

UTC Project Information	
Project Title	MPC-519 – Operational and Safety Analysis with Mitigation Strategies for Freeway Truck Traffic in WY
University	University of Wyoming
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Project Cost	\$53,405
Start and End Dates	September 30, 2013 to September 30, 2018
Project Duration	September 30, 2013 to September 30, 2018
Brief Description of Research Project	<p>Research Needs:</p> <p>The State of Wyoming road network is characterized by heavy truck traffic. In 2015, truck traffic comprised approximately 22% of Vehicle Miles Traveled (VMTs) along all routes in WY, according to the WYDOT Annual Traffic Report. The heaviest truck traffic exists along I-80, with about 47% truck VMTs. Trucks have significantly different physical and driving characteristics than passenger cars, especially on grades, which has impacts on operational efficiency, safety and pavement deterioration. The presence of heavy vehicles reduces the capacity of freeway segments, with the reduction being more significant along specific grades. Trucks generally decrease speed by more than 7% on upgrades as compared to their operation on level terrains, according to the HCM 2010. The maximum speed that can be maintained by trucks on upgrades primarily depends on the length and steepness of the grade, as well as the truck's weight-to-power ratio. On the other hand, the operation of passenger vehicles is much less impacted by the grade. This leads to variations in speeds between trucks and passenger vehicles, with more complex interactions between the two types.</p> <p>This study will look into impacts of truck traffic on selected freeway segments along I-80 in WY, as well as mitigation strategies to minimize negative impacts, through analyses of operational and safety implications that result from the interactions between trucks</p>

	<p>and passenger vehicles. The analysis will include the effectiveness of existing climbing lanes, and look into potential locations where the introduction of climbing lanes will be justified. The analysis will also look into other control strategies, such as different speed limits for trucks, truck lane restrictions along certain segments, and truck no-passing zones. Differential speed limits for trucks have been implemented by some US states, so this study will look into the state of practice and its effectiveness on operations and safety. Another potential issue with truck traffic on WY freeways is speed limit of 80 mph along certain segments. This raises a concern of the ability of conventional truck tires to handle such high speeds. The study will look into this issue through a review of literature and practice, as well as through crash data analysis to identify the potential relationship between truck tire failure and crash characteristics. The study will be divided into following tasks, where some of them can occur simultaneously.</p>
<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>Expected Outcomes:</p> <p>The first outcome of the study will be a synthesis of existing literature and practice related to freeway truck traffic, as well as the existing strategies used by agencies in order to improve operations and safety on freeways with high truck volume percentage. The second outcome will be complete sets of roadway and traffic data collected under the existing conditions. The data will be useful for engineers, educators and other interested stakeholders including, but not limited to, WY institutions, and can be used in potential future projects. The third outcome will be the assessment of current operational and safety conditions for freeway segments with high truck volume percentage and challenging geometric features. It will provide insights for potential problems, and the ways how to mitigate them. The study will describe current conditions, impacts, and mitigation recommendations.</p> <p>This research would be beneficial for WYDOT, as it looks to improve operations and safety on freeways with high truck volume percentage. Furthermore, it will be useful to agencies across the US that face similar problems with freeway truck traffic. The data and analysis methodologies collected and developed throughout the study can be used in future research projects.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>Educational Benefits:</p> <p>Students will be involved in all aspects of this study, and it will provide a good material for transportation courses in operations, safety, planning and design. The students will perform main tasks in literature review, data collection and data analysis. The data analysis will include transportation operations and safety methodologies, software, as well as mathematical tools, giving the students an</p>

	<p>opportunity to expand their knowledge in these fields. If the analysis requires simulation modeling, the students will have the opportunity to learn and work with traffic simulation software, which is more and more being used by companies and agencies.</p>
<p>Web Links</p> <ul style="list-style-type: none">• Reports• Project Website	