



GENERAL PLANNER FOR SCHÖNBUCHBAHN

The Schönbuchbahn is a standard gauge rail line south west of Stuttgart. For a number of towns and municipalities it is the rail link to the regional centre Böblingen and serves also as an example for the successful takeover of a DB secondary line by a local authority.

Since day one of operations in 1996 expectations have been exceeded by far. Passenger numbers were higher than forecast and have been growing ever since to bring the mostly one-track line of the Schönbuchbahn with its 17 km length to its capacity limits.

Therefore today's 30-min headways during peak times shall be doubled to a 15-min headway between Böblingen and Holzgerlingen.

This increased density of service requires infrastructure measures for which a grant with the government of Baden-Württemberg has been applied for in the summer of 2012. At present all plans and documentation for building lease and Transport and Works Act are being prepared. Splitting the application for the lease into several sections will allow realization of specific measures bit by bit and in due course. The ambitious time plan foresees the start of construction as early as 2016.

Construction work comprises two new double-track crossing sections, the prolongation of existing platforms as well as the construction of several new platforms along the foreseen double-track sections. Moreover, control and safety technologies are modernized and the entire line will be electrified. As there is a large number of level crossings the possibility of closing at least some and implementing level-free crossings at other points is discussed.

For the new electric rolling stock a depot with direct link to the station in Böblingen is foreseen. As this impacts also the urban surroundings the city authorities have been integrated into the planning process early on. Facades and roofing are developed together with the city's depart-

ment for urban planning in order to merge technical functionality with urban development on a site of former urban waste land.

During the planning process a number of individual measures were defined which are already now being realized. At the end of the existing dead-end line the station is extended by one platform. This measure as well as the improvements of control and safety technologies, but also the use of second-hand vehicles of similar design will increase Schönbuchbahn's attractiveness even further.

A task force of consulting engineers for Schönbuchbahn lead by TTK has been founded specifically for the project and appointed general planner by the local authority. The task force is made up of TTK, the architectural practice Basicc from Karlsruhe as well Signon (formerly Elbas) from Dresden. Other consulting engineers add their expertise in cases so as to provide for the idea of general planning – meaning the entire planning process in one hand.

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CONTACT
Anne Norkauer
anne.norkauer@ttk.de
Helmut Woßner
helmut.woessner@ttk.de

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Contact
TransportTechnologie-Consult Karlsruhe GmbH (TTK)
Gerwigstraße 53 / 76131 Karlsruhe, Germany
TEL +49-721-62503-0 / FAX +49-721-62503-33
info@ttk.de / www.ttk.de

Editorial Staff
Christiane Wiezorka
christiane.wiezorka@ttk.de

Layout
www.magmabranddesign.de

LIGHT RAIL IS THE FUTURE

TTK PROJECTS WORLD-WIDE FROM KARLSRUHE VIA SCANDINAVIA TO CANADA

Rail public transport projects are all the hype. In Germany for example federal funding is limited to the end of 2019 which leads to an increase in applications. Municipalities wish to realise their projects before it's too late. Even though it stands to reason that funding for rail public transport needs to be kept up.

This might explain, though, why TTK has rather a lot to do. Moreover, as an internationally oriented engineering consultant TTK works on the German, French, Dutch, British and now also Scandinavian markets with stints overseas like in Canada.

Tasks range from preliminary studies and the vast area of feasibility studies to detailed operational concepts and cost estimations. TTK also is an expert for planning in all phases specified by German HOAI, the fee structure for architects and engineers (compare back page).

Two more current projects make use of our expertise in the application of OpenTrack. Both for existing networks (example Karlsruhe) and for intended network extensions (Edmonton) TTK's experience in the simulation of operations in urban light rail networks leads to robust results and recommendations. A workshop highlighting the possibilities in this area was recently hosted by TTK in Karlsruhe.

It has become a tradition to compile slightly differing topics fitted to the individual markets and developments in our clients' countries. Feel free to also ask us for the German and/or French version of this newsletter.

Enjoy your reading!

TTK IN SCANDINAVIA

Depot Simulation Bergen (NO)



Bergen (270,000 inhabitants, second largest city in Norway) will extend her light rail network. Hence a new maintenance workshop and depot becomes necessary. An operational simulation was to show whether the existing lay-out plan provides sufficient capacity. To do so both line network and vehicles were modeled with PTV's VISSIM software tool. The model simulated the evening ramp down as well as the ramp up process in the morning as well as stabling and also maintenance works in low peak times. It also calculated which number of vehicles could be washed and sanded and in what intervals. The workshops capacity for all kinds of maintenance, inspection and repairs according to VDV was tested. Of high interest was also whether operations could be kept up in case of some switches' failure. Altogether the depot planning passed muster. Nevertheless, the simulation resulted in suggestions for further optimisation.



Tram Lund (S)



Since 2012 TTK has been working in Lund together with Trivector Traffic AB. Main focus is vehicle technology. The 5.9 km tramway in Lund is the first of three projects in the South Sweden region alongside Malmö and Helsingborg. Start of operations is planned for 2018.

In a first step TTK laid down a rough vehicle concept discussing basic questions such as maximum speed, 70 or 100 % low floor or catenary-free operations. Since 2013 we have been working on the technical vehicle specification based upon German BoStrab and VDV-norms. This also led to in-depth advice on questions of tram infrastructure in Lund. Another new TTK topic in this respect is EMC (electro-magnetic compatibility). As the line in Lund will lead right through university grounds this topic is highly relevant; TTK can contribute experiences in particular gained in Utrecht in the Netherlands.



Turku / Tampere (FIN)



Together with our Scandinavian partners WSP and Ramböll TTK developed an LRT MasterPlan for Turku and Tampere. Both these cities are planning to (re-)introduce an LRT system. They decided to jointly commission their feasibility studies to make use of synergies both in the planning and later on in the operations phase, e.g. in a joint procurement of vehicles, ITCS and rails. In the study TTK is responsible for the specific questions regarding the difference of light and heavy rail. Beyond the technical assistance and expertise during the planning phase, TTK developed an ITCS system, set up a dynamic operational simulation with OpenTrack and worked out a cost model for both cities. In particular these two models serve to supply reliable and transparent information about travel times, vehicle and infrastructure requirements as well as the investment and yearly operational cost already at an early stage. In the end most political decision processes are largely dependent on this kind of information.

Light rail to the airport in Copenhagen (DK)



Since 2013 TTK has been working together with Ramböll on a feasibility study concerning the „Extension of LRT Ring Line 3 to the airport in Kastrup“. The main project Ring 3 is mainly the western tangential LRT ring line in Copenhagen, for which detailed planning will be tendered at the end of 2013. The extension to the airport measures another 25 km from the station in Glostrup. TTK provides technical assistance to Ramböll for questions e.g. of vehicle technology, operations, infrastructure planning and cost estimations.

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CONTACT
Nils Jänig
nils.jaenig@ttk.de
Fosca Romani
fosca.romani@ttk.de

LATEST NEWS

+++ OpenTrack Workshop Karlsruhe - October 17, 2013 + About 20 participants discuss the application range of OpenTrack + Examples + Combination of OpenTrack and VISSIM + Results facilitate decision process +++

On September 17, 2013 about 20 participants discussed the simulation of tram and light rail operations with OpenTrack. The OpenTrack software was initially created for use in the heavy rail sector and – in close co-operation to the owner – has been further developed over the years by TTK to be applied for the simulation of urban rail networks.

So far larger networks were simulated mainly in England and France. Increasingly German authorities ask to have the critical points in their networks analysed. The simulation of various strategies shows their impact on operational quality, the avoidance of disruptions and the reduction of impacts is the main target.

The workshop also highlighted the difference but also potential interplay between OpenTrack und VISSIM based on an example from Karlsruhe. Here deviations caused by construction work



for the light rail tunnel on the main inner city section in the simulation showed capacity constraints at major nodes. Hence additional measures were taken and the result shows that operations carry on disruption-free; thus OpenTrack in the run-up to works avoided negative publicity and operational setbacks for authorities and operator.

EDMONTON II

The city of Edmonton, capital of the Canadian province Alberta with 812,000 inhabitants, is planning to extend their so far only urban light rail line (length: 20.5 km) by further lines. Thus a network of altogether 69 km will be created.



The future northern line of about 13 km length connects a number of educational institutions such as the Northern Alberta Institute of Technology (NAIT) in the north to the University Hospital in the south. In the central and southern section the existing partly underground line will be used, too.

On the new section and also in the central part of the existing line a new signalling system will be introduced. Stationary signals will be replaced by cab signalling allowing a more dense service pattern. However, on the existing line this new system will not yet be available until the start-up of operations on the new line. Therefore it had to be tested whether the existing signalling system can handle sufficiently dense train intervals.

TTK set up a dynamic model using the OpenTrack software tool. It mirrors both infrastructure including the signalling system as well as the vehicles with their dynamic characteristics and the timetables. Each trip is represented individually. In the model the trips differ – like in real life systems – in their run characteristics and stop dwell times. A large set of reliable statistical data on real-life trips were fed into the model. These also comprise the interaction between new and existing line at their mutual node in the inner city. That way OpenTrack can test even before implementation which measures are useful to significantly increase the system's capacity. It can also show how the system will be affected by perturbations. Thus an undisturbed start-up of operations of the new line right on schedule should be vouchsafed.

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CONTACT
Johannes Meister
johannes.meister@ttk.de