UTC Project Information	
Project Title	Big Data Visualization and Spatiotemporal Modeling of Aggressive Driving
University	San Diego State University (lead); Virginia Tech/VTTI
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Funding Source(s) and Amounts Provided (by each agency or organization)	Safe-D (Federal): $154,657 Faculty in-kind service and startup fund (Non-Federal): $137, 015
Total Project Cost	$280,672
Agency ID or Contract Number	Grant No: 69A3551747115 Project: 03-087
Start and End Dates	02/01/2018 - 06/01/2019
Brief Description of Research Project	More than half of fatal traffic crashes occur due to aggressive driving according to AAA (American Automobile Association) Foundation for Traffic Safety. Ubiquitous technology has made it possible to monitor driver behavior at a high frequency for a long period of time. This provides an opportunity for researchers to investigate risky driving behavior at a large scale. This project aims to develop a big data analytics framework and visualization tool to conduct spatiotemporal modeling and classify and visualize aggressive driving behavior using data from emerging technology. As an essential safety planning tool in the era of big data, this framework/tool can be used to identify where and when aggressive driving occurs. The Safety Pilot Model Deployment (SPMD) data, one of large transportation datasets available via the FHWA Research Data Exchange (RDE) program will be used as a big data example. A classification model will be developed to discriminate aggressive driving from normal driving using kinetic and environmental GIS data. Web-based data visualization tools will also be developed to identify the spatial and temporal distribution of aggressive driving. Furthermore, data visualization in a simulated real-time scenario will be conducted to produce insights from future transportation data considering the anticipated widespread adoption of autonomous and connected vehicle technology.

Describe Implementation of Research Outcomes (or why not implemented)
 	
Place Any Photos Here
	1) The final project outcomes including the final project report and all data sets used/developed in this project will be delivered to Safe-D according to the project timeline. Project tasks include:
	   • Literature review and data exploration
	   • Database development
	   • Aggressive driving classification
	   • Data visualization and tool development
	2) The education and workforce development plan include:
	   • Developing course materials for both undergraduate and graduate courses
	   • Reaching out to agencies local to SDSU (e.g. SANDAG) to create opportunities for practitioners to learn about big data platforms
	   • Providing funding for one and a half graduate/undergraduate students at SDSU and one graduate student from VTTI.
	3) The technology transfer plan includes:
	   • Developing a web-based visualization tool
	   • Developing a functionality for data subset download with query tools
	   • Publishing multiple journal/conference papers
	   • Possibility of hosting a webinar

Impacts/Benefits of Implementation (actual, not anticipated)	• The big data framework that will be developed in this project will be beneficial in managing, processing, and modeling large data sets. • The web-based visualization tools can help researchers and planners identify aggressive driving both spatially and temporally • It is expected that this tool could be expanded to other safety applications dealing with big data analytics. • Students involved with the project will have the opportunity to become proficient in using the latest tools and technologies to handle big datasets

Web Links
   • Reports
   • Project website	