

HEURISTIC FOR THE TRUCK AND TRAILER ROUTING PROBLEM ¹

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In this talk we present a multi-start greedy heuristic for the Heterogeneous Fleet Truck and Trailer Routing Problem (HFTTRP) arising in a real-life practice of delivering goods from a warehouse to stores. One of the first papers devoted to the HFTTRP problem with Time Windows (HFTTRPTW) is the paper of Semet & Taillard (1993). Later Hoff & Lokketangen (2007) developed a tabu search algorithm for the HFTTRP problem with multiple depots arising in milk collection. Caramia & Guerriero (2010) suggested a multi-start 3-stage heuristic for a similar problem with one depot. Drexel (2011) developed an integer programming model and a branch-and-price algorithm for the HFTTRPTW problem.

In our talk we consider the HFTTRPTW problem with restrictions of stores on the vehicles which can perform delivery, with soft and hard time windows, and with splitting a delivery of one store to two or more vehicles. To our knowledge the problem has never been considered in the literature in such a general formulation.

Our heuristic is based on a greedy insertion of stores to a route similar to the greedy algorithms suggested by Solomon (1987). Additionally we apply an improvement procedure which moves all the deliveries in the current route to earlier time in order to avoid delays. The algorithm of building a complete solution is iteratively repeated many times, and every new route is started from one of the farthest stores chosen randomly. The computational experiments on real-life data including up to 400 orders and 100 vehicles demonstrate the efficiency of the suggested heuristic.

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