



The goal for Sunday is to settle into ETH Week. You will meet your team members and exchange your personal viewpoints on the topic of mobility. Discuss your expectations and understand both the goals and the process of the week.

sunday
sep 8

12.00 — Registration and Snack at ETH Week Hall.

13.15 ◆ **OPENING ETH WEEK**
Welcome by our President Joël Mesot, Stephan Osterwald, Kerrin Weiss and Fabio Bargardi at ETH Week Hall.

14.00 ◆ **DESIGN CHALLENGE**
The Wallet—a demonstration.

↳ **Team building.**

↳ **STEEP Analysis.**

↳ **Template.**

↳ **Check out.**

18.30 — Dinner

19.45 ▲ **INSPIRATIONAL NIGHT**
Keynote by Claude Nicollier, hosted by Sarah M. Springman. Discussion followed by informal exchange at ETH Week Hall.

Dear participants!

Welcome to 'Rethinking Mobility', the fifth edition of ETH Week. This year, you and 200 students from over 30 countries and all across ETH Zürich will come together to work in interdisciplinary teams. Our aim is to design an inclusive and positive event, where you learn the state-of-the-art from professors and where professors learn from your critical attitude, enthusiasm and drive to rethink the world we live in today.

This year's ETH Week is organised in collaboration between ETH Sustainability, the SCCER Mobility, SparkLabs, the Chair of Technology and Innovation Management at D-MTEC, and our external partner SBB. As organisers, our role is to provide you with just enough structure to engage in a process that fosters creativity and critical thinking.

Creating a spirit of collaboration among a variety of different people is the foundation on which ETH Week rests. This set of workbooks contains those who had a part in making the fifth ETH Week possible. The short bios will introduce you to your Rector and President of ETH Zürich, to your tutors and facilitators, to the people running the event, to your professors and over 100 experts that join us during the week, and to us who designed the programme.



LUKAS BÜHLER holds a Master's degree in Atmospheric and Climate Science and founded the zero-waste catering startup "Zum guten Heinrich". Last year, he returned to his Alma Mater and joined ETH Sustainability to organise ETH Week and its follow-up programme "The Hatchery".



KONSTANTINOS BOULOCHOS holds a diploma from NTU Athens and a doctoral degree from ETH Zürich in Mechanical Engineering. During the last ten years, he became increasingly interested in modelling and optimisation of energy systems, including policy advice on energy and transport-related strategy development and implementation.



KIRSTEN OSWALD works in the management of the Swiss Competence Center for Energy Research - Efficient Technologies and Systems for Mobility (SCCER Mobility) and since 2019 she also coordinates the Master's programme 'Future Transport Systems' at ETH Zürich. She holds a doctoral degree in Environmental Systems Science.



ANNA MARIA STALLMANN is a cabinetmaker and architect from Germany. After finishing her Master's at ETH two years ago, she joined the ETH Week team as project coordinator and contributes with her passion for problem solving, crafts and design. In her free time she enjoys rooftop gardening, cycling, and swimming in the Limmat, close to ETH Sustainability headquarters.



GLORIA ROMERA is an Industrial Engineer by the ESII Carlos III, of Madrid, and specialised in Mechanics and Energy. She did a PhD at ETH Zürich at the Mechanical Department and worked as R&D Engineer at Sensirion AG. In May 2014 she joined the SCCER Mobility as Managing Director and helped to build up and coordinate the Swiss Competence Center of Energy Research dedicated to Efficient Mobility.



LINDA ARMBRUSTER holds a Master's degree in Strategic Design from the design akademie berlin. As Project Manager at Spark Works, a strategic human-centered innovation firm, she builds and leads inspiring research and advisory programs with interdisciplinary teams to tackle complex challenges in the private and public sector.



ALAN CABELLO LLAMAS holds a PhD from EPFL focused on human-centered innovation processes, having been a Visiting Researcher at Stanford's d.school. He is the founder of Spark Labs, an initiative with the purpose of teaching Design Thinking as an approach to innovation, as well as a Research Associate at ETH Zürich, and the General Manager for Adjoint in Switzerland, a blockchain technology company for Financial Services.



CHRISTINE BRATRACH is the Director of ETH Sustainability. Research and applied projects on the topic of sustainability as well as interactions with interest groups in business, politics, and NGOs have characterised her career. She has always loved to work in interdisciplinary groups of engineers, natural and social scientists during her doctoral studies in Environmental Science at ETH Zürich and before.



ANDREAS VATERLAUS is Professor for Physics and Education at ETH Zürich. In October 2012, he was appointed as Vice-Rector for Curriculum Development. In this role, he assists the Rector in matters related to curriculum development and innovation processes. He chairs the Teaching Commission.



STEFANO BRUSONI is Professor of Technology and Innovation Management at ETH Zürich. He holds a DPhil in Science and Technology Studies from SPRU at the University of Sussex, UK. Earlier, he worked as a firefighter, which he enjoyed tremendously. His research interests include the emergence of alternative product architectures, firm dynamics and modularity.



RETO KNUTTI is the Associate Vice President for Sustainability and Professor in Climate Physics at the Institute for Atmospheric and Climate Science at D-USYS. His research focuses on changes in the global climate system caused by anthropogenic greenhouse gases, like carbon dioxide. He is also a member of the Intergovernmental Panel on Climate Change (IPCC).

WELCOME SPEECHES AND THE ETH WEEK TEAM

Our President Joël Mesot will open the fifth edition of ETH Week. Elaborating on his view on interdisciplinarity as one of the most important keys to innovation, he welcomes you from your respective departments in the ETH Week Hall to collaborate and actively shape an ETH spirit of togetherness.

Fabio Bargardi and Kerris Weiss, our tutor trainers and both former tutors and participants, will share a personal story about what ETH Week has meant for them. They will tell you about their hopes of what you as participants of the fifth edition will gain from the process of just six days in critical thinking.

The members of the ETH Week team are in charge of implementing your day-by-day activities: the keynotes and expert inputs, the excursions, the knowledge fair, the panels, the feedback loops, morning sports programme and inspiration nights. They are also responsible for the first level support of the tutors, and the setup in the ETH Week Hall, including food and the invisible logistics that hold everything together.



JOEL MESOT grew up in Geneva and studied Physics at ETH Zurich, where he obtained his diploma and his doctorate in 1992 with a thesis on high-temperature superconductors. In 2008 he was named full Professor for Physics at ETH Zürich and EPF Lausanne, and became Director of the Paul Scherrer Institute (PSI) in Villigen. Since January 1, 2019 he is President of ETH Zürich.



KERRIN WEISS is in the last year of her Master's degree in Mechanical Engineering at ETH Zürich with a focus on Biomedical Engineering and Product Design. She sees ETH Week as an opportunity to engage and help others, to learn and to be challenged.



FABIO BARGARDI holds a Master's degree in Materials from ETH Zürich and is currently a doctoral student in the Complex Materials group studying Lithium ion batteries. He is a member of teampact, which is a group of students offering coaching sessions and focusing on ideation processes, project development, and team dynamics. In his free time Fabio likes swimming and paddling.



STEPHAN OSTERWALD is Head of Transport Economics, Statistics and Research Collaboration at SBB. Before that, he was consultant with Ecoplan, an economic research and policy consultancy. He holds a Master in Economics of the University of Berne. Within SBB he is responsible for the ETH Mobility Initiative: An initiative launched by ETH together with SBB to meet the numerous challenges of mobility.



RAPHAEL MEYER is an expert in Transport Economics and Statistics at the SBB Group Statistics. He holds a PhD in Science of the University of Berne. Being responsible for facts and figures at SBB he is actually not good in memorising figures. Look them up: reporting.sbb.ch



SIMON MOLLET has worked for several years in tourism and has organised group trips around the world. Now he is working for Compresso, a communication and event agency based in Zürich which supports ETH for different events. He loves to travel and explore hidden spots around the world such as the breathtaking nature in Switzerland.



IVRAINA BRÄNDLE holds a Master's degree in Food Science. She participated already two times in ETH Week, since she enjoyed the ETH spirit and the Critical Thinking concept a lot! This year she decided to join ETH Sustainability to support the coordination of ETH Week. In her free time she enjoys swimming in the Limmat and rock climbing.



ALEXANDRA BÜRGLER holds a Master's degree in Health Sciences and Technology. She is passionate about neuroscience and improving healthcare through technological innovation. A 2015 ETH Week alumna, she looks forward to contributing her energy and creativity to this year's edition. She loves learning, dancing, music and discovering new places.



ANDREA GERMANN has a background in tourism and started her career in Davos as a convention manager. After travelling the world she joined the corporate world by working for large financial companies based in Zurich. Andrea joined ETH Zürich last year and is fascinated by the variety of people working and studying here.



PIA AESCHLIMANN has worked for various international companies before joining ETH Academic Services seven years ago. People, cultures, celebration of differences and the joy in the little things are important to her. Pia is a mastermind when it comes to Excel. Since we realised this during the first ETH Week, we can no longer imagine the Info Desk without her.



EDDY SLOOF was born and raised in Holland, where he studied music and sound engineering. For 25 years he worked in the music business. He joined ETH Zürich three years ago and is responsible for the entire technology used at events. When he's not working you will find Eddy onstage behind his drums or in a recording studio.

RETHINKING MOBILITY

In our globalised world, we have taken mobility to another level: we have friends all over the world, we are flexible in where we live, work and spend leisure time, and studying in foreign countries has become commonplace. We eat exotic fruits produced on the other side of the planet and trade goods across continents, and most of these transactions involve very low economical costs.

However, we are beginning to face some of the unpleasant consequences of this approach. The growing demand for energy to fuel our mobile lifestyle is one of the leading causes of climate change. Some of its impacts, like rising sea levels and extreme weather patterns, are already blatantly obvious. If allowed to continue unimpeded, it may trigger devastating global effects. On a local scale, decreasing air quality, congestion and overcrowded trains and buses during rush hour are affecting our well-being. As we try to balance personal wishes and environmental impacts, we need to be aware that people from some parts of the globe are closely connected with the rest of the world, whereas others do not have access to reasonable infrastructure and transportation systems. In order to tackle growing emissions of greenhouse gases and pollutants, it is time for us to rethink mobility and find sustainable solutions.

What will mobility look like in the future?

How will we travel in 2050? How can we integrate spatial planning, new technologies and business models to meet people's needs more sustainably?

Let us dive in, react to these pressing issues and accept the challenge as a motivation to critically reflect and to shape a prosperous future.

CONCEPTUAL FRAMEWORK

We would like to structure this year's ETH Week along two main themes that represent future trends in mobility: **DECARBONISATION** and **DIGITALISATION**.

On Monday, Prof. Konstantinos Boulouchos will give an overview lecture. He will discuss major drivers for the evolution of various transport sectors, the interdependencies between demand for

mobility services and energy supply technologies as well as ways to minimise environmental impacts, in particular greenhouse gas emissions.

On Tuesday morning, we will delve into the two themes with input talks given by six lecturers and professors from ETH Zürich. The two main trends will each be covered by three presentations and structured along a conceptual framework that allows us to investigate them holistically, from single components to a systems perspective. In addition, all input talks will not only share the latest research findings and discuss upcoming research areas, but will also analyse the topics in terms of the following questions:

- How does this issue influence us on a personal level in everyday life?
- What are the conclusions for society (and the economy)?
- What are the environmental impacts?

DECARBONISATION

FUELS, EFFICIENCIES, MILEAGE: WHICH PATH TO CHOOSE?



CHRISTOPHER ONDER — D-MAVT
Institute for Dynamic Systems and Control

SUPPLYING FUTURE TRANSPORT WITH ENERGY



GIL GEORGES — D-MAVT
Energy Systems Group at
Aerothermochemistry and
Combustion Systems Laboratory

THE ROLE OF BATTERIES IN OUR ENERGY FUTURE



VANESSA WOOD — D-ITET
Materials and Device Engineering
Group

DIGITALISATION

CHALLENGES IN SENSING FOR AUTONOMOUS MOBILITY



MARGARITA CHLI — D-MAVT
Computer Vision for Robotics

DATA IN SERVICE OF INTELLIGENT AND SAFE MOBILITY



ELENI CHATZI — D-BAUG
Chair of Structural Mechanics
and Monitoring,
ETH Mobility Initiative

AUTONOMY FOR URBAN MOBILITY



EMILIO FRAZZOLI — D-MAVT
Institute for Dynamic Systems
and Control

GOOD TO KNOW

ETH WEEK HALL

The ETH Week Hall at Werkstadt Zürich is the central meeting place of ETH Week. It is the location for plenary sessions with all participants: the opening event and your final presentations, as well as input talks, panel discussions, and inspiration nights. The Hall is also the space where all ideas come together. During breaks or at the InfoBar in the evenings, there is plenty of time to meet other students, experts, guests or our team and exchange informally.

INFO DESK

The info desk is located in the entrance of the ETH Week Hall. We support you in case you have questions, e.g. regarding the organisation of the event, lost and found, access to the team spaces. You can subscribe here for the sports sessions.

TEAM SPACES

When working in your team, you will either be located in one of the rooms in 'Gebäude A,' or in ETH Week Hall itself. Either way, you will have basic office materials at your disposal ('team boxes') as well as additional material and tools you share with other teams ('prototyping boxes').

PROTOTYPING WORKSHOP

The workshop is located in the shed between ETH Week Hall and your team spaces. Material is provided for you. In order to keep costs under control and respect the environment, we kindly ask you to use these materials in a smart way. On Thursday you will have time to buy additional material at OFFCUT.

SPORTS FACILITIES

The sport sessions take place at 'Klub der Sportfreunde'. You can find more information related to our sports program on the following page. Meet in front of the sports centre at 6.50, classes start at 7.00.

HALLE D SÜD / is the official designation of the ETH Week Hall.

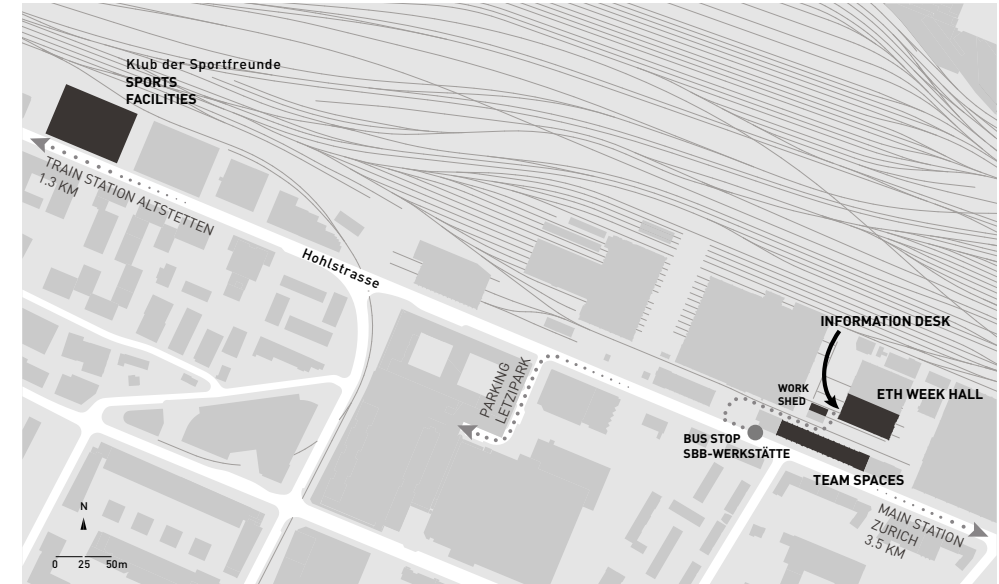
WIFI / only available at ETH Week Hall
login: werkstadt-halle-d
password: Mobility2019

HOTLINE / call the info desk using the following number:
+41 76 516 76 71.

BE RESPONSIBLE / please use the provided recycling bins for paper and PET. On Friday, each group is responsible to tidy up their space and recycle as much as possible!

IMPORTANT! / please bring back all tools from the shed by 13.30 on Friday! We need to dismantle the work benches at that time and bring them back to ETH. Make sure nothing is missing!

KLUB DER SPORTFREUNDE /
Hohlstrasse 506, 8048 Zurich.
Bus stop (Bus31): Luggwegstrasse



ETH WEEK HALL
Usually open: 7.30–23.00.
Closes during excursions on Monday (10.30–15.15).
Meet participants from other teams here during breaks and plenum events.

INFO DESK
Usually open: 8.00–20.00.
Opens at 12.00 on Sunday and closes during excursions on Monday 10.15–15.15. It transforms into the InfoBar at night (open end).

TEAM SPACES
Usually open: 7.00–23.00.

FOOD & WATER

A small wake-up breakfast with tea and coffee is ready in ETH Week Hall every morning before Kick-off.

For in-between snacks, go to the Energy Bar in the ETH Week Hall. You will find some fruits and other snacks to boost your energy levels during team work. We also provide you with a water bottle. Refill it at the Energy Bar or at any tap on or off Werkstadt Areal. The water is safe and delicious in Zurich!

On Monday you will receive a lunch bag on your way to the field trip, the rest of the week you and your team mates can help yourself at our lunch buffet. To foster informal exchange and so that we can all come together in the evenings, dinner is served in the ETH Week Hall. All food provided is either vegetarian or vegan. In case of allergies, please ask the catering staff.

BADGES

Please wear your ETH Week badge (including your student ID) at all times. The keychains are color coded.

SPORTS PROGRAM

Together with the ASVZ and Klub der Sportfreunde we offer sport sessions in the mornings, starting on Monday. You can choose to join the Cardiovascular Training (indoors) each morning. In addition, we offer Outdoor Sessions that borrows approaches from Jogging, Calisthenics, Streetworkout and Parkour. Meet in front of the sports centre at 6.50. Classes run from 7.00–7.45.

BREAKFAST / 7.30–8.30.

ENERGY BAR / available all day.

LUNCH / see daily schedule.

DINNER / usually: 18.30

WHERE / find the sports classes at Klub der Sportfreunde, Hohlstrasse 506, 8048 Zurich. Bus stop (Bus31): Luggwegstrasse. It's also the meeting point for the outdoor training, in front of the building.

SIGN UP / the sports programme has a limited amount of places and requires a subscription at the Info Desk the day before!

EMERGENCIES

In case of an emergency, inform the info desk directly or call the ETH Week hotline (+41 76 516 76 71). In case of urgent emergencies, call directly: ambulance (144), police (117), or fire brigade (118). Please immediately inform the Info Desk afterwards.

INFOBAR

On most nights, the Info Desk transforms to the so called InfoBar, where you can tie up the loose ends of the day and meet the students of the other teams. You can purchase alcoholic and non-alcoholic drinks there. Only guests with an ETH week badge can obtain drinks at the bar. Payments in cash only.

LAPTOPS

You are welcome to bring a laptop or tablet device. However, it is not necessary for all group members to bring one. Please note that you are responsible for your valuables.

PRINTING

Next to the info desk will be a basic printing station, just download the driver and print your PDF documents. Keep printing to a minimum please.

CREDIT POINT

To receive one credit point (1 ECTS) you must take part in the core program of ETH Week in full (8.30–18.30) and be present during the final presentation. Please subscribe for the course 701-0901-00L on mystudies.

DRINKS / available at the InfoBar.

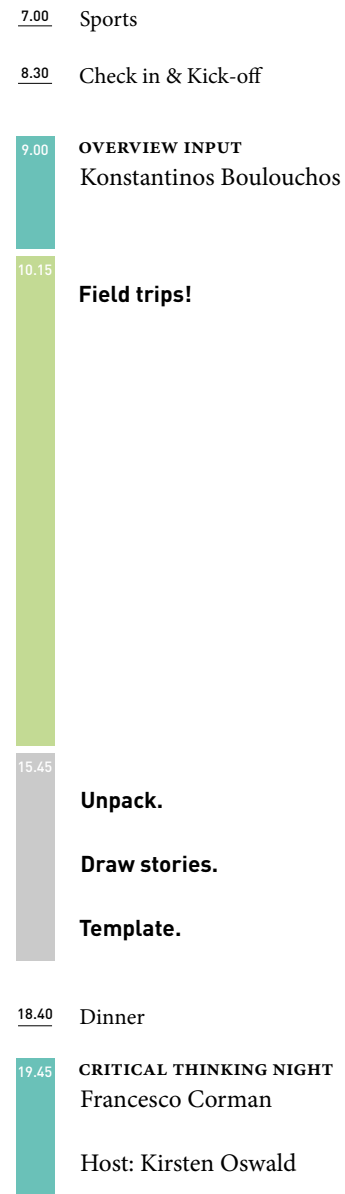
**sunday
sept 08**

↘
meet



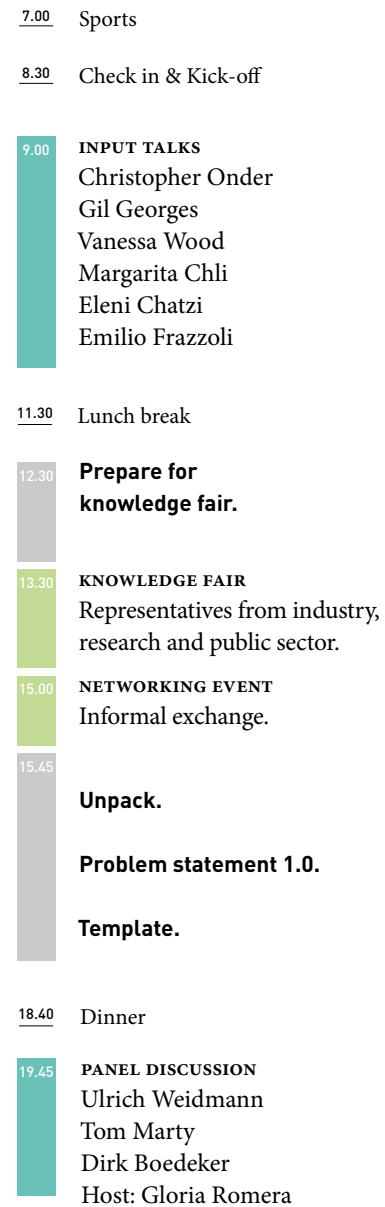
**monday
sept 09**

↘
experience



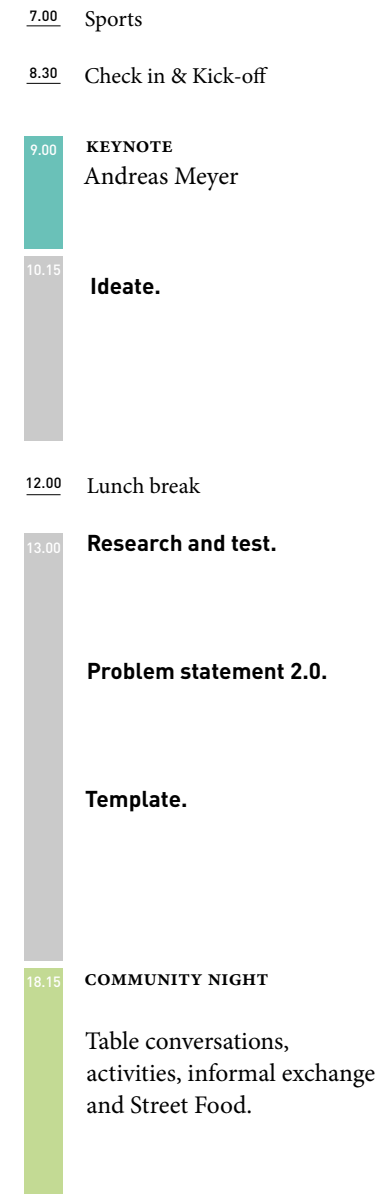
**tuesday
sept 10**

↘
funnel



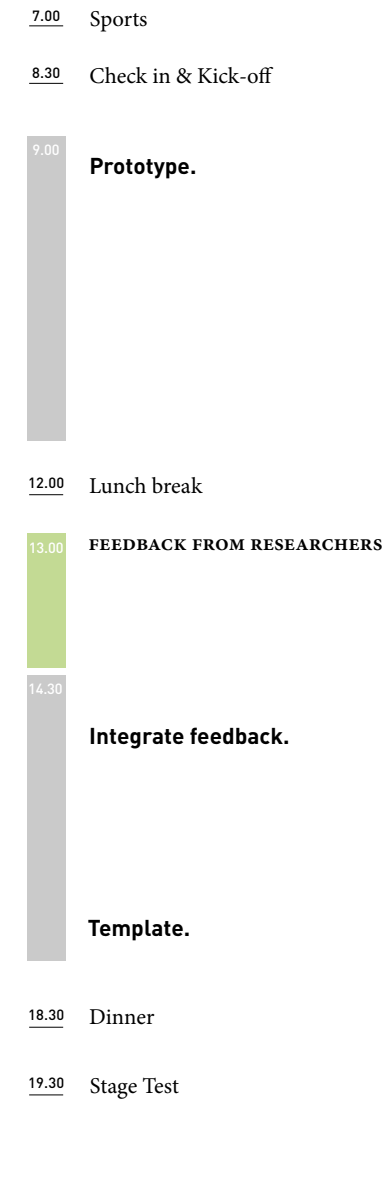
**wednesday
sept 11**

↘
refine



**thursday
sept 12**

↘
test



**friday
sept 13**

↘
communicate



THE TUTORS

The goal of ETH Week is to embed your learning processes in real-life problems. Your work will be self-directed to exercise your ability for problem solving. Your team will be accompanied by a tutor who is familiar with the different steps that you are expected to complete. He or she will explain if tasks are unclear, and will encourage constructive teamwork and team-forming processes.

The two tutor trainers Kerrin and Raphael have been coached by the administrative department Educational Development and Technology (LET) to become responsible for the tutor training program. They were tutors at several previous editions of ETH Week and they know the challenges the tutors face quite well. During ETH Week, they will be present to assist and supervise.



KERRIN WEISS holds a Master's degree in Mechanical Engineering from ETH Zürich and currently pursues her doctoral degree at pd|z Product Development Group Zurich. She sees ETH Week as an opportunity to engage and help others, to learn and to be challenged. In her free time she is a Coach at teampact and ARIS and enjoys reading and yoga.



FABIO BARGARDI holds a Master's degree in Materials from ETH Zürich and is currently a doctoral student in the Complex Materials group studying Lithium ion batteries. Fabio is an experienced facilitator of design thinking workshops and is looking forward to this year's challenge of training and coaching the tutors. In his free time Fabio likes swimming and paddling.



ADAM BUFACCHI grew up in Holland, studied Architecture in the UK and is currently a Master's student in Integrated Building Systems. There he works to make construction more sustainable by promoting low carbon timber housing as well as researching 3D printing with waste products. Adam is looking forward to engage in creative and cooperative work to take on the challenges of society.



CHRISTOS GOUNTIS grew up in Greece, went to Germany for his Bachelor's degree in Mechanical Engineering and now studies for his Master's degree from D-MTEC at ETH Zürich, while still carrying the Robotics flame inside him. He loves Zurich and Switzerland, and wants to travel the world before he turns 35!



DANIEL REICHMUTH is a Master student in Mechanical Engineering. He likes to help people, which is one reason he is keen to use his expertise gained throughout his studies in the biomedical side of engineering. Besides his studies, football, which consumes a large part of his free time, is probably his biggest passion.



ALEKSANDRA KIM is a doctoral student in Environmental Engineering at ETH and Paul Scherrer Institute with a background in robotics. Her current focus is on sensitivity and uncertainty analysis. She dedicates her free time to learning how to play piano and planning when to learn German. She enjoys reading science fiction, classical literature and math books.



CYPRIEN HÖLZL holds a Master's degree in Civil Engineering and is now doing his doctorate at SBB and ETH. Here he analyses the dynamic interaction of trains and tracks to monitor the condition of the infrastructure. For him, ETH Week is a good opportunity to work with students from different fields and with different ways of thinking.



EVA-MARIA MANZ is a Master student fascinated by Biology, specialising in Molecular Health Sciences. After participating in last year's event, she decided to come back as a tutor to ETH Week 2019. It's just difficult to say no to a good challenge. So grab some post-its, start walking and let the brainstorming begin!



ANN-CHRISTIN KERL studies for her Master's degree in Chemistry at ETH Zürich. She is a passionate swimmer and enjoys exploring the Swiss Alps while hiking. After being a participant of ETH Week 2017, she is now excited to return as a tutor this year.



DANIEL FLAVIÁN BLASCO is a Spanish Physics Master student at ETH Zürich, focused on experimental Condensed Matter research. For him, ETH Week is an ideal opportunity to combine scientific knowledge and Critical Thinking in a multidisciplinary way. He describes himself as an enthusiastic troubleshooter and enjoys travelling, cooking, skating or simply chilling by the lake.



IRENE HANKE holds a Bachelor's degree in pharmacy from ETH Zürich and is now starting her Master's studies. She is involved in local and international pharmaceutical student associations. She is looking forward to spending a week with students from different backgrounds. Dancing is her favourite activity to find balance.

MORE TUTORS



JOEL ZEDER obtained a Master's degree in Atmospheric and Climate Science and now continues as doctoral student with a focus on climate extremes. In his free time he teaches kids lifesaving and basic first-aid skills. Joel is eager to see diverse teams rethinking the concept of mobility in the 21st century, in itself a very interdisciplinary problem.



KLARA UHER is from Austria and started her Master's studies in Physics last year at ETH. She participated in ETH Week 2018 and enjoyed meeting people from different scientific backgrounds. She is friendly, open minded and (some say) funny. She is looking forward to sharing the ETH Week experience with other people and cannot wait to see your ideas thrive.



LINO CEREGHETTI grew up in Zurich and took a two-year break from academia after completing his Biology Bachelor's to gather various work experiences in Switzerland and abroad. Currently he is enrolled as a master student at the Institute of Agricultural Sciences and works at a start-up with his true passion, cannabis.



KEEGAN MCNAMARA is a Master student in Physics at ETH, with his main interests lying in Theoretical and Computational Condensed Matter. He moved from Australia to Switzerland for his studies, as well as for the gorgeous mountains. In his free time he likes to hike, ski, climb, or have a BBQ with friends by the lake.



LAURA GUERRINI is a Master student in the Department of Mechanical and Process Engineering at ETH Zürich, pursuing a Master in Robotics, Systems and Control. Laura enjoyed participating in three ETH Weeks and is now looking forward to being your tutor. In her free time, you can find her on the ice, synchronized skating with her teammates.



LOUISA BUTTSWORTH is a Master student in Process Engineering with a focus on renewable energy technologies. Besides this she is fascinated by topics in Medicine and Psychology. In her free time, she enjoys organising nature-themed events for children, swimming and baking.



LEONARD ZOUREK is an Austrian-Belgian Master student of Environmental Sciences with a focus on biogeochemistry and pollutant dynamics. He is particularly interested in problems at the interface between science and society, and enjoys working in diverse teams. In his spare time he passionately learns languages, plays music, discusses global politics, and cooks.



MICHAEL LIEM holds a Master's degree in Mechanical Engineering from ETH Zürich. He is a doctoral student at the Institute of Fluid Dynamics studying sub-surface flows. In his free time, Michael plays Volleyball at ASVZ and hikes through the Swiss mountains. He is a founding member of 'teampact', ETH's student network for team coaching and innovation processes.



NICOLE AEGERTER holds a Master's degree in Materials and is currently a doctoral student at CMASLab at ETH. Her doctoral project focuses on the manufacturing of thermoplastic composites for lightweight structural applications. In her free time, Nicole coaches an Unihockey team and enjoys outdoor activities like biking, running and mountaineering.



PATRICK ALTHAUS is a Swiss Master student at D-ITET, specialising on railway systems and power transmission. Prior to his Master's, he worked as an intern in the railway industry. He is convinced that ETH Week is a great opportunity to derive new ideas and tackle the problems of growing mobility.



SARA CERAR is from Slovenia, where she graduated in Conservation Biology. For a year, she studied Ecology in Portugal and now settled in Zurich to pursue a Master's degree in Environmental Sciences. Sara enjoys balancing the scientific nature of her studies with singing in a choir and jewelry making. In addition, she keeps a little beehive on her terrace.



NOËMI KAUFMANN is a material scientist at ETH. Enthusiastic about technology driven innovation and entrepreneurship, she believes that we can still shape our planet towards more sustainability. Her evening hours are filled with music and food. She is a passionate classical solo singer, plays the harp since the age of 6 and enjoys exotic flavours.



PRABHATH JOSHI comes from Nepal and is currently pursuing his Master's degree in Environmental Engineering at ETH Zürich. He previously worked as a Research Assistant in Bangkok and Kathmandu. He considers ETH Week as a great opportunity to work in a diverse group, and a good platform to promote systemic problem solving.



SIMONA MEILER is a Master student at D-USYS with a focus on Environmental Physics. For her thesis she uses modeling to determine the frequency, intensity and recurrence of ocean oxygen extremes in Eastern tropical Pacific. Prior to investigating marine extreme events, she was representing Switzerland in an "extreme" sport (Snowboardcross) at X Games and other top level competitions.



SAIJOSCHA HECK studied Physics in Frankfurt, Heidelberg and Berkeley and is now pursuing his doctorate in Physical Chemistry studying ultrafast electron processes in molecules. Outside the lab Saijoscha spends his time with various outside activities such as climbing, snowboarding and surfing, or enjoys reading a book in one of the many cafes in Zurich.



TANMAY SINHA is a doctoral student at ETH Zürich. He is interested in designing educational interventions to help students acquire soft skills like learning from failure and curiosity. Tanmay has investigated learning-related phenomena using online interaction and face-to-face data. Off work, he appreciates hiking and drinking good whiskey.

Team-building.

We have set aside time for you to get to know the people you will work with over the course of the next six days. Your tutor has prepared this initial team-building session. He or she will make sure that you become familiar with working in an interdisciplinary group setting. Take this time to learn about your different backgrounds, experiences, and motivations for joining ETH Week.

During the week, you will need to collaborate closely, take decisions together, share tasks, coordinate, and produce a presentation by Friday afternoon. This will be challenging. The role of the tutor is to help you navigate through the different phases of the team process so that you can eventually become a well-functioning team. A first step to becoming this team will also be your first decision: You must select a team name.

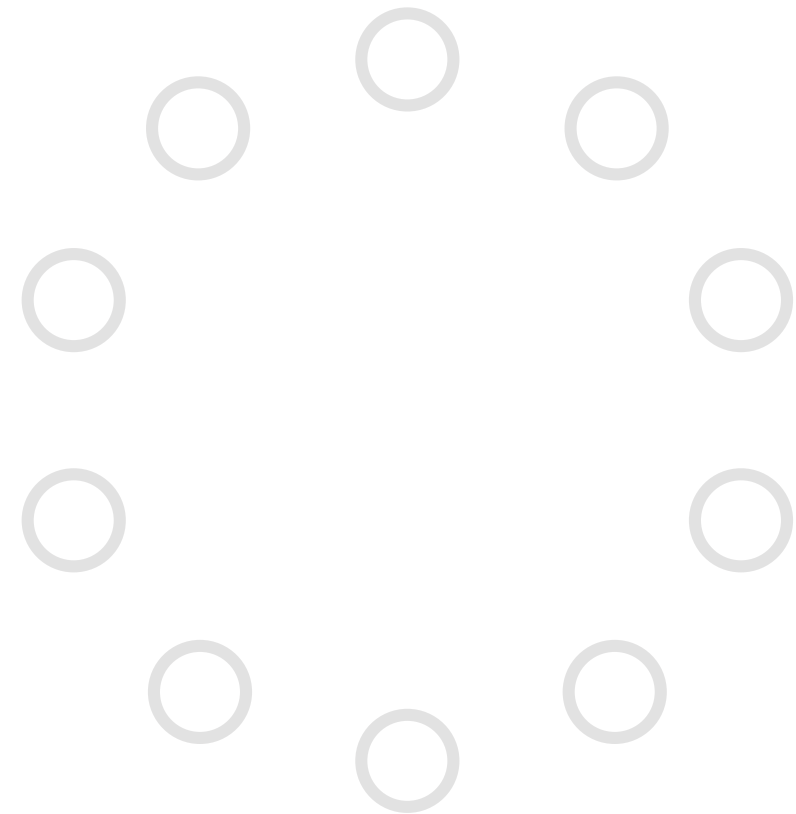
ROLES / During the week, you will take on different roles within the team. If your contribution actively reflects that role, that will make it easier for the team to grow together. There are also different task-related roles that you may distribute, such as: moderator, timekeeper, documenter, photographer, note-taker, mood encourager, etc. Try to rotate regularly and clarify who has which role.

× NOTE

This workbook is designed with plenty of white space for you to make it yours, to take notes and to keep track of what you judge to be important during the week. Some hints for how to fill this page:

- Who is who? Can you remember all the names of your team mates?
- What is your team name?

sunday
15.45
TEAM SPACES



Pick a name

THE BRIEF

The curriculum of ETH Week brings together elements from research and design thinking to solve real-world problems. As a team, you will go through a number of steps that urge you to think outside of the boundaries of your discipline. One goal of ETH Week is to provide a safe environment that encourages free-spirited critical thinking, while building on the scientific research tradition as an essential foundation for bringing responsible solutions to problems.

Instead of handing you a problem to solve, we ask you to define your own challenge, to frame a problem that you identify within the topic of 'Mobility'. On the next page, you will find 'the brief', your task for the week. Every step of the way will bring you closer to finding answers to its three points.

The focus will not be on finding a compelling solution, but on defining a good problem, as mentioned in point (1). You will start with a first definition on Tuesday and improve it on Wednesday and Thursday. As you move through the week, you will deepen your understanding so that you can formulate a more and more concise 'problem statement'

Point (2) is related to learning how to explain something complex in a simple and compelling way, so that your audience can understand why your work is relevant and how the problem you define is actually solvable in the real-world context.

Last, point (3) gives you guiding questions to help you reflect your ideas critically, based on the scientific research tradition of ETH Zürich.

× NOTE

Refer back to this page regularly throughout the week. Make sure you remain on track and use it as a guide during your creative process.

1. Define a problem statement that describes the challenge you want to address. It needs to be linked to a Swiss actor and to one of the six subtopics of the ETH Week concept (which will be introduced to you on Monday and Tuesday morning at 9.00).
2. Tell an inspirational story that explains where your ideas come from, why your problem statement is relevant and what a possible solution could look like.
3. Critically reflect your ideas by answering the following questions:

SCIENTIFIC RIGOUR

- What are your underlying assumptions?
- What facts and figures did you rely on?

FEASIBILITY

- How feasible is your solution?
- Are there uncertainties related to your solution that would need further clarification?

SYSTEMS THINKING

- How is the problem embedded in the ecological, societal and economical context?
- What are the implications and tradeoffs of your solution?

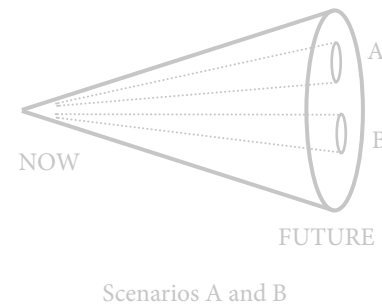
↘ STEEP Analysis.

Enter the topic: Mobility. We want you to build on the knowledge and the perspectives available within your team so that you can learn from each other. We do this by going through a small **STE**EP Analysis, i.e. by looking at the **S**ocietal, **T**echnological, **E**conomic, **E**nvironmental and **P**olitical dimensions of current trends and drivers that you associate with 'Rethinking Mobility'. In this way, we start to build on the knowledge, motivations and interests of your team.

The future is difficult to predict, especially if we are looking at a time horizon further down the road. Therefore, futurists generally develop different scenarios that depict different possible futures, to widen their perspective. Based on your identified trends, you will create two visual scenarios.

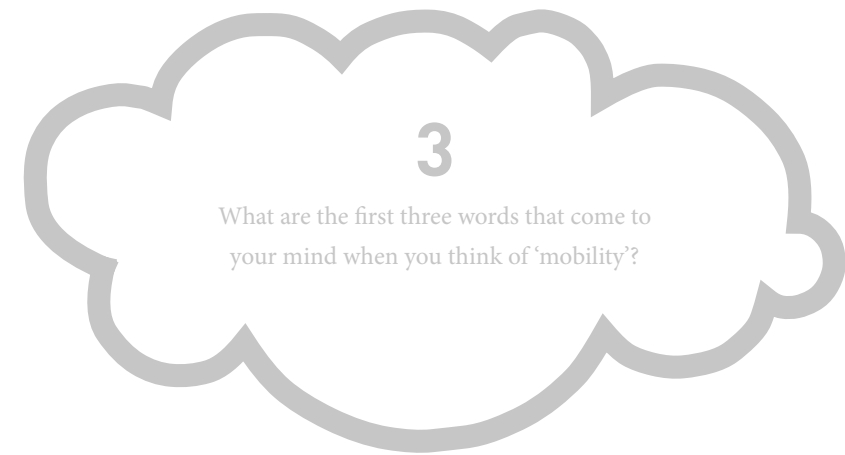
DOCUMENTATION / At the end of every day, you will fill in a daily template. We call this last step of the day 'Template check out'. Start by tidying up your workspace. Make sure that the results of your discussions and your ideas are clearly documented on the pin boards for the next day. Add structure and remove everything unnecessary. Also, make sure there are no documents lying on the floor, as this is related to respecting your work.

Your daily template is basically the essence of your day. It reflects what is pinned up in your workspace, documents your process, and contains the main results. We give you instructions for how to fill each template at the end of the day. When it is complete, you will hang it on your process wall in the ETH Week Hall. It will remain there until the end of the week. The process walls are public so that ideas can flow and build on each other, and to foster informal discussions between you and students from other teams, experts and guests of ETH Week.



× HEADS UP

Sign up before 20.00 at the Info Desk for tomorrow's Cardio training or the Outdoor session.



↘ Template.

Your first template will contain the two scenarios of the STEEP Analysis exercise. It highlights the team-building goals of the day: to familiarise yourself with the interdisciplinary group setting and to build on and discuss your own experiences, values, and perspectives.

EXPLORING SPACE

We have been exploring and utilising space since the launch of Sputnik 1 in 1957. This was followed by important milestones such as: the first man in space in 1961 and the first steps on the Moon in 1969. From 1981 until 2011, we witnessed the operation of the first manned reusable spaceship, the Space Shuttle. It was used extensively for the assembly of the International Space Station, which was completed in 2011 at the same time as the shuttle fleet was retired. In the more recent years, we have seen a significant rise in the activity and capabilities of private companies in spaceflight.

Access to space has brought us many very useful applications in communication, precise navigation, observation and monitoring of Earth and weather systems. It has also opened up a huge and very valuable base for scientific research in various disciplines, in particular in astronomy and solar physics.

This lecture will focus on astronomical research from space, specifically on the exploitation of the Hubble Space Telescope in Low Earth Orbit, as well as on the exploration of the solar system using probes, robots and rovers. The maneuvering of space systems and clever use of orbital mechanics are essential to accomplish rendezvous in space and long journeys in the solar system to reach remote destinations. The applied techniques and the results will be presented in this lecture.



SARAH M. SPRINGMAN is the Rector of ETH Zürich and Professor of Geotechnical Engineering. She studied soil mechanics at the University of Cambridge, then embarked on a career in industry before returning to Cambridge, where she earned her PhD and established an academic career. She also represented Great Britain as an athlete from 1983 to 1993, winning 20 elite European Triathlon Union (ETU) Championship medals in triathlon and duathlon.



CLAUDE NICOLLIER was originally trained and active as an astrophysicist (Universities of Lausanne and Geneva), and was a pilot in the Swiss Air Force. He was selected in the first group of ESA astronauts in 1978, and assigned to the NASA Johnson Space Center in Houston for Space Shuttle training. He flew on four Shuttle missions as a Mission Specialist in the nineties, including two repair missions of the Hubble Space Telescope. He is currently a member of the Swiss Space Center based at EPFL and teaches a course on Space Mission Design and Operations.



Your projects start tomorrow. Stay tuned.

Our follow-up programme:

ETH Week - The Hatchery

Would you like to take the next step? During ETH Week you will go through a process that begins with the search for a relevant problem to be solved and ends with a mock-up prototype of your solution. We don't want you to stop there, but take you a step further!

After ETH Week, we will launch a new version of the follow-up programme: over the course of 10 weeks, we will support you in developing your idea into a functional prototype that you can show and test with potential implementation partners. Bring your solution to life, be it as a research project, a start-up or even your future doctoral thesis.

On Wednesday morning, the two organisers (Moritz Mussnug and Michael Augsburger) will give a brief overview of the programme. They will also participate in the Community Night so that you can get in touch with them directly. If you have any further questions, please contact michael@sparkworks.ch.



The goal for Monday is to dive into the topic of mobility, and to get an overview of its complexities and opportunities. You will build empathy for a range of actors you meet during the field trips, and discuss stories that include your personal interpretations. In the evening, we will build a foundation for your critical approach to the topic.

- 7.00 — Cardio training and Outdoor session at Klub der Sportfreunde.
- 8.30 — Arrive at Process Walls in the ETH Week Hall.
 - ↳ Check in.
- 8.50 — Kick-off at ETH Week Hall.
- 9.00 ◆ **OVERVIEW INPUT**
'Rethinking Mobility' by Konstantinos Boulouchos.
 - ↳ Field trips!
- 15.30 — Return to ETH Week Hall.
 - ↳ Unpack.
 - ↳ Draw stories.
 - ↳ Template.
 - ↳ Check out.
- 18.40 — Dinner
- 19.45 ▲ **CRITICAL THINKING NIGHT**
Keynote by Francesco Corman,
Discussion followed by informal exchange at ETH Week Hall.

↘ Check in.

We have structured the week so that each day has a specific focus and that at the end of each day, you will document your results. The results of Sunday are visualised on the Sunday template on your process wall in the ETH Week Hall. The templates will also function as a roadmap for the whole week. Every morning you will meet there, look back at the previous days and plan the day ahead together with your tutor.

SELF-REFLECTION / The notion of self-reflection is linked to critical thinking. It covers the ability and willingness to understand how your own values influence your communication. This enables empathy, which is the willingness (and capability) of understanding other people's viewpoints. When you understand where you come from, and you are able to critically reflect on how your judgement is affected by your background, your mind should also be flexible to accept the different perspectives of other individuals. While you do not have to agree with the standpoint of the other individual, at least you should be able to see where they are coming from (or be willing to do so), and thus support a fair and rational communication, laying the groundwork for a positive and productive working process.

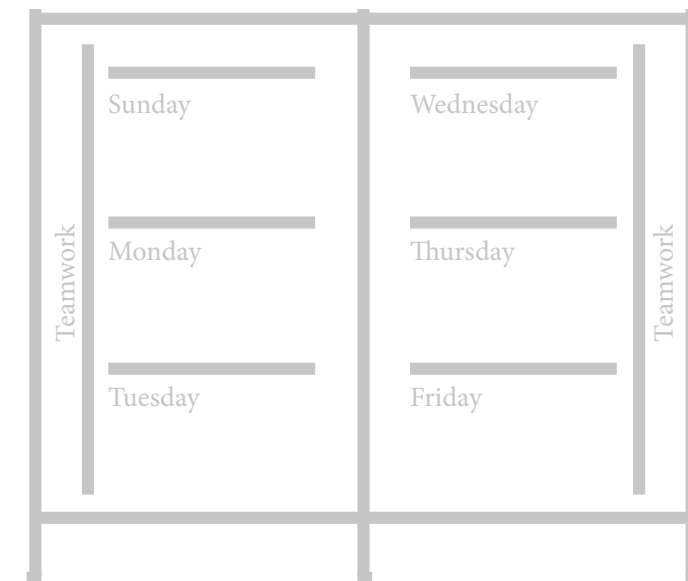
THE TWO THEMES / we structure the topic 'Mobility' along two main themes, representing future trends in mobility: **DECARBONISATION** and **DIGITALISATION**. The two main trends will be covered by three input talks each and structured along a conceptual framework that deals with the full range from single components to a systems perspective. This will enable us to get a holistic understanding of the topic as well as comprehend the interdependencies between the different subtopics. With this interdisciplinary approach, we aim to allow key challenges and opportunities to be identified, thereby empowering us, as a community of responsible citizens, to proactively shape the future of mobility.

× NOTE

This slot repeats every day. Walk to your process wall before Kick-off, where you will meet your tutor. Please be on time every day!

monday
8.30

ETH WEEK TENT



Process walls

◆ OVERVIEW INPUT

On Monday, we will start with a comprehensive overview of this year's topic. Konstantinos Boulouchos will elaborate on the structure of the concept and provides you with a foundation for the week.

RETHINKING MOBILITY

Mobility is central to our everyday lives, and it is hard to imagine a modern-day world without the ability to travel freely. The possibility of moving people and goods without limits is tied closely to economic growth and prosperity in Switzerland, in the EU and worldwide. However, this comes at a price: The transport sector is one of the major sources of greenhouse gas (GHG) and pollutant emissions, resulting in serious repercussions for the environment and the climate.

The unpleasant effects of global warming are already becoming evident, and if climate targets are taken seriously, we have to act now! In practical terms, fulfilling the Paris Agreement, which most nations of the world committed to in 2015, means that by the year 2040 the transport sector should be decarbonised, meaning virtually free of GHG emissions.

DECARBONISATION is not an easy task, considering that passenger and freight transport as well as the different transport modes (road, rail, air, maritime, private or public) have very diverse requirements in terms of fuels and infrastructure. Furthermore, each satisfies distinct needs, so that there is no fix-all solution. This makes climate-neutral and environment-friendly transport one of the great challenges facing society today.

Mobility and transport can be broken down into a chain of interrelated factors from mobility services, mode and vehicle choice, behaviour and driving patterns to technological aspects (vehicle efficiency, powertrains, energy carriers, primary energy source and infrastructure). Measures to achieve DECARBONISATION can act on these individual factors and rely on reducing demand, improving efficiency or replacing fossil fuels. DIGITALISATION and

× HEADS UP

Please make sure to pick up your lunch bag opposite the Info Desk before heading to the meeting point for the excursions. Please only take the vegan option if you specified so during registration. All buses and some public transport options leave at 10:15 sharp in front of ETH Week Hall.

interconnected mobility can be important enablers, especially for improving the overall efficiency of mobility systems. However, interconnected mobility in particular may lead to so-called rebound effects, where the benefits are outweighed by behavioral or systemic responses (e.g., more people have access to mobility, causing demand to increase).

What is more, transport is not isolated, but embedded in the overall energy system. This will become increasingly important with widespread implementation of electric mobility and alternative fuels (hydrogen or synthetic gas), which will be based on renewable sources of electricity. Given the fluctuating nature of renewables, long-term energy storage solutions will become increasingly necessary. It is important to keep in mind that the overall energy system will also have to be GHG-free to reach climate goals and has to supply not only the transport sector, but also all other end-use sectors (including manufacturing, buildings and private consumption). Thus, synergies and conflicts will arise on various levels.

This calls for an overarching and coordinated design of the mobility and energy system. Coherent policy and fair pricing are essential and urgent conditions for achieving this. Policy will have to address some major challenges and questions:

- We are running out of time.
- We need to invest huge amounts of money quite early and get the reward a few decades later.
- Thus, who will orchestrate the necessary “grand transformation”, and how?

monday
9.00

ETH WEEK HALL



KONSTANTINOS BOULOCHOS holds a diploma from NTU Athens and a doctoral degree from ETH Zürich in Mechanical Engineering. After a postdoctoral stay at Princeton University, he joined ETH Zürich as Research Group Leader at the Institute of Energy Technology. In 1995 he became Head of the Combustion Research Laboratory at PSI, and in 2002, he was appointed Full Professor at ETH Zürich. During the last ten years, he became increasingly interested in modelling and optimisation of energy systems, including policy advice on energy and transport-related strategy development and implementation.

↘ Field trips!

During ETH Week, the problems you will try to solve are most probably not your own. They are also set in a real-world situation. You will define a problem within a complex system of actors and an existing environment of ideas and mindsets.

Today, you will join students from other teams to go on a field trip. This is a chance to link the overview talk of this morning to a specific context. Keep an open and critical mind and pick another student so that you can work in pairs.

On the field trips, we ask you to engage with real-world partners by formulating your own questions, from the electricians who work on site to the CEOs or politicians who take high-level decisions. We want you to put yourself into their shoes and understand what is important to them, the way they think, and the values they hold. A deep understanding of people will help you find better problems to solve. This is called empathy, and it will give you a fresh perspective on the world around you. Without empathy, your mind will automatically filter out information without you realising it.

On your way back, you will translate your experience into a story that others can relate to.

× HEADS UP

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon for a brief telephone call (between 13:00 and 16:00).

monday
10.15

LATEST DEPARTURE FROM
ETH WEEK HALL

Build rapport.

Shift the focus to the actor and offer something of yourself.

Seek stories.

Learn about what he or she does, and more importantly thinks and feels.

Ask why?

What opinion made them take a decision, why it is it important to them?

HOW TO INTERVIEW

You will start by directly observing what people say and do, what challenge they are trying to solve, and how are they solving it. Then you will move on to infer what they think and feel. We offer a simple scaffolding as guidance: what? how? why?

It is a tool that helps you advance to deeper levels of observation, moving from the concrete and obvious to the more complex and inferred. Start by documenting the facts and descriptions and ask: 'what?' 'how?' - Then move on to the inferences. Ask 'why?'. You will need to evaluate the answers and use your own judgement. We want you to become comfortable with taking your own decisions. Be critical and put things into relation with the bigger picture discussed during the first talk in the morning.

Some tips on interviewing:

- When interviewing people, don't suggest answers to your questions. Even if they pause before answering, don't help them by suggesting an answer. This can inadvertently get people to say things that agree with your expectations. Ask questions neutrally.
- Don't be afraid of silence. Often, if you allow there to be silence, a person will reflect on what they've just said and say something deeper.
- Look for inconsistencies. Sometimes, there will be discrepancies between what people say and what they do (or say later). Probe these contradictions, but do so gracefully.
- Stay on the same path of a question. Respond to what your interviewee offers and follow up to go deeper. Use simple queries to get him to say more. Ask 'why?'

× NOTE

Use this scaffolding to move beyond facts and observations to inferences and interpretations.

what

is the expert trying to solve?
the facts

how

are they solving it?
the emotions and the techniques

why

are they doing it in this way?
your inferences

#1

CARROSSERIE HESS AG, BELLACH

E-Mobility for city buses made in Switzerland

Carrosserie Hess AG was founded in 1882 and has been family-owned for five generations. The headquarters in Bellach employs around 300 people and 25 apprentices. Hess was awarded the Watt d'Or in 2008, 2015 and 2018 by the Swiss Federal Office of Energy in the category of energy-efficient mobility together with the ETH institute IDSC for their hybrid electric bus (AHEAD). By replacing diesel-powered buses with Hess LightTram buses, bus companies around the world could save around 100 tonnes of CO₂ per year and vehicle, irrespective of trolley (DC), oppcharge (OPP) or flash charging (TOSA) technology.



NICOLAS AMACKER works as a development engineer in a new team at Hess specialising in the development of the traction system. He works at Hess on projects such as data monitoring, hardware requirements engineering and research projects with Swiss universities. Nicolas Amacker holds a Bachelor's degree in Automotive Engineering and has gained professional experience at bus manufacturers and operators.

#2

ESI PLATFORM (ENERGY SYSTEM INTEGRATION), PAUL SCHERRER INSTITUTE, VILLIGEN

Low-carbon fuels from renewable energy

The Paul Scherrer Institute, PSI, is the largest research institute for natural and engineering sciences within Switzerland. It performs world-class research in three main subject areas: matter and material; energy and the environment; and human health. We work on long-term solutions for major challenges facing society, industry and science. One of the more applied projects in Energy Research is the Energy System Integration (ESI) Platform, a real life demonstration comprising multiple energy conversion and storage system at PSI. It offers researchers and industry an experimental platform where promising approaches can be tested in all their complexity. The aim is to reduce the mismatch of energy supply and demand, and to decarbonise the energy system by producing low-carbon alternative fuels.



PETER JANSOHN is Head of the Energy System Integration (ESI) Project at the Paul Scherrer Institute (PSI). He is a Chemical Engineer by training and has been with ABB and Alstom before joining PSI in 2003. The ESI project comprises various activities (e.g. electrolysis, fuel cells, methane synthesis) and operates a demonstration platform in the 100kW scale.



JÖRG ROTH Deputy Head of the Division Energy and Environment at Paul Scherrer Institute and Managing Director of the Swiss Competence Center for Energy Research 'Heat and Electricity Storage'. He holds a diploma in Technical Chemistry and a doctoral degree in Mechanical Engineering. His professional life was dedicated to hydrogen and fuel cell technologies early on, with 10 years of experience in fuel cell development in automotive industry.

#3

POLICY IN URI, ALTDORF

Opportunities and challenges on the alpine transit axis

New transport infrastructures such as the Gotthard Base Tunnel (NEAT), the capacity expansion of the Gotthard road tunnel or the cantons new railway station in Altdorf offer many opportunities, but also involve a number of risks.

We have invited two local politicians who deal with mobility issues at the communal, cantonal and national levels. Learn from these experts how politics works and how local communities are affected by large-scale mobility projects.

Imagine you would live in Altdorf. How would you feel about living next to a major European transit axis? What would you like to know from the politicians you elected?

After two short presentations, you will directly discuss with the two politicians.

This excursion will be held in German.



URS KÄLIN is mayor of Altdorf, Uri. He holds a PhD in History and works as Deputy Director of Swiss Social Archives in Zurich. He is an author of numerous publications on social and economic history, especially on the early modern period and the history of the labor movement and work in the 19th and 20th centuries.



HEIDI Z'GRAGGEN is a member of the cantonal government of Uri. She holds a doctorate in Political Science. In the canton of Uri, she is responsible for spatial development, which is strongly influenced by international traffic transit. Heidi Z'graggen was President of the 'Zentralschweizer Vereinigung für Raumplanung' and is President of the 'Eidg. Natur- und Heimatschutzkommission'.

#4

GOTTHARD BASE TUNNEL, ERSTFELD

More than just another hole in a mountain: The longest railway tunnel in the world

The Canton of Uri has always been a transit canton. Since the Middle Ages, goods and passenger traffic via the Gotthard Pass have been an economic factor and shaped the local society. Almost one million trucks pass through the Gotthard road tunnel every year. In 2016, after 17 years of construction, the new Gotthard Base Tunnel (NEAT) was opened reaching 57 km in length – the longest railway tunnel in the world.

A window in the tunnel gives you a direct view of the passing trains. Learn a lot about the spectacular construction of this structure of the century from your guide and in the exciting exhibition.



CHARLY SIMMEN joined the AlpTransit project in 1996, at that time as Project Manager Coordination with tasks over the entire Gotthard Base Tunnel, in contact with the authorities of the three siting Cantons and the various municipalities. With the start of construction in November 99, he led the 'gravel works' and 'materials logistics' departments as Project Manager for Materials Management. Since May 2008, he has been the site manager for railway technology, responsible for all railway installations in the Gotthard & Ceneri Base Tunnel.

#5

SIEMENS MOBILITY AG, WALLISELLEN

One-stop shop for rail transport: from vehicles to infrastructure

Powerful, reliable and environmentally friendly transportation systems are essential for a functioning society and economy. Rail traffic is an important part of this picture. Simply getting quickly and efficiently from A to B is already taken for granted. Passengers expect more and cities, operators and industry must respond to meet these demands. As a single source supplier and system integrator, Siemens bundles the necessary expertise to meet these passenger requirements with innovations, and to allow transportation system providers to optimally deploy infrastructure and vehicles. The comprehensive portfolio from Siemens includes vehicle, infrastructure and automation solutions for everything from trams, light rail and metro services to commuter and regional trains as well as long distance trains on high-speed lines.



RUBEN ANDRE LORENZO is the Head of Sales for Mobility Services Switzerland. Together with his team, he works on classic services as well as data-based and innovative services for Swiss rail customers.



PHILIPPE SCHEUBER is a project manager at Siemens Mobility. After graduating ETH Zürich with a Master of Science in Mechanical Engineering, he attended a two year technical trainee program and is now mainly focused on internal operational excellence.



HENRY WÜNSCHE is a project manager in the strategic and product management program ROOF (Railway Operation of the Future) of Siemens Mobility Switzerland. He has 16 years of experience in the implementation, piloting and development of railway safety installations.

#6

AIRPORT ZURICH

Sleepless in Zurich: airplane maintenance and repair around the clock

The Airport Zurich is the largest international airport of Switzerland and the principal hub of swiss International Air Lines. The tour begins in the main building of SR Technics, where a jet engine and an aeroplane engine are on display. The group will then visit the SR Technics “turbo hangar”, where employees test the engines that have just arrived or are soon to be deployed. Afterwards, participants will witness the repair and assembly of engines and learn how each stage of the procedure is checked. One of the highlights of the tour is a visit to Hangars 2 and 3, both of which are operated by swiss Technics. Both long and short haul aircraft are maintained in these hangars, in 24-hour shifts.

We will touch topics like work control/planning of IT tools and fuel efficiency of aircraft engines, means of transport for baggage sorting systems (speed/efficiency) and have a look at the building itself and its airconditioning systems and photovoltaics.

No photos please!

Please don't forget to bring your national ID!



EMIL MAAG started his career at Saurer Arbon CH on Diesel-Engine Deverlopment Truck-Construction. He then went on to work for SWISSAIR, the Geneva Airport and now Zurich Airport. He started in 1991 to additionally give tours at Zurich Airport and since 2018 he has been following the development for Project CST (Cargo Sous Terrain).

#7

DESIGNWERK GMBH, WINTERTHUR

Futuricum and the future of electric mobility

Designwerk Products AG is the successor of the Designwerk subsidiary and electric truck producer Futuricum AG, which was founded in 2017. Since 2019, the company has taken over series production of all products of the parent company Designwerk Technologies GmbH and now operates under its name and brand.

The company's production programme includes Futuricum brand electric trucks, mobile rapid chargers, modular battery systems for electric vehicles and airport equipment. The first fully electric refuse collection vehicle on Swiss roads is one of these electric trucks. Designwerk chargers are popular among European vehicle manufacturers. With its modular traction batteries, the company also enables small and medium-sized vehicle manufacturers to make a successful transition to electric mobility.

To achieve all this, the company relies on a can-do attitude and reliable, sustainable Swiss quality.



FABIAN WYSSMANN is Head of Sales and Marketing. He joined Designwerk as the 14th employee and Business Developer 3 years ago. He is now in charge of all market related tasks and sells charging equipment to Europe's leading OEM's.



FRANK LOACKER is the CTO of Designwerk AG. The mechanical engineer combines years of experience in manufacturing electric vehicles and batteries. He combines visions with ingenuity and set a world record with a circumnavigation.

#8

SBB: OPERATION CONTROL CENTRE OLTEN

Train Traffic Management in Switzerland

The Operation Control Centre in Olten manages the train traffic in SBB's central region. Trains in and between the large cities of Basel, Bern and Lucerne as well as large parts of the European freight corridor through Switzerland are controlled in the large control room. From more than 100 work desks, train controllers use the latest technology in railways to ensure safe and on-time railway services in in major parts of Switzerland.

Follow-up questions only via e-mail, please.

You have to leave extra early for this excursion. Take BUS31 at 10:12!



THOMAS WIRZ is SeniorProject Manager of the Traffic Control Centre, within Operation Control Centre Olten. He joined SBB in 1988. He is a trained railway operations planner, and after being responsible for timetable planning for 'Region Mitte', being Head of Operation BZ Mitte and receiving further training as Corporate specialist, he obtained an MAS in General Management. He is 47 years old and a resident in Rothrist

#9

SBB: SWISS SMART MOBILITY / SMART CITY LAB, BASEL
Future challenges facing the Swiss Federal Railways

The mobility market is changing rapidly. With the newly created development unit 'Swiss.Smart.Mobility', SBB is actively shaping this change. Mobility is rethought: as 'Mobility as a Service', digital and cross-linked. SBB tests intermodal offers, knows the needs of tomorrow's customers thanks to regional laboratories, and experiments with new apps and services that make travelling an experience. During the excursion, the students get to know the biggest challenges of Swiss.Smart.Mobility in practice. With the help of their smartphones they are going to travel by different modes of transport from Werkstadt Zurich to the Smart City Lab in Basel and solve different tasks and challenges. In the Smart City Lab the students learn more about creating innovation. The Smart City Lab is a space for testing ideas, prototypes and services in the areas of mobility, logistics and more. It brings smart solutions to life, both for experts and interested members of the public, and discusses these with a wide audience at public events.

Be prepared to ride a scooter or bicycle, in any weather!

Lea Bregy and Rahel Maurer will accompany the excursion from Werkstadt Areal. They are not available for follow-up questions on Wednesday.



LEA BREGY works for Swiss.Smart.Mobility and is responsible for Innovation for the Passenger Division. She holds a Master's degree in Economics from the University of Berne.



RAHEL MAURER works for Swiss.Smart.Mobility. She was until recently Deputy Responsible for increasing the Load Factor. She holds an MSc of Materials Science and Engineering from ETH Zürich.



PHILIPPE STADLER BENZ is Deputy Head of the SBB Smart City Program. He holds an ETH diploma in Environmental Sciences and has completed the ETH Master in Science, Technology and Politics. Together with the team, he is responsible for managing the Smart City Lab in Basel.

#10

SBB: MAINTENANCE FACILITY ZURICH HERDERN
What happens behind the scenes of your rail journey?

A train also needs regular maintenance. Employees at nine service locations throughout Switzerland ensure that vehicles are ready for operation around the clock, seven days a week.

The service location Herdern takes care of passenger wagons and locomotives used in long-distance traffic as well as regional transport vehicles. Experience how maintenance work is carried out between operations, components are replaced and the vehicles are cleaned. Take a look behind the scenes at SBB's maintenance department and get an idea of the activities involved in the regular maintenance of passenger transport vehicles.

Don't forget to bring your (reliable) bicycle to this excursion!

Maybe bring a rainjacket too...

No follow-up questions on Wednesday, please.



MARTIN FISCHER studied Electrical Engineering and is Head of Light Maintenance Region Ost. He now works as Railway-Engineer with a long experience in fleet management, vehicle repair and preventive maintenance.

#11

EMPA'S FUTURE MOBILITY DEMONSTRATOR: MOVE, DÜBENDORF
Post-fossil mobility

Empa is a Swiss Federal research institute within the ETH-Domain with 1'000 employees. Roughly 50% of the employees are directly or indirectly involved in energy projects, e.g. by developing new materials for batteries, photo-voltaic systems, urban energy systems, insulations, building technologies, efficient powertrains, hydrogen storage, power-to-x technologies, and so on.

Within these energy projects, digitalisation is a growing research topic, for example by investigating the energy demand and supply for buildings and mobility in detail, or by investigating the real world behavior of sensors for automated driving.



CHRISTIAN BACH is the head of the Automotive Powertrain Technology Laboratory, which is working on the technical reduction of pollutants and climate gases from road mobility. The lab initiated the so called Future Mobility Demonstrator MOVE, showing how post-fossil (renewable energy operated) mobility could happen in future, at the same time serving a renewable energy policy.

#12

SOLAR REACTOR RESEARCH PLANT, ETH ZÜRICH
Carbon-neutral fuel made from sunlight and air

Carbon-neutral fuels are crucial for making aviation and maritime transport sustainable. ETH researchers have developed a solar plant to produce synthetic liquid fuels that release as much CO₂ during their combustion as previously extracted from the air for their production. CO₂ and water are extracted directly from ambient air and split using solar energy. This process yields syngas, a mixture of hydrogen and carbon monoxide, which is subsequently processed into kerosene, methanol or other hydrocarbons. These drop-in fuels are ready for use in the existing global transport infrastructure.



FABIAN DÄHLER is a postdoctoral researcher at the Professorship of Renewable Energy Carriers at ETH Zürich. His research ranges from designing high-flux optics for solar fuel production to developing thermal energy storage technologies allowing for continuous solar electricity production.



REMO SCHÄPPI is a doctoral student at the Professorship of Renewable Energy Carriers at ETH Zürich. He holds a Master's degree in Mechanical Engineering from ETH Zürich and is focusing his research activities on the production of solar fuels and the demonstration of the entire production chain from sunlight and air to liquid hydrocarbons.

#13

RHINE PORT, BASEL

Port of Switzerland

Activity started in 1904 when the first tug-train arrived in Basel. The Rhine links Switzerland with the northseaports Antwerp, Rotterdam and Amsterdam, but also with the Ruhr region and since 1992 with the Danube by the Main-Danube canal. The Port of Switzerland is composed of the ports of Basel-Kleinhüningen, Birsfelden and Au (MuttENZ). Every year, 5 to 6 million tonnes (mostly liquid fuels, grain and containers) are handled, which corresponds to more than 10% of Switzerland's total foreign trade.



URS VOGELBACHER began his career as deckhand in the 60ies for a Swiss navigation company, then worked for the cantonal Port and Navigation Authority with responsibilities in PR and security. Since 2008 he is a member of 'Verkehrsdrehscheibe Schweiz' as guide for port visitors

#14

STADLER RAIL, BUSSNANG

Trains in production

Stadler is headquartered in Bussnang, a town in the east of Switzerland. The company's founder Ernst Stadler erected a first works hall there in 1962. One of the walls from this first structure still serves as a supporting wall in the assembly facility to this day. Stadler had a workforce of 18 people when Peter Spuhler took it over in 1989. Nowadays, the facility in Bussnang comprises about 51.000 m² of production and storage space and employs about 1700 people. Stadler currently has a workforce of around 7000 employees around the world. Today, Stadler builds trains which are tailored to meet the needs of customers, for example high-speed and intercity trains, suburban and regional transport trains, light rail vehicles and trams.

This excursion will be accompanied by an expert from Stadler Rail.

↘ Unpack.

After the field trip, you will go back to your team and share your new knowledge with the others. To make it easier, you have prepared a story on four post-it notes. This is a simple way to condense a vast amount of information into a standardised sentence. Use the template for the story on the opposite page.

The story you bring back will help you externalise data and structure the conversation. Think of it as a hook to the experiences you have made. During the discussion, your teammates will use it as a starting point to dig deeper, probing your assertion. Stories can uncover knowledge, reinforce discussions, and stimulate creative thoughts, actions, and alternatives. Unpack and identify tensions, contradictions, and surprises.

× NOTE

Make sure to use the following color coding: Someone (yellow), wanted (green), but (pink), so (orange).

Someone ... (a person, a group)

wanted ... (sought, desired, had a goal)

but ... (complications, obstacle, conflict)

SO ... (climax, outcome, learning, resolution)

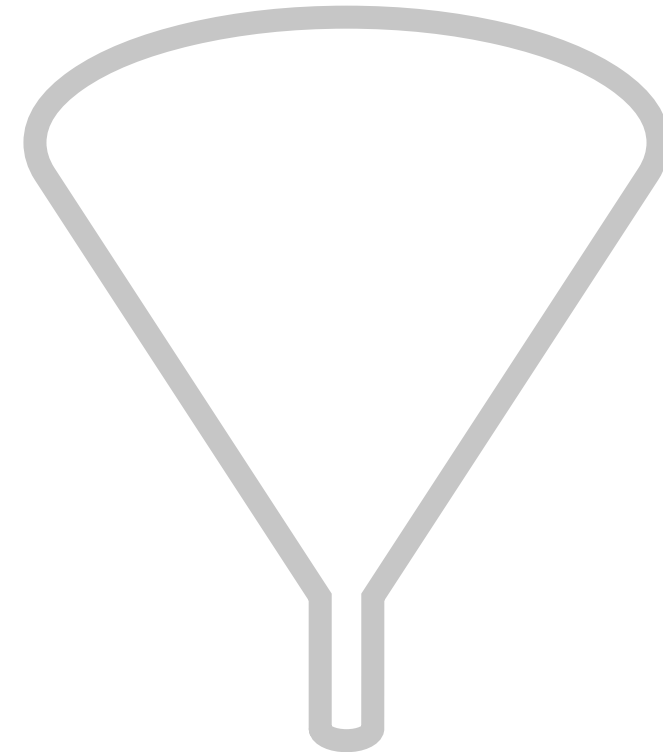
↘ Draw stories.

Learning how to take decisions together will be crucial in order to become a well-functioning team during the week. Only by creating room for exchange, you will be able to build on the thoughts of others. This will also help you to bring different ideas, opinions, and values together. Time pressure actually helps you in this process: it keeps you away from postponing important decisions.

Consider this slot a dry-run for the more important decisions that will need to be taken later in the week. Become comfortable with this work mode and learn how to establish a team culture that works for you. It needs to enable you to take decisions efficiently, representing the opinions of the team. Find out what rules could help you to stay focused and move ahead one decision at a time.

× HEADS UP

Sign up before 20.00 at the Info Desk for tomorrow's Cardio training with Vanessa Wood or the Outdoor session.



↘ Template.

Despite the fact that all teams have mostly visited the same excursions, we are almost certain that the results of your discussions in the afternoon will be very different from one team to the next. To visualise this, we ask you to draw three comics, representing the three most significant stories from the excursions onto the Monday template.

◆ CRITICAL THINKING NIGHT

On Critical Thinking Night, we will learn about historical trends and how they can help us understand current and future developments. Furthermore, we will reflect critically on the role of society and demand in making mobility-related decisions.

GOING FASTER, BUT GOING WHERE?

Within the current social, economic and environmental challenges, mobility raises multiple challenges and offers many opportunities. We provide an overview of some of those issues, with particular focus on demand (i.e., the users) and its interaction with the supply (i.e., the planning and operations of infrastructure and services, based on selected vehicular and infrastructural technologies).

Collective transport is a relevant solution for addressing urban mobility, even allowing for the potentially revolutionary impact of autonomous cars. We will discuss the challenges involved in the effective organisation of a collective transport network.

Digitalisation can tremendously improve operations under specific circumstances; tracking vehicles allows us to deliver the best information to users; tracking passengers allows us to analyse choice models and anticipate their reactions. This creates a great potential for scientists to advance models and algorithms that can characterise, describe, predict and optimise transport systems.

The possibility of moving over larger distances at higher speeds has changed the way we live and use mobility systems. By reviewing the development of mobility over time, we can understand how best to react and anticipate the mobility challenges of the future.

Why?



FRANCESCO CORMAN holds the chair of Transport Systems at D-BAUG of ETH Zürich. His main research interests relate to the solution of problems in the transport sciences by means of quantitative methods and operations research, especially focusing on the operations and planning of public transport, railways and logistics. He is currently working on multiple projects tackling railway traffic management, and user reaction during public transport disruptions.



Tomorrow will be about framing the problem.



On Tuesday, we will introduce the two themes to create some structure that is supposed to help you think about mobility along additional dimensions. You will get to meet 40 experts so that you can start defining the problem you will be working on for the rest of the week. Learn to take decisions quickly and act as a team.

- 7.00 — Cardio training and Outdoor session with Vanessa Wood at Klub der Sportfreunde.
- 8.30 — Arrive at Process Walls.
- ↘ Check in.**
- 8.50 — Kick-off at ETH Week Hall.
- 9.00 ◆ **INPUT TALKS**
Introduction to the two themes.
- 11.30 — Lunch break.
- ↘ Prepare for knowledge fair.**
- 13.30 ◆ **KNOWLEDGE FAIR**
30 representatives from industry, research, and society.
- 15.00 ◆ **NETWORKING APÉRO**
Chat with the experts.
- ↘ Unpack.**
- ↘ Problem statement 1.0.**
- ↘ Template.**
- ↘ Check out.**
- 18.40 — Dinner
- 19.45 ▲ **PANEL DISCUSSION**
With Ulrich Weidmann, Tom Marty and Dirk Boedeker hosted by Gloria Romera.

tuesday
sep 10

◆ INPUT TALKS

DECARBONISATION

We will begin with the topic of DECARBONISATION by diving deep into vehicle propulsion, fuels, their efficiency and their potential for reducing greenhouse gas and pollutant emissions.

FUELS, EFFICIENCIES, MILEAGE: WHICH PATH TO CHOOSE?

Vehicle propulsion systems provide the necessary force to drive the wheels by converting energy from an energy carrier to mechanical energy. There are many ways of achieving this, and depending on the application, the best solution has to be chosen.

The optimisation criteria that define the best solution are not obvious. Key factors may include CO₂, toxic emissions, time to travel, drivability or various combinations of properties. Due to the huge energy demand of modern transportation systems, their performance must be optimised. Special emphasis has to be put on the interaction of the components.

Simple models enable us to derive the energy demand of arbitrary vehicles for a given mission. With a sensitivity analysis, the most promising improvements can be determined, and actions can be planned accordingly. Hybrid propulsion systems provide more than one conversion path. This additional degree of freedom can be used to further optimise the entire system. A model-based energy management system must strike the optimal balance between the various conversion paths. Additional advantages of hybrid systems can often be exploited to further optimise the overall performance.

It is quite a challenging task to develop a control strategy that operates online in a car and recovers most of the offline potential. The ability to anticipate future driving and traffic situations enables the driver to make better decisions. Online learning algorithms can be used to derive this knowledge for a certain time horizon. Besides all these physical and technical considerations, we should not forget the customer. Purchasing decisions are not only based on technical or monetary criteria.



CHRISTOPHER ONDER is Professor at the Institute for Dynamic Systems and Control and heads the Engine Systems Group. His main research focuses on modeling, control and optimisation of engines and vehicle propulsion systems. Together with many industrial partners, the researchers at the institute tackle problems of efficient monitoring, control and design of complex systems. Based on first principles in mathematics and physics, they apply a model-based approach to a wide range of challenges.

DECARBONISATION

Zooming out from the vehicle level, we will study how the mobility system is embedded into the overall energy system and the implications of the resulting interactions.

SUPPLYING FUTURE TRANSPORT WITH ENERGY

New energy carriers for transport, such as electricity and hydrogen, address the root of transport CO₂ emissions by eliminating fossil fuels from vehicles. But the story does not end here: Many of those new carriers are very different from the energy sources that the existing vehicles were designed to consume.

The implications are threefold: (1) only new sold vehicles benefit. However, just because a new technology enters the market, that does not mean that every current owner will immediately buy a new vehicle. Renewing the entire fleet takes decades. (2) Most new energy carriers cannot be distributed using our current infrastructure, namely fuel pumps. This creates a “chicken or egg” problem: as long as there is no infrastructure, no one buys the car; and if there are no cars, no one invests in infrastructure. (3) The new energy carriers do not grow on trees (figuratively speaking). They need to be produced from primary energy sources. This can be an enormous burden on other sectors, in particular the electricity sector, which itself is undergoing a transformation. Our talk will review the available pathways and their opportunities and secondary effects. The key message is that all of them have merit, under the right set of circumstances. The challenge of the energy revolution in transport is that it is difficult to know what those circumstances will be, because the transformation is a long, convoluted process.



GIL GEORGES is a Senior Researcher in the Aerothermochemistry and Combustion Systems Laboratory at D-MAVT. There, he heads the Energy Systems Group, which studies how the energy transformation in transport affects the way we consume and supply energy. The group focuses on energy infrastructure for different modes of transportation, including trucks and planes, and how this energy demand can be integrated with production at the local and national scale.

DECARBONISATION

Wrapping up the topic of DECARBONISATION, Vanessa Wood will share her views on batteries and their role for the future of mobility and energy.

THE ROLE OF BATTERIES IN OUR ENERGY FUTURE

As an electrical energy storage technology, batteries have the potential to play an important role in the decarbonisation of our energy system.

Understanding how batteries work and the value chain of battery technology, which includes mining, materials production, cell manufacturing, pack assembly, integration into applications, and afterlife uses, is a key prerequisite for identifying open challenges and opportunities.

The lithium-ion batteries sector, which is growing at a rate of 15% and accounts for the second-largest amount of capacity produced per year after lead-acid, is promising yet highly complex. The increasing demand for consumer electronics over the past decade has led to economies of scale in materials production and cell manufacturing that has made electric mobility economically feasible, but has also locked the industry into technology originally designed for consumer electronics. Disruptive technologies often fail commercially due to high entry barriers, so incremental improvements to existing technology play a key role in advancing lithium-ion technology.

The drivers are changing, however. In 2018, 66% of production capacity went towards automotive applications. Battery energy storage systems (BESS), which can be used in conjunction with renewables for grid frequency regulation, storage and levelling, can replace gas-powered plants and promise long-term cost and emissions savings. BESS over 100 MWh are online, and if system costs decrease, high growth rates are expected in this sector as well. With increased market sizes, new technologies can emerge.

The challenges that lie ahead for batteries are not just technological, but also environmental and social. Do we have sufficient resources that can be accessed in socially responsible ways? Can we develop cost- and energy-efficient recycling technologies? What energy sources are we using for manufacturing and recharging?

Indeed, the future of battery energy storage will be determined by a complex mix of technological, economic, and political factors in which you have the opportunity to be involved.



VANESSA WOOD is Professor of Materials and Device Engineering at D-ITET. Her research group characterises materials and devices from the atomic level to the macroscale to enable systematic improvements to their design and manufacture. A special focus is placed on research and teaching in the area of lithium-ion batteries, their limitations and potential, and the techno-economic factors surrounding their penetration into new markets.

DIGITALISATION

Now we will switch to a major trend that can enable

DECARBONISATION: DIGITALISATION. Margarita Chli will start at the micro-level with a discussion of sensing technologies, which will be essential for making vehicles autonomous.

CHALLENGES IN SENSING FOR AUTONOMOUS MOBILITY

Recent progress in developing robotic perception to automate the navigation of vehicles, such as cars, and robots in general, has been spectacular, and is likely to have a great impact on our conception of mobility. These advancements have centered on the evolution of a plethora of sensing technologies that capture different aspects of the motion of the vehicle and its surroundings. For example, sensors can already record the GPS coordinates of a moving vehicle, provide close-range distance measurements that can aid assisted parking, and capture information-rich snapshots of a scene using cameras. But is it possible to capture all the information required for fully automated vehicle navigation with a single sensor?

Taking into account the weight, power and computational requirements of each sensor, research interest focuses on developing sophisticated and practical sensor fusion techniques in order to make the most of each sensor employed for onboard motion and scene estimation in a timely fashion. With the ultimate goal of developing robotic perception techniques that are sufficiently advanced to enable autonomous navigation, the challenge lies in dealing with all the uncertainties in the estimation processes. This effort promises to revolutionise mobility with a wide spectrum of applications ranging from autonomous driving, to drone inspection of infrastructure and robot-assisted search-and-rescue. Therefore, further research relies heavily on understanding the challenges and sources of uncertainty in this field.



MARGARITA CHLI is Professor of Computer Vision for Robotics at D-MAVT. Her work contributed to the first vision-based autonomous flight of a small helicopter and the first demonstration of multi-drone collaborative localisation and mapping using single cameras. Margarita's work has been featured in 2016 Robohub's "25 women in Robotics you need to know about", on Reuters and CNN, and she has given invited speeches at the World Economic Forum and the International Conference on Robotics and Automation.

DIGITALISATION

Moving from sensors to the data they collect, we will discover how big data and machine learning can aid in creating an optimised and energy-efficient transport system.

DATA IN SERVICE OF INTELLIGENT AND SAFE MOBILITY

In recent years, mobility has been redefined based on the availability of big data streams. Analysing these massive datasets offers valuable insights into different aspects of mobility, from the host infrastructure (e.g., rails and roads), to the enabling vehicles as well as the passengers/commuters.

Big data relating to mobility is made available via a variety of resources including, but not limited to, satellite and weather data, operational efficiency metrics, traffic records, massive movement trajectory datasets, infrastructure condition logs and maintenance downtime records. This spatially and temporally dense information generates tremendous opportunities, but also comes with numerous challenges that are felt at the infrastructural, economic and societal levels.

Perhaps the biggest challenge associated with data availability lies in the extraction of meaningful information from raw and diversified datasets. Machine learning is an invaluable tool for harnessing information that lays latent in raw data, often in the form of patterns and trends. However the implementation of such techniques also comes with challenges, particularly when used as a “black box”. Eventually, such information can support decisions on the optimal design, operation and maintenance of transportation networks.

This talk will touch upon examples ranging from utilisation of on-board monitoring data for the safeguarding and optimal management of our rail and roadway networks to crowd behavior algorithms that may be able to detect disruptive events in stations and hubs and much more. Both opportunities and challenges will be discussed based on a review of the broad activities carried out within D-BAUG on utilisation of data for safe and intelligent mobility.



ELENI CHATZI is Associate Professor of Structural Mechanics and Monitoring at D-BAUG. Her main research is focused on the domain of Structural Health Monitoring (SHM), i.e., the extraction of data from engineered systems via use of sensors, and the subsequent utilisation of this information for intelligent life-cycle assessment of these systems. She regards the meaningful aggregation and the explainable interpretation of data as key to the engineering of resilient and sustainable resources and networks.

DIGITALISATION

Emilio Frazzoli will wrap up our discussion of digitalisation with an overview of the current state of research in the field of autonomous driving and its potential to influence mobility demand, the urban landscape and ultimately emissions from urban transport.

AUTONOMY FOR URBAN MOBILITY

In recent years, many of the most urgent questions related to autonomous vehicles have been purely technological and vehicle-centered: how safe are these vehicles, how comfortable are they, what scenarios can they handle? As public trials worldwide are becoming more common, capabilities and limitations are becoming clearer, as are technology roadmaps and timelines.

On the other hand, there has been much less systematic research on the operation and impact of large-scale fleets of autonomous vehicles ('robotaxis') offering mobility-on-demand services in urban or rural areas. How will they affect congestion, parking or mass transit? What are the key parameters and operational criteria for ensuring dependable, reliable and accessible mobility for all? How should fleets of robo-taxis be scaled and composed? How will the demand for mobility evolve, and what will be the impact on urban landscapes?

Answering these and many other questions is an exercise that requires not only technical know-how, but also consideration of societal and economic aspects. While much is still in the dark, the most recent research results have answered some of the open questions. This talk will provide insights into what we already know about autonomous ride-hailing networks. Moreover, it will highlight some of the questions that so far remain unanswered.



EMILIO FRAZZOLI is Professor of Dynamic Systems and Control at D-MAVT, and Chief Scientist of Aptiv's Autonomous Mobility division. His main research interest are in controls, robotics, autonomous systems, and intelligent mobility. He directed the research group that first demonstrated an autonomous mobility ('robotaxi') service to the public. In 2013 he founded nuTonomy with Karl Iagnemma, and served as its Chief Technology Officer until its acquisition by Aptiv in 2017.

↘ Prepare for knowledge fair.

Between the input you received this morning and the knowledge fair this afternoon, you will get the chance to reflect and build on the information gathered so far. We want you to identify links between the key topics and the actors you will get to meet at the knowledge fair.

The knowledge fair is organised into 6 areas. Each area includes 5 or 6 different expert booths. You will again work in pairs, each pair in your team covering a different area. The knowledge fair has four rounds of 15 minutes each. For every round, you will switch to a different expert, which means you will get to see 4 of the experts of the chosen area. You will not be able to predict whom you will get to meet exactly or in which order, as the fair follows a free-market approach within the sector. Therefore, prepare at least five questions per expert for the chosen area, and do this for all experts. Also, in each round, students from different teams will be present in one booth. Use the 'what—how—why' questions on the opposite page, but try to be more specific. You will also find short abstracts, guiding questions, and portraits of the experts you will meet.

× NOTE

Use this scaffolding to move beyond facts and observations to inferences and interpretations. Also, refer back to the pages on the field trips.

what

is the expert trying to solve?
the facts

how

are they solving it?
the emotions and the techniques

why

are they doing it in this way?
your inferences

◆ KNOWLEDGE FAIR

Area 1

1.1) ALPINE INITIATIVE

Preserving the Alps by shifting freight from road to rail

The Alpine Initiative is an association founded in 1989. The aim is to protect the Alpine region from the negative effects of transit traffic and to preserve it as a habitat for humans, animals and plants. The NGO is working on the shift of freight traffic from road to rail and the decarbonisation of freight traffic in and through the Alps.

1.2) SBB SMARTRAIL 4.0

Improving railway systems through digitalisation

SmartRail 4.0 is a major innovation step in the very core of the railway production system and is currently the largest railway development project in Switzerland. It has achieved a high level of visibility internationally, and there is cooperation with several European railways. We are developing pioneering digitalised railway systems and are working together to achieve the following objectives: lower costs, more capacity, better punctuality and increased safety.

Follow-up questions only via e-mail, please.

× HEADS UP

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

Example questions:

What percentage of road freight can already be shifted to rail with the current infrastructure? What would be necessary for a complete shift?

What is the energy and emissions savings potential of a digitalised railway system?

tuesday
13.30

ETH WEEK TENT



DJANGO BETSCHART is Head of the policy division of the Alpine Initiative. He is responsible for the strategic political development of the NGO on EU and Swiss level and a member of the management board.



XIAOLU RAO is Senior Project Manager at SBB SmartRail 4.0. She is a research professional with a doctoral degree from ETH Zürich and won the ETH Medal 2016. Her expertise includes train automation and traffic management systems.

◆ **KNOWLEDGE FAIR**

Area 1

1.3) **IMAGINECARGO**

Shift to bike - decarbonising the last-mile of freight transport

We connect the warehouses of e-commerce companies with professional cargo bike couriers. As a 4th party logistics operator we manage vertically integrated supply chains with our IT platform. Consolidated pickup at the warehouse, transshipment in the city hubs and last mile delivery with cargo bikes. This enables us to operate a delivery system that meets the needs of consumers: speed, flexibility and sustainability.

1.4) **CARGO SOUS TERRAIN**

Relief for road and air freight

The freight transportation system Cargo sous terrain (CST) will connect Switzerland's logistical hot spots. Tunnels interlink production and logistics sites with urban centres. The first section will connect the Härkingen-Niederbipp area with Zurich. CST takes the pressure off the road and railway networks, reduces environmental impact and ensures the prompt delivery of goods for everyone.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What other solutions could contribute to making the last-mile of freight transport climate-neutral? What is needed to make the entire logistics chain low-emission?

In a country like Switzerland where rail infrastructure is already very extensive, why does it make sense to design and construct an entirely new infrastructure for the delivery of goods?

tuesday
13.30
ETH WEEK TENT



VILLE HEIMGARTNER is currently supporting e-retailers in offering the most convenient and sustainable delivery experience with ImagineCargo. In his corporate past, he has worked for Swiss Post and SBB. He gained various insights during his time in China, India and Mexico.



BEDA VIVIANI has a project management role within the Cargo sous terrain company. Holding a licentiate degree in Technology Management and a Bachelor's degree in Music, Beda's track record in the logistics sector enables him to contribute to the realisation of Cargo sous terrain.

◆ **KNOWLEDGE FAIR**

Area 1

1.5) **PORT OF SWITZERLAND**

Switzerland's most important hub for imports and exports

Port of Switzerland is a company under public law that enables, supports and develops the inland waterway interface for Switzerland. Within three port areas it offers a trimodal platform for the import and export of goods on the Rhine, rail and road. In addition to area management, PoS (Port of Switzerland) is responsible for the life cycle of the transport infrastructure, waterway operation and is part of the official Rhine administration for Switzerland. How can IWW (Inland waterways) transports be supported and developed to remain a sustainable part of the national good supply?

Follow-up questions only via e-mail, please.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What is the most promising option for making the transport of goods on waterways more sustainable?



FLORIAN RÖTHLINGSHÖFER
is Head of Large Infrastructure Projects and Port Railways of the Port of Switzerland. He holds a diploma in Civil Engineering from TH Karlsruhe and a diploma of Industrial Engineering from FernUniversität Hagen.

**tuesday
13.30**

ETH WEEK TENT

◆ **KNOWLEDGE FAIR**

Area 2

2.1) LIIP

Dynamic ticketing, driver coordination and bike sharing solutions

Liip stands for digital, human progress: we're a digital agency that works on stuff that matters. Instead of solving one big challenge, our 200 developers and designers are working to apply cutting-edge open technologies and top-notch user experience design to the many pressing problems of our clients, be it corporates, startups or non-profit organisations. A pioneer in open data, dynamic ticketing, driver coordination and bike sharing, Liip is rethinking mobility every day.

2.2) MOBILITY

Scooter Sharing

Mobility Cooperative is a well-known carsharing company from Switzerland. Due to the fast changing environment in the mobility sector, Mobility focuses on new projects like Scooter Sharing, Ride Sharing, One way and so on. Vehicle sharing is not about cars - it's about technology and therefore needs digitalisation. All services are included in the Mobility App: in the future, the customer will have the car key in his app and will no longer need an RFID card.

2.3) SBB SWISS.SMART.MOBILITY

Tackling future challenges in the mobility and rail sector

SBB is the backbone of sustainable mobility in Switzerland. Every day, it safely transports 1.25 million passengers, 205 000 tonnes of freight and over three million customers use the mobility app SBB Mobile. SBB is now preparing for the upcoming profound and comprehensive change. New customer needs, digitalisation, new mobility providers and regulatory developments are changing markets and business models.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What can we expect from digital technologies in shaping our mobility future?

Can we expect car- and ride sharing to make private car ownership completely obsolete?

What kind of services and business models could help SBB stay competitive with a possible rise of autonomous cars and trucks?

**tuesday
13.30**

ETH WEEK TENT



HANNES GASSERT is a co-founder of Liip and a successful serial social entrepreneur. His belief that new technologies must lead to true progress for all guides his projects and investments, and has even lead to him running for parliament this year.



TABEA LEIBUNDGUT is Business Development manager at Mobility Cooperative and is responsible for Scooter Sharing in Zurich. Furthermore she focuses on projects within AI to improve services and is currently implementing bluetooth shortloop.



LADINA PURTSCHERT is Head of Swiss.Smart.Mobility at SBB and she is responsible for radical and digital solutions for the strategic challenges within Passenger Traffic. She has worked previously at BCG and holds an MBA from IESE Business School.

◆ **KNOWLEDGE FAIR**

Area 2

2.4) **MOBILITY PLATFORM, ETH ZÜRICH**
Reducing the carbon footprint of ETH Zürich

Mobility is a cross-cutting issue, and one that is very important for ETH Zürich. To encourage sustainable mobility, both on campus and in business travel, the Mobility Platform was launched in spring 2016 by Prof. Ulrich Weidmann, Vice President for Human Resources and Infrastructure (VPPR). The platform coordinates ongoing activities and initiates new projects in collaboration with research and operational units. The goal is to reduce greenhouse gas emissions and energy consumption.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

Given the fact that researchers are generally frequent fliers, what kind of incentives need to be available to reverse this trend?



SUSANN GÖRLINGER works in the office of the Vice President for Human Resources and Infrastructure, is Co-Lead of the Mobility platform since 2016 and project lead of the ETH flight reduction project 'stay grounded, keep connected'.



NICOLE AESCHBACH supports the Mobility Platform on a freelance basis regarding various conceptual topics. She also researches and teaches in the transdisciplinary field Geographies of Climate Change at Heidelberg University.



URS NUSSBAUM is Co-Lead of the Mobility Platform ETH Zürich and specialises on sustainable campus mobility. In addition he works as Strategic Project Manager at the Department Services.

tuesday
13.30

ETH WEEK TENT

◆ KNOWLEDGE FAIR

Area 2

2.5) MOBILITY ACADEMY, TCS

Carvelo2go

The Mobility Academy was founded in 2008 as a subsidiary of TCS with the aim of looking at the nature of future mobility. As a think-tank, it is concerned with seeking a better understanding of trends, making them the basis for future activities in the field of mobility. It has the goal to create an impartial field for a creative approach to transportation extending beyond the boundaries of individual associations.

The Mobility Academy manages, among other things, the affairs of 'Swiss eMobility' (industry association), organises the Swiss 'Mobilitätsarena', conducts research in the field of automated vehicles and runs its own cargo-bike sharing scheme, carvelo2go.

2.6) GOWAGO

Purchasing a car made easy

gowago.ch is digitising the way people get a car. With gowago.ch, uncomfortable negotiations, inefficient processes, unclear pricing and countless dealer visits are a thing of the past. We take car buying into the future, into a place which is comfortable and easy. We focus on new ownership models such as leasing and auto-abos and use technology to provide a killer customer experience.

× HEADS UP

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What kind of services and incentives have to be in place so that bikes and cargo-bikes become the major urban transport mode?

Will private car ownership still be relevant in a possibly autonomous and sustainable mobility future?

tuesday
13.30

ETH WEEK TENT



MIRJAM STAWICKI is research associate at Mobility Academy and project leader of Carvelo2go, Switzerland's first and biggest cargo-bike sharing scheme. She studied Geography at the University of Berne.



RUTGER VERHOEF is representing gowago.ch. Rutger's background lies in management and finance, and in the automotive industry where he worked for three years in a large OEM. In 2017 he started together with Leo and Iwan gowago.ch, with the aim to simplify the way people get a car.

◆ KNOWLEDGE FAIR

Area 3

3.1) SBB SMART CITY

Smart City Lab

With more than 1.26 million passengers per day, SBB is the most important feeder for the smart cities of tomorrow. SBB's activities in the context of Smart City underpin the strategic orientation as a strong railroad, attractive development partner and trustworthy mobility service provider. These contribute to making SBB's mobility offerings and area development more efficient (less time, costs, energy) and better (higher attractiveness of the location, quality of life, competitiveness).

3.2) BAV, SWISS FEDERAL OFFICE OF TRANSPORT

Innovation and Digitalisation

The FOT is responsible for planning, financing and supervising Swiss public transport on a federal level. The FOT aims to profit from the benefits of digitalization and to avoid negative impacts concerning mobility. One of the benefits is a more efficient (including carbon emissions) mobility system. Furthermore, the FOT is also responsible for the implementation of the policy to transfer freight transport from road to rail.

× HEADS UP

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What is the role of smart cities for building a transport system that is compatible with the environment?



PHILIPPE STADLER BENZ is Deputy Head of the SBB Smart City Program. He holds an ETH diploma in Environmental Sciences and has completed the ETH Master in Science, Technology and Politics. Together with the team, he is responsible for managing the Smart City Lab in Basel.

What will the Swiss public transport system look like in 2050?



GERY BALMER is Vice-Director at the Federal Office of Transport. He is responsible for digitalisation and for a project that aims to foster intermodal mobility to increase efficiency of mobility in Switzerland. He studied forest sciences at ETH Zürich.

**tuesday
13.30**

ETH WEEK TENT

◆ KNOWLEDGE FAIR

Area 3

3.3) VBZ

Making public transport emission-free in the city of Zurich

Verkehrsbetriebe Zürich (VBZ) are the second-largest transport provider within Zurich's transportation association zvv. 325 million passengers travelled 670 million kilometer in total on the network. In the near future the passengers will be carried widely emission-free; VBZ set the goal to switch to electric drive for all busses. From summer 2020 onwards, VBZ will test the operation of an on-demand ride pooling service in Zurich-Altstetten (FlexNetz).

3.4) UMVERKEHR

Minimising motorised individual transport

umverkehR is an independent association with about 8000 supporters. We have been committed to sustainable mobility for 27 years. The vision at the origin of umverkehR was to cut motorised individual transport by half. Our main concern remains to reduce traffic, to make it more environmentally friendly and to save space.

× HEADS UP

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

How can the energy efficiency of public urban transport be further improved and emissions lowered?



NICOLÀ GABRIEL is Project Manager in Market Development at Verkehrsbetriebe Zürich (VBZ). Besides conceptual infrastructure planning he focuses on new modes of public transport and the integration of micro mobility into a multi-modal transport chain.

What technologies, options and other factors need to be in place to significantly reduce motorised individual transport in rural areas?



SILAS HOBI has been managing director of umverkehR since March 2017. He is an environmental scientist with a degree from ETH Zürich and many years of experience as a specialist in mobility at the Swiss Federal Office of Energy, including campaign work as part of the SwissEnergy programme.

tuesday
13.30

ETH WEEK TENT

◆ **KNOWLEDGE FAIR**

Area 3

3.5) **VCS**

Promoting sustainable mobility products and services

With over 100'000 members, VCS (Verkehrs-Club der Schweiz) is the largest traffic organisation in Switzerland with focus on transport and environment. Since 1979, VCS has been advocating for a human and environment friendly mobility. VCS is active in political lobbying and campaigning and offers services and products in the field of sustainable mobility.

3.6) **SENOZON**

Modeling movement

Senozon's mobility model provides businesses with data-backed intelligence regarding their choice of location. Customers in real estate, retail, advertising, and transportation benefit from these insights. Based on the MATSim framework, the model combines statistical data with daily decision patterns of the average population. The simulations then yield a population's movements. Additionally, the model can provide forecasts for changed environmental conditions. Senozon is a spin-off from ETH Zürich and TU Berlin.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What factors are important for creating a traffic system that is beneficial to both humans and their environment?



ANDERS GAUTSCHI is CEO at Verkehrs-Club der Schweiz. He holds an Engineering degree from ETH and an Executive MBA. Before joining the VCS in June 2018, he held leading positions in the public administration as well as in the private sector.



MICHAEL BALMER is co-founder and Head of Models and Solutions of Senozon AG. He holds a doctoral degree in Civil Engineering from ETH Zürich. His main research area is the demand generation for agency-based simulations (MATSim).



THOMAS HAUPT is Managing Director at Senozon Deutschland GmbH. He studied transportation planning, informatics and operations research and worked as research fellow at the University of Karlsruhe. Prior to his commitment for Senozon, he was Board Member and Vice President of PTV Group.

tuesday
13.30
ETH WEEK TENT

How can movement modeling help in increasing the efficiency of the mobility system?

◆ KNOWLEDGE FAIR

Area 4

4.1) KYBURZ SWITZERLAND

Low-emission mobility for the last mile

The original: The 3-wheeled KYBURZ electric vehicles for postal delivery have become an integral part of the roadscape in many countries. KYBURZ is a Swiss company that has been focusing on the development and production of electric three- and four-wheeled vehicles for 28 years. KYBURZ is an international leader in high-quality mobility and transport solutions for the last mile.

4.2) H₂ENERGY

Decarbonised road transportation for goods

H₂Energy is a Swiss based European Hydrogen technology, mobility and energy provider. Within its own production facility, it is producing renewable hydrogen to be used for decarbonised individual and transport mobility. H₂Energy is currently expanding its hydrogen production capacity and is building H₂ fuelling stations. H₂Energy and its JV partner Hyundai Motor Company founded Swiss based Hyundai Hydrogen Mobility, which will bring 1000 hydrogen powered heavy duty trucks to Switzerland, beginning in 2019.

No follow-up questions on Thursday, please.

× HEADS UP

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What would a sustainable logistics system of the future look like? What is needed to achieve this?



MARTIN KYBURZ is an electrical engineer and founder of Kyburz Switzerland AG. He is passionate about finding solutions for the needs and troubles of postal delivery and other logistics companies. More than 16,000 of his company's vehicles are in use worldwide, the most famous being the award-winning KYBURZ DXP.

As converting renewable electricity to hydrogen is less efficient than using electricity directly, why and how is this energy carrier part of a sustainable transport future?



THOMAS WALTER is Partner at H₂Energy and responsible for hydrogen applications in ships, rail and stationary. He holds a MSc in Mechanical Engineering from TU Munich. Previously, he worked at EMPA Dübendorf, Sauber Petronas Engineering AG, Kistler Instruments AG and Hug Engineering AG.

tuesday
13.30

ETH WEEK TENT

◆ **KNOWLEDGE FAIR**

Area 4

4.3) **ENERGIE 360°**

The drive for e-mobility

The largest range of services for electric mobility in Switzerland is being formed under the umbrella of Energie 360°. Together with its subsidiaries, Energie 360° is consistently driving the ecological change in mobility forward and offers a well thought-out and future-oriented range of products for charging at home, on the road, at the workplace and at the destination.

GOFAST is part of Energie 360°, and constructs and operates Switzerland's largest fast-charging network. Their ultra-fast charging stations can charge every electric car at maximum charging speed. GOFAST's continuous investments and their vision of a nationwide network of ultra-fast charging stations will allow the Swiss population to make the switch to electric cars and help Switzerland achieve its climate targets.

Follow-up questions on Thursday only between 14.30 - 15.30, please.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What are the major stumbling blocks on the way towards an ecological change in mobility - and how can we overcome them? Are ultra-fast charging stations already economically viable or when will this happen?



MICHÈLE BOLLE is a product manager for electric mobility at Energie 360° AG, working with a focus on charging solutions in buildings. She holds a Master of Science in Geography with focus on environmental education and GIS.



VERENA LÜBKEN is the Innovation Integrator at Energie 360° AG, focusing on building innovation partnerships with universities, startups and companies. She has experience in using innovation methods and developed new solution concepts in the area of e-mobility.



STEPHANIE SAUTER is a member of the executive management at Gotthard FASTcharge AG (GOFAST) and responsible for business development. Prior she worked in the logistic and medical device industry and holds a Master's degree in Entrepreneurship.

**tuesday
13.30**

ETH WEEK TENT

◆ **KNOWLEDGE FAIR**

Area 4

4.4) **PSI TECHNOLOGY ASSESSMENT GROUP**

Life cycle impacts of passenger car technologies today and in the future

The Paul Scherrer Institute is one of the institutes of the ETH domain. Energy research is one of its focus areas - both hardware development (e.g., fuel cells and batteries) and analytical research (e.g., LCA and energy system modeling) is performed. These activities are contributing to the decarbonisation of the Swiss energy system towards the goal of a net-zero greenhouse gas emission economy.

4.5) **ESORO**

Implementing alternative drive technologies for diverse applications

Since 1990 ESORO has been working intensively in the field of conception, implementation and testing of clean car concepts and drive systems. ESORO thus has well-founded experience in the development and operation of electric, plug-in-hybrid and fuel cell drives. For example, ESORO realises EV projects in close cooperation with renowned original equipment manufacturers (OEMs) from the initial conception through the prototype to the serial project phase. Main customers of ESORO are the R&D departments of OEM's.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

What are the requisites for making electric mobility more climate and environment friendly than cars with internal combustion engines?

Is there a drop-in replacement for vehicles run on fossil fuels? Will one technology or a mix prevail?



CHRISTIAN BAUER is a scientist in the Lab for Energy Systems Analysis at PSI. His research focuses on Life Cycle Assessment (LCA) of current and future energy supply and mobility.



STEFAN CAMENZIND holds a Master's degree in Mechanical Engineering from ETH, works as Senior Engineer at ESORO AG and was involved in different mobility projects concerning electric, hybrid, and fuel cell vehicles for OEM and industrial customers.

**tuesday
13.30**

ETH WEEK TENT

◆ **KNOWLEDGE FAIR**

Area 5

5.1) **BCOMP**

Sustainable high-performance materials for mobility

In response to the revolution for cleaner mobility, Bcomp develops and markets sustainable lightweight solutions made from natural fibres. Automotive interior panels can be made 40% lighter using 80% less plastic (cost neutral) and replacing carbon in motorsport bodies can achieve 75% less environmental impact and 30% lower cost with the same performance. Our philosophy is that in order to be truly sustainable and maximise impact, you must first check the performance and cost boxes.

5.2) **SWISSCLEANTECH**

Trade association for sustainability

swisscleantech has been pursuing a clear goal for ten years: Switzerland should play a pioneering role in sustainable development. As a cross-industry trade association, swisscleantech represents around 300 companies and associations from all sectors and regions of Switzerland.

To achieve sustainable mobility, it is not enough to replace vehicles with high emissions. Land use and the associated costs are being particularly neglected today. A vehicle driving through a bottleneck such as the Baregg tunnel at 1 am at night does not reduce the availability of space, quite differently at 8 am. This leads to an economic misallocation. Vehicles that require little space, such as trains, have no comparative advantage, even though they produce added value for the general public.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

Are materials made from natural fibers a viable global solution when considering the land surface needed to cultivate such crops?

What factors have to be in place for Switzerland to become CO₂ neutral by 2050? Is this feasible?

tuesday
13.30
ETH WEEK TENT



VINCENT HEY is an R&D engineer from EPFL. At Bcomp he is responsible for customer projects for world-leading clients in the mobility and aerospace industries, developing and implementing natural fibre lightweight solutions for large-scale applications.



EBBA CARLSON is the CMO and CFO of Bcomp AG.

Ebba will be available on Thursday for business / market / strategy related questions (E-mail / telephone).



CHRISTIAN ZEYER is Managing Director of swisscleantech and responsible for research issues. swisscleantech is a business association committed to the development of a sustainable economy. The aim is to shape the economic framework in such a way that Switzerland becomes CO₂-neutral by 2050 at the latest.

◆ **KNOWLEDGE FAIR**

Area 5

5.3) **SIEMENS MOBILITY**

Automatic train operation (ATO)

The constantly increasing need for mobility requires more efficient transport concepts. Siemens Mobility Switzerland develops intelligent mobility solutions that optimise the use of road and rail, increase the availability of infrastructure, make rolling stock more efficient and create a new quality of travel for passengers. We are dedicated to the electrification, automation and digitisation of infrastructure and vehicles. We are already setting standards today for tomorrow's mobility.

5.4) **CARROSSERIE HESS**

Swiss Trolley+

Carrosserie Hess AG with the headquarters in Bellach employs around 300 people. Hess was awarded the Watt d'Or in 2008, 2015 and 2018 by the Swiss Federal Office of Energy in the category of energy-efficient mobility. In 2007, Hess teamed up with the ETH Institute for Dynamic Systems and Control for the hybrid electric bus (AHEAD). Currently, Hess and IDSC are collaborating with VBZ in the field of Trolley-Bus-Systems in the SwissTrolley+ Project.

By replacing diesel-powered buses with HESS LightTram buses, bus companies around the world could save around 100 tonnes of CO₂ per year and vehicle.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

Long-term, how can rail transport be competitive with road transport? What political factors play a role here?



HENRY WÜNSCHE is a project manager in the strategic and product management program ROOF (Railway Operation of the Future) of Siemens Mobility Switzerland. He has 16 years of experience in the implementation, piloting and development of railway safety installations.

What would carbon neutral urban transport look like?
What role would hybrid bus systems play?



MARTIN WIDMER finished his Master at ETH IDSC in 2011 and has since worked at Hess. He started as the sole person responsible for introducing new traction systems designed by Hess, and is now head of the rapidly growing traction department.

tuesday
13.30

ETH WEEK TENT

◆ **KNOWLEDGE FAIR**

Area 5

5.5) **DATWYLER**

How the Datwyler Group contributes to sustainable passenger car solutions

The Datwyler Group is an international supplier of industrial components with leading positions in global and regional market segments. In its Sealing Solutions division, Datwyler provides custom sealing solutions to global industry segments, such as healthcare, automotive, consumer goods, oil and gas, general industries, and civil engineering. The products and services of Datwyler are based on high-quality materials, innovative technologies, and outstanding engineering and process know-how.

× **HEADS UP**

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

How would future automotive industry and production chains have to be redesigned to reach climate goals?



DAMIAN IMHOF is Senior Vice President and responsible for automotive customers (with sales of over CHF 320 million). He is 53 years old, married and has one child. He has been working with Datwyler for 31 years in various roles and departments.



DANIEL GLOOR is Product Development Manager in the field of advanced technologies. The development team focuses on seven major technology platforms in which various projects are carried out. He has been working with Datwyler on the development of new technologies since 2016.

tuesday
13.30

ETH WEEK TENT

◆ KNOWLEDGE FAIR

Area 6

6.1) INITIATIVE ON CARBON NEUTRAL AVIATION

Catching up to other transport modes in carbon neutrality

The Initiative on Carbon Neutral Aviation (ICNA) was launched by two students who are passionate about flying, yet very much aware of the negative climate impact. While carbon-neutral technologies already exist for a number of sectors (e.g. power generation, automobiles), aviation is far behind in this matter. The ICNA wants to become an interdisciplinary center for research on carbon neutral aviation, addressing this challenge from the angles of technology, policy and economics, in order to make commercial aviation compatible with the Paris agreement.

6.2) SWISS INTERNATIONAL AIR LINES

Digitalisation to enhance travel experience, operation and efficiency

SWISS, “The Airline of Switzerland”, is serving over 100 destinations with one of the most modern and fuel-efficient fleet in Europe.

The digital strategy of SWISS aims to take full advantage of the technological opportunities to further enhance our customers’ travel experience, optimise our business and operating processes and bring greater efficiency to the daily working lives of our employees on the ground and in the air.

No follow-up questions on Thursday, please.

6.3) DUFOUR AEROSPACE

Building aircraft for rugged operation in harsh environments

Dufour Aerospace is breathing fresh, sustainable life into classic aircraft concepts. After a strong start with an all-electric plane, they are making runways obsolete by developing hybrid-electric vertical take-off and landing (VTOL) tilt-wing aircraft, ranging in size from drones to a 5-seater. Dufour is currently expanding operations with a Zurich office in addition to its headquarters in Visp.

× HEADS UP

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

Is carbon-neutral aviation really feasible or mere science fiction? What are the promising technologies?

With the ongoing climate debate, can airlines still continue with business as usual? What do they have to do to keep up with political and societal pressure to lower greenhouse gas emissions?

What does aviation of the future look like and what factors are essential to make it climate-compatible?

tuesday
13.30

ETH WEEK TENT



OSKAR JÖNSSON is a Master student in Environmental Science at ETH Zürich. Involved in university politics since the first semester, Oskar campaigned with other students to make ETH aware of its carbon footprint due to aviation and thinks ETH should do more research in making aviation carbon neutral.



CHRISTIAN SIGG is Head of the Business Development & Executive Office and responsible for the strategy and business development at swiss. He holds a Master of Science degree in Management, Technology & Economics from ETH Zürich.



JASMINE KENT is a co-founder and the CTO of Dufour Aerospace AG. An early hire at Google’s Zurich office, she brings deep software engineering expertise and a passion for technology to the aviation world.

◆ KNOWLEDGE FAIR

Area 6

6.4) BAZL (FEDERAL OFFICE OF CIVIL AVIATION) Innovative Swiss products and services in the aviation sector

The BAZL (engl.: FOCA) is the responsible authority in Switzerland, which ensures the safety in the Swiss aviation system. The 'Innovation and Digitalisation' organisational unit ensures that the FOCA efficiently performs its function as a trend-setting 'enabler' for the sustainable integration of innovative Swiss products and services into the Swiss and global aviation system. To this end, ID actively participates in and influences the national and international effort in rulemaking for these new and often disruptive technologies to the benefit of the research, development and industry in Switzerland.

6.5) SWISSLOOP Transporting people in a vacuum at high speed

Swissloop is a student association at ETH Zürich. It was founded in 2016 and regularly participates at the SpaceX Hyperloop Pod Competition. The team placed 3rd in 2017 and 2nd in 2019. At the Hyperloop competition 2019, they also received an innovation award for developing their own linear induction motor and inverter. Swissloop's aim is to promote student innovation while also generating valuable research for high-speed ground transportation. Swissloop believes that the hyperloop technology could one day be more economical and energy efficient than short-distance flights.

× HEADS UP

You might want to contact these experts on Wednesday to get feedback on your ideas. Ask for their business card and if they have 15 min on Wednesday afternoon (between 13.00 and 16.00) for a brief telephone call.

In the future, could drones be an option for sustainable individual passenger transport?



FARNER MARKUS is Co-Leader Innovation and Digitalisation, leading the UAS Integration Program, which is responsible for all aspects of the safe integration of drones into the Swiss airspace. The Swiss risk-based approach paired with the liberal legal framework are two of the key factors for the success of the growing drone industry in Switzerland. The successful Swiss approach is also the basis for international harmonised rulemaking

How does the Hyperloop compare to magnetic levitation trains, a technology that is already being implemented?



DANIEL KAUFMANN was Swissloop's mechanical lead for the 2019 Hyperloop Pod Competition. There he was responsible for the mechanical team, as well as system interfaces. He also developed new high-speed wheels. Regarding materials for structural parts, Carbon Fiber and EN-AW 7075 are his personal favorites.

tuesday
13.30

ETH WEEK TENT

↘ Unpack.

About half of the time this afternoon is reserved for you to bring the information gathered during the knowledge fair into your teams, discuss it, and structure it into different clusters or frameworks that make sense.

To simplify sharing and understanding, the findings are aggregated into categories: actors—needs—insights. As time is limited and the amount of information gathered is large, you need to synthesise the discussions held at the fair into a few concise findings that you can share with your team. Make sure the other students understand why the finding was meaningful to you. Indeed, this synthesising process is very personal. You have to infer meaning and interpret what has been said. Then you must decide which information is important and filter the data accordingly.

× NOTE

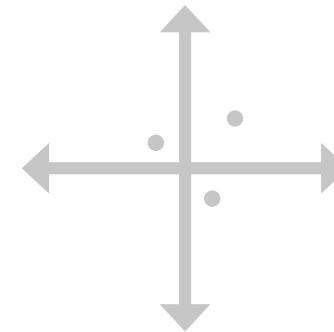
A few hints for writing post-it notes in style:

- One aspect per post-it note, to regroup ideas.
- Incorporate drawings to make your ideas more understandable.
- Be concise and adapt to the size of the post-it note.
- Color code! Today: actors (yellow), needs (green), insights (pink).

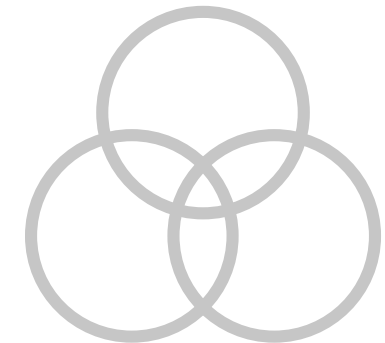
tuesday
15.45
TEAM SPACES

1 → 2 → 3 → 4

journey map



two-by-two



venn diagrams

Use frameworks

HOW TO FORMULATE A PROBLEM STATEMENT

A problem statement is short and has three ingredients: actor, need, and insight. By combining them into a sentence, they are put in relation and reveal initial dependencies. Problem statements are standardised sentences that guide the process of your team, like a slogan. They also provide focus to generate ideas during ideation tomorrow.

Example:

*Peter, who produces individualised fashion, needs a process to establish mass customisation for “personalised clothes”; however, fashion is nowadays produced by either inflexible mass production or labor-intensive, highly costly tailoring service.
(Project Snow White, ETH Week 2017 Manufacturing the Future).*

A good problem fulfils the following criteria:

1. Is the problem statement focused enough to have a specific impact?
2. Does the question allow for a variety of solutions?
3. Does the question take into account context and constraints?

You may have to play with the scope of your problem statement. If too broad, you might not know where to start and develop concepts that are unspecific. If too narrow, you might already have a specific solution in mind. In both cases, you need to adjust and dig deeper in order to find at what ‘altitude’ the real need lies so that you can overcome a precise constraint and innovate.

× NOTE

In pairs, use this scaffolding to formulate a first problem statement. Discuss your answers to each question, then move on to the next.

describe

the problem you have identified in three lines.

version 0.1

Phrase it as a problem statement.

impact

State the ultimate impact you are trying to have.

context and constraints

Finally, write down some of the context and constraints that you’re facing.

version 0.2

it as a problem statement.

↘ Problem statement 1.0.

Now it is time to start defining the problem you want to solve. You will do this by formulating a first problem statement that is short and simple and that inspires your team.

The trick is to feel comfortable with taking quick decisions. As this is an iterative process, there will be enough time to make it more precise tomorrow or change it if need be. At the same time, the trick is to iterate in a constructive way, which means to build continuously on every step and include the knowledge gathered. With every iteration, you will gain a better understanding of your problem, which is why your problem statement will become clearer and more precise.

In pairs, you will use the template on the opposite page to phrase a first problem statement. It is the least straightforward task of the week, and it is not easy to get right in a first attempt. The result will be a draft that you will improve again and again.

× HEADS UP

Sign up before 20.00 at the Info Desk for tomorrow's Cardio training or the Outdoor session.

Don't forget to bring your own cup, plate and cutlery to the No-Flight Night tomorrow!

(Actor)

needs

(need)

however

(insight)



↘ Template.

The crucial lesson of today was to take decisions quickly as a team. As you have become familiar with the dynamics, understand that your ideas are not lost, but may return later in the process, when they can be used to build on another thought. Therefore, the template contains more than just the selected problem statement.

◆ **PANEL DISCUSSION**

At this panel discussion, we will get first-hand information from experts about the role of disruptive developments in reshaping urban and interurban mobility systems. Hear their main concerns and challenges and pose your own questions!

**URBAN AND INTERURBAN MOBILITY
CONNECTING PEOPLE WITHIN AND BETWEEN CITIES**

Transport and mobility have global impacts, with climate change being the overarching challenge. However, on a local and regional scale, pollutant emissions such as particulate matter, ozone and nitrogen dioxide from vehicle exhaust are bad for our health, too. Moreover, traffic, congestion and overcrowded public transport also affect our well-being. Cities are already trying to counteract these effects by implementing low-emission zones or banning cars from city centers entirely.

This is a start, but how can we reshape mobility and transport in urban environments to ensure a high quality of life for all without restricting people's ability to go about their everyday lives? One option is to move away from personally owned vehicles and instead to adopt mobility as a service (MaaS) and disruptive innovations. Offers such as shared bikes and electric scooters are on the rise in cities, but they often only cover the last-mile and cannot satisfy the needs of certain user groups (e.g., families, elderly or disabled). Multi-modal solutions that also combine public and private transport as well as car- and ride-sharing could improve the efficiency of urban transport while also fulfilling very diverse customer needs. Here, digitalisation is a key factor, and new apps that guide consumers in combining modes and sharing vehicles will be crucial.



GLORIA ROMERA holds a degree in Industrial Engineering from Carlos III University, Madrid, and specialises in Mechanics and Energy. She completed a PhD at ETH Zürich at the Mechanical Department and has worked as R&D Engineer at Sensirion AG. In May 2014, she joined the SCCER Mobility as Managing Director and helped to build up and coordinate the Swiss Competence Center of Energy Research dedicated to Efficient Mobility.

And what about mobility between urban centres? Here, low-cost regional flights are crowding out other transport modes, and demand is increasing fast - so fast that any emission savings on the ground may be compensated by those emitted in the sky. Are there technologies and services that can reduce this trend, or do we require changes in our behavior patterns and policy? Experts in the field will discuss and weigh options for how such disruptive developments can help remodel the urban and interurban landscape. They will examine whether and how new mobility services can lead to an optimised and more sustainable urban and regional mobility system at the social, economic and environmental levels.



ULRICH WEIDMANN is Vice President for Human Resources and Infrastructure of ETH Zürich and Full Professor of Transport Systems at ETH Zürich. Weidmann's research has focused on the following areas: the design of passenger transport systems, the integration of rail freight transport systems in logistic chains, and the efficiency and automation of railway networks and track construction.



TOM MARTY is Country Manager Switzerland at smide. smide is the world's first high-performance e-bike and micro-mobility sharing service. We want to disrupt urban mobility and are providing a smart, sustainable, fast and fun alternative to move within cities. Tom holds a Master's degree in Economics and Business Administration from the University of Zurich.



DIRK BÖDEKER moved to the rail sector 18 years ago with a wealth of experience in communications technology (including Nokia Networks). While he was initially more focused on the hardware side, he took over ten years ago as Head of Customer Services at Siemens Mobility for the Swiss market. Today, he is Head of Digitalisation & Innovation.



You will redefine the problem statement tomorrow.



The goal for today is to formulate a refined problem statement that reflects the deeper understanding gained during the first iteration. During the morning, you will think of initial solutions to really understand your problem. The afternoon is reserved for integrating feedback and research results.

7.00 — Cardio training and Outdoor session at Klub der Sportfreunde.

8.30 — Arrive at Process Walls.

↘ Check in.

8.50 — Kick-off at ETH Week Hall.

9.00 ▲ **KEYNOTE**
Andreas Meyer at ETH Week Hall.

↘ Ideate.

12.00 — Lunch break.

↘ Research and test.

↘ Problem statement 2.0.

↘ Template.

↘ Check out.

18.15 ▲ **COMMUNITY NIGHT**
No Flight Night.

Table Talks, Community Workshops and Street Food.

wednesday
sep 11

◆ FOLLOW UP PROGRAMME - KICK-OFF

Would you like to take the next step in Design Thinking? During ETH Week, you will go through a process that starts with finding a relevant problem and ends with a mock-up prototype of your solution. We don't want you to stop there, but take you a step further!

ETH WEEK - THE HATCHERY

After ETH Week, we will launch a new version of the follow-up programme: Over the course of ten weeks, we will support you in developing your idea into a functional prototype that you can show and test with potential implementation partners. Bring your solution to life, be it as a research project, a start-up company or even your future doctoral thesis.

Thanks to our passionate coaches and some magic tricks for collaboration, you will experience teamwork on a whole new level. Weekly workshops, a CHF 500 grant for prototyping, access to co-working and makerspace, expenses and contact to relevant experts from academia and industry will provide an environment where you can make your ideas real. At the final event, you will have the opportunity to present your prototype to organisations, institutions and ETH Zürich chairs that could be interested in supporting you beyond this program.

The program is open to all ETH Week participants. You will be required to show a high level of personal responsibility, commitment and enthusiasm to develop your own project and actively participate in the workshops over ten weeks. The course takes place every Thursday from 17.15-20.45 at the ETH Student Project House at ETH (Hönggerberg), starting on September 19. We also provide snacks during the workshops.

× NOTE

If you wish to participate in 'The Hatchery', please use the sign up-sheet at the InfoBar or indicate your interest by e-mail until Friday, 13 September. Please let us know if you plan to participate as a team.

- The number of participants in this program is limited to 40.
- If you have any questions, approach Michi Augsburg, who will join us at the community night.
You can also contact him via e-mail: thehatchery@sph.ethz.ch.

wednesday
08.50

ETH WEEK HALL



MORITZ MUSSGNUG is working at ETH Student Project House as a Coordinator for Project Support and Programs. He holds a doctoral degree in Product Development and a diploma in Mechanical Engineering. He is passionate about the very early stages of the design process. He strongly believes in the power of interdisciplinary teams.



MICHAEL AUGSBURGER is finishing his Master's degree in Environmental Systems and Policy at ETH Zürich. His research focuses on the use of human-centered innovation processes for policy design. An advocate of interdisciplinary team work, he has experience in designing and facilitating Design Thinking Workshops for companies, NGO's and student teams as part of Spark Works, an innovation consulting company.

◆ **KEYNOTE**

Andreas Meyer, CEO of SBB, will share insights about the challenges SBB faces in the fast-changing mobility landscape and how the company tackles these to remain at the heart of the Swiss transport system.

SBB ON THE MOVE – HOW A SWISS RAILWAY COMPANY HELPS SHAPE FUTURE MOBILITY

SBB is the backbone of the Swiss public transport system, and day-to-day rail operations are the basis of the company's business. SBB has been transporting people and freight for more than 100 years. As such, the Swiss Federal Railways make an important contribution to the quality of life and competitiveness in Switzerland. The company intends to continue this success story, even in times when the entire economy and society, including the mobility industry, are undergoing profound changes.

The rail operator faces great challenges, as its customers expect increasingly customised, intermodal, networked and simple mobility and logistics solutions. And they want the service to be both digital and personal. They rightly expect their mobility data to be handled in a manner that justifies their trust. At stations, customers appreciate the optimised transfer connections between all modes of transport and the appealing range of services. At the same time, the competition between rail and road transport is intensifying. Long-distance coaches are already available for both international and domestic routes. In future, self-driving vehicles will also be added. Other modes of transport are catching up – in terms of both pricing and environmental advantage. Sharing models are also becoming increasingly important. By contrast, the overall system costs of the railway are rising.

SBB is committed to being on the move, safely, punctually and reliably. At the same time, it is determined to look beyond the day-to-day business and shape the mobility of the future.

wednesday
9.00

ETH WEEK HALL



ANDREAS MEYER has been CEO of SBB AG since 2007. He studied Law and passed his bar exam in 1989. In 1995, he was awarded an MBA from the INSEAD Business School in Fontainebleau, France. He began his career in 1990 as a legal counsel and project manager at ABB, and from 1996 to 2006, Meyer worked for Deutsche Bahn AG. Andreas Meyer enjoys unwinding from his workday with sports. He loves jogging, hiking, biking and ski touring. During his three to four training sessions per week, he can switch off and recharge his batteries.

THE DESIGN THINKING FACILITATORS

The design thinking facilitators will accompany you today and tomorrow to provide you with a wide range of methods that will be used to develop solutions and improve your problem statement. They will be the pacemakers of the week and collaborate with your tutors. As experts in creative processes, they will help your team take decisions in the right order.



ALICE REPETTI is a Social Scientist with a background in Economics. As innovation strategy consultant at Spark Works and teaching assistant at ETH Zürich, she has experience in designing research projects and facilitating training programs using collaborative and agile techniques. She explores new ways to integrate technology, innovation and design into effective strategies to create social change and shape new educational approaches.



AXEL ZEIJEN is a doctoral student in the Technology & Innovation Management group at ETH Zürich. He studies how new technologies, such as 3D Printing, can shape the future – and how organisations and we as a society can get there.



BARBARA SCHNYDER holds a Master's degree in World Society and Global Governance. She worked as journalist and researcher in an interdisciplinary think tank engaged with global trends in business, science and society before she joined Spark Works as an Innovation Consultant.



ENRICO SCOCCIMARRO is a Materials Science Master student and cofounder of ETH spin-off FenX. He is intrigued by product development and seeks an interdisciplinary approach to innovation. In his free time, he is split between skiing in the mountains, sailing at sea, and enjoying home-made drinks from his 'gin & tonic lab' with friends.



HELEN MEYER is focusing on product development in her Master's in Mechanical engineering at ETH Zürich. She tutored ETH Week last year and did some workshop facilitation with students and companies next to her studies. Besides ETH, you will find her somewhere in the mountains or climbing the closest wall.



JEREMIA GEIGER is passionate about developing and realising ideas and believes that trust and commitment are major keys to success. He joined ETH for his Mechanical Engineering Master's studies in 2017. Earlier, he had worked in industrial R&D, initiating and leading innovative projects in Germany and Turkey.



MICHAEL AUGSBURGER is finishing his Master's degree in Environmental Systems and Policy at ETH Zürich. His research focuses on the use of human-centered innovation processes for policy design. An advocate of interdisciplinary team work, he has experience in designing and facilitating Design Thinking Workshops for companies, NGO's and student teams as part of Spark Works, an innovation consulting company.



LILIAN HÖRLNER is an accomplished designer with a Bachelor's degree in Graphic Design from the Hochschule Luzern, Art & Design. Lilian develops the internal visual communication at Spark Works. Additionally, she is a trained Design Thinker at ETH Zürich. She enjoys working and experimenting with different design methods to find new, effective ways to communicate.



SONJA FÖRSTER is a trained mechanical engineer and business school graduate. Not being able to side with one or the other community, she has been working at the intersection ever since, trying to reveal the constructive forces of interdisciplinary team work. She is also very passionate about applying methods (to herself and others) that shake routine behaviour to expand the creative potential of individuals



LINDA ARMBRUSTER holds a Master's degree in Strategic Design from the design akademie berlin. As Project Manager at Spark Works, a strategic human-centered innovation firm, she builds and leads inspiring research and advisory programs with interdisciplinary teams to tackle complex challenges in the private and public sector.



XENIA MEIER is able to navigate and embrace ambiguity by embodying curiosity and analytical thinking. With a background in Business Studies and Political Science, she is driven to bring creative thinking and a human-centred approach to innovation for the greater good of society.

After establishing a first draft of the problem statement yesterday evening, it is time to see if it holds and if it is productive. You will start ideating, which means generating solutions in a democratic way. First of all, the goal is not yet to develop good solutions, but to get the obvious solutions out of your heads and advance beyond them. This will result in an improved problem statement and clusters of initial ideas.

Next, you will start sketching. This is a quick way to bring ideas onto paper and figure out the details of different solutions. You will need to take decisions, going from an abstract idea to concrete details. In this way, you can probe and clarify different aspects of an idea. As you are under time pressure, you will automatically have to focus on the essentials, which helps you discard weak ideas in the process. Sketching is also a quick way to make ideas shareable. In fact, you will work in sub-teams all morning, advancing different ideas in parallel.

× NOTE

Make sure that yesterday's problem statement and the actors-needs-insight post-its are visible in the space where you ideate.



Brainstorming rules

Research and test.

After generating first ideas, please set aside some time to evaluate the ideas and remain critical. Reconsider the brief that we introduced on Sunday, and start answering the scientific rigour questions from the opposite page.

This goes hand in hand with preparing for the first round of testing. In order to get feedback from the experts you have met so far (during the field trips or at the knowledge fair), choose who would be relevant to talk to and schedule a phone call or ask for an answer by e-mail (most experts reserved time from 13.30 - 16.00).

During the research and test phase in the afternoon, you will deepen your understanding of the problem you are trying to solve. For this, you will split up to work in parallel:

- do research to back up your assumptions;
- get feedback from experts by phone or e-mail;
- test your idea sketches with non-experts.

You will learn to build on other people's knowledge and decide which feedback is useful for advancing your project, and how to integrate it. You will learn to be critical about your own ideas and evaluate them as you move on.

We suggest that during this phase, you should listen as much as possible and talk as little as possible while explaining your ideas. You don't want to convince anybody; rather, you want to observe their reactions and learn from the exchange.

This marks the end of the first iteration. After this, you will jump back to defining, i.e. reframing your problem statement. You will go through a second iteration tomorrow.

× NOTE

Start answering the scientific rigor questions under point (3) of the brief:

- What are your underlying assumptions?
- What facts and figures did you rely on?

Now you may use the feedback capture grid below. Try to include getting answers to the feasibility part of the brief:

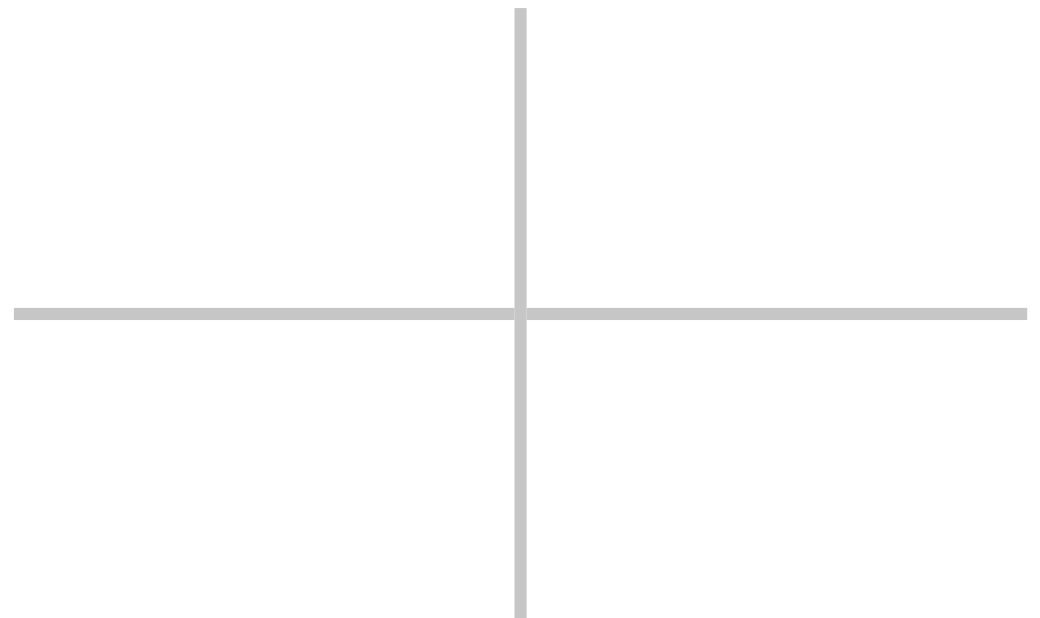
- How feasible is your solution?
- Are there uncertainties related to your solution that would need further clarification?

wednesday
13.00
TEAM SPACES

What worked well?



What did not work?



What questions remain?



New ideas that emerged.

↘ Problem statement 2.0.

Because we want you to fall in love with the problem and not with solutions, the formulation of the problem statement is always the goal of the day. Make sure it reflects the lessons learned from the ideation phase in the morning and the testing phase in the afternoon.

Make sure it fulfils the following criteria:

- Is the problem statement sufficiently focused to have a specific impact?
- Does the question allow for a variety of solutions?
- Does the question take into account context and constraints?

A problem statement has the following goals:

- It phrases a problem as a standardised sentence to guide the process of your team, like a slogan.
- It provides focus to generate ideas during brainstorming.
- It serves as an evaluation tool for competing solutions, so that your team can take decisions when working in parallel.
- It documents the progress of your understanding of the problem, deepening with every iteration.

× HEADS UP

Sign up before 20.00 at the Info Desk for tomorrow's Cardio training or the Outdoor session.

(Actor)

needs

(need)

however

(insight)

■

↘ Template.

The main result of Wednesday is an improved problem statement. The template will contain two solution ideas, the sketches of the morning, and the answers to the first questions of the brief: scientific rigour and feasibility. Additionally, you can talk to the various people you'll meet on today's Community Night. Consider it another forum to test your ideas.

◆ COMMUNITY NIGHT

Following the input talks, the knowledge fair, the keynote lecture and a lot of teamwork in time-constrained settings, this evening is all about informal discussions, concentrating on one special topic: aviation.

CONTRIBUTE TO A NO-FLIGHT SOCIETY

Today, flying is very affordable and is rapidly becoming an integral part of a widespread cosmopolitan lifestyle. However, in contrast to other modes of transport, aviation is tax-exempt. Airlines do not pay mineral oil taxes on kerosene, and passengers do not pay VAT. This means that of all transport modes, the environmental burdens of aviation are not compensated in any form. The facts that airplanes produce the highest GHG emissions per passenger kilometer and that air travel demand is increasing fast make it the most problematic in terms of climate protection goals. Furthermore, construction of new airports is usually funded by cheap or free government loans. Thus, air travel has been subsidised directly or indirectly for years already and will continue to contribute to GHG emissions unabatedly if these conditions persist.

This is why there is growing concern in our society about this lifestyle and current policy. Tonight, we invite various citizens' movements and present various approaches from the ETH family who are trying to lower the emissions caused by air travel. Sit down and enjoy a cosy dinner with the people behind these initiatives and find out what motivates them!



MICHAEL KUHN had so much fun organising the Community Night last year that he felt he had to repeat it this year and make it even greater. He now is studying for his Master's degree in Applied Psychology, works as an HR specialist at **SENOZON** and spends the rest of the time on the streets of Zurich as a bike messenger.

× HEADS UP

Bring your own cup, plate and cutlery! You can wash them at the dishwashing station.

PROGRAMME OF THE NO-FLIGHT NIGHT

TABLE TALKS

We invited several quite different people for dinner who will share their approach to flying with you. Please join them, have informal discussions and find out their story! More information on the following pages.

SPORTS PROGRAMME

Are you full of energy? Haven't had any time this week to let energy out? Why not try the different sports activities outside of the building.

PAPER PLANE CHALLENGE

When was the last time you made a paper plane? Today's your chance, the paper plane challenge is waiting for you outside.

BEER FROM A LOCAL BREWERY, TURBINENBRÄU

This local brewery is not only located in the centre of Zurich, it's their philosophy to source their ingredients from places close to Zurich. They brew a limited edition beer: "Amboss Gold Limited". So try it and ask them where they got their hops from.

STREET FOOD FAIR

Have some delicious vegan or vegetarian food and beverages from Einmachbibliothek, Gelateria Martin, or Orient Catering. Also, try some beer from Amboss brewery. Their headquarters are just opposite the ETH Week Hall!

wednesday
18.15

ETH WEEK HALL

TABLE TALKS

MAVT CARES - A FLIGHT REDUCTION PROGRAMME FROM D-MAVT

Air travel accounts for more than half of CO₂ emissions from ETH Zürich. The Department of Mechanical and Process Engineering (D-MAVT) therefore implemented MAVT CARES, an initiative that charges researchers for their flights and uses the collected money to support student projects and to purchase emission certificates.

Students can apply to the department with their own project proposals. The more sustainable development goals (SDGs) their project addresses, the greater the chances of winning scientific and financial support. CARES allows students to develop and implement project ideas to actively shape our sustainable future.



JULIA JÄGGI is a Mechanical Engineering undergraduate at ETH Zürich and is Head of the university politics team at D-MAVT. Since her first day at ETH, Julia is active in the student association and has implemented projects like the outstanding teaching assistant award or MAVT CARES.



MARCO MAZZOTTI is Professor of Process Engineering at ETH Zürich. He works on the science and technology needed to mitigate carbon dioxide emissions from industry, thus aiming at a sustainable energy system. Since 2011, he has been a Board member of the Energy Science Centre of ETH Zürich.

FROM EUROPE TO AUSTRALIA AND BACK – WITHOUT FLYING

After being invited to a wedding in Sydney, Giulia and Lorenz travelled from Zurich to Sydney and back by boat, bus and train to send a message: we can no longer wait to reduce our emissions. Technology may not be enough and far too late with many other possible repercussions, while offsetting means business-as-usual. The climate crisis is here and by staying grounded everyone can drastically reduce emissions and help to spark wider cultural change towards less, slower and better travelling.



GIULIA FONTANA is in her Master's studies of Environmental Sciences at ETH Zürich. She is interested in social change and transformation to a post-carbon society. In addition to her studies she has been engaged in many volunteer projects, including the Nachhaltigkeitswoche Zurich and the Swiss Sustainability Week. Three years ago she decided to stop flying.



LORENZ KEYSER is about to start his Master's of Environmental Sciences at ETH Zürich. He is interested in degrowth and plural economics. During his studies he has engaged in many student sustainability projects, including the VSETH Student Sustainability Commission, the Nachhaltigkeitswoche Zurich and Swiss Sustainability Week. He hasn't flown since 2015.

TABLE TALKS

INITIATIVE OF CARBON NEUTRAL AVIATION (ETHPLUS)

From travelling alone as a child to visit my grandparents in Sweden to departing for 6 months of university exchange to Hong Kong or working as a flight-attendant for one year, flying always was a self-evident and fascinating aspect of my life. The urgent threat of global warming now questions this so far irreplaceable mode of transport for long distances. Because there are no alternatives to international exchange across continents, we started the «Initiative on Carbon Neutral Aviation», with the aim to foster research making aviation carbon neutral by 2050.

The Initiative on Carbon Neutral Aviation (ICNA) was launched by two students who are passionate about flying, yet very much aware of the negative climate impact. While carbon-neutral technologies already exist for a number of sectors (e.g. power generation, automobiles), aviation is far behind in this matter. The ICNA wants to become an interdisciplinary center for research on carbon neutral aviation, addressing this challenge from the angles of technology, policy and economics, in order to make commercial aviation compatible with the Paris agreement.



OSKAR JÖNSSON is a Master student in Environmental Science at ETH Zürich. Involved in university politics since the first semester, Oskar campaigned with other students to make ETH aware of its carbon footprint due to aviation and thinks ETH should do more research in making aviation carbon neutral.

FLYING VETO - AN ONGOING PERSONAL EXPERIMENT

After the UN Climate Change Conference in Paris in December 2015, I decided to give up flying: the scientific community can set a good example, and test for itself how institutions can be reformed in order for a climate-friendly society to function. I understood my decision as an experiment that has been running for almost four years. So far I failed twice: in 2016 I flew to the Azores, and in 2019 I took train and boat to Athens but crossed the Mediterranean Sea by plane to reach Cairo.



CHRISTOPH KUEFFER is Professor of Urban Ecology at the Department of Landscape Architecture at HSR Rapperswil, senior lecturer (Privatdozent) at ETH Zürich and lecturer at various universities (e.g., University of Exeter, UK). He holds a Master in Environmental Sciences and a doctoral degree in Plant Ecology from ETH Zürich. Christoph's research focuses on urban ecology and global change impacts on biodiversity (e.g., in island and mountain ecosystems).

TABLE TALKS

ETH MOBILITY PLATFORM INITIATIVE - STAY GROUNDED, KEEP CONNECTED

To reduce flight-related emissions that amount to over half of ETH Zürich's CO₂ emissions, the Executive Board launched a project to embark on a real reduction path. In a participatory process, the departments, the Executive Board and the administrative units of ETH Zürich committed to a per capita reduction of approximately 11 percent between 2019 and 2025, compared to the average for 2016-2018. The reduction goal includes flights by employees, students as part of their curriculum and invited guests (www.ethz.ch/airtravel).

FRIDAYS FOR FUTURE - CLIMATE STRIKE SCHWEIZ

Due to my international engagement and work I travel a lot. In order to reduce my mobility footprint I plan all travels in Europe by train or bus and therefore travel up to 48h (longest train ride to Turkey) one way to a conference. Furthermore several projects where I'm part of are shaping the higher education landscape at ETH, in Zurich and all over Switzerland. One of our demands is that employees fly less and more sustainable alternatives get implemented.



SUSANN GÖRLINGER works in the office of the Vice President for Human Resources and Infrastructure, is Co-Lead of the Mobility platform since 2016 and project lead of the ETH flight reduction project 'stay grounded, keep connected'.



MARIE-CLAIRE GRAF is studying political and environmental sciences at UZH, is leading several sustainability and climate initiatives on a local (e.g. Student Sustainability Commission at ETH), national (e.g. Sustainability Week Switzerland) and international (e.g. Youth Constituency to the UNFCCC) level and traveled to 24 countries by train and bus last year. She participated in ETH Week 2017, is active at both Swiss and international climate strikes and was recently awarded as the female citizen of Zurich for her engagement on climate and gender issues.

UMVERKEHR

umverkehR is an independent association with about 8000 supporters. We have been committed to sustainable mobility for 27 years. The vision at the origin of umverkehR was to cut motorised individual transport by half. Our main concern is to reduce traffic, make it more environmentally friendly and save space.



GRETA STIEGER studied Environmental Sciences at ETH Zürich. After graduation, Greta worked at ETH's former Safety and Environmental Technology Group in the field of environmental chemistry and health. From 2015 to 2018, she further developed her science communication and event management skills at the non-profit organisation Food Packaging Forum in Zurich. In April 2019, she joined umverkehR as project manager of the campaign Zug statt Flug (train instead of flight), thus pursuing her passion for sustainable mobility and climate protection.



Tomorrow, you will get to prototype and test.



It is time to start prototyping. During the morning, you will work on solutions and make your ideas tangible. You will then use your prototypes to get feedback from experts, making a dry run of a first presentation. Afterwards, you will integrate their comments and reconsider the brief.

7.00 — Cardio training and Outdoor session at Klub der Sportfreunde.

8.30 — Arrive at Process Walls.

↘ Check in.

8.50 — Kick-off at ETH Week Hall.

↘ Prototype.

12.00 — Lunch break.

↘ Feedback from researchers.

↘ Integrate feedback.

↘ Template.

↘ Check out.

18.30 — Dinner

19.30 — Stage test

thursday
sep 12

↳ Prototype.

Prototyping is a chance to bring ideas out of your head into the material world, making them tangible. Your idea is just beginning to come to life. Also, try to forget about precision and perfection for the moment: low-resolution prototypes are quick and cheap to make, but they are still sources of valuable insights as you study, discuss, and test them with your peers. Similar to yesterday morning, you will again work in sub-teams and produce different prototypes in parallel. You will present two prototypes to the experts after lunch.

While prototypes can be very different in format, ranging from a wall of post-it notes to 3D models, and role-play, the general idea is the same: to gain an understanding of how your solution will function in reality and how it will be experienced from the actor's perspective.

In this iterative process, you need to take one decision after another in order to move from intangible ideas to a concrete model. What was unknown when you started off should now become precise. Also, design your prototype according to what you want to learn from it.

By making ideas tangible, they also become shareable. And the more you go into detail, the less chance there is of a misunderstanding. Therefore, prototypes are valuable conversation pieces that can have a rhetorical value of their own.

× NOTE

Some more reasons to prototype, in bullet points:

- To ideate and problem-solve
- Solve disagreements
- Communicate
- Start a conversation
- Fail quickly and cheaply
- Manage the solution-building process
- Test possibilities

thursday
9.00

TEAM SPACES

what

do you want to prototype?

how

do you want to prototype?

why

is it relevant?

Today you will get the chance to acquire extra prototyping material at OFFCUT. Send one or max. two teammates, your tutor will give you a time slot, just mention your team number at checkout. Each team has an allowance of 30 CHF. Please try to buy only what you need. OFFCUT is located close to ETH Week Hall, and we have partnered up for additional prototyping materials. As a socially and politically active network, it promotes self-awareness and awareness for resource conservation and circular thinking by collecting, storing and redistributing used and residual materials that would end up in waste.

Feedback from Researchers.

The feedback is organised in three rounds. You will first present the two final prototypes of this morning. Once you are done presenting, the experts give you feedback.

Some hints:

- Define beforehand what you want to test.
- Let the researchers experience the prototype:
Show, don't tell!
- Actively observe.
- Follow up with questions.

Make the most of this time. Keep track of what is being said and think about what this means for your project. What needs to change, what needs to be improved, what needs further research or clarification? Take notes on the feedback capture grid on the opposite page.

Also, make use of the time when experts are giving feedback to other teams. Focus on the third point of the brief: systems thinking. You can find the brief in the next step.

× HEADS UP

The experts will come into your team spaces, so that you lose no time in transit. There are three slots, 13.00, 13.30 and 14.00.

thursday
13.00
TEAM SPACES

What worked well?



What did not work?



What questions remain?



New ideas that emerged.

THE RESEARCHERS

The following researchers are going to meet you in groups of three to give feedback to your problem statement and the two solutions you have been working on during the morning. They are related to the two themes of 'Rethinking Mobility'. In addition, it is our pleasure to welcome again some of the people who have provided you with insights since the beginning of the week.



CHRIS ONDER is Professor at the Institute for Dynamic Systems and Control and heads the Engine Systems Group. His main research focuses on modeling, control and optimisation of engine and vehicle propulsion systems. Together with many industrial partners, the researchers at the institute tackle problems of efficient monitoring, control and design of complex systems. Based on first principles in mathematics and physics, a model-based approach is applied to a wide range of challenges.



SHELLY ARREGUIN completed her doctoral studies in Materials Science and Engineering, and Nanotechnology at the University of Washington in Seattle. She has dedicated her career in advancing materials for various energy enabling technologies (nuclear, mobility, building energy efficiency), with a focus on sustainable manufacturing for the further realisation of a low carbon economy.



OMAR KASSAB is a doctoral researcher at the Professorship for Social Psychology and Research on Higher Education at ETH Zürich, where he focuses on research evaluation and impact assessment. Complementary to this position, he works as a project manager at the sustainability office of ETH Zürich. Omar has a background in Political Science and holds a Master's degree in Comparative and International Studies from ETH Zürich.



ELENI CHATZI is Associate Professor of Structural Mechanics and Monitoring at D-BAUG. Her main research is focused on the domain of Structural Health Monitoring (SHM), i.e., the extraction of data from engineered systems via use of sensors, and the subsequent utilisation of this information for intelligent life-cycle assessment of these systems. She regards the meaningful aggregation and the explainable interpretation of data as key to the engineering of resilient and sustainable resources and networks.



BRATISLAV SVETOZAREVIC is a postdoctoral researcher at the Urban Energy Systems laboratory at Empa. His current work is related to data-driven, self-optimising control algorithms for building systems and district energy systems to improve their operational efficiency and reduce engineering and maintenance costs. Dr. Svetozarevic completed his doctoral studies in 2018 at ETH Zürich.



MADDALENA AGNESE VELONÀ is the Study Coordinator of the Department of Mechanical and Process Engineering at ETH Zürich since 2010. She received her doctoral degree in Geological Sciences at the University of Rome, La Sapienza, worked as researcher in the National Institute of Geophysics in Rome and as project manager in companies in Italy and Switzerland on risk and environmental assessment.

MORE RESEARCHERS



DAVID HAVELICK works as a Sustainability Manager at the Office for Sustainability of Harvard University. Before joining the office, he worked for ten years at the Harvard T.H. Chan School of Public Health in the Department of Epidemiology. David graduated from UMass with a degree in Political Science and Sociology, and holds a Master's degree in Sustainability and Environmental Management from the Harvard Extension School.



KIRSTEN OSWALD completed her doctoral studies at ETH Zürich and Eawag in Environmental Systems Science in 2016. Since 2017, she works in the management of the Swiss Competence Center for Energy Research - Efficient Technologies and Systems for Mobility (SCCER Mobility) at ETH Zürich.



MIRKO MEBOLDT is Professor of Product Development and Engineering Design at D-MAVT. His main research focuses on the development of new products in the field of mechanical engineering industries, biomedical applications and associated technologies. He regards the impact on the education of young engineers and its relevance for industry as a key motivation and benchmark for his research. He currently is working in user-oriented product innovations, new production technologies and challenging applications.



RAPHAEL ZAHN is a Senior Scientist in the Materials and Device Engineering Group (MaDE) at ETH Zürich. Raphael is fascinated by material interactions - an interest that has driven him to investigate the inner workings of Li-ion batteries. The MaDE group uses this insight to engineer novel nanomaterials and build better energy devices. Raphael is a keen cyclist and enjoys creating new dishes from his homegrown produce.



GIL GEORGES is a Senior Researcher in the Aerothermochemistry and Combustion Systems Laboratory at D-MAVT. There, he heads the Energy Systems Group, looking into how the energy transformation in transport affects the way we consume and supply energy. The group focuses on energy infrastructure for different modes of transportation, including trucks and planes and how this energy demand can be integrated with production at the local and national scale.



CORINE THOMMEN is a project manager and mobility intrapreneur at SBB, working on new mobility services in the field of (autonomous) on-demand mobility, bundling and mobility-as-a-service. Having studied social sciences, her focus in every new mobility service is the human and social element, putting the technology to work towards solving people's problems.



AHMAD RAFSANJANI is a mechanical engineer graduated at Iran University of Science and Technology, Tehran. He received his doctoral degree from ETH Zürich in 2013 and in March 2018, he joined the Complex Materials group in the Department of Materials. His research is focused on design, simulation, and additive manufacturing of programmable metamaterials and structures for soft robots and smart medical devices.

MORE RESEARCHERS



MATTIS STOLZE holds a Master's degree in Mechanical Engineering. He was part of several engineering design teams, mentored student projects and worked with international NGOs. Today he is combining complex design engineering with user-centered product development as a consultant at "Radiate Engineering and Design"



SIMONE SCHÜRLE is Professor of Responsive Biomedical Systems at D-HEST since 2017, researching on micro- and nanosystems for health care applications. She is a Co-Founder of an ETH Spin-Off for magnetic manipulation systems and serves as a Fellow of the WEF Global Future Council on the Future of Human Enhancement.



PAUL BAADE is a doctoral candidate in the Materials and Device Engineering group. He has worked on energy storage materials at Lawrence Berkeley National Laboratories and his doctoral research is focused on manufacturing processes for lithium ion batteries. He is investigating opportunities to lower the adoption barrier for future battery technologies.



GIANFRANCO GUIDATI joined ETH Zürich in 2017 as a manager for the SCCER-SoE (Supply of Electricity). Before that, he worked in various positions in the future technology department of Alstom in Baden. He is a mechanical engineer by education and did his doctoral studies in wind turbine aeroacoustics at the University of Stuttgart.



FELIX BÜCHI is Head of the Electrochemistry Laboratory at PSI. In his research he is developing fuel cell technology with lower cost and higher durability for mobile and stationary application. The work is based on materials development and advanced diagnostic methods, in particular operando X-ray imaging.



MELANIE ZEILINGER is an Assistant Professor for Intelligent Control Systems at the Institute for Dynamic Systems and Control at ETH Zürich. Her research focuses on integrating the potential of data and adaptation into safety-critical control systems in order to address high performance requirements in the presence of increasing complexity, uncertainty and interaction.



LAURA KELLER is a senior scientist at the department of mathematics of ETH Zürich. Her research focus lies at the intersection of mathematics and life sciences. In addition, she has a strong interest in new and modern teaching techniques and coordinates the corresponding group at her department (MELETE-group).



DASUN PERERA is postdoctoral researcher at the Urban Energy Systems Laboratory at Empa. His current work is related to modeling and optimisation of urban energy systems in order to improve the sustainability and climate resilience of cities. Dr. Perera completed his PhD in 2019 at the Swiss Federal Institute of Technology Lausanne.



FANNY GUTSCHE-JONES completed her PhD in Media Anthropology at the University of Basel in 2017. Since 2018, she works as a Community Manager at the Citizen Science Center Zurich, a joint initiative of the University Zurich and the ETH Zürich, supporting academics and citizen scientists in doing research together.



GIUSEPPE TAMBURELLO is an engineer in electronics and telecommunication and holds a postdiploma in microelectronics from the MICROSWISS Centre at the University of Applied Sciences in Rapperswil. With 15+ years experience in the airline industry and another 15 year's experience in optoelectronics for high-speed data communication, he is now part of the staff at the Institute of Electromagnetic Fields (IEF) at ETH Zürich.

↘ Integrate feedback.

By now, you have learned to be open to feedback and how to be critical of it. You have almost 24 hours left before you get to present your story on stage. As you are part of a large team, this is a lot of time and the most exciting part of the week. Start by including the feedback and iterate a third and last time. Also, reconsider the brief:

1. Define a problem statement that describes the challenge you want to address. It needs to be linked to a Swiss actor and to one of the three layers of ETH Week.
2. Tell an inspirational story that explains where your ideas come from, why your problem statement is relevant and what a possible solution could look like.
3. Critically reflect your ideas by answering the following questions:

SCIENTIFIC RIGOUR

- What are your underlying assumptions?
- What facts and figures did you rely on?

FEASIBILITY

- How feasible is your solution?
- Are there uncertainties related to your solution that would need further clarification?

SYSTEMS THINKING

- How is the problem embedded in the ecological, societal and economical context?
- What are the implications and tradeoffs of your solution?

DRY RUN

We meet your tutors at 19.00 to explain how we will organise the final presentations and make a quick run through. They will then inform you.

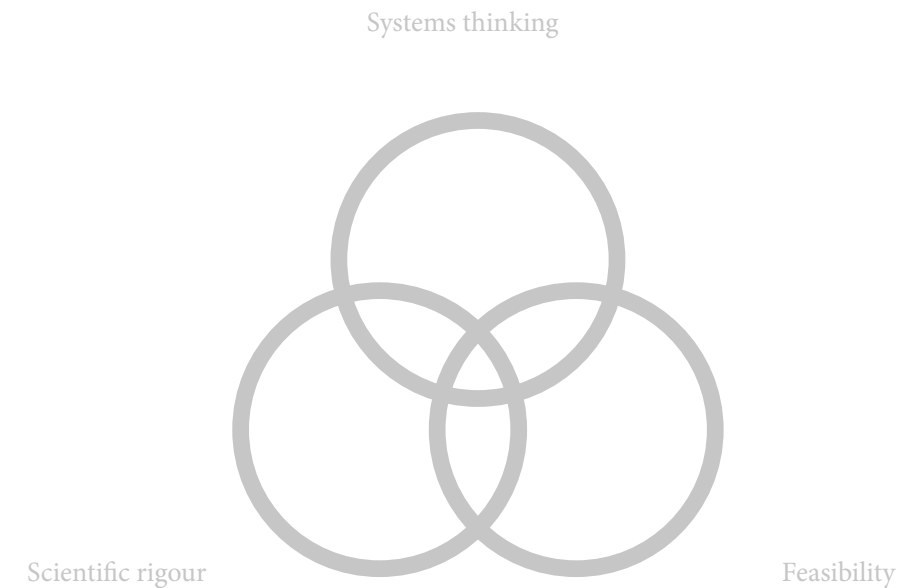
× HEADS UP

Test microphone and technics today between 19.30–20.30. Send some representatives to understand what you need to pay attention to and what technical tools are available when preparing your presentation tomorrow morning. The ETH Week team, facilitators and tutors will have a drink afterwards, so stay with us if you like, the InfoBar closes at 22.00.

Sign up before 20.00 at the Info Desk for tomorrow's Cardio training or the Outdoor session.

thursday
14.30

TEAM SPACES



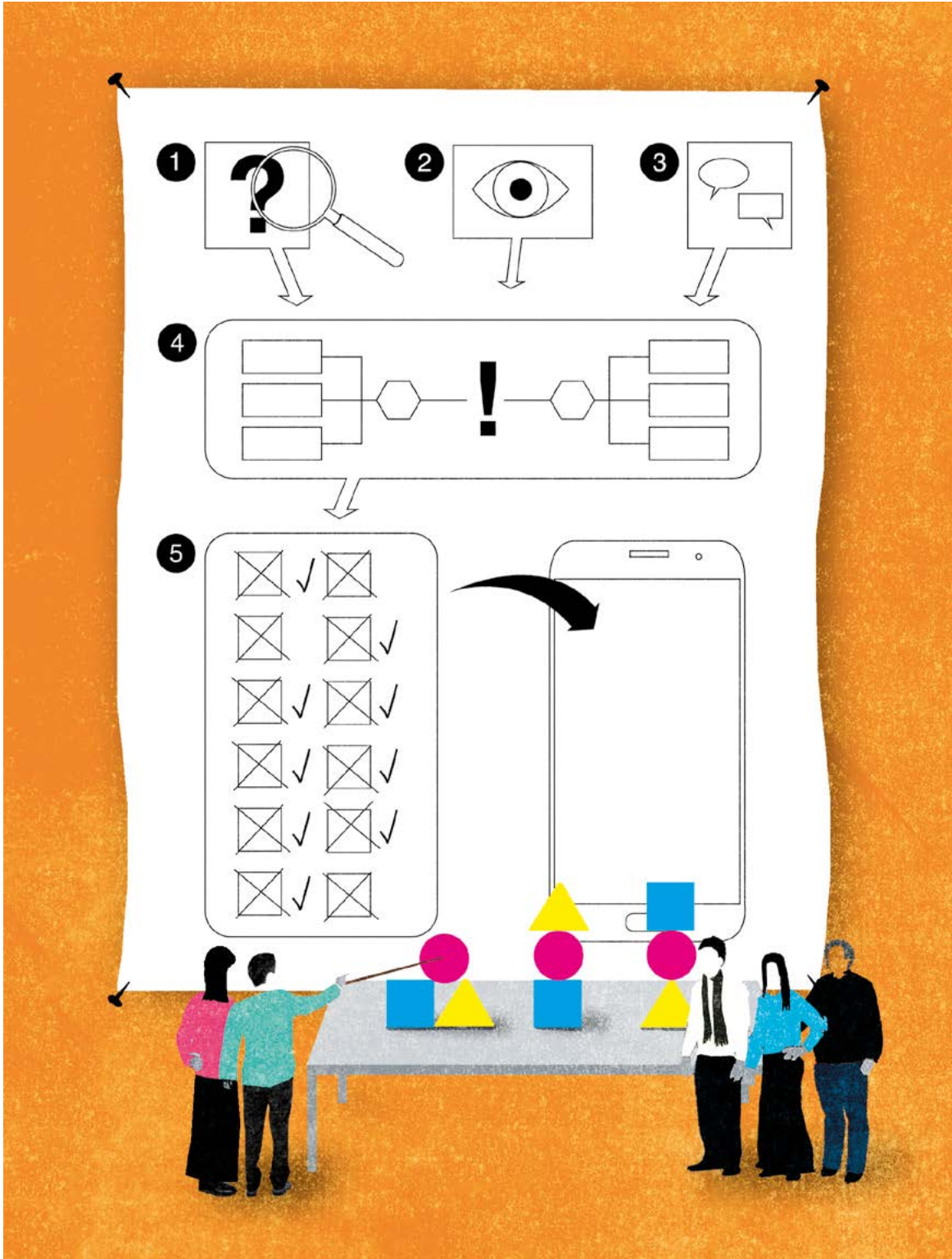
Name your project

↘ Template.

You will be amazed to see how much you can achieve in just one day. In order for everyone else to be able to put your advancements into perspective, we ask you to document both the ideas that you presented as well as the feedback you received. Also, answer the last questions of the brief before getting ready for tomorrow. Please also note your final project name on your template.



Good night! Tomorrow's the day.



On this last day of ETH Week, we ask you to focus on telling a balanced story that takes into account all three parts of the brief. Convince the audience of your problem statement and solution. We then conclude with a bigger picture before we all come together to celebrate six days of critical thinking!

- 7.00 — Cardio training and Outdoor session at Klub der Sportfreunde.
- 8.30 — Arrive at Process Walls.
- ↳ Check in.
- 8.50 — Kick-off at ETH Week Hall.
- 9.00 ▲ **KEYNOTE**
Cathy Macharis at ETH Week Hall.
- ↳ Polish your presentation.
- ↳ Last Template.
- 13.30 — **DEADLINE FOR HAND IN AND LUNCH BREAK**
- 14.45 ◆ **FINAL PRESENTATIONS**
It is time to get on stage and tell a convincing story at ETH Week Hall.
- ↳ Wrap up.
- 19.15 ◆ **CLOSING CEREMONY AND ANNOUNCEMENT OF THE AWARD WINNERS**
Stefano Brusoni, Alan Cabello Llamas, Martina Zinsli and Heather Kirk, Reto Knutti, Gloria Romera, Stephan Osterwald and Marco Mazzotti at ETH Week Hall.
- Our rector Sarah M. Springman concludes at ETH Week Hall.
- 20.00 ▲ **UNTIL NEXT YEAR?**
It is time to celebrate the last six days at ETH Week Hall.

◆ **KEYNOTE**

The last day of ETH Week will begin with insights from Cathy Macharis, an expert in logistics, sustainable mobility and policy. After two days of intensive discussions about technology and the future, we will learn about other factors that are essential for shaping urban transport systems to make cities more liveable for all.

RETHINKING MOBILITY FOR A HUMAN CITY

We are living in amazing times. Research in the field of transport has never been this inspiring and challenging, as several technological advancements have emerged that create new possibilities and will change our travel behaviour dramatically. At the same time mobility problems such as congestion and air pollution are on the rise due to urbanisation and other societal trends. The new technologies and mobility concepts, such as autonomous vehicles, ride-sourcing, mobility as a service or free-floating car sharing all have a considerable potential to impact the way that people and goods travel around in urban areas. While these new technologies provide new opportunities to tackle long-standing problems, they do not automatically lead to better liveability for everyone.

The question is: How can we rethink mobility to create a human city? How can we build a city that is liveable and healthy for everyone, that is pleasant both for residents and visitors, where human activities are supported by a mobility system and not vice versa, i.e., it is not the mobility system that defines how people should live. In order to prioritise actions that bring us closer to a human city, we propose the concept of the five P's: proximity, place for humans, prosperity for all, participation and finally passion.



CATHY MACHARIS is Professor at the Vrije Universiteit Brussel. Her research group MOBI (Mobility, Logistics and Automotive Technology) is an interdisciplinary group focusing on sustainable logistics, electric and hybrid vehicles and urban mobility. Her research focuses on how to include stakeholders within decision and evaluation processes in the field of transport and mobility.

↘ Polish your presentation.

Use this last session to finish your project. Decide how to best use the 5 minutes to tell your story. In order to be more time-efficient, you may delegate responsibility for finishing the prototype, polishing specific arguments, and writing the overall narrative. Integrate the final answers to the questions of the brief. You will also need to decide on a name for your project.

Your story can only be 5 minutes long, which is more than sufficient to bring a great idea across. In order to present successfully in such a short time, you need to practise. Rehearse your story to your neighbouring team and vice-versa. You would probably prefer to continue working on your presentation or prototype instead of wasting valuable time on a dry run. However, what matters is not only what you say, but also how you say it, and this is how you control that aspect.

Try to do 2–3 iterations and pretend there are more than 200 people in the audience. Include the logistics of the event: the time to prepare before getting on stage, the time you need to get on stage, and how to react to the ‘1 minute left’ notice. Also clap when the time is up to find an elegant way to wrap up in case you should run over time.

× HEADS UP

All documents and material needs to be handed in before 13.30 in the ETH Week Hall:

- 1. Your digital files for the screens during the presentation and the 1-pager at the [InfoBar](#).
- 2. Hang up your process templates and put your prototype to the [process wall](#).
- 3. Your props to the [backstage area](#).

friday
9.00

TEAM SPACES

↘ Last Template.

Your process wall will be part of the final exhibition together with your prototype. In order for your project to be understandable, write a short abstract, document your arguments for the questions in the brief, and write the final version of the problem statement on the last template. Also, answer to the question of why you believe your work is relevant. Fill all of this into your 1-pager digitally as well.

FINAL PRESENTATIONS

1. Define a problem statement that describes the challenge you want to address. It needs to be linked to a Swiss actor and to one of the subtopics of ETH Week.
2. Tell an inspirational story that explains where your ideas come from, why your problem statement is relevant and how a possible solution could look like.
3. Critically reflect your ideas by answering the following questions:

SCIENTIFIC RIGOUR

- What are your underlying assumptions?
- What facts and figures did you rely on?

FEASIBILITY

- How feasible is your solution?
- Are there uncertainties related to your solution that would need further clarification?

SYSTEMS THINKING

- How is the problem embedded in the ecological, societal and economical context?
- What are the implications and trade-offs of your solution?

× HEADS UP

- Keep in mind that each group has 5 minutes for their final presentation.
- There are two hand microphones.
- In order to guarantee a smooth change between two groups we ask you to take seats according to the sequence of the final presentation. Seats will be labeled.
- Get up and gather in the backstage area during the switch before the last presentation before your own. That means each team misses one presentation and waits backstage for their own presentation instead. Prepare your props quietly.
- There are only 2 minutes between presentations. Therefore, once finished, each group needs to leave the stage swiftly. Then, bring your prototype to the process wall. Bring the props to the designated area.

Without Powerpoint

We are no fans of powerpoint and believe that you will find more inspiring ways to tell us a convincing story.

↘ Wrap up.

After all the time dedicated to your tasks, we have now reserved some time to reflect. Between the final presentations and the closing ceremony, you will have the opportunity to meet one last time in your teams and wrap up. Your tutor has designed this slot to help you reflect your team process. It is a chance to think about how your group worked together. Discuss what was good and what could have been improved. Also, sit together with your tutor and teammates and reflect on what you have learned during the last 6 days. As it will be your last formal meeting during ETH Week, use it as an opportunity to find a common understanding of the experience you have gone through together.

× HEADS UP

- Cast your votes before heading to the debriefing.

Your take home message

Anything that you would like to share with your team before closing the week?

◆ FINAL EVENT

We have invited ten guests to listen to your stories. Their task is to decide which team will get the awards for **THE MOST FASCINATING SCIENCE** and for **THE MOST INSPIRING STORY**. It is in your own hands to vote for **THE PEER-TO-PEER AWARD**.

AWARDS

THE PEER TO PEER AWARD

This award is going to the team of your choice. Every participant has one vote for their favorite project (apart of their own of course), so choose wisely! Consider all points of the brief and build your own assessment.

THE MOST INSPIRING STORY

Stefano Brusoni, Alan Cabello Llamas, Martina Zinsli and Heather Kirk are specifically responsible for evaluating point (2) of the brief. They will evaluate the teams in terms of who offered the most inspiring story, i.e., how the teams acted together, how their storytelling helped the audience to better understand the problem as well as the solution. They will also assess how well the teams managed to explain a complex issue in a simple way, while nonetheless communicating a clear message by using a compelling visualisation. They will select the group that wins the **AWARD FOR THE MOST INSPIRING STORY**.

THE MOST FASCINATING SCIENCE

Reto Knutti, Gloria Romera, Stephan Osterwald and Marco Mazzotti are responsible for evaluating point (3) of the brief. They will evaluate the teams in terms of scientific and technical quality, i.e., how solid the foundation of their work appears from the perspective of energy and sustainability experts. Their evaluation will be based on the questions for scientific rigour, feasibility, and systems thinking. They will select the group that wins the **AWARD FOR THE MOST FASCINATING SCIENCE**.



STEFANO BRUSONI



ALAN CABELLO LLAMAS



MARTINA ZINSLI



HEATHER KIRK



MARCO MAZZOTTI



GLORIA ROMERA



STEPHAN OSTERWALD



RETO KNUTTI

CLOSING CEREMONY

By the time we get to this point, André Sandmann will add his last touches to THE GRAPHIC RECORDING of ETH Week 2019. He accompanies us throughout the day and will have the difficult job to document the essence of what has been said, thought and discussed during 'Rethinking Mobility'. He will document your projects as you present them. The drawing will be exhibited together with your prototypes throughout the evening.

We are excited that our Rector, Sarah M. Springman, is present during the last moments of the week, to listen to your presentations, and to close the week. But before we all fall into bed, a few more surprises await. Stay tuned! We hope you stay to celebrate, David Suiwez is in charge of the music on our final night in the ETH Week Hall. See you all under the disco ball!



SARAH M. SPRINGMAN is the Rector of ETH Zürich and Professor of Geotechnical Engineering. She studied soil mechanics at Cambridge University, then embarked on a career in industry before returning to Cambridge, where she earned her PhD and established an academic career. She also represented Great Britain as a athlete from 1983 to 1993, winning 20 elite European Triathlon Union (ETU) Championship medals in triathlon and duathlon.



ANDRÉ SANDMANN is a graphic artist and illustrator, living in Zurich. He understands design as a term derived from disegno, Italian for idea or draft. He believes in the potential of hand-drawn sketches because they leave room for interpretation in the viewer. As a graphic recording artist, he uses them to document discussions and ideas.



DAVID SUIVEZ is a DJ, Yoga Teacher and producer of the Swiss band 'Liricas Analas'. He also founded the 'Movement Masterclass', a platform where transdisciplinary approaches of movement based forms are being researched and investigated in a non-dogmatic way. He is as excited as we are about the last evening of ETH Week 2019.



Thank you!

We warmly thank Avina Stiftung and Dätwyler Foundation
for their kind support.