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Does Dockless Bikesharing Create a Competition for Losers?

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Date: June 18, 2024 (Tuesday)
Time: 11:00 a.m. – 12:00 p.m.
Venue: Room 612B, 6/F Haking Wong Building, The University of Hong Kong

Abstract
We model the oligopoly competition in a dockless bike-sharing (DLB) market as a dynamic game. Each DLB operator is first committed to an action tied to a specific objective, such as maximizing profit. Then, the operators play a lower-level game to reach a subgame perfect Nash equilibrium, by making tactical decisions (e.g., pricing and fleet sizing). We define a Nash equilibrium under either weak or strong preference to characterize the likely outcomes of the dynamic game and formulate the demand-supply equilibrium of a DLB market that accounts for key operational features and mode choice. Using the oligopoly game model calibrated with empirical data, we show that, if an operator seeks to maximize its market share with a budget constraint, all other operators must either respond in kind or be driven out of the market. When all operators compete for market dominance, even a slight efficiency edge gained by one operator can significantly shift the outcome, which signals high volatility. Moreover, even if all operators agree to focus on making money rather than ruinously seeking dominance, profitability still plunges quickly with the number of operators. Taken together, the results explain why an unregulated DLB market is often oversupplied and prone to collapse under competition. We also show this market failure may be prevented by a fleet cap regulation, which sets an upper limit on each operator's fleet size.

About the Speaker
Dr. Yu (Marco) Nie is currently a Professor of Civil and Environmental Engineering at Northwestern University. He received his B.S. in Structural Engineering from Tsinghua University, his M.S. from National University of Singapore and his Ph.D. from the University of California, Davis. Dr. Nie's research covers a variety of topics in the areas of transportation systems analysis, transportation economics, and sustainable transportation. Dr. Nie served as a member of the TRB committees on Transportation Network Modeling and Traffic flow Theory and Characteristics. He is currently an Area Editor for Transportation Science, an Associate Editor for Transportation Research Part B and Service Science. Dr. Nie's research has been supported by National Science Foundation, Transportation Research Board, US Department of Transportation, US Department of Energy, and Illinois Department of Transportation.

- ALL ARE WELCOME -

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