

The Hong Kong Polytechnic University
Department of Logistics and Maritime Studies
Research Seminar

**Shared Mobility for Last-Mile Delivery:
Design, Operational Prescriptions and Environmental Impact**

by

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Venue: M802, Li Ka Shing Tower
The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

Two socioeconomic transformations, namely, the booms in the sharing economy and retail e-commerce, lead to the prospect where shared mobility of passenger cars prevails throughout urban areas for home delivery services. Logistics service providers as well as local governments are in need of evaluating the potentially substantial impacts of this mode shift, given their economic objectives and environmental concerns. In this work, we address this need by providing new logistics planning models and managerial insights. These models characterize open-loop car routes, car drivers' wage-response behavior, interplay with the ride-share market and optimal sizes of service zones within which passenger vehicles pick up goods and fulfill the last-mile delivery. Based on theoretical analysis and empirical estimates in a realistic setting, our findings suggest that crowdsourcing shared mobility is not as scalable as the conventional truck-only system in terms of the operating cost. However, a transition to this paradigm has the potential for creating economic benefits by reducing the truck fleet size and exploiting additional operational flexibilities (e.g., avoiding high-demand areas and peak hours, adjusting vehicle loading capacities, etc.). These insights are insignificantly affected by the dynamic adjusting of wages and prices of the ride-share market. If entering into this paradigm, greenhouse gas emissions may increase due to prolonged car trip distance; on the other hand, even exclusively minimizing operating costs incurs only slightly more emissions than exclusively minimizing emissions.

Bio:

Z. Max Shen is a Chancellor's Professor at the University of California, Berkeley. He holds joint appointments in the Department of Civil and Environmental Engineering and the Department of Industrial Engineering and Operations Research. He is also an honorary professor at Tsinghua University, and Co-Director of the Environment and New Energy Center at the Tsinghua-Berkeley Institute. He has been active in the following research areas: integrated supply chain design and management, logistics system automation and optimization, and transportation system planning, and has overseeing many projects funded by the National Science Foundation, California Department of Transportation and other entities. He is currently on the editorial/advisory board for several leading journals.

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All are welcome!