

**TechnologieRegion
Karlsruhe**
Hightech meets the Good Life



Karlsruhe Mobility Lab

powered by **TechnologieRegion
Karlsruhe**
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Hub for intelligent urban and regional mobility concepts

www.trk.de/mobilitaet

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The partners of the Karlsruhe Mobility Lab



Intelligent Urban Transport Systems



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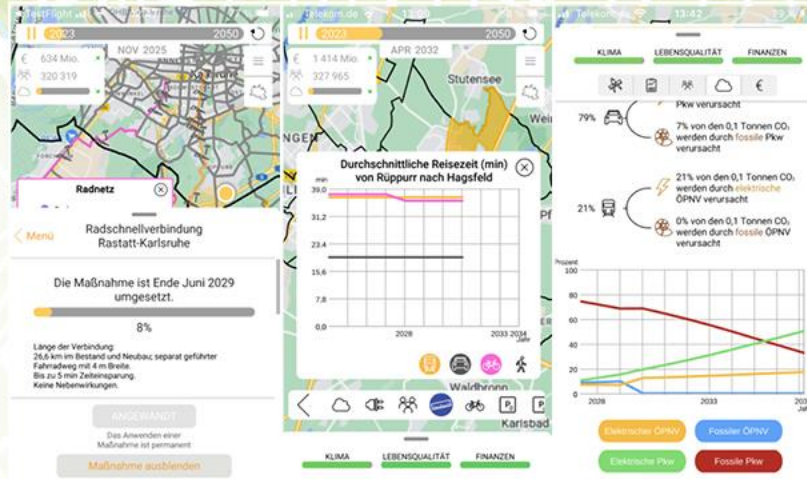
In collaboration with:

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MobileCityGame: 2050 Designing Transitions



MobileCityGame is a serious computer game for experiencing options and pitfalls of the urban mobility transition towards 2050. The game is developed for the city of Karlsruhe. A serious transport model allows testing a large variety of measures in infrastructure development, mobility management, new technologies and urban design. Its core objective is meeting climate targets while maintaining citizens' satisfaction and financial viability.

MobileCityGame addresses professional users and non-expert players alike for scenario development, workshops, communication, education and fun.

Facts and Figures about Profilregion

Seven leading institutions for research and teaching
Network of > 25 industrial partners.
Funded by the Ministry of Science, Research and the Arts and the Ministry of Economic Affairs, Labour and Housing in Baden-Württemberg and as a national High Performance Center by the Fraunhofer-Gesellschaft.

www.isi.fraunhofer.de/mobilecitygame
www.profilregion-ka.de



FZI Research Center for Information Technology

As an independent and non-profit research foundation, the FZI Research Center for Information Technology delivers the latest scientific findings in information technology to companies and public institutions. Furthermore, it has stood for top-level applied research in the field of information technology and its application fields for over 35 years. One of the central research fields is mobility research: Together with partners from industry and science, software and hardware solutions for mobility and transportation concepts for vehicles and autonomous mobile systems of future generations are developed, researched and evaluated.

Facts and Figures

- Legal form: non-profit foundation under civil law
- Foundation: 1985
- 245 employees
- 172 research assistants
- Overall budget in 2020: €25 million
- 178 projects in 2021: 78 industrial projects, 100 public projects
- Average duration of projects: 24.7 months (as of 2021)





Test Area Autonomous Driving Baden-Württemberg (TAF BW)

Testing and development possibilities for
sustainable mobility concepts of tomorrow

At the Test Area Autonomous Driving Baden-Württemberg, companies and research institutions can test future-oriented technologies and services related to connected and automated driving in everyday road traffic. In addition, the regulatory and legal framework conditions can be evaluated and updated. For this purpose, traffic areas of various types were prepared, highly accurate 3D maps were generated; sensors and computers for real-time recording of traffic and its influencing factors as well as communication units were installed. The legal, organizational and insurance framework for the operation of the infrastructure and potential applications of autonomous mobility was also created.





FZI Shuttles

Interconnected and automated shuttles for last-mile transport of cargo and passengers

The FZI shuttles are networked and autonomously driving mini-buses for the last mile. Innovative mobility concepts are presented with the FZI shuttles that showcase on-demand passenger transport solutions from the front door to the next public transport hub and back again as well as cargo solutions. These concepts are evaluated under real conditions on the Test Area Autonomous Driving Baden-Württemberg (TAF BW). Furthermore, the use case of platooning and telesupervision via the TAF BW will be demonstrated in the EU project SHOW. The project aims to support the deployment of shared, connected and electrified automation in urban transport to promote sustainable urban mobility all over Europe.





Innovation campaign „nextGen“

Taking Public Transport to the next level

More than 1,000 highly dedicated INIT employees around the world are committed to the digital transformation of public transport. In innovation and research projects, but also in partnership with our customers, we develop the solutions for the mobility of the future.

This dedication is demonstrated with our “nextGen” innovation campaign, which represents a technological leap in the INIT systems. Artificial intelligence, automation, optimization tools, assistance systems, broker architecture and cloud-based solutions open up completely new dimensions to overcome the challenges that lie ahead.

Our next generation overall solution, MOBILE nextGen, demonstrates INIT’s mission to provide transport companies around the world with the very best support in order to fulfil their operational tasks. Today and in the future, we strive to deliver the very latest technologies as they emerge, since it is our mission to make mobility easier - for passengers and public transport providers alike.



init



KAMO: Karlsruhe Mobility.

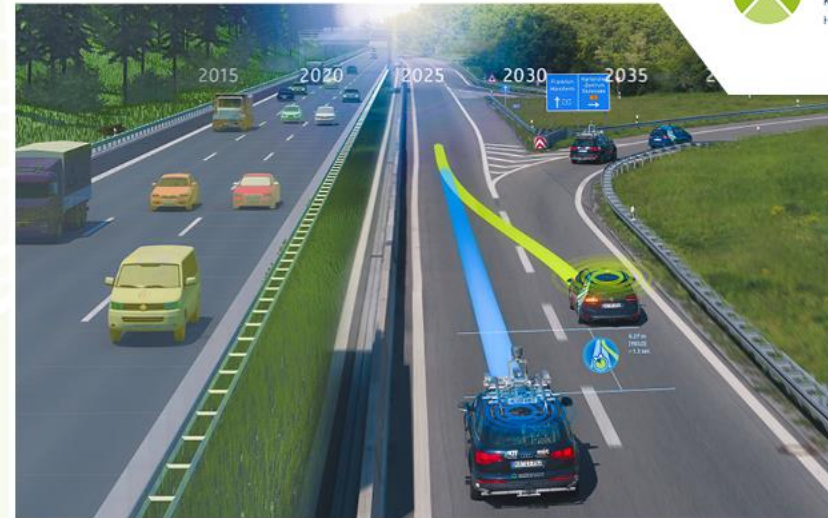
A collaboration between the institutions for research, development and education.

KAMO is the well-established collaboration between the institutions for mobility and logistics research, development and education in Karlsruhe, Germany:

- Karlsruhe's four Fraunhofer-Instituts ICT, IOSB, ISI, IWM
- Karlsruhe Institute of Technology (KIT)
- FZI Research Center for Information Technology and
- Karlsruhe University of Applied Sciences (HKA).

Together, we stand for interdisciplinary development and support for innovative mobility and logistics solutions in their entire systemic spectrum.

Along with our international clients and partners from industry, research and civil society, innovations are brought into application quickly and reliably. Together, we take your ideas further!





Research project LogIKTram



LogIKTram



Even though public transport is very full at peak hours, there are times with free capacity. The “LogIKTram” joint project aims to make optimal use existing capacities. The idea behind this is that free space is used to transport parcels in mobile containers that enter and exit the tramtrain autonomously within the passengers’ usual transfer times so that the tramtrains’ timetable is kept. An ICT (information and communications technology) platform and automation systems support the logistics processes and connect ITCS (Intermodal Transport Control System) with TMS (Transport Management Systems).

The demonstrator shows how combined passenger and freight transport could look like.

logiktram.de/en
www.kamo.one

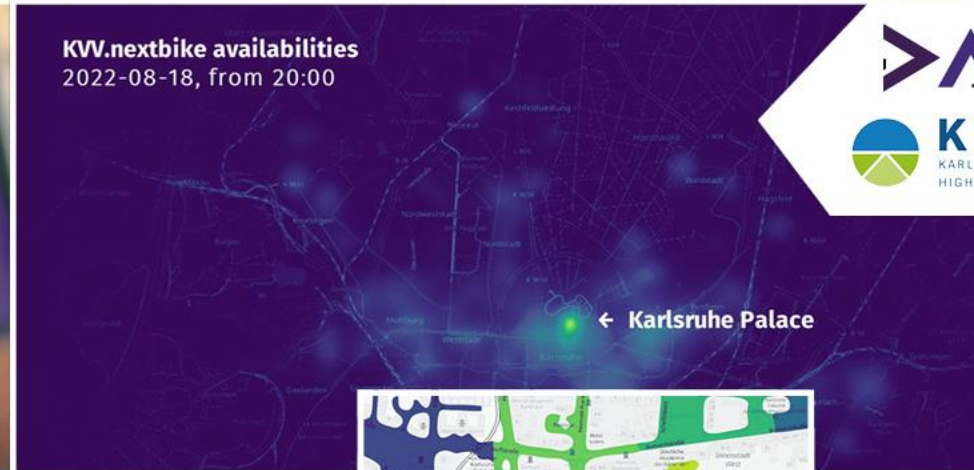


DAKIMO Project

Data and AI as Enabler for Sustainable,
Intermodal Mobility



KVV.nextbike availabilities
2022-08-18, from 20:00



The DAKIMO project aims at supporting seamless intermodal, sustainable mobility using AI. The project is funded by the German Federal Ministry of Education and Research (BMBF). It joins Fraunhofer IOSB, raumobil GmbH, INIT GmbH, INOVAPLAN GmbH, the Karlsruhe Institute of Technology (KIT), and the Karlsruhe public transport provider KVV, and is part of the KAMO Karlsruhe Mobility High Performance Center.

AI methods fuse data from users, municipalities, public transport, weather, etc., such that various services can improve intermodal traffic options in real time – e.g. by providing more versatile and reliable routing recommendations on the “KVV.regiomove” public transport app.



dakimo.server.de
www.kamo.one



KIT Mobility Systems Center

Seamless Mobility for Future Public Transport



The KIT Mobility Systems Center pools the vast competencies and resources in the field of ground-based traffic to develop trans- and multi-disciplinary solutions for tomorrow's mobility. With our activities, we aim at the best possible integration and coordination of different means of transport for passenger and goods as well as the dissolution of border between them in a concept of Seamless Mobility. Further development of key technologies, such as alternative drive systems, traffic planning and automated driving, are on the scientific agenda of the KIT Mobility Systems Center. About 800 KIT employees at more than 35 institutes focus on mobility research at KIT.

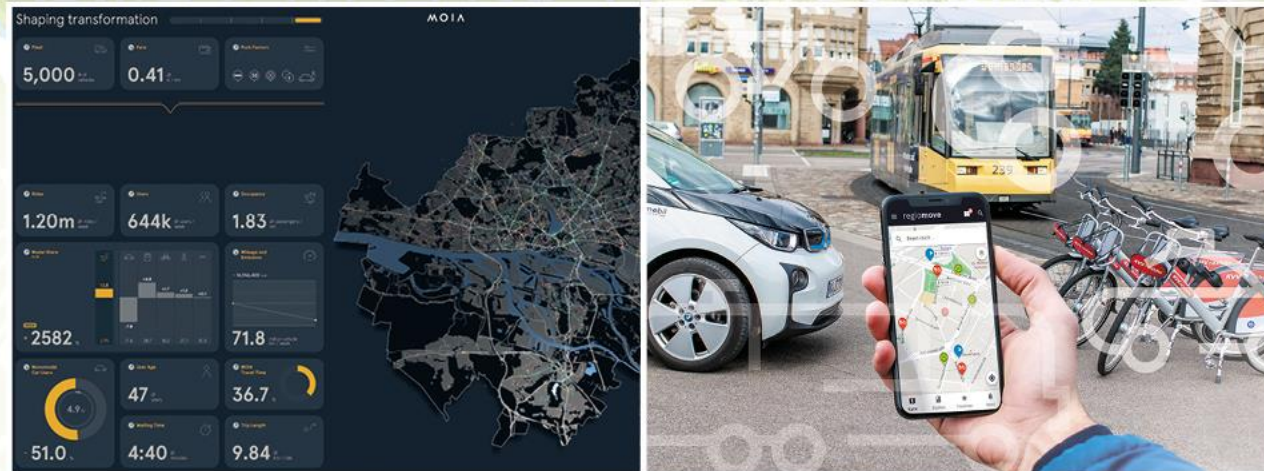
Facts and Figures about KIT

- 385 professors
- 9,783 employees
- 22,275 students
- 1,090.7 million € budget in 2021
- www.mobilitaetssysteme.kit.edu
- www.kit.edu

www.mobilitaetssysteme.kit.edu/PTRH.php

Evaluation of Mobility Solutions

Karlsruhe Institute of Technology (KIT) – Institute for Transport Studies



With an interdisciplinary concept, the research of the KIT Institute for Transport Studies consists in making transport efficient and sustainable. We analyze and forecast the impact of new mobility solutions on the travel behavior with a holistic view of the transport sector.

The effects of, for example, the regiomove Ports or of the MOIA ridepooling service are simulated with our agent-based travel demand model mobiTopp. Furthermore, we are working on evaluation of automated public transit systems, such as shown in the KIRA project.



Platooning of City Buses

The next Step towards Automated Driving
in Public Transport

With platooning, vehicles are able to automatically follow the trajectory of a lead vehicle at a short distance. This is achieved on the one hand by data communication via an air interface (“over-the-air”) from the vehicle in front to the vehicle behind (“vehicle-2-vehicle” / V2V). On the other hand, the following vehicle is equipped with sensors to follow the rear of the lead vehicle. Developed algorithms calculate the driving trajectory from these redundant data sources. By developing the technology automation can be advanced and economic efficiency can be created. This topic is being addressed, among others, in the TEMPUS project funded by the Federal Ministry for Digital and Transport.



TEMPUS
VERNETZT. DIGITAL. VORAUS.



SW/M

MVG

KIT
ITV

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IT-TRANS 14 – 16 May 2024

International Conference and Exhibition for Intelligent
Urban Transport Systems. **Plan your participation now!**

With more than 7,000 trade visitors from 71 countries, 270 exhibitors on the exhibition floor and 800 participants in the conference, **IT-TRANS 2022** brought together the key players in the public transport sector.

In 2024, **IT-TRANS** will again be the leading marketplace for ticketing, MaaS, passenger information systems, software solutions, cyber security, scheduling, and many more.

For more information:



Intelligent Urban Transport Systems

14 – 16 May 2024
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— karlsruhe

www.it-trans.org





Karlsruher Verkehrsverbund GmbH (KVV)



The KVV is one of the largest public transport networks in southern Germany and the most important mobility provider within the Upper Rhine Valley, consisting of more than 20 transport companies. Albtal-Verkehrs-Gesellschaft (AVG) and Verkehrsbetriebe Karlsruhe (VBK) operate the tram and light rail within the KVV area. AVG is an elementary pillar of the “Karlsruhe Model” which is a tram-train system linking the inner-city tram network of the fan-shaped city with the rail lines in the region.

170 million passengers use this attractive public transport offers of the municipal association yearly, which was founded in 1994. The association partners are the cities and counties of the Karlsruhe region. The association includes the counties Germersheim, Karlsruhe, Rastatt, Südliche Weinstraße and the cities of Baden-Baden, Karlsruhe and Landau. KVV plans, coordinates and sells public transport services on behalf of its shareholders and the transport companies involved.

Facts and Figures / 2021

- 93,6 mio. passengers in 2021
- 50 employees
- 29 associated companies
- 15 regional S-Bahn
- 25 city and tram lines
- 225 bus lines
- 933,2 km route length

www.kvv.de



regiomove: Anything is possible



regiomove is a pioneer project. Its goal: Connecting the existing public transportation network with new mobility services and the communities in the area. No matter if tram, train, bus, bike or car sharing. No matter if rural or urban.

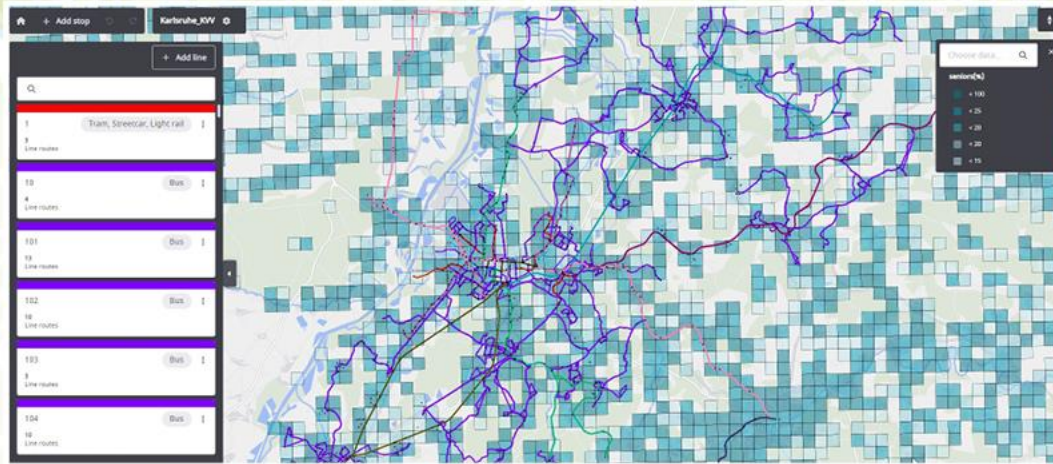
The regional cross-linking is carried out using two fundamental components: The ports and the app. At regiomove ports people can easily connect their journey with tram, bus, shared bikes or cars. Such combined journeys are digitally connected via the regiomove App. With only one single account you can route, book and pay intermodal journeys. Furthermore, the ports may offer new service components, like digital information terminals, charging stations, locker boxes or bicycle service stations.

www.kvv.de/regiomove



PTV Lines

Tool for public transport supply planning
with all the scope and zero complexity



PTV GROUP

PTV Lines is an easy-to-use web-based platform for public transport planning. It provides planners with all functionalities needed for a rapid design and modification of new and existing public transport supplies. It does not, however, require expert knowledge in public transport planning software. The tool enables planners to test out ideas quickly and to understand the effects of changes to the infrastructure right away. The result: PTV Lines facilitates sharing, reduces copy errors and accelerates creativity and productivity during the planning process.

Features

- Service planning & evaluation
- Accessibility & demand analysis
- Simple, powerful editing
- Collaborative working
- Web application

ptv.to/lines



PTV Model2Go Demand

The world's first ready-to-use transport model including demand



PTV GROUP

PTV brings you the evolution of the next model generation: With PTV Model2Go Demand, the new cloud-based process combines smart model development technology with travel demand data powered by TomTom's trustworthy GPS data.

With the provision of about 10%-30% of the total private transport for any city in the world, the new ready-to-use demand models boost modelling efficiency as it reduces the effort for collecting data empirically. Plus: The OD data are precise to the point, which make them applicable to your desired matrix – resulting in even more accurate results.

Area of Applications

- Multimodal transport accessibility
- On-demand service potential studies
- Transport masterplans
- Transport logistics masterplans, Traffic impact analyses and many more

ptv.to/model2go



UITP Regional Training Centre Karlsruhe

The graphic features a dark red background with a white banner at the top containing the text 'UITP - Karlsruhe Mobility Innovation Partnership'. Below this, there is a white circle with the text 'UITP Regional Training Centre Karlsruhe'. To the right of the circle is a stylized globe with various transport icons (car, bus, train, bicycle, wheelchair) overlaid on it. At the bottom left, there are two white arrows pointing right, containing the website addresses 'www.trk.de/mobilitaet' and 'www.uitp.org/training'. The UITP ACADEMY logo is in the top right corner of the graphic.



The UITP-Karlsruhe Mobility Innovation Partnership between UITP and Karlsruhe TechnologieRegion, unique in this form, exists since 2019. The partnership is supported by the TRK-UITP Liaison Office in Karlsruhe and the associated UITP Regional Training Centre Karlsruhe. Three times a year, the UITP Regional Training Centre Karlsruhe offers training programmes for public transport employees. Those programmes are: Ticketing, Bus planning and Scheduling, Cybersecurity, Autonomous Driving and Mobility as a Service.

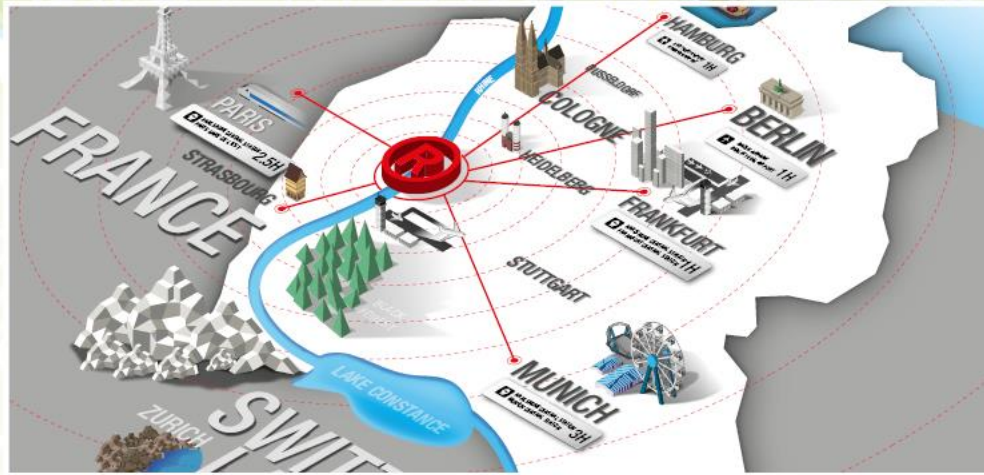
www.trk.de/mobility-innovation-partnership
www.uitp.org/trainings

Facts and Figures

- Founded 2019
- Hosts three trainings a year virtually or on site in Karlsruhe
- Internationally recognized trainings
- Qualified UITP Trainings
- Trainings delivered by public transport experts, for public transport experts
- Interactive session
- Best practice showcases and site visits

TechnologieRegion Karlsruhe GmbH

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www.trk.de

Public authorities have joined forces with businesses, chambers of commerce and scientific institutions to form the TechnologieRegion Karlsruhe GmbH.

Together we are shaping the development of the region with the aim of strengthening and promoting it as a hub for business, science and innovation. Our focus is very much on the themes of mobility, energy and IT. Projects are initiated on a real-lab scale through the strategic networking of partners from business, science and the public sector. The TechnologieRegion Karlsruhe GmbH acts as a platform, takes over the steering of the different actors and contributes to co-financing.

Facts and Figures

- Around 1.7-million people living within an area of 6,000 km²
- Working population of 675,000
- Around one-third of the labour force work in technology-intensive industries – more than in almost every other region in Europe over 100,000 companies
- Economic output above the German average for many years¹⁾
Regional GDP risen to more than € 60 billion in recent years
- Purchasing power: about €33 billion in total¹⁾

1) Includes only the figures for the German cities and districts of the Karlsruhe TechnologyRegion.

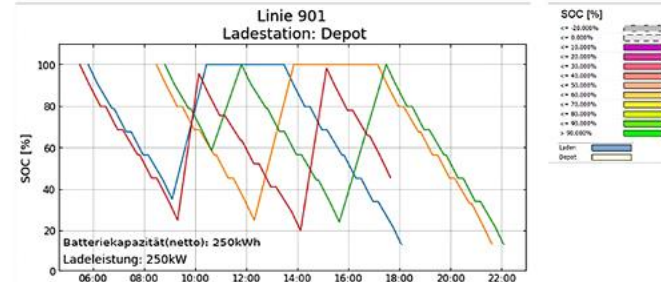
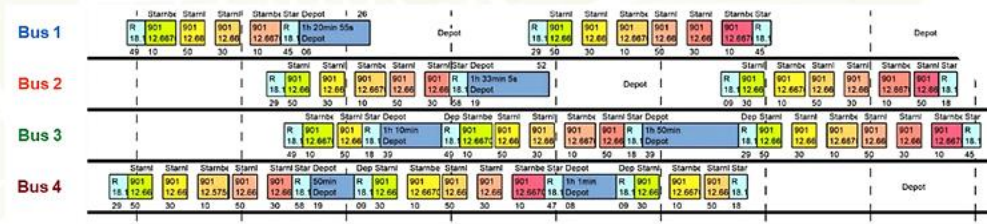


Alternative motorizations

Comparison between alternative motorizations of bus, tramway and train lines

TTK has participated to the transformation of the float motorization of several networks by conducting:

- **comparisons studies between the different motorizations:** advantages and disadvantages, environmental impacts, technical maturity of the solutions, possible development directions and trends
- **development of motorization strategy** for public transport networks: capability and impacts of change of motorization for each line
- **studies on the entire line operation** in order to identify the effects of the new technology. The models made by TTK enabled to determine the concept for recharging buses and ensure the charged of the vehicles, while maintaining the regularity and punctuality of the lines





International transport knowledge sharing

Public transport knowledge sharing between authorities from different countries

TTK with its German-French bicultural identity was initially created to share the knowledge and expertise of one country in the other, and since then at the international scale:

- Specificities and expertise of the German Tram-Train/ Light-Rail in France, rest of Europe, North America, Australia and Africa
- Development of BRT in Germany based on the French model of BHNS and integration of active modes in such a project
- Tramway Operation in Europe and in the Middle-East, using specific modelling tools (OpenTrack, RailSys, VISSIM)
- Expertise on infrastructure and operational costs of tramway lines
- Development of public transport concepts and public transport master plans for cities





Comparison of innovative transport systems

Feasibility studies focused on the implementation of innovative transport systems

From individual mobility solutions in rural areas, like small automatic shuttles all the way to high-capacity transport systems such as maglev train, innovative concepts for mobility systems and transport modes are emerging daily.

How competitive are those innovative mobility systems in comparison with the “conventional” ones? This question is the subject of a number of studies led by TTK in which we assist cities and regions with analyzing the technical, operational, economical, environmental feasibility of innovative mobility systems. Moreover, in order to keep our knowledge continuously up-to-date, we also conduct research projects in the field of innovative mobility concepts.



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