Riding in Real-Time: Information Provision and User Behavioral Response in Public Transportation Systems

Candace Brakewood, PhD Student

Start: September 2010
Thesis Advisor: Professor P. Christopher Zegras, Department of Urban Studies and Planning
Committee: Professor Joseph Sussman, ESD Interim Director & Professor Nigel Wilson, Department of Civil and Environmental Engineering

The Challenge

- Urban systems are becoming increasingly digitized, which has important implications for metropolitan mobility systems

- Public transportation providers are leveraging ICTs to improve system operations and provide information to travelers

- Rapid adoption of mobile technologies by travelers - namely smartphones - has enabled distribution of real-time, personalized information on-the-go

Theoretical Background

- Transport planners traditionally model travel choices based on travel time and cost
- The literature suggests that other "softer" factors influence travel choices
- Real-time, personalized information on these "softer" factors is becoming available, creating a transport network with nearly perfect information

Research Question and Objectives

- Research Question: Will new sources of real-time, personalized information influence the behavior of travelers? - Will they attract new riders to transit?
- Hypothesis: Individual travelers have heterogeneous responses to these new information sources
- Objective: Quantify these variations in order to understand their potential impacts on the larger system

Methodology

- Discrete choice modeling has a long tradition in analysis of complex socio-technical systems, particularly regarding consumer decisions. Recent advances have set forth new, flexible models that may increase behavioral realism.

Planned Research

- The planned research approach conducts stated and revealed preference discrete choice experiments to evaluate the impact of new information sources on short term travel decisions (e.g. mode, route, and departure time choice).

Expected Contributions

- Increased understanding of the role of information in complex socio-technical systems
- Methodologies for improved demand modeling in public transportation systems
- Insights specific to regional case studies, such as information provision strategies

Thank You!

- This research is funded in part by the Singapore MIT Alliance for Research and Technology (SMART) and a US Department of Transportation (DoT) Eisenhower Scholarship.
- Thanks to my doctoral committee for their expert guidance.
- I am grateful to my fellow ESD PhD students and Master of Science in Transportation students for their support.
- I would also like to thank Francisca Rojas, Postdoctoral Research Fellow at the Kennedy School of Government, Michael Frumin, Systems Engineering Manager at MTA, and Joshua Robin, Director of Innovation at the MBTA.