Dear Readers

This is the second annual report of the Center for Mobility at the University of St. Gallen (CfM-HSG).

The CfM-HSG was established on January 1, 2020 with the aim of coordinating research on topics related to the field of “management of personal mobility” and its related value creation systems and effects. The center provides a showcase and interface for this field beyond the various institutes, chairs, and researchers at the University of St. Gallen. It differs from similar centers, for instance at ETHZ and EPFL, primarily in disciplinary terms by adopting a clear social science perspective.

Various challenges and associated opportunities shape this field, such as digitalization, climate change, and future land use and related mobility systems.

- The topic of digitization is particularly concerned with the future development of our work-based economy (stationary vs. online), the associated way of life, and related system and business models (including the use of space or the provision of mobility).
- The topic of climate change is primarily concerned with questions of future energy supply for mobility purposes (with a shift from fossil fuels to renewable energy) and the allocation of these energy sources to different forms of mobility and the associated economies.
- The topic of land use and mobility systems primarily concerns questions about models of future use as well as allocation and distribution of the limited resource “land” as well as existing and possibly newly created means of transport.

Four institutes at the University of St. Gallen are currently part of this center:

- Institute for Systemic Management and Public Governance (IMP-HSG) and herein in particular the SBB Lab and the Research Center for Tourism and Transport.
- Institute for Mobility (IMO-HSG)
- Institute of Technology Management (ITEM-HSG)
- Institute for Economy and the Environment (IWÖ-HSG)

Administratively and financially, the Center is supported by the SBB Lab, which is also located at the IMP-HSG.

We are pleased to report briefly on our activities in 2021.

Prof. Dr. Thomas Bieger
President of the Academic Advisory Board

Prof. Dr. Christian Laesser
Managing Director
Institute for Systemic Management and Public Governance

This year, the topic of mobility occupied us not only within the framework of our ongoing activities but also, and especially, because of the pandemic’s impact on this domain, along with tourism.

Projects

Three projects were in the foreground in 2021. The project “Option Values in Public Transport” aims to determine the perceived value of transport options, considering personal characteristics and travel context. Theoretical considerations, explorative studies, and market-based instruments such as season tickets and insurance suggest that significant option value also exists in Swiss passenger transport.

Furthermore, through the SVWG, together with the partner organizations DVWG in Germany and ÖVG in Austria, we were involved in the biennial three-country conference; this time on September 30 and October 1 at the Zeppelin University in Friedrichshafen on the topic of “Cross-border traffic”. Thanks to a relatively relaxed Corona situation, we were able to hold the conference stationary.

Last but not least, we are participating in initial conceptual work on the topic of “High-Performance Transportation Systems – Paradigm Shift in the Nature of Governance and Control Needed.” This project is steered by like-minded third parties and within the framework of a loose network and includes colleagues from academia as well as practice.

In addition, the institute was involved in many projects in the field of tourism which is impacting personal mobility – also with a special focus on the Corona Crisis and its effects.

Publications

Among other publications (mostly project related) we have continued to publish the Yearbook of Swiss Transportation and have participated with a paper at this year’s Swiss Transport Research Conference.
Education and training

The course “Transportation Systems” at Master level, was held for the eleventh time this year. About 15 students familiarized themselves with various aspects and perspectives on the topic of “Transportation Systems”, such as demand, supply, impact, policy, governance or management. The institute also is responsible for the course “Aviation Systems” of our colleagues of the Center of Aviation Competence and the introductory course in Management and the Integration Seminar for first year students. Both use several case studies related to transport (e.g., case for Integration Seminar Airport Zurich).

Various

For many years, the general secretariat of the Swiss Society of Transportation Sciences (SVWG; www.svwg.ch) has been domiciled at our institute. On behalf of this society, we organize two forums of Swiss transport every year. Furthermore, we are, together with ETHZ, EPFL and USI Lugano, member of the organizing committee of the annual Swiss Transport Research Conference (STRC; www.strc.ch). The Institute is also managing the SBB Research Fund.

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The Institute for Mobility (IMO-HSG) was officially founded in April 2021 and since then has taken up several new projects and initiatives while successfully completing others.

**Selected Projects**

*Micro-mobility.* In a project with BCG, the IMO-HSG aims to shed light on the integration of micro-mobility vehicles into urban transportation systems. A global consumer study involved more than 11,000 participants from 10 key markets on three continents. A joint report will be published in February 2022. In a related collaboration, the IMO-HSG is additionally conducting a city-specific deep dive on these matters for the city of St.Gallen.

*Mobility & Social Inclusion.* In a joint project between the WEF, BCG and IMO-HSG, the project partners developed an analytical approach to investigate the impact of mobility on social equity. The resulting white paper was published in December of 2021 and is supposed to inspire and expand efforts by public and private sector to better understand which levers to apply to make mobility more inclusive and equitable. Together with the IWE-HSG, the IMO-HSG is currently continuing this project (funded by the basic research fund of the HSG).

*Urban Transportation.* Together with Toyota, the IMO-HSG investigates the future of urban transportation and mobility ecosystems. The two project partners are particularly looking into the question of how new urban districts can be optimally connected in terms of transportation. Further attention is being paid to the question of what role OEMs play in these ecosystems. Results are planned to be published by mid-2022.

*The Swiss Mobility Monitor.* The IMO-HSG is part of a project team led by the University of Lucerne that has developed the Swiss Mobility Monitor, a representative panel survey aiming at identifying the psychological barriers to adoption of new forms of mobility. The results will be published in mid-February of 2022 and the study is supposed to be conducted on a regular basis.

*The Future Mobility Lab.* In December 2021, the IMO-HSG launched the “Future Mobility Lab” together with fischerAppelt and Systemiq. The Future Mobility Lab is a consortium with various mobility players with the goal to develop and implement holistic sustainable mobility solutions. In a first next step, the FML will focus on shared mobility solutions and will accompany and assist private households in the DACH area in adopting new forms of mobility.
Publications & Conferences

In 2021, the team of the IMO-HSG published in various scientific journals as well as renown newspapers and management magazines. Together with the World Economic Forum and the Boston Consulting Group the IMO-HSG published a white paper on social inclusion and mobility. Furthermore, the IMO-HSG has been a partner at the IAA 2021, contributing to a unique program and taking part in several panel discussions. Andreas Herrmann is co-hosting two popular podcasts with bi-weekly new episodes.

Education & Training

Since fall 2020, we have been offering the CAS Smart Mobility Management. In 2021 the program has successfully concluded its first round with 30 participants and the second cohort is about to graduate. The third round will commence in May. So far, there is no mobility program in undergraduate teaching. All professors at the IMO-HSG teach in the marketing master’s program.

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In the research area of Prof. Dr. Oliver Gassmann at the Institute of Technology Management we had several mobility projects in 2021. Our leading research questions are mostly around the perspective of new business models. We are interested in the question how to create and capture value around mobility.

The Energy Innovation Lab, headed by PD Dr. Maximilian Palmié, complemented its traditional focus on how organizations can progress towards social, environmental, and economic sustainability (and how they can utilize digital technologies to do so) with a stronger emphasis on the scaling of sustainable business models. After the EU had approved of our application for additional funding and a temporal extension of our Horizon 2020 project Smarter Together, the project finally came to an end in late 2021. It thus joined the Swiss Competence Centers of Energy Research (SCCER) program, which had ended in December 2020. As we were involved in these two consortia since 2014 and 2016, respectively, leading SCCER CREST’s work package “Energy, Innovation, Management” in the final years, the end of both projects certainly represents a major caesura for us. Fortunately, we were able to acquire new projects such as a 36-months endeavor on sustainable, multi-modal mobility in rural areas, which is funded by the Swiss Federal Office of Energy. We also continued our work on the replication and upscaling of Smart City (SC) solutions in the NRP 77 arrangement Scaling Smart City Projects - from Individual pilots towards a Common strategy of industry Emergence, which is funded by the Swiss National Science Foundation. Over the year, insights of our various activities were published in several leading journals, received prestigious accolades from the Academy of Management and the Strategic Entrepreneurship Journal, and were selected into its “top stories” by the University of St.Gallen.

Headed by Dr. Wolfgang Bronner (Executive Director Bosch) and Prof. Dr. Felix Wortmann (Scientific Director), the Bosch IoT Lab investigates business model innovation in the Internet of Things (IoT). In addition, the Bosch IoT Lab explores disruptive IoT products and services. In 2021 the
lab developed the EaaS Navigator that helps product companies to design, implement and scale “as a service” business models. In addition, core activities were centered around digital trust and how to establish a fundamental basis for digital business. Furthermore, the lab realized the Platform Navigator, a tool that facilitates the design and implementation of platform business models. Lastly, within its IoT technology exploitation domain, the lab investigates new opportunities in the realm of driver monitoring and safety (hypoglycemia detection, drunk driving prevention). Research results were published in renowned journals like MIS Quarterly Executive and Diabetes, Obesity and Metabolism.
The Institute for Economy and the Environment (IWÖ-HSG) addressed mobility topics in various projects in 2021. The main research foci were (1) customer acceptance of electric mobility and solar charging, and (2) overcoming path dependence in the automotive industry. Linking renewable energy and electric mobility is also a focus of the newly launched national research project SWEET EDGE (www.sweet-edge.ch), in which IWÖ is researching the implementation of the Energy Strategy 2050 with universities and practice partners from all over Switzerland. The market share of electric vehicles has again risen sharply in 2021. While purely electric cars accounted for only 5.1% of new registrations in Q4 2019, the share had already doubled a year later, and by Q4 2021 had nearly quadrupled to 19.5%. In combination with renewable energies, electric mobility is key to decarbonizing transport. As part of the 11th Customer Barometer of Renewable Energy (www.kuba.iwoe.unisg.ch), conducted in collaboration with Raiffeisen and EnergieSchweiz, we identified a dynamically growing customer segment of “early electrifiers” – customers who are interested in both electric cars and their own solar system, thus driving the convergence of climate-friendly energy and mobility solutions. In another research project, we analyze the development of successful business models for solar charging in the B2C and B2B sectors, as well as the electrification of agricultural transport.

As our second research focus, we are investigating how path dependence can be overcome in the automotive industry. In innovation research, path dependence refers to the tendency for established technologies to remain on the market even when new technologies would actually be preferable from a customer and/or environmental perspective. If companies hold on to an old technology for too long, this leads to a competitive disadvantage or even to the failure of the company, as classic examples in other industries such as Kodak or Xerox have shown. In the current upheaval in the automotive industry, there are strong differences in the way companies deal with technological change. Whereas a wait-and-see attitude toward electric mobility initially prevailed, various players have now adopted a more proactive strategy. There is still a need for action in overcoming path dependence of so-called non-market strategies, i.e. in the area of managing the regulatory framework.
Mobility also plays a role in various IWÖ-HSG courses and in the continuing education course CAS Renewable Energy Management. For example, in the course “Clean Energy Marketing” as part of the Masters in Marketing Management, students dealt with the question of how the NGO Protect Our Winters (POW) Switzerland can encourage the outdoor community to switch to public transport and electric mobility. In the Master of International Affairs (MIA), a new course “The Political Economy of the Car” was offered for the first time, in the contextual studies program we address “Social Acceptance of Sustainability Innovation” and the new MIA Consultancy Project will be dedicated to the marketing of night train travel in cooperation with ÖBB. These are also elective courses for the certificate program Managing Climate Solutions (MaCS-HSG, www.macs.unisg.ch).
The governance of the CfM-HSG consists of an Advisory Board and the Management. For the term of office 2020-2022 the following persons hold these positions.

**Academic Advisory Board**

- Prof. Dr. Thomas Bieger, President
- Prof. Dr. Oliver Gassmann, Member
- Prof. Dr. Andreas Herrmann, Member
- Prof. Dr. Rolf Wüstenhagen, Member

**Management**

- Prof. Dr. Christian Laesser, Managing Director

**Collaborators**

- Dr. Daniel Bazzi, Project Manager
- Simon Kuster, M.A., Research Associate
- Barbara Bieger, Secretariat
Projects
(in parentheses: funding and principal investigators)

- Alternative Antriebstechnologien (CNG Mobility, GFF; PI: Maximilian Palmié)
- Applying nudging techniques to promote fuel efficient car purchases (Swiss Federal Office of Energy (SFOE); PI: Rolf Wüstenhagen, in cooperation with University of Geneva, Switzerland)
- Connected Business and IoT Performance Management (Bosch; PI: Felix Wortmann)
- Consumer barometer of renewable energy 2021 (Raiffeisen Switzerland, EnergieSchweiz; PI: Rolf Wüstenhagen)
- Distributed Ledgers (Siemens, Bosch, EnBW; PI: Kilian Schmück)
- Entwicklung der Quartiersmobilität in Städten (Toyota; PI: Michael Semmer, Andreas Herrmann)
- IoT Platform Economy (Bosch; PI: Felix Wortmann)
- Mikromobilität St.Gallen (Stadt St.Gallen; PI: Michael Hohenreuther, Philipp Scharfenberger, Andreas Herrmann)
- Option Values in Public Transport (SBB Lab; PI: Simon Kuster)
- Scaling Smart City Projects - from Individual Pilots towards a Common Strategy of Industry Emergence (SNF; PI: Maximilian Palmié)
- Smart and Inclusive Solutions for a Better Life in Urban Districts-SMARTER TOGETHER (EU; PI: Maximilan Palmié)
- Smart City Lab (EY; PI: Barbara Bencsik) [https://www.smartcitylab.ch/home/barbara-bencsik/]
- Social Inclusion and Mobility (WEF, BCG; PI: Beatrice Hügler, Philipp Silvestri, Philipp Scharfenberger, Andreas Herrmann)
- Sustainable Multimodal Mobility in Toggenburg (Bundesamt für Energie; PI: Maximilian Palmié)
- Sweet Edge (Funding: Swiss Federal Office of Energy (SFOE); PI: Rolf Wüstenhagen)
- The Future Mobility Lab (Consortium with various partners; PI: Andreas Collet, Philipp Silvestri, Philipp Scharfenberger, Andreas Herrmann)
- The New Mobility Insight (Porsche; PI: Beatrice Hügler, Michael Hohenreuther, Philipp Scharfenberger, Andreas Herrmann)
- The politics of overcoming carbon lock-in: Managing decline and transition in the automotive industry (Research Commission of the University of St.Gallen (GFF); PI: Adrian Rinscheid)
- The Socioeconomics of Shared Micro-Mobility: An Investigation of the Potential of E-scooters to foster Social Mobility (GFF, PI: Philipp Silvestri, Philipp Scharfenberger, Andreas Herrmann)
- The Swiss Mobility Monitor (Consortium with various partners; PI: Lena Illg, Andreas Herrmann, Reto Hofstetter and his team at the University of Lucerne)
Consecutive and executive education at UNISG

Consecutive education on master level

**Aviation Systems**
Andreas Wittmer

**Business Innovation I: Geschäftsmodelle entwickeln**
Oliver Gassmann

**Clean Energy Marketing**
Rolf Wüstenhagen

**Climate Solutions 101**
Rolf Wüstenhagen and Merla Kubli

**Energy and Climate Governance**
Philipp Thaler and Adrian Rinscheid

**Innovationsmanagement im Energiesektor**
Maximilian Palmié

**Social acceptance of sustainability innovations**
Merla Kubli and Emmanuelle Reuter from the University of Neuchatel

**Transportation Systems**
Christian Laesser

**Climate Change and the Psychology of Decision-Making**
Karoline Gamma

Executive education

**CAS Renewable Energy Management (REM-HSG)**
[https://www.renewable-energy-management.ch](https://www.renewable-energy-management.ch)
Rolf Wüstenhagen et al.

**CAS Smart Mobility Management**
[https://www.es.unisg.ch/de/programme/cas-smart-mobility-management](https://www.es.unisg.ch/de/programme/cas-smart-mobility-management)
Karolin Frankenberger, Oliver Gassmann, Andreas Herrmann, Marco Leimeister
IAA Mobility, 07. – 12. September 2021, Munich

• “Smart mobility in smart cities – How do we want to live, how do we want to move?”
  Diskussionsrunde, Andreas Herrmann mit Jörg Sandvoss (DB Regio AG), Martin Schmitz (VDV e.V.), Maximilian Rohs (PwC GmbH WPG), Tanya Altmann (Skoda Transportation Deutschland)

• “Setting the Stage – How future Smart Cities will look like”
  Diskussionsrunde, Andreas Herrmann mit Silke Bargstaedt-Franke (Bundesamt für Sicherheit in der Informationstechnik), Christian Haas (PTV Group), Nikolaus Lang (BCG), Wee Shann Lam (Land Transport Authority Singapore), Steffen Szeidl (Drees & Sommer)

• “How Mobility-as-a-service will foster the Mobility Revolution”
  Diskussionsrunde, Andreas Herrmann mit Johann Jungwirth (Mobileye), Lukas Neckermann (Splyt)

• “Mobilität und soziale Gerechtigkeit”
  Diskussionsrunde, Andreas Herrmann mit Cem Özdemir (MdB)

• “Initiating PAVE Europe: Call for Founders”
  Diskussionsrunde, Andreas Herrmann mit Brad Stertz (Audi), Frederic John (Neckermann Strategic Advisors), Lukas Neckermann (Splyt), Tara Andriga (PAVE)

• “How MaaS will change the value chain of mobility”
  Diskussionsrunde, Hans-Peter Kleebinder mit Lukas Neckermann (Splyt), Gunnar Froh (Wunder Mobility), Wolfgang Kopplin (Emil Frey Gruppe Schweiz), Anja Hendel (diconium)

• “Mobility and Social Inclusion”
  Diskussionsrunde, Philipp Scharfenberger mit Nikolaus Lang (BCG), Pedro Gomez (WEF), Molly Poppe (cta), Jan Lüdtke (Via)

• “Das Bedürfnis Anzukommen”
  Impulsreferat, Philipp Scharfenberger im FischerAppelt Room @ IAA
The Emergence of Solar Mobility, with the following speakers:

• Arina Anisie, Innovations for End-Sector Electrification (Power-to-Mobility), IRENA, Bonn, DE
• Dominik Müller, Head Sales, Sun2Wheel, Liestal, CH
• Stefan Gahrens, University of St.Gallen (workshop co-leader)
• Merla Kubli, University of St.Gallen (workshop co-leader)
  Replay: https://youtu.be/TiSUBr74ftk

Swiss Mobility Research and Innovation Conference,
9 September 2021, Luzern

“User Preferences for Smart EV Charging”
Keynote, Merla Kubli

SmartSuisse, 27 – 28 October, Basel

“Mobility as a Service: Mit welchem Konzept in welcher Stadt?”
Keynote, Andreas Herrmann

2. DACH Kongress der DVWG, ÖVG, SVWG, in collaboration with Zeppelinuniversität Friedrichshafen, 30 September – 1st October 2021, Friedrichshafen:

Grenzüberschreitender Verkehr der Zukunft: Perspektiven des DACH-Raumes.
Numerous speakers, topics, and replay: https://www.dvwg.de/dach-kongress and https://www.youtube.com/watch?v=1Fz6o0P48vA
Publications


Schweitzer, Fiona; Palmié, Maximilian; Gassmann, Oliver; Kahlert, Jonas & Roeth, Tobias (2021): Open innovation for institutional entrepreneurship: how incumbents induce institutional change to advance autonomous driving. *R&D Management*. https://doi.org/10.1111/radm.12490


From insight to impact.

CFM-HSG: Managing personal mobility from a social science perspective.