

# MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 18-367 (project 409) | September 2018

## Identification of Fatigue Countermeasures for the Short Line Railroad Industry, Phase 1 & 2



### the **ISSUE**

The Railroad Safety Improvement Act of 2008 significantly tightened the hours-of-service restrictions for railroad train crews. In response to some of these restrictions, the 400 members of the American Short Line and Regional Railroad Association (ASLRRA) face considerable staffing challenges during annual peak seasons. Significant economic hardship can accrue based on labor shortages. Consequently, concerns about working safely during these peak periods were raised and the question of developing effective fatigue countermeasures was explored.

### the **RESEARCH**

A representative sample of work schedules and sleep diaries were obtained from the short line railroad industry and analyzed for the likelihood of risk for fatigue related accidents. Results indicate that typical day time schedules have the least risk of fatigue. Standard night shifts, working from 11 p.m. to 6 a.m., had the greatest risk of fatigue. Typical work schedules were analyzed using modeling techniques to evaluate the inclusion of fatigue countermeasures. Researchers explored the feasibility of modifications to schedules and the effectiveness of fatigue countermeasures in reducing fatigue during these high-demand periods.



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## Project Title

Identification of Low-Risk  
Adjusted Work Schedules  
Designed to Manage Fatigue  
During Peak Service Demand  
Periods in the Shortline  
Railroad Industry

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## the FINDINGS

Modification of work schedules using strategic naps included in the work schedule, addition of off-duty sleep time, and other modifications resulted in a significant reduction in fatigue risk. After reviewing the work schedules and operational demands a number of suggested counter measures were reviewed and considered. The operational feasibility of these suggestions was reviewed by safety professionals working for the short line railroad association. The following countermeasures were considered most feasible: 1) Utilization of on-duty naps to offset the negative impact of overnight hours; 2) Increase in the amount of off-duty sleep time; 3) Increase the amount of on-duty supervision to recognize fatigue; 4) Alteration of the start and end time of work shifts to avoid circadian rhythms; 5) Decrease the number of hours worked.

## the IMPACT

The research demonstrated that fatigue levels of individuals working shifts that incorporate fatigue countermeasures, such as naps and greater amounts of sleep during off hours, are more likely to have a lower risk for fatigue-related human factors-caused accidents.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=943>

For more information or additional copies, visit the Web site at [www.mountain-plains.org](http://www.mountain-plains.org), call (701) 231-7767 or write to Mountain-Plains Consortium, Upper Great Plains Transportation Institute, North Dakota State University, Dept. 2880, PO Box 6050, Fargo, ND 58108-6050.



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