ELECTRIC & AUTONOMOUS VEHICLE LAB

AT OUR LAB, WE LEAD AN EXPERT RESEARCH GROUP INTO THE FULL VALUE-CHAIN AND SOCIO-ECONOMIC ASPECTS OF ELECTRIC AND AUTONOMOUS VEHICLES, WHICH WE COMBINE WITH ENGINEERING PRACTICES

The automation of vehicles is following the developments for the electrification of vehicles.
Where automated vehicles are is still largely in the R&D phase, electric vehicles are already in a mature market state (light vehicles and personal cars) or just about to gain traction and entering the mass production phase (larger vehicles and heavy duty). The research in our lab follows the market developments and is aimed at facilitating large-scale deployment of these technologies.

ELECTRIC VEHICLES

To stimulate the transition towards zero emission mobility, our research focuses on the key aspects of EV adoption. We regularly conduct user surveys to assess customer opinion of electric vehicles and related recharging infrastructure. The information gathered from the respondents provides insight into user preferences and barriers for adoption (around price, driving range and recharging infrastructure). Further, we assess the economic and social impacts with total cost of ownership (TCO) calculations. Finally, we use data analytics to optimize the roll-out of EV charging infrastructure.

DATA DRIVEN ADVICE ON EV ADOPTION

- Total cost of ownership calculation
- Wide range, starting from Light Electric Vehicles (e-bikes) to heavy duty logistics mobility
- CO2 impact analysis included to allow to assess the real total cost to society (and link to CO2 pricing)
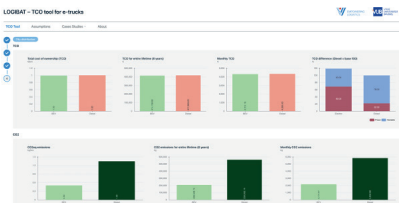
LOCATION MODEL OF RECHARGING INFRASTRUCTURE

- Methodological improvements on location optimization models
- Forecasting EV charging demand to support charging infrastructure roll-out
- Designing future proof charging infrastructure for V2G and SAEV
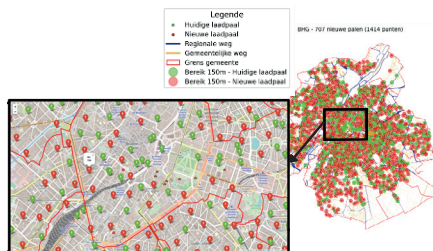
STUDY OF USER ACCEPTANCE

- Consumer monitor for EU27 countries
- Acceptance of technology, charging infrastructure and smart charging

## VUB | MOBI — ELECTROMOBILITY RESEARCH CENTRE
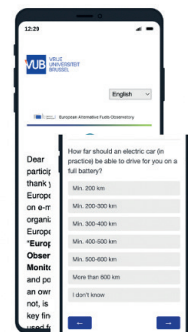
AUTONOMOUS VEHICLES

We study user acceptance of the technology in combination with transport habits and preferences. We use agent-based simulation models to assess the effects of different autonomous vehicle implementations on the transport system. Furthermore, we evaluate the overall impacts on society, from a multi-stakeholder and multi-criteria perspective. Our expertise is both theoretical (model development) and empirical. In 2020, we deployed our own shuttle project on the university campus. Lastly, we focus on the combination of electric and autonomous vehicles in the form of shared autonomous electric vehicles (SAEVs), and incorporate vehicle-to-grid charging within the location optimization models.

USER ACCEPTANCE

- Acceptance of AV technology and future AV mobility services
- Data collection in real life settings and living labs
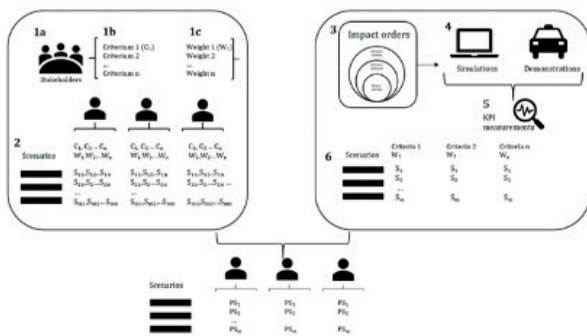
SIMULATION MODELLING

- In-house development of Brussels simulation model using MATSim (https://www.matsim.org/)"
- Focus on deployment of shared autonomous vehicles for both passengers and freight purposes

IMPACT ASSESSMENT

- Development of an impact assessment framework tailored to future automation scenarios
- Policy advice for deployment and recommendations for future viable business models
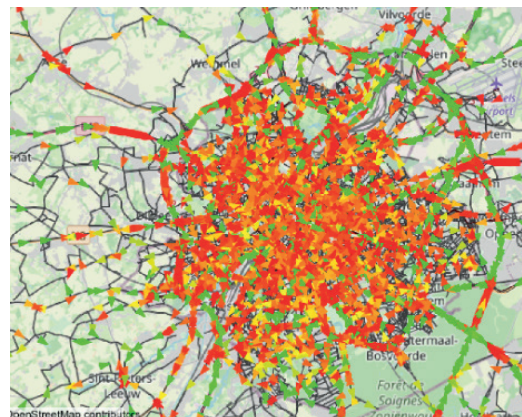
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