

TRENDS, CONCEPTS AND CHALLENGES OF CHINA'S INNOVATIVE RAILWAY TRANSPORT

16 – 17 November 2017



MOBILITY IN CHINA (MIC)

TRENDS, CONCEPTS AND CHALLENGES OF CHINA'S INNOVATIVE RAILWAY TRANSPORT

**Technische Universität Berlin
Straße des 17. Juni 135
10623 Berlin
Room: H 2036**

Demands on mobility are increasing worldwide. Especially China currently faces major challenges due to rapid social, economic and technological change. Urgent problems include environmental pollution, as well as substantial urbanization and internal migration. Chinese municipal governments have taken measures to decrease traffic in large cities, such as the expansion of the road and track network and the announcement of new rules for car traffic. In the long run, there are ambitious plans regarding the broad electrification and automation of traffic. Still, for solving China's pressing issues, dealing with infrastructure and mobility concerns now is of key importance.

This workshop will bring together international actors from different fields to examine the current technological, scientific and economic questions in the context of geopolitical developments and strategies concerning mobility. Railway scientists, administrators, operators and logistics professionals will present and discuss their views on China's railroad development.

THURSDAY, 16 NOVEMBER 2017

08:45 – 9:20	Registration
09:30 – 10:00	Welcome addresses <ul style="list-style-type: none">• Dr Sigrun ABELS (Director China Center, TU Berlin)• Prof. Dr Hans-Liudger DIENEL (Institute of Vocational Education and Work Studies, Head of China Center advisory board, TU Berlin)• Evelina SKURSKI (Head of Section Asia, Oceania, North and South America, International Scientific Cooperation, TU Berlin)

10:00 – 10:45	Workshop introduction: scope, expectations and goals Dr Dirk FORSCHNER & Philipp MAHLTIG (TU Berlin)
10:45 – 11:15	Coffee and tea break
11:15 – 12:15	CONTEXTUALIZATION I <ul style="list-style-type: none"> • <i>Germany's Role in China's Historic and Present Railway Development</i> Dr Dirk FORSCHNER (TU Berlin)
12:15 – 14:00	Lunch break
14:00 – 15:00	CONTEXTUALIZATION II <ul style="list-style-type: none"> • <i>China's Railways and the One Belt, One Road initiative</i> Dr Ágota RÉVÉSZ (FU Berlin) & Prof. Dr Johannes KÜCHLER (TU Berlin)
15:00 – 16:00	FREIGHT SERVICES OF CHINESE RAILWAYS <ul style="list-style-type: none"> • <i>The strategic importance of the New Silk Road connection Europe - China</i> Guanzhe CAO (duisport / Duisburger Hafen AG) • <i>Relieve roads from heavy cargo – innovation for freight logistics</i> Monique HERMANN & Peter WURZINGER (CargoBeamer AG)
16:00 – 16:30	Coffee and tea break
16:30 – 17:30	URBAN AND LOCAL RAILBOUND TRANSPORT I <ul style="list-style-type: none"> • <i>Urban Mobility in China</i> Prof. Dr PAN Haixiao (Tongji University, Shanghai) • <i>Metros - Trends for the next 10 years</i> Thomas SIEGEMUND (Former company: Bombardier)
19:00	Joint dinner at "12 Apostel Berlin" (Savignyplatz)

FRIDAY, 17 NOVEMBER 2017

09:30 – 11:00	URBAN AND LOCAL RAILBOUND TRANSPORT II <ul style="list-style-type: none">• <i>On the way towards “Rapid Mobility Planning” in China</i> Michael ABRAHAM (TU Berlin)• <i>Chinese tramway systems in the past and future</i> Lu LU (TU Berlin)• <i>Innovation in large technological systems: insights for urban rail transport</i> Rafael MILANI MEDEIROS (TU Berlin)
11:00 – 11.30	Coffee and tea break
11:30 – 12:00	HIGH-SPEED PASSENGER SYSTEMS <ul style="list-style-type: none">• <i>The high-speed rail development in China and its economic impact analysis</i> Prof. ZHAO Jian (Jiaotong University, Beijing)
12:00 – 12:30	Wrap-up session
12:30	Lunch
14:30 – 17:00	Cultural program: Guided city tour – A glimpse of Berlin’s history Dr Tania BECKER VON FALKENSTEIN (TU Berlin)
20:00	Cultural program: Concert for the Nations – 9€ entry fee

SATURDAY, 18 NOVEMBER 2017

11:00 – 13:00	Cultural Program: Guided city tour – Railbound spots in Berlin Dr Dirk FORSCHNER (TU Berlin)
---------------	---

FREIGHT SERVICES OF CHINESE RAILWAYS

GUANZHE CAO

(DUISPORT / DUISBURGER HAFEN AG)

duisport's role in intercontinental rail solutions:

The strategic importance of the New Silk Road connection Europe – China

As a trimodal logistics hub and the largest inland hub in Europe, duisport provides the optimal combination of advantageous geographical location and favorable location conditions with an extensive logistics expertise. With a total handling of 3.7 million TEU (twenty-foot equivalent unit), duisport is the world's largest hinterland container port. With its well-connected network of logistics services, the port provides locally active enterprises with the best conditions for Europe-wide supply and disposal for trade and industry. Direct, multi-modal networking with international freight traffic underlines the port's leading position as the gateway to European markets.

The diverse range of services offered by the duisport Group is supported by the ever-increasing importance of transcontinental railway connections. Every day, a train departs from Duisburg for Chinese business metropolises like Chongqing, Chengdu, Wuhan or Yiwu. Right now, 25 Far East trains are processed in Duisburg every week.

About Guanzhe CAO

Born 1986 in Hefei, Anhui, China. Graduated at the Dresden University of Technology (Technische Universität Dresden). Got his academic degree "Master of Science (M.Sc.)" of the Railway Engineering System, majoring in logistics and railway cargo. Guanzhe CAO is the Project Manager Asia of duisport and takes charge of the china activities.

Email: Guanzhe.Cao@Duisport.de

MONIQUE HERMANN & PETER WURZINGER

(CARGOBEAMER AG)

Relieve roads from heavy cargo – innovation for freight logistics

With its innovative rail freight technology, CargoBeamer offers an economic solution to shift goods from environmentally problematic road cargo to railroad tracks – automatically and fast. -- Strengthening rail-based cargo has become more and more important to not only relieve the roads, but also the society and, of course, the environment. CargoBeamer solves a lot of the immanent problems. The company has developed innovative rail wagons and so-called “GateModules” allowing to load standard road semi-trailers onto the wagons automatically. This technology, developed from 2008 – 2012 and operational since 2013 on international routes in Europe, applies to almost 100 per cent of road semi-trailers on European, Russian, Chinese, Central Asian and Turkish markets. On German roads, for example, the road cargo volume already exceeded the nominal layout capacity in 2010 – and nothing has changed to the positive so far. On the contrary: Traffic has become much worse. The number of traffic jams has tripled since. In 2015, the economic costs of traffic jams reached 25 billion Euros. Also, the German government expects road cargo to grow by an additional 40 per cent until 2030, while the capacity will only increase by four per cent. This trend is seen in most industrialized regions across the world.

CargoBeamer wagons are designed for rail gauges in Europe, Russia and China, to transport either standard semi-trailers for national transports, or, in addition, high volume land containers “CBoXX” – a loading equipment which is designed to maximize the utilization of key advantages of rail transportation: its ability for efficient transportation of heavy weight and high volume freight. Combined with CargoBeamer’s automated and highly efficient terminal technology, a most efficient and fully de-carbonized cargo transportation solution across China, Russia, and Central Asia into Europe is enabled.

About Monique HERMANN and Peter WURZINGER

Monique HERMANN is CargoBeamer’s Referent of CFO. Her responsibilities include financing projects, liquidity management and controlling, co-operation and management of internal CFO projects. Peter WURZINGER is CargoBeamer’s lead engineer for infrastructure planning in the range of railways, terminals and lane changes.

Email: mhermann@cargobeamer.com, pwurzinger@cargobeamer.com

URBAN AND LOCAL RAILBOUND TRANSPORT

PAN HAIXIAO

(DEPARTMENT OF URBAN PLANNING, TONGJI UNIVERSITY, SHANGHAI)

Urban Mobility in China

For a long time in China, there was very little investment in urban transport infrastructure.

With the policy of opening up and the increasing economic growth, almost all city governments have made the construction of urban trunk road systems their great priority – now the policy is shifting towards environment and energy concerns.

In this presentation, the car ownership control and public transport encouragement measures, such as large-scale metro and bus rapid transit systems, will be discussed.

The free floating bike sharing development of the recent two years and the discussion on how to design streets will also be presented.

About Prof. Dr PAN Haixiao

Prof. Dr PAN Haixiao (PhD in 1989 from Shanghai Jiao Tong University) is working in the Department of Urban Planning of the Tongji University since 1989.

He is president of the IVM international chair (China). Furthermore, he is the urban planning advisor for the Shanghai Government, board member of the China Urban Studies Society, Steering Committee Member of the World Transport Research Conference Society. Prof. Dr PAN's major research interests are the areas of land use and urban transport, especially the impact of the metro system on urban spatial structure, mobility and sustainability, the transport in suburban, modal choice and built environment design.

Email: hxpank@online.sh.cn

THOMAS SIEGEMUND

(METRO EXPERT, FORMER COMPANY: BOMBARDIER)

Metros – Trends for the next 10 years

Since 1862, Metros have become the backbone of urban transportation infrastructure in more than 150 cities around the globe. Transportation by metros is fast, efficient and provides a high capacity. This mode of transport has reached a high level of maturity through continuous development and innovation. The basic concept and design of metros is not expected to be changed in the foreseeable future – it will very likely remain a rail vehicle with steel wheels on rails.

However, global trends such as climate change, urbanization, an aging population and changing lifestyles call for continual innovation in the metro segment. New technologies, digitalization, security policies, changes in business models, but also the changes in the expected volumes of passengers will demand innovations in the entire system of metros. Other modes of transport, such as the e-mobility, are catching up in efficiency and sustainability.

The presentation touches a number of aspects in terms of requirements to the next generation of metros or, to put it another way, metro systems, because it is not only the rolling stock affected by these demands.

About Thomas SIEGEMUND

After studying electrical engineering at the Technical University Berlin, Thomas Siegemund started his career 1982 at AEG Rail Technology in Berlin (later merged into ADtranz and Bombardier Transportation) as a sales and project engineer for LRV and metro vehicles. In 1985, he changed to the engineering department for propulsion and auxiliary inverters. In 1989, he was appointed as the Project Manager for the Metro Shanghai Line 1 project, which was the first import Metro project in China. From 1998 on, he assumed responsibilities for the Engineering Department for metros and commuters and Project Engineering for metros. In 2003, he took over the responsibility of Project Management of all Chinese metro projects including of those of the Bombardier Joint Venture CBRC in Changchun/China. Since the beginning of 2006, he assumed responsibility as Director Product Management for Mass Transit within the Passengers Division of Bombardier Transportation. He was an active member of the UITP Metro Division and finished his career in November 2016.

Email: TSiegemund@t-online.de

MICHAEL ABRAHAM

(CENTER FOR TECHNOLOGY AND SOCIETY (CTS), TU BERLIN)

On the way towards “Rapid Mobility Planning” in China

Cities and megacities are growing quickly in most parts of the world. But in some developing and emerging countries, the urban growth rate is extreme. One country that stands for this development is China. This growth leads to a high demand for new mobility options, solutions and for the related infrastructure. In order to be able to cope with the tremendous speed of those developments, the processes and implementations must be accomplished in an equally rapid way.

This presentation summarizes a newly developed approach to speed up planning processes by taking aspects of environmental planning, participation and feasibility criteria into account. Based on experiences and practices by researching and combining existing rapid planning projects, this rapid planning approach, developed by the TUB, focuses on three aspects that can be combined to increase the planning speed: 1) Institutional. Speeding up planning and decision-making processes within planning organizations involved in planning and implementation processes. 2) Action-oriented: Designing quickly implementable plans and projects with high impacts. 3) Technological: Applying dynamic planning and forecasting by software and big data; providing decision-making tool kits and big datasets. This approach is applicable for various kinds of mobility such as freight transport, (high-speed) passenger transport, and urban and local transport. The presentation ends with the formulation of premises that need to be taken into consideration whenever rapid planning is intended.

About Michael ABRAHAM

Michael Abraham is a Research Fellow at the Center for Technology and Society (CTS) of the TU Berlin since 2007. He has studied City and Regional Planning at the Technische Universität (TU) Berlin. Supported by a DAAD scholarship, he also spent one year studying architecture, geography and management at Montana State University, USA. He has worked in several European and international projects aiming at promoting sustainable urban mobility. Within his research field, he is currently focusing on the process and impact evaluation of transportation measures. Additionally, he dedicates his activities to general and specific questions related to the conception, implementation, analysis and evaluation of Smart City concepts.

Email: m.abraham@tu-berlin.de

LU LU

(CENTER FOR TECHNOLOGY AND SOCIETY (CTS), TU BERLIN)

Chinese tramway systems in the past and future

The urbanization rate of China is increasing and expected to reach 70 percent in 2030. This means that over 1 billion people will live in cities whose infrastructures must be further developed and rapidly extended. As more and more Chinese cities are constructing metro systems to solve their traffic problems, some notices are released to strengthen the urban rapid rail transit construction management. It set up the conditions for cities applying for metro or light rail projects. In this situation, trams provide an alternative solution for small and medium-sized cities.

The first tramway system in China can be traced back to 1899. In the second half of the 20th century, the tramway system experienced a downfall, as many cities worldwide substituted the tramway systems with buses, metro systems and also designed more space for private transportation with cars. So did China. Nowadays, we are witnessing the rebirth of the tramway.

During the presentation, a brief review of the tramway history in China will be given at the beginning, followed by the advantages of tramway systems in the urban development, explaining the reason of the tram rebirth. In the next part, some examples of new tramway systems in China and Europe will be given along with discussing their strengths and weakness. The presentation will end with an outlook into the future, reviewing the latest development and the vision for tram systems in China.

About Lu LU

Lu LU was born in China in 1987. He started his master program in Geodesy and Geoinformation Science at Technische Universität Berlin in 2011. From 2012 – 2015, Mr. Lu has worked as a student assistant for the research unit “Mobility and Space” at the Center for Technology and Society. He initially worked in the project “Energyatlas Berlin” where he was responsible for the GIS data analysis and model design. After receiving his master’s degree in 2015, he became a scientific researcher at CTS. His research fields are transportation planning, traffic emissions, sustainable urban mobility and GIS analysis for transportation.

Email: lu@ztg.tu-berlin.de

RAFAEL MILANI MEDEIROS

(INSTITUTE OF VOCATIONAL EDUCATION AND WORK STUDIES,
TU BERLIN)

Innovation in large technological systems: insights for urban rail transportation

Cities are normally seen as spaces of change and innovation, of permanent dynamics between people and artifacts. In fact, large urban technological systems may be obdurate, such as those of urban mobility – they may be difficult to manipulate, improve or substitute. On the other hand, many case studies on transport development reveal frameworks of sociotechnical change - the conditions that have altered social and technical matter throughout history. New technologies mold different societies and cities, as culture shapes technology. As studies have shown; established sociotechnical relations acquire a *momentum* where the new is not always welcome or possible. In this way, traces of hardness and malleability can be identified if one studies innovation in a single unit of analysis, encompassing the social and the technical altogether. As innovation is difficult to predict, much can be learned from looking at it in a symmetrical perspective, where learning from success is equally important as learning from failures. This presentation will contain examples of sociotechnical changes in urban mobility, focusing on development in rail transport systems and innovation, to stimulate a reflection on the limits and the potentials of sociotechnical change. Moreover, the present merging of information and communication technologies to the level of individuals in daily urban mobility will be discussed.

About Rafael MILANI MEDEIROS

Rafael is a PhD candidate at the Technische Universität Berlin, researching on obduracy and disruption through information and communication technologies in urban mobility sociotechnical change. Long term experienced in design lead, market research and innovation. He has lead planning, technology development and implementation of bike share schemes in Brazil. As an urban mobility designer and planner, he has managed teams for public policy making and the design of urban mobility infrastructure, focusing on active transport modes and bus rapid transit.

Email: rafaelorama@gmail.com

HIGH-SPEED PASSENGER SYSTEMS

PROF. ZHAO JIAN

(DEPARTMENT OF ECONOMICS, BEIJING JIAOTONG UNIVERSITY, CHINA)

The high speed rail development in China and its economic impact analysis

This presentation examines the variation in the value of travel-time savings (VTTS). Following a review of time allocation theories, a time allocation model for general travel behavior is proposed as a further elaboration of Evans' (1972) activities analysis. This model indicates that two or more activities can be simultaneously rearranged to improve time management, which may be a source of variation in VTTS. This time allocation model can explain why large-scale HSR construction in China faces significant market risks and a high likelihood of economic loss. Data from a new ticket sales and booking system for railway passengers indicate that passengers prefer conventional overnight sleeper trains, rather than high-speed trains, for long-distance travel, which supports the analysis of the time allocation model.

In about 10 years, China has built 22000 kilometers HSR, which really provide a faster and convenient travel mode for travel, but also means three problems: First, the debt of China Rail Corporation increased from RMB 476 billion in 2005 to 4.72 trillion in 2016. Second, because of a lack of transport capacity, huge coal and cargo are transported by motor vehicles. The market share of rail freight transport declined from 50% in 2005 to 17% in 2016, and the market share of road freight transport has increased from 21% to 49%. Third, the sharp increase of motor vehicle freight transport worsens the air pollution, especially in northern and eastern China.

About Prof. ZHAO Jian

ZHAO Jian is a Professor at the Department of Economics of the Beijing Jiaotong University (BJU) and the director of the China Urbanization Research Center. He has taken part in the rail reform research program of the Ministry of Railways and the National Development and Reform Committee. One of Prof. ZHAO's research areas is the relationship between transport and economic growth. Since 2006, he has published many papers against the large-scale construction of high-speed railways in China that have been widely cited by domestic and international media, including The New York Times, the Washington Post, Time magazine and the Financial Times. Email: jzhao@bjtu.edu.cn

IMPRINT

Trends, Concepts and Challenges of China's Innovative Railway Transport Mobility in China (MiC)

Project lead: Dr Sigrun ABELS

Research associates: Dr Dirk FORSCHNER, Philipp MAHLTIG

Research assistance: Sophie WOHLGEMUTH

Thanks to

Internal Research Funding, Service Area Research, TU Berlin

Dr Tania BECKER VON FALKENSTEIN, Wei-Lin LEE, Rebecca SAMPSON, Renjian ZHAO,
Nico JACOB, Johannes SICHTER, Meike BUNTEN

2017

Workshop booklet: Sophie WOHLGEMUTH

Get in touch with us!

Dr. Sigrun ABELS sigrun.abels@tu-berlin.de

Dr. Dirk FORSCHNER d.forschner@tu-berlin.de

Philipp MAHLTIG philipp.mahltig@tu-berlin.de

Sophie WOHLGEMUTH sophie.wohlgemuth@campus.tu-berlin.de

TU Berlin

Center for Cultural Studies on Science and Technology in China

Sekr. MAR 2-2

MAR 2.032-2.035

Marchstr. 23

10587 Berlin

www.china.tu-berlin.de

www.china.tu-berlin.de/mic

