MBA - Sustainable Mobility Management

Three-Semester Master's Degree

Taught in English

Berlin, Germany

Syllabus

Summer Semester 2018
Winter Semester 2018-19

Academic Director
Prof. Dr. Hans-Liudger Dienel
Prof. Dr. Andreas Knie

Academic Coordinator
Dr. Massimo Moraglio
Charlotte Hegel

Administration and Service
Laura Lehmann

Technische Universität Berlin

tubs

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CHANGES MAY OCCUR.

TUBS GmbH – TU Berlin Science Marketing

c/o Sustainable Mobility Management

Hardenbergstr. 19

10623 Berlin

Secretariat

FH 6-3 - Fraunhoferstr. 33-36

10587 Berlin

Phone: +49 (0)30 314 256 13

contact@master-in-energy.com

www.master-in-energy.com

General Information

Location and Times

Unless otherwise announced, lectures, tutorials, consultancy and peer group meetings take place in Building 9 (Haus 9), EUREF-Campus, Torgauer Straße 12-15 - 10587 Berlin, room S1. Students can access this room during regular office hours for peer groups and individual study for the preparation and revision of lectures and tutorials.

Lectures

Lectures are held by professors, academic staff of TU Berlin, other universities, and by professionals of the transport industry. They will convey the core teachings. Group work is frequent. Homework may be assigned. Lectures start *sin tempore*, i.e. sharp.

Semesters

- **First semester** (Winter semester - WiSe 2017-18)
  First lesson on Monday, October 16th, 2017
  Last lesson on Monday, February 19th, 2018

- **Second semester** (Summer semester – SoSe 2018)
  First lesson on Monday, April 16th, 2018
  Last lesson on Friday, July 13th, 2018

- **Third semester** (Winter semester - WiSe 2018-19)
  First lesson: Mid-October 2018
  Last lesson: Mid-February 2018

Lessons

For the exact titles of lectures, lecturers and literature see below (changes may occur).

Attendance is obligatory.

Tutorials

Tutorials repeat lecture material, supply supportive information or offer additional training, e.g. in scientific writing. **Attendance is obligatory.**

Consultancy

Students are welcome to seek advice and present ideas in person. Please make an appointment beforehand. Feel free to contact the lecturers concerning issues of a specific course. For any other issue, you can contact the coordinator (or alternatively the academic directors).

E-Learning Platform 'Moodle' and Internet

TUB runs an online learning platform called MOODLE. It is the official channel for announcements, the distribution of material, and registration to events, etc. Students must log on frequently, even during the lecture free periods. Wireless access for all students and lecturers will be provided. TU Berlin's various IT services can be used by all participants.

Exams

A written exam, paper, presentation, or portfolio concludes each module. All subject matter covered in the lectures, tutorials, and compulsory excursions within the module may be subject to examination. Exams start on-time, sharp. A failed examination may be repeated twice. For further details, please refer to the official Study and Examination Regulation (available also at https://master-in-energy.com/wp-content/uploads/Study-and-Examination-Regulations_SMM_ENG.pdf). **Attendance is obligatory.**

Excursions

Extra-curricular excursions and presentations by research institutes or commercial enterprises are foreseen. Registration before attendance may be required.

Participation

Students are encouraged to self-organize, form committees, and vote on a speaker. TU Statutes stipulate student participation on the examination board. Students are asked to choose two German-speaking students (if possible) as their representatives for the examination board. Students are required to provide feedback on lecturers, tutorials, coaching, organization, and service.

The course program and structure

Module description

The Master program is taught over a period of three semesters. The first two semesters include lectures, tutorials, seminars, and excursions. The program will be completed in the 3rd semester by writing a master thesis.

The first semester is dedicated to the fundamentals of mobility and sustainability, considering these issues from different perspectives such as economic factors, social and managerial elements, and naturally including technological drivers.

In the second semester, trends, the future of transport as well as the transition toward sustainable mobility will be the main focus. This will also encompass the issue of governance and management of complex structures. A lecture series will provide world-based case studies and additional broad based information.

The third semester is mainly devoted to specialization and the master thesis.

Elective courses for specialization are offered.

Module Course Plan

<table>
<tr><th>First Semester (WiSe 2017-18)</th><th>Second Semester (SoSe 2018)</th><th>Third Semester (WiSe 2018-19)</th></tr>
<tr><td>M01 - Project Management (in Mobility)
9 ECTS</td><td>M05 - Mobility Trends and Futures
9 ECTS</td><td>M08 - Managing Smart and Green Mobility
6 ECTS</td></tr>
<tr><td>M02 - Mobility Actors and Practices
6 ECTS</td><td>M06 - Managing Transition: Governance and Skills
9 ECTS</td><td rowspan="2">Thesis
18 ECTS</td></tr>
<tr><td>M03 - Technological Foundations in transport
9 ECTS</td><td>M07 - Lecture Series
6 ECTS</td></tr>
<tr><td rowspan="3">M04 - Macro-Economics and Business Models of Sustainable Mobility
6 ECTS</td><td colspan="2">Compulsory electives</td></tr>
<tr><td>M09A - Innovation and Technology Management I - 6 ECTS</td><td>M09B - Innovation and Technology Management II - 6 ECTS</td></tr>
<tr><td>M010 - Managing ICT and Mobility 6 ECTS</td><td>M011 - Mobility and Development 6 ECTS</td></tr>
<tr><td>30 ECTS</td><td>30 ECTS</td><td>30 ECTS</td></tr>
</table>

Second semester

Summer semester – SoSe 2018

Crash courses	9 ECTS

Sustainability and Finance (Dr. Rainer Quitzow)	
Friday, 20 April 2018 - 16:00- 18:00	Intro to Sustainable Development
Saturday, 21 April 2018 - 9:00- 12:30	9:00 – 10:00: Ecological Modernization and Green Economy: Concepts and Discourses 10:15 – 11:15: Environmental Innovation and Technological Change 11:30 – 12:30: The German Energy Transition as Process of Societal Transformation
Saturday, 28 April 2018 - 9:00- 12:30	9:00 – 10:00: Introduction to Financing Sustainable Innovations 10:15 – 11:15: De-Risking Sustainable Investments: The case of renewable energy 11:30 – 12:30: Trends in Sustainable Finance: Green Bonds, Social Impact Investing, etc.

Micro and macroeconomics (Sarah Elsheikh)	
Friday, 4 May 2018 - 9:00-17:00	• Supply & demand and Market Equilibrium • Elasticity • Externalities (relevant to sustainability) • Production function and economic profit • Market competition
Saturday, 5 May 2018 - 9:00-17:00	• Gross Domestic Product (GDP): concept and calculation • The concepts of Inflation (and deflation, stagflation, and unemployment) • Monetary & fiscal policy • Circular flow of money and business cycle • Interest rate and the cost of money • Foreign exchange and international trade

Project Investment Management (Hamid Doost)	
Friday, 1 June 2018 - 9:00-12:30	Project Investment management
Saturday, 2 June 2018 - 9:00-12:30	Sustainability Management

Module 05 - Mobility Trends and Futures	9 ECTS

	Lectures	
1	**Dr. Ulrike Engel-Ziegler** *DB Engineering & Consulting GmbH* MA and PhD TU Berlin ´Potentials of Transport infrastructures in East Africa – Case Study Renewing the railway line between Djibouti and Addis Abeba´ Since 2010 working at Deutsche Bahn	
2	**Dr. Irene Feige** *Institute for Mobility Research (A research facility of the BMW Group)* Director of the Institute for Mobility Research	
3	**Dr. Roland Nolte** *Institute for Futures Studies and Technology Assessment* Dr. Roland Nolte has been working at IZT as scientist since 1993 and as Managing Director of IZT since 2001. Fields of research/ expertise: technology assessment, sustainable development, environmental strategies for companies, transportation research, telematics applications for the transportation sector, energy efficiency technologies and strategies.	

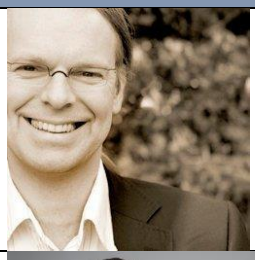
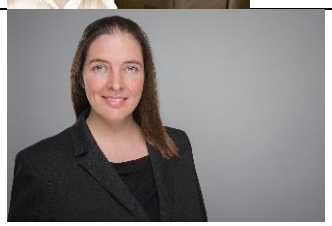
Qualification Aims
After the module - students understand mobility trends in order to manage the complexity of the open and networked transport of the future; - students can assess social and technological shift and transition; - the students master the fundamentals for forecasting; - students can develop scenarios on this basis and plan long-term developments of a mobility change.

Plan of the lessons	
Monday 16 April 2018 11:00-13:00	A catalogue of sustainability tools: an introduction
Lesson	Lecturer present: Dr. Ulrike Engel-Ziegler
Monday 16 April 2018 14:00-18:00	Trends in Mobility Methodologies of Futures Research 1
Lesson	Lecturer present: Dr. Roland Nolte
Tuesday 17 April 2018 13:00-15:00	Solar energy in transport sustainability
Lesson	Lecturer present: Dr. Ulrike Engel-Ziegler
Monday 23 April 2018 09:30-18:00	Trends in Mobility Methodologies of Futures Research 2 EU Policy on sustainable transport Comparison of different modes of transport
Lesson	Lecturer present: Dr. Roland Nolte
Monday 07 May 2018 11:00-13:00	Wind energy in transport sustainability
Lesson	Lecturer present: Dr. Ulrike Engel-Ziegler

Monday 07 May 2018 14:00-18:00	The Future of Mobility • Scenarios, Visions • Alternative Futures • Normative scenarios
Lesson	Lecturer present: Dr. Roland Nolte
Tuesday 15 May 2018 13:00-15:00	Hydropower energy in transport sustainability
Lesson	Lecturer present: Dr. Ulrike Engel-Ziegler
Friday 18 May 2018 09:30-18:00	Toolkit for understanding the future: trends, prognosis, projections, scenarios, short vs. long term, which method is the right one for which forecasting problem? Applied corporate foresight: How does an ideal foresight process work in a multinational mobility company? Case Study: Urban Mobility 2030: How to get a consistent picture of a complex global challenge?
Lesson	Lecturer present: Dr. Irene Feige
Monday 28 May 2018 09:30-18:00	Electro-mobility and greening of transportation • green electricity & potential for renewable energies • Risks of electro-mobility Future logistics: green logistics or non-sustainable high-tech?
Lesson	Lecturer present: Dr. Roland Nolte
Monday 4 June 2018 11:00-13:00	Biogas energy in transport sustainability
Lesson	Lecturer present: Dr. Ulrike Engel-Ziegler
Monday 4 June 2018 14:00-18:00	Autonomous Driving (beyond the car)
Lesson	Lecturer present: Dr. Roland Nolte
Tuesday 05 June 2018 13:00-15:00	Air compression in transport sustainability
Lesson	Lecturer present: Dr. Ulrike Engel-Ziegler
Monday 11 June 2018 09:30-18:00	Workshop: Completing Case Study Urban Mobility 2030
Lesson	Lecturer present: Dr. Irene Feige
Monday 18 June 2018 11:00-13:00	Hydrogen in transport sustainability
Lesson	Lecturer present: Dr. Ulrike Engel-Ziegler
Monday 18 June 2018 14:00-18:00	Future Transport infrastructures
Lesson	Lecturer present: Dr. Roland Nolte
Monday 25 June 2018 09:30-12:30	Wrapping up: from niche to mainstream
Lesson	Lecturer present: Dr. Ulrike Engel-Ziegler
Monday 25 June 2018 14:00-18:00	Energy performance and energy efficiency of Railways
Lesson	Lecturer present: Dr. Roland Nolte
Monday 2 July 2018 09:30-18:00	Final Examination and showroom for the projects with stakeholders 40 % Oral exam 40 % Presentation of scenario development 20 % Written report of scenario development
Examination	Lecturer present: Dr. Ulrike Engel-Ziegler, Dr. Irene Feige, Dr. Roland Nolte

Literature
TBC

Module 06 - Managing Transition: Governance and Skills	9 ECTS

	Lectures	
1	**Dr. Christian Hoffmann** *HMKW Hochschule für Medien, Kommunikation und Wirtschaft* **Since 2010** Project Leader at InnoZ GmbH **Since 2000** Founding member e-fect eG and head of division Environmental Psychology Founding member and co-editor journal „Umweltpsychologie“ (-2010)	
2	**Dr. (des.) Lisa Ruhrort** Social Science Research Centre Berlin (WZB) Dr. (des.) Lisa Ruhrort works as a researcher at the Social Science Research Centre Berlin (WZB). She has recently finished her doctoral thesis at Technical University Berlin on the implications of new mobility patterns and attitudes for policy strategies to achieve sustainable mobility. Her main research interest lies in understanding the interplay between different factors that influence the possibility of decarbonisation and sustainability transition in the transport sector.	
3	**Dr. Robert Schönduwe** MotionTag Dr. Robert Schönduwe is working as a business development manager at MotionTag. Prior to that, he worked at Helmholtz Centre for Environmental Research, Goethe-University Frankfurt/Main and the Innovation Centre for Mobility and Societal Change – InnoZ. A major focus of his research are data driven innovations and decarbonization strategies in the transport sector as well as travel behavior of special population groups.	

Qualification Aims
After the module - students can compile different paths and strategic options to form a sustainable mobility concept, including the needed management tools; - students can evaluate and implement ways of sustainable change; - students can apply and develop existing control instruments and integrate and evaluate non-political actors.

Plan of the lessons	
Friday 20 April 2018 09:30-15:30	Overview, Planning of tasks, distribution of project work and presentations; Introduction into the field of Governance and Skills; New Urban Mobility: some global trends
Lesson	Lecturer present: Dr. Christian Hoffmann, Dr. Lisa Ruhrort, Dr. Robert Schönduwe
Wednesday 25 April 2018 09:30-12:00	Characteristics of Sustainable Mobility Concepts (Social, ecological and economic sustainability goals in the transport sector, "Avoid-Shift-Improve")
Lesson	Lecturer present: Dr. Lisa Ruhrort

Wednesday 02 May 2018 09:30-15:30	"Theory of change" 1: Theoretical concepts of sustainability transitions; Sustainability transitions in practice: key challenges of sustainability transitions in the transport sector; the role of innovations for sustainable mobility concepts
Lesson	Lecturer present: Dr. Lisa Ruhrort
Wednesday 09 May 2018 09:30-15:30	Theory of change 2; Governance tools: Push versus pull measures, Sustainable Urban Mobility Plans (SUMPs), acceptability of transport policy measures and mobility innovations
Lesson	Lecturer present: Dr. Lisa Ruhrort
Wednesday 16 May 2018 09:30-15:30	Excursion:Start-ups in the New Mobility sector
Lesson	Lecturer present: Dr. Robert Schönduwe
Friday 25 May 2018 09:30-15:30	Toolbox 1: Target Group analysis, the role of Lead Users / Innovators , ggf Toolbox 7: needed personal Skills for governance of the process
Lesson	Lecturer present: Dr. Christian Hoffmann
Wednesday 30 May 2018 09:30-15:30	Project work (1): Mobility as a Service as part of a sustainable mobility concept (Toolbox 2: CoCreation-Method)
Lesson	Lecturer present: Dr. Robert Schönduwe
Wednesday 06 June 2018 09:30-15:30	Project work (2): Mobility as a Service as part of a sustainable mobility concept
Lesson	Lecturer present: Dr. Robert Schönduwe
Wednesday 20 June 2018 09:30-15:30	Toolbox 5: Big data in transport management and planning
Lesson	Lecturer present: Dr. Robert Schönduwe
Friday 22 June 2018 09:30-15:30	Project work (3): Acceptance, Stakeholder Involvement; (Toolbox 3: Facilitation / Moderation, networking)
Lesson	Lecturer present: Dr. Christian Hoffmann
Wednesday 27 June 2018 09:30-15:30	Toolbox 6: Evaluating the role of innovations for sustainability goals; End of project work, presentation (practise).
Lesson	Lecturer present: Dr. Lisa Ruhrort
Thursday 12 July 2018 09:30-15:30	Portfolio Exam 40 % Oral exam 40 % Project presentation 20 % Written project report
Examination	Lecturer present: Dr. Christian Hoffmann, Dr. Lisa Ruhrort

Plan of the Excursion		
TBD	Berlin, Mobility at EUREF-Campus	Dr. Christian Hoffmann
TBD	Berlin, actual Mobility Concepts / enterprises	Dr. Christian Hoffmann

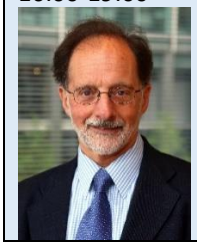
Literature
Rode, P., Hoffmann, C., Kandt, J., Smith, D. & Graff, A. (2015). Towards New Urban Mobility: The case of London and Berlin. Peter Griffiths (ed). LSE Cities/ InnoZ. London School of Economics and Political Science: London.

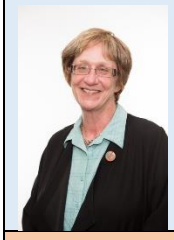
Kandt, J., Rode, P., Hoffmann, C., Graff, A. & Smith, D. (2015). Gauging interventions for sustainable travel: A comparative study of travel attitudes in Berlin and London. Transportation Research Part A: Policy and Practice, Volume 80, October 2015, Pages 35–48.
Gehl, J. (2010). Cities for people. Washington: Island Press
Canzler, Weert / Knie, Andreas (2016): Die digitale Mobilitätsrevolution. Vom Ende des Verkehrs wie wir ihn kannten. München: oekom verlag.

Module 07- Lecture series | 6 ECTS

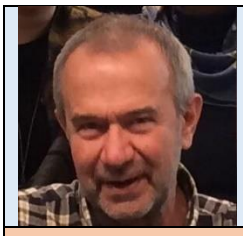
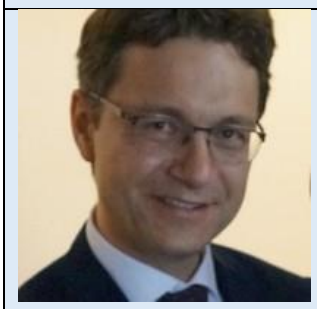
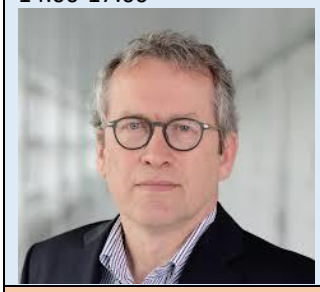
	Convener and supervision	
1	Dr. Massimo Moraglio *Technische Universität Berlin* MBA and PhD in Torino, Italy, Highlights of my career so far include an EU Marie Sklodowska Curie IEF fellowship. My 100+ publications encompass books in English, including editing and co-editing, and articles in international journals. I coordinated many European projects devote to the future of transport.	

Qualification Aims
At the end of this module, students will have an overview of state-of-the-art sustainable mobility trends. National and international experts from industry, academia and research centres involved in the transition toward sustainable mobility will present different opinions, case-studies and perspectives.

Plan of the lessons	
Tuesday 17 April 2018 15:30-18:30 	**Smart mobility and sustainable mobility; never the twain shall meet?** **Prof. dr. J.F. (Hans) Jeekel** Hans Jeekel is a Part time Professor in the section of Technology, Innovation & Society of the School of Innovation Sciences, and holds the Chair for Societal Aspects of Smart Mobility. At the moment he works at Rijkswaterstaat, the Dutch Roads and Water Authority, as the corporate strategist for research, knowledge and innovation. He is chairman of the Board of the Association of European Transport (AET), a networking organisation for European transport professionals.
Wednesday 18 April 2018 16:00-19:00 	**Travel in the Twenty-First Century** **Prof. Dr. David Metz** David Metz is honorary professor in the Centre for Transport Studies, University College London, where his research focuses on how demographic and technological factors influence travel demand. He spent part of his career as a senior civil servant in a number of UK government departments,

	both as policy advisor and scientist, including five years as Chief Scientist at the Department of Transport.
Tuesday 24 April 2018 14:00-17:00 	**Mobility Network planning: or how to provide public transport services that compete with the car**
	Prof. Dr. Corinne Mulley Professor Corinne Mulley is a transport economist and has been active in transport research at the interface of transport policy and economics. She was the founding Chair in Public Transport at the Institute of Transport and Logistics Studies at the University of Sydney.
Wednesday 25 April 2018 12:30-15:30 	**Handling uncertainty in transport planning**
	Glenn Lyons Glenn is the Mott MacDonald Professor of Future Mobility at UWE Bristol and the founding Director (2003-2010) of the university's Centre for Transport & Society. He divides his time between UWE and (on secondment) Mott MacDonald, bridging between academia and practice.
Wednesday 02 May 2018 16:00-19:00 	**Assessment of Sustainable Urban Transport Policies**
	Angelo Martino Angelo Martino is a transport modeler and policy analyst. He is partner of TRT Trasporti e Territorio, an Italian consultancy specialized in transport modelling, planning and economics. Angelo combines his long experience in the transport modelling field, where he has developed models using different methodologies at different scale of analysis, with a deep knowledge of transport policy themes acquired in studies carried out for the European Commission and other international institutions.
Tuesday 15 May 2018 15:30-18:30 	**Sustainable Mobility as a matter of fundamental systemic change**
	Dr. Merja Hoppe ZHAW Zurich University of Applied Sciences Senior Lecturer, Head Research Team Sustainable Transport Systems and member of the directorate of the Institute of Sustainable Development. Research expertise in sustainable mobility and transport system, regional development and system transformation.
Tuesday 22 May 2018 15:30-18:30 	**Future Urban Transport: Global Challenges and local solutions**
	Jürgen Perschon Dr. Jürgen Perschon has professional working experience in the transport sector of both developed and developing countries since 1995, predominantly on transport planning, road safety, low-cost public and non-motorized transport as well as gender-related transport

	in rural and urban Africa and in the European and Eastern European context.
Wednesday 23 May 2018 16:00-19:00 	**Urban mobility and digitalization: technology, business and social innovations** **Gabriele Grea**
Tuesday 29 May 2018 14:00-17:00 	**"Why are there still many jobs?" The Fourth Industrial Revolution in a long-term perspective** **Dr. Simone Fari** Simone Fari is Assistant Professor of Economic History at the University of Granada. Previously he worked as a teacher and researcher at the University of Turin (Italy), at the University of Italian Switzerland in Lugano and at the Science Museum of London. He published three books about the history of telecommunications in the XIX century, one of which with Palgrave/MacMillan.
Wednesday 30 May 2018 16:00-19:00 	**Satisfying individual mobility needs in urbanized territories: a challenge for the transport system's sustainability** **Nuno Ribeiro** Nuno Ribeiro is CEO of VTM, a global consultancy company
Tuesday 05 June 2018 16:00-19:00 	**INNOVATION GOVERNANCE. Role of Scientists, Industry and Public Authorities in Mobility Innovation Management** **Maria Cristina Marolda** Maria Cristina MAROLDA has been Senior Policy Officer in charge of designing strategy for Research and Innovative Transport Systems in the Directorate General for Mobility and Transport of the European Commission. She is graduated in Technology of Architecture at the University of Rome.
Wednesday 06 June 2018 16:00-19:00	**European Transport research: how does it foster sustainable mobility?** **Dr. Alessandro Damiani**

	Alessandro Damiani is currently the President of APRE, the Italian Agency for the Promotion of European Research. During 35 years and until recently he has worked for the European institutions, notably the Council of Ministers and the European Commission, dealing with Transport and Mobility research as well as R&D Framework Programme coordination and international cooperation in S&T.
Tuesday 12 June 2018 14:00-17:00 	**Free2Move – Rethinking shared mobility** **Flora Bellina** Flora Bellina is Head of the mobility platform Free2Move of Groupe PSA. Free2Move enables users to identify all available car-sharing vehicles in their vicinity on their smartphone. With a background in politics (IEP Paris) and Sustainable business (Cambridge University), Flora was Head of Public Affairs and Corporate Communications for PSA in Germany until 2016 and started her career working for General Electric as Development Coordinator, in charge of strategic and growth related projects.
Wednesday 13 June 2018 16:00-19:00	**The path to a sustainable electricity generation mix: Insights from viable European renewable energy projects**
	**Johannes Ziegler** Johannes Ziegler currently heads the Risk Management for Real Assets at Aquila Capital covering renewable energies as well as further alternative asset classes. In previous roles at Allianz SE and Deutsche Bank AG he worked on risk and investment management topics regarding renewable energies and climate change as well as in asset management of liquid funds. Johannes holds a master-equivalent degree in Economics from Humboldt-Universität Berlin.
Tuesday 19 June 2018 14:00-17:00 	**The dynamics of accessibility and travel demand** **Prof. Dr. Kay Axhausen** Future Cites Laboratory - Swiss Federal Institute of Technology in Zurich

Wednesday 20 June 2018 16:00-19:00 	**Framing Infrastructure Policy: The Lessons of British Railways ca 1955-75 (A ´History Lab´)**
	Prof. Dr. Colin Divall Colin Divall is professor emeritus in the University of York, UK and was for nearly 20 years head of the Institute of Railway Studies & Transport History, a joint initiative with the National Railway Museum. In the past few years he has co-facilitated several workshops for the UK civil service aimed at getting decision-makers to reflect on how adequately current policy deals with the long-term implications of transport and land-use policy.
Tuesday 26 June 2018 14:00-17:00 	**Understanding individual travel needs and behaviour**
	Dr. Sophia Becker is mobility researcher at the Institute for Advanced Sustainability Studies Potsdam. Her work focuses on individual travel behaviour change, cargobike-sharing, and quality of life. She holds a diploma in psychology and recently finished her dissertation at the University of Stuttgart, department for Sociology of Technology and the Environment.
Wednesday 27 June 2018 16:00-19:00 	**Public participation in spatial planning: lessons learned from history**
	Dr. Bert Toussaint Is senior historian at Rijkswaterstaat.
Tuesday 03 July 2018 14:00-17:00 	**Will Chinese e-mobility save the world?**
	Dr. David Tyfield **David Tyfield** is a Reader in Environmental Innovation & Sociology at the Lancaster Environment Centre, Lancaster University. He is Co-Director of the Centre for Mobilities Research (CeMoRe), Lancaster University, a co-editor of *Mobilities* journal and an Executive Director of the Joint Institute for the Environment (JIE), Guangzhou
Wednesday 04 July 2018 16:00-19:00 	**Sustainable transformation in urban transport**
	Prof. Dr. Felix Creutzig

Tuesday 10 July 2018 14:00-17:00	**Will the 'smart mobility' revolution matter?**
	**Prof. Dr. Graham Parkhurst**
Wednesday 11 July 2018 16:00-19:00	**Back to the Future: Redesigning railway processes as part of introducing digital technology**
	**Felix Laube** Felix Laube is senior manager at Emch und Berger, Switzerland

Elective course

Students can choose between:

- *Module 09A and Module 09B (Innovation and Technology Management I)*
  OR
- *Module 10 (Managing ICT and Mobility) and Module 11 (Mobility and Development)*

• *Module M09B:* • *Technology and Innovation Management (TIM)*	12 ECTS

	Lecturers	
1	Prof. Dr. Jan Kratzer	
	Chair of Entrepreneurship and Innovation Management Technical University Berlin School of Economics and Management Centre for Entrepreneurship TU Berlin	
2	Dr. Maren Borkert	
	Technical University Berlin School of Economics and Management Centre for Entrepreneurship	
3	Julian Alexandrakis (né Jerlich)	
	Technical University Berlin School of Economics and Management Centre for Entrepreneurship *+49 30 314 29699* *julian.alexandrakis@tu-berlin.de*	

Course overview and objectives
The module Technology and Innovation Management is an interdisciplinary project. Students learn about innovation and technology management in theory and practice. First, the course provides theoretical input sessions about innovation management, technology management, project management, team building, and more. Second, the students will apply this knowledge to a real project and work together with industrial partners. They will develop a business model and prototype in (interdisciplinary) teams based on a given problem. Finally, the teams hand in a written project report and give an oral presentation on their prototype. Please note: Students from Building Sustainability and Sustainable Mobility Management will take part in all classes and will receive 12 ECTS. Students from Energy Management will take part in the first three classes of the summer semester plus all six of the winter semester and receive 10 ECTS.

Schedule of Classes	
Thursday, 19 April 2018 09:30 – 17:00 (All Students)	**09:30 - 11:00** Introduction lecture **11:15-12:30** Teaming **12:30 - 13:45** Lunch Break **13:45 - 14:45** Air Mobility, Energy & Blockchain **15:00 - 17:00** World Café with Industry Partner
Thursday, 26 April 2018 09:15 – 17:00 (All Students)	**09:30 - 11:00** Air Mobility in the City **11:15-12:30** Qualitative Research Methods: Introduction **12:30 - 13:45** Lunch Break **13:45 - 14:45** Qualitative Research Methods: Practice **15:00 - 17:00** Project Planning
Thursday, 17 May 2018 09:15 – 17:00 (All Students)	**09:30 - 11:00** Qualitative Research Methods: Development **11:15-12:30** Qualitative Research Methods: Practice **12:30 - 13:45** Lunch Break **13:45 - 14:45** Ideation I **15:00 - 17:00** Ideation II
Thursday, 24 May 2018 09:15 – 17:00 (SuMo and BuSu only)	**09:30 - 11:00** Technology and Innovation Management I **11:15-12:30** Technology and Innovation Management II **12:30 - 13:45** Lunch Break **13:45 - 14:45** Technology and Innovation Management III **15:00 - 17:00** Technology and Innovation Management IV
Thursday, 07 June 2018 09:15 – 17:00 (SuMo and BuSu only)	**09:30 - 11:00** Qualitative Research Methods: Analysis I **11:15-12:30** Qualitative Research Methods: Analysis II **12:30 - 13:45** Lunch Break **13:45 - 14:45** Business Model Development I **15:00 - 17:00** Business Model Development II
Thursday, 14 June 2018 09:15 – 17:00 (SuMo and BuSu only)	**09:30 - 11:00** Assessment Preparation **11:15-12:30** Group Work **12:30 - 13:45** Lunch Break **13:45 - 14:45** Group Work **15:00 - 17:00** Assessment: Interim Presentation (SuMo and BuSu only)

Schedule for Winter Semester (Subject to Change)	
Following are the planned dates for the continuation of the module in the winter semester.	Please keep in mind that these dates are only a reference and are subject to change. Students from all programs are to attend these classes. Thursday, 08.11.2018 Friday, 09.11.2018 Thursday, 22.11.2018 Friday, 23.11.2018 Thursday, 06.12.2018 Friday, 07.12.2018 (Final Presentation for all programs!)
Evaluation and grading procedures:	
	Grades will be computed using the following weighting scheme: 50 % for the final presentation including the prototype 50 % for the project report

Literature
[1] Donald L. Anderson. Organization Development. The Process of Leading Organizational Change. Sage Publications, 2010.
[2] Thomas Bieger. Zukünftige Geschäftsmodelle: Konzept und Anwendung in der Netzökonomie; mit 3 Tabellen. Springer, 2002.
[3] Roman Boutellier and Mareike Heinzen. Growth Through Innovation: Managing the Technology-Driven Enterprise. Springer, 2014.
[4] Peter F. Drucker. Innovation and Entrepreneurship. HarperBusiness, 2006.
[5] Jack R. Meredith and Jr. Samuel J. Mantel. Project Management. A Managerial Approach. John Wiley & Sons, 2006.
[6] Barbara Praetorius, Dierk Bauknecht, Martin Cames, Corinna Fischer, Martin Pehnt, Katja Schumacher, and Jan-Peter Foß. Innovation for Sustainable Electricity Systems. Exploring the Dynamics of Energy Transitions. Physica, 2009.
[7] V W Ruttan. Technology, Growth, and Development. An induced innovation perspective. Oxford University Press, 2001.
[8] Melissa A. Schilling. Strategic Management of Technological Innovation. Mcgraw-Hill Education, 2013.
[9] Joe Tidd and John Bessant. Strategic Innovation Management. Wiley, 2014.
[10] Paul Trott. Innovation Management
[11] Michael Crosby et al. Blockchain technology: Beyond bitcoin. Applied Innovation, 2:6–10, 2016.
[12] Sinclair Davidson et al. Economics of Blockchain. 2016.
[13] William Mougayar: The Business Blockchain: Promise, Practice, and Ap- plication of the Next Internet Technology. John Wiley & Sons, 2016.
[14] Shermin Voshmgir & Valentin Kalinov. Blockchain. A Beginners Guide. Blockchainhub, 2017.

Elective course

Students can choose between:

- *Module 10 (Managing ICT and Mobility) and Module 11 (Mobility and Development) OR*
- *Module 09A and Module 09B (Innovation and Technology Management I)*

Module M10 Managing ICT and Mobility	6 ECTS

	Lectures	
1	Prof. Dr. Barbara Lenz *German Aerospace Center, Institute of Transport Research* Barbara Lenz studied geography and German literature at the university of Stuttgart where she held a position as a senior researcher in Economic and Social Geography at the University of Stuttgart for more than ten years. She was appointed Director of the DLR Institute of Transport Research in Berlin in 2007. At the same time, she is a professor for Transport Geography at the Humboldt University. Barbara's research is focused on transport demand in both, the passenger and the freight sector with a particular focus on the impact of new technologies on behavioral change. Her current research topics are the impact of automation on the transport system for both passenger and freight and informal transport in developing countries.	
2	Thomas Meissner *Berlin Partner for Business and Technology* Thomas Meissner studied Mechanical Engineering at the Berlin University of Technology (TU Berlin). His current professional position is Head of Division Energy | Mobility at Berlin Partner for Business and Technology. In this context he is also Cluster Manager for Transport | Mobility | Logistics Berlin-Brandenburg and Deputy Head of Berlin Agency for Electromobility eMO. Besides his expert tasks, Thomas Meissner is responsible for the coordination of cluster development activities inside Berlin Partner and in close collaboration with the Berlin Senate. Amongst other fields, Thomas' expertise covers urban mobility, electromobility, transportation projects, transport telematics, rail systems technology, automotive engineering. He is also experience din the management of EU RTD projects.	

Qualification Aims
After this module, - students can assess current and future practices in the digitization of the transport industry and transport services; - students are able to identify disturbing factors as the consequences of digitization in the mobility sector and to develop appropriate solutions and future scenarios - students are able to position the options and effects coming along with the digitization of the transport industry and transport services in different contexts.

Plan of the lessons	
Tuesday 17 April 2018 08:30-11:45	ICT and Mobility Management - an overview Application of ICT for Mobility Management: Definition, motivation and history Today's and future challenges for mobility management, how to achieve sustainability Driver and bottlenecks Overview about the content of course
Lesson	Lecturers present: Prof. Dr. Barbara Lenz, Thomas Meissner
Tuesday 24 April 2018 08:30-11:45	Digitalisation – gamechanger for the transport business? Digitization: Definition, classification Potential for disruption – not only in transport Big Data, data privacy and data protection Trends and future technologies, with regard to - Automated and autonomous transport systems - Connected transport Phase-in approaches – stepwise Perspectives and (potential) show stopper
Lesson	Lecturers present: Thomas Meissner + expert(s)
Tuesday 08 May 2018 08:30-11:45	Mobility Management Mobility Management (passenger services) - the objectives Organisation and optimisation of intermodal and multimodal transport ICT – enabler to optimise mobility management
Lesson	Lecturer present: Prof. Dr. Barbara Lenz
Tuesday 15 May 2018 08:30-11:45	ICT for freight transport and logistics Trends and challenges – in particular for urban logistics Online platforms Competition vs. collaboration Impact on transport business, retail business, the cities The role of consumers
Lesson	Lecturer present: Thomas Meissner
Tuesday 22 May 2018 08:30-11:45	ICT – the enabler for new transport concepts and schemes - Sharing economy - Automation - Connection and intermodality - Flexible public transport
Lesson	Lecturer present: Prof. Dr. Barbara Lenz
Tuesday 29 May 2018 08:30-11:45	Environmental impacts and climate protection Relevance of ICT based mobility management to reduce environmental loads Pollutant emissions Noise Greenhouse gas emissions
Lesson	Lecturer present: Prof. Dr. Barbara Lenz + expert
Tuesday 05 June 2018 08:30-11:45	ICT and electromobility ICT aspects for - Electric vehicles - Charging Infrastructure Interoperability – interfaces and standards
Lesson	Lecturer present: Prof. Dr. Barbara Lenz + expert
Tuesday 12 June 2018 08:30-11:45	New business models in transport Increasing relevance of software Interaction operators – customers New jobs vs. obsolete jobs Interaction operators – customers
Lesson	Lecturer present: Thomas Meissner

Tuesday 19 June 2018 08:30-11:45	ICT in Rail systems and in unconventional modes of transport ICT – the driver for • new schemes for rail operation and safety • new business models and customer interfaces for rail operators Remote piloted air vehicles (RPAS) – example for a new dimension of transport driven by ICT
Lesson	Lecturer present: Thomas Meissner + experts
Tuesday 26 June 2018 08:30-11:45	International dimension – International examples International pilot projects International cooperation Initiatives for international standardisation and harmonisation
Lesson	Lecturer present: Prof. Dr. Barbara Lenz , Thomas Meissner
Tuesday 03 July 2018 08:30-11:45	Wrap up and outlook Wrap up of the lecture Workshop on "ICT and Mobility in 2030"
Lesson	Lecturers present: Prof. Dr. Barbara Lenz , Thomas Meissner
Friday 06 July 2018 08:30-11:45	Portfolio exam 50 % Written test 50 % Oral exam
Examination	Lecturers present: Prof. Dr. Barbara Lenz , Thomas Meissner

Literature
ICT and the shaping of access, mobility and everyday life. Journal of Transport Geography, 17 (2) (Special Issue).
Banister, David; Stead, Dominic. Impact of information and communications technology on transport. Transport Reviews 24 (5) (2004): 611-632.
Maurer, Markus; Gerdes, J. Christian; Lenz, Barbara; Winner, Hermann (2016). Autonomous driving: technical, legal and social aspects. Springer Publishing Company, Incorporated.
Mokhtarian, Patricia L.; Tal, Gil. Impacts of ICT on Travel Behavior: a tapestry of Relationships. Handbook of Transport Studies, Sage, 2013.

Third semester

Winter semester – WiSe 2018-19

Module M08: Managing Smart and Green Mobility	6 ECTS

	Lectures	
1	Dr. habil. Weert Canzler *Berlin Social Science Center* Since 2015 habitation in social science based mobility research at faculty of transportation and traffic sciences "Friedrich List" at TU Dresden. Since 2013 Speaker of Leibniz research alliance "energy transition" Since 2009 senior researcher in research group: science policy studies	

Qualification Aims
At the end of this module, the students will compare the key concepts emerging from the sustainability debates and literature, assessing and managing the tensions and synergies between environmental, social and economic objectives. The students will thus design, plan and deploy sustainable transport regimes, developing the transition towards novel models.

Plan of the lessons	
Thursday, 18 October 2018, 16:00-19.15	Introduction in current debates on sustainable transport and transformations processes in transport (“Verkehrswende”)
Lesson	Lecturer present: Dr. habil. Weert Canzler
Friday, 19 October 2018, 16:00-19.15	Overview on topics and methods of social based mobility research Suggestions for recommended reading (see reference list below)
Lesson	Lecturer present: Dr. habil. Weert Canzler
Thursday, 8 November 2018, 17:15-19.15	Comprehension and joint discussion on read texts
Lesson	Lecturer present: Dr. habil. Weert Canzler
Friday, 9 November 2018, 17:15-19.15	Introduction in foundations of empirical social research on mobility issues Defining of small research projects including surveys and questionaires in working groups
Lesson	Lecturer present: Dr. habil. Weert Canzler
Friday, 16 November 2018, 16:00-19.15	Presentations of research projects by working groups II
Lesson	Lecturer present: Dr. habil. Weert Canzler
Thursday, 22 November 2018, 17:15-19.15	Overview on national and international pioneers in smart and green cargo and delivery services
Lesson	Lecturer present: Dr. habil. Weert Canzler
Friday, 23 November 2018, 17:15-19.15	Presentation of a smart logistic project/start up
Lesson	Lecturer present: Dr. habil. Weert Canzler and guest (cargo bike project)
Thursday, 29 November 2018, 15:00-19.15	Overview on national and international pioneers in smart and green passenger transport

Lesson	Lecturer present: Dr. habil. Weert Canzler
Friday, 30 November 2018, 16:00-19.15	Presentation of an innovative passenger transport project
Lesson	Lecturer present: Dr. habil. Weert Canzler and guest
Thursday, 6 December 2018, 16:00-19.15	Introduction and overview on cross-sectoral projects in particular "sector-coupling"
Lesson	Lecturer present: Dr. habil. Weert Canzler and external speaker
Friday, 7 December 2018, 17:15-19.15	Working groups on the role of social based research on cross-sectoral projects and developing project ideas
Lesson	Lecturer present: Dr. habil. Weert Canzler
Thursday, 13 December 2018, 16:00-19.15	Lessons learnt and open questions
Lesson	Lecturer present: Dr. habil. Weert Canzler
Friday, 14 December 2018, 16:00-19.15	Contents of the exam • 50 % Project presentation of the project idea (cross-sectoral project, see 7th of December) • 50 % Written project report
Examination	Lecturer present: Dr. habil. Weert Canzler

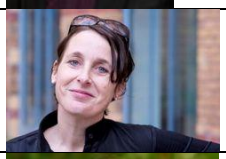
Literature
Beck, Ulrich, 2008: Mobility and the Cosmopolitan Perspective, in: Canzler, Weert, Sven Kesselring and Vincent Kaufmann (Eds.): Tracing Mobilities. Towards a Cosmopolitan Perspective, Ashgate, p. 25-36 Canzler, Weert, 2008: The Paradoxical Nature of Automobility, in: Canzler, Weert, Sven Kesselring and Vincent Kaufmann (Eds.): Tracing Mobilities. Towards a Cosmopolitan Perspective, Ashgate, p. 105-118 Canzler, Weert and Andreas Knie, 2016:): Mobility in the age of digital modernity: why the private car is losing its significance, intermodal transport is winning and why digitalisation is the key, in: Applied Mobilities, Vol. 1, DOI: 10.1080/23800127.2016.1147781. Freudendahl-Pedersen, Malene, 2005: Sructural Stories, Mobility and (Un)Freedom, in: Thomsen, Thyra Uth, Lise Drews Nielsen and Hendrik Gudsmundsson (Eds.): Social Perspectives on Mobility, Ashgate, p. 29-45. Kaufmann, Vincent, Gil Viry and Eric. D. Widmer, 2010: Motility, in: Schneider, Norbert and Beate Collet (Eds.): Mobile Living across Europe II, Opladen/Farmington Hills, p. 95-111 Manderscheid, Katharina, 2009: Integrating Space and Mobilities into the Analysis of Social Inequality, in: distinction 18, p. 7-27 Urry, John, 2007: Mobilities, Cambridge: Polity Press (esp. part 1 and 2)

Elective course

Students can choose between:

- *Module 09A and Module 09B (Innovation and Technology Management I)*
  OR
- *Module 10 (Managing ICT and Mobility) and Module 11 (Mobility and Development)*

Module M09B: Innovation and Technology Management II	6 ECTS

	Lectures	
1	Prof. Dr. Jan Kratzer *Technische Universität Berlin*	
2	Dr. Maren Borkert *Technische Universität Berlin*	
3	Julian Alexandrakis AFFILIATION	

Qualification Aims
After this module, - students understand central concepts and the basis of innovation and technology management, - students understand the interplay between innovation and technology management, - students are familiar with innovation management methods and innovation projects, - students can apply creativity and presentation techniques with a focus on the successful development and presentation of innovation projects, - students are able to carry out and organize interdisciplinary group project work, - students can systematically prepare the implementation of innovation projects in order to develop a first prototype.

Plan of the lessons	
Thursday 8 November 2018 09:30-17:00	Technology and Innovation Management I Technology and Innovation Management II Technology and Innovation Management III Technology and Innovation Management IV
Lesson	Lecturer present: Prof. Dr. Jan Kratzer, Dr. Maren Borkert, Julian Alexandrakis

Friday 9 November 2018 09:30-17:00	Excursion: Urban Air Mobility
Lesson	Lecturer present: Prof. Dr. Jan Kratzer, Dr. Maren Borkert, Julian Alexandrakis
Thu 22 November 2018 09:30-17:00	Quant Data Collection – Survey Design Quant Data – Questionnaire Quant Data– Questionnaire Development & Feedback Quant Data – Pre-Test with Prototype
Lesson	Lecturer present: Prof. Dr. Jan Kratzer, Dr. Maren Borkert, Julian Alexandrakis
Friday 23 November 2018 09:30-17:00	BMC Environment 3D-Business Modelling Competitor Analysis Competitor Analysis: BM USP
Lesson	Lecturer present: Prof. Dr. Jan Kratzer, Dr. Maren Borkert, Julian Alexandrakis
Thursday 6 December 2018 09:30-17:00	3D-Business Modelling & Feedback Rapid Prototyping Pitch Training Q&A Project Report
Lesson	Lecturer present: Prof. Dr. Jan Kratzer, Dr. Maren Borkert, Julian Alexandrakis
Friday 7 December 2018 09:30-17:00	Project Report & Pitch Preparation Assessment II: Final presentation Final grade results from the assessment of 50 % final presentation (incl. Prototype) and 50 % project report.
Final examination	Lecturer present: Prof. Dr. Jan Kratzer, Dr. Maren Borkert, Julian Alexandrakis

Literature
Recommended Readings [1] Donald L. Anderson. *Organization Development. The Process of Leading Organizational Change*. Sage Publications, 2010. [2] Thomas Bieger. *Zukünftige Geschäftsmodelle : Konzept und Anwendung in der Netzökonomie; mit 3 Tabellen*. Springer, 2002. [3] Roman Boutellier and Mareike Heinzen. *Growth Through Innovation: Managing the Technology-Driven* Enterprise. Springer, 2014. [4] Peter F. Drucker. *Innovation and Entrepreneurship*. HarperBusiness, 2006. [5] Jack R. Meredith and Jr. Samuel J. Mantel. *Project Management. A Managerial Approach*. John Wiley & Sons, 2006. [6] Barbara Praetorius, Dierk Bauknecht, Martin Cames, Corinna Fischer, Martin Pehnt, Katja Schumacher, and Jan-Peter Foß. *Innovation for Sustainable Electricity Systems. Exploring the Dynamics of Energy Transitions*. Physica, 2009. [7] V W Ruttan. Technology, *Growth, and Development. An induced innovation perspective*. Oxford University Press, 2001. [8] Melissa A. Schilling. *Strategic Management of Technological Innovation*. Mcgraw-Hill Education, 2013. [9] Joe Tidd and John Bessant. *Strategic Innovation Management*. Wiley, 2014. [10] Paul Trott. *Innovation Management*

Elective course

Students can choose between:

- *Module 10 (Managing ICT and Mobility) and Module 11 (Mobility and Development) OR*
- *Module 09A and Module 09B (Innovation and Technology Management I)*

Module M011: Mobility and Development	6 ECTS

	Lectures	
1	Dr. Wulf-Holger Arndt *Technische Universität Berlin* Dr.-Ing. Wulf-Holger Arndt is head of the research unit "Mobility and Space" in the Center of Technology and Society (CTS) at the Technical University of Berlin. He studied Transportation Planning in Petersburg, Dresden and Berlin. He wrote his doctor thesis about optimization of commercial and freight transport. Dr. Arndt is now leading research projects in sustainable transportation planning in international context and Megacities, climate change and transport system as well as barrier-free mobility. He gives lectures for international urban transportation and commercial transport in urban areas. wulf-holger.arndt@tu-berlin.de | www.ztg.tu-berlin.de/mobilitaet	

Qualification Aims
After this module students are able to, • identify factors that distinguish the mobility sector and related challenges in developing and emerging countries from those in industrialized countries; • to use analytical methods in various institutional and economic contexts on this basis; and • to develop effective instruments based on this to realize sustainable urban mobility.

Plan of the lessons	
Friday, 02 November 2018 09:00-15:30	Definitions, Homework introduction
Lesson	Lecturer present: Dr. Wulf-Holger Arndt
Friday, 09 November 2018 09:00-15:30	Worldwide urbanisation and globalisation, Spatial structure and traffic

Lesson	Lecturer present: Dr. Wulf-Holger Arndt
Friday, 16 November 2018, 09:00-15.30	Urban transportation systems Traffic problems in urban areas
Lesson	Lecturer present: Dr. Wulf-Holger Arndt
Friday, 23 November 2018, 10:00-16:30	Commercial transport definition and drivers Planning instruments and concepts for sustainable urban logistics Mobility data and surveys Modelling in transport: principles and basic elements
Lesson	Lecturer present: Dr. Wulf-Holger Arndt
Friday, 30 November 2018, 09:00-15.30	Introduction to the topic of bike traffic Bike excursion
Lesson	Lecturer present: Fabian Deter
Friday, 14 December 2018, 09:00-15.30	Strategies and measures in sustainable mobility planning Planning structures and stakeholders
Examination	Lecturer present: Dr. Wulf-Holger Arndt
Monday, 17 December 2018, 09:00-17:00	Presentations Written examination: two hours (120 minutes), 100 points
Examination	Lecturer present: Dr. Wulf-Holger Arndt

Plan of the Excursion (Suggestions Welcomed!)		
Date and time TBC	Kastanienallee - Sustainable Design of inner-urban main street	
Date and time TBC	Underground delivery center Potsdamer Platz	
Date and time TBC	Bike excursion by external NGO	

Literature
Knoflacher, Hermann, Ocalir-Akunal, Ebru V.: Engineering Tools and Solutions for Sustainable Transportation Planning, 2017 at https://www.igi-global.com/book/engineering-tools-solutions-sustainable-transportation/172014
Jeffrey Tumlin: Sustainable Transportation Planning: Tools for Creating Vibrant, Healthy, and Resilient Communities, 2012
Sustainable Urban Mobility Plans (SUMP) http://www.mobilityplans.eu
Sustainable Transportation Planning: Tools for Creating Vibrant, Healthy, and Resilient Communities http://eu.wiley.com/WileyCDA/WileyTitle/productCd-0470540931
World Bank projects in different countries "Sustainable Urban Transportation“ http://www.worldbank.org/projects/search
Arndt, Wulf-Holger et al. 2014: Mobility and Transportation Solutions for Future Megacities https://www.jovis.de/de/buecher/product/future-megacities-2-mobility-and-transportation.html (available in the ZTG department “Mobility and Space”)
Arndt et al.: Urban Tramway Systems, a system-based overview 2015 (available in the ZTG department “Mobility and Space”)