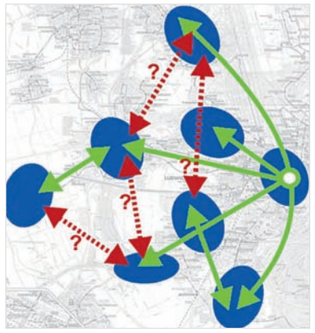
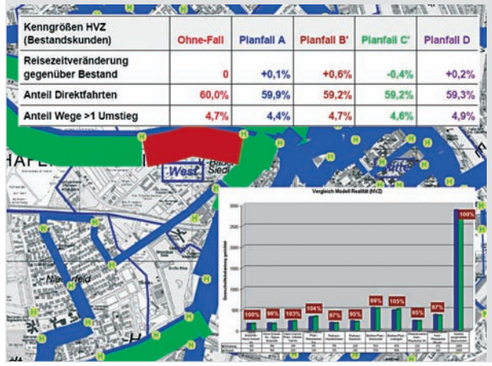


● Analysis of direct links between quarters

Kenngrößen HVZ (Bestandskunden)	Ohne-Fall	Planfall A	Planfall B'	Planfall C'	Planfall D
Reisezeitveränderung gegenüber Bestand	0	+0,1%	+0,6%	-0,4%	+0,2%
Anteil Direktfahrten	60,0%	59,9%	59,2%	59,2%	59,3%
Anteil Wege >1 Umstieg	4,7%	4,4%	4,7%	4,6%	4,9%



● Demand modelling with VISUM

NETWORK OPTIMISATION, LUDWIGSHAFEN

Redevelopment of Public Transport Supply in the Ludwigshafen network – Light Rail and Bus

Ludwigshafen is a city in Germany with approximately 170.000 inhabitants. The major driver of the city's economy is the headquarter of the chemical company BASF. Ludwigshafen forms a joint agglomeration with Mannheim, a major city of more than 300.000 inhabitants. Ludwigshafen and Mannheim are operating an integrated light rail network.

Following a brief of the Ludwigshafen PT-operator's (Verkehrsbetriebe Ludwigshafen GmbH - VBL) board, a network optimisation of PT services has been carried out. The goal of this optimisation was to align the network and operating structures more closely to the existing and future urban development and demand distribution of Ludwigshafen.

Identifying potentials for efficiency gains both for infrastructure and operating cost was part of this brief.

Demand modelling was carried out using the VISUM software tool, for which existing data had to be calibrated and extrapolated to the assessment year 2015. Included was demand data for private transport which was distributed to the respective public transport supply in order to be able to identify so far unused demand potentials.

BUS SUPPLY COULD BE SIGNIFICANTLY EXTENDED

The different scenarios for the light rail network showed a preferred solution. Currently a north-south light rail route including a longer tunnel section is by-passing the inner city. This line will be closed. The few passengers of this line are able to use parallel light rail and bus services. By closing the light rail tunnel, investment into a major infrastructure refurbishment programme can be omitted.

Bus supply on the other hand could be significantly extended. A smaller number of longer bus lines lead to better network transparency. Travel times and the number of transfers can be reduced. New tangential routes (partly on PT only busways) provide advantages for public transport users.

Bus timetables will be harmonised and in the future only 10' and 20' frequencies consistent to the 10' frequencies of the tramlines will be provided where previously 15', 20' and 30' were used. This is not only an increase in supply but also means fixed interval, easy to memorise timetables.

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Seven light rail vehicles (which would have needed replacement in the near future) were replaced with 8 buses on other lines, resulting not only in cost reductions but also in higher demand.

FLAG

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WHO OVERTAKES WHOM?

TTK PROJECTS SPEED UP PUBLIC TRANSPORT

After the successful celebration of "10 years TTK" last year, the company has moved a step forward with new incentive. Transport planning software such as VISUM, the timetable planning system FBS or the railway simulation tool OpenTrack are increasingly used to tackle challenging tasks in transport and operation planning. At the same time all software for the design of infrastructure such as Card/1 and AUTOCAD is always kept up to date.

The tramtrain projects in Heilbronn, Mulhouse and St. Etienne as well as the optimisation of public transport in Ludwigshafen benefited from the practical experience characteristic for TTK. It was gained by the staff's continuous cooperation with operators but also in similar projects not only in Germany and France but also in Great Britain.

For the first time with this edition of "TTK inform" we have prepared different topics fitted to the markets and developments in Germany and France. We would be happy to send you the German or French version, too.

Enjoy your reading!

TRAMTRAIN PROJECTS IN HEILBRONN AND MULHOUSE – TTK-EXPERIENCE IN DEMAND

During the last 10 years more than 10 tramtrain projects have been successfully implemented with the help of TTK, therefore, we were pleased to have been asked to contribute our vast range of experience to the two projects described hereafter.

HEILBRONN

Ever since the start in 1992 of the light rail services between Karlsruhe and Bretten, which turned out to be a huge success, plans have existed to extend this line all the way to Heilbronn. At the same time the idea existed in Heilbronn, as phase number 1, to have their "light rail system" connect Eppingen with the city centre and through to Ohringen. Service on the section between Eppingen and Heilbronn's main railway station started in October 1999. In the mean time, plans were made to lead the light rail service into the heart of Heilbronn.

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After the successful start of operations on the first tramtrain line in Heilbronn in 2001 at present plans are pushed for the northern section towards Neckarsulm. A consortium formed by TTK together with another Karlsruhe planning office and the Albtal-Verkehrs-Gesellschaft (AVG) has been commissioned with all planning tasks from the operational concept via infrastructure to the technical design and equipment.

The new inner city section has a length of 3.5 km and leaves the existing east-west line at the stop "Harmonie" northwards in the direction of Neckarsulm. Based upon the Karlsruhe Model (i.e. the tramtrain system) on this section of the line inter-running on the existing DB-line is foreseen. The cost for the two-track line up to the district boundaries, the 6 stops, the restructuring of the road and its immediate surroundings as well for all other construction work is estimated to amount to approx. 55 Mio. EUR.

MULHOUSE

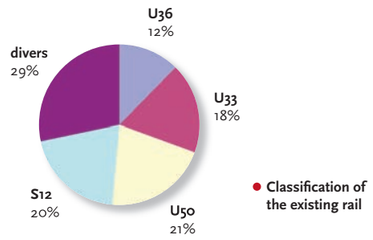
The development of an urban tramway and of a tram-train in the Thur Valley is a major aim for the Mulhouse area. For this specific tramtrain project it was less the TTK experience concerning conceptual planning, design, and construction that was demanded, but rather TTK's expertise for an evaluation of the existing line and the definition of the necessary maintenance with a view to the implementation of a tramtrain system.

The existing infrastructures' state of preservation was assessed to reach conclusions about the necessary investment and maintenance efforts. This survey included ballasted track sections, street running sections, overhead line equipment, stations and stops, drainage, switches and crossings.

The proposed measures were categorised according to their urgency. For the economic assessment, complete financial budgets over a 20 year period were compared with the line fees necessary for the use of the existing track.

● Inspection of the existing infrastructure

● Existing line in Heilbronn with east-west orientation with the envisaged turnout at the stop „Harmonie"



● Classification of the existing rail

These projects in Heilbronn and Mulhouse are of particular importance for TTK as we are promoting the Karlsruhe Model (internationally known as the tramtrain system) at home and abroad. Therefore we are very interested in its further development and improvement. The experience gathered by the Karlsruhe operator AVG is also at our disposal.

LATEST NEWS

INTEREST IN TRAMTRAIN GROWING IN THE UK
After some years of reluctance, the interest in the idea of tramtrain operation appears to be growing again. As subsidiary to the largest tramtrain operator, AVG, TTK is a logical knowledge base for many of those interested in tramtrain technology. TTK hosted several British groups, including parties from Network Rail, public transport authorities and operators. Network Rail intends to carry out a tramtrain trial to assess the applicability of tramtrain technology in the British railway environment. Lessons learned in the Karlsruhe system will be included in this trial, as Network Rail asked TTK to act as an expert advisor.

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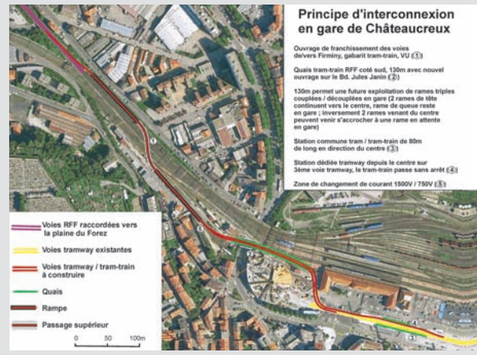
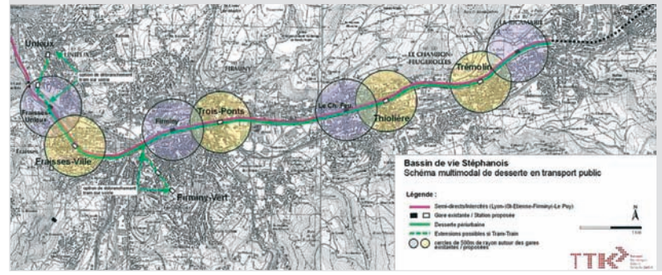
NOTTINGHAM EXPRESS TRANSIT – PHASE 2
As partner of MottMacDonald, TTK was able to win a major project in the United Kingdom, the job of Design Services Consultant (DSC) for the second phase of the Nottingham tramway, NET phase Two. Within the DSC team, TTK will be responsible for operational analysis including timetable modelling and operational simulation and will provide support for the areas of tram vehicle design and depot design. This project is a major step forward for TTK in the UK market, where TTK is more and more recognized as a specialist consultancy for tram, light rail and tramtrain systems.



● Principle of interconnection in St Etienne main station



● Location of new stops in the valley of Ondaine

SAINT ETIENNE 2025

PT-concept (tramtrain) for the Saint Etienne greater area

To develop a coherent regional transport offer, the Rhones-Alpes Region, Saint Etienne Métropole, the department of La Loire and other local economic players have assigned TTK to carry out a five-phase study for defining a multi-modal scheme of transport for the Saint Etienne area to help the local authorities in the political decision-making for mid (2015) and long-term (2025) PT planning.

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The initial study and analysis of the current situation of PT, road, motorway and cycle paths, socio-demography, main projects and key players' orientations plus the trip projections for 2025 had the following results: Without public intervention, the number of PT trips would decrease from 11.5% in 2006 to 9.5% in 2025 in the greater St-Etienne area and from 25% to 20 % in the city of St-Etienne. Coordination between the different PT offers, especially the suburban bus network and the train network is missing. A double tramtrain potential has been identified: a) serving the densely populated areas in the outskirts of Saint Etienne and b) structuring the urbanisation of other zones with significant demographic growth.

Based on these results, four long-term regional transport scenarios were presented to the local authorities such as heavy rail infrastructure development, improvement of Saint Etienne's urban public transport network, two concerning Saint Etienne's north-south axis by extending the current tram network or creating new BRT (Bus Rapid Transit) lines. For the east-west axis a BRT project was approved.

The scenarios will then be modelled and evaluated to see what is most advantageous: a connection of tram and heavy rail infrastructures for a tramtrain insertion in Saint Etienne, improving the centre's accessibility or else a development of interconnections in smaller towns outside Saint Etienne with an increase in the number of stations planned along the tram-train lines? After this phase a long-term scheme will be chosen and measures for a midterm scheme (2015) proposed.

A DOUBLE TRAMTRAIN POTENTIAL IS IDENTIFIED