Challenges in developing and implementing mobility innovations, and how socio-economic research can facilitate the process

Dr. Viktoriya Kolarova – DLR - Institute of Transport Research
Co-Author: Dimitris Milakis

The challenges

Innovations*:
- do not always meet **the needs of society** as a whole or specific parts of society,
- often encounter **societal opposition,** sometimes due to lack of societal trust or understanding,
- face **bottlenecks in development and deployment**, and negative externalities,
- benefits are often **unequally distributed**.

This results to:
- inability of innovations to **be accepted and have a meaningful societal impact**,
- **ineffectiveness of public funding** for R&I,
- **failure to act quickly and effectively** in response to the socioeconomic challenges.

*How could we foster R&I that is more **effective** and **efficient** in meeting **societal needs**, while avoiding or mitigating **negative implications** and distributing **benefits** in a **just** way?*

* Innovation refers to new ideas, products, business models or processes that create value for individuals or organizations. (involves ideation, experimentation, design, marketing, and customer engagement and is broader than technology). Technology, refers to the tools and techniques that enable innovation.

The concept of Societal Readiness

Societal Readness is a concept that aims to **improve the adaptation**, **acceptability**, and **uptake** of **innovations**, including those based on technology, by **society**. It does this by **steering innovation** trajectories towards **societally desired** and **needed goals**, building **inclusive** and **broad** coalitions for change, and **understanding** and **adapting** to bottlenecks.
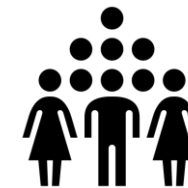
Technology Readiness Level

Market Readiness Level

Society Readiness

Will it work?

Will anyone want it?

Will it acceptably address broader, long-term societal concerns?

Example projects
Assessment of cultural, geographical and political diversity and development of tailored CCAM services

Diversification Factors

Cultural Factors
- Language
- Mobility cultures (travel behaviours, needs)
- Innovation cultures
- Work cultures
- Governance cultures
- Sustainability cultures
- Social norms

Geographical Factors
- Diversity in topography (e.g. landforms such as mountains, hills, and waterbodies, context-specific physical barriers)
- Built environment (e.g. urban, rural, and regional morphology, land use, road and transport infrastructures)
- Climate and weather conditions

Policy Factors
- Heterogeneity of policy instruments
- Political, legal, regulatory, and governance frameworks across the studied contexts.
- Policy priorities
- Decision-making processes
- Stakeholders' engagement and collaboration
- Local laws and regulations.
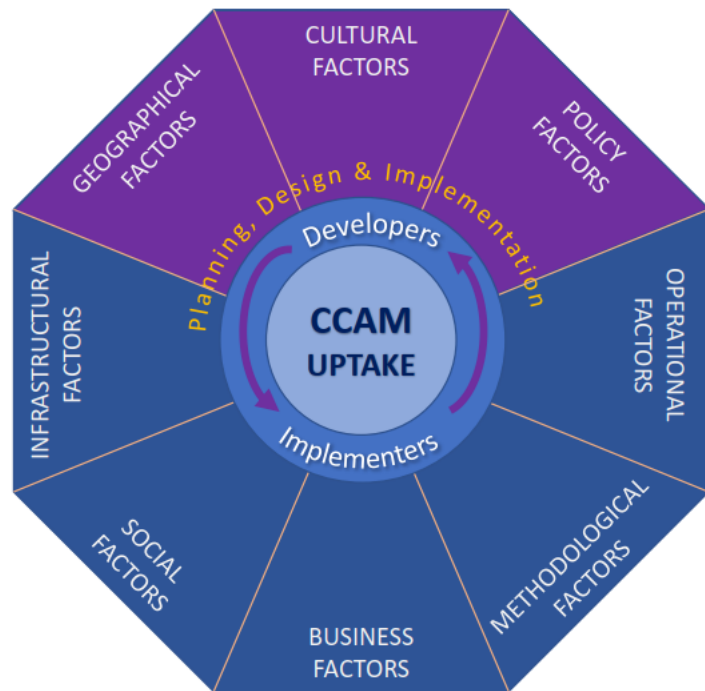
Conceptual model of impact of diversity on behavior

Mock-Up of the D-Tool

https://diversify-ccam.eu/
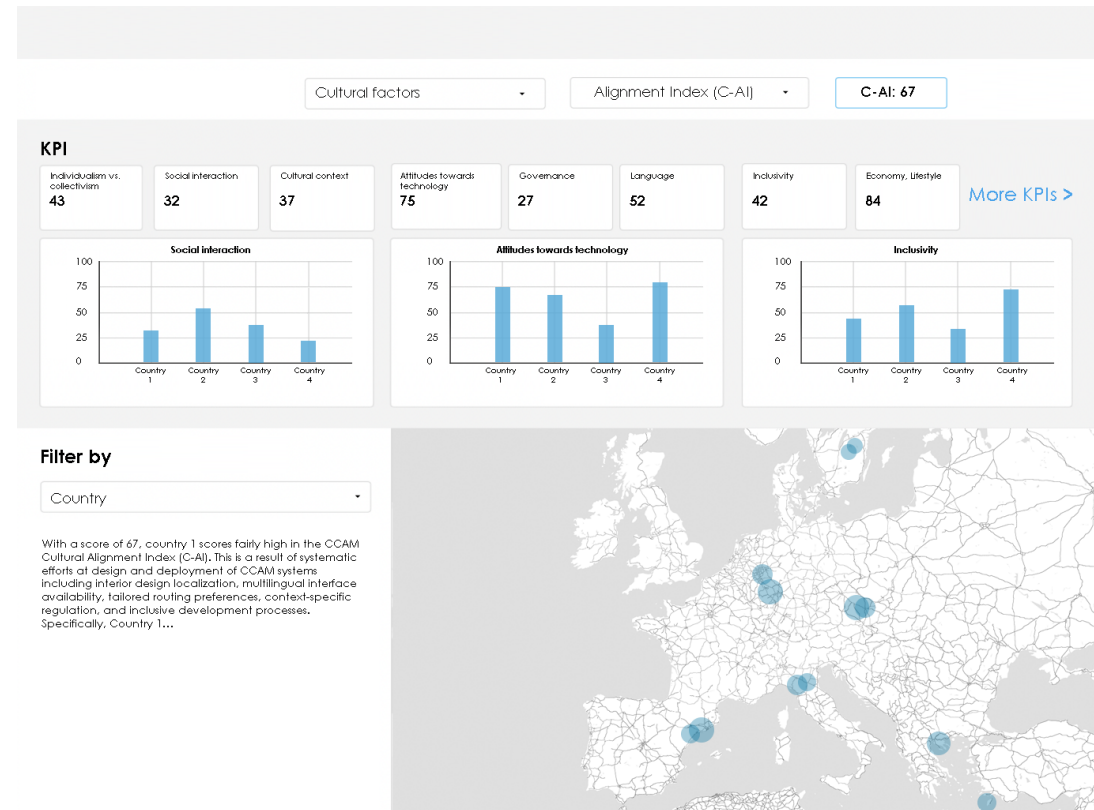
Example projects
Accompanying Level 4 autonomous vehicle trials of an on-demand service in Germany to implement services that meet local demand and the strategic objectives of the stakeholder

Supply: Which interest and requirements do various stakeholder have?
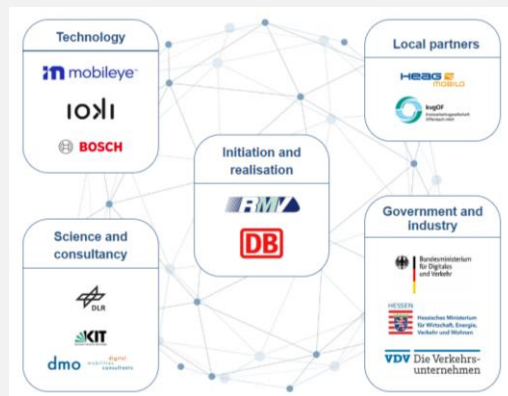
- Interactive workshops

Demand: What needs, expectations and requirements do users and citizens have?

- Citizen dialogues
- Surveys
- Travel patterns tracking
- Walk-/ Drive-alongs

What are the necessary requirements for technical supervision, incl. HMI

- Surveys
- Simulation studies
- Laboratory experiments

https://kira-autonom.de/en/

Other methods and tools to increase societal readiness for mobility innovations

Engaging citizens in co-creating a vision for the future through experience, discussion, and collaborative scenario-building

Using an app to track travel behavior and conditions to identify specific mobility needs
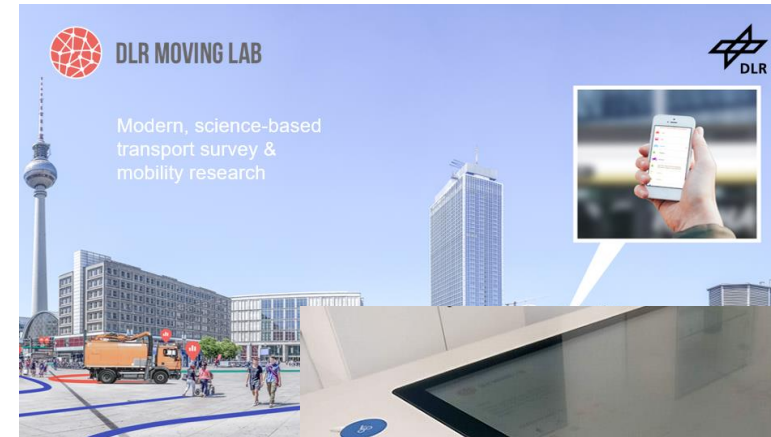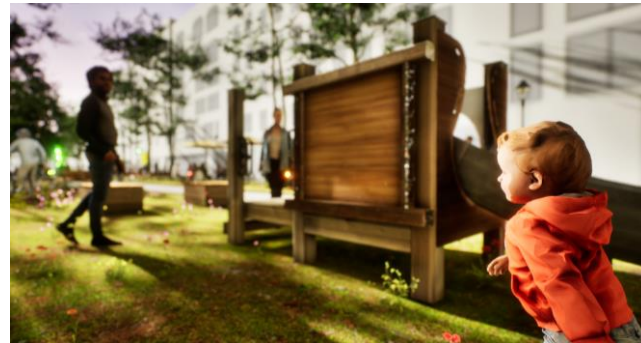
Other methods and tools to increase societal readiness for mobility innovations

Visualizing research results to engage stakeholders and provide the public with access to scientific findings, suitable for use in a Decision Theatre* setting.

Smart Transit Fleetplaner

TAPAS/SUMO: Transport Models
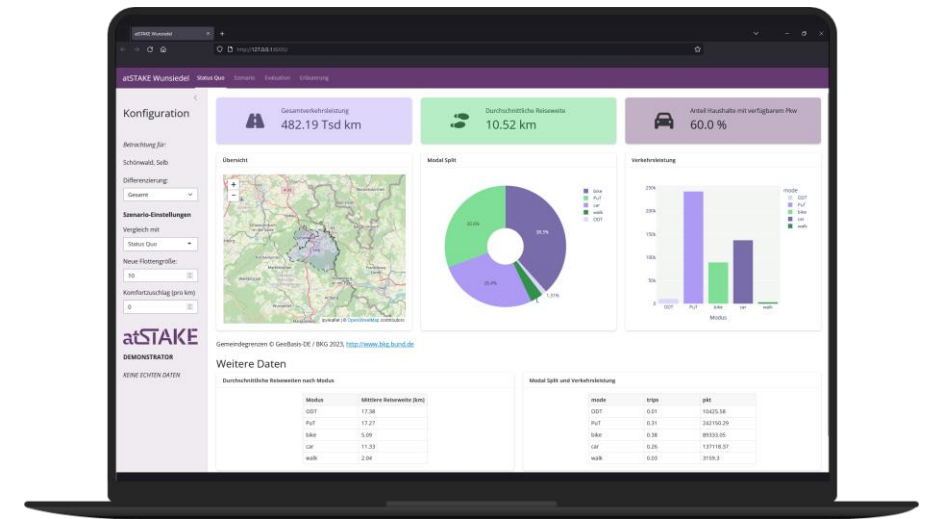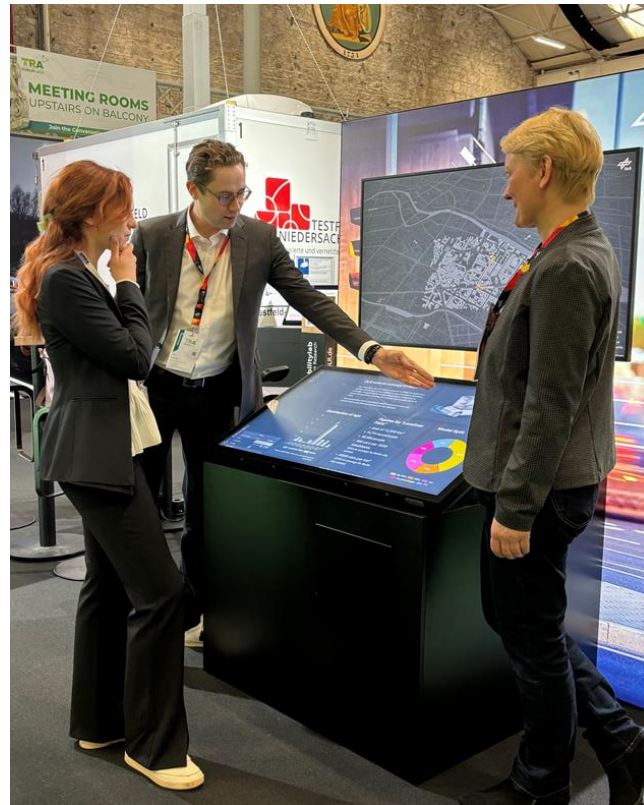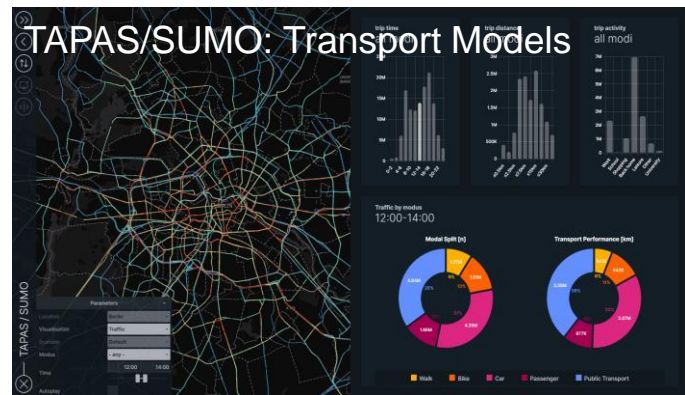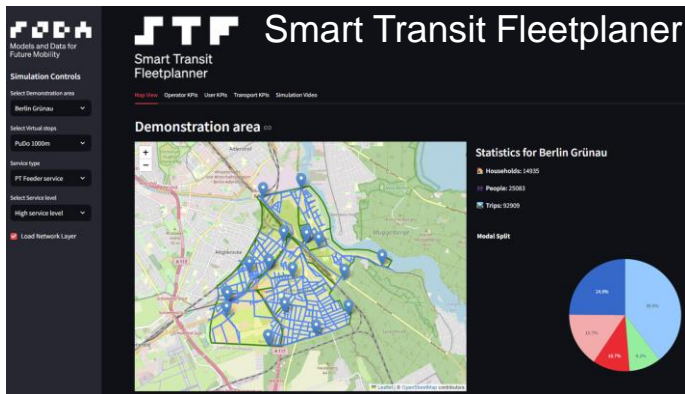
A Decision Theatre (DT) is an IT-supported participatory method used in research on societal challenges. It enables interaction and collaboration between science, policy and society (globalclimateforum)

Last but not least …
Understanding societal requirements and needs goes hand in hand with the technical development and implementation of viable mobility solutions.

Development of user-centered interfaces between automated vehicles and (road) users

Transforming reality into data and models to test and optimize in virtual space, followed by field testing and functional prototyping

Research, development and evaluation of new vehicle concepts and technologies in light of future demand on transportation systems

Thank you for your attention!

Dr Viktoriya Kolarova
Head of the research group
„Automated and connected driving"

German Aerospace Center (DLR)
Institute of Transport Research