GoEco!
A community based eco-feedback approach to promote sustainable personal mobility styles

Roman Rudel,
University of Applied Sciences and Arts of Southern Switzerland (SUPSI)
Head of the Institute for Applied Sustainability to the Built Environment

Martin Raubal,
ETH Zürich
Head of the Institute of Cartography and Geoinformation
The project background

- Private motorised transport still being perceived as positive and desirable
- Mobility patterns are strongly embedded in everyday life
- Changes in mobility behaviour are hindered by social and psychological barriers
  - the fear for sacrifices
  - the fear of returning to the past
  - the fear of losing social prestige (the car as a status symbol)
The project background

Even though effective alternative mobility options to reduce energy consumption are already available!
Our research questions

Can eco-feedback information and social interaction (social comparison and peer pressure) be effective triggers to:

• foster changes in personal mobility behaviour?
• facilitate the long-term challenge to reduce private motorized transport?
• promote a transition to more energy efficient mobility options, such as vehicle-sharing, intermodal use of means of transport, public transportation and slow mobility?

We run a medium-to-large-scale Living lab experiment with a significant number of users sharing information about their mobility behaviour and receiving feedback on their choices.
The activities we envision

- Participants to the Living lab test a smartphone app developed on purpose, that:
  - tracks their trips
  - provides them with eco-feedback on their mobility performances
  - suggests alternative, low-impact modal options
  - lets them define personal reduction objectives and targets
  - sets up a social comparison rewarding scheme within the community of the users

- The Living lab is run both in Canton Ticino and in the City of Zürich: we can thus take into account differences in the supply of mobility options and in the socio-cultural attitude of the population towards mobility

- To get a deeper insight into perceptions and attitudes, a selection of participants is closely followed with focus groups and interviews
Our approach

- An inter-disciplinary, bottom-up approach, based on direct interaction with the end-users
- At the crossroads of different research branches
  - energy sciences: going beyond the traditional awareness raising approach
  - behavioural sciences and sociology: assessing the effectiveness of eco-feedback and competitive schemes in triggering collective behaviour change (persuasive technology approach)
  - “gamification” techniques: using game design elements in non-leisure contexts
  - information and communication technologies: exploiting smart mobile devices as tools to provide inexpensive sensing of mobility behaviour (crowdsourcing) and to suggest energy-efficient alternative mobility options (intelligent transport systems ITS)
  - geomatics and artificial intelligence: using machine learning and data-mining techniques to understand mobility patterns (trajectories and motivations)
The GoEco! Living lab

Overall 600 active participants (testers) + 200 passive participants (control group) in the City of Zürich and in Canton Ticino

Current mobility behaviour 1 month
Only tracking

Persuaded mobility behaviour 4 months
Tracking + eco-feedback and peer pressure + suggestion of energy-efficient alternatives

Long term mobility behaviour 1 month
Only tracking

Assessment of changes over the tracking periods and differences between Canton Ticino and the City of Zürich

Quantitative analyses
Qualitative analyses

Policy recommendations for local authorities

Advisory board, social media and communication
The implementation activities

• An advisory board follows the whole project – from the very beginning
  • Federal authorities in the mobility, energy and sustainability fields, including SwissEnergy
  • experts from the academic world: energy competence centre SCCER “Efficient Technologies and Systems for Mobility”
  • transport associations: Pro Velo, VCS Verkehrs-Club der Schweiz, TCS Touring Club Schweiz

• A project website and accounts on major social networks are activated and regularly updated

• Periodic dialogue with local mass-media is performed, starting with a communication campaign for the recruitment of the participants

• A final project conference is held, for the presentation of the „Policy recommendations for local authorities“ and the release of the GoEco! smartphone app to the general public

• Scientific publications and participation to conferences are guaranteed throughout the project
Our research group

- SUPSI
  - Institute for Applied Sustainability to the Built Environment – ISAAC
  - Laboratory of Visual Culture - LCV
  - Dalle Molle Institute for Artificial Intelligence - IDSIA

- ETHZ
  - Institute of Cartography and Geoinformation – IKG

- External researchers involved:
  - Kay Axhausen - Professor of Transport Planning at ETHZ
    (Institute for Transport Planning and Systems): measuring and modelling travel behaviour
  - Christoph Hölscher - Professor of Cognitive Science at ETHZ
    (Department of Humanities, Social and Political Sciences): designing and performing field tests
  - Piero Fraternali - Professor of Web Technologies at Politecnico di Milano
    (Dipartimento di Elettronica Informazione e Bioingegneria): developing and testing of the conceptual framework for the gamification activities