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Invited Lecture

Modeling Demand-Responsive Transportation from Taxis to Paratransit

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Railways Amphitheater, Materials Resistance Building, NTUA Campus

ABSTRACT: Demand-responsive transportation systems provide service to users that is responsive to the time and location that they want to travel. A variety of modeling approaches are useful for understanding the demand and supply for these types of services. This talk will explore two related projects. First, Recent efforts to model demand for taxis in New York City with count regression models explored the factors that drive yellow taxi demand and how these patterns vary over space and time. These models provide a method to understand the imbalance between taxi demand and supply in various neighborhoods and at certain times of day by controlling for all other factors. Second, a continuous approximation method is used to model operations of paratransit systems that can carry multiple passengers in shared vehicles. These models have been calibrated to services in New Jersey to provide estimates of operating parameters that are related to cost (e.g., required number of vehicles, vehicle-distance traveled, and vehicle-hours operated). The resulting models are useful for understanding the effects of changes in service area, demand density, and peaks in daily travel volumes. The model is useful for designing optimal demand management policies.



Dr. Eric Gonzales is an Assistant Professor in the Department of Civil and Environmental Engineering at the University of Massachusetts Amherst. Dr. Gonzales has research experience in modeling urban street networks, and my interests are in the operation, management, design, safety, and sustainability of large-scale multimodal transportation and logistics systems. His recent research has focused on modeling traffic and public transportation in urban networks using aggregate network models of traffic and transit operations. Ongoing projects include modeling and analysis of demand-responsive transportation systems and estimating network-wide emissions. His research is published in journals including *Economics of Transportation* and *Transportation Research Parts A and B*. Dr. Gonzales is a member of the Transportation Research Board Committees on Traffic Flow Theory and Characteristics (AHB45) and Paratransit (AP060).

Dr. Gonzales received a Ph.D. in Civil and Environmental Engineering from the University of California, Berkeley, in 2011 and was on the faculty at Rutgers until joining UMass in 2014. Dr. Gonzales has been recognized with the Gordon F. Newell Award for Excellence in Transportation Science from Berkeley's Transportation Engineering group and as an Eno Transportation Foundation Fellow in 2010.