The Roles of Vehicle Footprint, Height, and Weight in Crash Outcomes

Research Team:

T. Donna Chen, Graduate Research Assistant
The University of Texas at Austin, Center for Transportation Research
chen.donna@gmail.com

Dr. Kara M. Kockelman, Professor
The University of Texas at Austin, Department of Civil, Architectural, and Environmental Engineering
kkockelm@mail.utexas.edu

Poster Presented by: T. Donna Chen

Abstract:

This analysis uses a heteroscedastic ordered probit (HOP) model to distinguish the effects of vehicle weight, footprint and height on the severity of injuries sustained by vehicle occupants while controlling for many occupant, roadway and other characteristics. Model results suggest that the impacts of physical vehicle attributes on crash outcomes depend on the number of involved vehicles, and typically are more significant in one-car crashes than in two-car crashes. While larger-footprint vehicles and shorter vehicles are estimated to reduce the risk of serious injury for their occupants in single-vehicle crashes, they appear to be less crashworthy in two-vehicle collisions. Heavier vehicles are anticipated to be more crashworthy regardless of crash type. Under evolving U.S. fuel economy standards, moderate changes in light-duty-vehicle weights, footprints, and heights are estimated to have relatively small impacts on crash severities, while other factors, such as seat belt use, driver intoxication, and the presence of roadway curvature and grade influence crash outcomes much more noticeably.