

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

**A Revenue-preserving and Pareto-improving Strategy
for Managing Transit Peak-hour Congestion**

by

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Date: 29 September 2017 (Friday)
Time: 10:30am - 11:30am
Venue: M714, Li Ka Shing Tower
The Hong Kong Polytechnic University

(Conducted in English)

Abstract:

A new fare-reward scheme is proposed for managing commuter's departure time choice in a rail transit bottleneck, which aims to incentivize commuters' shift of departure time to the shoulder periods of the peak hour to relieve queueing congestion at the transit stations. A framework of the rail transit bottleneck is provided and the user equilibrium with a uniform-fare and social optimum with service run-dependent fares is determined. A fare-reward scheme (FRS) is then introduced that rewards a commuter one free trip during the shoulder periods after a certain number of paid trips during the peak hour. For a given number of peak-hour commuters and ex-ante uniform fare, the FRS determines the free fare intervals and the reward ratio (the number of paid trips required for one free trip, which is equivalent to the ratio of the number of rewarded commuters to the total number of commuters on each day during the peak hour). The new fare under the FRS is determined so that the transit operator's revenue keeps unchanged before and after introducing the FRS. Our study indicates that, depending on the original fare, FRS implements an optimal reward ratio up to 50% and yields a reduction of system total time cost and average equilibrium trip cost by at least 25% and 20%.

Bio:

Prof. Hai Yang is currently a Chair Professor at The Hong Kong University of Science and Technology. He is internationally known as an active scholar in the field of transportation, with more than 220 papers published in SCI/SSCI indexed journals and a SCI H-index citation rate of 46. Most of his publications appeared in leading international journals, such as Transportation Research, Transportation Science and Operations Research. Prof. Yang received a number of national and international awards, including National Natural Science Award bestowed by the State Council of PR China (2011). He was appointed as Chang Jiang Chair Professor of the Ministry of Education of PR China; Chair Professor of Tsinghua University. Prof. Yang is now the Editor-in-Chief of Transportation Research Part B: Methodological, a top journal in the field of transportation.

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All are welcome!