
Multi-Depot Inventory Routing Problem in the last-mile delivery: a case of study

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Abstract

In this work a Multi-Depot Inventory Routing Problem (MDIRP) for last mile deliveries is presented. The MDIRP aims at optimizing the inventory at the customers by avoiding stock-out, while minimizing the last mile deliveries to the customers in a big city context. The MDIRP is Np-hard because it subsumes the classical Vehicle Routing Problems. The context of analysis is an urban space of high dimension (a big city) that is characterized by a huge complexity. The presence of several depots allows to face the problem in the big city context by splitting the urban space into districts and by solving a single depot Inventory Routing Problem for each district. A two-phase matheuristic algorithm is used for solving the problem. In the first phase a cluster of customers is built around each depot. In the second phase a route generation procedure is designed to build a limited number of feasible routes for each cluster. Computational results are presented on real case instances.

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