

UTC Project Information	
Project Title	MPC-681 – Effectiveness of Mitigation Methods and Signage in Reducing Railway Trespassing Events
University	Colorado State University
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Brief Description of Research Project	Railroad right-of-way trespassing is the leading cause of rail-related deaths in the United States. Previous literature proposes that accidental and intentional trespassing events are highly preventable and various engineering, education, and enforcement countermeasures have been implemented. However, these pedestrian-train collisions continue to occur, suggesting benefits could be realized from further analysis of public perceptions relating to railroad rights-of-way. The overall goal of this project is to identify gaps in knowledge between public perception and mitigation methods used to minimize railroad right-of-way trespassing. This will be accomplished by (1) Synthesizing current methods utilized to prevent railroad right-of-way trespassing; (2) Identifying public perceptions of safe and permissible railroad right-of-way crossing behaviors; and (3) Evaluating comprehension of messaging on signs relating to railroad right-of-way trespassing prevention. A literature review will be conducted to compile a list of countermeasures, which will be used to inform the development of a survey. The survey will capture how road users interpret messaging/mitigation methods at their location under various contexts, and how the use of these countermeasures may divert behavior to more unsafe actions in other locations. The results of this study will better inform efforts to mitigate railroad right-of-way trespassing, and as a result, improve safety.

<p>Describe Implementation of Research Outcomes (or why not implemented)</p> <p>Place Any Photos Here</p>	<p>The results reveal that action-conveying signs (such as “Stop Railroad Crossing” or “Do Not Cross”) and emotionally-motivated signs are generally more effective in discouraging pedestrian crossings in high-risk situations compared to information-only signs. Action-conveying signs were found to be particularly impactful when a train was present, while emotionally-motivated signs elicited stronger responses when warning lights were flashing, or gates were down. The MaxDiff analysis of sign design effectiveness highlighted that black symbols on yellow backgrounds were perceived as the most effective in conveying safety information, while signs with black on white or red on white backgrounds were rated less favorably. The study further found that square-shaped signs were slightly more effective than circular ones. These findings have been made publicly available and the researchers are seeking further collaboration with DOTs and the TRB community to implement these findings. The results suggest that high-contrast colors and action-conveying signs play a crucial role in enhancing the visibility and interpretability of safety signs, supporting quicker and more accurate decision-making by pedestrians.</p>
<p>Impacts/Benefits of Implementation (actual, not anticipated)</p>	<p>Annually in the US, there are more than 700 fatalities due to crossings of railroad rights-of-way, many of which are largely preventable. In addition to these annual fatalities, these collisions lead to trauma experienced by railway staff, rescue personnel, passengers, any eyewitnesses. This research seeks to reduce the number of injuries and fatalities due to train-pedestrian conflicts and improve transportation rail-related safety.</p>
<p>Web Links</p> <ul style="list-style-type: none"> • Reports • Project Website 	<ul style="list-style-type: none"> • MPC Final Report – Effectiveness of Mitigation Methods and Signage in Reducing Railway Trespassing Events