

Research Centre
for
Integrated Transport Innovation (rCITI)
Web Seminar

Web Seminar Link: <https://unsw.zoom.us/j/8493874422>
Date/Time: **Thursday, 10 December 2020, 12:30pm - 1:00pm**
Title: **A game theoretical analysis of metro-integrated city logistics systems**



PRESENTER: Mingyou Ma
PhD candidate, rCITI, UNSW

Bio:

Mingyou Ma is a second-year Ph.D. student at the Research Centre for Integrated Transport Innovation (rCITI) in the School of Civil and Environmental Engineering in University of New South Wales. He received his B.Eng. degree with First Class Honours in Civil Engineering from University of New South Wales, Australia in 2019. He was with the Commonwealth Scientific and Industrial Research Organisation (CSIRO, Australia) as an undergraduate vacation scholar in 2018. His research interests include transport dynamics and transport economics.

Abstract:

The spare capacity of public transit systems during non-peak duration might be utilized to transport parcels. Recent studies proposed an integration of the metro system with freight transportation for intra-city delivery services to improve resource utilization efficiency. However, existing studies on the metro-integrated logistics systems (MILS) mainly focus on operational-level issues, e.g., parcel distribution problem and courier path optimization. To the best of our knowledge, little has been done to examine the strategic interactions between metro and logistics operators in the context of MILS. This study conducts a game theoretical analysis of MILS, where a metro company and a logistics company may work either independently or jointly (non-cooperative or cooperative game). In particular, the logistic company decides the number of parcels assigned to MILS, and the metro company controls the price of the MILS service. We examine the decisions of the metro company and the logistics company under different market power regimes, and quantify the system performance. Besides, we conduct analytical sensitivity analysis regarding the relative location of the logistics company's distribution center against the metro station. Numerical studies are conducted to illustrate the analytical observations and provide further insights. Our results show that introducing MILS has the potential to yield a Pareto-improving outcome for the metro company and the logistics company.