Optimal Truck Dispatching For Construction Waste Conveyance

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***Abstract*—Waste from the construction industry has to be conveyed to and disposed at specific waste-treatment plants. Decision makers, who work in environmental protection companies, usually schedule and dispatch the trucks used for conveying construction waste to plants manually, which is neither efficient nor effective. In practice, there are space and capacity limitations in every construction site and waste-treatment plant, meaning that the amount of the construction waste for transporting and disposing at a specific time and position is restricted. Moreover, when the number of trucks is insufficient, the responsible environmental protection companies could also hire vehicles from car rental companies. Given these considerations, coupled with the related operational constraints and objective of construction waste conveyance in practice, in this study we employ a time-space network flow technique to develop an optimal scheduling model that can assist decision makers in dispatching both their own and rented trucks for conveying construction waste efficiently. The model is formulated as an integer network flow problem with side constraints. Finally, a case study using the real data from an environmental protection company in Taiwan is performed and the results indicate that the model could be useful for dispatching trucks efficiently and thus decreasing the conveyance cost.**

***Index Terms*: construction waste; conveyance cost; truck dispatching; network flow; integer programming.**

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