A Conceptual Framework for Freight Transport Modeling With Logistic Choices

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Abstract

Freight movements have significant impacts on transportation system and economic growth of any region. Because of the complexity of decision-making of freight transportation, freight transport models can be used as effective tools to predict freight transportation demand and to better address the impacts of these movements. Many available freight transport models are short in term of logistic elements such as, predicting the exact trip chain, considering intermediate handling facilities, determining shipment size, etc. This paper outlines a conceptual framework for freight transportation modeling by incorporating the logistic choices into a former freight transport model called FAME (Freight Activity Micro-simulation Estimator). FAME is a micro-simulation model for freight transportation in the U.S. that has been developed by the transportation research team at UIC in 2010. This model simulates commodity movements in the U.S. at a very disaggregate level of firm-to-firm, but it also lacks some of the logistic choices such as considering consolidation centers, distribution centers, warehouses, etc. This paper deals with the incorporating missing logistic elements in FAME framework and proposing a new conceptual framework. The proposed logistic model framework simulates the national freight movements in the U.S at the disaggregate level of firm-to-firm and replicates the logistic choices such as, selecting supplier, use of intermediate handling facilities, choice of shipment size, mode choice, etc. This paper proposes the conceptual framework of this micro-simulation logistic model.

Keywords: Freight transport modeling- Logistic elements - Framework.

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