
The impact of depot location, fleet composition and routing on emissions in city logistics

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Abstract

This paper investigates the combined impact of depot location, fleet composition and routing decisions in city logistics with a particular focus on vehicle emissions. We consider a city in which goods need to be delivered from several depots to customers located in nested zones characterized by different speed limits. The objective is to decide on the locations of the depots, types of vehicles to be used in deliveries and routing of the vehicles to minimize the total depot, vehicle and routing cost, where the latter can be defined with respect to the cost of fuel consumption and CO₂ emissions. This talk will describe a new adaptive large neighborhood search algorithm successfully applied to a large pool of new benchmark instances. We present extensive analyses to empirically assess the effect of various problem parameters, such as depot cost and location, customer distribution and heterogeneous vehicles on key performance indicators, including fuel consumption, emissions and operational costs, and discuss findings to provide managerial insights.

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