

# MOUNTAIN-PLAINS CONSORTIUM

PROJECT BRIEF | March 2015

## Implementation of Intelligent Compaction Technologies for Road Constructions in Wyoming



### the **ISSUE**

A literature review of the benefits and costs of intelligent compaction revealed that, prior to this study, there is little quantifiable evidence to support the claim of increased long-term or short-term cost savings by using intelligent compaction. Also, there are no investigations that examine the financial return of improved compaction quality using intelligent compaction.

### the **RESEARCH**

Research on utilizing roller-integrated continuous compaction control (CCC) and intelligent compaction (IC) began in 2013 by the research team at the University of Wyoming. The goal of this research is to improve pavement quality and safety, decrease road maintenance and construction costs, and decrease road construction duration in the state of Wyoming using IC. Five objectives have been established in order to achieve this goal, which are to 1) examine current IC technologies and practices, 2) analyze state and national survey results about how other agencies implement IC for soil and pavement compaction, 3) conduct an economic analysis of IC, 4) propose recommendations for quality assurance implementation in Wyoming, and 5) establish future research needs. A literature review was performed to evaluate technologies and practices that best benefit Wyoming through

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Implementation of  
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## the **RESEARCH** (cont.)

learning IC technologies, IC case studies, and quality assurance standards. A nationwide survey and a Wyoming survey were conducted to complement the literature review and provide information about how research from IC has been implemented. An economic analysis was conducted to evaluate the short-term and long-term benefits and costs of utilizing IC for compaction of roadways.

## the **FINDINGS**

This research demonstrates how adoption and implementation of roller-integrated CCC and IC technologies best benefit the state of Wyoming and other jurisdictions nationally and internationally. Eighteen states have begun drafting IC quality control/quality assurance specifications, and at least 36 states have initiated the process of implementing IC by starting with workshops and field demonstrations. Surveys of Wyoming professionals and state DOTs indicate that there is support for the implementation to IC; however, cost information remains a concern and data are limited. The benefit-cost analysis demonstrated a 37-percent decrease in construction costs for a thick asphalt overlay and 54-percent decrease for new roadway construction when using IC. The increased service life from using IC was determined based on increased compaction uniformity, which resulted in a \$15,385 savings per year per one lane-mile.

## the **IMPACT**

The research provides quality assurance (QA) guidelines for the implementation of roller-integrated CCC or IC for soil and pavement compaction to the state of Wyoming. These guidelines can be adopted by other transportation agencies in the United States. The research results demonstrate the economic benefits of using IC by reducing compaction costs and increasing roadway life.

For more information on this project, download the entire report at <http://www.ugpti.org/resources/reports/details.php?id=789>

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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