

A two-phase heuristic for the three-dimensional loading vehicle routing problem with split pickup and time windows under real-time disruptions

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Abstract:

This work studies a three-dimensional loading vehicle routing problem with split pickup and time windows. Throughout the day, real-time changes, called disruptions, occur, such as the arrival of a new customer, the addition of boxes to a planned customer request and the cancelation of a customer. The logistics service provider (LSP) has to react by adapting the loading, route and customer scheduling. By focusing on pickup operations, even if the products are customer-specific, the recourse actions differ from those in delivery operations. This is because the vehicle is initially empty and progressively filled up.

We present a two-phase heuristic that will help the LSP to adapt his ongoing routes while minimizing the total travel distance and visiting the highest number of customers.