

CEAR Workshop: Traffic Risk

February 21 and 22, 2011

General Information

Traffic congestion is becoming an increasingly urgent problem for many metropolitan areas around the world. With limited resources for expanding transportation infrastructure, alternative solutions have been sought using congestion pricing. The effects of congestion pricing depend on the reactions of individual drivers to the pricing schemes, including the extent to which travel time reliability is perceived by drivers to be affected by tolls. This workshop considers the theoretical and econometric modeling of individual choice over transportation options when there is risk and uncertainty over attributes such as travel time and reliability. The congestion effects on transportation systems from individual reactions to the pricing schemes will also be considered.

Organizers

Glenn Harrison, Lars Hultkrantz and Elisabet Rutström are the organizers of this workshop, which is funded by the Center for the Economic Analysis of Risk (CEAR) at Georgia State University. See cear.gsu.edu for more information on CEAR. Contact Rutstrom at erutstrom@gsu.edu about the substance of the workshop, and contact Mark Schneider at cear@gsu.edu with questions about participation and logistics.

Dates & Times

Monday 2/21 – 10:00am to 5:00pm. Refreshments and lunch will be provided.

Tuesday 2/22 – 10:00am to 12:30pm. Refreshments will be provided.

Contact Mark Schneider at cear@gsu.edu for special dietary needs.

Location

The CEAR Seminar Room is on the 11th floor of the J. Mack Robinson College of Business at Georgia State University. Here is a map link to [CEAR](#); the physical address is 35 Broad Street, **11th Floor**, Atlanta, GA 30303.

Directions

MARTA Subway:

CEAR is located 1 block North of the Five Points Marta Rail Station in Downtown Atlanta; one-way Rail Ride cost \$2.50. Tickets can be easily purchased from vending machines at all MARTA stations. This is by far the easiest method, and is on a direct line to Atlanta International Airport. Here is a map of the [MARTA rail system](#).

Driving:

From Interstate 75/85 (the connector) **going NORTH** take exit 248B for Edgewood Ave toward Auburn Ave / J W Dobbs Ave. Turn left at Edgewood Ave SE and proceed 0.7 miles. Turn right at Marietta St. NW. The next intersection is Broad St. and where our facility is located. There is no street parking available nearby; however, there are pay lots and garages nearby. Costs range from \$5 to \$10 depending on the lot/garage used.

From Interstate 75/85 (the connector) **going SOUTH** take exit 248D for J W Dobbs Ave toward Jesse Hill Dr. Slight left at Jesse Hill Jr. Dr. NE. Turn right at Edgewood Ave SE and proceed 0.6 miles. Turn right at Marietta St. NW. The next intersection is Broad St. and where our facility is located. There is no

street parking available nearby; however, there are pay lots and garages nearby. Costs range from \$5 to \$10 depending on the lot/garage used.

Lodging

CEAR recommends lodging at The Ellis Hotel, which is walking distance to CEAR. Their information: 176 Peachtree Street Northwest, Atlanta, GA 30303. (404) 523-5155 ellishotel.com.

Also in walking distance to CEAR is:

The Ritz-Carlton: 181 Peachtree Street, Northeast, Atlanta, GA 30303. (404) 659-0400 ritzcarlton.com

Residence Inn Atlanta Downtown: 134 Peachtree Street, NW, Atlanta, GA 30303. (404) 522-0950 marriott.com

Atlanta Marriott Downtown: 160 Spring Street NW, Atlanta, GA, 30303. (800) 716-6316 marriott.com

The Glenn Hotel: 110 Marietta Street NW, Atlanta, GA 30303. (404) 521-2250 glennhotel.com

Program

Monday, February 21

9.30 – 10 am Coffee

10.00 – 11.00 Glenn Harrison (GSU and CEAR) *Welcome and General Introduction*

Elisabet Rutström (GSU) *An overview of the GSU and UCF field experiment on “Driving Under Uncertain Congestion Conditions”*

11.00 – 12.00 Mogens Fosgerau, Technical University of Denmark , *Congestion with Incidents*

Discussant: Hernán Bejarano, Penn State University

12.00 –12.15 Coffee Break

12.15 – 1.15 Martin Treiber, Technical University Dresden, *A Microscopic Traffic Flow Model Based on Prospect Theory. Weighting Speed Against Uncertainty and Risk*

Discussant: Vinayak Dixit, Louisiana State University

1.15 – 2.15 Lunch (buffet in CEAR Seminar Room)

2.15 – 3.15 Clifford Winston, Brookings Institute, *Exploring the Costs of Congestion*

Discussant: Glenn W. Harrison, Georgia State University

3.15 – 3.45 Coffee

3.30 – 4.30 Song Gao, University of Massachusetts Amherst, *A Rank-Dependent Expected Utility Model for Strategic Route Choice with Stated Preference Data*

Discussant: Peter Moffat, University of East Anglia

6.30 Dinner for invited guests

Tuesday, February 22

9.30 – 10.00 Coffee

10.00 – 11.00 Anders Karlström, Royal Institute of Technology, *Valuation for Costly Duration Uncertainty Per Se: An Economic Experiment*

Discussant: Morten Lau, Durham University

11.00 – 11.15 Coffee

11.15 – 12.15 Lars Hultkrantz, Örebro University, *Uncertainty, Hypothetical Bias and Value of Time Elicitation*

Discussant: Karen White, Federal Highway Administration

Abstracts

Elisabet Rutström: *An overview of the GSU and UCF field experiment on “Driving Under Uncertain Congestion Conditions”*

An overview of a large field experiment on driver responses to road pricing that is launched this spring by researchers at GSU and UCF. The experiment is conducted in Atlanta and Orlando during March – October 2011 and involves tracking drivers using GPS, as well as observing the same drivers make route choices in driving and traffic simulations.

Mogens Fosgerau. *Congestion with Incidents*

This paper considers the impact of random delays during a repeatedly occurring demand peak in a congested facility, such as an airport or an urban road. Congestion is described in the form of a dynamic queue using the Vickrey bottleneck model and assuming Nash equilibrium in departure times. Every period an incident may occur at a random time, temporarily reducing the bottleneck capacity to zero. The paper gives some properties of Nash equilibrium and the social optimum as well as a pretty good welfare improving tolling scheme.

Martin Treiber: *A Microscopic Traffic Flow Model Based on Prospect Theory. Weighting Speed Against Uncertainty and Risk*

To be added.

Clifford Winston: *Exploring the costs of congestion.*

This presentation will provide an overview of the direct costs of congestion to motorists, truckers, and shippers and the additional distortions caused by congestion to the labor market, land use, and fuel consumption. I will focus on measurement issues and briefly discuss policy approaches toward ameliorating congestion..

Song Gao (with Michael Razo): *A Rank-Dependent Expected Utility Model for Strategic Route Choice with Stated Preference Data.*

Route choice behavior under real-time traffic information needs to be adequately modeled for the proper analysis of a transportation system in the presence of Advanced Traveler Information Systems (ATIS). This paper focuses on the strategic route choice, where a traveler is able to plan ahead for traffic information that s/he will receive in the future. A stated preference (SP) survey was conducted with interactive maps showing two types of networks with risky travel times, one type eliciting risk attitude and the other allowing for strategic route choice with a detour to an incident-prone road segment and real-time traffic information.

The preliminary analysis suggests that a traveler's risk attitude is probability-dependent. A rank-dependent expected utility (RDEU) model is adopted to account for such a phenomenon, where the decision weight of a probabilistic outcome depends on its ranking among all outcomes and a non-linear transformation of the cumulative probability. A latent-class mixed Logit model for panel data is specified with a RDEU component and two latent classes, strategic and non-strategic route choice. The estimated strategic class probability is significantly different from 0 and 1 respectively, suggesting a route choice model under real-time information should consider both types of behavior. The estimated RDEU parameters show significant diminishing sensitivities to both outcome and probability and explains the probability-dependent risk attitude.

Anders Karlström: *Valuation for Costly Duration Uncertainty Per Se: An Economic Experiment*

To be added.

Lars Hultkrantz: *Uncertainty, Hypothetical Bias and Value of Time Elicitation*

We present results from a series of willingness-to-accept value-of-time choice experiments with students in Sweden and China, using both real and hypothetical purchases of the students' time. Our results confirm negative hypothetical bias in stated choice elicitation of value-of-time when real and hypothetical choices concern time allocation decisions at different occasions. However, we find no evidence of hypothetical bias for a task to be done at once. This is so although the students are asked to perform a morally commendable task, which has been suggested to promote such a bias. This highlights the important role of timing of choice in eliciting value of time (and time reliability), as timing issues affect both the actual and the perceived opportunity cost of time/scheduling constraints. Moreover, at least in the Chinese sample, we find that ex-post mitigation of negative hypothetical bias by certainty calibration, through re-coding of uncertain "yes" responses into "no", gives rise to another bias, with opposite sign, while calibration by restricting estimations to confident "yes" and "no" responses reduces the bias.