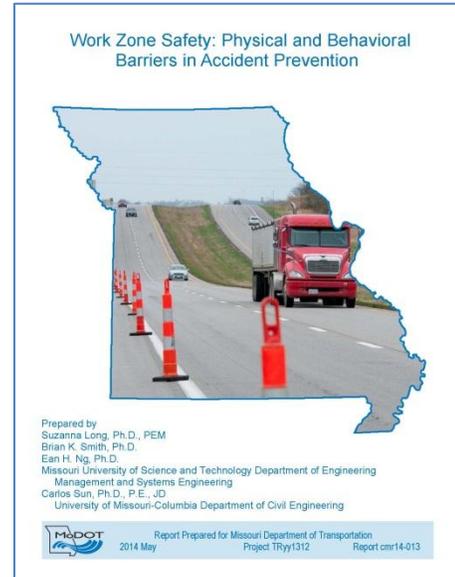


# Research Summary

## Work Zone Safety: Physical and Behavioral Barriers in Accident Prevention

This project focused on the usefulness of creating a work zone traffic safety culture as a methodology to improve the overall safety of both work zone personnel and the traveling public in Missouri. This research collected the general public's perception of work zone safety using the existing and augmented versions of the MoDOT Work Zone Rating Survey, evaluated the historical data on work zone crashes and identified trends that were specific to Missouri, and identified attributes that were associated with severe crashes.

The Work Zone Rating survey showed a difference in stakeholder perceptions regarding the adequacy of work zone warning signs and the safety level in traveling through work zones. Based on survey responses from current MoDOT employees, existing work zone warning signage and guidance (barrels, cones, and striping) are adequate to protect the driving public and are in accordance with the MoDOT Temporary Traffic Control Elements. However, responses from the general public reveal that a plurality of respondents perceived that the warning signs were insufficient in terms of information provided, provided inaccurate information, or were wrongly placed. One possible reason for the difference in stakeholder perception is that the general public lacked the safety awareness and knowledge of existing



protocols and standard operating procedures for work zones. Anecdotal evidence from the comments received through the surveys suggests that strong enforcement of traffic laws would contribute to the general public's adherence to work zone signs and warnings, especially the reduced speed limit warning. Another possible reason is the influence of organization culture on MoDOT employees. Thus MoDOT employees seek confirmation of the existence of signage and warning when they approach a work zone.

Missouri work zone crash data from 2009 to 2011 was used for analysis. As a comparison, overall Missouri crash data from 2009 to 2011 was also used, including non-work zone data. In addition, crash analyses from reports such as the MoDOT Tracker and Missouri's Blueprint to Save More Lives were used as references. The result shows that there is not an elevated risk in work zones when compared to roadways with no work zones. The percentage of crashes in the fatal, injury, and property damage only categories between work zones and non-work zones differed by less than one. In contrast, other states have reported an elevated risk in work zones.



Crashes that occurred when dark seemed to be overrepresented in fatal and severe crashes. Therefore it might be useful to consider improving lighting, delineation, and visibility at nighttime work zones.

*Results show that there is not an elevated risk in Missouri work zones when compared to roadways with no work zones.*

In terms of accident type, a large number of work zone crashes involved vehicle interactions. These crashes point to possible factors such as traffic queues, lane drops or distracted driving. Of the two-vehicle collisions, rear-end crashes are the most significant, and they tend to be more severe. The failure to stop could be due to a failure of perception/reaction or a failure to brake. Countermeasures that increase driver attention and compliance such as enforcement, larger fines, and education could be useful in reducing two-vehicle and rear-end crashes.

If the contributing categories of aggressive drivers, distracted drivers and failure to yield/violation are viewed together, it implies that human factors may be a large contributing factor to crashes. This fact again points to solutions related to education, enforcement, and legislation more than just engineering.

*Seat belts are extremely important. Lack of seat-belt use was a factor in 383 of the 720 work zone fatal accidents in 2008 (FHWA).*

## ***Project Information***

**PROJECT NAME:** Work Zone Safety: Physical and Behavioral Barriers in Accident Prevention

**PROJECT START/END DATE:** July 2012 through May 2014

**PROJECT COST:** \$99,954

**LEAD CONTRACTOR:** Missouri University of Science and Technology

**PRINCIPAL INVESTIGATOR:** Dr. Suzanna Long and Dr. Carlos Sun

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