

VORTRAG

Dynamic long-haul truck scheduling – a case study

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Abstract:

We report on a project in cooperation with a big German Logistics Service Provider (LSP) who controls a fleet of about 1200 trucks. They transport full loads across whole Europe in a network-free transport-on-demand system. The average length of a transport is 1300 km and the average duration 2 - 3 days.

The problem can be modeled as a dynamic single-load Pickup&Delivery problem with time windows and with complicating constraints: First, The appropriateness of the trucks for the various transport orders is restricted. Second, the EC regulations on driving hours and rest periods and on working hours must be strictly observed. There are two conflicting objectives: minimizing the total distance travelled empty and minimizing the total lateness regarding the soft time windows. We solve the problem using a periodic planning every 10 minutes and a multiple-neighborhood Tabu Search. The conflict between the objectives is resolved by weighting parameters, the variation of which permits to determine a trade-off curve.

Comprehensive computational tests using real-life data of the LSP for a 5-weeks period have shown remarkable improvements compared to the manual benchmark solution.