Developing Multi-objective Model for Multi-commodity Capacitated Arc Routing with Uncertainty in Demands

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Abstract

The capacitated arc routing problem (CARP) is one of the most important routing problems with many applications in real world situations. In some real applications, decision makers have to consider more than one objective and investigate the problem under uncertain situations. In this paper, we introduce a new fuzzy chance constrained programming model based on credibility measure for CARP with two objectives: minimizing the number of vehicle and minimizing the total travel cost. In this model each required edge has demand for more than one type of commodity and also all demands for each commodity are supposed to be fuzzy numbers. The designed model is a generic and applicable in refuse collection, snow removal, etc.

Keywords: ***Multi-commodity capacitated arc routing, Fuzzy chance constrained programming, Uncertainty***