Grant Deliverables and Reporting Requirements for UTC Grants

UTC Project Information	
Project Title	Active Transportation, Environment, and Health
University	Cornell University
Principal Investigator	Ricardo Daziano
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Funding Source(s) and Amounts Provided (by each agency or organization)	USDOT: $75,586 Cornell: $51,002
Total Project Cost	$126,588
Agency ID or Contract Number	Sponsor Source: Federal Government CFDA #: 20.701 Agreement ID: 69A3551747119
Start and End Dates	Start date: 11/30/2016 End date: 8/15/2019
Brief Description of Research Project	Active transportation –cycling and biking– not only are sustainable travel modes with zero environmental impact, but also have associated health benefits. However, in comparison with motorized transportation, the motives underlying demand for active transportation –especially beyond recreational purposes– is poorly understood, especially because the standard tradeoff between travel time and cost does not apply to active modes (as it is virtually free and usually takes longer). We propose to further investigate the factors that explain demand for active transportation, including non-instrumental attributes, non-standard observed attributes (e.g. calories burned), and extended decision rules. To integrate non-instrumental attributes (attitudes and perceptions) we will use extensions of the hybrid choice models (HCM) and a structural model. In particular, this line of research is to extend our previous work, where we used a hybrid choice model with non-instrumental variables that not only enter utility but also inform assignment to latent classes. Using a discrete choice experiment we analyzed the effects of weather (temperature, rain, and snow), cycling time, slope, cycling facilities (bike lanes), and traffic on cycling decisions by members of Cornell University (in an area with cold and snowy winters and hilly topography). We showed that cyclists can be

	separated into two segments based on a latent factor that summarizes cycling skills and experience. Specifically, cyclists with more skills and experience are less affected by adverse weather conditions. We envision to extend the hybrid choice model to a specification with a semi-parametric representation of how preferences for cycling vary in the population. Semi-parametric models are attractive because they don't impose any specific shape to preferences, instead preference distributions are revealed by actual behavioral responses.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	An estimator was implemented in the open-source gmnl package in R for a choice model with a discrete-continuous heterogeneity distribution. A set of highly realistic immersive cycling scenarios was implemented. These scenarios can be used for in-lab experiments to determine the effect of characteristics of the built environment to either encourage or deter demand for cycling. A screenshot of the implemented virtual scenarios is shown below:

	
Impacts/Benefits of Implementation (actual, not anticipated)	• Discrete-continuous random parameter logit choice model implemented in R. • An application of the discrete-continous random parameter logit choice model was used in an empirical study to analyze residents' willingness to financially support resilience to extreme events. This case study was published as: Wang, C., J. Sun, R. Russell and RA Daziano. 2018. Analyzing willingness to improve the resilience of New york City's transportation system. Transport Policy 69, 10-19. • The immersive in-lab experiments are being implemented as part of a follow-up study by the same researchers involved in this project .
Web Links • Reports • Project website	http://ctech.cee.cornell.edu/final-project-reports/