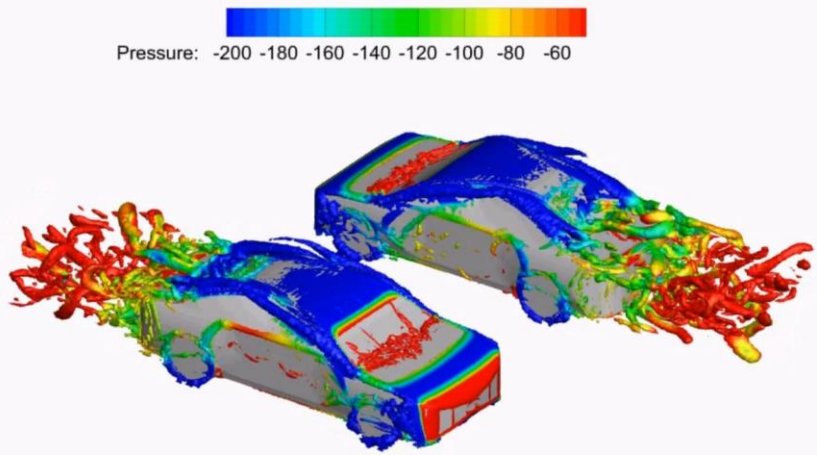


UTC Project Information	
Project Title	Aerodynamic Effects on Two-Lane Highway Safety
University	University of Idaho
Principal Investigator	Tao Xing
PI Contact Information	xing@uidaho.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans \$60,000 University of Idaho \$60,000
Total Project Cost	\$120,000
Agency ID or Contract Number	DTRT13-G-UTC40
Start and End Dates	September 16, 2015– June 15, 2017
Brief Description of Research Project	The goal of this project is to use advanced computational fluid dynamics (CFD) models and wind tunnel experimental measurements to study the effects of aerodynamics on two-lane rural highway safety in the United States. The project will focus on the changes of forces and moments in three dimensions during the crossing and overtaking process between cars and trucks under various environmental wind conditions, especially cross-wind. Additionally, comprehensive data will be produced for the flow fields (vortical structures, pressures, and velocities) around ground vehicles (car, truck) during those process, which will be used to better understand the stability and safety of the vehicles. The data produced in this project will help modify/improve existing highway policies and/or designs of automobiles to improve the stability and safety.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	This research project was exploratory in nature and investigated the effect of crosswinds on aerodynamics of two vehicles (passenger cars and trucks) Crossing or overtaking each other on two-lane rural highway. The published results in the final report and a Journal article provided the safety community with a better understanding of the transient aerodynamics forces and moments in three dimensional before and after the vehicle interactions. The results are obtained on a model-scale car and a truck but the research outcome can be extended to full-scale vehicle interaction.

	
<p>Impacts/Benefits of Implementation (actual, or anticipated)</p>	<p>Vehicle manufacturers, transportation system operators can use the findings of this research to ensure safe vehicle interactions in two-lane rural highway operations with and without crosswinds resulting in safer operations in this highway. For example, the impact of the lateral distance between the two interacting vehicles on safety can be assessed using some of the results presented.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website 	<p>Final Report: http://www.taoxing.net/web_documents/pactran-final-report-2017.pdf</p>