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Séminaire du CIRRELT Seminar

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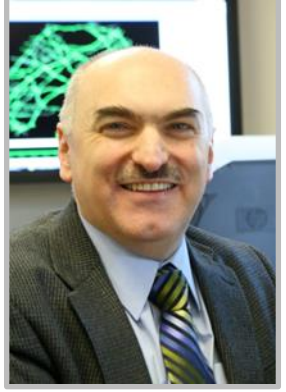

Leveraging Transaction Data to Support Online Pricing and Sourcing of Carrier Capacity in the Truckload Spot Market: Models and Application

Abstract: Moving goods generates large volumes of transaction data—some of it is available in real-time to support order fulfillment and operational decisions, and when properly retained creates large databases of historical transactions. These can form the basis of valuable business intelligence and predictive tools to support strategic and operational decisions. We discuss the use of transaction data as part of a decision support system for online pricing and sourcing capacity in the truckload spot market by third party logistics (3PL) providers. The transportation spot market consists of shipments handled on a one time load-by-load basis, and exists to facilitate urgent or unfulfilled demand. It is characterized by price volatility and uncertainty in the availability of capacity. The online decision support system recommends to brokers prices to quote a shipper in real time, along with a list of potential carriers to contact to source the load. At the core of the system are discrete choice models of shipper and carrier acceptance, and an expected profit maximization model. The discrete choice models predict the acceptance or rejection of an offer for a shipment to shippers and a bid for capacity to carriers. The profit maximization model determines the shipper price that maximizes the 3PL provider's expected profit. In addition to these models are procedures for determining and ranking a list of potential carriers for an incoming shipment. The system is applied to real-world data for a 3PL provider, with excellent results. In addition, we examine in more detail aspects of carrier behavior underlying their acceptance of shipper loads tendered on the spot market, particularly when multiple loads are bundled together. Carriers' responses to a hypothetical field experiment are used to estimate carrier reservation prices for bundled shipments, and analyzed to assess the effect of bundling on the 3PL's ability to secure capacity for those shipments more quickly and at better rates. The results indicate that reservation prices can vary considerably across carriers in the same lane. Accounting for the behavioral dynamics of carriers in operational and revenue management strategies can lead to better decision-making, particularly for shippers and their representatives.

Note: Dr. Hani S. Mahmassani holds the William A. Patterson Distinguished Chair in Transportation at Northwestern University, where he is the Director of the Northwestern University Transportation Center. He has over 30 years of professional, academic and research experience in the areas of intelligent transportation systems, freight and logistics systems, multimodal systems modeling and optimization, traffic science, demand forecasting and travel behavior, and real-time operation of transportation and distribution systems. http://www.transportation.northwestern.edu/mahmassani/

VENDREDI / FRIDAY

11 mars 2016 / March 11th, 2016
14h30

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