

# MOUNTAIN-PLAINS CONSORTIUM

PROJECT BRIEF | December 2015

## Calibration of the Mechanistic-Empirical Pavement Design Guide for Local Paved Roads in Wyoming



### the ISSUE

Wyoming DOT has begun efforts to implement the DARWIN-ME pavement design software for use on its interstate and highway systems. However, local paved roads have not yet been considered in Wyoming. These roads are very important because of the increase in traffic associated with the oil and gas industry.

### the RESEARCH

This study aimed at developing traffic characteristic inputs and local calibration coefficients for use within the DARWIN-ME pavement design software program when designing local paved roads that experience heavy truck traffic associated with the oil and gas industry. To do this, Wyoming traffic characteristics will be analyzed to develop a set of data that is indicative of the type of loadings that an industrial service road can expect to see.

Once these traffic characteristics are developed, calibrating the DARWIN-ME software to produce distresses and smoothness values similar to those being seen on local paved roads in Wyoming is necessary.

This study considered local paved roads located within four counties and intends to provide a set of local calibration coefficients and traffic characteristics that will aid in the design of new and rehabilitated roadways. The findings of this study will then be made available to local agencies in an effort to expedite the total implementation process in Wyoming and to assist in the mitigation of the oil and gas industry impact on local paved roads.



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## Project Title

Calibration of the  
Mechanistic-Empirical  
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## Sponsors | Partners

University of Wyoming  
Wyoming LTAP  
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Innovative Technology  
Administration

## the FINDINGS

The localized DARWIN-ME calibration coefficients and traffic distributions developed during this research are applicable for use when designing local paved roads that experience heavy truck traffic loadings, as well as heavy truck traffic volumes.

- The prediction capabilities of the DARWIN-ME program were significantly improved when using local calibration coefficients. The bias and sum of squared errors between predicted and observed distresses were significantly decreased and minimized when comparing results using default and local calibration coefficients.
- Note that with additional information regarding material characteristics, pavement ages, layer thicknesses, and an increased sample population, the calibration procedures used during this research can be applied to refine the calibration coefficients. Implementation and calibration are continuous processes which lead to improvement on initial calibration results. The calibration coefficients and traffic distributions developed during this study are sufficient for current implementation, but with additional information, can be improved.

## the IMPACT

The recommendations from this research provide steps that should be taken to implement the findings of this report, as well as how to further the research that has already taken place. If these steps are followed, successful implementation of the DARWIN-ME calibration coefficients and traffic distributions will be achievable and necessary improvements can be made.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=830>

For more information or additional copies, visit the Web site at [www.mountain-plains.org](http://www.mountain-plains.org), call (701) 231-7938 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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