

# Center for Sustainable Future Mobility Symposium

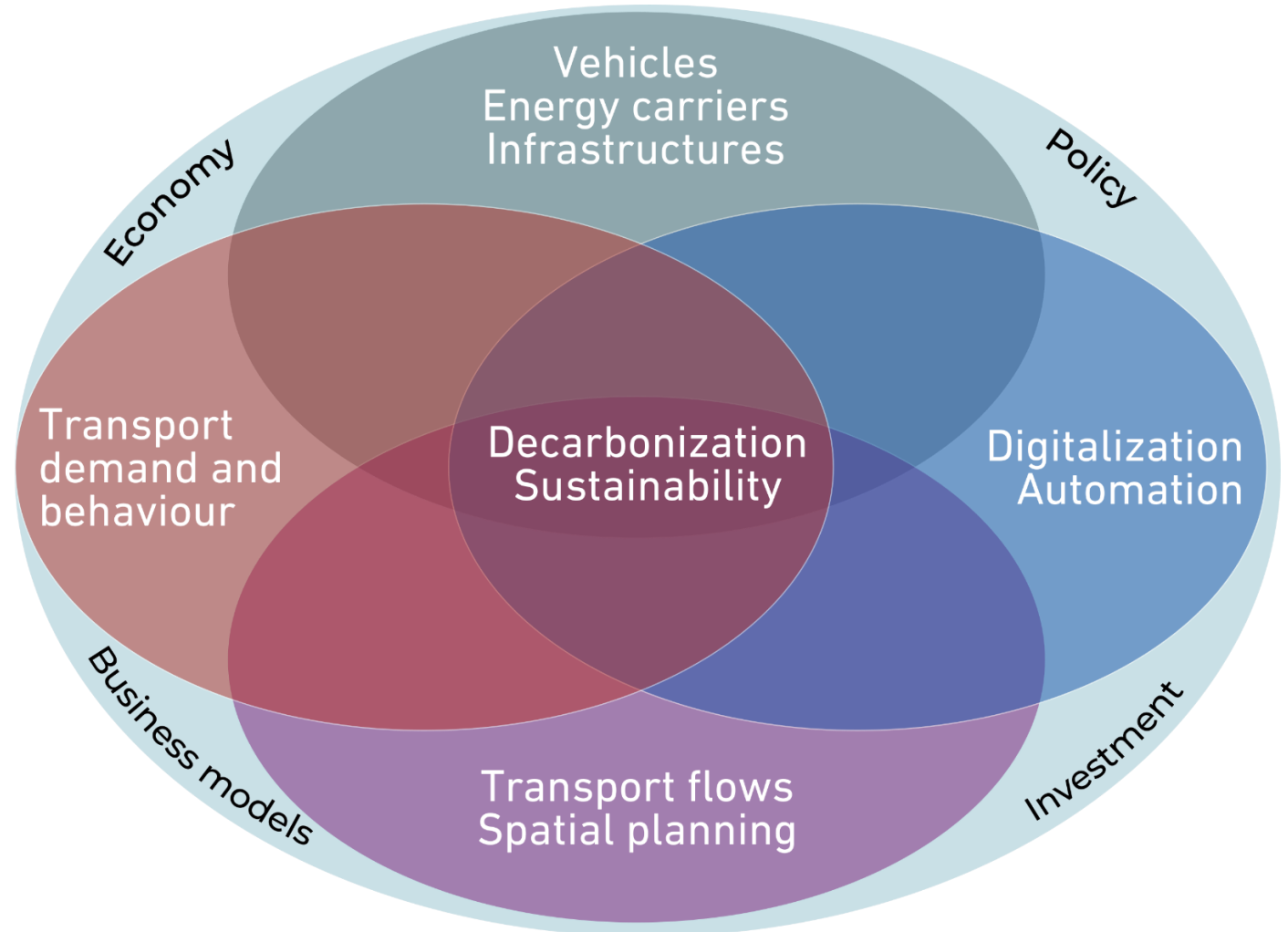
ETH Zurich, 6 June 2023



# Sustainable future mobility

## The challenges ahead

- **Energy demand (37 % in CH)**
- **CO<sub>2</sub> emissions (48% in CH)**
- Land use
- Congestion
- Safety
- Increasing demand
- Logistics
- Mobility-as-a-Service (MaaS)
- External costs
- Sharing economy
- Regulation



# Main objectives of the CSFM

- Link groups with complementary competences to better **address the challenges** regarding the future of (Swiss and global) mobility systems
- Facilitate **knowledge transfer**
- Foster the **cooperation** with industry / business / federal administration offices (e.g. UVEK)



# Main activities of the CSFM



Research Program «Future Mobility»



Integrative project «Digital Twin of the Swiss Mobility System»



Knowledge transfer events



Continuing Education

# Research Program “Future Mobility”

## Mobility Initiative

- Structured around yearly calls:
  - Relevance for Industry
  - Scientific quality
  - Interdisciplinary approach
- long-term commitment (10 years)
- From 2018 **39** projects were submitted and **22** projects funded
- Strategic partnership:



SIEMENS

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# MAS | CAS ETH in Future Transport Systems

- Continuing education program developed within the framework of the Swiss Competence Center for Energy Research in Mobility
- It imparts knowledge and skills to develop marketable products and services that promote sustainable and resource-efficient future mobility
- Master of Advanced Studies (MAS) consists of three interdisciplinary Certificates of Advanced Studies (CAS):
  - System Aspects
  - Technology Potentials
  - New Business Models or Transport Engineering at IVT





# Members

## Steering committee



**Prof. K.W. Axhausen**  
Transport Planning and Systems (D-BAUG)  
**Chairman**



**C. Bach**  
Automotive Powertrain Technologies  
(EMPA)



**Prof. C. Onder**  
Institute for Dynamic Systems and  
Control (D-MAVT)



**Prof. U. Grossner**  
Advanced Power Semiconductors  
(D-ITET)



**Prof. E. Frazzoli**  
Dynamic Systems and Control (D-MAVT)  
**Deputy**



**Prof. A. Patt**  
Climate Policy (D-USYS)



**Prof. M. Raubal**  
Institute of Cartography and  
Geoinformation (D-BAUG)



**Prof. T. Bernauer**  
International Environmental Policy  
(D-GESS)

 <b>Prof. A. Bardow</b> Energy and Process System Engineering	 <b>Prof. J. Kolar</b> Power Electronic Systems	 <b>Prof. Aldo Steinfeld</b> Renewable Energy Carriers	 <b>Dr. A. Kouvelas</b> Traffic Engineering	 <b>Prof. F. Yu</b> Visual Intelligence and Systems	 <b>Prof. T. Bernauer</b> International Environmental Policy
 <b>Dr. Miriam Elser</b> Vehicle Systems EMPA	 <b>Prof. M. Lukatskaya</b> Electrochemical Energy Systems	 <b>Prof. E. Frazzoli</b> Dynamic Systems and Control	 <b>Prof. M. Raubal</b> Geoinformation Engineering	 <b>Prof. B. Adey</b> Infrastructure Management	 <b>Prof. M. Filippini</b> Energy and Public Economics
 <b>Prof. P. Ermanni</b> Lightweight Systems	 <b>Prof. M. Mazzotti</b> Carbon Capture and Storage	 <b>Prof. M. Hutter</b> Robotics and Intelligent Systems	 <b>Prof. F. Dörfler</b> Institute for Automation	 <b>Prof. E. Chatzi</b> Structural Mechanics and Monitoring	 <b>Prof. V. Hoffmann</b> Sustainability and Technology
 <b>Prof. C. Frank</b> High Voltage Engineering	 <b>Prof. R. McKenna</b> Laboratory for Energy Systems Analysis	 <b>Prof. R. Siegwart</b> Autonomous Systems Lab	 <b>Prof. J. Lygeros</b> Automatic Control Lab	 <b>Prof. I. Hajnsek</b> Remote Sensing	 <b>Prof. A. Patt</b> Climate Policy
 <b>Prof. U. Grossner</b> Advanced Power Semiconductors	 <b>Prof. N. Noiray</b> Power and Propulsion Systems				 <b>Prof. T. Schmidt</b> Energy Policy
 <b>Prof. S. Hellweg</b> Environmental Impact	 <b>Prof. C. Onder</b> Dynamic Systems and Control	 <b>Prof. K.W. Axhausen</b> Traffic Planning, Transport Modelling	 <b>Prof. M. Pollefeys</b> Institute for Visual Computing	 <b>Prof. D. Kaufmann</b> Urban Planning	 <b>Prof. M. Stauffacher</b> Science – Society Interface
 <b>Prof. G. Hug</b> Electric Power Systems	 <b>Prof. T. Schmidt</b> Electrochemistry	 <b>Prof. F. Corman</b> Transport Systems	 <b>Prof. S. Tang</b> Computer Vision and Learning	 <b>Prof. K. Schindler</b> Photogrammetry and Remote Sensing	 <b>Prof. B. Steffen</b> Climate Finances and Policy

Energy efficiency,  
e-mobility and batteries

Autonomous driving  
and robotics

Traffic and  
transportation systems

Connected car, security,  
control, vision, and  
automation

Infrastructure,  
maintenance, logistics,  
and built environment

Policy and economics



# Center for Sustainable Future Mobility

Symposium 2023 – 1/2

09:15 **Welcome** Prof. Dr. Christopher Onder

09:25 **Digital Twin Project of the CSFM**, Dr. Jascha Grübel

09:50 **Overcoming barriers to electric vehicle adoption**, Dr. Davide Cerruti

10:10 **Interactive augmented reality-guided maintenance**, Dr. Julian Wolf

*10:30 Break*

11:00 **Long-range obstacle detection for early alert in advanced driving assistance**,  
Dr. Cornelius von Einem

11:20 **Short pitches - Best poster award** (from preselected posters)

*12:00 Lunch & poster session*

# Center for Sustainable Future Mobility

Symposium 2023 – 2/2

13:30 **Welcome to part II**

13:35 **Beyond carbon-neutral mobility – Sustainability in the Volkswagen Group Innovation**, Kristin von Szadkowski

14:15 **Sustainable fuels for the future transportation sector**, Dr. Gianluca Ambrosetti

14:55 **Break**

15:20 **European rail research advisory council vision for 2030 and 2050 & the relevance for Swiss railway**, Dr. Roland Moser

16:00 **Panel discussion: Research & innovation for sustainable mobility**,

16:45 Closing remarks

17:00 End of the symposium