Trassenbörse II

Development of an internet based route schedule management server for stock exchange oriented distribution and sales of rail transport slots; final report (Project no. 19M4031A)

Entwicklung eines Fahrplantrassenmanagement-Servers für einen börsenorientierten und internetbasierten Vertrieb von Fahrplantrassen des Schienenverkehrs; Teilvorhaben: Technische Universität Berlin (Project no. 19M4031A)

Funding: National (Germany)
Duration: Jan 2006 - Dec 2007
Status: Complete with results

Objectives:

During this project, an alternative system of contracting routes of the railway network is supposed to be developed. It is aimed at basing it on the auctioning of rail network capacities to replace the ordinary first-come-first-serve regime of allocating slots for the German rail network.

Methodology:

The steps to developing the contracting system of the rail network were the following:

- Development of the auctioning design and software for the conduct of auctions
- Process of mathematical optimization of the route allocation at certain levels of demand and infrastructure
- Appropriate mapping of infrastructure and the way of driving of trains to enable mathematical approaches
- Development of an iterative approach for evaluating the optimization results under support of the operational planning software RailSys for adjusting the mapping of the infrastructure

Parent Programmes:
MOBEV - A Better Understanding of Mobility

Institute type: Research agency
Institute name: Akademie Rheinland GmbH, PT MVBW - on behalf of Federal Ministry of Education and Research (BMBF)
Funding type: Public (national/regional/local)
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Partners:
Workgroup for Infrastructure Policy (WIP) at Berlin Institute of Technology (TU Berlin)
Zuse Institute Berlin (ZIB)
Workgroup Track and Railway Operations at Berlin Institute of Technology (TU Berlin)
IMP Ilgmann Miethner Partner Management Consultants
Institute of Transport, Railway Construction and Operation (IVE) formerly University of Hannover, now Technische Universität Braunschweig
Key Results:

In the previous year long phase 1, the feasibility of the project route management system was examined. In this phase, the overall concept was developed and first components were created. It was focused on a part of the German railway network, which includes the area around Hanover, Braunschweig, Hildesheim, Göttingen, Kassel and Fulda. At the end of phase I, a sketch of the auctioning design was available as well as an optimization tool based on a modelling language with low performance.

For achieving the project objectives (developing an auction-based efficient route management/contracting system), a mathematical optimization of schedule computation is necessary. The algorithms needed are so far not available, so that a complete redevelopment could not be avoided. It is characteristic for research projects, that the right approach is unknown. Accordingly, the partner ZIB, which was responsible for the optimization software TS-OPT, developed model after model to time after time live up to the requirements of the route optimization.

The Federal Network Agency has shown interest in using our tool to review isolated cases of contracting practices from the Deutsche Bahn. Generally, the schedule optimization software, especially TS-OPT, serves for increasing the productivity of infrastructure operators.

Findings of the study are published in detail by a final report (German only) which is available online via https://www.tib.eu/suchen/id/TIBKAT%3A578641313/Trassenb%C3%B6rse-Phase-II-Forschungsprojekt-Abschlussbericht/?tx_tibsearch_search%5Bsearchspace%5D=tn

STRIA Roadmaps: Network and traffic management systems, Infrastructure
Transport mode: Rail transport
Transport sectors: Passenger transport, Freight transport
Transport policies: Societal/Economic issues
Geo-spatial type: Other