McCormick Northwestern Engineering

The Transportation Center

Transportation Center Seminar

"Flight Delays, Capacity Investment and Welfare under Air Transport Supply-Demand Equilibrium"

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Thurs. April 4, 2013
4:00 – 5:00 pm

Location:
Transportation Center
Chambers Hall – 600 Foster
Ruan Conference Center
Refreshments available at 3:30 pm

Abstract: Flight delay is a serious problem in many parts of the world. One of the major causes of flight delay is inadequate capacity in the air transportation system. The Federal Aviation Administration (FAA) and local airport agencies have established multi-billion investment plans to enhance the capacity of the system, under the Next Generation Air Transportation System (NextGen) and beyond. To justify the investment, appropriate assessment methodologies are of critical importance.

Conventional benefit assessment methods often oversimplify the benefit assessment problem by considering only part of the supply-demand components and causal relationships in the air transportation system, therefore producing a biased picture of the benefit gains from capacity investment. In this study we recognize that capacity change in the system will trigger a complicated set of interactions among different system components, with the final outcome being an equilibrium shift in the system. To this end, we propose an equilibrium framework that explicitly takes into consideration responses from various system components such as passenger demand, air fare, flight traffic, operational performance, and airlines cost. Build upon this framework, both a micro-level competitive equilibrium model and a meso-level system equilibrium model are developed. Under each model we investigate how equilibrium can be formulated and achieved, the direction and magnitude of equilibrium shift in response to capacity change, and the associated welfare gains. Results from both models reveal that by considering the systemic response, the equilibrium approach yields more consistent, plausible, and comprehensive benefit estimates than the conventional methods. The findings shed new insights into future decision making in aviation infrastructure investment.

Bio: Bo Zou is an assistant professor in the Department of Civil and Materials Engineering at the University of Illinois at Chicago. He received his PhD degree in Civil and Environmental Engineering from the University of California at Berkeley in 2012, his dual Master's degrees in Transportation Planning and Management, and General Engineering (Diplôme d'ingénieur), respectively from Tsinghua University in China and the Ecole Centrale de Nantes in France in 2007, and his Bachelor's degree in Civil Engineering from Tsinghua University in 2005. Dr. Zou's research interests are in the areas of transportation systems analysis, transportation economics, with application focus on air transportation systems. He has articles published in Transportation Research Parts A, B, E, ASCE Journal of Infrastructure Systems, Journal of Air Transport Management, and contributed to two book chapters. In the past, Dr. Zou has been involved in multiple research projects sponsored by the Federal Aviation Administration, National Aeronautics and Space Administration, the International Council on Clean Transportation, and the University of California Transportation Center.