UTC Project Information	
Project Title	Advancing Traffic Flow Theory Using Empirical Microscopic Data
University	The Ohio State University
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Brief Abstract of Research Project	Traffic flow theory has come to a point where conventional, fixed time averaged data are limiting our insight into critical behavior both at the macroscopic and microscopic scales. This paper develops a methodology to measure relationships of density and vehicle spacing on freeways. These relationships are central to most traffic flow theories but have historically been difficult to measure empirically. The work leads to macroscopic flow-density and microscopic speed-spacing relationships in the congested regime derived entirely from dual loop detector data and then verified against the NGSIM data set. The methodology eliminates the need to seek out stationary conditions and yields clean relationships that do not depend on prior assumptions of the curve shape before fitting the data. Upon review of the clean empirical relationships a key finding of this work is the fact that many of the critical parameters of the macroscopic flow-density and microscopic speed-spacing relationships depend on vehicle length, e.g., upstream moving waves should travel through long vehicles faster than through short vehicles. Thus, the commonly used assumption of a homogeneous vehicle fleet likely obscures these important phenomena. More broadly, if waves travel faster or slower depending on the length of the vehicles through which the waves pass, then the way traffic is modeled should be updated to explicitly account for inhomogeneous vehicle lengths.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	

Impacts/Benefits of Implementation (actual, not anticipated)	
Web Links • Reports • Project website	