ITS Berkeley
Institute of Transportation Studies

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Improving the Policy Relevance and Accuracy of Bicycle Demand Models

Timothy Brathwaite, UC Berkeley

4:00-5:00 PM, 290 Hearst Memorial Mining Building

Coffee and cookies at 3:30 PM

Across all levels of government in the U.S., transportation and planning agencies have prioritized encouraging bicycle use. However, despite such admirable goals, actually increasing bicycle usage has been a struggle.

To successfully make planning and investment decisions regarding bicycle infrastructure projects, agencies must accurately judge how much each possible project is expected to increase bicycle ridership. To support this activity, my research aims to improve bicycle demand models. In this talk, I will focus on three flaws of current mode choice models: (1) the exclusion of roadway-level variables (e.g. on-street bicycle infrastructure measures, traffic speeds, etc.), (2) the assumption of "perfectly rational" decision makers, and (3) the issue of class imbalance (i.e. the relatively small numbers of cyclists in household travel surveys). In addressing these issues, I merge traditional discrete choice with recent advances in statistics and machine learning, making use of methods such as parametric link functions, Bayesian decision trees, and Gaussian Process models. In all cases, these methods are modified and theoretically extended for use in a transportation context. Together, the developed techniques increase the policy relevance and accuracy of bicycle demand models in particular, and they advance the field of choice modeling in general.

About the Speaker: Timothy Brathwaite is a Ph.D. candidate in transportation engineering in the Civil and Environmental Engineering department at UC Berkeley, working under the supervision of Professor Joan Walker. Previously, he received his Master of City Planning and Master of Science in Civil Engineering from UC Berkeley and his Bachelor of Science in Urban Studies and Planning from the University of New Orleans. Professionally, Timothy has worked on the data science team at Lyft, with transportation consulting firms (Fehr and Peers and Cambridge Systematics), with the bicycle facilities program at the City of Oakland, and with the non-profit "Bike Easy" in New Orleans.

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