

UTC Project Information	
Project Title	Towards Development of Asphalt Materials to Resist Studded Tire Wear to Mitigate Hydroplaning
University	Washington State University
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Funding Source(s) and Amounts Provided (by each agency or organization)	University of Washington PacTrans \$40,000 Washington State University \$ 40,000
Total Project Cost	\$80,000
Agency ID or Contract Number	DTRT13-G-UTC40
Start and End Dates	September 16, 2015– September 15, 2016
Brief Description of Research Project	<p>This proposed study deals with the PacTrans theme of “Developing Data Driven Solutions and Decision-Making for Safe Transport.”</p> <p>Currently, all four northwestern states, including Alaska, Idaho, Oregon, and Washington, allow the use of studded tire. Studded tire can dig into asphalt pavement and picking out the small aggregate, eventually results into pavement rutting.</p> <p>Rutting was reported as one of the most important reasons of vehicle hydroplaning and loss of skid resistance in wet weather and can be closely related with traffic accidents during night and accidents under rain weather conditions.</p> <p>Each year, millions of dollars are spent to repair/rehabilitate the wear from the studded tire. Developing pavement surface materials that resist studded tire wear will greatly improve the conditions of pavements, and reduce the traffic accidents and repair/rehabilitation costs associated with the studded tire wear.</p> <p>Therefore, the objectives of this proposed study is to determine potential material and mix design variables towards development of a wear-resistant asphalt mix.</p>

<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>This study evaluated the studded tire resistance of common asphalt mixes in northwestern states in terms of main mix design parameters include asphalt binder type and content, aggregate type and Nominal Maximum Aggregate Size (NMAS). The new method of laboratory test to measure the studded tire wear was introduced through this project and can be used by state and federal agencies to verify the studded tire wear of Hot Mix Asphalt (HMA) pavements. Furthermore, the comprehensive statistical analysis was conducted to obtain the key mix design parameters that affect the studded tire wear of flexible pavements. The detailed outcomes of this project were summarized in final report. In addition, one journal paper, which is in the process of revision, was submitted to the Journal of Materials in Civil Engineering (ASCE).</p>
<p>Impacts/Benefits of Implementation (actual, or anticipated)</p>	<p>The main impacts of this study can be summarized as follows:</p> <p>1-Developing new laboratory test method to measure the studded tire wear of asphalt mixes before field construction. Therefore, state agencies can use this test method to evaluate the studded tire wear resistance of HMA pavements before construction.</p> <p>2-Identifying key parameters of asphalt mix design procedure that affect the studded tire wear resistance of flexible pavements. For this purpose, state agencies can control these parameter during their mix design procedure to reduce the studded tire wear of flexible pavements.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website 	<p>https://digital.lib.washington.edu/researchworks/handle/1773/43512</p>