

Truck Scheduling Problem in a Cross-Dock Centre with Fixed Due Dates

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Abstract : In this paper, a truck scheduling problem is investigated at a two-touch cross-docking center with due dates for outbound trucks as a hard constraint. The objective is to minimize the total cost comprising penalty and delivery cost of delayed shipments. The sequence of unloading shipments is considered and is assumed that shipments are sent to shipping dock doors immediately after unloading and a First-In-First-Out (FIFO) policy is considered for loading the shipments. A mixed integer programming model is developed for the proposed model. Two meta-heuristic algorithms including genetic algorithm (GA) and variable neighborhood search (VNS) are developed to solve the problem in medium and large sized scales. The numerical results show that increase in due dates for outbound trucks has a crucial impact on the reduction of penalty costs of delayed shipments. In addition, by increase the due dates, the improvement in the objective function arises on average in comparison with the situation that the cross-dock is multi-touch and shipments are sent to shipping dock doors only after unloading the whole inbound truck.

Keywords : cross-docking, truck scheduling, fixed due date, door assignment

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