Inland Transportation Service Sharing in a Dry Port System

Dr. Xuan QIU  
Department of Industrial Engineering and Logistics Management  
The Hong Kong University of Science and Technology

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Abstract

A dry port system consists of a dry port and a number of shippers, where shippers enjoy the public logistics and auxiliary services provided by the dry port. This paper studies the shared transportation services in this system. The interaction between a dry port and shippers is modelled as a bilevel program. The optimal properties of the model are analysed analytically and an enumeration algorithm is proposed to solve the model. Furthermore, a bilevel model is developed for the direct transportation system. CO2 emissions in transportation are calculated under the two scenarios: with and without sharing transportation. Numerical studies are conducted to investigate the economic and environmental value of sharing. The studies show that sharing transportation service could bring significant benefits to both dry port and shippers in most circumstances. It is found that CO2 emissions are not always mitigated when the distance between shippers is too long, or the dry port locates too close to shippers. When the total distance travelled in the direct transportation system is longer than that in the shared one, the analysis reveals that carrying lighter cargoes could generate more significant CO2 emissions savings.
About the Speaker

Xuan Qiu is a lecturer in the Department of Industrial Engineering and Logistics Management at The Hong Kong University of Science and Technology. Before joining HKUST, she was working as a research fellow at Nanyang Technological University. Her research focuses on modelling and analysis of supply chains, warehousing and distribution systems, ports and related areas. She obtained her Ph.D. in Industrial Engineering from The University of Hong Kong, and B.E. from Sun Yat-sen University.

Enquiry: 3442 2147

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