



# e-mobiliTI

## A living lab to investigate the transition towards electric mobility

Roman Rudel<sup>1</sup>, Francesca Cellina<sup>1</sup>

<sup>1</sup> University of Applied Sciences and Arts of Southern Switzerland SUPSI, Institute for Applied Sustainability to the Built Environment (ISAAC)

### 1. Background and research questions

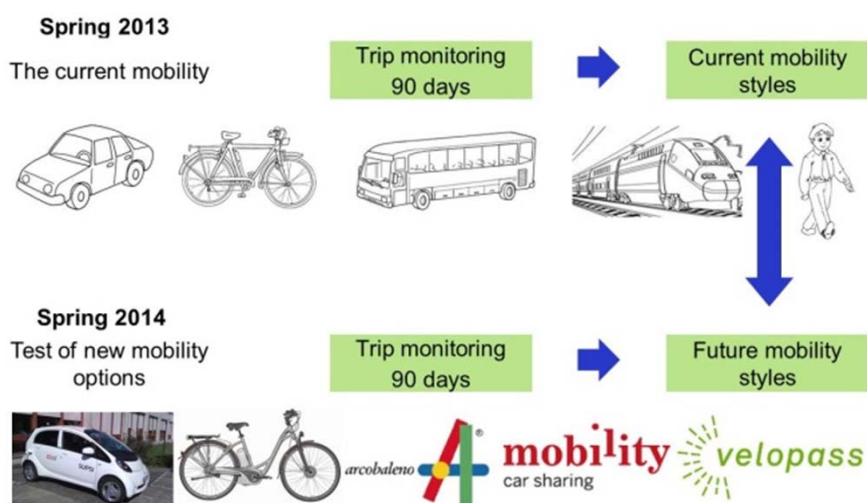
New mobility options are arising:

- slow mobility
  - inter-modal use of the means of transport
  - sharing of individual transportation vehicles
  - electric vehicles
- Can we take such opportunities in Southern Switzerland?
  - What happens when a family is endowed, at no cost, with an electric vehicle for a long period?
  - Does a *substitution* between the conventional and the electric vehicle happen?
  - Or does the electric vehicle act as a leverage, favouring a *modal transformation* towards more ecological mobility choices?

### 2. Design of the e-mobiliTI living lab

A living lab: real-life users explore new mobility options in complex, real-world settings

Sixteen families in the Lugano Region (TI), in total twenty-seven participants  
We are aware *this is not* a representative sample of the Lugano population



Two phases:

- Phase 1 - Spring 2013: monitoring of the users mobility patterns, simply observing their behaviour, without any attempt at influencing it
- Phase 2 - Spring 2014: each user is endowed with alternative mobility options (e-car, e-bike, public transport, car-sharing and bike-sharing season tickets)

Two monitoring approaches, integrating each other:

- quantitative, automatic monitoring of all their trips through the e-mobiliTI smartphone application (*app*), developed on purpose
- qualitative monitoring of the reasons for their mobility behaviour through individual interviews, group meetings and focus groups

Two categories of users:

- *new users*: they have no previous experience with electric mobility and, in Phase 2, they are endowed with electric cars, electric bikes and season tickets for public transport, car-sharing and bike-sharing
- *old users*: they already own an electric vehicle and in Phase 2 they are only endowed with season tickets for public transport, car-sharing and bike-sharing

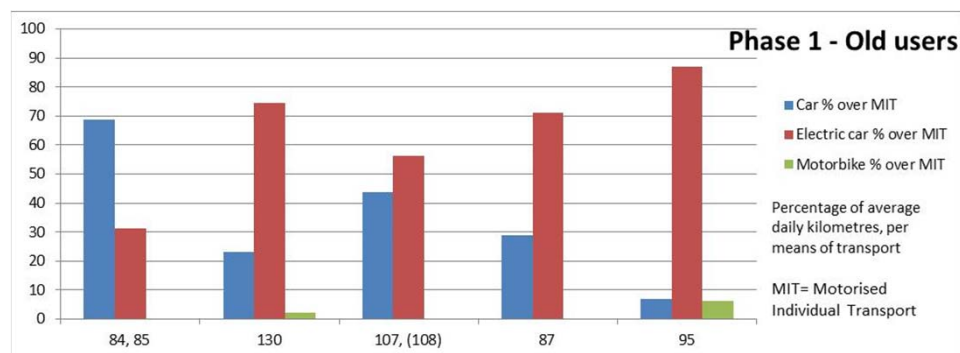
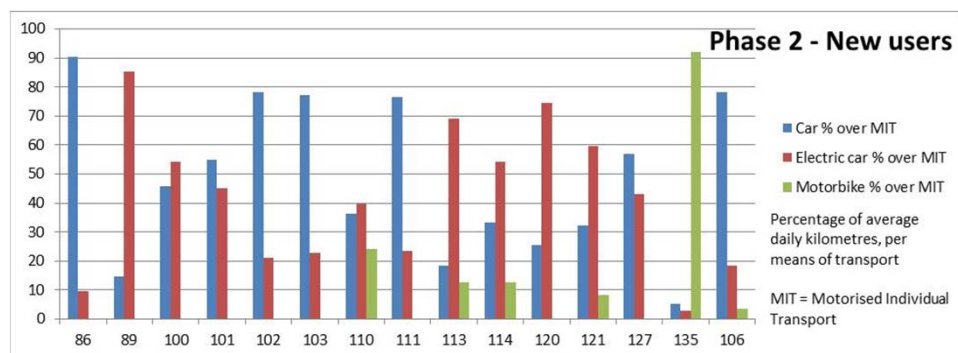
### 3. Challenges in data collection and preliminary assessments

In a living lab, control of experimental conditions is difficult.

Both the app and the users themselves are source of potential errors: poor GPS and Internet connectivity, battery problems, lack of direct compensation for the efforts of the participants to use the *app* properly

Further, from Phase 1 to Phase 2 six users (22%) changed home or place of work : quantitative data we monitored for them are useless

We are now validating the data collected, discussing them with each user: at this stage we can only provide preliminary assessments



- Considering the average daily percentage of kilometres driven, the electric car is more used than the conventional car in 64% of the families of our sample (55% of *new users* families in Phase 2 and 80% of *old users* families in Phase 1): the substitution process happens, even though it is not complete
- The electric car substitutes the conventional car for 50% of the daily average percentage of kilometres in *new users* families and for 59% in *old users* families
- Differences between *old* and *new users* families suggest to investigate whether the electric car requires a longer adaptation period than three months
- Reasons for incomplete substitution, as emerged from the first e-mobiliTI focus group, refer to already well-known limitations of electric vehicles: limited autonomy, long recharging times, need to plan trips in advance. All in all, the e-mobiliTI users indicate the electric car as a good option as a second family car
- The modal transformation process is, instead, more difficult to achieve
- Preliminary results show that giving free electric cars, (electric bikes) and season tickets to public transportation, car-sharing and bike-sharing, is not enough to favour the decrease in the average daily percentage of motorized individual kilometers
- For 16 users out of 21 (76%), no modal transformation happens
- Therefore, favouring ecological mobility choices requires stronger policies than offering free alternative options to private vehicles
- Above all, it requires increasing flexibility and capillarity of the new mobility options

Effects on Motorized Individual Transport (MIT) Differences between phase 1 and Phase 2	New users [%]	Old users [%]	All users [%]
Probability that MIT increases	53.3	16.7	43.0
Probability that MIT remains constant	20.0	66.7	33.0
Probability that MIT decreases	26.7	16.7	24.0
<b>Probability that MIT increases or remains constant</b>	<b>73.3</b>	<b>83.3</b>	<b>76.0</b>