The Role of Temporal Instability in Transportation Modeling:
The Example of Highway Accident Data

Tuesday, February 19, 2019 at 2:00PM EST

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About the Talk
Virtually every statistical analysis of transportation data involving human behavior such as elements of travel demand (including mode choice, activity scheduling, vehicle purchase and usage, etc.) and highway safety (including choice of speed, resulting crashes, etc.) is predicated on the assumption that the estimated model parameters are temporally stable. That is, the assumption that the effects of explanatory variables in statistically estimated models do not change over time. In the case of highway accident data, this would mean that human behaviors that influence accident likelihoods and resulting accident-injury severities do not change over time. This talk draws from research previously conducted in fields such as psychology, neuroscience, economics, and cognitive science to build a case for why we would not necessarily expect the effects of explanatory variables to be stable over time. The review of this literature suggests that temporal instability is likely to exist for a number of fundamental behavioral reasons, and this temporal instability is supported by the findings of several recent accident-data analyses. The potential implications of this temporal instability for contemporary accident-data modeling methods (unobserved heterogeneity, data driven, traditional, and causal inference methods) will be discussed in detail. Finally, an assessment of how temporal instability might be addressed and how its likely presence can be accounted for to better interpret accident data-analysis findings, and other transportation-related analyses, will be presented.

About the Speaker
Fred Mannering is currently the Associate Dean for Research in the College of Engineering and a Professor of Civil and Environmental Engineering (with a courtesy appointment in Economics) at the University of South Florida. His research interests are in the application of econometric and statistical methods to a variety of transportation-related issues including highway safety, transportation economics, automobile demand, and travel behavior. He has published extensively in these fields and his work has been highly cited. Dr. Mannering is currently Editor-in-Chief of the Elsevier Science journal Analytic Methods in Accident Research (and founding Editor) and previous Editor-in-Chief (2003-2012) and current Associate Editor for Transportation Research Part B - Methodological, also an Elsevier Science journal. He previously held professorial appointments at the Pennsylvania State University, the University of Washington, and Purdue University. Dr. Mannering has his Bachelor’s in engineering from the University of Saskatchewan, Master’s from Purdue University, and PhD from the Massachusetts Institute of Technology.

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