



#### Task 29\*:

# Electrified, Connected and Automated Vehicles

(Germany, Austria, US)

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\*"free" task;

## **Objectives**



- Analyze the potential technological synergies of electrification, connectivity and automation of road vehicles and derive research, development and standardization needs
- Assess the impact of user / driver behavior on the combination of electrification, connectivity and automation and conclude on needs for measures in awareness and legislation
- Study the business and operational models combining electrification and connectivity / automation of road vehicles and identify need for action by companies and/or governments
- Share information about the results and future strategies for research and development programs, best practices in business development and lessons learned from implementation measures and actions e.g. in legislation, or standardization

#### **Impacts on Roadmaps**

- Strategic Research Agenda
   of the European Technology
   Platform on Smart Systems
   Integration (EPoSS)
- European Roadmap Electrification of Road Transport of the European Technology Platforms ERTRAC and EPoSS
- A3PS Roadmap Eco Mobility 2025+
- Strategic Transport Research and Innovation Agenda STRIA)
   of the European Commission
- Strategic Research Agenda of the Joint Undertaking ECSEL (EU)





## **Impacts on/of Funding Programs**



- German Federal Ministry of Education and Research (BMBF)
   Electronics for autonomous, electrical driving (ELEKTRONOM)
- German Federal Ministry of Education and Research (BMBF)
   Disruptive vehicle concepts for autonomous electric mobility (Auto-Dis)
- Austrian Federal Ministry of Transport, Innovation and Technology (BMVIT) **Mobility of the Future** Car Sharing optimizes energy use Electrification Automation





6 Dec 2018, Berlin (Germany)

#### **Objectives**

- Exchange information about roadmaps, strategies and public funding programmes covering synergies of automation and electrification
- Review approaches and results of research projects
- Discuss best practices and lessons learned.

#### Task 29 Workshop



- Austrian Research and Innovation Programmes and Strategies
   Walter Mauritsch, AustriaTech (on behalf of BMVIT)
- German Research and Innovation Programmes and Strategies Cornelius Schuberth, VDI/VDE-IT (on behalf of BMBF)
- Presentations of Selected Research Projects

  Alp.Lab (A), Jost Bernasch, Virtual Vehicle

  Digibus Austria (A), Karl Bahri, Salahura Basagrah

Digibus Austria (A), Karl Rehrl, Salzburg Research

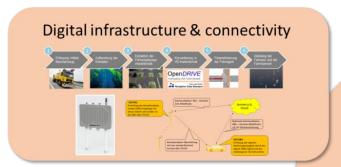
Via-Autonom (A), Philippe Nitsche, AIT

KLEE (D), Daniel Göhring, Freie Universität Berlin UniCarAgil (D), Hans Christian Reuss, FKFS / U Stuttgart

- Perspective from the Industry
   Kerstin Mayr, Bosch Deputy Chair eNOVA Strategy Board
- Perspective from Silicon Valley
   Sven Beiker, Silicon Valley Mobility, USA
- Perspective from the EU: Lighthouse Mobility.E of ECSEL JU Gereon Meyer, VDI/VDE-IT
- Discussion on Best Practices and Lessons Learned

#### **Insights**



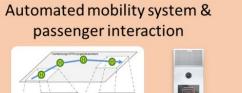


**Driving scenarios & interaction** with (vulnerable) road users













Reference model for planning, deployment & operation of automated shuttles



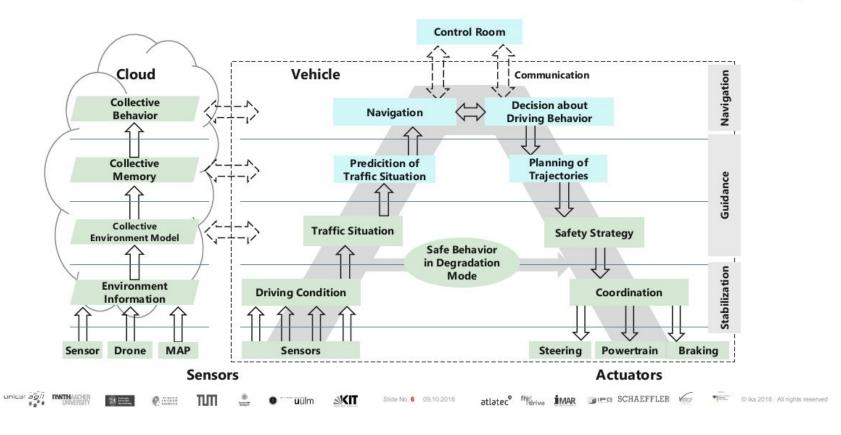
Precise positioning of a self-driving shuttle Karl Rehrl, Salzburg Research, Digibus Austria

#### **Insights**

#### VDI VDE IT

#### **FUNCTIONAL ARCHITECTURE**





Interplay of perception and powertrain architectures Hans-Christian Reuss, FKFS / University Stuttgart

#### **Insights**



In summary, there are several synergies between automation and electrification



**Technology** – similar control architectures (which, BTW, also exist for ICE vehicles); especially research vehicles benefit from "limitless" electrical power supply



**Timeline** – automation and electrification happen roughly with the same schedule of the "mobility revolution" with both still facing challenges in technology, regulation, market



**Strategy** – vehicle manufacturers capitalize on the situation that both, automation and electrification, are seen as innovative technologies and both combined amplify a corporation's message



**Use cases** – electric drivetrains are inherently smooth and quiet, which benefits applications for people transportation with convenience, smoothness, space maximization being key

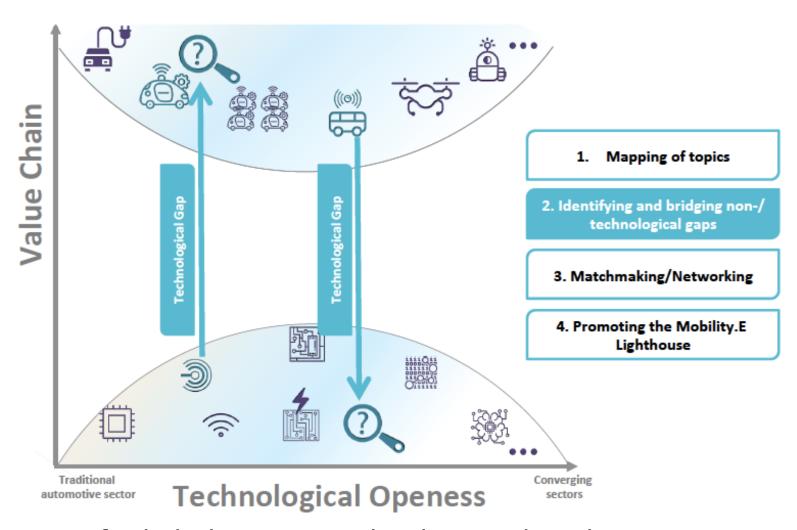


Regulation – as automated vehicles might be deployed in urban settings first, there will be more and more restrictions on vehicle access to inner-cities, from which electric vehicles might be exempt

Comprehensive picture from technology to applicactions Sven Beiker, Silicon Valley Mobility

# Lighthouse Mobility.E





Scouting for links between technology and application COSMOS project

#### What's next?



MICRO MOBILITY		URBAN MOBILITY					SHORT-HAUL TRAVEL					LONG-HAUL TRAVEL			
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 Characterize the new modes of transportation in terms of the synergies of electrification, connectivity and automation, derive research and development needs and public funding plans.