

Reverse Logistics under Uncertainty

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Abstract: This talk addresses a stochastic extension of the vehicle routing problem with simultaneous delivery and pickup. It is assumed that pickup orders are not known a priori. Due to possible route failures, i.e. the vehicle reaches a customer with insufficient remaining vehicle capacity, compensation strategies need to be considered. The arising stochastic model is formulated as a two-stage stochastic integer program with recourse. As solution framework the integer L-shaped method is chosen. Lower bounding functionals are constructed based on partial routes. The concept of partial routes originally introduced by Horring and Holt is compared to general partial routes proposed by Jabali, Rei, Gendreau, and Laporte. Risk neutral routing decisions are examined and faced to risk averse strategies.

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