

UTC Project Information	
Project Title	MPC-540 – Updating and Implementing the Grade Severity Rating System (GSRS) for Wyoming Mountain Passes
University	University of Wyoming
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Funding Source(s) and Amounts Provided (by each agency or organization)	<p>USDOT, Research and Innovative Technology Administration \$95,162</p> <p>Wyoming Department of Transportation \$98,990</p>
Total Project Cost	\$194,152
Agency ID or Contract Number	69A3551747108
Start and End Dates	November 2, 2017 to July 31, 2023
Brief Description of Research Project	The proposed study is aimed at achieving two main goals. First, the FHWA’s GSRS model will be updated to reflect the current truck population characteristics. This will be achieved by carrying out field tests with an instrumented vehicle to update parameters in the model that reflect current truck characteristics and braking systems. The second objective of the study is to evaluate Wyoming mountain passes and their warning systems with regard to truck downgrade crashes. By doing this, the best means of communicating with truck drivers to reduce the probability of runaway truck incidences can be recommended.
Describe Implementation of Research Outcomes (or why not implemented) Place Any Photos Here	The findings of this research are anticipated to assist highway engineers and policymakers in deciding safe descent speeds for trucks and thus preventing brake failure-related crashes.
Impacts/Benefits of Implementation (actual, not anticipated)	The project has produced a better understanding of the relationship between truck weight and the maximum descent speeds necessary to prevent road crashes on the mountainous downgrades in Wyoming.

	<p>Prior to this phase of the project, the maximum speeds were only preventing brake fade. Now maximum speeds preventing rollover and skidding/side slip in addition to brake fades can be predicted by the model. In addition to this, a model has also been created to account for trucks equipped with only drum brakes which still consist of the majority in the U.S.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website 	<ul style="list-style-type: none"> • MPC Research Report – <u>Automating the Implementation of the Updated Grade Severity Rating System (GSRS) for Wyoming Mountain Passes</u> • Journal Article – <u>Automating the Updated Grade Severity Rating System (GSRS) Using the Visual Basic.net Programming Language</u> • Journal Article – <u>Comparing Grade Severity Rating System Models for Trucks Fitted with Drum Brakes versus Disc Brakes</u> • Journal Article – <u>Incorporating Horizontal Curves and Roadway Geometry into the Automated Updated Grade Severity Rating System</u>