



# A Pavement Management System for Wyoming County Roads

*CTIPS-013 – UTC Project Information*

<b>Recipient/Grant Number:</b>	North Dakota State University, University of Wyoming Grant No. 69A3552348308
<b>Center Name:</b>	Center for Transformative Infrastructure Preservation and Sustainability
<b>Research Priority:</b>	Preserving the Existing Transportation System
<b>Principal Investigator(s):</b>	Mohamed S. Yamany, Ph.D. Khaled Ksaibati, Ph.D., P.E.
<b>Project Partners:</b>	USDOT, Office of the Assistant Secretary for Research and Technology – \$101,048 Wyoming LTAP – \$101,362
<b>Total Project Cost:</b>	\$202,410
<b>Project Start and End Date:</b>	6/7/2024 to 6/6/2026

## Project Description

A pavement management system (PMS) is an asset management tool that helps decision-makers determine the most effective strategies for maintaining pavements in optimal condition within a specific timeframe. Most highway agencies in the United States employ PMS to proficiently and effectively manage their pavement assets on state roads. Unlike the state level, most local agencies administering county roads have yet to implement PMS. This may be attributed to insufficient resources, technical proficiency, and data availability and quality limitations. Hence, this research proposal addresses this gap by developing a comprehensive PMS for Wyoming county roads. The development of this PMS will follow a multi-stage approach based primarily on data collected via questionnaire survey and historical pavement conditions. This proposed project is expected to result in a PMS tailored for Wyoming counties, which will incorporate historical pavement conditions, alternatives and costs of maintenance and rehabilitation (M&R) treatments, decision trees for effective treatment selection, a prioritization framework for M&R treatment scheduling, and financial requirement assessment. The findings and the developed PMS will not only assist Wyoming counties in effectively and efficiently managing their roads, but they will also offer guidelines and recommendations that could benefit counties in other states.

## **USDOT Priorities**

The primary goal of this proposed project is to develop a PMS tailored for Wyoming county roads. This system will assist decision-makers in making cost-effective choices to ensure that their roads are well-maintained and in a good condition, despite budget limitations. This will aid policymakers in preserving their current transportation systems in an economic and sustainable manner. Moreover, improving the condition of pavements across Wyoming counties will lead to a reduction in traffic accident rates and a boost in customer satisfaction. Hence, the proposed system aims to assist highway agencies in effectively implementing pavement preservation plans that align with the USDOT's strategic goal of Economic Strength and Global Competitiveness while also achieving socio-economic objectives.

## **Outputs**

The results and products of this project, such as developed optimization models, decision trees, will be disseminated through peer-reviewed journal articles and showcased at scientific research conferences like the Transportation Research Board Annual Meeting. This will help in transferring methodologies, results, and products to the national and international pertinent research communities. Workshops, seminars, and webinars will be arranged to further disseminate the research findings and communicate its outcomes with professionals, practitioners, and highway agencies. The incremental results and progress of this project will be consolidated in a semi-annual progress report. Upon the completion of this project, it will be synthesized along with recommendations and guidelines in a technical report.

## **Outcomes/Impacts**

At the conclusion of this research project, customized M&R decision trees will be developed specifically for Wyoming county roads. Additionally, an M&R prioritization framework will be created to efficiently automate the selection of M&R treatments and prioritize treatment projects. This will facilitate the accurate assessment of future financial needs. This project will also furnish pavement managers with the alternatives and costs of M&R treatments presently adopted by Wyoming counties, which should be updated annually or whenever new data becomes accessible. Essentially, a comprehensive PMS will be developed for Wyoming counties, which will incorporate historical pavement condition data, alternatives and costs of M&R treatments, decision trees for effective treatment selection, and prioritization framework for M&R treatment scheduling, and financial requirement assessment. This PMS will aid Wyoming counties in making cost-effective and efficient decisions, and ultimately maintaining their roads in a state of good repair, while utilizing the limited resources effectively.

## **Final Report**

Upon completion, the final report link will be added to the [project page on the CTIPS website](#).