deliverable to SUNSET innovations.

SUNSET innovations	Contribution of this deliverable
Social mobility services that motivate people to travel more sustainably in urban areas	In the Living Labs the SUNSET services are put to the test in a real world situation. This deliverable reports on the Living Lab execution and deployment of the SUNSET services to end-users.
Intelligent distribution of incentives (rewards) to balance system and personal goals	N/A
Algorithms for calculating personal mobility patterns using info from mobile and infrastructure sensors	N/A
Evaluation methodologies and impact analysis based on living lab evaluations	The Living Labs operation is described in this deliverable. In the planning of activities a close link is ensured with the evaluation framework and the experimental work.

1.3 Document Structure

This document describes the experiences with the Living Lab in Gothenburg. The document is readable on itself, but there are strong ties with the deliverables of the Enschede (D7.2) and Leeds (D7.3) Living Lab, as well as D7.5: Evaluation. In general, all management aspects are covered in this document, and all experimental results are documented in D7.5. Figure 1-1 shows the links between the three Living Lab reports.

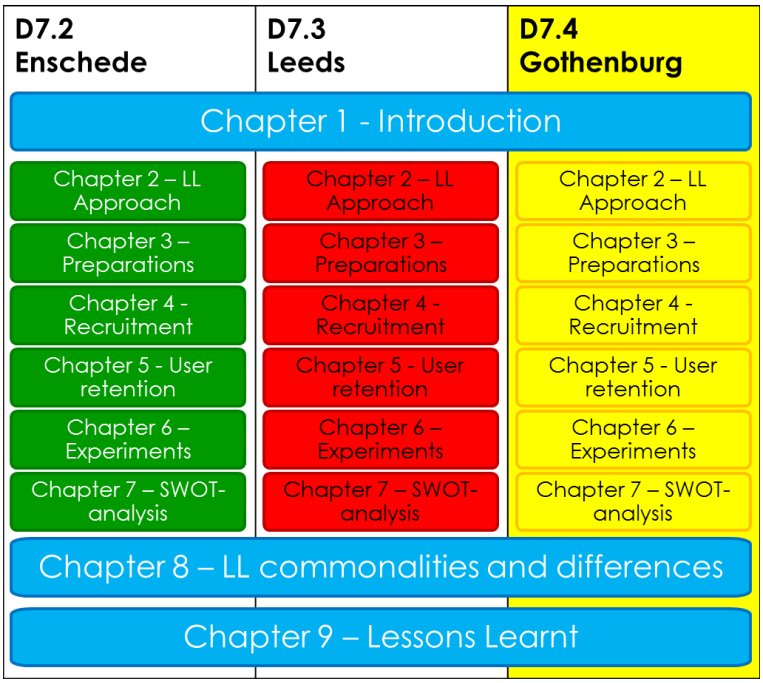


Figure 1-1: Links between the different Living Lab Reports

All three reports start with the common chapters introduction and approach, also they end with equal commonalities and differences between the Living Labs. On the different Living Lab topics, each of the Living Labs has described the situation with their own local variations, except for

several general paragraphs about the tripzoom[1] system. There are strong ties between the different Living Labs, where a shared discussion lead to different choices made in different labs. On one hand, the success of one lab are copied to another as much as possible. On the other hand, different approaches are used in different labs as a means of risk avoidance as well as a way to test as many aspects as possible.

This document describes the Living Lab operations in Gothenburg, starting by the high level choices made in the Living Lab Approach (Chapter 2). The rest of the document described the different stages in operation: preparation activities (Chapter 2.5), recruitment action (Chapter 4) and retention strategies (Chapter 5). Chapter 6 describes the different experiments set up in the Living Lab. Chapter 7 presents an overall conclusion in terms of a SWOT-analysis. In chapter 8, the overall commonalities and differences between the three SUNSET Living Labs are presented. Chapter 9 presents the main lessons during Living Lab operation, and gives hints and suggestions on how to run future Living Labs.

[1] tripzoom is the brand name of the mobile application and it's related systems, as they are used in the SUNSET Living Labs.

2. Living Lab Approach

Employing users' smartphones to conduct research experiments under real life conditions has been a new and developing domain prior to the launch of SUNSET. These devices offer ubiquitous, unobtrusive and cost-effective access to user data which previously was not possible due to a range of reasons, for example technological limitations, high costs or user fatigue (Raento et al, 2009). Contemporary technological developments have allowed the evolution of research methods such as the Day Reconstruction Method (Kahneman et al, 2004) which are currently being facilitated through smartphone use and which can be applied in controlled research environments, namely Living Labs. Rigorous design, development, implementation and analysis of the Living Lab experiences form indispensable components of such an approach, in order to bring correlations and causalities to light and leading to the identification of future challenges (Gustarini et al, 2013). The use of a Living Lab approach within SUNSET has been described in previous deliverables (e.g. D1.1 and D7.1), so a brief summary of the benefits of using this research method are offered here:

- *"Co-creation in users' real-world context results in mobile artifacts with **higher expectation-experience** fit than artifacts that were co-created in laboratory-like settings*
- *Co-creation in users' real-world context results in mobile artifacts with **higher acceptance value in terms of usage behavior** than artifacts that were co-created in laboratory-like settings*
- *Co-creation in users' real-world context results in mobile artifacts with **higher acceptance value in terms of fulfilling user needs** than artifacts that were co-created in laboratory-like settings*
- *Co-creation in users' real-world context results in mobile artifacts with **higher business value in terms of economic success** fit than artifacts that were co-created in laboratory-like settings*
- *Co-creation in users' real-world context results in mobile artifacts with **higher business value in terms of user retention** fit than artifacts that were co-created in laboratory-like settings"*

  (Pergler and Tarcus, 2013)

These issues inform the contents of this deliverable, starting with chapter 2 here, which focuses on the approach taken in the SUNSET Living Labs. It starts with a structured planning of the Living Lab, described design choices made and presents the management modal for living lab operation. The detailed activities in the different stages for the Gothenburg Reference Living Lab are described next. Lessons learnt and aspects of good practice are presented at the end of the chapter.

2.1 Living Lab Stages

Figure 2-1 shows the different stages of the Living Labs in time. It starts. The interaction with participants in divided into three successive stages:

- Preparation stage
- Pre-operation stage
- Operation stage

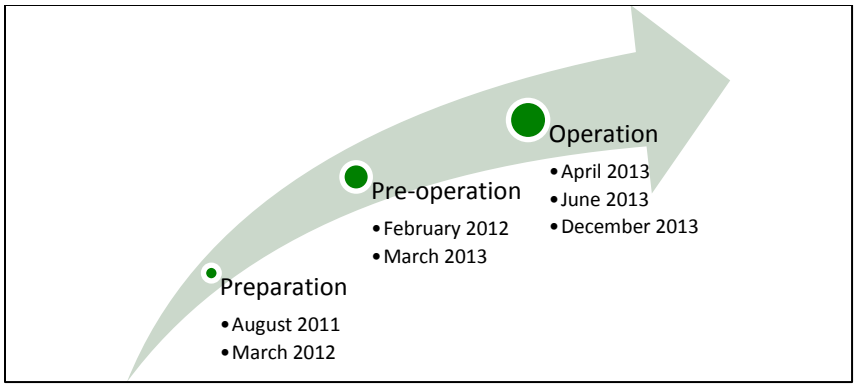


Figure 2-1: Stages of participant interaction

Preparation
During the preparation stage, participants were involved in order to provide user inputs to the design process. These design preparations are outlined in the deliverables arising from other work packages and are reflected in the final tripzoom software. The Living Lab partners (Enschede, Gothenburg and Leeds) contributed towards improvement of localisation in software design aspects, in the design of the Living Lab and initiated recruitment plans and processes. During this stage, SUNSET was used as a project name in communications with the participants.

Pre-operation
The pre-operation stage involved testing the tripzoom system. Technical development of the software took place in several releases and for each the Living Lab partners carried out an evaluation from a user's perspective. This included both the travellers role and the Living Lab Co-ordinator role. In the later releases, members of the public become the users and took part in this evaluation.

Alongside system preparation, preparation for other aspects also took place. Examples include: submission to the app stores[2], development of privacy regulations and other good practices around privacy and establishing the organisation for operation of the lab.

Operation
During the operation stage the app was introduced to a broader audience and in the different Living Labs, different aspects of the SUNSET concept were tested. This was undertaken using both experiments in a Living Lab setting and partially by designing Focus Groups for those parts of the concept which were not integrated in the tripzoom system.

2.2 Design of the Living Lab

During the operational stage, the aim was to establish proof of concept for the total SUNSET system. In order to achieve this, a mixed approach was used in the format of the Living Labs.

Living Lab with Experiments
The first choice made was to work with a Living Lab that involved members of the travelling public. The app was made available for everyone who had been recruited to download from the app store. A set of targeted experiments were designed with a shorter time line rather than a

[2] The app is developed for iOS and Android. The term app store is used as a general term for both the Apple iTunes App Store as well as Google Play.

single extended experiment. With each of the experiments, different aspects of the SUNSET concept were evaluated.

Integrated approach
With the choices made within the Operational Stage, an integrated approach was taken overall. This is an alternative schema to the approach whereby there is a largely discrete software development stage followed by an independent testing and operational stage. In SUNSET, operations were strongly interlinked with the technical development, the SUNSET goals and the evaluation framework. This was intended to draw as much user input as possible into the design and operation, resulting in the most effective experiments.

Adaptive planning
As with all new software, there was a fragile basis of trust with the users, hence an adaptive planning approach was used. This ensured that lessons learned in one Lab could quickly be addressed in the others. Also, based on local circumstances, risk aversion strategies could be applied as soon as possible.

Mixed recruitment strategies
For the Enschede and Leeds Living Labs, a Living Lab was set up where recruitment was an on-going action during the entire Operational Phase. In contrast, for the Gothenburg Living Lab specific recruitment actions were taken per experiment.

Mixed experiments
At the operational stage, different ways to involve users were used to explore the broadness of the SUNSET concept. In Enschede and Gothenburg, experiments were carried out with a user base using the tripzoom application. In Leeds, it was decided to explore a wider set of issues that were important to the longer term future of a tripzoom application, for which focus groups and survey methods were the most suitable research tools.

2.3 Management Model for Living Lab Operation

In the operation stage, the intention was that several experiments would be organized following the Management Model for Living Lab operations, which was developed based on the planning in D7.1 (see Figure 2-2). The model consists of three sequential phases through which the experiments are performed. In the Leeds Living Lab, implementation of Phase 2 followed a different route in order to explore wider issues for users.

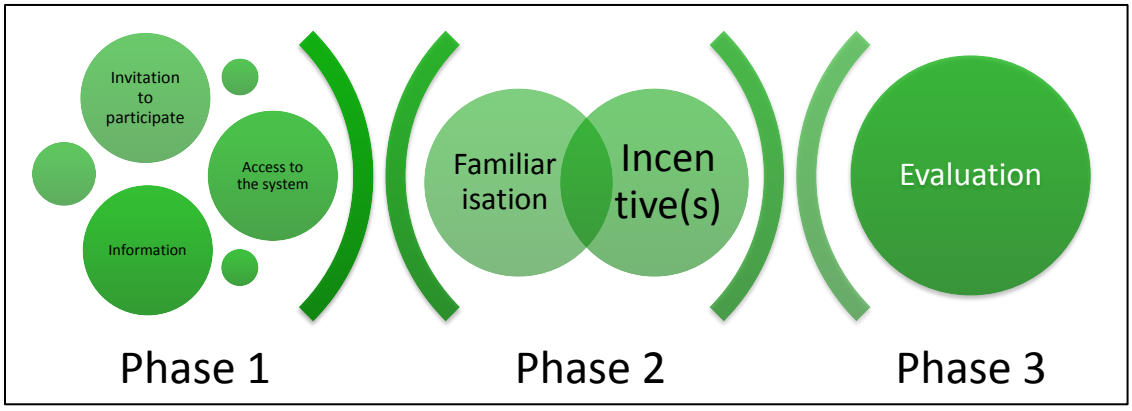


Figure 2-2: SUNSET Living Lab Operation Model for each experiment

Phase 1 makes the step from unknown people to tripzoom users. The main steps are recruiting users, informing users about the project, and getting users involved in the project. Chapter 4 describes the actions taken in this phase.

Phase 2 is the experimental phase. It starts with familiarisation where users use the tripzoom app without any other intervention from the project. This way, they have the chance to explore the different functionalities of the system and build up a mobility profile demonstrating their 'regular' behaviour.

During this first activity the Living Lab Co-ordinator monitors the activities using a strategy designed to retain users in the Living Lab and to prevent participants to drop out (see chapter 5 on retention). The Living Lab Co-ordinator also designs the incentives to be offered during the second activity. The mobility profile is used to determine which user should get the incentive. When users are invited to join a second experiment, they immediately start with the experiment. In that case, phase 1 and the familiarisation is not repeated. The different experiments carried out are described in chapter 6.

In order to align the experiments with all different stakes (user preferences, SUNSET goals, traffic system goals), a general format was used for the experimental design (Table 2-1). This format was also used to align the design of experiments between the Living Lab. It interfaces the high level ambitions of the experiment with the context in which the experiments take place, leading to the detailing of different parameters.

Table 2-1: Experimental design format

Research Question					
What do we target in the experiment?		Do we reward behaviour or do we stimulate change?		What is the research question?	
Context					
SUNSET Innovation	SUNSET High level goals	The System	The Data	The Users	The Living Lab
Experiment					
Base case	Incentive situation	Target Group	Incentive	Scope	Repeat Pattern

In the Leeds Living Lab, Phases 2 and 3 take an alternative route and involved exploratory work using focus groups and a questionnaire survey. These provided an evaluation of these kinds of functionalities and services within the wider commercial domain based on the kinds of apps and services that are currently available.

As is described in the Living Lab Evaluation Deliverable (D7.5), the evaluation of the data arising from the Enschede and Gothenburg LL also involves analysis of questionnaire results arising from both a pre- and a post-questionnaire. Trip data is used to back up any reported behaviour in the questionnaires. Experiences from operating the Living Lab were also collected and reviewed in order to synthesis a set of recommendations on the operation of a Living Lab operation.

2.4 Gothenburg Reference Living Lab planning

The preparation stage (Figure 2-3) included interaction with the user at a point where the actual application was not yet introduced to the people. The studies in the stage focused on potential system functionalities and served as input for the system development.

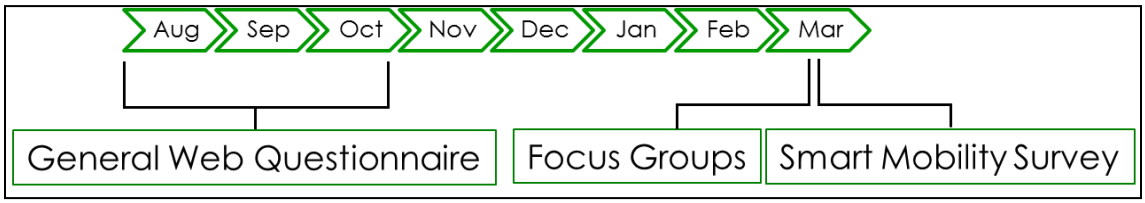


Figure 2-3: Preparation stage (August 2011 – March 2012)

The pre-operation stage (Figure 2-4) were different studies where the application was the central field of study. During this stage, it was an incremental process from a pre-alpha version towards a version which could be used in an open Living Lab setting. The stage ended with the Technical Trial which focused on data quality. During this stage, the submission to the Apple App Store and the Google Play Market was done.

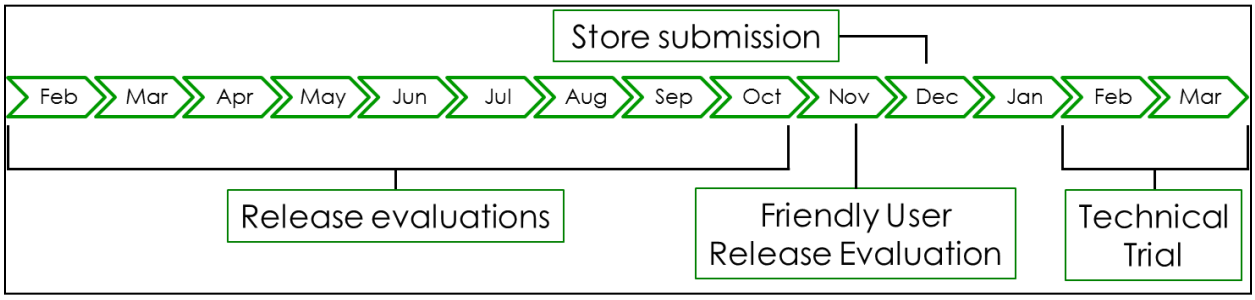


Figure 2-4: Pre-operation stage (February 2012 – March 2013)

After the pre-operation stage was finished, the operational stage started (Figure 2-5). During the Open Living Lab, the sample of users steadily increased. This stage was ended with a set of targeted experiments.

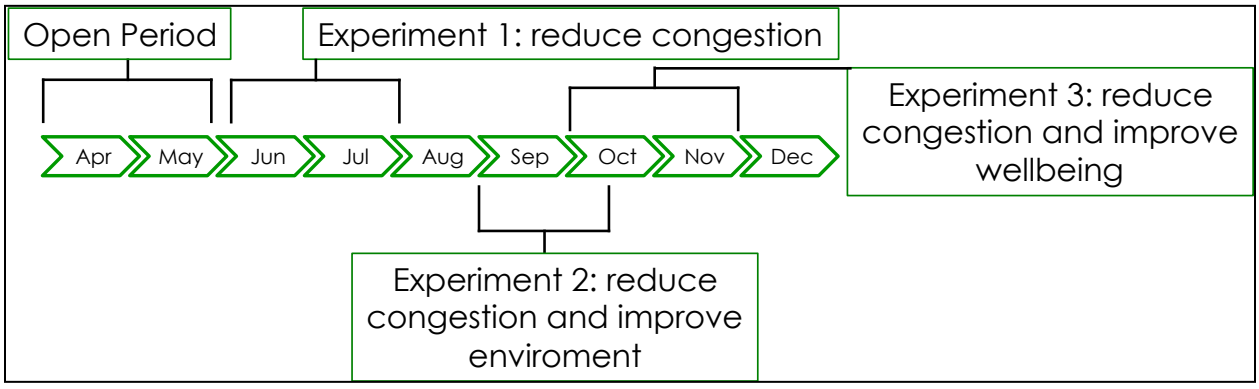


Figure 2-5: Operation stage (April 2013 – December 2013)

Error! Reference source not found. shows the types of evaluation that took place within the Living Lab.

Table 2-2: Evaluations in the Gothenburg Reference Living Lab

	Month	Experiment name	Type of experiment	Users	Deliverable reporting results
Preparation	August / November 2011	General Web Questionnaire	Web based questionnaire	Open group of users	D1.1
	March 2012	Smart Mobility Survey	Web based questionnaire	Open group of users	D3.3
Pre-operation	February – October 2012	Release 1-6 evaluation	Heuristic evaluation, cognitive walkthrough	Project internal	D7.5
	November 2012	Release 7 evaluation	Heuristic evaluation, think-aloud method, experience interview	Colleagues	D7.5
	February / March 2013	Technical Trial	Two diaries comparison	People of previous surveys	D7.5
Operation	May – July 2013	Experiment 1	Experiment with the purpose to reduce congestion	Interested participants from previously performed experiments and new recruited users All with the common denominator that they commuted to/from Lindholmen Sicence Park	D7.5
	September - October 2013	Experiment 2	Experiment with the purpose to reduce congestion and improve environment		D7.5
	October – November 2013	Experiment 3	Experiment with the purpose to reduce congestion and improve personal wellbeing		D7.5

The focus of the rest of this deliverable will be on the Living Lab phase and the experiments that took place within the Living Lab.

2.5 Lessons learnt and good practice

The focus of the rest of this deliverable will be on the Living Lab phase and the experiments that took place within the Living Lab.

Organisational model for Living Lab Operations

By using a model for the Living Lab Operation, preparations could be done in a more structured way. Early user involvement highlighted main topics on which the Living Lab Co-ordinator might expect feedback. In order maintain good practice around the format and operation of the Living Lab, a Management Model was designed and adopted, as visualised in Figure 2-2.

Structured design

One of the main challenges in designing the experiments is the wide set of optimisation parameters. On the one hand, a meaningful and personal user experience is desired. On the other, there are system and project level goals to be achieved. For a successful experimental design, both should be taken into consideration from the outset.

Pre-Operational Stage
The pre-operational stage proved to be an essential part of the implementation of tripzoom in the Living Lab. During this controlled stage where the app was used intensively and tested on all its features, a lot of improvements were made. During the operational stage, technical issues were quite often a trigger for people to drop out.

Balancing act
The operation of a Living Lab is a balancing act; on one hand a stable Living Lab worthy system was desirable to prevent drop outs, on the other hand users made change requests and hoped to see them implemented. Expectations of users regarding the amount of changes to be realised have to be managed from the start. Ideally, there would be a great deal of flexibility in the system components as this would allow for user involvement in the design. However, users also expect a functioning system which requires high system stability and availability.

The central role of the Living Lab Co-ordinator
The Living Lab Co-ordinator served as the hub between all different activities within the Living Lab. As this was one of the project team members, there was also a good understanding of the system and close contact with the developers. This proved to be a successful strategy as all relevant knowledge was centralised and there where strong ties with relevant stakeholders. For instance in serving as a helpdesk, the Living Lab Co-ordinator should be able to explain to the user the requirements for joining, and should be sufficiently technically knowledgeable to address relevant queries regarding the system. However, there is also a vulnerability related to this central role, as a lot of knowledge is lost when the Living Lab Co-ordinator might become unavailable.

3. Preparation for the Reference Living Lab

Before the open living lab stage could start, several preparations have to be made as is depicted in Figure 3-1. The tripzoom system had to be stable functioning, the local context provided obligatory actions to take regarding data protection, the operational team had to be prepared to run the Living Lab, and the first actions regarding stakeholder involvement had to be taken.

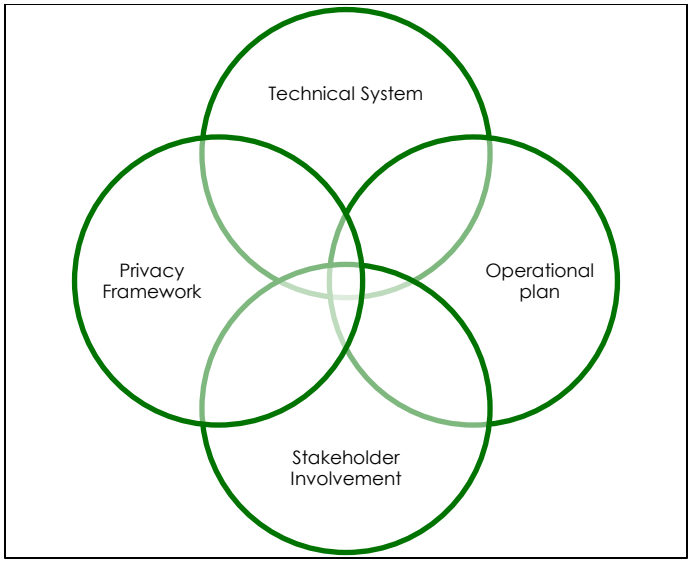


Figure 3-1: Preparations for Living Lab Operation

3.1 tripzoom system

The system design and development are organised within work package 2 (server components), work package 4 (mobile client) and work package 5 (system integration). The work in the Living Labs regarding the system development was a series of evaluations of different software releases. First with project members acting as end users, later with some friendly end users. The results of these evaluations are documented in D7.5.

3.1.1 Release evaluation with the project team

In the first six releases, the application was evaluated by a team of internal reviewers. Within the Gothenburg Living Lab, Viktoria contributed to executing the evaluation. Since project internal users were involved, recruitment was done by sending an e-mail to the project team. This took little effort and resulted in one or two persons per partner, on average four of which joined in the different release evaluations.

These releases focussed on the technical functionality of the system. Checking all major user interfaces, system functionality and trip registration.

3.1.2 Release evaluation with external friendly users

In the seventh release, a number of friendly users was involved. These people were direct colleagues of the R1 – R6 evaluation users, who we worked closely together with. Within all partners departments, there were interested colleagues who are willing to use the app and work

together with us in the evaluation. The recruitment was typically done by face to face contact on the work floor. This resulted in four colleagues working with us.

The aim of this release was to have broader group of users, and specifically test the registration process with unknown people.

3.1.3 Submission to app stores

The last step to get the system ready was submission to the app stores. In the release evaluations, a development version of the app was distributed using the development server. This way, updates could be done more easily form the developer perspective. For the open Living Lab situation, a regular user experience was needed. The submission of the app to the app stores marked a change in development strategy, as from this moment on a trade off had to be made between the importance of an update and the annoyance an update would cause by the users.

3.2 Data protection and management issues

As tripzoom is an app which collects personal data, the data protection and management is a crucial task in preparing for Living Lab operation. Within the project a privacy framework has been set up to take care of this (Figure 3-2).

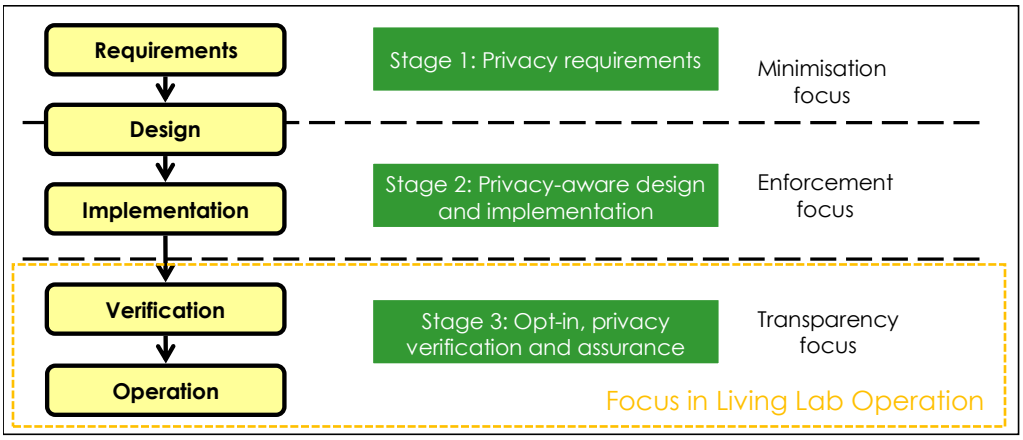


Figure 3-2: SUNSET Privacy Framework

SUNSET has complied with all relevant national and EU regulation and directives in order to ensure safety and privacy following a *privacy-by-default* and a *privacy-by-design* approach. The approach is compliant with the current status 2012 EU legal framework on the protection of personal data. (see also http://ec.europa.eu/justice/data-protection/index_en.htm)

In order to protect data of users and to assure privacy is maintained our approach consists of three elements:

A minimisation focus. The collection of personal information is kept to a strict minimum in the design of the tripzoom app and the Living Lab operation. Data anonymity is the default option for research-related analysis purposes.

An enforcement focus. When users opt-in, personal data is protected by appropriate (technical and procedural) security safeguards against risks as loss or unauthorized access, modification or disclosure of data.

A transparency focus. Users should be able to trust the system. We provide transparency to each user on the way privacy preservation is ensured and what types of data will be collected. Moreover, we provide user insight into all personal data gathered and a mechanism where user data is fully deleted from the system on request.

To get to stage 3, the design of the framework had to be organised. This was done as a cooperate effort by the three Living Labs.

3.2.1 Operation

After implementing the first two steps of the framework in the technical system, verification and operation took place as part of the Living Lab operation. Within the Living Labs, user text for all of the consent stages have been developed and operationalized by all of the Living Labs. In Gothenburg, the privacy protocol was in line with the SUNSET privacy framework as it was designed with the Dutch Personal Data Act as basis. Project members using the Swedish Personal Data Act (PDA), which is supervised by the Swedish Data Inspection Board, reviewed it. The SUNSET privacy framework was in addition sent to the Inspection Board with a question from the project to review the framework based on the act, however the board answered that they do not review specific frameworks only supervise that organisations and individuals follows the regulations provided by the Act. Therefore, no conclusions on the correctness of the framework could be drawn from this request. Since the guidelines of the Dutch Data Protection Agency were used to set up the privacy regulations and project internally reviewed based on the Swedish PDA, the framework is deemed sufficient to protect the users' data within the Gothenburg context.

The privacy regulation was made an integral part of the registration process, as will be described in section Chapter 4. During registration, users had to explicitly opt-in at several stages:

- Downloading the app – Allow the use of smart phone sensors;
- Account registration – Accept the terms & conditions, as well as the privacy regulation;
- Logging into the app – Agree with measurement and storage of location traces.

3.3 Gothenburg Living Lab Operation Team

As a final preparation in Gothenburg a Living Lab Operation Team was organized in May 2013. It consisted of three members from Viktoria Swedish ICT who were divided on four main functions:

- Living Lab Co-ordination
- Recruitment
- Support and retaining activities
- Experimental design and evaluation
- Risk management

Living Lab Co-ordination was the management function in the operation team. The individual working in this function was the main contact person towards potential persons. He was also the primary link to the other Living Lab and also the project as a whole. One of the responsibilities within this function was to design the Living Lab approach and adapt it to the Gothenburg Reference Living Lab context. Two members were involved in recruitment and were responsible for designing and operating the four waves of recruitment performed in 2013 (see chapter 4). One of these members were also involved in support and retaining activities, especially the helpdesk and the newsletter (see chapter 5). One member was solely in charge of experimental design and evaluation. His responsibility was to design the experiments according to the overall plan for experimental work in SUNSET. He also utilized the evaluation framework produced in WP6

and together with representatives from the other Living Lab conducted the evaluation reported in D7.5. The team in addition utilized the risk management approach designed in D7.1 to identify and manage risks during the operation.

3.4 Lessons learnt and good practice

The need of a preparation phase
Conducting experiments within a Living Lab requires that the Living Lab is prepared beyond the completion of a working system. This involves the organisation of an operational team that could design, run and maintain the Living Lab. This is of equal importance if the Living Lab is a main living lab or a reference Living Lab.

Release evaluation
Release evaluation as a tool to steer user experience worked well. However, friendly end users outside the projects scope have a hard time seeing the systems potential instead of user interface design.

Privacy framework
A privacy framework must be in place if the system involved in the Living Lab involves personal data; e.g. travel behaviour. One lesson learnt is that the review process of this framework in relation to national legislation is a time and resource consuming process. A Living Lab oriented project must ensure ahead of time that resources are available for such review.

4. Establishing the Reference Living Lab

During the first Living Lab stages (From August 2011 to November 2012) the tripzoom app was not yet finished. Therefore, all communication was done using SUNSET as the project title. When the tripzoom app was introduced to the users, this shifted how the project was promoted to potential users. In this chapter we described the different strategies used to recruit users to the Gothenburg Reference Living Lab.

Each of the Living Labs has recruited users using different strategies. During the entire process of registration and setting up the tripzoom app for a specific user, and then later using tripzoom and filling in surveys people sometimes lost interest and quit participating. In order to make a clear distinction people who actually used tripzoom are called *users* and for these people we will have a least one trip registered in the database. All are people that are referred to as *participants*; they have with varying degree showed interest in the project and tripzoom but have not used the application.

4.1 Target group, recruitment waves and strategies used

As stated in D7.1 the target group in Gothenburg was commuters who on a daily basis commuted to and from the city centre in Gothenburg and Lindholmen Science Park as primary target area (Figure 4.1). On a daily basis 20000 individuals commutes to this area using mainly car and public transportation. It is one of the areas in Gothenburg that creates most congestions during weekday peak hours (06:00-08:00) and (16:00-17:30). A congestion tax was introduced in Gothenburg from January 1, 2013, with the Stockholm congestion tax as a model. It is a congestion pricing system implemented as a tax levied on most vehicles entering and exiting central Gothenburg, including some main roads passing by the city. The primary objective of the congestion tax is to reduce traffic congestion and improve the environmental situation in central Gothenburg, and to get financing for large infrastructure projects in and around Gothenburg. The largest such project is Västlänken. Several strategies for recruitment were used to engage with this target group. Ranging from focussed personal contact to the use of existing channels and organisational established relationships.

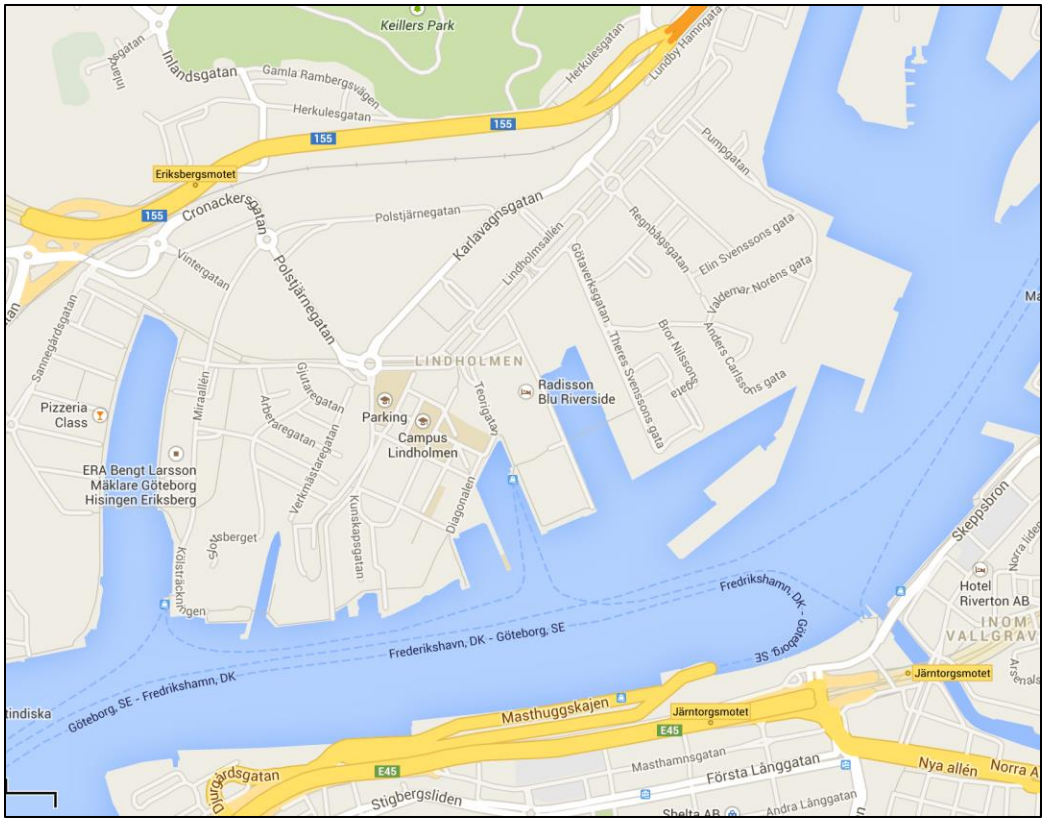


Figure 4-1: Lindholmen – target area for the Gothenburg Living Lab

In Gothenburg several recruitment phases were performed in 2013. The first wave was conducted around the organisation of the technical trials and commenced in February 2013. The The second wave was conducted in May 2013 for experiment 1 and the third and fourth waves contributed to registered users for experiments 2 and 3.
Table 4-4-1 presents an overview of the different recruitment waves performed in 2013.

Table 4-4-1: Overview of recruitment waves in the Gothenburg Reference Living Lab

Wave	Target group	Recruitment period	Number of recruited participants
Wave 1	Commuters to Lindholmen science park	February 2013	36
Wave 2	Commuters to Lindholmen science park	May 2013	56
Wave 3	Students commuting to Lindholm science park	October 2013	8
Wave 4	Commuters in Gothenburg primary commuting to Lindholmen	October 2013	38
Total			138

Overall the methods that were used in the different waves ranged from face-to-face meetings and distribution of flyers to advertisements in local newspapers, through presentations for target groups. In **Error! Reference source not found.** the progress in the total number of users in the system is shown from wave 2, and the expansion of registered participants in wave 2, 3 and 4 are clearly visible in this diagram. Corrected for test participants there are 95 registered participants in the system additional to the 36 recruitments that was done for the technical trials in February 2013.

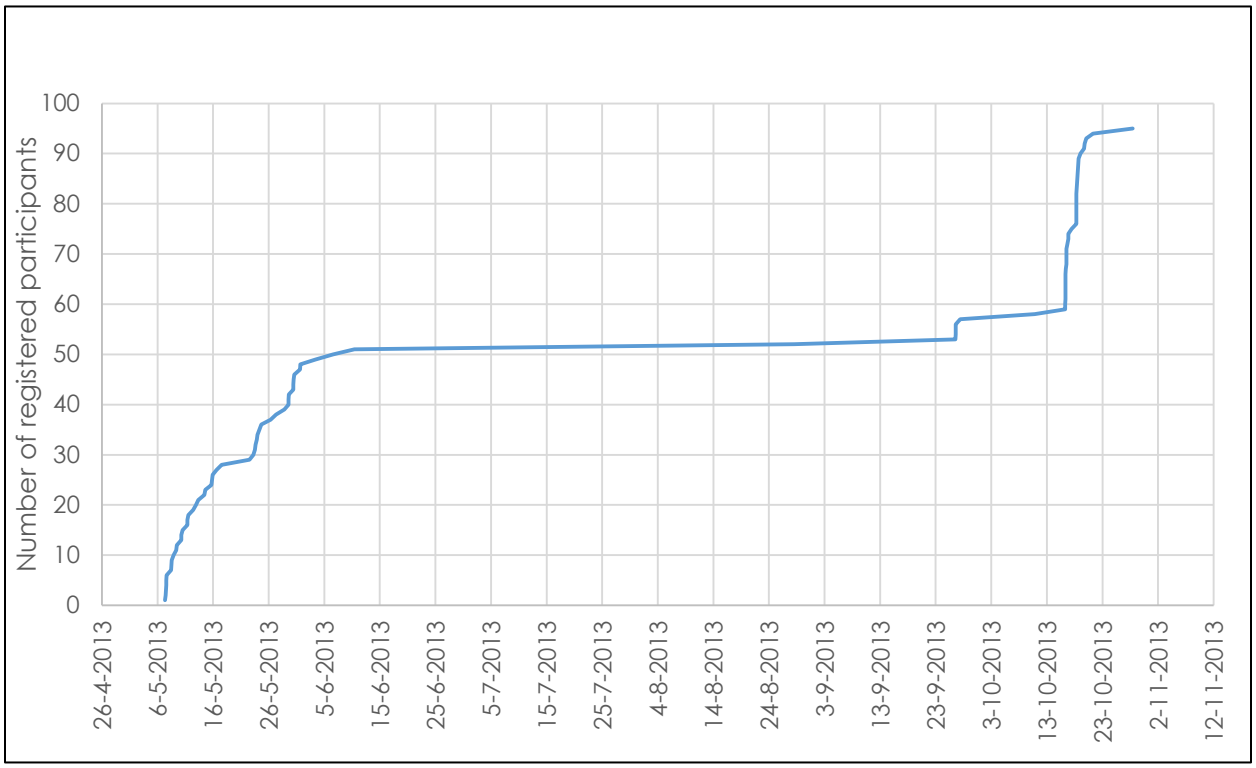


Figure 4-2: Total number of additional registered participants in the Gothenburg Living Lab during wave 2, 3 and 4

4.2 Wave 1: Recruitment for the Technical Trial

For the technical trials the main target group were participants already involved in the SUNSET project to support work performed in WP1, WP2, and WP3. They had been recruited through newspaper advertisements from the beginning of the project and onwards. On average these participants has cost €200 to recruit in advertisement costs. This pool of potential Living Lab participant consisted of 40 individuals commuting on a daily basis from the city suburbs to Lindholmen. In December 2012 these individuals were invited to become users in the technical trial of tripzoom. The invitation was repeated in January 2013 and eventually 18 joined as users of the service.

The challenge for the project was that tripzoom did not recruit its own users based on viral marketing and word of mouth as was first envisaged. In order to increase the body of users from 18 a strategy were designed to be used by the Living Lab operation team to recruit as many users as possible for the trial that commenced in February of 2013. The strategy consisted of three activities:

- Distribution of flyers
- Recruitment through established organizational relationships
- Alignment with on-going projects

Figure 4-3: Distribution of flyers

During the last week of January and the two first weeks of February 2013 2400 flyers were distributed in the Lindholmen area inviting commuters to participate (Figure 4-3). In all this resulted in eight registered users and participants in the technical trial. In parallel the Living Lab operation team utilized their established connections with organizations and on-going projects in order to connect to additional potential users. An invitation to participate in the technical trials was distributed in two organizations (Lindholmen Science Park and Business Region Gothenburg). Together with an advertisement towards users involved in the Commute Greener project (Volvo IT) 10 additional users signed up to be a part of the technical trial.

4.3 Wave 2: Recruitment for experiment 1

Building on the experiences from recruitment wave 1 described above the recruitment strategy for wave 2 to 4 was sharpen and expanded. Overall the methods that were used in the different waves ranged from face-to-face meetings and distribution of flyers to advertisements in local newspapers, through presentations for target groups.

4.3.1 Flyers distributed face-to-face

During May 7th and 8th, the SUNSET event days, Viktoria Swedish ICT stood outside the reception at Lindholmen Science Park with the objective to recruit users for tripzoom. To increase the attention of people passing by, the Living Lab operation team put up a rollup, a television screen with the animated film about SUNSET in a loop and a table with smoothies. Figure 4-4 shows a picture of what it looked like during one of the days. During the first day Living Lab operation team handed out 350 flyers and 150 smoothies, and on the second day the team handed out 200 flyers and 80 smoothies. The lesser amount of flyers and smoothies handed out the second day could be explained by a significantly smaller amount of people passing by since

May 9th was a bank holiday in Sweden and lot of companies only work half the day the day before holidays.

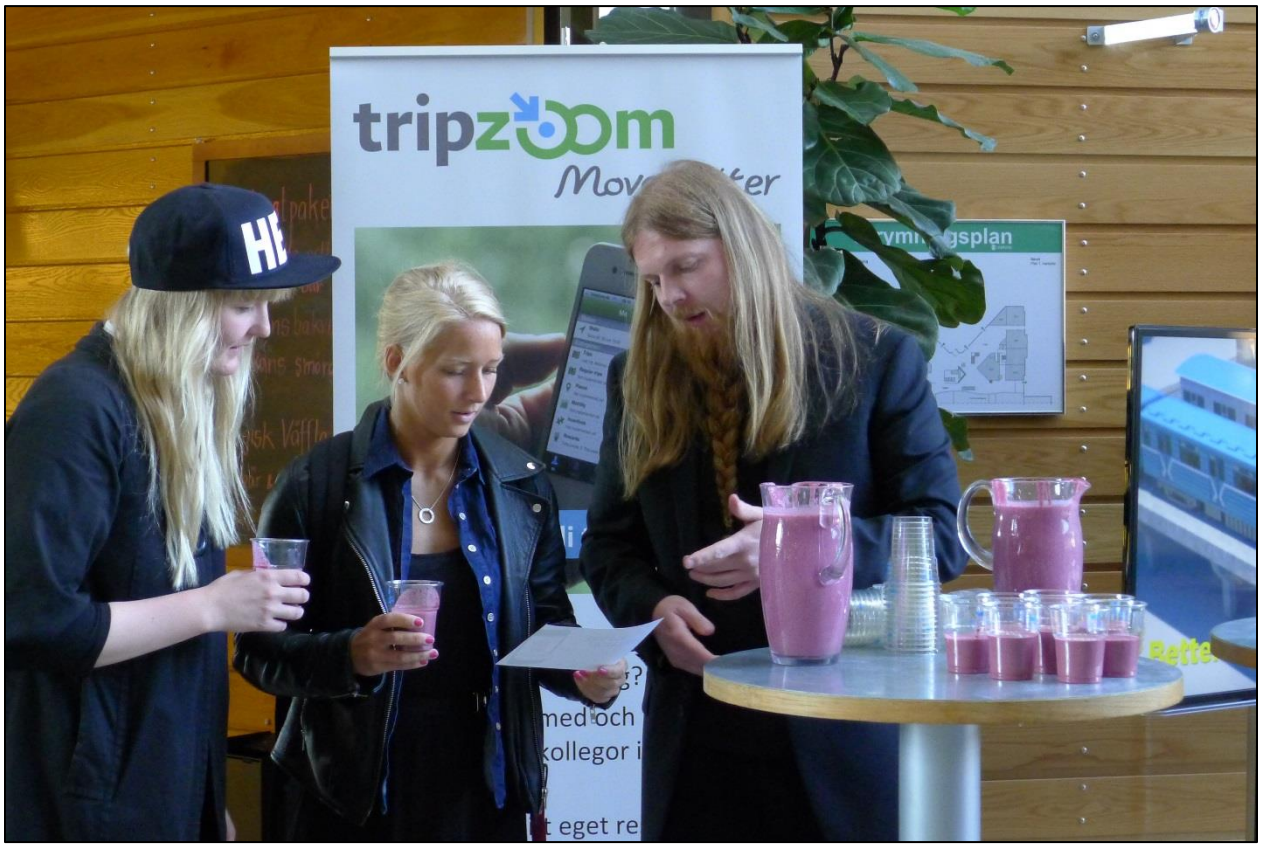


Figure 4-4: A picture from the SUNSET event day.

4.3.2 Flyers at strategic places

In late April, and a couple of times in May, the Living Lab operation team had placed flyers in the area around the reception at Lindholmen Science Park. During SUNSET event days there were several people who asked if they could take a bundle of flyers with them and hand out at their offices. There were also a few students from the IT University who also took a bundle of flyers to hand out at the University. According to the feedback we received from the registration form on our Website, five of the new users stated that they came in contact with the project because they took a flyer.

4.3.3 Direct recruitment with advertisement in newspapers

During late April and early May the Living Lab operation team contacted several newspapers to see what kind of options they could give us regarding advertisement and what it would cost. Based on the price and that they are focusing on different municipalities around Gothenburg the Living Lab team chose to advertise in the following local papers: Alekuriren, Mölndals-Posten, ST tidningen, Kungälvs-Posten and Kungsbacka-Posten. Ads were also ran a second time two weeks after the first one.

Alekuriren reaches around 13.500 households in Ale, Lödöse and Nygård, and 1.142 organizations in the municipalities of Ale and Lilla Edet every Wednesday. ST magazine is a free local newspaper, published on a weekly basis and distributed to all residents in the municipality

of Stenungsund. The picture in **Error! Reference source not found.** shows a prints screen from Alekuriren and a scanned copy of Mölndals-Posten.

Figure 4-5: The picture to the left is a picture from the ad that was published in Alekuriren, the picture to the right is from the first page on part 2 in Mölndals-Postens

The advertisement in the five local newspapers gave the Living Lab a total of 16 new users during wave 2 in May 2013.

4.3.4 Information on Public Radio about the project

During the recruitment process the Living Lab operation team made efforts to broadcast information through the local radio stations. The reason why the team thought this could be a good idea is that many people are listening to the radio when they commute to and from work. The team contacted one of the established contacts at the Swedish radio and booked a lunch meeting in middle of May. During the meeting we talked about the project and we also provided our contact with some flyers since the team thought she could leave those to her colleagues at the radio station. Our contact forwarded the information to program managers but unfortunately they had no opportunity to address the project on the radio.

4.3.5 Advertisement in Lindholmen Science Park Newsletter/Homepage

Since the Living Lab operation team earlier had been in contact with the PR and communication department at Lindholmen Science Park we contacted them again to see if the team could get some information into their newsletter that they send out every month and if they could promote our event at their website. Unfortunately they had already planned all the

news for the May edition of their newsletter and they did not have any space left. They did however promote the SUNSET event days on their website and on their Facebook page, which you can see in **Error! Reference source not found.**.

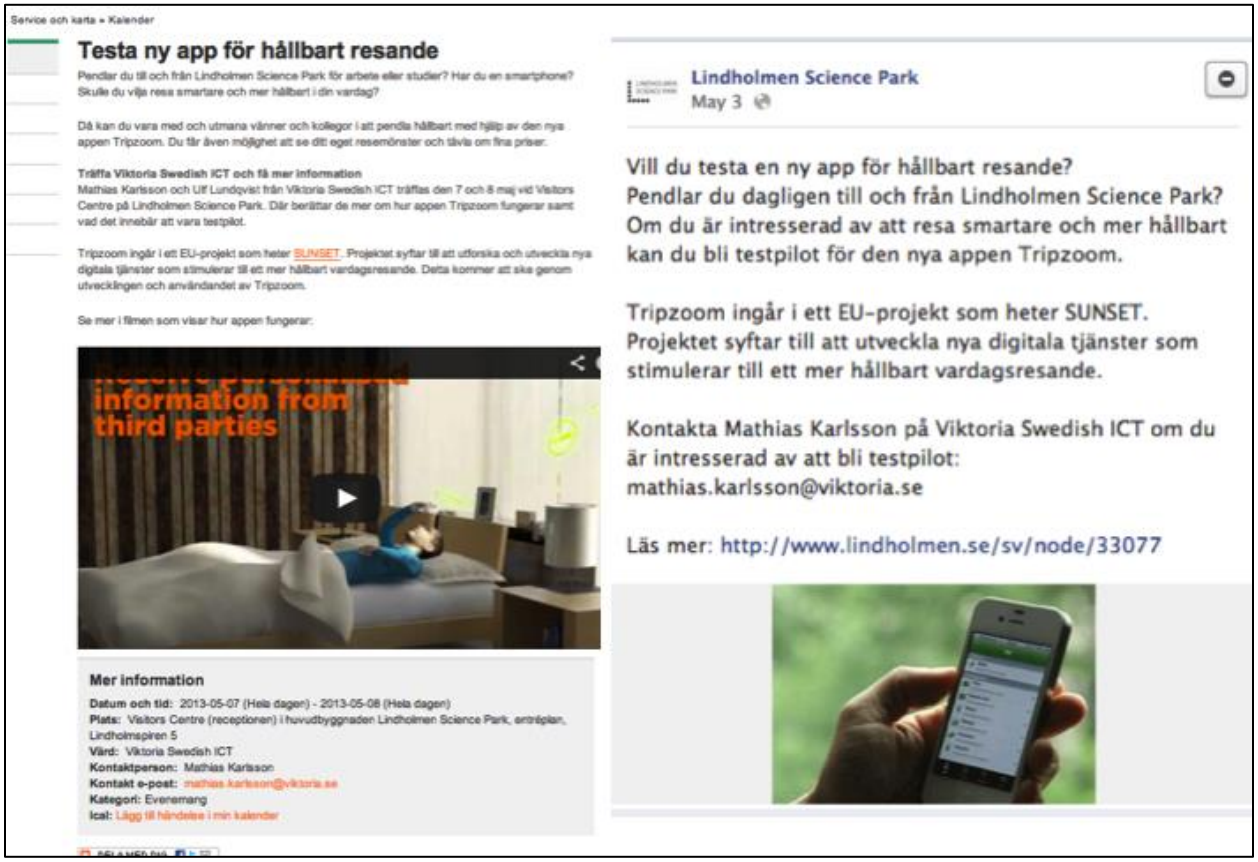


Figure 4-6: The left picture is a screenshot from the webpage of Lindholmen Science Park and the screenshot to the right is from their Facebook page.

4.3.6 Dataföreningen Västra Kretsen

During the SUNSET event day people from Dataföreningen Västra Kretsen offered to put some info about SUNSET and that the Living Lab operation team are looking for users for the digital travel service tripzoom in their monthly newsletter, which they send out to their members. We gratefully accepted their offer and the newsletter were sent out to their members on May 12th. The newsletter gave us three new registered users.

4.3.7 Viktoria Swedish ICT

On the website of Viktoria Swedish ICT the Living Lab operation team made an information and registration page were people could read more about SUNSET, watch the animated video about the project, learn what it means to participate as a user and register to become a user. A screen shot of the webpage is presented in Figure 4-7.

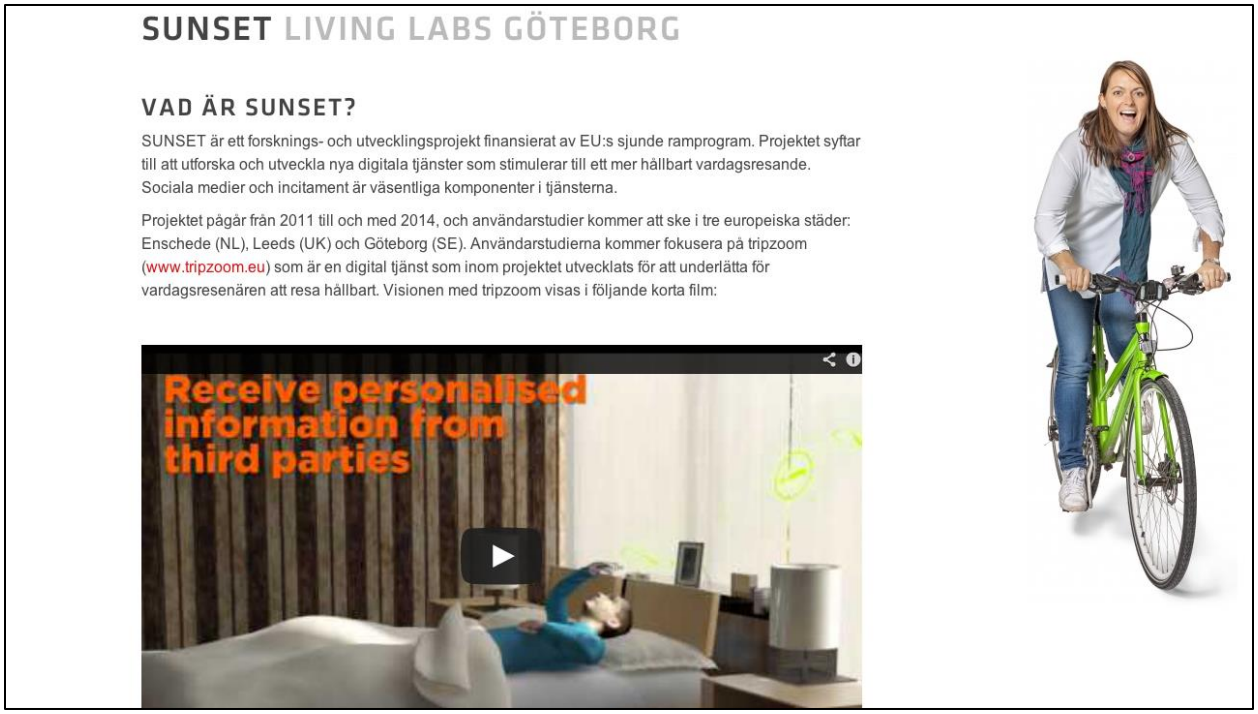


Figure 4-7: A screenshot of www.viktoria.se/sunset

4.3.8 Additional pitch-presentations

The Living Lab operation team did do two pitch presentations for two different companies. The first one was August Leffler & Son (Leffler), which is a part of the Maersk Broker Agency Sweden AB in Gothenburg. Leffler was selected since it is an interesting company with a long history, they are one of the oldest companies in Sweden and have served vessels in Gothenburg 365 days a year since 1781. What also makes them interesting is that some of the employees believe they are dependent of their own car even though Leffler has a company car, which every agent is allowed to use. They are eight employees at the Gothenburg office and one signed up to become a user.

The Living Lab operation team also pitched the project for one of the employees at the operation department at Saybolt Sweden AB, which is a part of Saybolt International BV, based in Rotterdam. Saybolt specializes in independent inspection and analysis and the company was founded in Philadelphia1889 by Edward W. Saybolt. The people working there as surveyors are using the company cars when they are at work but they use their own car to travel to and from work, so they have possibilities to use the public transportation system but they do not utilize it. One of the employees signed up to become a user.

4.3.9 Recruitment results wave 1

As mentioned earlier, the Living Lab operation team carried out various activities to recruit users during wave 1, and these activities generated in 56 new users. Figure 4-8 shows a diagram of the different activities carried out and how many new users each activity attracted.

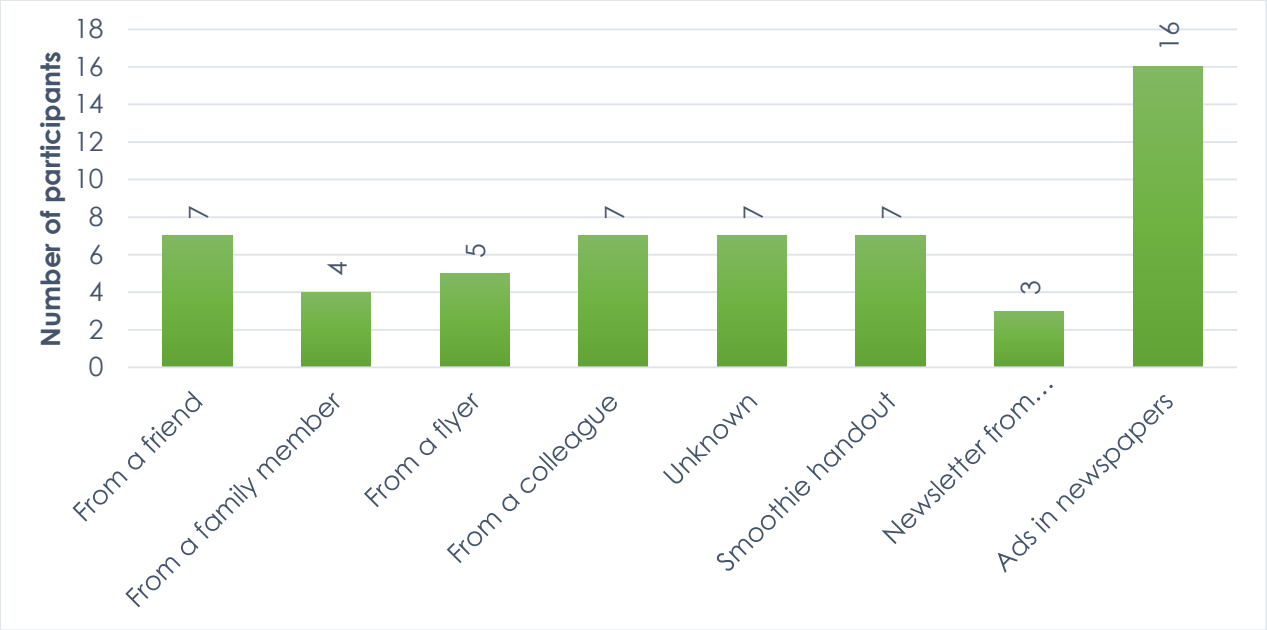


Figure 4-8: The diagram shows how many users we recruited through different activities in wave 2.

The activity that had the biggest success regarding number of recruited users was the advertisements in different newspapers, which gave 16 new users. It should be mentioned that the ads were published twice in each newspaper. The two local papers that had the best reach and gave us 10 new users were Alekuriren and Kungsbacka-Nytt, which is presented in Figure 4-9. Face-to-face recruitment should be the most effective in terms of conversion into actual users, but on the other hand it is also the most time consuming. Advertisements had lower conversion however yielded the highest amount of interested participants.

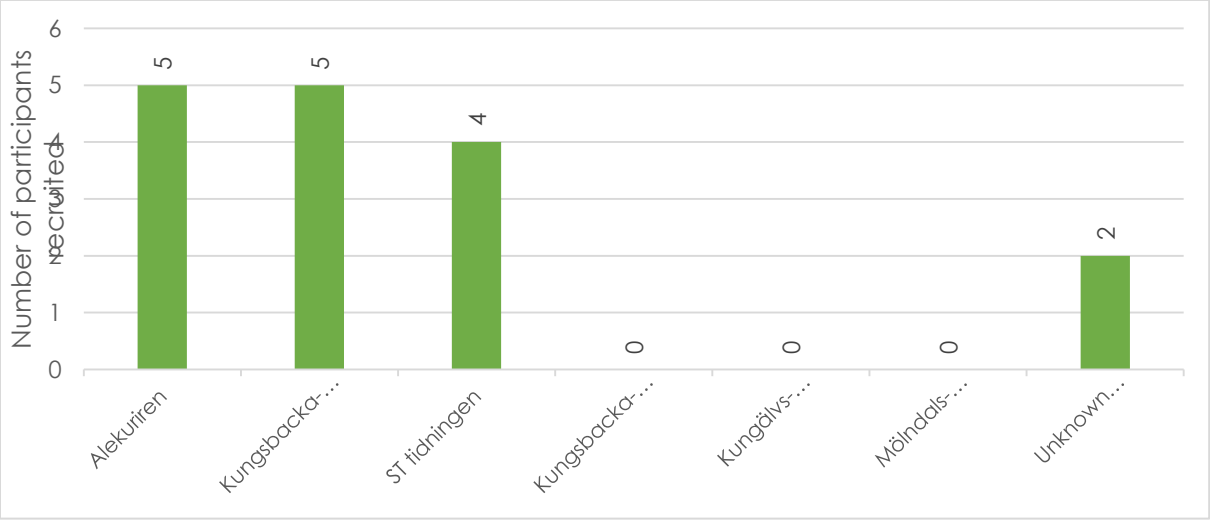


Figure 4-9: The diagram shows which newspaper that had the best reach and recruited most users.

The recruitment budget for the Living Lab was €10.100 and before the summer vacations the Living Lab operation team had spent €4.270. That left the team with €5.845 to use for the rest of the Living Lab to cover the cost for recruitment of users during wave 3 and wave 4 and the costs for rewards and prices for the users.

The different recruitment methods used in wave 1 gave the Living Lab operation team good indications how to effectively recruit new users for wave 2, 3 and 4. The diagram in Figure 4-10 shows the average cost per recruited user in wave 2. "Unknown" means that we do not know how the user got in contact with SUNSET. We have not calculated the working hours the operation team addressed to conduct every activity.

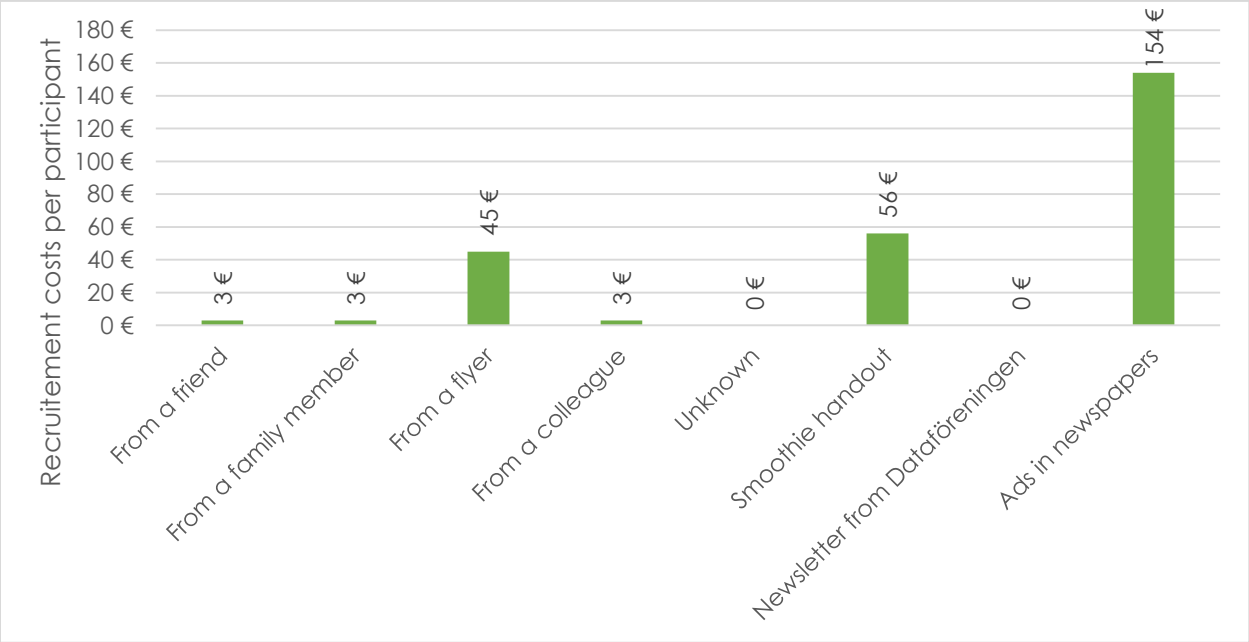


Figure 4-10: The diagram shows the average cost per recruited user divided in each activity.

4.4 Wave 3: recruitment for experiment 2

For the second experiment the initial objective was to recruit students that travel by bus to Lindholmen Science Park. The bus services to Lindholmen Science Park, mainly bus line 16 is heavily congested during peak hours and the idea was to try to create a challenge for the students to either travel at different times during the day or to walk or take the bicycle to the university. The students were recruited during a lecture given by the Living Lab Coordinator on the 26th September about the SUNSET project in relation to their course "IT strategi, ledning och styrning" at the IT University in Gothenburg. The lecture had 83 students and the Living Lab operation team managed to recruit 8 of them, which are illustrated in Figure 4-11.

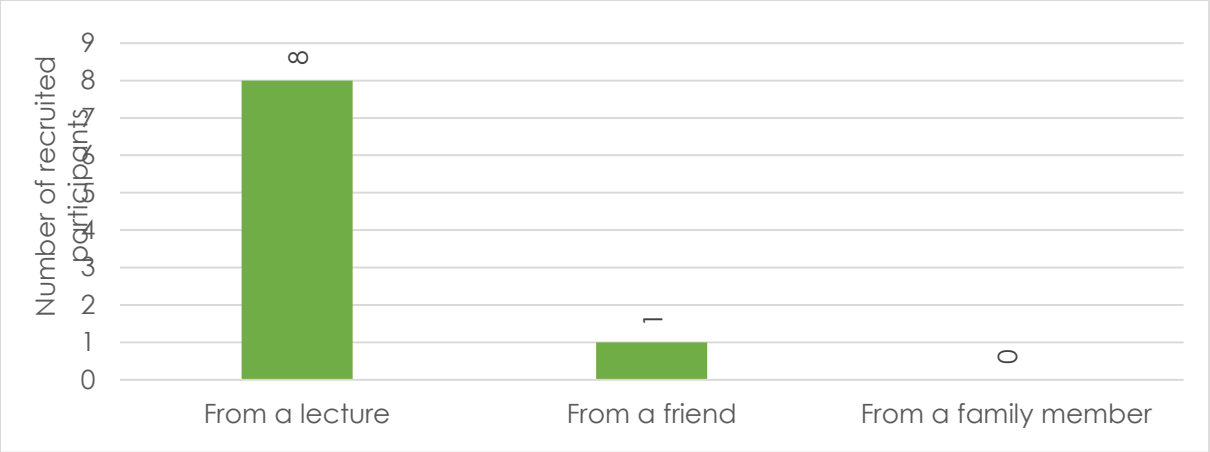


Figure 4-11: The diagram shows users recruited in wave 3 after lecture at Gothenburg IT-university.

4.5 Wave 4: recruitment for experiment 3

The previous recruitments, wave 2 and wave 3, were all focussed on travellers with a destination to Lindholmen Science Park in Gothenburg. In the final stage of the project the Living Lab operation team felt it was time to open up the recruitment to commuters in Gothenburg in general. The team knew from experience with recruitment of users in wave 2 and wave 3 that the most effective way to recruit new users and to reach out to a large group of people is to buy advertisement in a newspaper.

The Living Lab operation team decided to buy advertisement in the free morning newspaper Metro, Figure 4-12 shows an illustration of the area around Gothenburg where Metro is distributed. The advertisement was published twice in October, once on Wednesday 16th and once on Friday 18th and a prime spot was chosen within the paper. According to Metro an ad that is published twice has about 534.000 unique readers. The target group of Metro is people who are on the move and therefore the paper should only take about 20 minutes to read, and since it is a free newspaper the reader has a greater understanding that there are more ads in it compared to a subscribed newspaper. The picture in Figure 4-13 shows the two ads that were published in Metro.

Figure 4-12: The picture shows the areas where our ad was published in Metro

Figure 4-13: Advertisement in Metro newspaper. The picture to the left is a scanned page from 16th May and the one to the right is from 18th May.

In total 33 people were recruited through the Metro advertisements. Additionally 4 persons were recruited through mouth-to-mouth recruiting of one of the Metro recruited participants, which is shown in Figure 4-14.

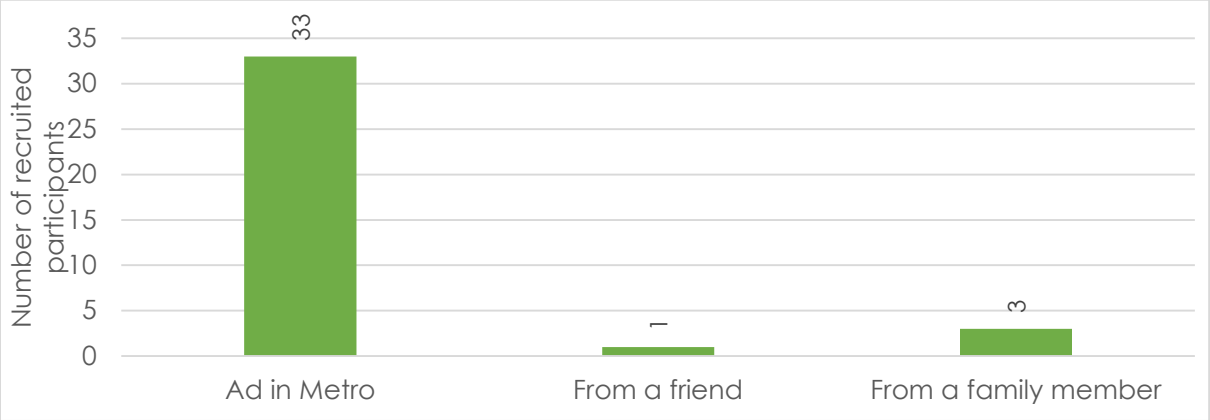


Figure 4-14: How the 37 new users where recruited.

The costs of advertisements were €2.630 leading to a cost per participant of €80, which is shown in Figure 4-15.

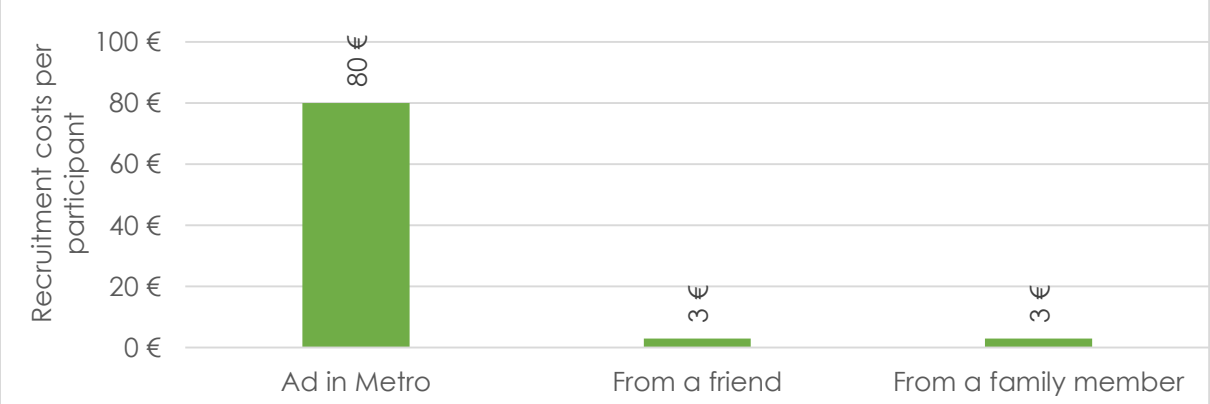


Figure 4-15: Shows the cost per recruited user in wave 4.

4.6 Recruitment results wave 2, 3 and 4

In total the Living Lab operation team recruited 131 Living Lab participants during wave 1 to wave 4 (Corrected for test users from the technical trials there was 95 registered participants in the system, 2013-10-28). Figure 4-16 demonstrates the different recruitment activities and how many users the Living Lab operation team managed to recruit per activity. The activity with the best success rate was the advertisement in newspapers, which gave 49 users. If we look at Figure 4-17 we can see that recruitment via advertisement in newspapers was the most expensive of the different activities but it was also the most effective recruitment activity with a cost of €104 per user

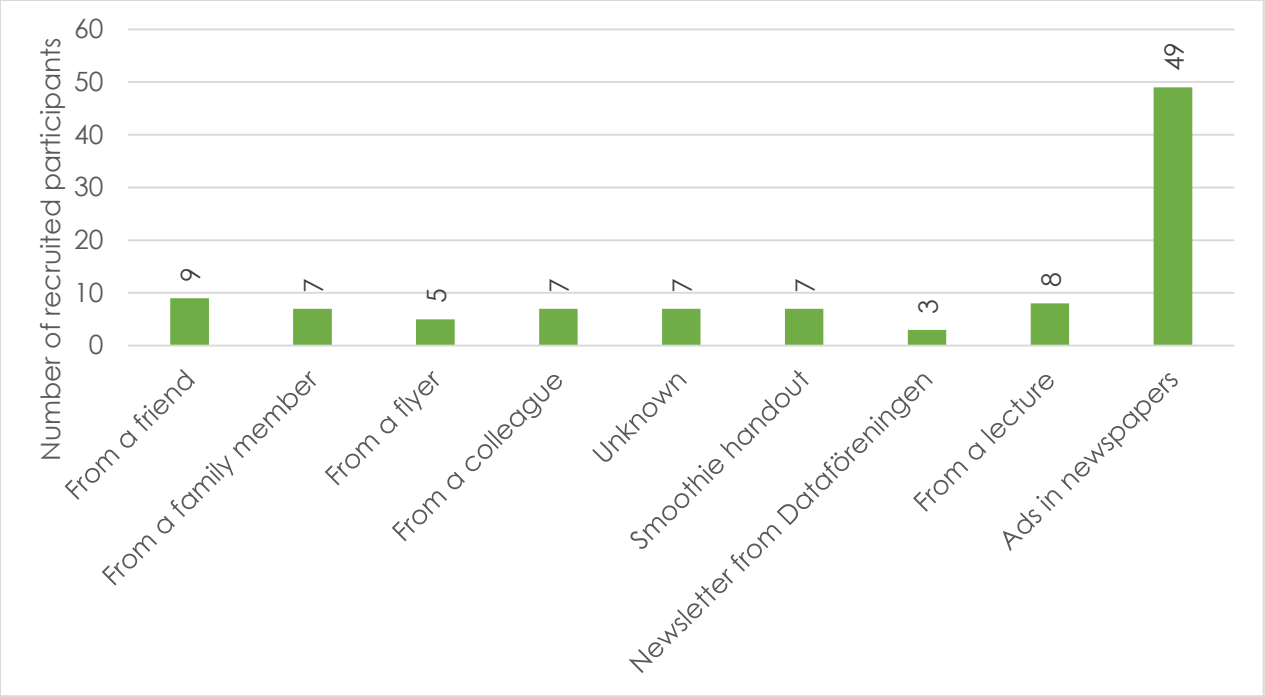


Figure 4-16: Shows the different recruitment activities we used in wave 2 to wave 4 and how many users each activity attracted.

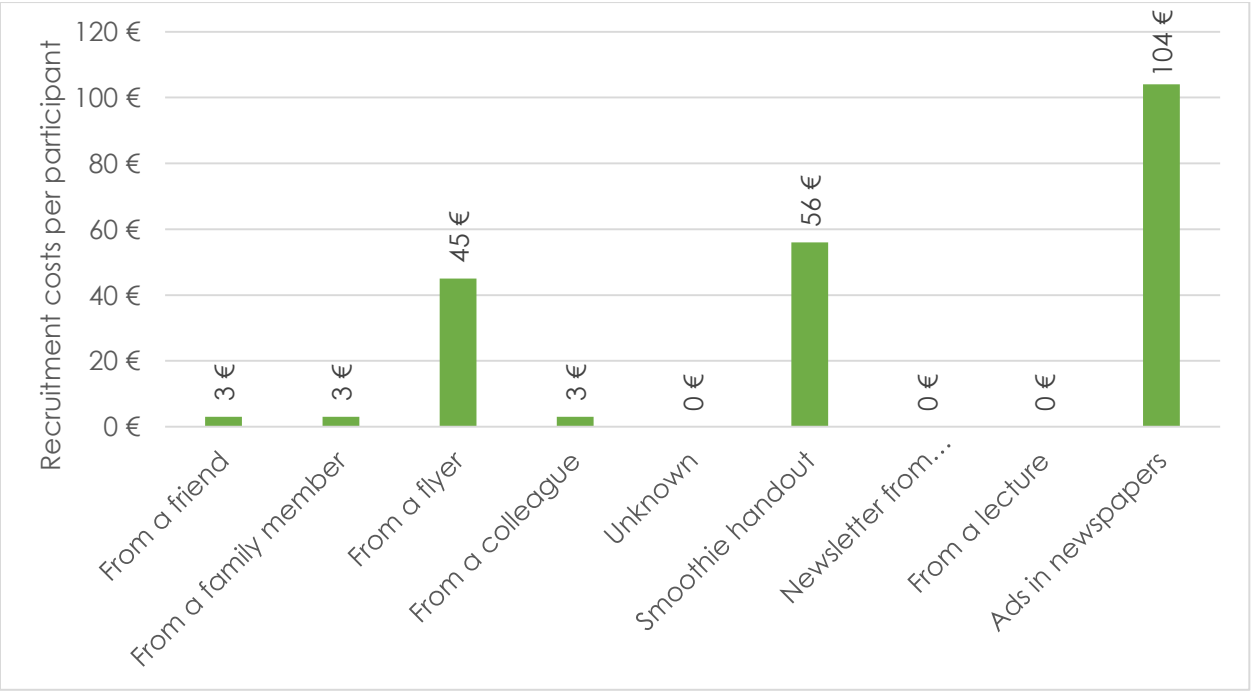


Figure 4-17: Cost per user and activity.

4.7 Information procedure

When a user showed his/hers interest to participate in one of the tripzoom experiments this triggered a two-step designed information procedure with the aim to inform the user so he/she

could make an informed decision to be a part of the experiment. The procedure was developed in January 2013 and revised based on experiences received from the technical trial and experiment 1.

4.7.1 Stage 1 – Information package prior to tripzoom user registration

When a participant registered his/her interest to be involved in one of the tripzoom experiments he/she received a personal email from the Living Lab coordinator in Gothenburg confirming the submission of the interest. In this email the potential user received a short introduction in Swedish about the SUNSET-project, the motives and objectives with the Living Lab, a time table of the specific experiment, the gifts associated with the experiment and how to fulfil the requirements to receive the gift. The information package also provided a Swedish version of the privacy framework and an introduction of the Living Lab team in Gothenburg and contact information to the team. The email in addition included a registration roadmap how to register as a user in tripzoom together with a link to www.tripzoom.eu, Google Play and iOS App Store to start the registration process (see section 4.8). The interested user was also invited to attend an information brief about the service that the project arranged at Viktoria Swedish ICT prior to the experiment phase. Information was provided about the basic functionality of the service together with an FAQ that evolved during 2013 (c.f. appendix A and B).

4.7.2 Stage 2 – Information package after tripzoom user registration

When the participant had registered as user and been approved by the Living Lab coordinator he/she received a second personal email from the Living Lab coordinator. In this mail the user was welcomed to the experiment and the Living Lab. Information about the familiarization stage and following challenge stage was also overall described in this second email. The user also received a link to the pre-questionnaire which collected data about the users travel behaviour and attitudes toward digital services and current commuting experiences. This email was also in an alternative form sent out to users that had been involved in previous experiments, he/she then received for example a less detailed pre-questionnaire.

4.8 Registration workflow

Before running tripzoom, users have to go through several steps in order to be registered. This process was designed in such a way that the Living Lab Co-ordinator has full control over the sample. In the rest of this section the process will be described. In general, there are two ways to register (Figure 4-18). In the first case, the user account is registered on the mobile client in the app. In the second case, the account is registered using the website. In both cases the same registration process had to be followed. In the process that follows, the routing of the first case is described.

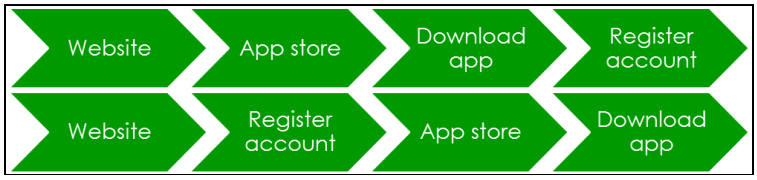


Figure 4-18: Roads to registration

Downloading the app

The first action toward registration is downloading the app. In either the Google Play Store or the Apple App Store (Figure 4-19), users could download tripzoom like any other app. Before downloading, the user had to opt in to let the app use several system features of the phone:

- Your location

- Network communication
- Storage
- Your accounts
- System diagnostic tools
- Influence on battery
- Information about your apps

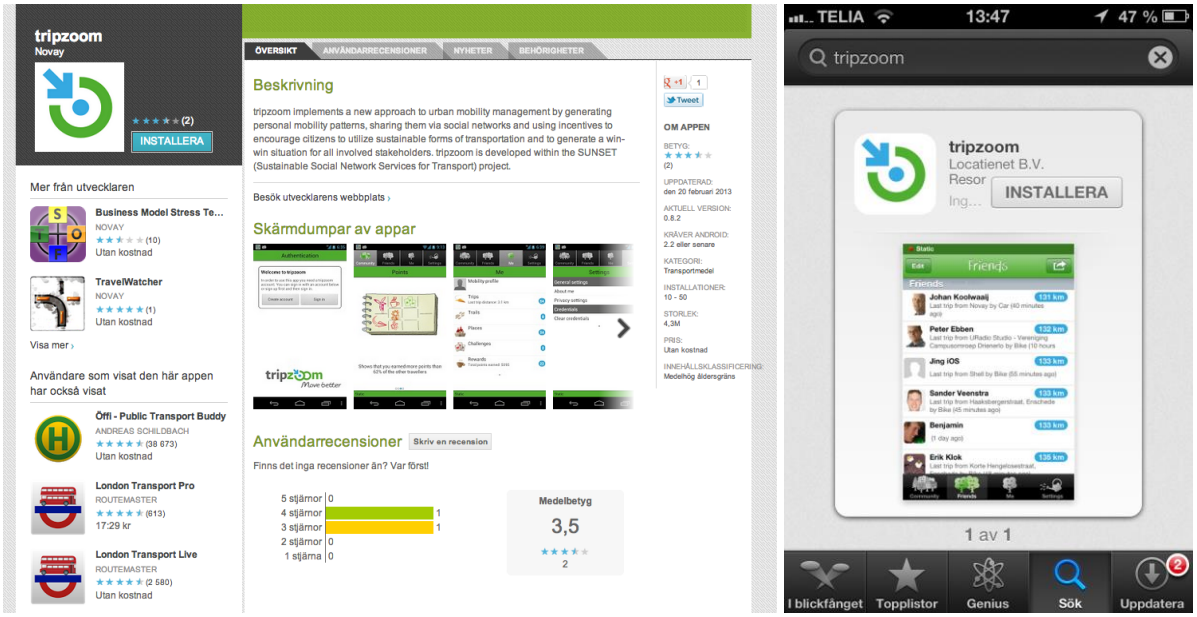


Figure 4-19: tripzoom in Google Play and iOS AppStore

After downloading, the installation starts immediately and after a minute or two users can start the app. A welcome message asks her to either log in of sign up, this message is localised based on the phones language setting. As the user is new, he/she clicks Sign Up and is directed to the registration web page where she can register by filling in username, e-mail and a password (figure 4-20). Also, she has to agree with the participant consent.

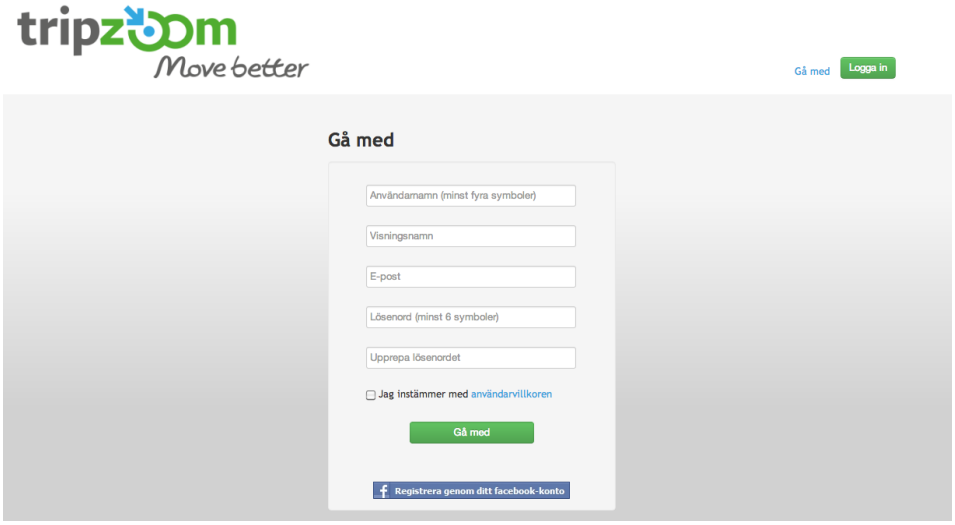
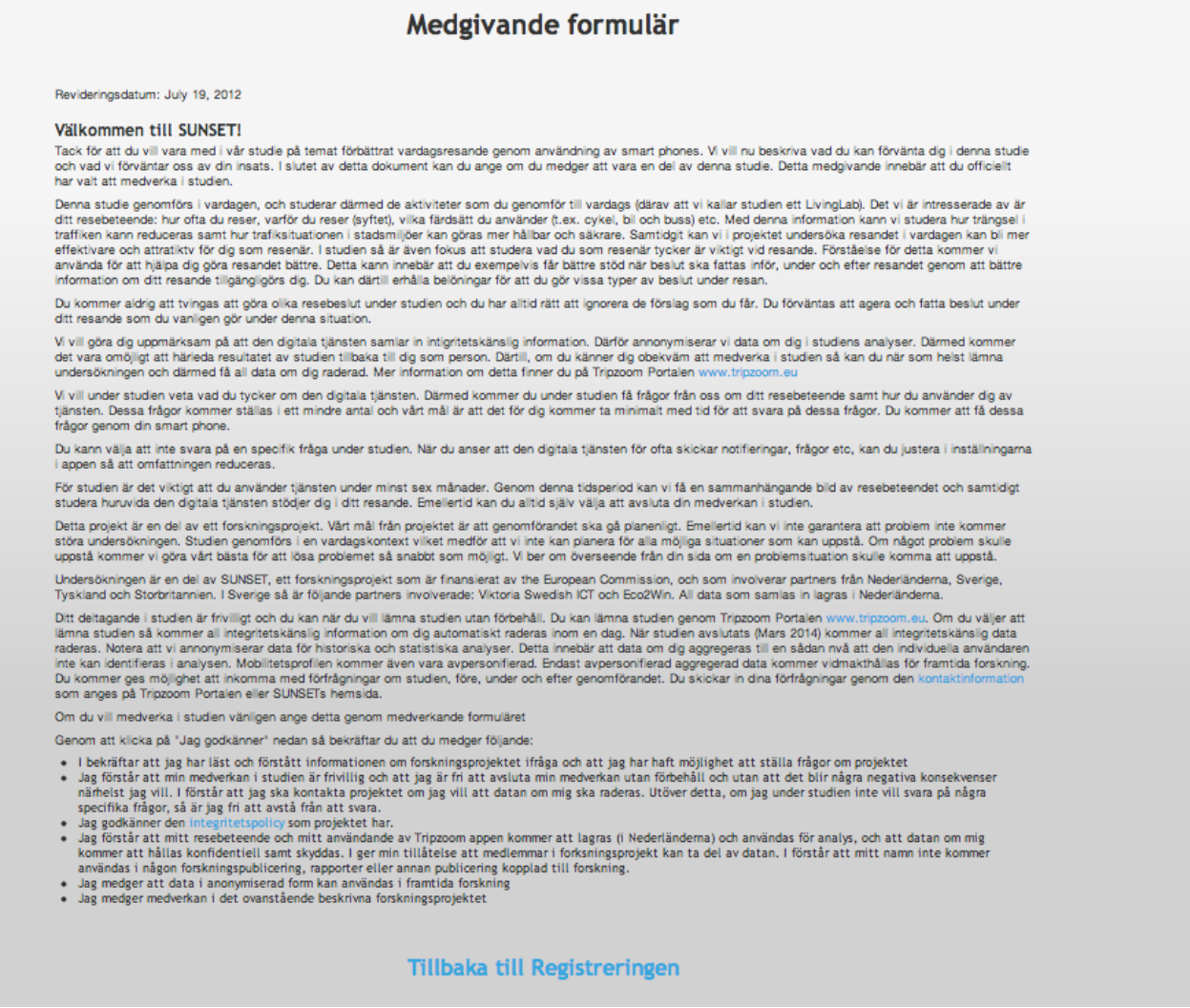


Figure 4-20: tripzoom registration screen

Registration is done by filling in username, display name, e-mail and a password. Also, the user has to agree with the participant consent (Figure 4-21 and see Appendices C). This consent informs users about the experiment, the aim of the data collection, and their freedom to act as they like. Also, the privacy protocol and terms of service are explained to the users (see Appendices D and E).



Medgivande formulär

Revideringsdatum: July 19, 2012

Välkommen till SUNSET!

Tack för att du vill vara med i vår studie på temat förbättrat vardagsresande genom användning av smart phones. Vi vill nu beskriva vad du kan förvänta dig i denna studie och vad vi förväntar oss av din insats. I slutet av detta dokument kan du ange om du medger att vara en del av denna studie. Detta medgivande innebär att du officiellt har valt att medverka i studien.

Denna studie genomförs i vardagen, och studerar därmed de aktiviteter som du genomför till vardags (därav att vi kallar studien ett LivingLab). Det vi är intresserade av är ditt resebeteende: hur ofta du reser, varför du reser (syftet), vilka färdsätt du använder (t.ex. cykel, bil och buss) etc. Med denna information kann vi studera hur trängsel i trafiken kann reduceras samt hur trafiksituationen i stadsmiljöer kan göras mer hållbar och säkrare. Samtidgit kan vi i projektet undersöka resandet i vardagen kan bli mer effektivare och attraktkv för dig som resenär. I studien så är även fokus att studera vad du som resenär tycker är viktigt vid resande. Förståelse för detta kommer vi använda för att hjälpa dig göra resandet bättre. Detta kann innebär att du exempelvis får bättre stöd när beslut ska fattas inför, under och efter resandet genom att bättre information om ditt resande tillgängligörs dig. Du kan därtill erhålla belöningar för att du gör vissa typer av beslut under resan.

Du kommer aldrig att tvingas att göra olika resebeslut under studien och du har alltid rätt att ignorera de förslag som du får. Du förväntas att agera och fatta beslut under ditt resande som du vanligen gör under denna situation.

Vi vill göra dig uppmärksam på att den digitala tjänsten samlar in intigritetskänslig information. Därför annonymiserar vi data om dig i studiens analyser. Därmed kommer det vara omöjligt att härleda resultatet av studien tillbaka till dig som person. Därtill, om du känner dig obekväm att medverka i studien så kan du när som helst lämna undersökningen och därmed få all data om dig raderad. Mer information om detta finner du på Tripzoom Portalen www.tripzoom.eu

Vi vill under studien veta vad du tycker om den digitala tjänsten. Därmed kommer du under studien få frågor från oss om ditt resebeteende samt hur du använder dig av tjänsten. Dessa frågor kommer ställas i ett mindre antal och vårt mål är att det för dig kommer ta minimalt med tid för att svara på dessa frågor. Du kommer att få dessa frågor genom din smart phone.

Du kann välja att inte svara på en specifik fråga under studien. När du anser att den digitala tjänsten för ofta skickar notifieringar, frågor etc, kan du justera i inställningarna i appen så att omfattningen reduceras.

För studien är det viktigt att du använder tjänsten under minst sex månader. Genom denna tidsperiod kan vi få en sammanhängande bild av resebeteendet och samtidigt studera huruvida den digitala tjänsten stödjer dig i ditt resande. Emellertid kan du alltid själv välja att avsluta din medverkan i studien.

Detta projekt är en del av ett forskningsprojekt. Vårt mål från projektet är att genomförandet ska gå planenligt. Emellertid kan vi inte garantera att problem inte kommer störa undersökningen. Studien genomförs i en vardagskontext vilket medför att vi inte kan planera för alla möjliga situationer som kan uppstå. Om något problem skulle uppstå kommer vi göra vårt bästa för att lösa problemet så snabbt som möjligt. Vi ber om överseende från din sida om en problemsituation skulle komma att uppstå.

Undersökningen är en del av SUNSET, ett forskningsprojekt som är finansierat av the European Commission, och som involverar partners från Nederländerna, Sverige, Tyskland och Storbritannien. I Sverige så är följande partners involverade: Viktoria Swedish ICT och Eco2Win. All data som samlas in lagras i Nederländerna.

Ditt deltagande i studien är frivilligt och du kan när du vill lämna studien utan förbehåll. Du kan lämna studien genom Tripzoom Portalen www.tripzoom.eu. Om du väljer att lämna studien så kommer all integritetskänslig information om dig automatiskt raderas inom en dag. När studien avslutats (Mars 2014) kommer all integritetskänslig data raderas. Notera att vi annonymiserar data för historiska och statistiska analyser. Detta innebär att data om dig aggregeras till en sådan nvå att den individuella användaren inte kan identifieras i analysen. Mobilitetsprofilen kommer även vara avpersonifierad. Endast avpersonifierad aggregerad data kommer vidmakthållas för framtida forskning. Du kommer ges möjlighet att inkomma med förfrågningar om studien, före, under och efter genomförandet. Du skickar in dina förfrågningar genom den kontaktinformation som anges på Tripzoom Portalen eller SUNSETs hemsida.

Om du vill medverka i studien vänligen ange detta genom medverkande formuläret

Genom att klicka på "Jag godkänner" nedan så bekräftar du att du medger följande:

- I bekräftar att jag har läst och förstått informationen om forskningsprojektet ifråga och att jag har haft möjlighet att ställa frågor om projektet
- Jag förstår att min medverkan i studien är frivillig och att jag är fri att avsluta min medverkan utan förbehåll och utan att det blir några negativa konsekvenser närhelst jag vill. I förstår att jag ska kontakta projektet om jag vill att datan om mig ska raderas. Utöver detta, om jag under studien inte vill svara på några specifika frågor, så är jag fri att avstå från att svara.
- Jag godkänner den integritetspolicy som projektet har.
- Jag förstår att mitt resebeteende och mitt användande av Tripzoom appen kommer att lagras (i Nederländerna) och användas för analys, och att datan om mig kommer att hållas konfidentiell samt skyddas. I ger min tillåtelse att medlemmar i forksningsprojekt kan ta del av datan. I förstår att mitt namn inte kommer användas i någon forskningspublicering, rapporter eller annan publicering kopplad till forskning.
- Jag medger att data i anonymiserad form kan användas i framtida forskning
- Jag medger medverkan i det ovanstående beskrivna forskningsprojektet

Tillbaka till Registreringen

Figure 4-21: tripzoom participation screen

Once the users clicks on the green regiter button, a notification is given that tripzoom is a closed experiment. In order to complete registration, the user is asked to send a short e-mail asking permission to join.

The Living Lab Co-ordinator monitors the City Dashboard (figure 4-22), in order to manually add users to the Lab. Also those who did not send an e-mail, but are probably eligible for the Gothenburg lab based on either name or the .se extention of their e-mail address are added. Consequently, the Living Lab Co-ordinator sends the user an e-mail to welcome him to the Living Lab. The system also has send an e-mail to the user, asking the user the validate the e-mail address used.

Figure 4-22: City Dashboard User Administration

Logging into the app

After the first log in, there is a screen asking permission to actually measure the users' mobility profile. When the user clicks ok, he is ready to go. The app will be running in the background, but he can check it whenever she likes to see hsi progress.

Authorize Access

The tripzoom system requests access to the following information to function and to evaluate its usage:

- Travel behaviour: Locations you have been to and trips you have made
- Actual information: Your current location and whether you are travelling or not
- Personal information: Data from your user profile like name, email address or buddy list
- Application information: The energy the application uses and whether errors occurred
- Answers to pop-up questions

To create community overviews, we only use anonymized and aggregated data.

Facebook connection

In order to faclititate sharing on Facebook, an implementation of logging in with Facebook was made. Users have to register manually first, with the same e-mailadress as they use with Facebook This implementation was done, in order to be able to guarantee that consent was given adequeately. However, as in general website implement this differently, users expect an equal workflow and struggled with the presence of the "Log in with Facebook" button, they could not get to work.

4.9 Lessons learnt and good practice

Without recruitment, no users

A living lab does not recruit its own users. In order to organize a viable living lab, the organizers must develop and use a recruitment strategy that involves several channels. This in order to trigger recruitment of interested participants which after recruitment can be transformed into test users in the lab. As visible in the plateau in figure 1, no recruitment activities means that no additional users joins the lab. Consequently a viable living lab must be catered and continuously recruitment is one of the tools by which the Living Lab coordinator can cater the lab.

Recruitment through traditional mass-media best alternative in Gothenburg
What strategy worked best? What is the pro and cons for each recruitment strategy used? If we examine Figure 4-12 and compare it to other recruitment activities we conducted during wave 1 to wave 4 we can se that the most effective way to recruit users was to advertise in the free newspaper Metro, which gave the Gothenburg Reference Living Lab 33 new users. Additionally 4 users were recruited through mouth-to-mouth thanks to the users recruited via the ad in Metro. If Figure 4-6 is reviewed it is clear that the advertisement in different local newspapers in wave 2 also was one of the most effective recruitment activity during the lab, as generated 16 new users. In total the advertisements generated 49 users, which is about 50 percentages of all registered users in the Gothenburg Reference Living Lab.

The newspaper ads were the most expensive way to recruit users, which is illustrated in Figure 4-8, Figure 4-13 and Figure 4-15. One reason that the ads are so effective could be that a newspaper ad reaches more people than face-to-face communication. During wave 2 when the operation team advertised in local suburban newspapers, people living outside the city and people who commute to their jobs from the suburbs were focused. One theory could be that these people feel they have the most to gain from trying to change their modes of transportation. The advertisement in Metro wave 4 was also very successful. Also this ad targeted commuters and however opened up the recruitment to commuters in Gothenburg in general. The newspaper Metro also focuses mainly on people who travel by public transport since the newspaper is available for free at almost every bus stop, on the trams, on the express buses, on the ferries and on the trains.

Not novel app or gifts the primary motive for participation
The theory that potential changes in commuting triggers participation is strengthen when the post-questionnaires from this group is reviewed. A majority of the responding participants states that they joined the Living Lab, as they wanted to review alternative ways to organize their commute. This category of registered users was larger than people joining the endeavour due to being apart of a research project or because they were compensated by the project. To be able to investigate how the commute pattern can be changed triggers people to participate. In order to promote this the project used an recruitment strategy with a message that tripzoom promotes behaviour change through rewards opposite to the congestion charge system in Gothenburg that through punishment stimulate people to change travel behaviour. This situation was utilized as an opportunity in recruiting participants to the lab.

The problem with Proxy organisations
One reason for that the established contacts and the utilization of on-going projects did not render that many participant is that the use of proxy people either describes the value with the project wrong or not at all. By utilizing proxy organisations to market the lab you distribute the control of the recruitment of participants to organizations that are not involved or incentivised by the project. Using proxy people or organization should be used as a secondary line of recruitment strategy that might render additional registered users, however the lesson from Gothenburg living lab is that as first line of recruitment must be done within the realms of the project.

Penetration difficulties
When analysing the post-questionnaires it becomes evident that one of the reasons for why it is hard to recruit participants is that "a new novel app" is not that novel as it was 4-5 years ago. The app market is filled by new and novel apps, which means that a Living Lab must create exposure in order to reach the interested participant. The lesson learnt is that in a future Living Lab with a larger budget a certain amount of this budget should be used to communicate information about the Living Lab using mass-media; e.g. TV, radio. In retrospect was the selling

pitch to participate not tripzoom as an app in Gothenburg; it was the possibility to participate in a positive alternative to congestion charges in the city.

Sweet spot difficult to target
It is a complex process to attract users to a living lab. One reason is that a living lab in itself is a complex process which requires a target population of users with multiple characteristics. The target users in the SUNSET living labs are people interested in 1) mobility, 2) behavioural change, 3) research, 4) apps, 5) social media and 6) who are willing to find time in their everyday to participate in a experimental process consisting of stages that covers at least 30 to 45 calendar days. It is to this target group a core message projecting the value of tripzoom and the value of participation must be designed and distributed.

A too rigid registration process scares people away
In order to prevent for example under aged people to join the Living Lab a rigid registration process was adapted in SUNSET. The drawback using this procedure were however that this became one of two sequences in the Living Lab phases were participants dropped out. A too lengthy process have as an effect that the initial interest to be a part of the Living Lab disappears. In order to prevent this user retention measures were adopted and used.

5. User retention

5.1 Introduction

It became evident during the technical trial in February – March 2013 that a strategy was needed to retain users in the Reference Living Lab Gothenburg (see chapter 4 in D7.5). Tripzoom itself did not retain users and that the Living Lab got several drop outs in terms of users. The overall causes for this, reported in feedback provided by drop outs, was identified as 1) that the Living Lab participation was perceived as too labour intensive for the users, 2) took too long time, 3) that tripzoom consumed too much battery power too fast, 4) that tripzoom was perceived as an unstable service, 5) that tripzoom did not generate enough value-in use resulting in low interest to participate amongst registered users. In order to retain users within the lab a strategy for retaining users were design in April of 2013 and implemented and evolved during Experiment 1, 2 and 3 in Gothenburg. The strategy consisted of reactive as well as proactive measures used by the Living Lab coordinator and the Living Lab operation team to stimulate users to stay on as participants and registered users.

5.2 Reactive measures: helpdesk, escalation and feedback

The idea with reactive measures in the retention strategy was to create a Living Lab operation in Gothenburg that actively responded to any issue that users identified while becoming familiarized with the service during the period before the actual experiment. Experiences from the technical trial indicated that the lab lost participants either a) in the time period between submitting an interest to join the living lab and register as a user, or b) in the period between successful user registration and actual experiment, consequently during the familiarization phase.

In order to retain users in the latter phase three reactive measures were adopted for experiment 1, 2 and 3 and also marketed towards the users: helpdesk, escalation and feedback:

- **Helpdesk**. The Living Lab team, which in Gothenburg consisted of three members from Viktoria Swedish ICT, assigned one resource as primary contact person toward the Living Lab. After a user had registered he invited the user to channel any issue or question that the user had regarding tripzoom using email or telephone as main channel. The requirement defined was to respond to any issue received within 8 hours. The aim was to signal toward the user population that the Gothenburg Living Lab was an active Lab and that the users were not merely passive contributors to the research and innovation project but instead co-designers of the service. When receiving the issue the contact person classified it as either 1) an operating issue, 2) a technical issue, 3) an evaluation issue, 4) a general experience. If the issue was classified as an operating issue the contact person forwarded this issue to another resource within the team who was responsible to provide operating support. If the issue was defined as an evaluation issue or a general experience the contact person thanked the participant for the input, documented it and invited the user to provide this as an input in post-questionnaire that followed each experiment. If the issue was evaluated as a technical issue this triggered a transparent escalation of the issue to the technical partners at hand in the SUNSET-project.
- **Escalation.** Being a Living Lab in a research and innovation project means that the service in question is not complete. The experiments performed are steps to both develop new knowledge and improve the digital service as a product. It consequently became important to foster amongst the users that signed up to the lab that they was

not a part of a product launch but instead co-designers of the development of a novel service platform. If technical issues appeared this could easy result in several dropouts. In order to prevent these technical issues were escalated from the Living Lab to the technical partners within SUNSET. As a first step the issue was escalated to the technical partner QMUL and as a following step, if needed, the issue was escalated further to either NOVAY (if it concerned the Android App), LOCNET (if it concerned the iOS app) or DOCOMO (if it concerned the social portal). In this escalation the contact person from VIKTORIA acted as facilitator of the dialogue between the technical partners and the user in question in order to support user-designer interaction.

- **Feedback.** As a third reactive measure feedback was provided to the user population about the progress in the project. Their input meant something and resulted in improved versions of the tripzoom system including enhanced versions of the system. In addition findings in the evaluation of the experiments was channelled back to the users as well as the winners of the user participation prize.

As a consequence the use of these measures resulted in that the number of lost participants from registration to evaluation dropped in Experiment 1, 2 and 3.

5.3 Proactive measures: newsletter, gifts and challenge prizes

In order to reduce the number of lost participants from the time period submitting interest to accomplish user registration, three proactive measures was designed and implemented: newsletter, participation gifts and challenge prizes.

- **Newsletter.** From June 2013 to December 2013 a newsletter in form of an email from the Living Lab coordinator was distributed on a regular basis to the population. The receivers of this newsletter consisted of 1) registered tripzoom users and 2) potential users that had during that specific time submitted an interest to participate in the lab. The aim with the newsletter was twofold: feedback news to the registered users and show for the interested participants that the Living Lab was a viable lab with an active community of users.
- **Participation gifts.** From Experiment 1 and onwards participation gifts was provided as incentive to actively promote users to complete experiment. In Experiment 1 the participation gift was two lottery tickets (in a national lottery value €3) if the users participated in the pre-questionnaire, the experimental phase and the post-questionnaire. They in addition received one additional lottery ticket for every new user they recruited. Every user that completed the experiment and the questionnaires also had the chance to win a €150 euro gift card to be used on Radisson Blu hotels. In Experiment 2 and 3 the national lottery ticket for recruiting participants was retained, however the grand prize of €150 euro as well as the two lottery tickets promoting participation was change to a gift card for €30 to be received if the users participated in the questionnaires and the experimental phases.
- **Challenge gifts.** From Experiment 1 and onwards challenge prizes was also provided as incentives to stimulate users to participate in the challenges distributed during the experimental phase. In experiment 1 every user received one lottery ticket (in a national lottery value €3) for every 500 points that the user received achieving tripzoom challenges. In Experiment 2 and 3 this was changed (which will be described in detail in chapter 5) to if the user achieved the requirements for the challenges distributed through tripzoom then for each 500 points, 750 points or 1000 points (depending on reward size) €1, €1.5 or €3 were added to the baseline gift card for participation with the value of €30.

Table 5-1 summaries the measures for retaining users that was utilized to operate the Gothenburg Reference Living Lab. It also includes an account of the costs for the measures in time or euros spent. Note the hours for systematic escalation and valuable feedback to user excludes the hours spent by the technical partners. It only covers the operation performed by the Living Lab team.

Table 5-1: User involvement prior to and during the Gothenburg Reference Living Lab

Experiment name	Reactive measures used	Aim	Cost	Proactive measures used	Aim	Cost
Technical Trial	Unstructured helpdesk Unsystematic escalation	Support users Feedback issues to partners	20 hours 20 hours	N/A	-	-
Experiment 1	Systematic helpdesk Systematic escalation Valuable feedback	Capture issues Enable user-designer interaction Display Effects	60 / 20 /40 hours	Regular newsletter Participation gifts Challenge prizes (fixed vs. relative)	Show a viable Lab Incentivise general participation Reward behaviour change	50 hours
Experiment 2			20 / 10 / 20 hours			€300 / €50 / €550
Experiment 3			30 / 10 / 20 hours			€150 / €700
Total			270 hours			50 hours and €1750

5.4 Living Lab Co-ordinator Tools

Next to the communication outside tripzoom, there are also some features in the system that helped the Living Lab Co-ordinator to work with the users.

City Dashboard

The City Dashboard (Figure 5-1) is the central tool for the Living Lab Co-ordinator. Using this tool, three main actions are available:

- Management of Users
- Management of Challenges
- Management of Experience Sampling Questions

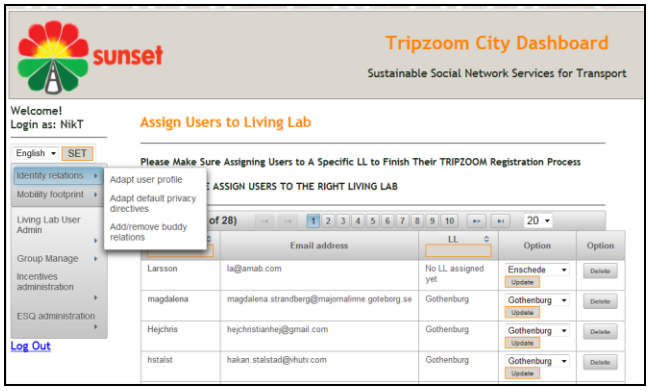


Figure 5-1: City Dashboard

Users can be assigned to Living Labs and groups using the City Dashboard. Some profile information can be retrieved, like username, user ID, e-mail address. As well as very useful information regarding the status of the account (e.g. registered, validated).

The Challenge Management was the main tool used to issue and monitor incentives. To register a new incentive though the Manual registration option, the respective fields needed to be filled in i.e. Incentive name, Notification Description (the challenge notification received by the user when a new incentive became available), Reward description (the notification received by the user when a challenge was met and some points are rewarded), the target Living Lab, the Repeat pattern (how often this incentive should be offered), incentive Start and End times, Incentive Notification issue time (i.e. when users should be notified about this new incentive).
Then the Reward criteria conditions for this incentive had to be set. The reward criteria could be based on cost, distance, CO_2 emissions, target group, TripObjective, TripModality. Several criteria could be set by filling in the desired value e.g. for distance and then clicking the Add button. Finally, the points to be rewarded when this challenge was met should be input at the bottom.

Experience Sampling Questions could be registered through the dashboard. The LLC could type the question text, provide the different answers by adding them, make this ESQ active for tripzoom users at this time or not (Yes/No option), select the desired question frequency, define the target group conditions for the ESQ to be issued based on their trip patterns (e.g. time, distance) by selecting appropriate rules (and, or, not) and then defining the conditions according to which this particular ESQ should be issued. As early testing proved it to be hard to set up an ESQ correctly, use of this functionality has been limited.

Trip page
The trip page gives the Living Lab Co-ordinator access to all trips in the Living Lab (csv-style). Using the trip page, the activity of users can be monitored (and users be reminded of their participation accordingly). Also, this data is used to select users for the experimental groups, to define Enschede-specific peak hours, and to do the evaluation work.

Trip viewer
This tool proved especially valuable in solving issues reported by users. The Living Lab Co-ordinator has in depth access to trip measurements (map-style). As the tool gives in-depth insight in a users trips, detailed feedback can be given. For instance the case where a user who saw a wrong route displayed, the analysis showed that only an origin and destination were recorded and the route was a best guess, which the user interpreted as a failure. As the Living Lab Co-ordinator sees a lot of data of a user, it felt sometimes a bit discomforting. For instance to see a midnight pub visit of a user. Whilst it is a good debugging tool, it would be recommendable to limit access to such tools as much as possible.

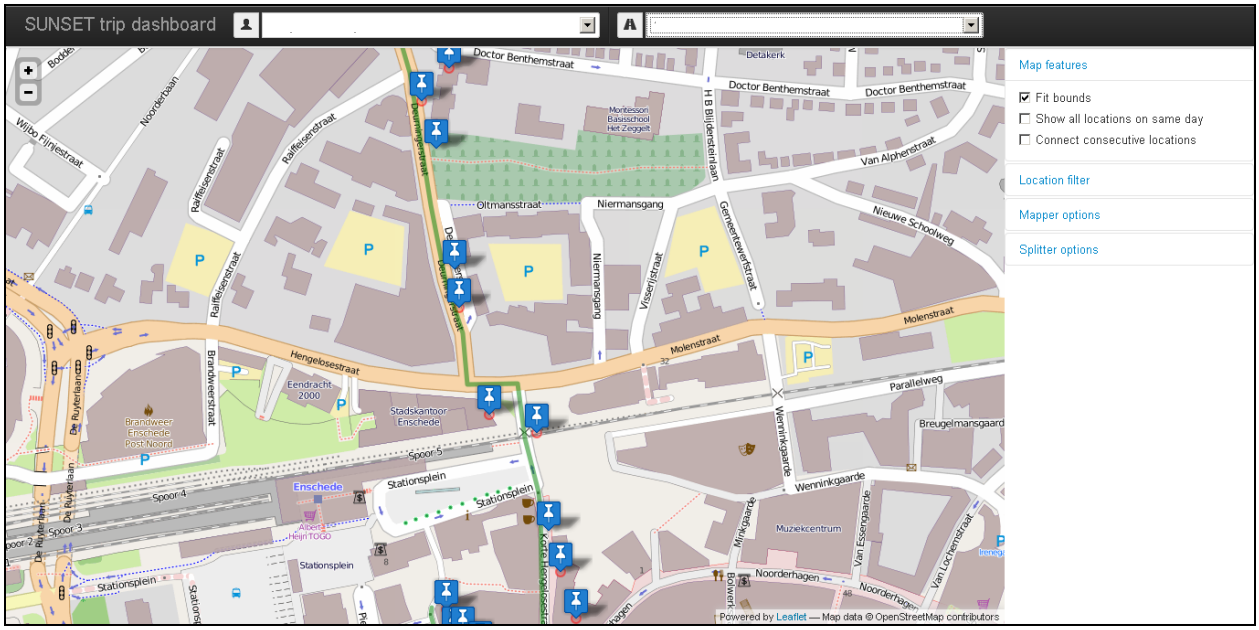


Figure 5-2: Trip viewer

SPS Map-page

The SPS Map-page has some overlap with the tripviewer, but is limited in the level of detail (measurement points are not shown individually). A great extra feature is the reading of the battery level, which was very useful in providing feedback to users.

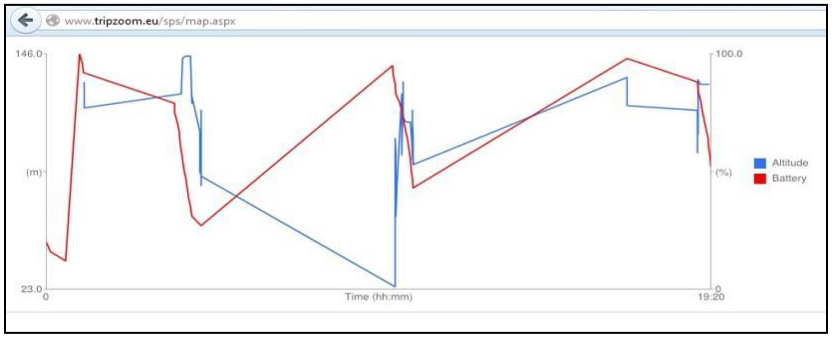


Figure 5-3: Insight in battery usage

ESQ log and IMP log

These two log pages give insight in the answers given to ESQ's and the points rewarded for the incentives. They have been used to monitor the experiments, to do the evaluation and to determine the winners.

Tools outside the tripzoom system

For the reference Living Lab operation team in Gothenburg the following tools in addition to the above-described tools within the tripzoom system provided capability to run and maintain the Living Lab:

- Netigate web based questionnaires
- The Viktoria Swedish ICT web page www.viktoria.se/sunset; used as a storefront towards interested participants making it easy to sign up and register an interest to participate

5.5 Lessons learnt and good practice

Experiences when people drop out

Participants drop out from the Living Lab during especially two sequences in each experiment:

Sequence 1: in the time between signing up that they were registered and actually registration
Sequence 2: in the familiarization phase before the actual experiment

In the follow-up dialogue with limited number of dropped out participants the main reasons for dropping out from sequence 1 is that the interested participants mistook what participation was all about. They when signing up believed for example that the experiment time should be quick and not cover 45 to 90 days. The length resulted in the perception that the experiment and actual trial would take much longer time that it actually did take. So this generated drop outs. In order to prevent this, some proactive measures were implemented. The purpose with the newsletter was primary to build and ensure correct expectations amongst the users. The purpose with the participation and challenge gifts was to stimulate pay back for participations but also exemplify the mechanism in the tripzoom system to enable change in behaviour – the reward. These measures did not prevent drop outs from the first sequence during the Living Lab, however from the trial to the third experiment the introduction of these measures reduced the number of drop outs by adding staying power to interested participants.

The main reasons for dropping out in sequence 2 are related to the Tripzoom system. The system was not as stable as expected, the battery consumption was too fast for some users and the added value in the experimental platform was regarded as too low by the user. Establishing an helpdesk, facilitating the escalation of problems to the technical partners as well as prompt feedback reduced the drop outs in this sequence during the year, however it is believed amongst the Living Lab operation team that a more stable and value adding version of the tripzoom system would have been the best reactive measure to reduce drop outs in this sequence.

Recruitment cost, retaining users also cost

Two important lessons learnt from this phase are that retaining users costs both in terms of work effort and money. Operating a Living Lab for a year requires that resources as well as processes are designed and in place to meet the persons recruited to the lab. The more recruitment that is done the more effort must be made available to retain the lab. Regardless of the quality of the service or concept tested a Living Lab should be viewed as a living and changeable entity. A proper Living Lab should be organized as system that both retain existing users as well as has the capability to replace users with new once if needed during the year.

6. Design and operation of experiments

6.1 Introduction

In Gothenburg three incentive-based experiments were conducted between May and December 2013 (c.f. figure 2-5). In the experiments a selected group of users was given a challenge in which points could be earned for certain travel behaviour. The challenges were based on the overall goals that the SUNSET project is managed towards. In all the experiments a conversion rate of 500 points = €1 was adopted. In this chapter we will discuss the phases of the different experiments, the design of individual challenges, the selection criteria of users, and a summary of earned rewards. In Deliverable 7.5 the results of the experiments and the effects of challenges on travel behaviour are analyzed and discussed.

6.2 Experiment time line

The experiments were conducted directly after the recruitment of users in order to retain users within the Living Lab. Each experiment consisted of a familiarization period and a incentive period as is presented in Table 6-6-1.

Table 6-6-1: Operational stages Living Lab Gothenburg

Phases	Familiarization period	Incentive period
Experiment 1	27 May – 10 June	11 June – 20 June
Experiment 2a	7 -17 October	21 October – 1 November
Experiment 2b		
Experiment 3a	21 October – 1 November	5 November – 18 November
Experiment 3b		

The first experiment was conducted before the summer and it was actually the first Living Lab experimental phase within the SUNSET project. In the fall of 2013 Experimental phases 2 and 3 were conducted as well as the experimental phases in other LLs, which could partly build on the lessons learnt from experimental phase 1. This relates mainly to the limited functionality of the Incentive Market Place (IMP) engine, as we will discuss later in this chapter.

6.2.1 Familiarization period

The objective of the familiarization period is to get users to use and evaluate the different functionality within the tripzoom app and for users to start correcting the resulting trip measurements. The familiarization period also provides data to Living Lab coordinators about mobility patterns of users, which is the basis for the design of suitable challenges as well as a source of data for evaluation of challenge effectiveness.

At the end of the familiarization period a questionnaire was distributed to users in order to get initial feedback from users of tripzoom, on their understanding of their mobility patterns, their attitudes towards transportation issues, and potential effects of the tripzoom functionality on the travel behaviour.

6.2.2 Incentive period

Directly after the familiarization period a challenge period was started. In a challenge period different groups of users could receive different challenges. For different reasons all challenges

were formulated as a trip based challenge where points could be earned for showing certain behaviour (use a specified mode, travel at a specified time).

1) In principal it would have been of interest to test challenges based on for example travelled distance, but the functionality of the Incentive Market Place (IMP) only allowed for trip-based challenges.
2) Another limiting restriction of the choses IMP implementation is that challenges only could be defined as a single combination of trip characteristics. It was for example not possible to define a single challenge that would reward a bus trip OR a cycle trip, this could only be implemented by defining separate challenges for bus and cycle. In order to limit the burden on users it is however undesirable to have a large number of simultaneous challenges with small permutations.

In order to research if challenges can lead to behavioural changes amongst users it is important to provide each user with a sensible, personalized incentive on an as largest scale as possible. It does for example not make sense to provide habitual public transportation users with a challenge where rewards are received for each trip by public transportation. Another example is to provide challenge for users to avoid the peak hour when they already travel outside the peak. Again the limited functionality of the IMP did not allow for truly personalized challenges, instead users needed to be divided into groups of different standardized challenges. In order to do this the mobility profiles of the users from the familiarization period were analyzed in order to identify challenges that are both sensible, effective, and in line with SUNSET objectives regarding congestion, environmental, safety, and personal wellbeing.

6.3 Experiment 1 – reduce traffic congestion

6.3.1 Introduction

From May 27th to June 20th the first experimental phase took place. The familiarization period ended on June 10th. The main focus in experimental phase 1 was to actually get users in a Living Lab, and to get feedback on tripzoom functionality. In phase 1 only one challenge was conducted which focussed on the SUNSET congestion objectives, where car commuters were challenged to travel outside the morning peak hour. We will discuss the design of this challenge, present some descriptive statistics on the users within experimental phase 1 and on the rewards they earned. The section concludes with some discussion on the implementation issues that arose in the experimental phase.

6.3.2 Experiment design

The challenge in experiment 1 focussed on the congestion objectives of the SUNSET project and aimed at getting car commuters to avoid driving during the peak hour by either using car or bus, and by starting the commute trip earlier than 06:30 or later than 07:30. For each trip measured with the purpose work or school outside the range of 06:30-07:30 users would get 500 points (equivalent to €1). Table 6-6-2 provides a summary description of the challenge design.

Table 6-6-2: Challenge design experiment 1 – Car commuter peak hour avoidance

Research Question		
What do we target in the experiment?	Do we reward behaviour or do we stimulate change?	What is the research question?
Motivate car drivers to travel outside the morning peak period to school or work	Rewards behaviour	Will user avoid peak hours when incentivised and will they experience improved travel conditions?

Context					
SUNSET Innovation	SUNSET High level goals	The System	The Data	The Users	The Living Lab
Sensing, distribution of incentives	Reduce congestion	Distribute challenges	Monitor changes in the timing of car trips	Car commuters (work/school)	Gothenburg
Experiment					
Base case	Incentive situation	Target Group	Incentive	Scope	Repeat Pattern
Normal tripzoom functionality	500 points reward per eligible behaviour	Car commuters	500 points per trip outside peak with purpose work/school and mode bus or car	Morning peak only, commuters towards Lindholmen science park	Each application trip

6.3.3 Users and rewards

Of the 25 users that received the challenge to avoid peak hour travel by car for commute trips, only 17 users actually acknowledge that they had received the challenge in their tripzoom app and only 7 users actually accepted the challenge within the app. Even if users did not accept the challenge within the app they were still eligible to earn rewards, which explains why 13 users actually earned rewards. Figure 6-1 shows how from the initial registration of participants, users were participating in the experiment.

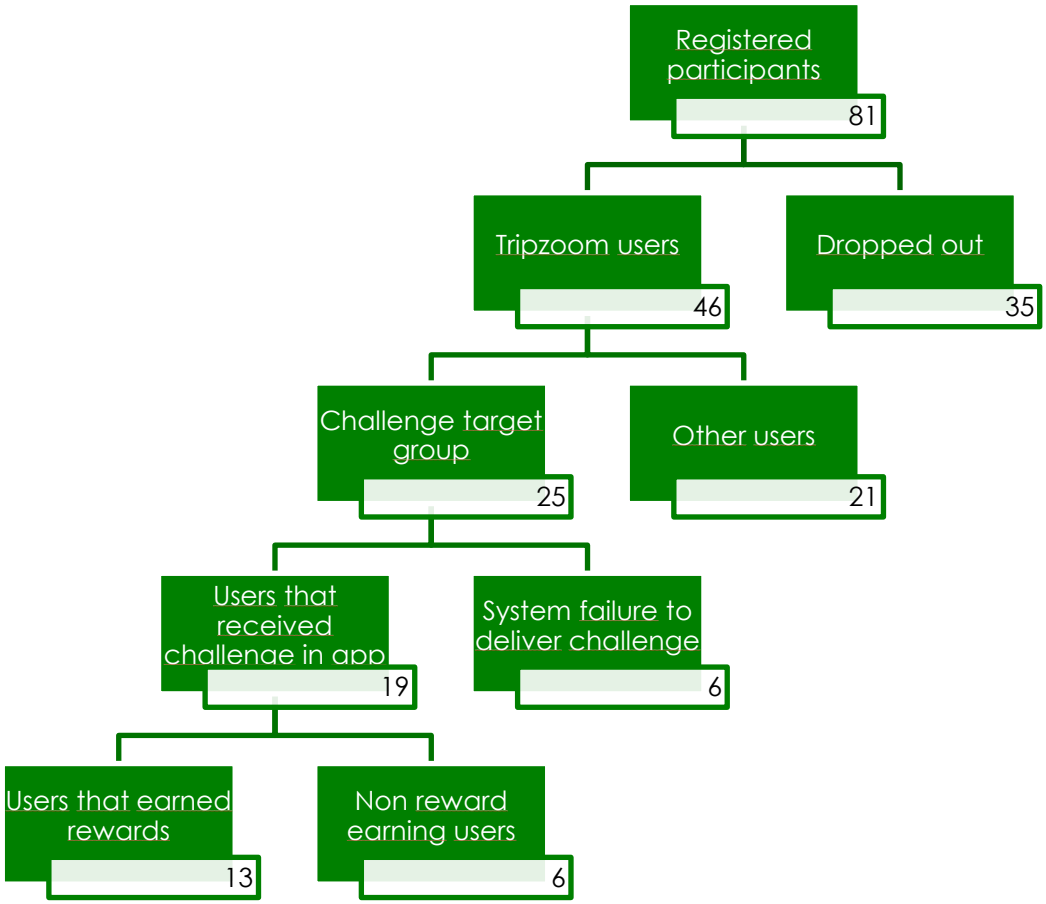


Figure 6-1: User registration, participation, challenges, and rewards - experiment 1

After the initial registration for tripzoom a large drop occurs when participants needed to install tripzoom on their smartphones and get a tripzoom account. This is largely due to tripzoom functionality and it is discussed in more detail in Deliverable 7.5. Since the challenge in experiment 1 focussed on car commuters as a target group, a significant group of non-car commuters did not receive a challenge so for this group tripzoom only provided 'normal' functionality of measuring their personal mobility profile, providing passive insight in their individual travel behaviour. In later experiments this was avoided by defining different challenges within the experiment so that all users received a challenge. Also the technical issue of users not receiving the challenge in the app was resolved in later experiments.

Even if in total 46 users installed and used tripzoom, there is a ramp up period that was not really anticipated. Not all users register on day 1. Figure 6-2 shows how the total number of users developed over the time of the experiment. It needs to be a balance between letting already registered users wait for the experiment to begin and letting new users enter the system. An ESQ system (See **Error! Reference source not found.**) could have been a useful tool to engage and retain users under a registration period.

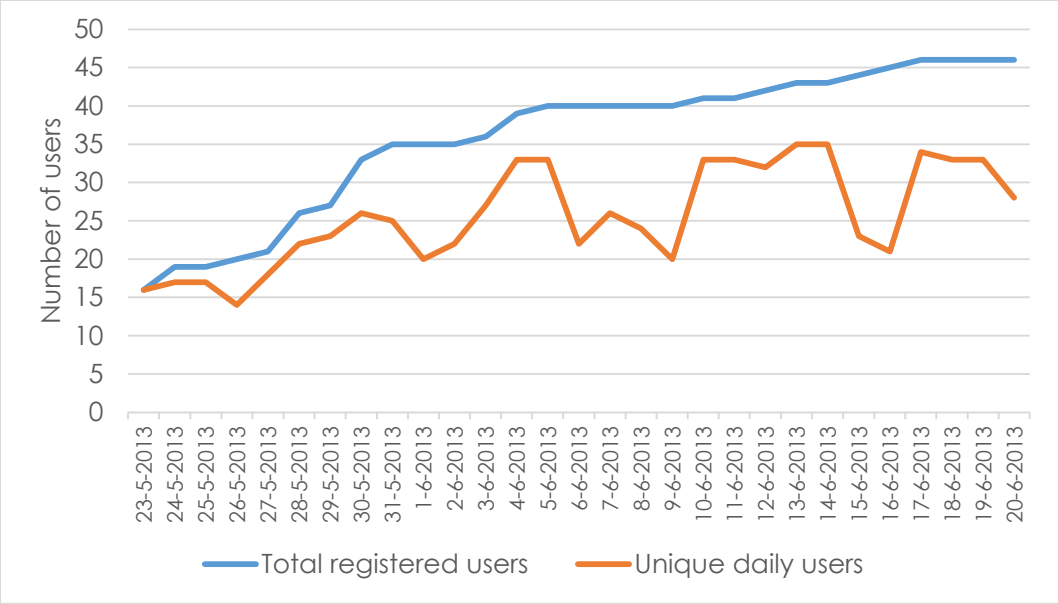


Figure 6-2: Users in the system (with recorded trips on that date)- experiment 1

6.3.4 Challenge implementation issues

Even if there is a significant initial group of interested participants there is a substantial group that does not proceed in registering for tripzoom and installing and using the app. The experiments focused on the congestion objective of SUNSET, which left a significant number of users outside of the target group for a challenge. In later experiments different targets groups were given different challenges to address different SUNSET objectives not leaving out any of the users from getting a challenge.

Defining the peak hour restrictions was not implemented in the IMP and required an extra manual setting upon the normal challenge definition in the tripzoom dashboard. This extra setting was ad-hoc implemented for this specific challenges, but was later used in other challenges as well.

There was a technical issue with sending the challenges from the Living Lab dashboard to the individual smartphone app. Not all user received the challenge once it was send out. This technical issue was resolved benefitting later experiments.

6.4 Experiment 2 – reduce traffic congestions and improve environment

6.4.1 Introduction

Experiments 2 started on the 7th of October and lasted until November 1st. In this experiment all users received a challenge. In total 2 challenges were introduced to users, one challenge focussing on avoiding peak hours for public transport users and one challenge focussing on mode shift from car to more sustainable modes of transportation.

The first challenge focussed on students going to Lindholmen science park where the university campus is located. During peak hours the BRT-like service from the city centre to the science park is highly congested. The second experiment focussed on the environmental protection objective of SUNSET and tried to motivate car users to switch to bus or cycle for their commute trips. The users in experiment 2 come from wave 2 recruitment and reactivation of wave 1/ experiment 1 users. Different users were assigned to one of the challenges based on their predominant travel behaviour recorded in the familiarization period.

The challenge period for each of the challenges was split up into two periods, where the challenge in the second week was identical to the challenge in the first week, but users could receive a higher number of points per trip.

6.4.2 Experiment design

In experiment 2a assigned users were given a reward of 1000 points if they changed their departure time outside of the 7:00-8:00 morning peak. The users assigned to this challenge currently use public transportation as their dominant mode of travel for commuting. The challenge was formulated to give a reward when taking either the bus or tram to work or school outside the peak period. In reality, because of restrictions in the IMP, the trip purpose was not enforced. In the second week the reward was increased to 1500 points per trip. Table 6-6-3 shows the summary description of the challenge and its background.

Table 6-6-3: Challenge design experiment 2a – peak avoidance public transport

The Research Question					
What do we target in the experiment?		Do we reward behaviour or do we stimulate change?		What is the research question?	
Motivate public transport users to travel outside the morning peak period to school or work		Rewards behaviour		Can we motivate PT user to travel at other times in order to reduce congestion? Does the size of the reward matter?	
The Context in					
SUNSET Innovation	SUNSET High level goals	The System	The Data	The Users	The Living Lab
Sensing, distribution of incentives	Reduce congestion	Distribute challenges	Departure times of PT trips	PT commuters (work/school)	Gothenburg
The Experiment					
Base case	Incentive situation	Target Group	Incentive	Scope	Repeat Pattern
Mobility pattern, normal tripzoom functionality	1000 points in first week and 1500 points in second week	Public transport commuters	1000-1500 points per trip outside peak with purpose work/school	Morning peak commuters towards Lindholmen science park	1 week low reward, 1 week period with high reward

The analyses of the trip data collected in the base situation, 727 trips in total, without incentives were used to identify suitable incentives with a relation to SUNSET objectives. The congestion relieve oriented incentive in experiment 2a was created based on the observed departure time profile of users, shown in Figure 6-3, which clearly shows a peak profile between 7:00 and 8:00 a.m.

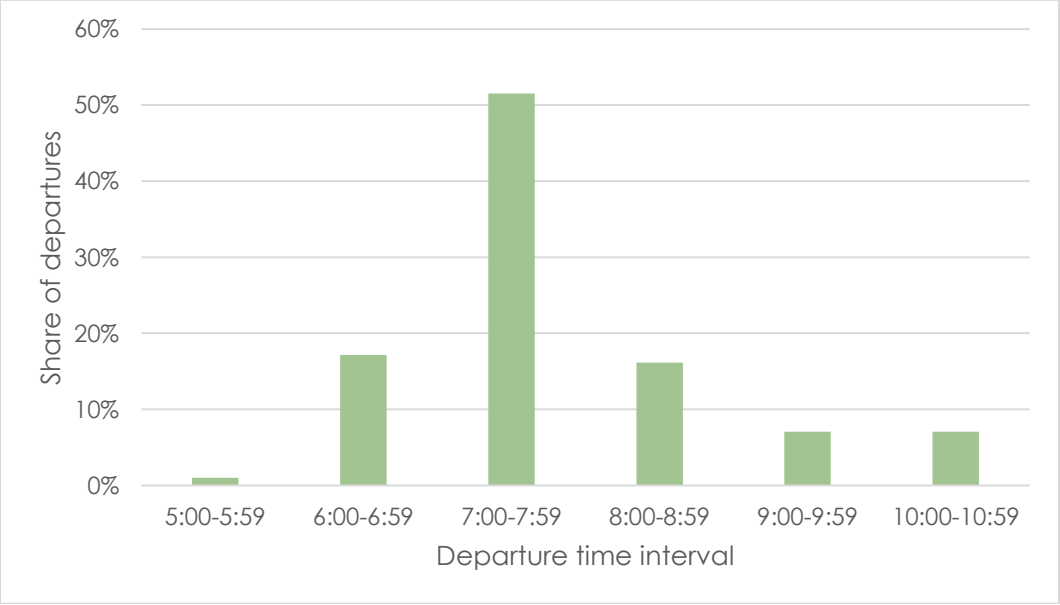


Figure 6-3: Departure time profile of users

The next step was to identify what users to assign to a public transport peak avoidance incentive. This was done analyzing the frequency of public transport trips and mode shares of individuals,

see Figure 6-4. Users with 5 or more trips with public transportation were assigned to the public transportation group, with two exceptions (a 3 time and a 1 time public transport user). The exceptions were made to get more balanced groups.

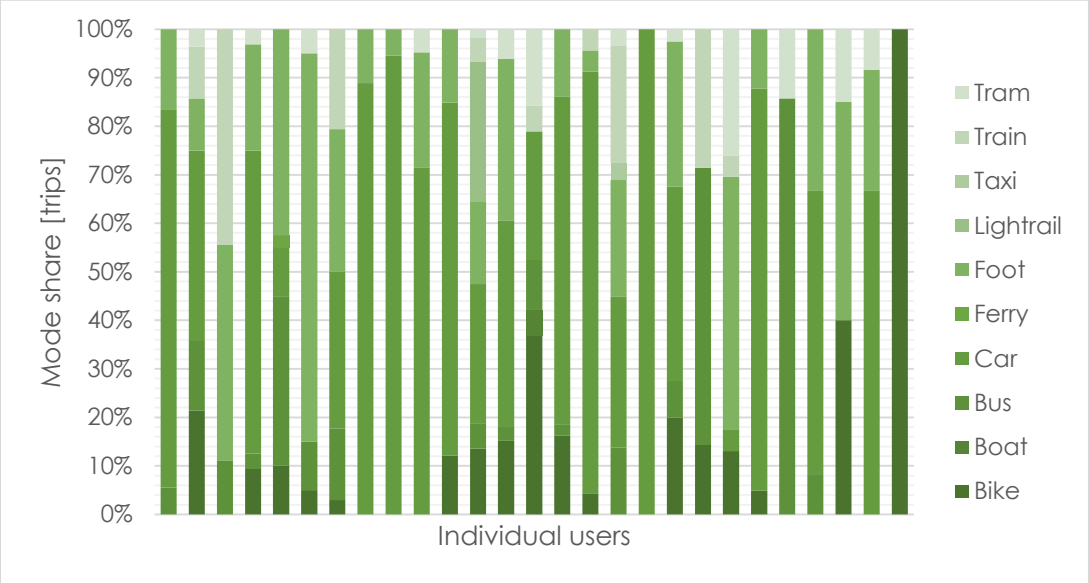


Figure 6-4: Mode shares of individual users

Once users were assigned to experiment 2a based on their use of public transport, the remainder was automatically assigned to experiment 2b. In experiment 2b the car commuters were challenged to use buss or bicycle for their commute trips. For each trip a reward of 500 points was given, which was in the second week increased to 750 points. The assigned users mainly originated from the reactivated experiment 1 users. Table 6-6-4 provides a summary of the challenge design and background.

Table 6-6-4: Challenge design experiment 2b – mode shift to bus or bicycle

The Research Question					
What do we target in the experiment?		Do we reward behaviour or do we stimulate change?		What is the research question?	
Motivate car commuters to use bus or bicycle		Rewards behaviour		Can we seduce car commuters to change mode? Does the size of the reward matter?	
The Context in					
SUNSET Innovation	SUNSET High level goals	The System	The Data	The Users	The Living Lab
Sensing, distribution of incentives	Environmental protection	Distribute challenges	Changes mode choice	Car users	Gothenburg
The Experiment					
Base case	Incentive situation	Target Group	Incentive	Scope	Repeat Pattern
normal tripzoom functionality	500 points in first week and 750 points in second week	Car commuters	500-750 points per trip using bus or bicycle	Car commuters towards Lindholmen	2 week period

6.4.3 Users and rewards

Totally 29 registered participants joined experiment 2. These consisted partly of reactivated experiment 1 participants, which implied that they were already registered tripzoom users. The newly recruited students all registered in tripzoom so no users dropped out of the experiment. The users were divided more or less evenly between the two experiments, even if the travel behaviour from the familiarization period was the determining factor. Due to some late registrations of users in tripzoom, 27 of the 29 users were assigned to a challenge I week 1. In this situation with lower rewards (see Figure 6-95) 4 of 10 and 7 of 15 users received rewards for experiment 2a and experiment 2b respectively.

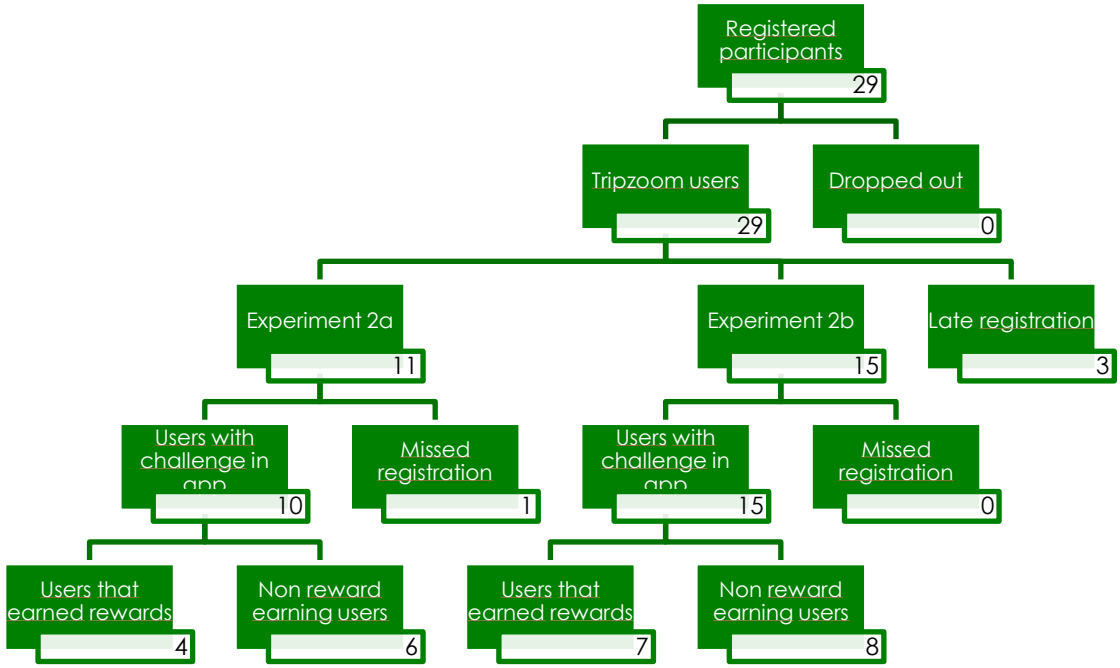


Figure 6-5: User registration, participation, challenges, and rewards - experiment 2 low rewards

In the second week of the experiments the rewards were increased. Also one of the late registrations could be added to experiment 2b. In week 2, as shown in Figure 6-10, 8 of 10 and 9 of 16 users received rewards for experiment 2a and experiment 2b respectively.

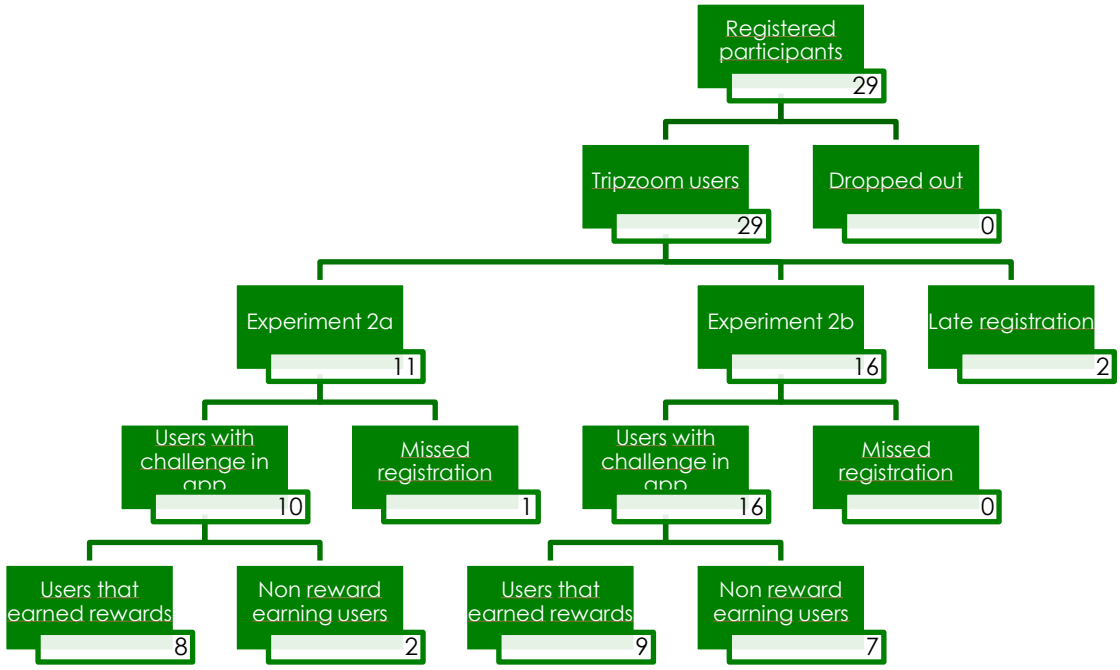


Figure 6-6: User registration, participation, challenges, and rewards - experiment 2 high rewards

Figure 6-7 show how the total number of users in the system developed over time. The registration period was much shorter than in experiment 1 but it still took about a week to get the majority of the users in the system (have tripzoom installed and registered). Figure 6-7 also shows that over time the number of users for which trips is registered daily seems to decrease somewhat.

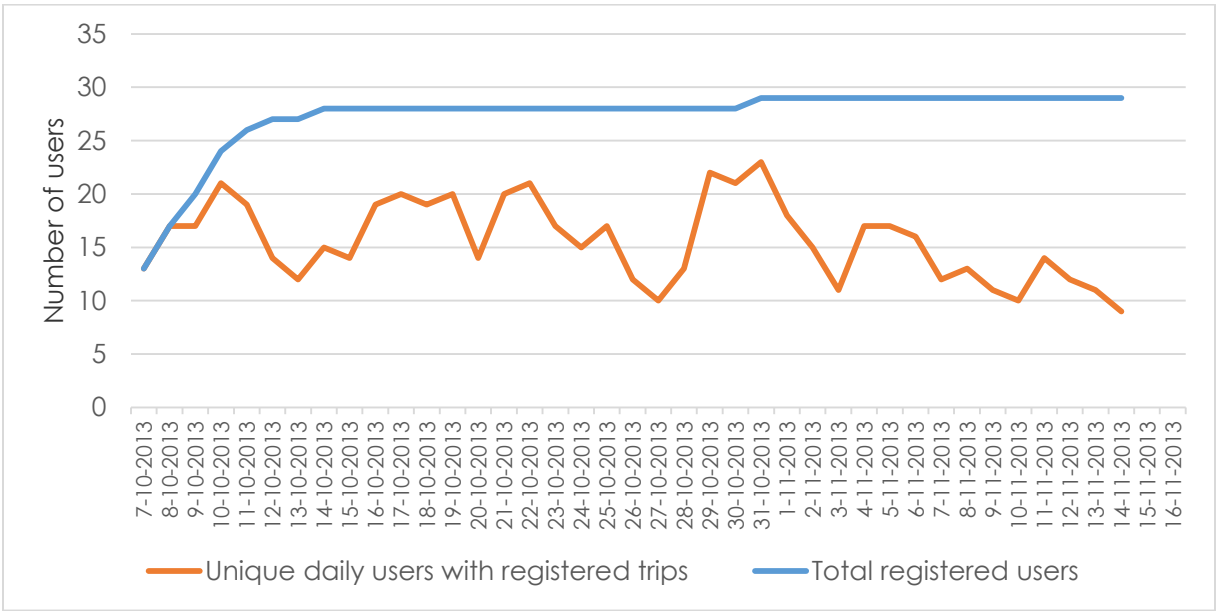


Figure 6-7: Users in the system experiment 2

6.5 Experiment 3 – reduce congestion and improve wellbeing

6.5.1 Introduction

In the third experiment, which ran from 21st of October to the 18th of November 2013, two challenges were conducted with newly recruited users through the Metro newspaper (see Section 4.5). One challenge focussed on the environmental protection and congestion objective of SUNSET and rewarded users that used either bus or tram outside the defined peak hour (7:00 – 8:00). This challenge was targeted at car users. The second challenge was focussed on both the environmental protection and personal wellbeing objective and rewarded current public transport users if they travelled by bicycle instead. The increased use of bicycle will lead to positive health effects improving personal wellbeing.

Like in experiment 2 the reward was changed in the second week of the challenge period. In order to account for a potential learning element in week 1 that might lead to higher behavioural changes in week 2 regardless the level of the reward, each group was randomly split into a group with an unchanged reward level and one group with an increased reward level.

6.5.2 Experiment design

In experiment 2b car users received a challenge to shift to public transportation and it seemed that more people shifted with a higher-level reward. In experiment 3a this challenge was extended to not only include a mode shift for car commuters but also a departure time shift to outside the peak hours, see Table 6-6-5. In order to further investigate the effects of reward levels in isolation from a potential learning effect in the second week, two groups were randomly created for week 2 in which half received an unchanged reward level and the other half received double the reward level. Doubling the reward level is also a stronger increase in reward level than was used in experiment 2b. In trying to get commuters to change, both, mode and departure time, this challenge tries to contribute to both the congestion and the environmental protection objectives of SUNSET.

Table 6-6-5: Challenge design experiment 3a – mode shift from car to public transport and avoid peak

The Research Question					
What do we target in the experiment?		Do we reward behaviour or do we stimulate change?		What is the research question?	
Motivate car commuters to use bus or tram and travel outside the peak		Rewards behaviour		Can we seduce car users to switch to public transport and avoid the peak? Does the size of the reward matter?	
The Context in					
SUNSET Innovation	SUNSET High level goals	The System	The Data	The Users	The Living Lab
Sensing, distribution of incentives	Congestion Environmental protection	Distribute challenges	Monitor changes mode choice and departure time choice	Car users	Gothenburg
The Experiment					
Base case	Incentive situation	Target Group	Incentive	Scope	Repeat Pattern
Mobility pattern, normal tripzoom functionality	500 points in first week and 1000 points in second week (for high reward group)	Car commuters	500-1000 points per trip using bus or tram	Travellers in entire Gothenburg	2 week period

In experiment 3a car users were identified by analyses of the base case data. In total 1938 trips were analysed. The analyses showed that 5 users were dominant car users, 5 dominant public transport users, 2 dominant bicycle users, and 4 very mixed users without a dominant mode. The mode shares of the users is presented in Figure 6-8.

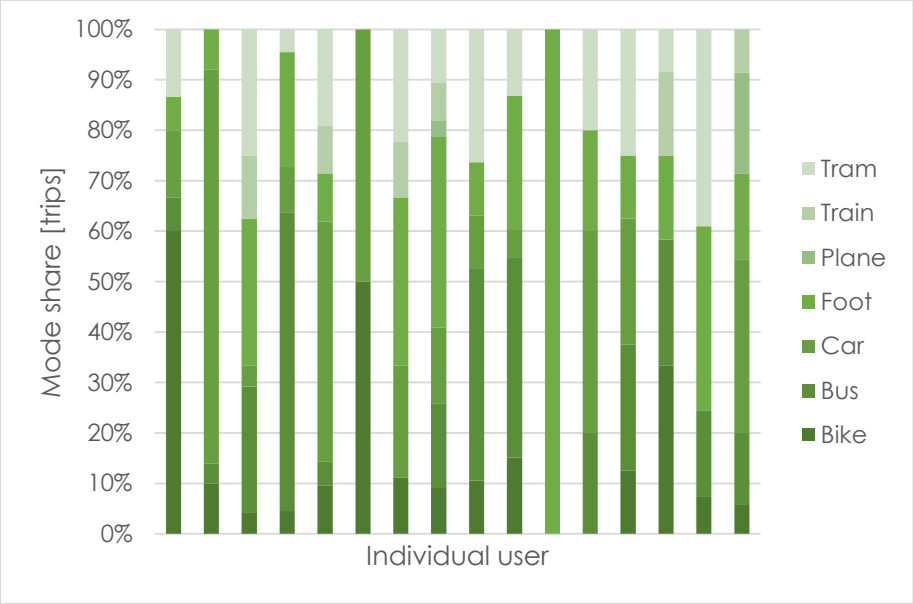


Figure 6-8: Mode share of users in experiment 3

The second challenge in experiment 3, see Table 6-6-6, focussed on one to objectives of SUNSET that had not been covered by a challenge in Gothenburg yet, namely personal wellbeing. The rational is that cycling instead of motorized forms of transport leads to health effects for the user, thus improving his/her personal wellbeing, but even secondary positive effects of increased cycling (less congestion, less pollution (air, noise, vibrations, sight)) may lead to improved wellbeing for others. The challenge was focussed on public transportation users and they were rewarded for cycling to work/school. The reward level in the first week was 500 points per cycle trip and in the second week a randomly chosen half remained at 500 points while for the other half the reward was doubled to 1000 points per trip.

Table 6-6-6: Challenge design experiment 3b – mode shift from public transport to bicycle

The Research Question					
What do we target in the experiment?		Do we reward behaviour or do we stimulate change?		What is the research question?	
Motivate public transport commuters to use bicycle		Rewards behaviour		Can public transport users shift to bicycle? Does the size of the reward matter?	
The Context in					
SUNSET Innovation	SUNSET High level goals	The System	The Data	The Users	The Living Lab
Sensing, distribution of incentives	Environmental protection and personal wellbeing	Distribute challenges	Monitor changes mode choice	Public transport users	Gothenburg
The Experiment					
Base case	Incentive situation	Target Group	Incentive	Scope	Repeat Pattern
Mobility pattern, normal tripzoom functionality	500 points in first week and 1000 points in second week	PT commuters	500-1000 points per trip with bicycle	Traveller in the entire Gothenburg	2 week period

6.5.3 Users and rewards

The recruitment wave 3 led to 38 participants of which in the end 23 installed tripzoom on their smartphone and got a tripzoom account. There were again some late registrations, and at the time of distribution of the challenges for week 1, there were 10 users for both experiment 3a and experiment 3b. All of these users received the challenge and for experiment 3a 2 of 10 users received rewards, while 6 of 10 users received rewards for experiment 3b. Figure 6-9 presents this break down in number of users in each of these steps.

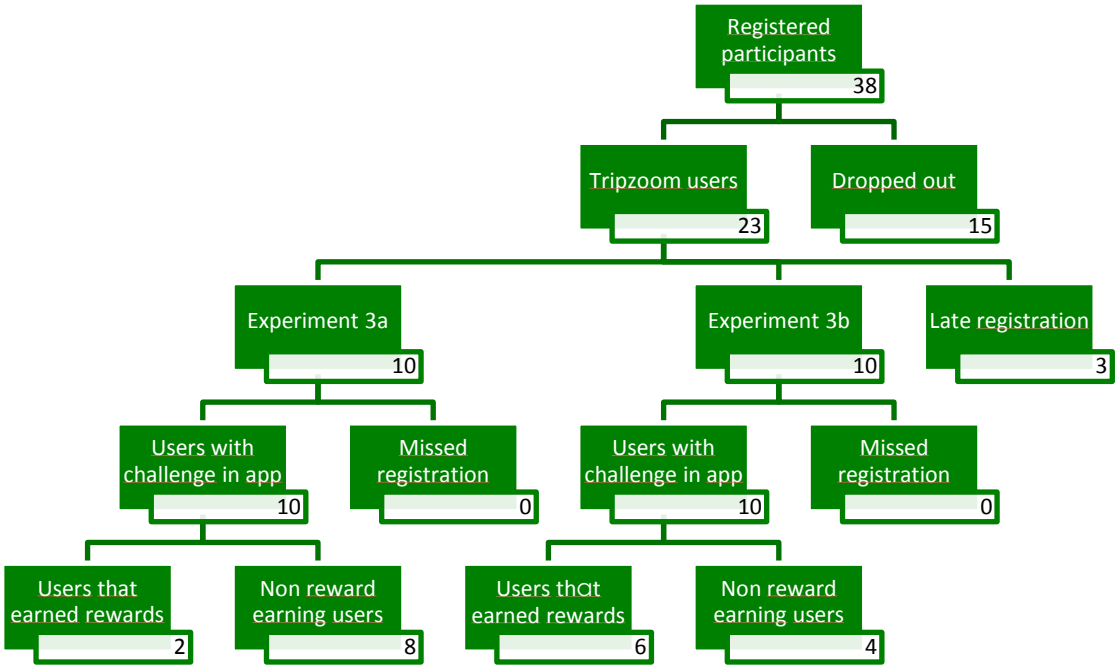


Figure 6-9: User registration, participation, challenges, and rewards - experiment 3 week 1

Figure 6-10 presents the user breakdown for week 2 in which there is an extra yes/no level namely the randomized groups of reward amounts. For experiment 3a no rewards were earned in the lower reward amount group, while one reward was received in the higher reward amount group. Although further investigated in D7.5, this low received reward levels indicate that the challenge is too hard for travellers, changing both mode and departure time may well be too much to ask (given reward levels). For experiment 3b the number of received rewards were higher, in the lower reward level group 2 users received rewards, while in the higher reward level group 4 rewards were received.

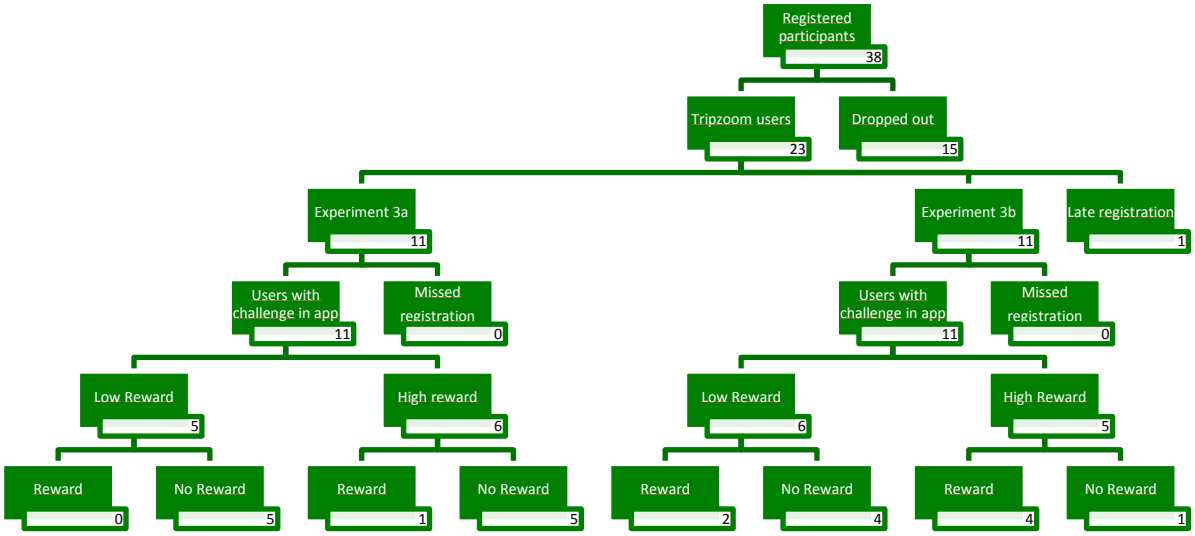


Figure 6-10: User registration, participation, challenges, and rewards - experiment 3 week 2

Figure 6-11 shows how the number of registered users developed over time. The majority of users entered the system within 4 days after registration opened. The number of daily users for whom trips were registered is about half the total number of available users. This can be the result of that people actually do not travel every day or that smartphones, Tripzoom or GPS were turned off while travelling. In D7.5 this is analysed to some extent based on questionnaire results.

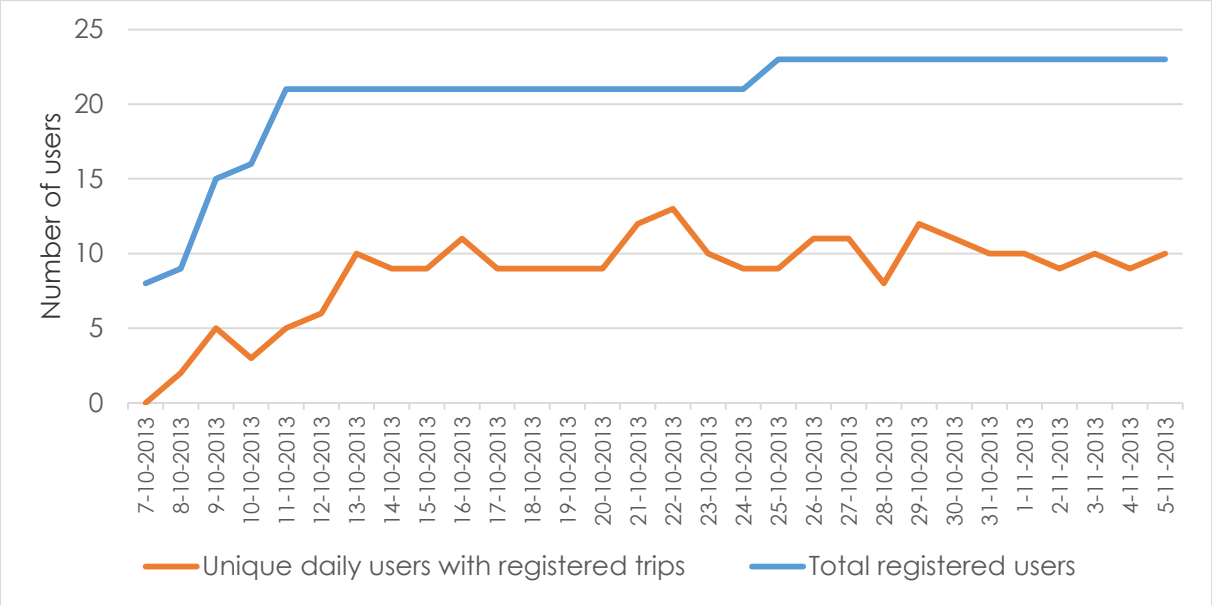


Figure 6-11: Users in the system experiment 3

6.6 Lessons learnt and good practice

Proved concept – living lab operation model

The living lab operation model described in chapter 2 has proven to be a useful and effective tool to organize experimental user involvement on a large scale. The model is generic and consists of three phases.

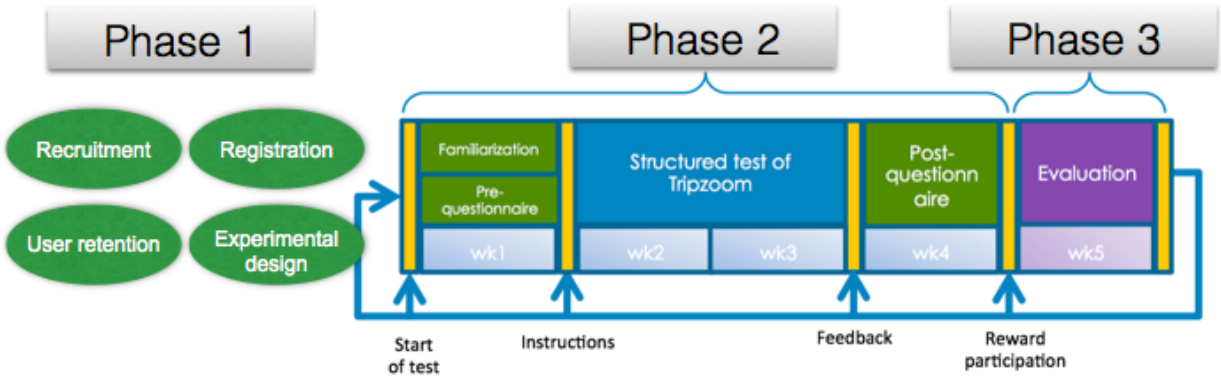


Figure 6-12: Living Lab operation model

During phase 1 the activity in the lab is prepared following four activities. Participants are recruited and through a systematic process transformed into users. This involves registration, information about the experiment and what is expected from different involved actors during the test. In this phase the experiment is also planned using the experimental template presented

in Chapter 2 and recruited users retained. On average this first phase took 2 weeks when organizing the Gothenburg Living Lab.

Phase 2 involves a familiarization phase in which the user base becomes familiarized with the tripzoom system and creates a travel behaviour profile. During this first phase pre-questionnaires is sent out to collect data from the users prior to the structured test/experiment. On average took this sequence one to two weeks in the Gothenburg Living Lab. The structured test that followed involved challenges sent out to the user group instructing them what to do in order to be rewarded. On average this second sequence in the second phase took two weeks.

Feedback was then collected in a systematic way using post-questionnaires and together with the data collected from tripzoom usage and evaluation was performed to answer the research question that governed the specific experiment. The living lab work in Gothenburg has contributed to the design and refinement of the model, which is now regarded as a fifth innovation result from SUNSET.

Proved concept - tripzoom
The unstable IMP was constrained by technical design and implementation decisions made early on in the project. An important lesson learnt after the experiments is that the design of a project with a living lab requires that substantially more resources are made available for improving the system based on the experiences that the experiments generate. Moreover it is important to have a stable development team or to have improved knowledge transfer processes in place to be able to make effective code change over longer periods of time. Despite the unstable IMP and the drop out of users, the experiments in the Gothenburg reference Living Lab have resulted in data sets that have enabled the project to successfully evaluate the system. The system has proven to be a working mechanism to design and distribute challenges and points to users via mobile devices with the purpose to stimulate them to change their travel behaviour. The results from the experiments that prove the concept are presented in D7.5.

Implementation improvements
The experiments identified a number of improvements for the Incentive Market Place component of the tripzoom system . This IMP manages challenges and reward (point) design, implementation, issuing and monitoring. How challenges should be designed and implemented would benefit if the criteria available also includes OR. This criterion would enable the Living Lab coordinator to design even more appropriate challenges than currently possible. In addition currently no distance-based challenges can be designed as the system lacks this criterion. The experiences from using the IMP in experiment 1-3 indicates that this improvements would strengthen the system even more making it possible to design relevant challenges based on the user base travel behaviour

IMP design improvements
A number of improvements were identified in the IMP design. When defining a challenge the OR criterion would enable the Living Lab coordinator to design appropriate challenges with higher level of complexity. In the current system a more complex challenge requires for example that multiple challenges must be designed in order to fulfil an incentive purpose. Peak period definition functionality was also absent. In Gothenburg focus was on peak period avoidance and the challenges designed would have been easier to create if this functionality should have been implemented. The current system is also only built around trip based incentives and challenges. A wider amount of different incentives' will enable the Living Lab coordinator to use more tools to stimulate the user base to change behaviour. The assignment of challenges is in the current system based on manual actions. In a situation were a living lab has several

hundreds/thousands of users this will become to labour intensive to manage and automatic management of incentives is required. Additional improvements identified are:

- Increase reliability of challenge delivery to users
- Align IMP log data with trip page data
- Show rewards given in the city Dashboard
- Create better overviews of challenges in the different Living Labs
- Improve the notification system to users, especially for iPhone
- Make ESQ engine more reliable

7. SWOT analysis

The following table summarises all points made throughout this deliverable and provides a SWOT analysis of the Gothenburg Reference Living Lab from the Living Lab Co-ordinator's team point of view.

7.1 Strengths

- Development of a new generic management model for Living Lab Operation which can be reused in future projects (see the ITRACT project request in D8.2)
- Development of a re/usable three layered experimental design tool (template) to systematically design experiments in a setting with several living labs creating the possibility to perform rigid experiments producing comparable results
- Proven recruitment method that creates a user base for experimental analysis within SUNSET
- Create the opportunity for future projects to engage with these users again (of 138 recruited participants 62 have indicated that they want to be in a pool of users in future projects)
- Collected 19.746 trips of real travellers in Gothenburg during 2013
- Collected a lot of user input and feedback about the tripzoom system itself, drivers for travel behaviour change and when and why people drop out from a Living Lab
- Implemented effective system and division of labour for retaining users with helpdesk, escalation and feedback as key reactive measures, and newsletter and gifts as proactive measures.
- Development and use of powerful system management tools for the Living Lab coordinator
- Implementation of personal incentive provisioning with real rewards to stimulate people to shift behaviour
- Designed and implemented a privacy and data management protocol, which can be reused in future projects
- Even with relatively low numbers of users in Gothenburg, the results actually are amazingly consistent providing the basis for a proof of concept (confer D7.5)
- A systematic account of how much user recruitment and retention costs in money and effort

7.2 Weaknesses

- Tension between broad research objectives (also see what doesn't work) and clear message and value for the user
- The lack of an attractive core message made the system and living lab participation difficult to "sell" to potential users
- Difficult to communicate the "what's in it for me" of such a diverse system as well as participation
- A living lab experiment in the eyes of a users from recruitment, registration, familiarization, experiment and post-questionnaires was viewed by many as a to labour intensive endeavour, resulting in drop outs between submission of interest to actual registration
- Technical flaws and battery consumption made user retention hard, resulting in high numbers of drop outs (during the familiarization phase)
- High hurdle for registration

- Not using default architecture for facebook integration made connecting to facebook hard
- Exact CO_2 and calorie measurements are hard to do without a lot of detailed personal data
- Technical flaws in the incentive engine prevented the design of flexible challenges
- One must know the strengths of the system to be able to setup a trustworthy experiment

7.3 Opportunities

- The proof of concept shows that further development in line with the SUNSET vision can be fruitful
- Users stating that despite a an experimental system with many flaws they favour the idea with positive incentives as driver for travel behaviour change, and that tripzoom as an platform with automatic trip detection have lots of potential if an attractive core service can be designed using the platform as engine (c.f. D7.5)
- Lots of rigours data and structured user feedback to be probed for future research and benchmark
- Elaborate on the analysis and management tools for the living lab coordinator towards a more mature city level traffic analysis tool.
- Transfer the living lab operation model to other projects to support the design, operation and evaluation of living labs
- Explore the user needs for a living lab coordinator to further enhance the City Dashboard
- In Sweden, creative and innovative solutions for increased accessibility are seen as essential from a national and local government perspective. This paves the way for the flourish of project like SUNSET.
- Broaden the recruitment scope by using proxy organizations more systematically using formal agreements and letters of intention.
- Connect tripzoom to open data resources available in a city/region so for example real time information about the traffic situation can be used to improve the service

7.4 Threats

- Social media require constant monitoring to avoid negative publicity since the first user impression counts disproportional
- An unreflected belief that a novel mobile digital service for sustainable transport will in itself create an impact amongst users
- Opposing stakes of a recruitment proxy can hamper your recruitment efforts. Especially if you have to rely on their prioritisation of activities.
- Relying on external services and data can cause technical issues which might have a negative impact on the project's image.
- An underestimation of the work load required to set up and operate a living lab.

8. Commonalities & differences between Living Labs

The SUNSET approach with three distinct Living Labs in three European countries (Figure 8.1), which were designed in close collaboration and operated as one full Living Lab in Enschede and two reference Living Labs in Gothenburg and Leeds, has resulted in valuable findings.

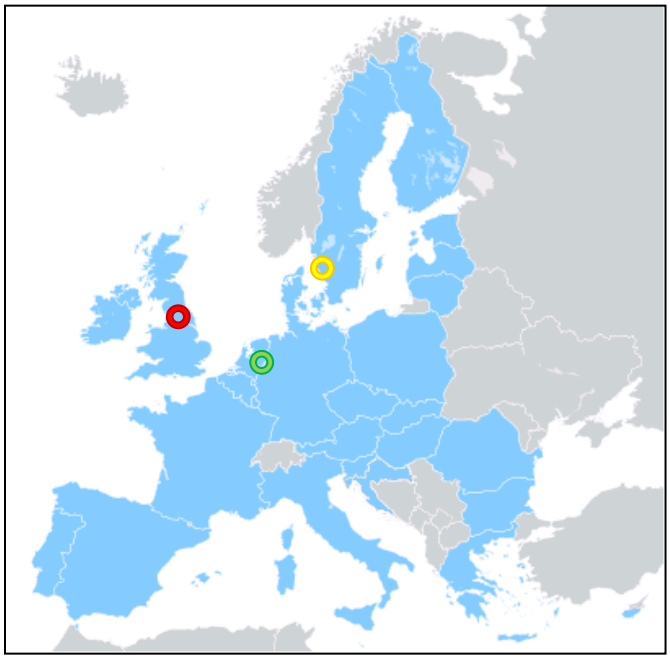


Figure 8-1: The location of the Living Labs (Enschede, Green; Leeds, Red; Gothenburg, Yellow)

The Living Lab reports D7.2 (Enschede), D7.3 (Leeds) and D7.4 (Gothenburg) describe the process for designing and operating the three different SUNSET project Living Lab. As, there were both commonalities and differences between Enschede, Leeds and Gothenburg we bring together the lessons learnt and draw some comparison in this final chapter. The three Living Labs are compared on four aspects (Figure 8-2). This Chapter is therefore the same over the three deliverables.

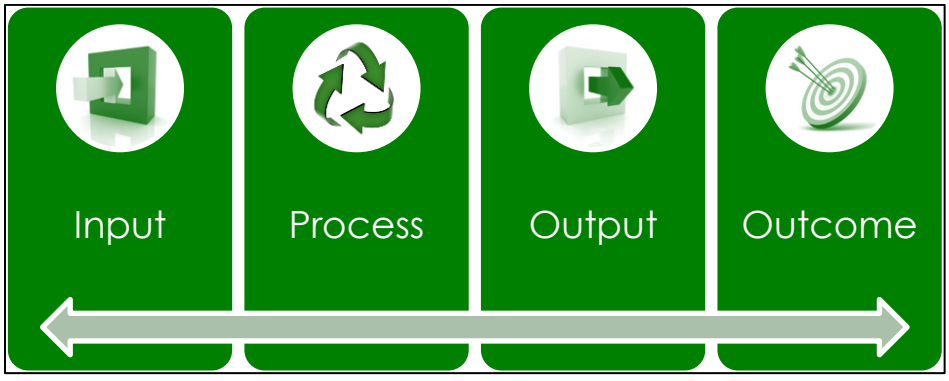


Figure 8-2: Living Lab comparison aspects

The comparison is primarily an analysis to identify the processes and resources needed to successfully operate the different Living Labs with the aim of providing the transport and ICT

sector communities with insight and knowledge of the design and operation issues. Output form the Living Labs is described in D7.5.

8.1 Input

The input towards the Living Labs is based on the Living Lab Plan (SUNSET Deliverable 7.1). The context of all the Living Labs is an urban area where there is a congestion problem and governments are more and more looking for novel solutions. SUNSET developed the tripzoom system as one such solution. In the Living Labs, the main innovations of social networking services, personalisation, incentives and the tripzoom system are the main tool used as input.

Error! Reference source not found. gives an overview of the activities that took place in the three different Living Labs. All labs had a similar preparation and pre-operation stage. During the operation stage, choices were made based on differences between the labs and the sharing of experiences. This approach allowed the use of three different Labs for testing of a wide variety of aspects; all contributing to the overall SUNSET research objectives.

Table 8-1: Key Living Lab Characteristics

	Enschede	Leeds	Gothenburg
Key Information			
Living Lab Type	Main Living Lab	Reference Living Lab	Reference Living Lab
Living Lab Co-ordinator	Municipality of Enschede	University of Leeds	Viktoria Swedish ICT (Research institute)
Governmental involvement	City of Enschede is a project partner	West Yorkshire PTE offered some assistance.	Gothenburg Region was involved in the Living Lab Preparations
Recruitment area	Enschede and surroundings	City of Leeds	Gothenburg Region
Target groups	Open sample City centre commuters	General public sample Time poor travellers	Commuters to Lindholmen Science Park and city centre
Statistics			
Living Lab Participants	268	112	138
tripzoom users (#)	108	6	95
Trips (#)	28.104	2.157	19.746
Kilometres driven (km)	355.874	19.673	337.698
Recruitment			
Proxy companies and networks	Twente Mobiel, four associated companies	West Yorkshire Travel Plan Network	Business Region Göteborg, Lindholmen Science Park, August Leffler & Son, Saybolt Sweden AB
Newspaper ads	☑	☑	☑
Facebook ads	☑	☑	☑
General online ads	☑	☑	☑
Flyers & Posters	☑	☑	☑
Digital newspapers	☑	☑	☑
University Lectures	☒	☑	☑
User interaction during Living Lab Stages			
Living Lab Preparation	Questionnaires, focus group	Questionnaires, focus group	Questionnaires
Living Lab Pre-operation	Release evaluation, technical trial	Release evaluation, technical trial	Release evaluation, technical trial
Living Lab Operation	Four experiments	Focus groups	Three experiments

Living Lab planning
As the Living Lab experiments were developed using an iterative approach, there has been uncertainty and shifting in the planning. Contingency plans and a flexible planning were used to address the risks associated with these uncertainties. These plans proved to be of great value as they enabled the Living Lab Co-ordinators to actively use the experiences of the other labs in the operation of their own.

8.2 Process

A number of different management processes were observed to be of significance to the successful implementation of a Living Lab. Based on the experiences in the different SUNSET project Living Labs we think that a process and resource analysis that offers insight into: user recruitment, system vulnerabilities, data management, Living Lab coo-ordination, and stakeholder involvement can be useful as lessons to future Living lab implementations.

Recruitment
The time and resources required to recruit the anticipated number of users has been a constant challenge for all three Living Labs. It was found difficult to introduce tripzoom in an appealing and easy-to-comprehend way to users due to the diverse app features and research objectives. In addition it was found that support from Living Lab co-ordinator was required to 'hand-hold' users over hitches at the registration phase, otherwise the rate of attrition increases. For future projects it is recommended that at least the purpose of the introduced app can be explained and summarized in one short, single sentence. This will allow better promotion of such apps, allowing recruitment of more targeted users.

Living Lab Co-ordinator
In all three Living Labs there was a central person who acted as the Living Lab Co-ordinator. This central role turned out to be a valuable position within the Lab. As this person had close contact with both the users and the developers, communication worked well. A broad range of user feedback could be channelled towards the developers, and in depth technical user remarks could quickly be discussed with the responsible developer. Increased numbers of users would require a more distributed model and new practices of coordination and communication. As users expect a helpdesk to be available constantly, a Living Lab Co-ordinator worked almost in a 24/7 style. Specifically in Enschede, the fact that the municipality took this role meant an even stronger position with all stakes at hand. This way municipal stakes were taken in consideration by default, but also caused users to have high expectations.

System vulnerability
A common finding across all three Living Labs was that users expect high quality software to test, even if it is an alpha or beta version. Although corrective actions took place, the users in all the Living Labs faced significant difficulties with registering and using tripzoom. Therefore it has been suggested in chapter 7 to aim for a stable system with limited research objectives in Living Lab trials.

Stakeholder involvement
Along the same lines, the inclusion of stakeholders has presented particular challenges in all Living Labs. Enschede had a distinct advantage since the local authority was part of the SUNSET consortium. Yet, the city council in Leeds has expressed interest about SUNSET, as had transport operators and some other large employers. In Gothenburg, the Business Region Göteborg and Lindholmen Science Park in particular became involved in the recruitment and involvement of stakeholders. However, informing, coordinating and managing the expectations of such

stakeholders proved to be a significant task which could not be successfully completed within this timeframe based on the available resources.

Data management
Organising and managing data was a major task for the Living Lab Co-ordinators as explained in detail in chapter 3. Local and national data protection variations coupled with the lack of experience by the approving authorities of similar Living Lab implementations influenced system design and in particular the insistence of consent form stage. It was found across all three Living Labs that it would have been useful to delegate this task as a specific activity which would be realised in coordination with the system design and Living Lab implementation. On-going discussion around the new General Data Protection Regulation might ease this process, as there will hopefully be more equal procedures between different countries.

8.3 Output

The three concrete outputs of the Living Lab operation are the management model, the experimental design and the privacy framework.

Management Model for Living Lab Operation
As highlighted throughout this deliverable, a management model for operating Living Labs has been successfully developed and tested in Enschede, Leeds and Gothenburg. Enschede and Gothenburg managed to expand testing to include more challenges, as was allowed by the local circumstances. However, all three Living Labs made a positive contribution since it is worth operating such Living Labs in urban areas with different local circumstances. In the Gothenburg Living Lab, the ITRACT project has shown great interest in the management model and how it may be used for operation the Living Labs.

Experimental Design
In all living labs, one of the main challenges in designing the experiments is the wide set of optimisation parameters. On the one hand, a meaningful and personal user experience is desired. On the other hand, there are system and project level goals to be achieved. For the design of experiments with the use of tripzoom, this worked very well. As it was specifically designed for these experiments, the alternative nature of the social media experiment in Enschede and the focus groups in Leeds fit less well within the format.

Privacy Framework
Privacy concerns were of equal importance amongst the different labs co-ordinators: it is generally perceived to be a major issue and the outcomes of the qualitative work in the Leeds Living Lab confirm this to be the case with the Leeds focus group participants. However users of tripzoom (in the mobility monitoring research) in the Living Labs did not raise the issue substantially and this may be because only those who were comfortable with the arrangements for privacy had proceeded to become users. In the Leeds Living Lab, conformity with the different privacy regulations created additional processes and a burden of work for both the Living Lab Co-ordinator as well as the user. The framework as it was setup within the SUNSET context has already been reused in the SMART project in Enschede.

8.4 Outcome

As well as concrete outputs there are two specific outcomes identified from the process of implementing the SUNSET Living Labs. These outcomes are the proof of the concept and the legacy. We did not reach the level of a proof-of-product with significant take-up resulting in city-level effects on congestion, sustainability, safety and well-being. Therefore the tripzoom

implementation showed too little operational success. Nevertheless the development and operation of tripzoom in the field as created a number of valuable lessons on the strengths and weaknesses of the concept, showed that the concept works on an individual level and finally creates a solid basis for next generation products and services.

Proof of concept
Overall, the proof of the SUNSET concept has taken place, with different Living Labs highlighting particular aspects and effects as reflected in the Living Lab evaluation (D7.5) All Labs had their distinct areas of focus, contributing to the total SUNSET concept.

Legacy
Within the SUNSET project, new technology and services have been developed and tested in situ. More detail on the uptake can be found in D8.2 on Exploitation results.

This legacy of tripzoom has resulted in service exploitation uptake by both LocatieNet and Mobidot, a spin-off company from Novay. Both have taken a position as ICT service provider of (social networking based) mobility services leveraging on three important components: automated 24x7 tracking functionality, personalised information delivery and incentive distribution. A number of next generation Apps/services based on the SUNSET and tripzoom ideas, the SUNSET technical innovation components and the project's lessons learnt are developed and already exploited by these companies in (semi-)commercial settings in the Netherlands.

Secondly, several new projects have started to continue R&D on the concept of SUNSET and on tripzoom like ICT systems for transport. These projects include:

- Big Data Centre, University of Leeds;
- SMART project, Enschede Municipality;
- Technology Strategy Board Feasibility project, University of Leeds;
- Algorithms for mode detection, University of Twente;
- Travel Surveys using automated methods, University of Twente.
-

The SUNSET legacy also contributed to the plan of an existing EU funded project, iTRACT (http://www.itract-project.eu/). This project is especially interested in the organization and operation of Living Labs within SUNSET.

Finally, in their role as municipality and direct stakeholder in urban mobility, the city of Enschede has positioned itself as a customer of tripzoom-type of social transport services and as a proving ground of these kind of new services. In that respect the Enschede Living Lab will continue to exist after SUNSET project end and will function as a test bed for next generation systems and services in the area of personal and social networking based mobility services like SMART. As such the Enschede Living Lab is an exploitation result in itself.

9. Lessons Learnt

As a result of the Living Lab experiences in the three Living Labs, and the Gothenburg Lab in particular, several valuable lessons learnt and tips for future Living Labs are documented in this chapter. This chapter gives an overview of the different lessons in a more or less chronological order of running a Living Lab. This chapter covers common lessons for the three Living Labs, with Living Lab specific additions underlined. For lessons in relation to the experimental design, please also refer to SUNSET Deliverable 7.5 Living Lab Evaluation.

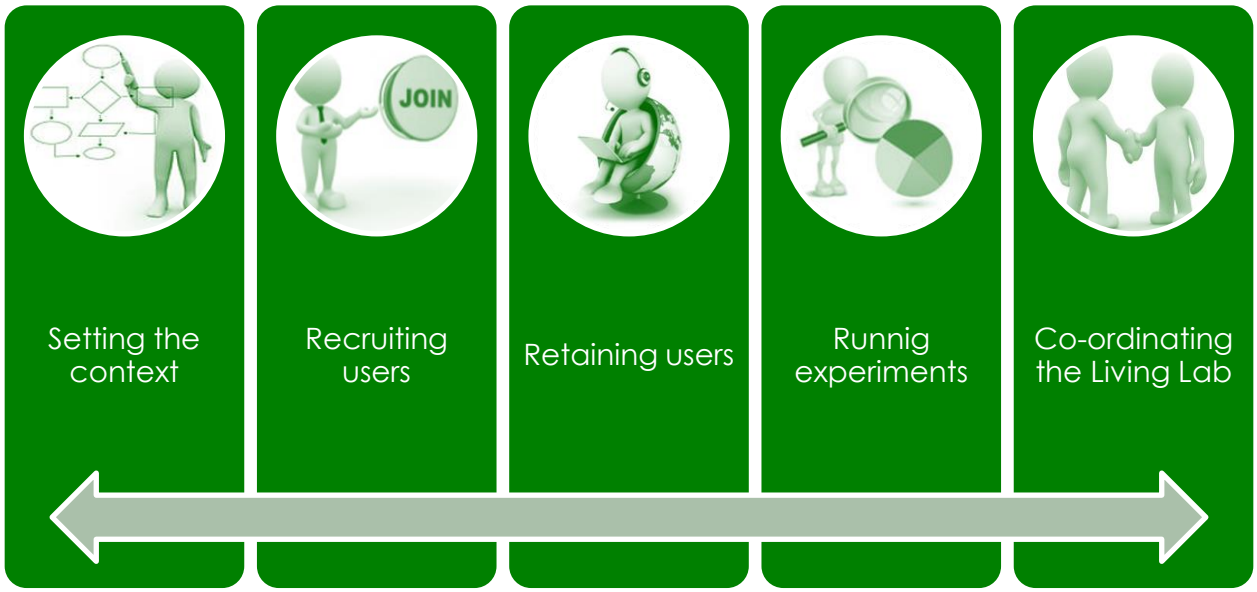


Figure 9-1: Chronological scope of lessons learnt from the living labs

9.1 Setting the context

Developing the application

Although development of the application was a research task, a solid user experience was nonetheless expected by the users. In the development plan, there should be specific attention for user consultation. Also, one should take in consideration the fact that the development in a live environment raises particular challenges compared with a static development context, for example bug fixing (and even feature development) are expected by users. However there are also advantages to this approach, for example in the case of SUNSET, the involvement of non-developers in the release based process resulted in valuable input to the development of the application.

Building the privacy framework

Although user interest in the actual privacy documentation may be limited, the development of privacy documentation is essential when working with location tracking of individuals. On the one hand, it helps the user to trust the integrity of the Living Lab Operation. On the other hand, it provides solid guidelines for choices to be made during the course of the project.

In Gothenburg case, the privacy framework was reviewed in relation to the DPA. A professional review requires a lot of resources and this should be taken into account when the budget for the project is designed.

Using the operational model
Using the operational model to structure the Living Lab work helps the Living Lab Co-ordinator to manage the different phases of the Living Lab. A structured, step wise process gives clear guidance to all stakeholders involved.

Organising a pre-operational stage
The pre-operational phase is a good way to work towards a larger release of the application. A number of lessons were learnt about this stage:

- As the application is exploring the boundaries of the technical possibilities, it is good practice to devote specific time to test the basic functionalities of the system.
- Extending the user base during the final stages of development helps to broaden the range of smart phone types that are used to test the app. This may serve to increase the number of future users of the app.
- In the case of using companies as proxies in recruitment, it is good practice to involve at least one 'friendly user' per company in order to make sure that features of specific types of smart phones that may be common in the company are taken into account.

9.2 Recruiting users

Triggering users
The first step for a user to get involved in the Living Lab is some sort of trigger to join. A careful choice of communication channels in providing the stimulus to join can help the Living Lab Co-ordinator keep control of the Living Lab size. Snowballing via social media might take place, but only when early users are satisfied with the product and can tell others 'what's in it for them'; preferably within one sentence. A viral effect could happen but cannot be planned. Due to a lot of competition in the general market place for apps, reaching out is difficult. Even if people do get involved in a Facebook page, conversion to the stage of app download is limited. Engaging users to participate requires systematic efforts from the consortium that is organizing the Living Lab. The consortium has to trigger an interest to participate and contribute to both the development of the service and the creation of new knowledge.

Contingency planning
A lesson learnt throughout the Living Lab recruitment phase was the necessity to have a very well–thought out contingency plan for recruitment. This was important to manage the relationship with 'gatekeepers' (organisations that through their functions have access to and are in active communication and have relationship of some trust with citizens) to recruitment and other key stakeholders. It was also important in ensuring consistency in responses to recruited users, particularly where recruitment had included the offer of a reward to participate. The contingency plan should cover the whole period of the Living Lab operation, in order to deal with and mange low volumes of recruits in all stages. Management of the relationship with recruitment 'gatekeepers' is vital to avoid the perception of ad hoc requests for help or persistent requests for help over time. This is often 'overlooked' if the key 'gatekeeper' stakeholders are also members of the consortium.

Preparing contingency plans
In recruiting successfully it is important to establish contingency plans, that is, a series of strategies in case initial publicity to recruit users is only partially successful. This level of contingency

planning is necessary to avoid the perception that any channels used are overloaded with requests, such as ad hoc requests to disseminate more recruitment material or to help recruit more users. We recommend a firm budget be associated with this task.

Rewarding participation
Surveys performed in SUNSET indicate that participants are not always triggered to participate by the prospect of tangible gifts; instead users may want to participate in the development of a service that improves everyday travel for themselves as well as the community as a whole. This does not mean that tangible gifts do not have a function in a Living Lab, to the contrary, tangible gifts have a role in both (a) stimulating curiosity and to reward users for participation; and (b) to stimulate behavioural change.

User enrolment
The majority of users dropping out of the experiment did so in the phase between signing up as interested in participating and actually participating. The process to download, register and install the app should be made as intuitive, seamless and efficient as possible. Barriers, unclear steps and choices should be removed in order to ensure that participants who have signed up do not drop out at an early stage. There is a distinction between a Living Lab that is conducted with a stable and pre-tested app and the case where the Living Lab forms a component of a research and innovation project. In SUNSET, the latter was the case. In this type of Living Lab there is a need to balance the requirement to ensure 'informed consent' with the requirement to ensure a 'seamless' download and registration process. Information about the project aims and the terms of participation should therefore be embedded in the enrolment process for users.

Downloading the application
To encourage as many users as possible to use the application, the smooth alignment of the regular app-procedures turned out to be essential. In early stages, there was an installer file available which many friendly users were unable to install without face-to-face contact. Once the app was available in the Google Play Store and Apple App Store, downloading and installing the application was no longer a hurdle.

Registering an account
Having experimental design control over the users in the Living Lab by manually assigning users to the Living Lab, turned out to come with a great cost. Users want to use an app as soon as they have downloaded it, so it is advisable to give at least some functionality without the time elapse involved in manual permission by the Living Lab Co-ordinator. Using available login services such as Facebook, Google, etc. makes it even easier for the user to join the Living Lab. However, easy access to an account must be addressed without compromising the users right to make an informed choice about whether to be a part of the Living Lab and consequently, part of a research project.

Using the application
Once people have installed the app, it is challenging to encourage them to maintain usage. Generally, people tend to forget about it unless there is some sort of reminder. This could be done using the incentive schemes, successive experiments or 'out-of-app' communication (for instance a newsletter).

In order to keep the users interested in participation the application should also have a core message that is aligned with the core message used to trigger their participation (for example the expected environmental merits or the cost saving). Just because there has been success in recruiting a cohort of users, one cannot test everything (i.e. all possible experimental functions,

the spectrum of incentives etc.) and expect all users to maintain their interest and to prolong their participation in the Living Lab.

Reaching out to the target group
When trying to motivate people based on sustainability aspects, it should be taken into account that there are two types of persons who may be very interested in participation, but who won't be able to contribute to the higher level goals: those who believe they are already acting in the 'right' way and those who may challenge the ability of the system to change them. It might be easier to recruit the desired target group based on characteristics from other data sources, for instance based on commute pattern data from the employer.

When trying to motivate people based on sustainability aspects, it should be taken into account that there is no easily available dataset of people's attitudes or desire and intention to change. This makes it hard for any Living Lab to recruit those people who have an intention to change. The lesson learnt was to use combined datasets of travel behaviour (for instance known commute patterns from the employer) and transport services provision (e.g., major employment sites parking capacity, public transport provision), to identify and recruit the desired target group.

In Gothenburg, a new system for congestion tax was introduced in January 2013. This was used in the project to mobilize participants to test out a system that used positive incentives rather than punishment to reduce congestion in the traffic system. It was fruitful to use this to mobilize participation on one hand, on another it created a lot of expectations amongst the participants as it connected Tripzoom to an on-going debate in the region.

9.3 Retaining users

Running the helpdesk
A Living Lab always triggers feedback, as well as a need to be supported. One ground rule is that the application should be built to be as intuitive as possible to enable the users to self-support during the lab. However, in order to be able to operate successfully, the Living Lab feedback operation has to be organized in a systematic way. One fruitful way to do this in the SUNSET case was to setup and organize a helpdesk in a more or less 24/7 style. All comments and questions by users were directed to the helpdesk, where the Living Lab Co-ordinator fronted all users in a specific Living Lab. The helpdesk categorised the feedback and either directly addressed the issues or escalated it to a second line of support by the technical team. The effect for the lab was a systematic approach to both acknowledge user input and take care of the user's input in an effective way.

Aligning with developers
The Living Lab operational team had an important role to play in the interaction between the users and the developers. They acted as facilitators in translating the input from the users to the developers, resulting in alignment between the technical work packages and the on-going Living Lab experiments.

Involving users in the process
In addition to promoting users to feed back issues to the help desk, user involvement - and in the long run, retention of users in the lab - was stimulated by informing users about the progress in the project using regular newsletters to distribute information. When informing, the aim was not only to inform about progress based on user involvement but also to inform about the issues that were not managed (for example due to restrictions in resources). In this transparent way, feedback received from users was acknowledged, triggering more user involvement during the

project. In Gothenburg a monthly newsletter was complemented with weekly information briefs during the experiments.

9.4 Running experiments

Designing the experiments
A number of lessons were learnt in the implementation of the Living Labs. The first was there is a necessity for a pre-defined template for experimental design using incentives. Using the same pre-defined template in all Livings Labs made it possible to do cross-comparisons between the Living Labs.

The second was that the template should be organised with three sequential processes:

- On the first level the research question and aim of the research is stated.
- With this as a base, the context for the experiment was set e.g. what data to use and what target group to involve in the specific experiment.
- On the last level the actual experiment was designed in terms of what incentives to use, when to start the experiment, when to end it and how participation should be rewarded.

When the experiment in designed on this conceptual level, it can be implemented in the system and distributed to the users.

Personalising incentives
Prior to the conceptual design of the experiment, the users were encouraged to use the system in their everyday life in order to measure regular behaviour. This created data which was used in the experimental design to create personalised incentives for the users. Based on the trip data, incentives were personalised to different users groups during experiment. This was pioneered in the Gothenburg Living Lab. The lessons learnt when working with personalisation were that:

- a lot of effort has to be spent on the personal design;
- a very flexible incentive engine is needed to also facilitate this on a technical level.

Taking time
A message shown by all the experiments in the Living Labs is the time users need to adjust and adapt to the challenge. One should not expect an overnight change, but grant users the time to familiarise themselves with the options they have. Therefore, it is advisable to design experiment in such a way that users are given the time to adapt.

Planning for the unexpected
A Living Lab is a living entity during set up, recruitment, retaining activities and the experiments. It is necessary to plan for the unexpected and have resources available in order to manage these unexpected issues. In SUNSET this resulted in the use of different and recurrent recruitment waves to add participants to the labs (see previous discussion on contingency planning). The Living Lab Co-ordinator should work with a mind-set that everything can change over-night and might have to be redone, as well as the notion that reserve resources should be available to enable this mind-set.

9.5 Co-ordinating the Living Lab

The role of the co-ordinator
The Living Lab Co-ordinator is the central hub within the Living Lab. As there are many field of study involved in the operation of a Living Lab, this person should be able to bring all these fields

together. A team of professionals in different areas (e.g. technical development, communications, experimental design) should be available to co-operate during the Living Lab.

Using management tools
The monitoring tools developed in the SUNSET project turned out to be of great value in operation of the Living Lab. Although one should be cautious about the users' privacy rights, insights from data can help to understand any issues a user experiences and improve the feedback given. Also, the location traces have a huge opportunity in providing management information to the road authority.

Storing the data
During the course of a Living Lab, a lot of valuable data is collected. For both the scientific community and the traffic managers, the location traces provide a useful source of information. However, from a user's perspective, personal data should be stored for as short a time as possible. The best way to cope with this tension is to have a procedure in place which can de-personalise the data. This may involve either stripping the locations of the journey start and end points or by storing data at an aggregate level.

Staffing the Living Lab Co-ordinator position
In typical staffing structures of road authorities, there is almost certainly no current position which should most logically staff the Living Lab Co-ordinator. Depending on the stakeholder fulfilling this role, there will be a difference in the approach taken. On one hand, the government might not be the most trusted party (by users) to handle personal data and to try to optimise the personal situation. On the other hand, the government is typically a place where different interests are joined and where there is funding available. In the SUNSET research context, it worked well to assign a local partner with the Living Lab Co-ordinator role, but in a more permanent situation this decision should be carefully considered.

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Appendix A: Introduktion till SUNSET

Om SUNSET

SUNSET står för Sustainable Social Network Services for Transport och är ett innovations- och forskningsprojekt finansierat av 7:e ramprogrammet i Europeiska Unionen. Projektet genomförs 2011-2014. Antalet vardagsresor ökar enormt vilket medför allt större utmaningar vad gäller säkerhet, resekostnader och miljön. SUNSET (Sustainable Social Network Services for Transport) adresserar dessa utmaningar genom en ny approach på mobility management baserat på mobil informationsteknik. Grundtanken i denna approach är att resenärer genom samverkan vill dela med sig av information till andra resenärer samt att man som resenär är villig att ändra resebeteende som en konsekvens av positiva incitament, såsom utmaningar och belöningar. Vilket är ett alternativt förhållningssätt i jämförelse med t.ex. trängselskatter. Projektet är inriktat mot att studera individens resebeteende och använda data från denna nivå som grund för att påverka resenären i dennes resande. Iden är att denna personaliserade approach möjliggör att andra sociala problem såsom säkerhet och trygghet, social exkludering samt individuell hälsa kan adresseras.

Partners in SUNSET

The consortium of the SUNSET project consists of a mix of domain experts, industrial, and research partners from across Europe. Most partners have longstanding experiences in carrying out EU projects. The project is managed by the NOVAY research institute in Enschede, the Netherlands. The consortium includes dominant representatives from all relevant segments; it covers the complete value-chain that is needed for the objectives of the project. The consortium consists of an internet mobility-application provider (LOCNET), a municipality that owns traffic information and will be running a living lab (ENSCHEDE), a small company focussing on i sustainability and environmental performance aspects of systems (ECO2WIN) and a large mobile operator (DOCOMO Euro-Labs) who brings a lot of expertise in mobile (multimedia) solutions and web technologies. In addition, the participation from well-known European research institutes on ICT applications (NOVAY), on mobility systems (QMUL, ULEEDS), traffic safety (UTWENTE), and living lab studies (VIKTORIA). Together, the partners in the SUNSET consortium provide complementary expertise and capabilities to achieve the ambitious objectives.

SUNSET i Göteborg

SUNSET omfattar tre teststäder: Enschede, Leeds och Göteborg. Under våren 2013 genomförs grundläggande tester av projektets resultat parallellt i dessa städer. I Göteborg leds arbetet av forskningsinstitutet Viktoria Swedish ICT. Viktoria startades 1996 och är lokaliserat på Lindholmen. Verksamheten omfattar 40 forskare som inriktar sitt arbete mot att studera hur ICT kan effektivisera transportsystemet. Viktoria har i detta projekt främst varit inblandad i att kravställa e-tjänsten samt utvecklat affärsmodeller för systemet och därtill ansvarar för det testarbete som ni är en del av.

Ansvarig för Viktorias insatser i arbetet med SUNSET i Göteborg är Anders Hjalmarsson. Kontaktinformation är:

Viktoria Swedish ICT
Lindholmspiren 3A
SE-417 56 Göteborg, Sweden
www.viktoria.se
Anders Hjalmarsson

Tel: 070-7567870
e-post: anders.hjalmarsson@viktoria.se
e-post: livinglabs@viktoria.se

Vill du veta mer om projektet?
Vi har samlat all information om projektet på nedanstående webbsidor. Det är viktigt att du som testanvändare sätter dig in i denna information. I nästa avsnitt kommer vi introducera dig till både tjänsten som ska testas och vad testet innebär för dig som användare. Detta är baserat på den information som finns på de aktuella sidorna. Vi ber er därmed att sätta er in i denna information samt om ni har frågor kontakta den lokale projektansvarige

Om SUNSET som projekt: http://sunset-project.eu/

Om Tripzoom som digital tjänst: http://www.tripzoom.eu/portal/

Visionen för SUNSET illustreras även genom följande film:
http://www.youtube.com/watch?feature=player_detailpage&v=8bWuxMhgbvs

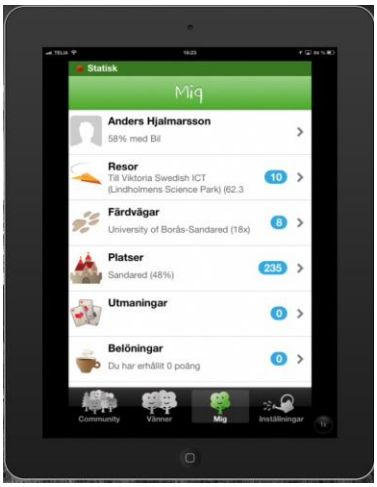
Användarvillkor för Tripzoom som digital tjänst (läs dessa):
http://www.tripzoom.eu/portal/terms.php

Integritetspolicy (läs denna): http://www.tripzoom.eu/portal/privacy.php

Introduktion till testet av Tripzoom
SUNSET är ett innovations- och forskningsprojekt. Inom ramen för projektet utvecklas kunskap om hur människor genom positiva incitament kan påverkas att ändra sitt resebeteende. En central utgångspunkt i SUNSET är att Smartphones kan underlätta för människor i vardagsresandet. En smartphone kan i detta sammanhang både vara en sensor som kartlägger användarens resmönster och en coach gentemot användaren så att denne förändrar hur han eller hon reser i vardagen. För att testa teorin att positiva incitament förmedlade genom en smartphone kan ändra människors resmönster utvecklas det en mobil digital tjänst i SUNSET som heter Tripzoom.

Tripzoom har utvecklats i form av en portal (som kan nås via www.tripzoom.eu/portal) samt genom en app som för närvarande finns på Android och iOS plattformarna. Som app kompletterar tripzoom befintliga ITS-system i samhället. I motsats till andra real-time mobility monitoring systems som fokuserar på aggregerade data så genererar tripzoom detaljerade

mobilitetsprofiler baserade på användarna av systemet. Mobiltelefonen blir med andra ord genom Tripzoom en sensor som automatiskt detekterar när användaren reser, hur han eller hon reser, vart han eller hon reser, när han eller hon reser samt förmedlar tillbaka till användarna vilka konsekvenser som resan innebär, avseende kostnad och miljöpåverkan. Dessa profiler möjliggör för användare av systemet att zooma in på en specifik resa och baserat på denna detaljerade data få statistik om sitt resande. Tripzoom är grunden för att positiva incitament ska kunna förmedlas till individen.

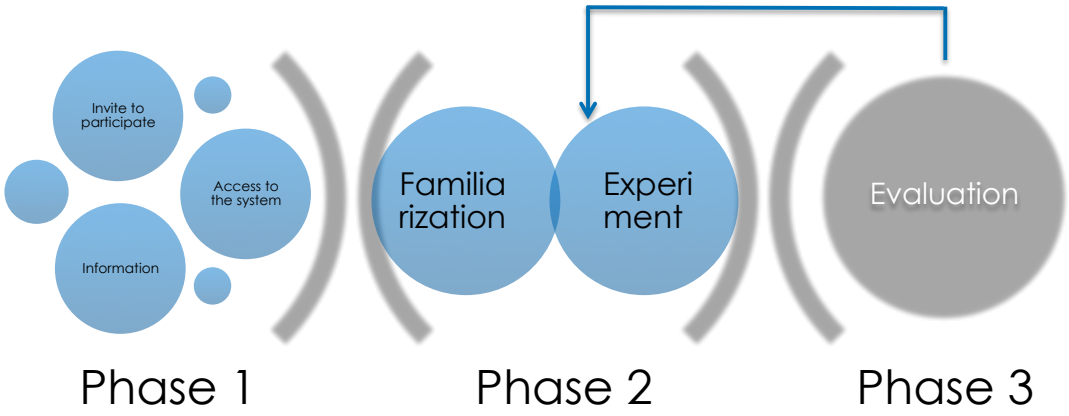


Vad ska testas?

Du som testpilot ska vara med och testa tripzoom som app samt funktionaliteten i portalen. Du kommer under testet få utmaningar att förändra ditt resande baserat på ditt resemönster. Om du följer dessa och klarar av utmaningen kommer du erhålla poäng. En viktig del av testet är att utvärdera distribution av utmaningar, verifiering av huruvida utmaningarna lyckas, samt distribution av poäng och belöningar.

Hur ser testprocessen ut?

Ovanstående uppgift, att testa såväl tripzoom portalen som den mobila e-tjänsten, pågår parallellt i Enschede (Holland), Leeds (UK) och Göteborg (Sverige) från våren 2012 till hösten 2013. Tidigare i vår har det genomförts grundläggande tester av tjänstens funktionalitet. Under de kommande testerna är det framför allt fokus på att testa den funktionalitet som gör att användaren kan erhålla och utföra utmaningar genom tjänsten samt den funktionalitet som gör att belöningar kan distribueras.



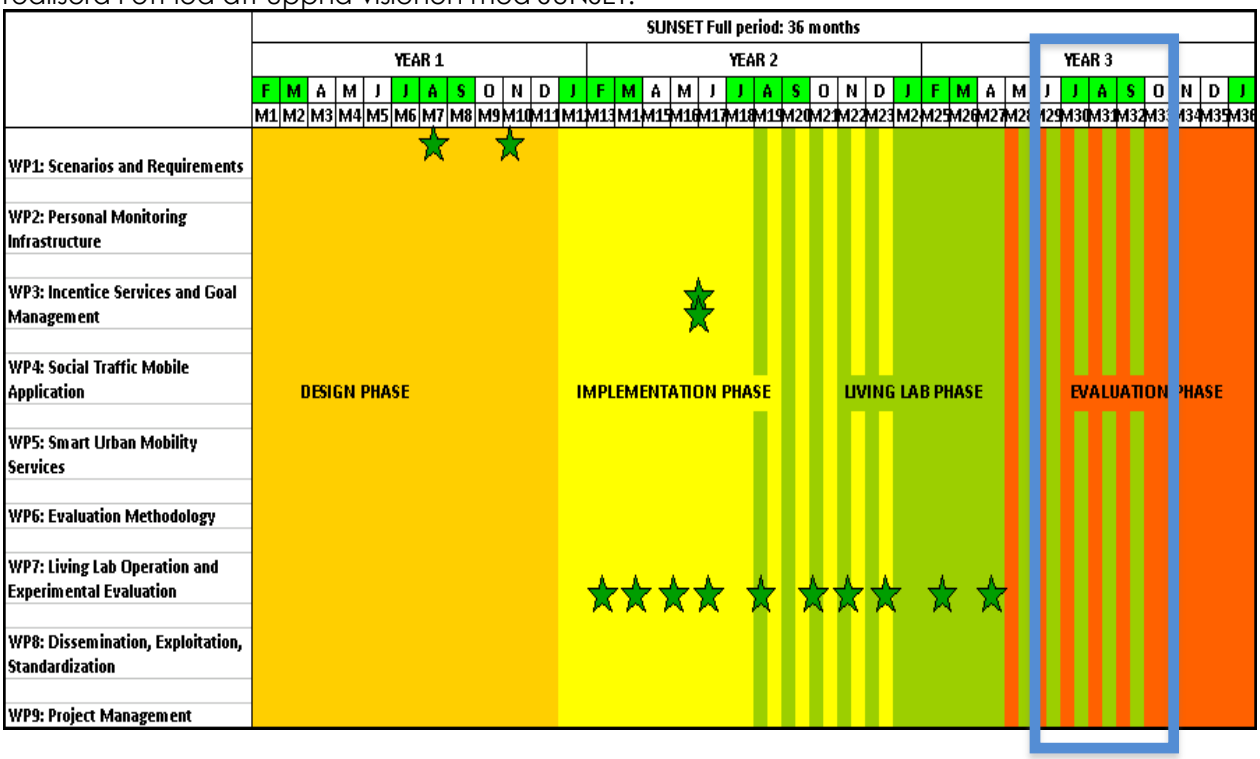
Figur 2: Testprocessen av Tripzoom

I fas 1 bjuds testpiloter in till projektet. Testpiloterna erhåller under denna fas även information om forsknings- och innovationsprojektet, om tjänsten samt om vad testet innebär. I samband med denna information släpps även testpiloterna in i systemet. Genom att släppas in i systemet så påbörjas även fas 2 där den första delen har som målsättning att testpiloten ska lära känna systemet. Detta första steg i fas 2 genomförs under tre veckor och parallellt lär sig systemet

användarens resmönster vilket mini-experimenten (det andra steget i fas 2) senare kommer att baseras på.

Tre mini-experiment planeras för att testa hur utmaningar gällande att resa mer hållbart kan distribueras och belönas. Experimenten startar tidigast två veckor efter det att användaren har kommit in i systemet och börjat använda tjänsten. Experimenten baseras på användarens resmönster som appen automatiskt ska detektera och bestämma. Information om experimenten kommer att distribueras både via epost samt genom appen. Ett mini-experiment tar två veckor och data för utvärdering samlas in automatiskt genom tjänsten samt genom att testpiloten bjuds in att besvara enklare enkäter. Belöningar kommer att distribueras till testpiloterna efter att utvärderingen genomförts.

Testet av tripzoom görs under projektets tredje år och är en viktig del för att utvärdera den motor för detektering av resor, distribution och utmaningar och belöningar som projektet har försökt realisera i ett led att uppnå visionen med SUNSET.



Figur 3: Testet av tripzoom i förhållande till projektets upplägg

Var genomförs testet?
Testet av Tripzoom genomförs samtidigt i Göteborg, Leeds och Enschede. Enschede (i Holland) är den stora testarenan och här genomförs ett fullskaligt test av systemet. I Leeds respektive Göteborg görs samma test som i Enschede men i mindre omfattning.

Hur används testresultatet?
Resultatet från testet kommer användas för att utvärdera tjänsten och vidareutveckla funktionaliteten. Resurser för implementation har avsatts i projektet för att kunna möta den feedback som testarna förmedlar till projektet. Resultatet kommer därtill användas för forskning om hur hållbart vardagsresande kan främjas genom digitala mobila tjänster.

Vad innebär det att vara testanvändare av tripzoom?
Som testanvändare av tripzoom använder du en mobil digital tjänst som samlar in data om ditt resebeteende. Insamlandet av dessa data ska göra det möjligt för tjänsten att presentera incitament avsedda att stimulera till att du som resenär optimerar sitt resebeteende ur ett hållbarhetsperspektiv – både på kort och på lång sikt.

För att åstadkomma detta behöver tjänsten "lära sig" ditt resebeteende genom att följa och mäta de resor som du genomför. Tjänsten gör detta genom att samla in positioneringsdata med hjälp av appen du installerar på din mobiltelefon. Appen sänder data punktvis till en skyddad server som använder dessa data för att beräkna ditt personliga mobilitetsmönster. Baserat på detta mobilitetsmönster skickas sedan personaliserade utmaningar till dig som användare. Om du antar och lyckas med utmaningarna kommer du att erhålla poäng som kan omvandlas till fysiska priser.

Tjänsten är för närvarande i en utvärderingsfas och är alltså ingen färdig produkt. Den ska därför inte heller värderas som en sådan. Tjänsten innefattar i dagsläget ett flertal delar som fortfarande är under utveckling och förbättring, detta gäller bland annat batterikonsumtion, layout, språk, geografisk situationsanpassning samt grafisk utformning. Tjänsten är tillgänglig för dig som testpilot för fälttest och utvärdering i syfte att få värdefull feedback till SUNSET projektet.

Parallellt med att du går igenom beskrivningen av hur man som testanvändare registrerar sig i portalen, laddar ner och installerar appen respektive bekantar dig med appens grundläggande funktionalitet så ber vi dig även att ta del av den integritetspolicy som vi formulerat för testet:

http://www.tripzoom.eu/tripzoom/privacy.php

I integritetspolicyn beskriver vi vilken data som samlas in, varför data samlas in, var data lagras och vilka rättigheter som du som testanvändare har. Du kan närhelst du vill avbryta medverkan i testet och avinstallera applikationen. Medverkan under testet är helt frivilligt.

Om du har några frågor om integritetspolicyn, projektet eller testet alternativt om det uppstår problem under något skede av testet, kontakta mig då för support.

Vi hoppas att du vill vara med och testa tripzoom och bidra till att SUNSET-projektet vidmakthåller sin status som ett mycket framgångsrikt innovations- och forskningsprojekt finansierat av 7:e ramprogrammet.

Anders Hjalmarsson
Viktoria Swedish ICT

Appendix B: Registrera konto i Tripzoom-portalen

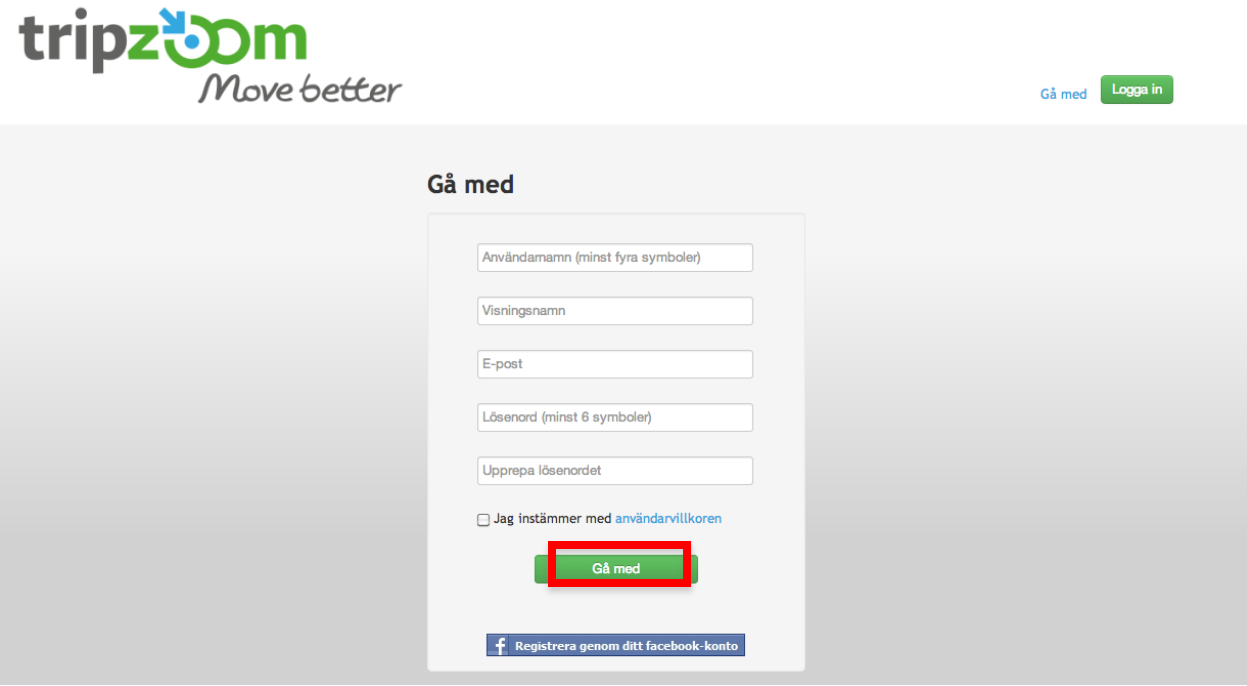
För att kunna använda tripzoom måste du som användare registrera ett konto i tjänstens web-portal. I detta avsnitt kommer vi redogöra för hur detta genomförs.

Påbörja registreringen av konto i Tripzoom-portalen

Starta en webbläsare och gå till adressen www.tripzoom.eu. Följande fönster öppnas.

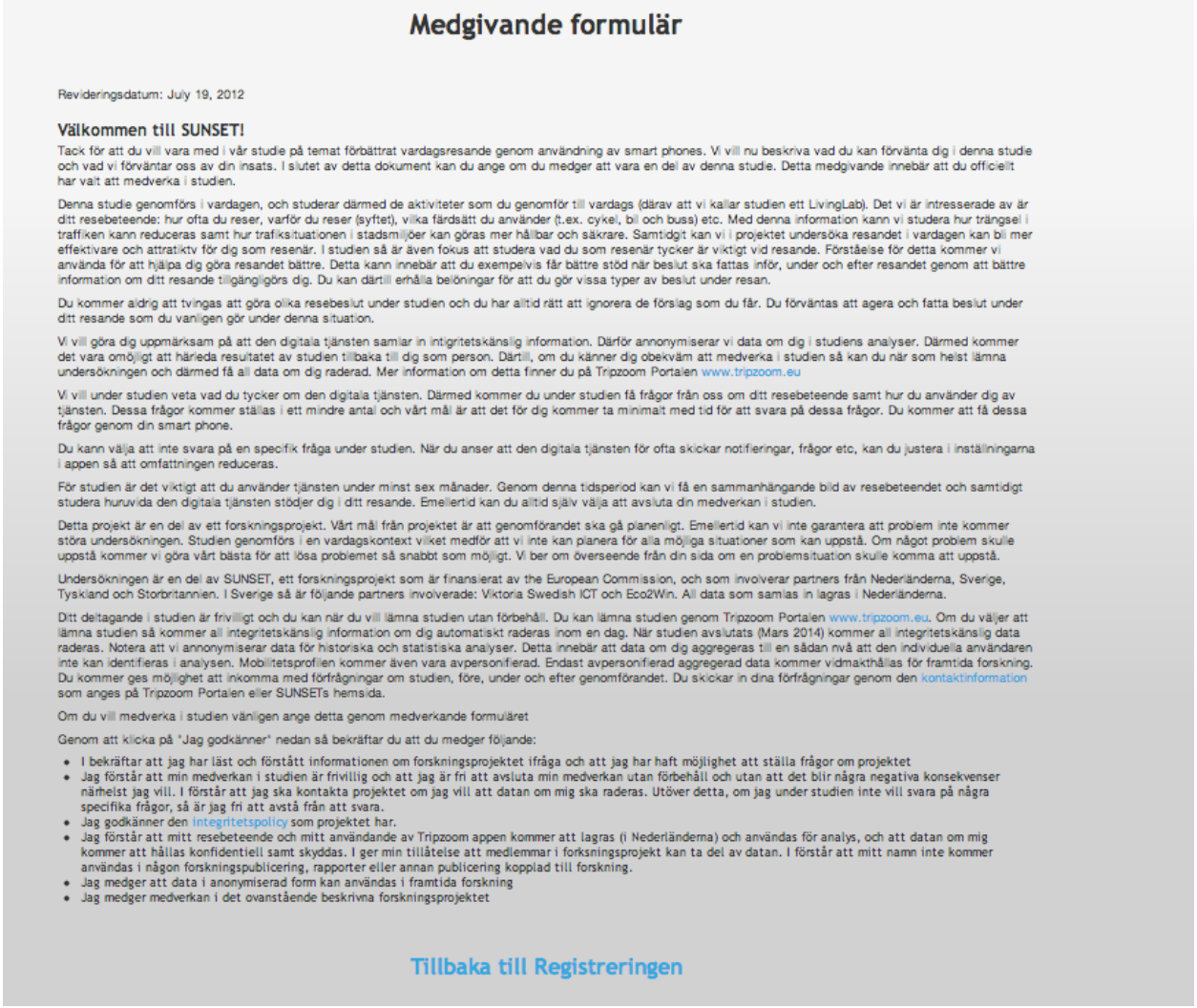
Du kan längst ned på denna sida ändra till svensk text. Texten är dessvärre delvis maskinöversatt så ordsammansättningen kan och görs kontinuerligt bättre. På denna webbplats kan du hitta övergripande information om tjänsten samt den integritetspolicy och de användarvillkor som tagits fram för tjänsten.

För att påbörja registreringen ska du nu välja register/gå med.



När du klickat på register/gå med så öppnas följande vy. Du kan välja att antingen registrera dig med genom ditt facebook-konto om du har ett sådant, eller genom att registrera ett separat tripzoom konto.

Då inloggningen genom facebook inte fullt ut testats så föreslår vi att du registrera ett separat tripzoomkonto. Detta gör du genom att du fyller i ett användarnamn med minst fyra symboler, du anger även ett visningsnamn (vilket är det namn som kommer vissas i tjänsten), din epostadress samt ett lösenord som minst har sex symboler. Om du inte har läst användarvillkoren så bör du i detta läge klicka på länken som öppnar villkoren.



Medgivande formulär

Revideringsdatum: July 19, 2012

Välkommen till SUNSET!

Tack för att du vill vara med i vår studie på temat förbättrat vardagsresande genom användning av smart phones. Vi vill nu beskriva vad du kan förvänta dig i denna studie och vad vi förväntar oss av din insats. I slutet av detta dokument kan du ange om du medger att vara en del av denna studie. Detta medgivande innebär att du officiellt har valt att medverka i studien.

Denna studie genomförs i vardagen, och studerar därmed de aktiviteter som du genomför till vardags (därav att vi kallar studien ett LivingLab). Det vi är intresserade av är ditt resebeteende: hur ofta du reser, varför du reser (syftet), vilka färdsätt du använder (t.ex. cykel, bil och buss) etc. Med denna information kann vi studera hur trängsel i trafiken kann reduceras samt hur trafiksituationen i stadsmiljöer kan göras mer hållbar och säkrare. Samtidgit kan vi i projektet undersöka resandet i vardagen kan bli mer effektivare och attraktiv för dig som resenär. I studien så är även fokus att studera vad du som resenär tycker är viktigt vid resande. Förståelse för detta kommer vi använda för att hjälpa dig göra resandet bättre. Detta kann innebär att du exempelvis får bättre stöd när beslut ska fattas inför, under och efter resandet genom att bättre information om ditt resande tillgängligörs dig. Du kan därtill erhålla belöningar för att du gör vissa typer av beslut under resan.

Du kommer aldrig att tvingas att göra olika resebeslut under studien och du har alltid rätt att ignorera de förslag som du får. Du förväntas att agera och fatta beslut under ditt resande som du vanligen gör under denna situation.

Vi vill göra dig uppmärksam på att den digitala tjänsten samlar in intigritetskänslig information. Därför annonymiserar vi data om dig i studiens analyser. Därmed kommer det vara omöjligt att härleda resultatet av studien tillbaka till dig som person. Därtill, om du känner dig obekvämt att medverka i studien så kan du när som helst lämna undersökningen och därmed få all data om dig raderad. Mer information om detta finner du på Tripzoom Portalen www.tripzoom.eu

Vi vill under studien veta vad du tycker om den digitala tjänsten. Därmed kommer du under studien få frågor från oss om ditt resebeteende samt hur du använder dig av tjänsten. Dessa frågor kommer ställas i ett mindre antal och vårt mål är att det för dig kommer ta minimalt med tid för att svara på dessa frågor. Du kommer att få dessa frågor genom din smart phone.

Du kann välja att inte svara på en specifik fråga under studien. När du anser att den digitala tjänsten för ofta skickar notifieringar, frågor etc, kan du justera i inställningarna i appen så att omfattningen reduceras.

För studien är det viktigt att du använder tjänsten under minst sex månader. Genom denna tidsperiod kan vi få en sammanhängande bild av resebeteendet och samtidigt studera huruvida den digitala tjänsten stödjer dig i ditt resande. Emellertid kan du alltid själv välja att avsluta din medverkan i studien.

Detta projekt är en del av ett forskningsprojekt. Vårt mål från projektet är att genomförandet ska gå planenligt. Emellertid kan vi inte garantera att problem inte kommer störa undersökningen. Studien genomförs i en vardagskontext vilket medför att vi inte kan planera för alla möjliga situationer som kan uppstå. Om något problem skulle uppstå kommer vi göra vårt bästa för att lösa problemet så snabbt som möjligt. Vi ber om överseende från din sida om en problemsituation skulle komma att uppstå.

Undersökningen är en del av SUNSET, ett forskningsprojekt som är finansierat av the European Commission, och som involverar partners från Nederländerna, Sverige, Tyskland och Storbritannien. I Sverige så är följande partners involverade: Viktoria Swedish ICT och Eco2Win. All data som samlas in lagras i Nederländerna.

Ditt deltagande i studien är frivilligt och du kan när du vill lämna studien utan förbehåll. Du kan lämna studien genom Tripzoom Portalen www.tripzoom.eu. Om du väljer att lämna studien så kommer all integritetskänslig information om dig automatiskt raderas inom en dag. När studien avslutats (Mars 2014) kommer all integritetskänslig data raderas. Notera att vi annonymiserar data för historiska och statistiska analyser. Detta innebär att data om dig aggregeras till en sådan nvå att den individuella användaren inte kan identifieras i analysen. Mobilitetsprofilen kommer även vara avpersonifierad. Endast avpersonifierad aggregerad data kommer vidmakthållas för framtida forskning. Du kommer ges möjlighet att inkomma med förfrågningar om studien, före, under och efter genomförandet. Du skickar in dina förfrågningar genom den kontaktinformation som anges på Tripzoom Portalen eller SUNSETs hemsida.

Om du vill medverka i studien vänligen ange detta genom medverkande formuläret

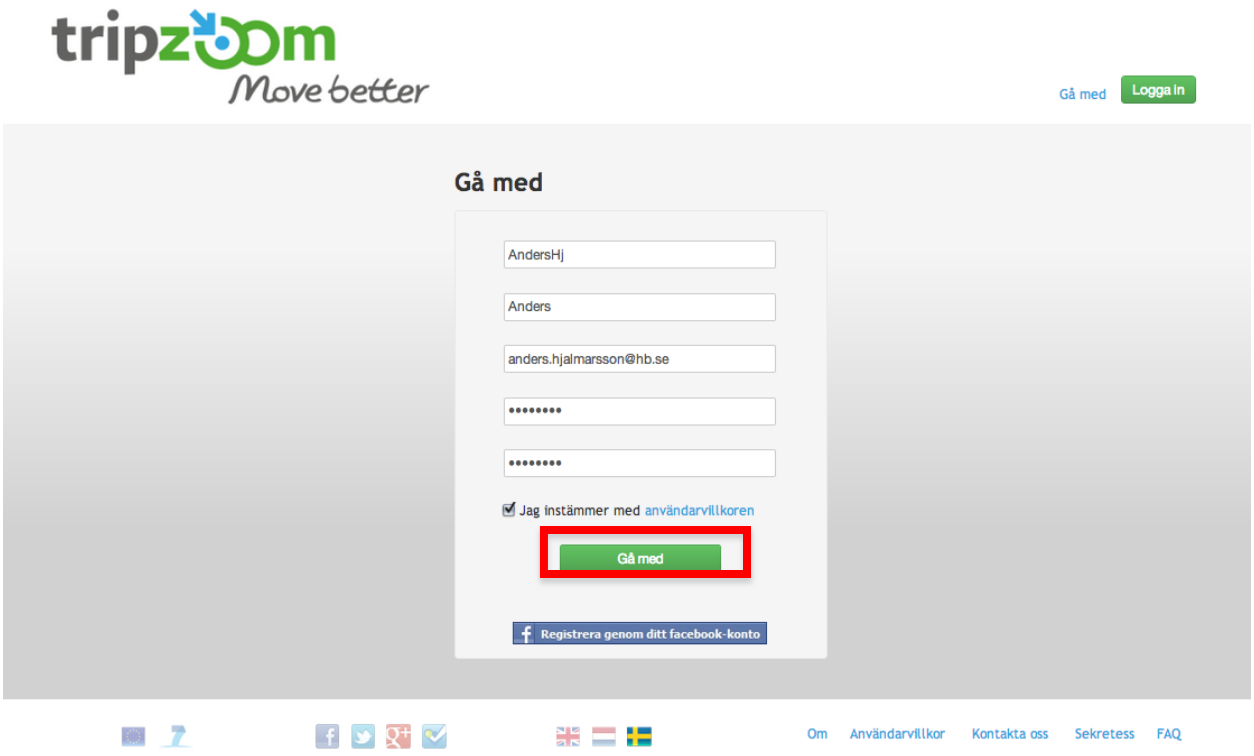
Genom att klicka på "Jag godkänner" nedan så bekräftar du att du medger följande:

- I bekräftar att jag har läst och förstått informationen om forskningsprojektet ifråga och att jag har haft möjlighet att ställa frågor om projektet
- Jag förstår att min medverkan i studien är frivillig och att jag är fri att avsluta min medverkan utan förbehåll och utan att det blir några negativa konsekvenser närhelst jag vill. I förstår att jag ska kontakta projektet om jag vill att datan om mig ska raderas. Utöver detta, om jag under studien inte vill svara på några specifika frågor, så är jag fri att avstå från att svara.
- Jag godkänner den integritetspolicy som projektet har.
- Jag förstår att mitt resebeteende och mitt användande av Tripzoom appen kommer att lagras (i Nederländerna) och användas för analys, och att datan om mig kommer att hållas konfidentiell samt skyddas. I ger min tillåtelse att medlemmar i forksningsprojekt kan ta del av datan. I förstår att mitt namn inte kommer användas i någon forskningspublicering, rapporter eller annan publicering kopplad till forskning.
- Jag medger att data i anonymiserad form kan användas i framtida forskning
- Jag medger medverkan i det ovanstående beskrivna forskningsprojektet

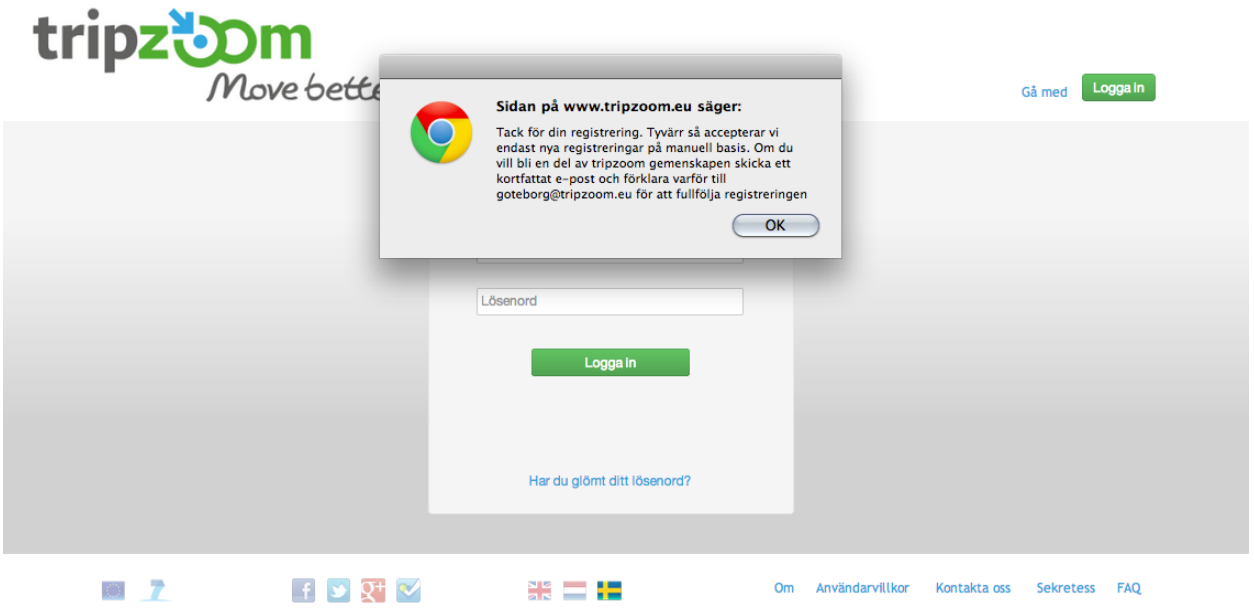
Tillbaka till Registreringen

Om du bockar för att du godkänner användarvillkoren så medger du även att du blir en del av det forskningsprojekt som testet av tripzoom är en del av. Du ska därmed inte som testpilot underteckna en skriftlig version av detta dokument och skicka in detta till projektet, utan genom att godkänna användarvillkoren så medger du även att du blir en testpilot i projektet SUNSET. Genom att välja Tillbaka till registreringen så går du tillbaka till registreringsvyn.

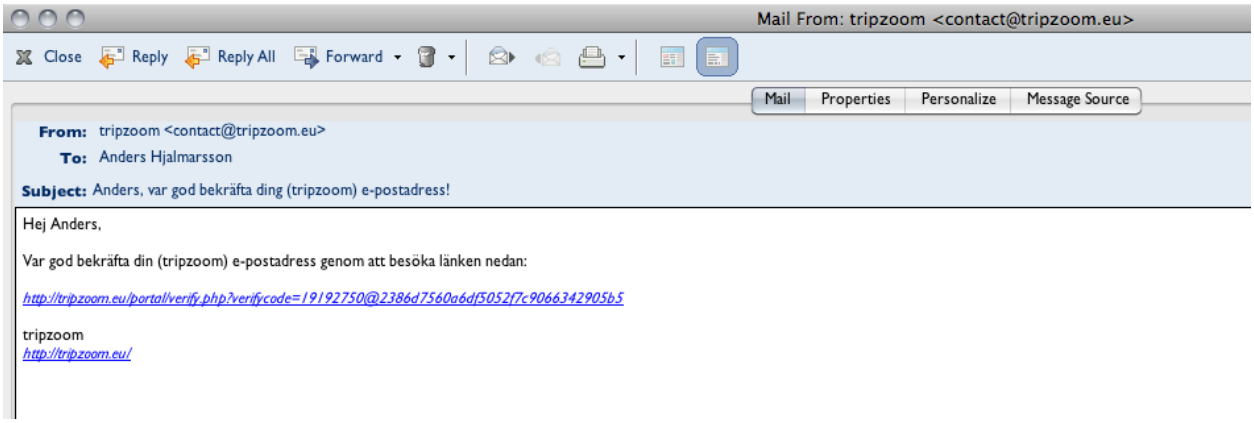
Nedanstående bild visar på ett exempel av ett ifyllt registreringsformulär.



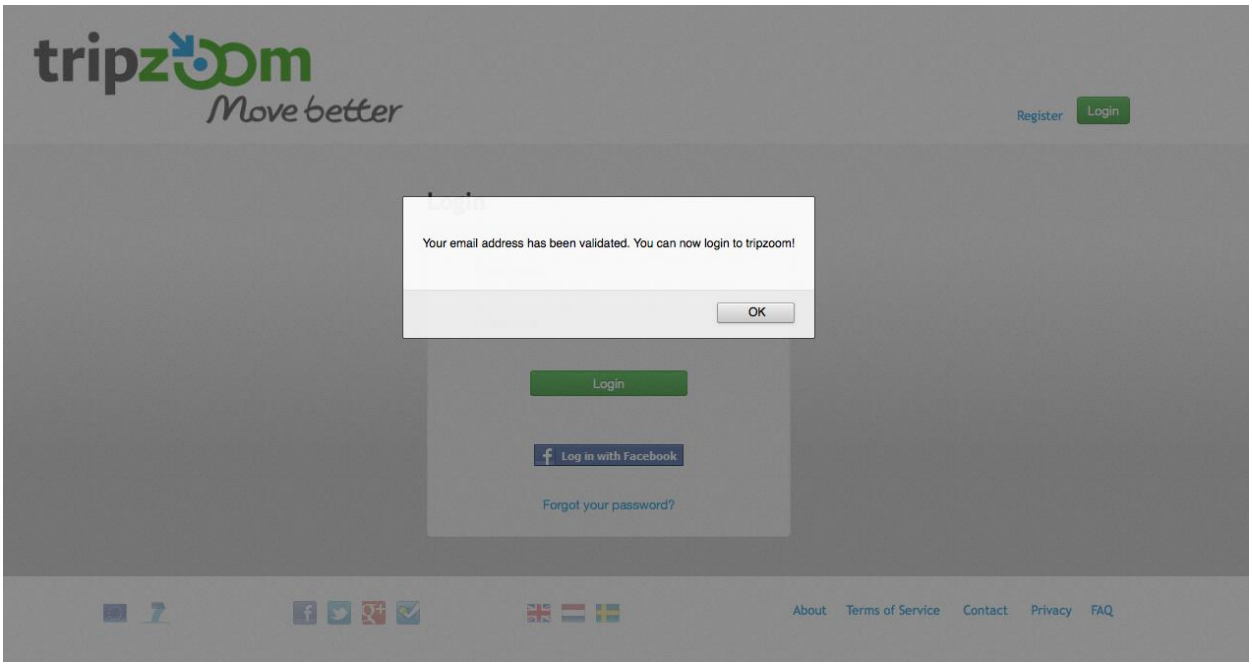
När du har fyllt i ditt formulär och angett att du instämmer med användarvillkoren, klicka då på knappen "gå med". Du kommer då följande meddelande som är helt i sin ordning. Systemet testas nu och därför så sker enbart manuell registrering av användare. Detta innebär att i samma stund som du har klickat på knappen "gå med" så har vi erhållit dina uppgifter och kommer manuellt gruppera dig till testområdet Göteborg. När detta har genomförts, vilket kommer ske löpande, förmedlas ett verifieringsmail till den e-postadress som du har uppgett.



Verifieringsmail från tripzoom
Till den e-postadress som du har angett i registreringsformuläret får du inom kort ett verifieringsmail. Gå till ditt mailprogram och leta efter nedanstående mail (om svenska som språk har valts eller motsvarande mail på engelska). Öppna mailet och klicka på den verifieringslänk som finns i mailet.



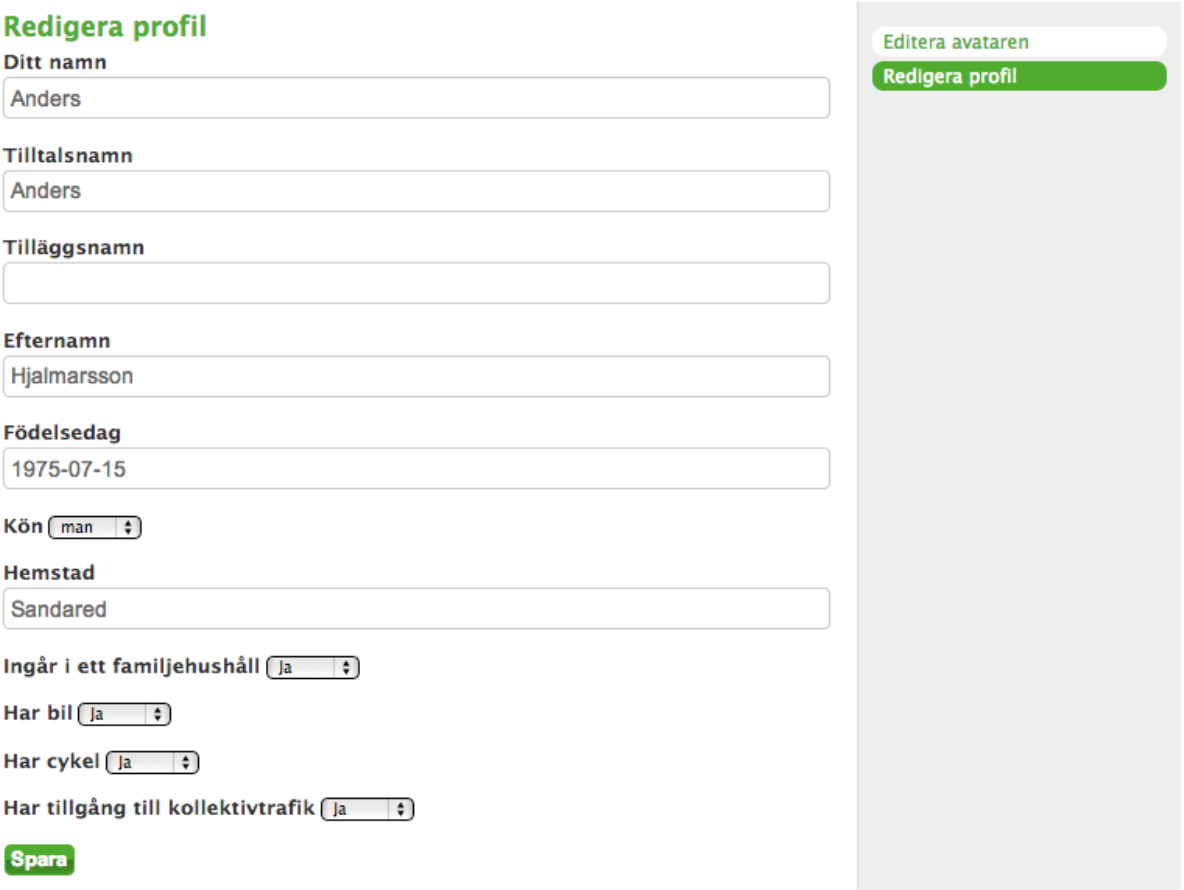
webbläsaren öppnas och du kommer få följande besked på skärmen



Du kan nu logga in i systemet och fullfölja registreringen av ett konto i portalen.

Fullfölja registreringen av ett konto i portalen
För att fullfölja registreringen av ett konto i portalen så loggar du in med det användarnamn och det lösenord som du använde för att skapa kontot. Följande vy öppnas

Flikarna Vänner, Bloggar, Activity, Inställningar samt knappen "Lägg till småapplikationer på din sida" kommer inte användas för de två första faserna i testet och du kan bortse från dessa i detta läge. Välj "redigera profil"



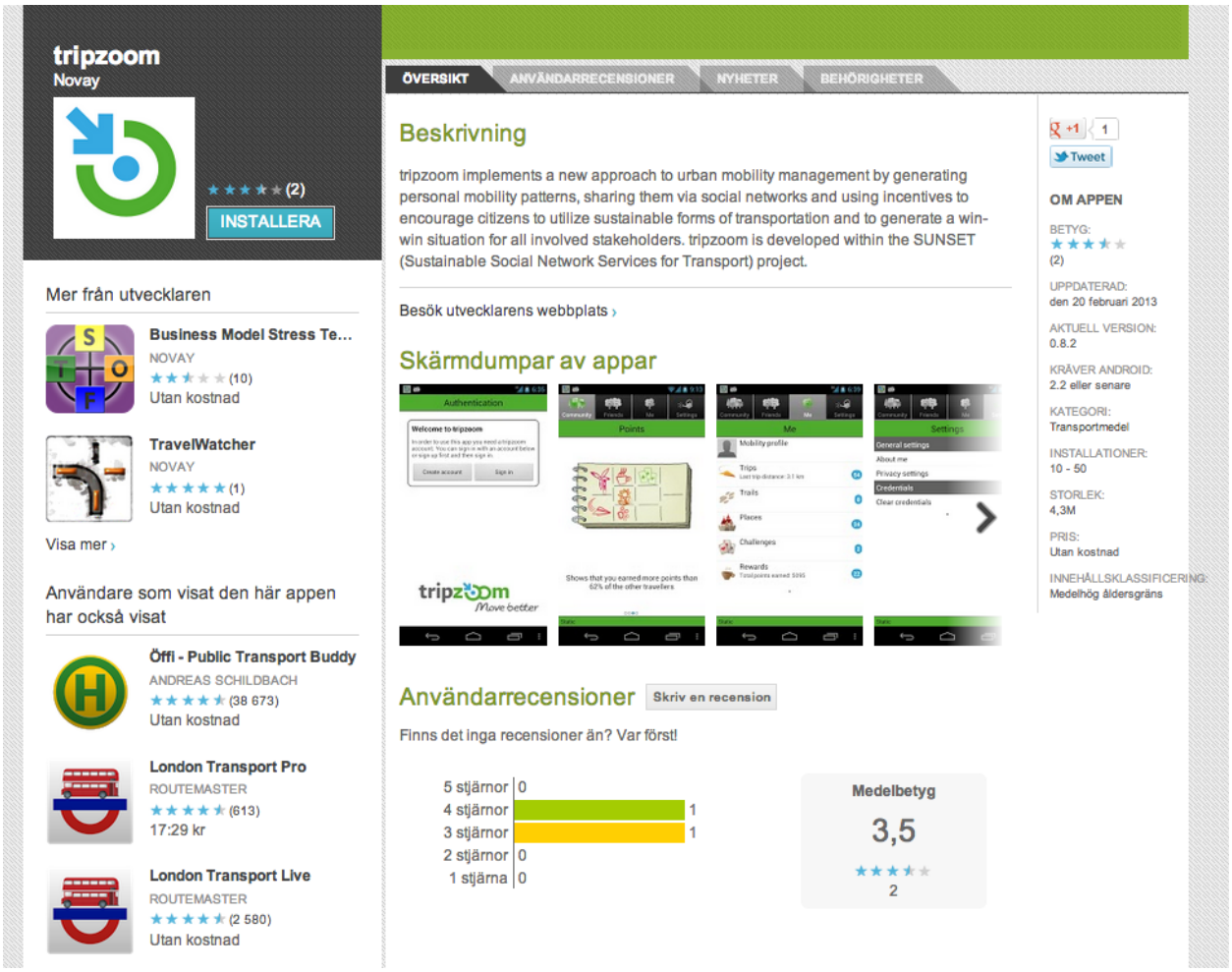
Här kan du justera och lägga till ditt namn (som det kommer visas i systemet), Tilltalsnamn, ev. Tilläggsnamn (vanligt i Holland), Efternamn, Födelsedag, Kön och Hemstad där du bor. För forskningsyfte (att kunna jämföra olika användargrupper) ber vi dig även ange om du ingår i ett familjehushåll (ett nej innebär att du är ensamstående), om du har bil, om du har cykel samt om du har tillgång till kollektivtrafik. Efter att du har fyllt i formuläret så sparar du din profil genom att

klicka på knappen "spara". Denna information kan du ändra närhelst du vill, här i portalen samt under fliken inställningar i appen.

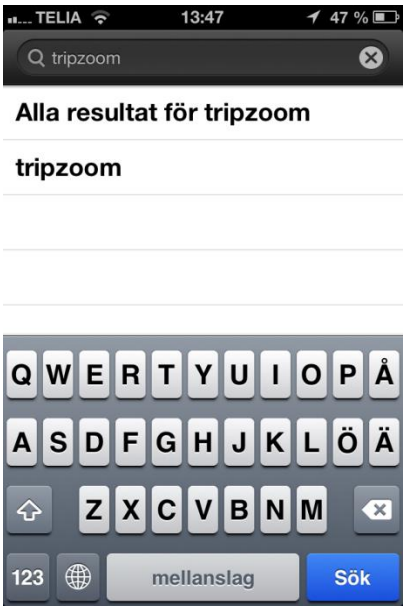
Genom knappen "Editera avataren" kan du ladda upp ett foto på dig själv. Vyn för att genomföra detta ser ut så här och när fotot är uppladdat får du möjlighet att förhandsgranska det samt justera storleken.

När du har redigerat och sparat både din profil och din avatar så är du redo för att komma igång med appen tripzoom.

Installera Tripzoom i din Smartphone
Om du har en telefon med operativsystemet android så hittar du tripzoom i google play. Sök på namnet tripzoom för att hitta tjänsten



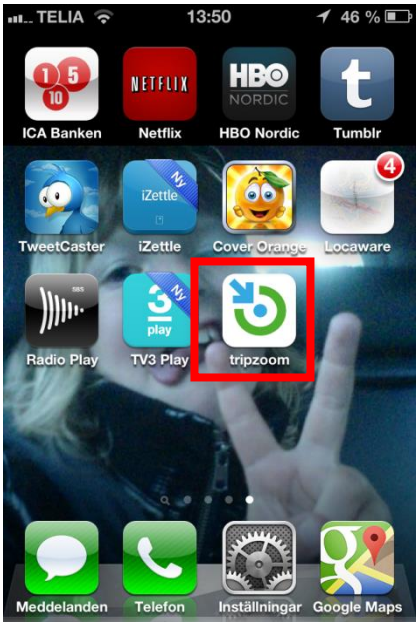
Om du har en iPhone så går du till Appstore och öppnar upp sökfönstret och skriver tripzoom



När du väljer tripzoom så öppnas följande vy.

Välj installera och appen installeras på din iPhone.

Lär känna funktionaliteten i Tripzoom
Leta upp tripzoom på din iPhone.



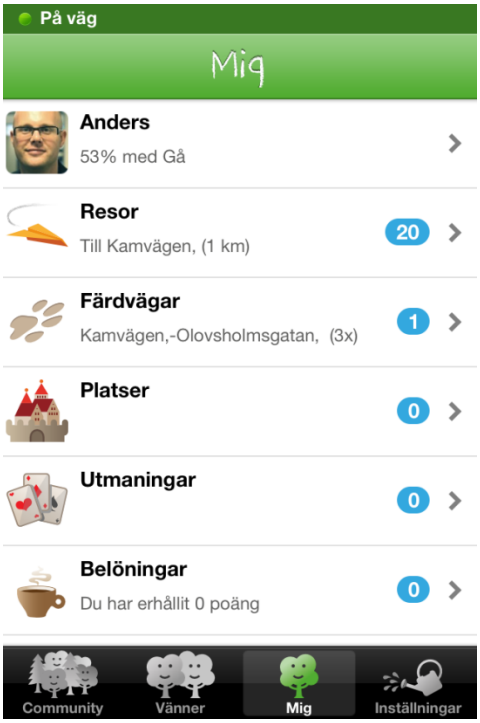
I bilden ovan ser du ikonen för tripzoom, starta tripzoom genom att klicka på den samma. Du ombeds nu att välja att registrera ett nytt konto alternativt logga in med ett befintligt konto. I och med att du ovan har registrerat ett konto så väljer du att logga in med dina verifierade kontouppgifter. Du kommer efter detta få en förfrågan om appen får använda generell funktionalitet i mobiltelefonen. Välj att du instämmer till detta och appen startar. Första gången

appen startar får du en fråga om du tillåter appen att skicka din position. Välj att du tillåter appen att göra detta

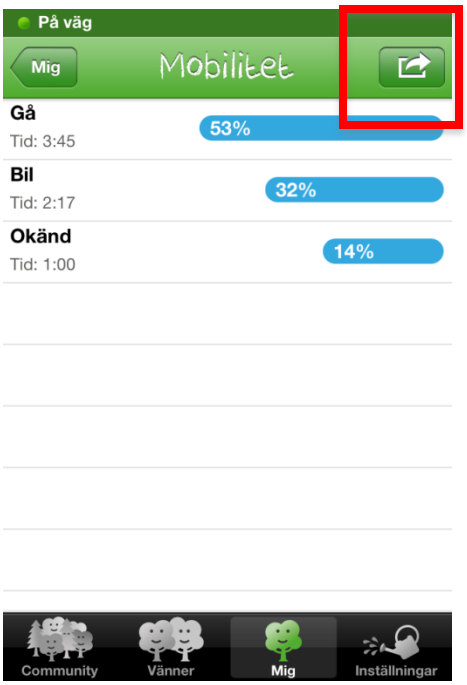
Fliken Inställningar
Appen startar i någon av de fyra flikarna "Inställningar" "Mig" "Vänner" "Community". För testets första faser kommer fokus vara på fliken "Mig", det kan även vara intressant att titta på statistiken som visas i fliken "Community" samt är det viktigt för dig att känna till vilka inställningar som man kan göra i fliken "Inställningar". Fliken "Vänner" kommer vi inte gå igenom nu utan det kommer ske först senare under testet då denna funktionalitet ska testas. Om du klickat på någon av flikarna klicka då åter på "Inställningar" för att gå tillbaka till vyn som visas ovan. Den funktionalitet som finns här är

- Logga ut. Genom att välja detta alternativ loggar du ut ur systemet. Om du enbart väljer att genom iPhones hemknapp stänga appen så stängs den inte; den kärs i bakgrunden. Om du verkligen vill stänga av appen så väljer du "Logga ut"
- Privacy inställningar (grad av sekretess). Funktionalitet som framträder om du väljer detta alternativ kommer vi gå igenom när testet övergår till fas 3 och 4. I och med att du nu inte har knutit några tripzoom vänner till systemet eller kopplat samman tjänsten med något socialt media så föreligger det inget behov att ställa in graden på vad du delar med dig av ditt resebeteende till andra.
- Om mig. Här finns den information som du angav när du redigerade din profil. Du kan här göra samma förändringar som du kunde göra i portalen.
- Visa aktivitetsrubrik. Om du väljer att stänga av aktivitetsrubriken så försvinner "På väg" eller "Statisk" som syns längst upp till vänster i appen.
- Dokumentera min po…(sition). Om du väljer att stänga av Dokumentera min po… så detekterar appen inte din position och du kan röra dig helt fritt utan att dina resor dokumenteras av appen. Detta försämrar naturligtvis appens kärnfunktionalitet.
- Version. Här anges vilken version av appen som du har installerat.

Fliken Mig
Under fliken "Mig" finns den grundläggande funktionaliteten i tripzoom. Det är denna vy som ger dig dels en spegelbild över ditt egna resande, dels kommer distribuera utmaningar till dig samt förmedla belöningar i form av poäng. De två sista funktionerna kommer att testas först i och med fas 3 och 4 i testet. Under testets andra fas kommer funktionerna kopplat till spegelbilden av ditt resande testas. Dessa funktioner utgörs av raden <<Namn>> (i exemplet nedan Anders), raden Resor, Raden Färdvägar och raden Platser.



Om du klickar på raden <<Namn>> (i exemplet Anders) kommer du få fram en sammanställning av ditt resemönster.

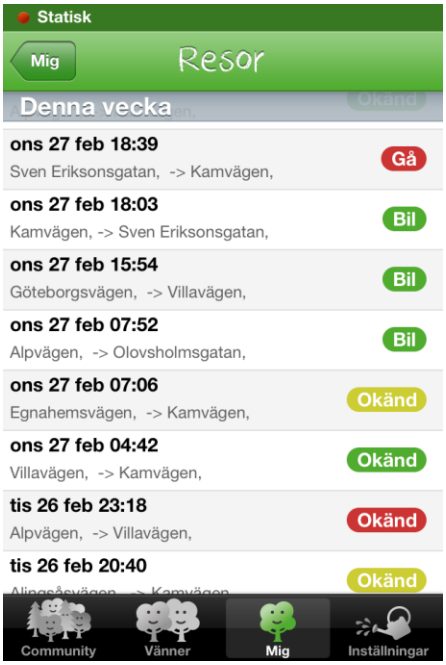


I det här exemplet så har under den vecka som Anders använt tripzoom gått 53% av tiden då han rest, han har kört bil 32% och under 14% av tiden så har inte tripzoom kunnat avgöra vilken modalitet som han använt när han har rest. Genom att klicka på den markerade knappen så kan du ställa in spegelbilden genom olika alternativ.

Du kan ställa in skärpan i spegelbilden baserat på tid, distans, kostnad, utsläpp eller förlorad tid. Du kan också ställa tidsintervallet avseende användning. Ska du utgå från data insamlat två veckor tillbaka i tiden, 2 månader eller 6 månader. Du kan även filtrera vyn baserat på väderförhållanden samt rusningstrafik. Gör ditt vad och klicka därefter på Tillbaka. Knappen

Dela används för att dela med dig av din reseprofil till dina vänner via Facebook. Detta ska inte testas i fas 1 och 2 och kräver att du länkat samman tripzoom med ett eventuellt sådant konto. Bortse därmed från knappen Dela.

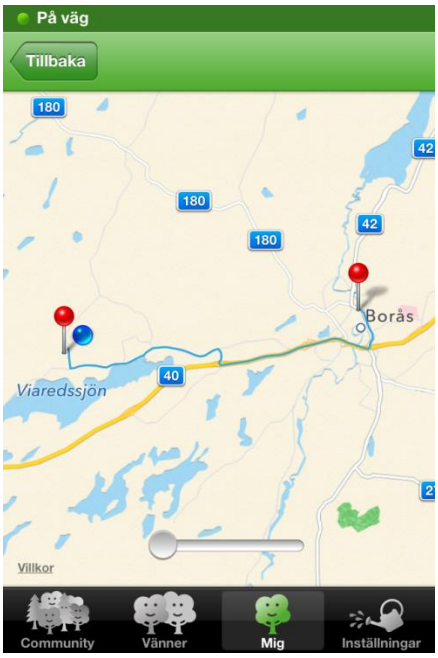
Vi går nu tillbaka till Mig huvudmeny. Nästa rad heter Resor. Välj denna rad genom att klicka på den. Följande vy öppnas.



Här visas en sammanställning av alla de resor som tripzoom automatiskt har detekterat, sparat och kategoriserat. Det är dessa resor som ligger till grund för den statistik som visades i spegelvyn. I detta läge visas när resan genomfördes, från var den gjordes till dess destination. Det anges även vilken modalitet som tripzoom bedömt du använt för resan. Grön kvalitet markerar hög kvalitet i detektionen, gul sämre kvalitet, och röd stora brister i kvaliteten. Du kan nu klicka på respektive resa och få ytterligare information om resan som du utfört. Vi väljer här en resa som exempel och följande vy framträder.

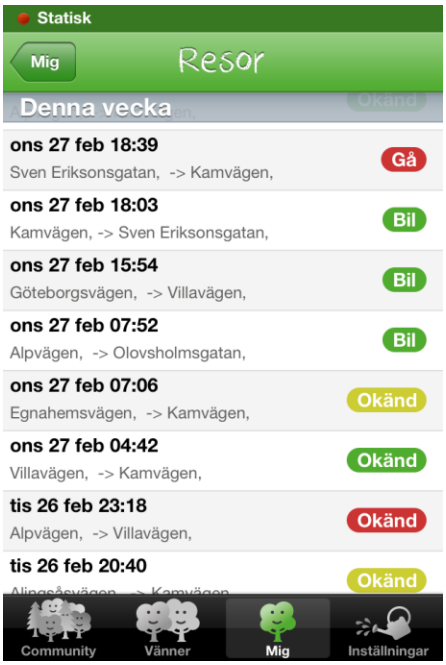
Här anges färdsätt, mål med resan, roll som användaren av tripzoom har haft, kvaliteteten i detektionen, från var resan startade samt dess destionation. Om inte tripzoom har valt rätt här kan användaren manuellt gå in och justera respektive alternativ och därigenom hjälpa tripzoom att lära sig resebeteendet till nästa gång. Om användaren fortsätter och scrolla nedåt framträder följande vy.

Här anges datumet för resan, när den startade, när den avslutades, varaktigheten, distansen, kostnad i SEK samt beräknat utsläpp för resan. Genom att klicka på knappen Karta så kan användaren se resan i en kartvy.



Om vi väljer Tillbaka så kommer vi tillbaka till sammanställningen av resan. Målet för resan ”Affärsresa” stämmer inte utan resan syftade till möjliggöra en kvällsaktivitet i form av en middag. Användaren går därmed in under Mål och ändrar målet med resan till Kvällsaktivitet.

Användaren väljer därefter att gå tillbaka till sammanställningen av samtliga resor.

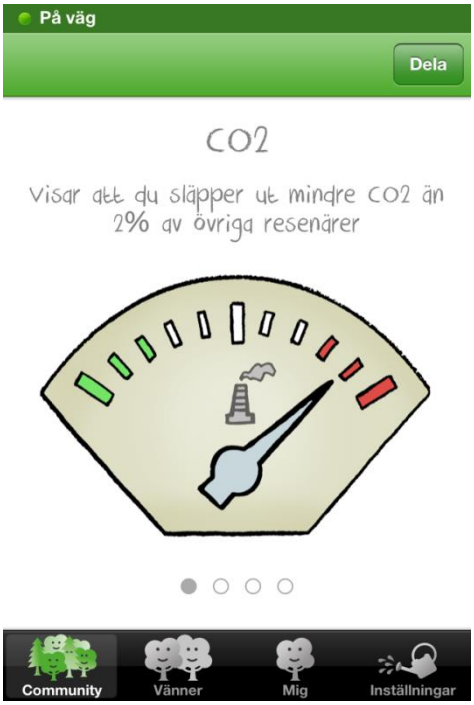


Den andra resan från slutet har dålig kvalitet och är röd markerad. Användaren väljer denna resa och inspekterar den. Han jämför med sitt minne och konstaterar att denna resa är en spökresa; en resa som inte är gjord. Han klickar på kvalitet och anger kvaliteten som skadad. Resan tas genom detta bort från tripzoom.

Om vi går tillbaka till den övergripande menyn i Mig så finns ytterligare två funktioner kopplade till spegelbilden. Färdvägar och Platser. Dessa funktioner kommer efter en tids användning sammanställa vilka Platser du som användare regelbundet befinner dig på och vilka Färdvägar du regelbundet färdas på. Även denna vy av spegelbilden över ditt resande kan sorteras och delas

Fliken Community

Den grundläggande funktionaliteten i tripzoom finns under fliken Mig. Under fliken Community jämförs din reseprofil - på övergripande nivå - med de användare av tripzoom som reser i ditt närområde. Här kan du se huruvida du reser miljövänligare än andra användare av tripzoom, hur mycket dina resor kostar i förhållande till andra, hur hälsosamt du reser samt hur mycket poäng du i förhållande till andra samlat in.



Frågor och svar
Vi har sammanställt svar på ett antal återkommande frågor här:

http://tripzoom.eu/tripzoom/faq.php

Utöver detta har det kommit fram några frågor under de informationsmöten som vi genomfört i Göteborg, här kommer svaren på dessa frågor:

Fråga 1: *kostar det något att använda tripzoom?*

Tjänsten är fri och kostar inget. Emellertid kan det uppstå kostnader för datatrafik. Dessa kostnader ansvarar användaren för. Om du åker utomlands bör du stänga av tripzoom för att undvika utgifter.

Fråga 2: *Hur mycket data konsumerar tripzoom?*

Vi strävar mot att detektion av resor ska konsumera mindre än 1MB per dag; användning av kartor samt vissa funktioner under Vänner kan dock medföra att tjänsten konsumerar mer data.

Fråga 3: *Hur ofta behöver jag ladda min telefon?*

Vi rekommenderar att användaren laddar telefonen en gång per dag eller över natten. Detta bör räcka för merparten av de enheter som kan använda tjänsten. Om längre resor genomförs så rekommenderar vi att man laddar telefonen under resan. Tjänsten kommer påverka telefonens batterikonsumtion.

Fråga 4: *Hur får jag support?*

Om det uppstår några problem så kontaktar du ansvarig i det specifika testområdet: anders.hjalmarsson@viktoria.se

Fråga 5: *Hur avbryter jag medverkan i testet?*

Du meddelar ansvarig i det specifika testområdet, anders.hjalmarsson@viktoria.se i Sverige, avinstallerar appen och avregistrerar dig. Observera, detta innebär att all data om dig försvinner och kan ej återskapas.

Fråga 6: *Jag vet andra som vill vara med och testa tripzoom, så jag kan bygga ut med egna sociala nätverk inom tripzoom! Hur gör jag?*

Du ger dem länken www.viktoria.se/sunset, ber dem anmäla sig och i rutan där de ska ange hur de

Fråga 7: *Om jag rekryterar vänner kommer jag belönas?*

Om du rekryterar ytterligare testpiloter och expanderar ditt sociala nätverk så kommer du erhålla bonusbelöning!

Fråga 8: *vilka belöningar kan jag få genom att vara testanvändare?*

Alla testanvändare som deltar får en trisslott. Alla testanvändare deltar även i utlottningen av ett större pris för deltagandet. Om du rekryterar ytterligare testdeltagare in i systemet så kommer du

erhåll bonusbelöning. Om du antar utmaningarna i mini-experimenten och lyckas så kommer du erhålla poäng. Dessa poäng kommer vara möjliga att "växla" in till fysiska priser när viss nivå uppnåtts. Ev vinstskatt står testanvändaren själv för.

Fråga 9: *när får jag information om mini-experimenten samt hur göra utvärderingen?*

Testanvändningen är uppbyggd kring två steg. I det första steget (ca 2-3 veckor) ska du lära känna systemet och samtidigt lär systemet känna ditt resebeteende. I samband med att detta steg går mot sitt slut kommer du att få information per e-post samt genom appen att ett experiment är på gång samt hur utvärderingen genomförs i anslutning till experimentet. Detta kommer att återupprepas inför varje mini-experiment.

Appendix C. Participant Consent Form

Welcome to SUNSET!
Thank you for expressing a willingness to take part in our study on improved travel using smart phones. We now want to give you a clear idea of what to expect in the study as well as your rights and what we expect of your contribution. At the end of the document, you can provide your consent after which you can officially participate in the study.

The study is performed in a real-life context, as part of your daily activities (which is why we call it a Living Lab). What we are interested in, is your travel behaviour: how often you travel, for which purpose, using which means (e.g., bike, car, and bus), etcetera. With this information we can research how we can reduce traffic jams and make travel in urban environments more sustainable and safe. At the same time, with this research we investigate how we can make travel more effective, efficient and pleasant for you and what you find important. In the study, we try to help you in making travel decisions, for example by providing you relevant information which can help you to choose between alternatives. You may even get rewards for making certain travel choices!

How are we collecting travel behaviour and helping you in making travel decisions? For this, you need a smart phone. On this smart phone you have to install an app called Tripzoom. Based on geographical data, this app gathers information on your travel behaviour, and creates an individual travel profile. For example, the app detects how often you travel between your home and important locations (e.g., work, school, shop), and which travel means you are using. This information alone already provides you with insight on your travel behaviour (for example, what distance you travel by car or bicycle each week). Moreover, this profile is used to advise you on making your travelling less costly, more healthy, less polluting, etcetera.

You are never forced to make a certain travel decision, and are always free to ignore the suggestions you get. You are expected to behave and make decisions as you would normally do.

We acknowledge that the app is gathering privacy-sensitive information. Therefore we will anonymise your data in our analyses, so that it is impossible to trace any result back to your person. Moreover, if you are uncomfortable with the situation, and want to step out of the study, then you are free to leave at any time and to ask for your data to be deleted. More information about this subject can be found on the Tripzoom Portal www.tripzoom.eu

Of course we value your opinion on anything the app offers you. So, every now and then we will ask you questions related to your travel behaviour and/or the interaction with the app. This will always consist of small sessions with only a few questions (sometimes only one), taking a small moment of your time. You will get these questions via your smart phone.

You can decline to answer any particular question or questions during the study. When you find that the app is too often providing notifications, questions, etcetera, you can always adjust your personal settings to make it less obtrusive.

It is relevant for our study that you use the app for a period of at least six months.

This way we can get a clear consistent view of your travel behaviour, and establish the helpfulness of the application on the long term. But, as we stated above, you are free to withdraw at any time.

As you understand, this study is part of a research project. Of course we will do everything to let the study run as smoothly as possible, but we cannot guarantee that there will be no small disturbances during the study. Especially because the study is in a real-life context, we cannot anticipate every thinkable situation the app is used in. If something is wrong, we will do our best to solve the problem as fast as we can. We ask for your forbearance should a situation like this occur.

The study is part of SUNSET, a research project funded by the European Commission, involving several parties from the Netherlands, Sweden, Germany, and the United Kingdom. In [the Netherlands; Sweden; the United Kingdom] the following parties are involved in this study: [Novay, University of Twente, Municipality of Enschede and Locatienet; Viktoria Institute and Eco2Win; University of Leeds and Queen Mary University of London]. All the data we gather are stored in the Netherlands.

Your participation is voluntary and you are free to withdraw from the study at any time with no further obligation. You can indicate you want to withdraw at the Tripzoom portal www.tripzoom.eu In that case all your privacy-sensitive data will be deleted automatically within one week. In any case after the ending of this study (March 2014) all privacy-sensitive data will be deleted. Please note that we anonymise data for historical and statistical analysis. In that case, your data is aggregated to such an extent that the individual user can not be identified and mobility information is disconnected from personal, identifying information. Only this non-personal, aggregated data is kept for further future research. You will be given the opportunity to raise any issues of concern before, during or after the study. For this, you are always free to contact us via the contact form on our website <<add link to webpage on contact, this will redirect people to the right address when needed>>.

If you are happy to participate then please complete the consent form.

By clicking on the "I agree" box below, you confirm that you agree with the following statements:

- I confirm that I have read and understand the information about the above research project and I have had the opportunity to ask questions about the project.
- I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason and without there being any negative consequences. I understand that I should let you know if I wish to withdraw my data. In addition, should I not wish to answer any particular question or questions, I am free to decline.
- I agree with the privacy policy of the project. << add link to policy>>
- I understand that my travel behaviour and interactions with the Tripzoom app will be stored (in the Netherlands) and used for analysis and that these will be kept confidential. I give my permission for members of the research team to have access to the data. I understand that my name will not be used in any papers, reports or other publications about the research.
- I agree for the data to be used in anonymised form in future research.
- I agree to take part in the above research project.

☑ I agree

Appendix D. tripzoom Terms of Service

1. Terms of service & Disclaimer

This documents sets out the terms of service and disclaimer ("**Terms of service & Disclaimer** ") under which users ("**User**" or "**You**") may test the SUNSET Service ("**Service**") provided by the SUNSET Consortium ("**SUNSET Consortium**" or "**We**") in alpha status and accessible under www.tripzoom.eu ("**Website**"). The SUNSET Consortium consists of Stichting Novay, Docomo Communications Laboratories Europe GMBH, Queen Mary and Westfield College, University of London, University of Leeds, Eco2Win AB, LocatieNet, Universiteit Twente, Gemeente Enschede, and Viktoria Institute and collaborates in a research & development project of the European Union. More information on this innovation project can be found at www.sunset-project.eu. Before testing the Service You must read and accept these Terms of service & Disclaimer.

2. Description of the service

The Service enables You to collect, store and share the current and past physical locations of Your mobile device ("**Your Location**") with other registered Users. You may submit and share with other Users additional information, in particular location related context information such as texts, photos, videos and audio files (sounds, music and recordings) (jointly "**Content**"). Further, the Service allows you to discover contextual relationships between Your Location and the Content submitted by You and other Users (e.g. a certain constellation of users may be qualified as the situation "being with friends").

The Service is currently alpha, i.e. experimental in nature and in the testing phase and not released for commercial use. The Service is made available to You for the purpose of testing, evaluation and providing feedback to SUNSET Consortium only. The Service includes experimental applications and is still under development.

SUNSET Consortium may, at its sole discretion, modify, suspend or discontinue the availability of the Service with or without notice at any time and without any responsibility to You. The Service is provided at least in English language, translations into Dutch and Swedish are provided as much as possible.

SUNSET Consortium allows You – subject to these Terms and Conditions – to test the Service solely for private, non-commercial purposes.

The Service does neither include the provision and functioning of telecommunications devices, such as mobile devices, nor the provision of telecommunications services, in particular no internet or online connectivity. Your mobile operator and/or other service provider are responsible for these products and services.

3. Preconditions for using the software

In order to test the Service:

- You must create an account by registering at the Website. The registration form is available here.
- You must have a Smartphone with Android 2.2 or higher or an iPhone 3G with iOS 4.2 or higher. Ideally equipped with a WiFi and a GPS module for location tracking.
- You must be over the age of 18 years and may not be a minor under Your local legislation.
- You must download and install software ("**SUNSET Software**") on Your mobile device. The SUNSET Software can be downloaded from the Apple Appstore and Google Play.
- You must be the owner and exclusive user of the mobile device on which the SUNSET Software is installed.
- You must accept these terms & conditions for the SUNSET Software in order to download, install and test the SUNSET Software.

4. Your obligations

You may test the Service only, if the requirements set forth in Section 2 are met. You may not use the Service for any illegal or unauthorized purpose.

You must keep Your login name and password for Your account strictly confidential and may not disclose it to any third party, or otherwise make accessible the Service to third parties via Your account.

You may not use the Service to locate third parties. In particular, You may not install the SUNSET Software on a mobile device not owned by You or used by a third party. If You sell, lease, borrow or otherwise make available Your mobile device to a third party (including Your employees) You must ensure that the Service is not used by the third party with Your account (e.g. You can deinstall the SUNSET Software before making available Your mobile device to a third party).

Your use of the Website may not compromise the security or integrity of SUNSET Consortium's computer systems, networks or Website or servers, whether by allowing intruders into the same, introducing viruses or other threats, imposing a disproportionate or unreasonably large load on the Website or its infrastructure, or using any computer programming routine, file or device to damage or interfere with the operation of the Website or Service.

You agree to abide applicable export control laws and not to transfer or make available, by electronic transmission or otherwise any Content, software or materials subject to restrictions under such laws to a destination prohibited by such laws.

5. Costs

The Service provided to You by SUNSET Consortium is free of charge. However, using the Service may require the use of mobile or internet services of Your mobile operator and/or other service providers, including but not limited to internet connectivity. SUNSET Consortium is not responsible for the payment of such fees. Please contact Your mobile network operator or other service provider to obtain information about any such costs.

6. Services provided by third parties

Some optional services you may use together with the Service make use of the following third party services and resources:

Third Party	Short Description of Third Party Service
Twitter.com	Community-based online messaging service
Google.com	Location- and map-based data visualization (Google Maps and Google Earth)
Google Analytics	Analytical tools to monitor website visits
Openstreetmap.org	Map matching, location- and map-based data visualization
4Square.com	Community-based online sharing of travel information in terms of visited locations
Facebook.com	Community-based social network service

Further third party services and resources might be used in the future and we reserve the right to amend these Terms and Conditions accordingly and/or inform You in any other reasonable manner, once we make use thereof.

The services and resources listed above are not part of the Service, and not subject to these Terms and Conditions, and separate terms and conditions and privacy policies apply to them. SUNSET Consortium is not responsible for the Third Party Components and the services and resources listed above.

7. Google Analytics

This website uses Google Analytics, a web analytics service provided by Google, Inc.("Google"). Google Analytics uses "cookies", which are text files placed on your computer, to help the website analyze how users use the site. The information generated by the cookie about your use of the website (including your IP address) will be transmitted to and stored by Google on servers in the United States. Google will use this information for the purpose of evaluating your use of the website, compiling reports on website activity for website operators and providing other services relating to website activity and internet usage. Google may also transfer this information to third parties where required to do so by law, or where such third parties process the information on Google's behalf. Google will not associate your IP address with any other data held by Google. You may refuse the use of cookies by selecting the appropriate settings on your browser, however please note that if you do this you may not be able to use the full functionality of this website. By using this website, you consent to the processing of data about you by Google in the manner and for the purposes set out above.

You may refuse the placement of Google Analytics cookies by selecting the appropriate settings on your browser. In doing this, you will safeguard your right to disagree with any future collection, processing and use of data by Google Analytics. For this purpose, you may install the Google Analytics deactivating add-on for browsers to prevent Google Analytics from storing any information on websites you visited. Click here for further information on downloading and installing the before mentioned deactivating add-on.

8. Indemnification obligation of you

You are obliged to indemnify and defend SUNSET Consortium against all claims, liability, damages, costs and expense, including legal fees, arising out of a breach of these Terms and Conditions by You.

The foregoing is, however, conditional upon SUNSET Consortium (i) notifying You of a respective claim of a third party in writing and in detail without undue delay, (ii) authorizing You to conduct any judicial and extrajudicial proceedings with the third party raising the claim on Your own, (iii) providing You at Your expense with any reasonable assistance so that You can defend against the claim.

9. Warranties, Limitation of liability

The Service and the Website are provided to You free of charge and for testing purposes only. All liability of SUNSET Consortium with regard to the Website or the Service is hereby expressly excluded, except in the case of gross negligence or intent. SUNSET Consortium does not warrant the availability of the Website and the Service and the accuracy of the locating functionality.

10. Term and termination

SUNSET Consortium and You have the right to terminate this agreement for convenience at any time with immediate effect. The right to terminate for good cause remains unaffected. Good cause shall exist in particular if You have breached Your obligations set forth in Sections 3.
You can declare termination of this agreement by withdrawal from the Service via www.tripzoom.eu. The SUNSET Consortium can declare termination by sending You an e-mail or by deleting or locking Your account.

After termination of this agreement You may no longer use the Service unless You have created a new account. In case SUNSET Consortium has terminated this Agreement for good cause, You are not allowed to create a new account unless expressly allowed by Us. The latter obligation survives termination of this agreement for five years.

11. Data protection

When You use the Service we collect and process certain data of You, including the physical location of Your mobile device. Please see the SUNSET Privacy Policy to learn what data we collect, how we use it and what Your respective rights are.

12. Jurisdiction and dispute resolution

These Terms and Conditions shall be governed by and construed in accordance with the laws of The Netherlands under exclusion of its conflict of law rules. The courts of the district of Almelo have exclusive jurisdiction for all disputes arising out of or in connection with use of the Website and the Service, except where local law allows You to bring an action in the place where you live.

13. Severability

If any provision of this Agreement or part thereof is rendered void, illegal or unenforceable in any respect under any law, the validity, legality and enforceability of the remaining provisions shall not in any way be affected or impaired thereby. SUNSET Consortium and You commit to replace the void, illegal or unenforceable provision by such an effective and feasible provision which corresponds as closely as possible to the economic result of the void, illegal or unenforceable provision. The same shall apply in case of an omission.

14. Copyright and trademarks of SUNSET consortium

SUNSET Consortium and SUNSET Consortium product and service names are trademarks of the SUNSET Consortium. Other product and company names mentioned at the Website and in the Service may be trademarks of their respective owners. By providing the Website and the Service SUNSET Consortium does not grant any license or right to use any marks appearing on the Website or within the Service without the prior written consent of SUNSET Consortium or the third party owner thereof.

The Service including any applications and the Website are Copyright © 2011-2013 SUNSET Consortium (or the respective SUNSET Consortium service providers or other third parties). Any rights not expressly granted herein are reserved. Reproduction, transfer, distribution or storage of part or all of the contents in any form without the prior written permission of SUNSET Consortium is prohibited except in accordance with the following terms.

15. Links

The Website and Service may contain links to other providers' websites. These Terms and Conditions apply exclusively to the Website and the Service. Upon following a link to such third-party website, You shall review and agree to that website's rules of use before using such website. We have no way of controlling the content of other providers and exclude liability for content created or published by such Websites.

16. Amendments

SUNSET Consortium reserves the right to amend these Terms and Conditions at any time if the amendment does not adversely affects the rights of the User (e.g. a new third party within the meaning of clause 5 is added). If the User does not accept such amendments, the User may terminate this agreement for convenience with effect to the effective date of the amendment. SUNSET Consortium will give the User a 10 days prior notice of any intended amendments by email.

17. Contact information

If You have any questions concerning these Terms and Conditions, the Website or the Service, please contact:

SUNSET
c/o Novay
Postbus 589
7500 AN Enschede
The Netherlands

e-mail: [enschede;gothenburg;leeds]@tripzoom.eu

Appendix E. tripzoom Privacy Statement

Thank you for using Tripzoom (the "service"), operated by the SUNSET consortium ("we" or "us"). This document describes what we do, what kind of information we collect, and how it is used. It also describes how you can revoke any permission you have given to use data, and what this means for your use of the service

1. Description of the service

The service provides incentives to travellers to optimize their mobility behaviour, both in the short and long term. To do this, the service needs to know your travel behaviour by measuring trips you make. It does this by collecting location data with an app installed on your mobile phone, and sending it from time to time to a protected server that uses the data to calculate your personal mobility patterns and present you with incentives to decide when and how best to travel. The service is accessible to you via the Tripzoom app downloadable via Apple Appstore of Google Play under the search name 'Tripzoom'.

The service is currently alpha, i.e. experimental in nature and in the testing phase and not released for commercial use. The Service is made available to you for the purpose of testing, evaluation and providing feedback to us only. The service includes experimental applications and is still under development.

In this policy we try to explain our service as clearly and concise as possible. Nevertheless, the use of some technical terms is inevitable. If there are any questions, please contact us.

2. Research program

Tripzoom is part of the European SUNSET research program www.sunset-project.eu investigating how we can help travellers in making sustainable travel choices. When joining Tripzoom, your data will a source of information for the SUNSET research.

3. What data we collect

We collect different types of information from the mobile phone app in a 24-hour fashion, with the purposes to detect all the trips you make, irrespective of the modality you use. With this information we can provide you with incentives that suit your situation and actual travel behaviour best. To this end, we collect:

Data	Description	Reason
Location measurements	GPS, WiFi, cell tower, accelerometer, and magnetometer sensors data when available, as able to read from the device.	To construct trips based on location and modality.
Trips	Distinguishing between periods the user travels or stays in the same location.	To give you an overview of your mobility behaviour.
Mobility profile	Statistics based on your trips. For instance your personal modal split.	To give you an overview of your mobility behaviour.
Regular trips	Trips which occur multiple times within a given measurement period.	To give you an overview of your mobility behaviour.

Data	Description	Reason
Personal places	Places you regularly visit. For instance Home, Office, etc.	To give you an overview of your mobility behaviour.
Accompaniment	Information on people who are in your vicinity during a entire trip, who are probably travelling with you.	To give you an overview of your mobility behaviour.
Power measurements	Mainly battery status and power source.	To track battery usage and work on improvement of battery lifetime.
Errors	Unexpected behaviour in the context of the application.	To get insight in unintentional behaviour of the application.
Experience samples	Simple situational questions and the user's answers to those.	To improve the service and evaluate user preferences.
Profile information	A user profile is provided for manual entry of personal information. - First name - Sur name - Screen name - User picture - E-mail - Date of birth - Gender - City - Application specific items (extensible list) such as vehicle ownership and family situation	To support research and enhance the social network.
Friends	A user provided collection of family, colleagues and/or buddies.	To provide social functions
User preferences	Settings in the application on sharing of data, location tracking, etc.	To personalise the system and evaluate user preferences.
User credentials	User accounts (username, encrypted password) of the Tripzoom system, as well as credentials of social networks.	To personalise the system and link to different social media.

In the app, you can specify what data should and should not be collected, but please be aware that if the app does not collect certain types of data that not all parts of the service may be available. Also, if you turn of your phone the service no longer collects data for the time your phone is switched off. Turning off the data transmission (such as in "airplane mode") does not necessarily mean that no data is collected; it is just shared with the server at a later point.

4. How we collect data

There are a few different ways we collect data:

- Automatic sensing – When the app is running, it automatically registers your location at short intervals in time. This is initially stored on your mobile device and, after pre-processing, synchronised with the server at regular intervals, like at the end of each trip. In order to preserve battery life, the method of synchronisation is subject to change.
- Manual entry to trips – Next to the automatic trip recognition, you can further enhance and correct your trip information manually.

- Experience sampling – Within the app, we use a tool called Experience Sampling to pose short questions to you about your experiences with the system.
- Stand-alone questionnaires – Next to the app, we also send out questionnaires to selected users to further investigate on the research questions within the SUNSET project.

5. How we store data

Collected sensor data is cleaned and smoothed before storage and extensive calculations are performed to create your mobility pattern on a daily basis. Each trip is analyzed directly after it has been recorded, and during a nightly batch all trips are analyzed again in more detail and personal mobility patterns are created. We store the processed data for us to be able to 1) provide the service to you and 2) execute our scientific research programme. Personal data can be deleted when desired by the user. All personal data or data that can be connected to an individual is regarded as confidential data.

We store the temporary raw data and the processed information in one location only, although we may use off-site back-up services to safeguard the data. The app can only communicate with the server. All data collected is stored at a central server in the Netherlands. Transfer of data within the European Union is strictly regulated by the European Data Directive.

6. Purposes and use of data

We collect mobility information for the purpose of generating a personal mobility profile, and providing the right incentives at the right time, as well as improving the algorithms that play a role in pattern detection and incentive matching and presentation.

We will provide you with new information about the system, for example on software updates available or changes in terms and conditions via the e-mail address that you signed up with.

We may also use part of your profile data, such as your family situation or vehicle ownership, to improve the notifications for particular incentive or experience samples.

7. Which data we share

We do not share your data with companies, organizations and individuals outside of SUNSET unless one of the following circumstances apply:

- You give your prior consent - We will only share your data with companies, organizations or individuals outside of SUNSET or any (mobile) application developed by these parties, when we have your explicit consent to do so. We require opt-in consent for the sharing of any sensitive personal information. Consent can be revoked at any time, but data shared when consent was given cannot always be deleted. Please be aware of who you share it with, and how it may be shared further.
- For legal reasons – We will share personal information with companies, organizations or individuals outside of SUNSET if we have a good-faith belief that access, use, preservation or disclosure of the information is reasonably necessary to:
    - meet any applicable law, regulation, legal process or enforceable governmental request.
    - enforce applicable Terms & Conditions <<add link>>, including investigation of potential violations.
    - detect, prevent, or otherwise address fraud, security or technical issues.
    - protect against harm to the rights, property or safety of SUNSET, our users or the public as required or permitted by law.

In some cases, access to certain products and services may require you to provide your personal information to a third party. In such cases, this will be stated during the registration process, in the terms of use or in a similar manner. The third party's use of such information is governed by that party's privacy policy, and Tripzoom usage is governed by this Privacy Policy. If you are offered to use Tripzoom by your employer or any other organisation they are fully liable for processing of any data you supply to them. If you do not wish for such use of your personal data taking place, you should not register for the applicable product or service

8. Revoking permission to collect and use personal data

The app gives you the possibility to give permission to collect different kinds of information. You may revoke any permission at any time, but please be aware that when you revoke certain permissions, the system may only be partly functional or stop working altogether.

9. Your possibilities to access the data

All data which is stored from you is also displayed to you in the Tripzoom app. As a result you always have a transparent view on what data from you is known to the system.

Please note that we anonymise data for historical and statistical analysis. In that case, all personal data is aggregated to such an extent that the individual user can not be identified and mobility information is disconnected from personal, identifying information. To give an example, this would be to investigate the number of users on a typical highway during Monday's rush hour, or the modality usage of all users in a region during a particular month.

10. Changes

Our Privacy Policy may change from time to time. We will not reduce your rights under this Privacy Policy without your explicit consent. We will post any privacy policy changes on this page and, if the changes are significant, we will provide a more prominent notice (including, for certain services, email notification of privacy policy changes).

11. Termination

You can at any time terminate your SUNSET account, and on request all privacy sensitive data will be erased from the system. If you do not explicitly request deletion of your data, it will solely and only in anonymous form be used for the research objectives of the study and not be disclosed to any application or party whatsoever.