Abstract

“Split Delivery Vehicle Routing Problem, unlimited and limited fleet, column generation, branch-and-price-and-cut method.”

In this work we develop a branch-and-price-and-cut method for the solution of the Split Delivery Vehicle Routing Problem (SDVRP). The SDVRP is the problem to serve customers with a fleet of capacitated vehicles at minimum traveling cost. With respect to the classical Vehicle Routing Problem, where each customer is visited exactly once, in the SDVRP a customer may be visited any number of times. The exact method we propose is based on a decomposition of the problem where the possible routes, with the delivery quantities, are generated in the sub problem. We consider both the case where the fleet of vehicles is unlimited and the case where the fleet is limited to the minimum possible number of vehicles. We solve to optimality instances with larger size with respect to previous approaches and improve dual and/or primal bounds on most of the benchmark instances we tested.

Author:
C. Archetti, N. Bianchessi, M. G. Speranza Dipartimento Metodi Quantitativi, University of Brescia C. da S. Chiara, 50, I-25122
Brescia, Italy