The Mixed Capacitated General Routing Problem with Time-Dependent Demands

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The Mixed Capacitated General Routing Problem (MCGRP) is defined over a mixed graph, for which some nodes, arcs and edges must be serviced. The problem consists of determining minimum cost routes that satisfy the demand. Some problems like snow plowing or salt spreading have a time dependent demand which was ignored in the previous studies. This variation of demand is due to weather or traffic conditions. This study presents two models without graph transformation and another with graph transformation to node routing. We used CPLEX to solve small instances and we developed a "Slack Induction by String Removals" metaheuristic for large instances. The proposed models and metaheuristic were tested on problems derived from a set of classical instances of the MCGRP and CARP with some modifications.