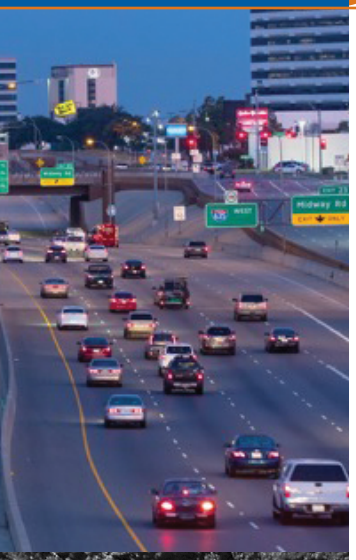


The Exploratory Advanced Research Program Fact Sheet

Safer, More Reliable Transportation with Behavioral Economics:
Cellphone Use and Managed Lane Choice

Exploratory Advanced Research . . . Next Generation Transportation Solutions

Behavioral economics draws on insights from integrating psychology and economics to better understand human decisionmaking. Understanding cognitive biases and heuristics—such as loss aversion and present bias—may help policy makers predict human behavior and facilitate choices that support public benefits by avoiding suboptimal outcomes. Behavioral economists call these nudges—subtle tweaks to the decisionmaking environment that may influence human behavior. When applied to transportation studies, a behavioral economics framework may enable the development of more accurate models for predicting the choices travelers make on the road and may inform policy and transportation planning decisions.

Two projects supported by the Federal Highway Administration's (FHWA) Exploratory Advanced Research (EAR) Program are looking at transportation issues through a behavioral economics lens. "Comparative Effectiveness of Alternative Smartphone-Based Nudges to Reduce Cellphone Use While Driving" is examining how technology-based nudges and tiered incentives could influence distracted driving behaviors. "Using Behavioral Economics to Better Understand Managed Lane Choice" is evaluating how behavioral economics could improve travel demand models.

Reducing Cellphone Use While Driving

The most recent data from the National Highway Traffic Safety Administration (NHTSA) indicates that the rates for motor vehicle crashes associated with distracted driving have held steady since 2012 (NHTSA, 2018). This, despite the fact that 97 percent of the most affected population—teen drivers—report knowing the dangers of cellphone-based distracted driving (AT&T, 2012).

To better understand this discrepancy between knowledge and behavior, researchers from the University of Pennsylvania and the Children's Hospital of Philadelphia are conducting field experiments that combine behavioral economics and novel smartphone technology. This includes encouraging the adoption of phone settings like Do Not Disturb While Driving, which automatically block some cellphone functions during driving, such as silencing notifications and restricting handheld use, unless the driver opts out of the setting during a trip.

The research team is also comparing tiered incentives for reducing cellphone use while driving. These incentives include standard rewards already offered by usage-based insurance programs, such as earned savings for desirable driving behaviors, as well as alternative incentive structures, including social comparison feedback and repositioning cash incentives as a weekly payout rather than one lump sum.

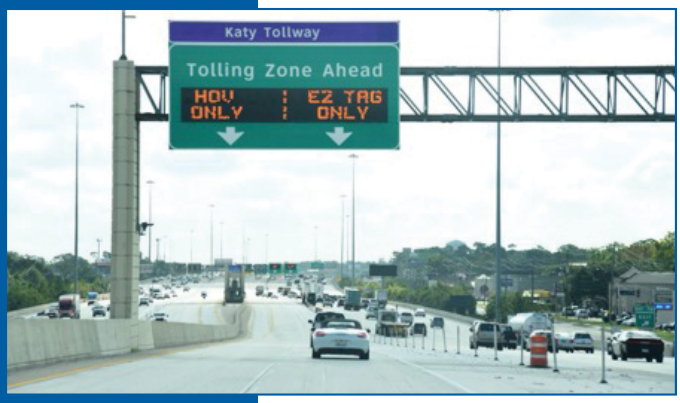
"By bringing together a team with experience in behavioral economics and behavioral design, traffic safety, statistics, and epidemiology, we'll be able to determine whether these strategies successfully address these other problem areas and can help reduce the dangerous and potentially lethal behavior of using a cellphone while driving," said M. Kit Delgado, M.D., M.S., assistant professor of Emergency Medicine and Epidemiology at the University of Pennsylvania's Perelman School of Medicine in a Penn Medicine press release about the project (Penn Medicine News, 2018).

The data derived from these scalable smartphone and incentive strategies may help develop public safety programs for reducing dangerous distracted driving behaviors.

U.S. Department of Transportation
Federal Highway Administration

Safer, More Reliable Transportation with Behavioral Economics:
Cellphone Use and Managed Lane Choice

Understanding Managed Lane Choice



Previous research gathered data from travelers with transponders using the Katy Freeway in Houston, Texas. © *Texas A&M Transportation Institute*

Models that predict the use of priced managed lanes (MLs) are important for gauging the demands placed on highways and planning future infrastructure. Researchers at the Texas A&M Transportation Institute want to improve travel demand models by differentiating travelers as either choosers between MLs and general purpose lanes or non-choosers.

The new approach uses psychology and behavioral economics methodologies to better understand and model travel behavior on ML corridors. "People aren't making the choices we thought they were as modelers, so I had to step back and look at how we do our travel behavior modeling when it comes to toll roads and managed lanes," said Mark Burris, Ph.D., of Texas A&M University's College of Engineering.

The research team has identified behavioral traits that may help predict habitual compared to deliberative decisions and is constructing survey questions to identify these traits among research participants, who will undergo laboratory experiments and field trials. This emerging data may reveal new elements, such as novel questions for ML use surveys, that could enhance the precision of the current prediction algorithm and improve the overall accuracy of travel demand modeling for MLs and toll roads.

Photo page 1: Traffic modeling relies on data from highways such as the Lyndon B Johnson Freeway in Dallas, Texas. © *Texas A&M Transportation Institute*

EXPLORATORY ADVANCED **RESEARCH**

What Is the Exploratory Advanced Research Program?

The EAR Program addresses the need for longer term, higher risk research with the potential for transformative improvements to transportation systems. The EAR Program seeks to leverage advances in science and engineering that could lead to breakthroughs for critical, current, and emerging issues in highway transportation by experts from different disciplines who have the talent and interest in researching solutions and might not do so without EAR Program funding.

To learn more about the EAR Program, visit https://highways.dot.gov/research/exploratory-advanced-research. The website features information on research solicitations, updates on ongoing research, links to published materials, summaries of past EAR Program events, and details on upcoming events.

Learn More

For more information about the EAR Program project addressing cellphone use, contact James Pol, FHWA Office of Safety Research and Development at (202) 493-3371 (email: james.pol@dot.gov). For more information about the EAR Program project addressing managed lane choice, contact Bingxin Yu, FHWA Office of Transportation Policy Studies at (202) 366-6021 (email: bingxin.yu@dot.gov).

Publication No.
FHWA-HRT-20-013
HRTM-30/01-20(WEB)E

National Highway Traffic Safety Administration. (2018). "Distracted Driving 2016." (research note) Available online: https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812517, last accessed October 13, 2019.

AT&T. (2012). "AT&T Teen Driver Survey." (executive summary) Available online: https://www.att.com/Common/about_us/txting_driving/att_teen_survey_executive.pdf, last accessed October 13, 2019.

Penn Medicine News. (2018). "Penn and CHOP Team Receives $1.84 Million Grant to Study Best Practices for Curbing Cell Phone Use While Driving." (press release) Available online: https://www.pennmedicine.org/news/news-releases/2018/november/penn-and-chop-team-receives-grant-to-study-best-practices-for-curbing-cell-phone-use-while-driving, last accessed November 23, 2019.