

Project Title: Identifying High-Risk Roadways for Infrastructure Investment Using Naturalistic Driving Data
Project Abstract (Brief Description): The goal of this research is to identify high-risk roadway segments for capital investment to mitigate future increases in crash rates. This is achieved by establishing a statistical relationship between surrogate crash measures and roadway segments with historically high crash rates. This research may lead to identifying locations with relatively low crash rates now, but potentially could increase in the future. These findings could potentially reduce the loss of life and property of the traveling public as well as identify roadway segments in need of targeted capital investment to provide a sustainable highway infrastructure for multimodal use.
Describe Implementation of Research Outcomes (or why not implemented) The state-of-the-practice for most municipal traffic agencies seeking to identify high-risk road segments has been to use prior crash history. While historic traffic crash data is recognized to be valuable in improving roadway safety, it relies on prior observation rather than future crash likelihood. Recently, however, researchers are developing predictive crash methods based on “abnormal driving events.” These include abrupt and atypical vehicle movements thought to be indicative of crash avoidance maneuvers and/or near-crashes. Because these types of near-crash events occur far more frequent than actual crashes, it is hypothesized that they can be used as an indicator of high-risk locations and, even more valuably, to identify where crashes are likely to occur in the future. This paper describes the results of research that used naturalistic driving data collected from global positioning system (GPS) sensors to locate high concentrations of abrupt and atypical vehicle movements in Baton Rouge, Louisiana based on vehicle acceleration and vehicle rate of change of acceleration (jerk). Statistical analyses revealed that clusters of high magnitude jerk events while decelerating were significantly correlated to long-term crash rates at these same locations. These significant and consistent relationships between jerks and crashes suggest that these events can be used as surrogate measures of safety and as a way of predicting safety problems before even a single crash has occurred.
Impacts/Benefits of Implementation (actual, not anticipated) The final report reveals that clusters of high magnitude jerk events while decelerating were significantly correlated to long-term crash rates at these same locations, and these events can be used as surrogate measures of safety and as a way of predicting safety problems before even a single crash has occurred.
Web Links: http://evaccenter.lsu.edu
Budget (Funding) Amounts & Source(s) (US DOT +Match(s) =Total Costs): Budget: \$198,373 Match: \$61,828
Project Start and End Dates: 10/01/13 – 09/30/14. A no cost extension approved to 06/30/15. Project complete.
Principal Investigator(s) and Contact Information: Brain Wolshon, Ph.D., P.E., P.T.O.E.
Principal Investigator Institution (University): Louisiana State University