Welcome and presentation of the Center for Mobility

Dear Readers

This is the first 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 here in particular the SBB Lab and the Research Center for Tourism and Transport.
• Institute for Mobility (IfM-HSG)
• Institute for 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 2020.

Prof. Dr. Thomas Bieger     Prof. Dr. Christian Laesser
President of the Academic Advisory Board   Managing Director
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 related questions.

**Projects**

Three projects were in the foreground in 2020. In the project “Future Rail Business Models”, we developed a morphology of configuration options for the business models of rail companies using Switzerland as an example, identify novel configurations based on future mobility scenarios, and derive strategic implications for existing rail business models with a particular focus on passenger transport. Some outcomes of this project shall be further refined within the context of services and business models in leisure transport (together with SBB, and other).

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, 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.

**Education and training**

The course “Transportation Systems” at Master level, was held for the tenth time this year. About 30 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](http://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](http://www.strc.ch)). Together with DenkRaumBodensee, ThinkTankThurgau, the International Lake Constance University as well as the University of Konstanz, we staged a very well attended conference on the topic “Does the future of mobility have a future” on September 18. Together with our colleagues from the German and Austrian Transport Science Societies, we started preparing an international conference on the topic of “Cross-border Transport”.

The Institute also is managing the SBB Research Fund.
Institute for Mobility

At the Institute for Mobility, we have deployed a number of activities.

Projects
A project with BCG examined what the introduction of autonomous shuttles and pods would mean for traffic, exhaust emissions and other variables in 44 metropolitan areas. A project with Porsche was about analyzing the motives for “wanting to be on the road.” At its core is a deeper understanding of the need for mobility and the implications for automakers derived from that.

With BCG, micro mobility will be looked at in another project. Who uses these modes of transportation and how can scooters, and bicycles be integrated with public transportation? Very little is known about the people who use micro mobility. Moreover, micro mobility is completely independent of public transport. Not even the pricing systems are aligned. Empirical research on this will be conducted in Los Angeles, Berlin and a Chinese city.

The WEF aims to investigate the extent to which the provision of mobility brings people into work and prosperity. Is it worth investing in expanding mobility with the goal of reducing unemployment and increasing wages? People have a larger radius with better mobility, which gives them more opportunities in life. This study will be conducted in three cities on different continents.

Two projects are being undertaken in the discussion of carbon dioxide emissions: First is the holistic assessment of transport modes. In other words, infrastructure must also be considered with regard to the causation of CO2 emissions. To this end, intensive discussions are being held with political parties in Switzerland and Germany. In addition, the various drive energies (electric with battery, e-fuel, hydrogen) are to be evaluated. For this purpose, a committee has been formed in Switzerland in which top-class scientists and experts are discussing.

Publications
A book is being written on “Mobility for all ... at a Push of a Button” together with Johann Jungwirth, Vice President, Mobileye, Jerusalem. This book will describe Mobility-as-a-Service and present its importance for a different mobility. The book will be published by Emerald in London in early 2022.

Education and training
Since fall 2020, we have been offering the CAS Smart Mobility Management. This is a 15-day program in which 30 students are currently enrolled. The program is held in Munich and St. Gallen. The lecturers come from all over the world, e.g., from BCG, WEF, LSE, SBB, Tesla, Uber, Google and Facebook as well as from numerous other institutions. From HSG, colleagues, Gassmann, Leimeister and Frankenberg are among them. So far, there is no mobility program in undergraduate teaching. All professors of the Institute for Mobility teach in the marketing master’s program.

Various
The Institute for Mobility becomes a partner of the new IAA in Munich. Together with the WEF, numerous presentations on new mobility are to be planned at the IAA in September.
Projects

Mobility is a core topic in our smart city projects under the lead of Ass. Prof. Dr. Maximilian Palmié. In the reporting period, we continued our work in the EU Horizon 2020 project “Smart and Inclusive Solutions for a Better Life in Urban Districts”. Moreover, we started a new project in 2020: We are now engaged in a consortium studying the replication and upscaling of Smart City (SC) solutions and the formation of a SC industry in Switzerland. This project, which is called “Scaling Smart City Projects – from Individual Pilots towards a Common Strategy of Industry Emergence” and funded by the Swiss National Science Foundation adopts an integrative strategic approach to support smart city projects, combining user/citizen, organizational and system-level perspectives.

Within our Bosch IoT Lab under the lead of Ass. Prof. Dr. Felix Wortmann, we look into different areas on business model innovation: Success factors and patterns of platform-based business model innovation with two sided markets, e.g. mobility-as-a-service, IoT platforms, and the role of data privacy in the realm of data-driven innovations. In addition, the Bosch IoT Lab investigates next generation driver assistance systems. Today, car manufacturers are concerned with the question of how to adapt the vehicle to drivers and thereby enable a superior driving experience. To this end, we investigated how to determine the emotional state of drivers from real-time in-vehicle vehicle data and whether the emotional state of drivers can be systematically improved while driving. A second relevant challenge that the Bosch IoT Lab investigates together with the Inselspital Bern and ETH Zürich is the real-time detection of critical driver states. In two projects, the research partners are analyzing whether states of intoxicated driving or sudden sickness are detectable from driving data.

We have also investigated mobility applications of Distributed Ledger Technologies (DLT) in ongoing projects, including Siemens, Bosch, and EnBW (Kilian Schmück). In this context, they provide a common basis for trustworthy communication and transaction. For example, Siemens and Bosch have been using this to let barriers and traffic lights interact with cars to provide access to parking spaces. EnBW and Bosch allow electric charging stations and electric vehicles to negotiate prices for e-charging autonomously. Subsequently, the car can access a parking space containing an electric charging station that has already been reserved by the car – all based on a price that has already been negotiated autonomously.

Future mobility services are not limited to the ground but will conquer the 3rd dimension through urban air mobility (UAM). A feasibility study by Barbara Bencsik has been conducted together with E&Y. In our study, which was elaborated in cooperation with EY, we shed light on the co-evolution of UAM’s technology, markets and institutions investigated through the theoretical lens of innovation ecosystems. Therefore, we have examined all five ongoing UAM initiatives located or being active in Germany.

Education and training

We contributed to several programs, specifically under the umbrella of smart city, energy and business models.
The Institute for Economy and the Environment (IWÖ-HSG) addressed mobility topics in various projects in 2020. The two main research foci were (1) customer acceptance of electromobility, with a special focus on renewable energies, and (2) climate-friendly choice of transport modes. The research was financially supported by Innosuisse within the framework of the national competence center SCCER Mobility, by the Swiss Federal Office of Energy, and by the City of St. Gallen, among others.

While in pioneering countries such as Norway, every second newly registered car is already electric, a dynamic change is now also taking place in Switzerland. The market share of electric cars has doubled in each of the last two years. On the one hand, our research focuses on the question of how potential customers decide between electric cars and vehicles with combustion engines. Based on these insights, we developed behaviorally informed policy recommendations in a project with psychologists from the University of Geneva. Another focus was on emotional factors influencing the purchase decision, such as gender-specific perceptions of different drive technologies. In combination with renewable energies, electric mobility can make a significant contribution to reducing greenhouse gas emissions from transport. We are therefore also investigating how bundling electric cars with renewable energies can be made as customer-friendly as possible. Furthermore, we investigated how to reduce purchasing barriers among business customers (B2B). In a pilot project with the city of St. Gallen, we set up a web portal that enables SMEs to easily try out various electric car models. Our accompanying research analyzes how customer preferences change as a result of the one-week trial and illustrates the effectiveness of this measure.

Consumer decision-making is also at the forefront of our second research focus, the climate-friendly choice of transport mode. The relevance of this topic stems from the fact that between 12 and 18 percent of Swiss CO2 emissions are caused by air travel. Our research shows that the decision whether to travel by air or by train is strongly influenced by familiarity with the respective mode of transport, in addition to economic factors. Furthermore, time perceptions play an important role – travelers who only look at pure flight time often come to a different conclusion than those who decide on the basis of the total time spent door-to-door.

Mobility also plays a role in various courses taught by IWÖ-HSG. For example, in the course “Clean Energy Marketing” as part of the Master in Marketing Management, students dealt with the question of how the Swiss car-sharing market leader Mobility could make its new electric mobility offering attractive to students. A new course, “The Political Economy of the Car,” will be offered in the Master of International Affairs, and a course in the contextual studies program focuses on “Social Acceptance of Sustainability Innovation.” These are also elective courses for the Managing Climate Solutions certificate program successfully launched in 2020 (MaCS-HSG, www.macs.unisg.ch).
CfM-HSG Academic Advisory Board and Management

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

- **Applying nudging techniques to promote fuel efficient car purchases** (Swiss Federal Office of Energy SFOE; PI: Rolf Wüstenhagen, Tobias Brosch, Ulf Hahnel at University of Geneva)
- **Bundling of EV and charging services** (Repower/ Plug’n’Roll; PI: Karoline Gamma)
- **Connected Business and IoT Performance Management** (Bosch; PI: Felix Wortmann)
- **Consumer barometer of renewable energy 2020** (Raiffeisen Switzerland, EnergieSchweiz; PI: Rolf Wüstenhagen)
- **Distributed Ledgers** (Siemens, Bosch, EnBW; PI: Kilian Schmück)
- **Future Rail Business Models** (SBB Forschungsfonds; PI: Christian Laesser and Stephan Reinhold)
- **Gender associations with electric vehicles as determinants of adoption** (Internal; PI: Jana Plananska)
- **How do we feel about flying? Exploring the role of implicit associations on travel mode choices** (internal; PI: Nathalie Dällenbach)
- **Increasing Willingness to Buy an Electric Car: the Added Value of Community Solar – An experimental investigation of product-bundling opportunities in Germany** (SCCER CREST and internal; PI: Alexander Stauch)
- **IoT Platform Economy** (Bosch; PI: Felix Wortmann)
- **Option Values in Public Transport** (internal; PI: Simon Kuster)
- **Scaling Smart City Projects - from Individual Pilots towards a Common Strategy of Industry Emergence** (SNF; PI: Oliver Gassmann)
- **SCCER Mobility – Customer and Investor Acceptance of Electric Mobility; B2: Integrated Assessment of Mobility Systems** (Innosuisse; PI: Rolf Wüstenhagen, Merla Kubli; in cooperation with ETH Zürich, PSI, SUPSI, ZHAW)
- **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/](https://www.smartcitylab.ch/home/barbara-bencsik/)
- **Sustainable aviation – a management perspective** (internal; PI: Alexander Stauch; in cooperation with CFAC-HSG)
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.es.unisg.ch/rem](https://www.es.unisg.ch/rem)  
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
Consecutive and executive education at UNISG

www.REMforum.ch inklusive #REMforum #MaCSHSG #GreenBagSeries:

(1) “The Role of Product Bundling to electrify post-COVID-19 urban Transport“
September 25, 2020 / Zoom => Video: https://youtu.be/y_zBXnupsGw
- Jana Plananska & Nathalie Dällenbach University of St.Gallen (workshop leaders)
- Judith Häberli Co-founder & CEO, Urban Connect, CH
- Stefan Büscher Product Manager E-Mobility, Repower, CH

(2) “Learning (not) to fly – Overcoming emotional Barriers to low-carbon Travel Choices“
October 23, 2020 / Zoom => Video: https://youtu.be/z7ZlJHKnlD8
- Nathalie Dällenbach & Jana Plananska, University of St.Gallen (workshop leaders)
- Susanne Görlinger ETH Zürich, CH
- Anna Hughes, Founder Flight Free 2020, UK

Hat die Zukunft der Mobilität eine Zukunft?
Amriswil, 18. September 2020
In Zusammenarbeit mit ThinkTank Thurgau, Denkraum Bodensee, Internationale Bodensee Hochschule, Universität Konstanz
https://denkraumbodensee.org/hat-die-zukunft-der-mobilitaet-eine-zukunft/


“From insight to impact”

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