

Pavement

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Project Title:
National Road Research Alliance -
(NRRRA)

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National Road Research Alliance – NRRRA TPF-5 (341)

A study focuses on researching California's climate zones to improve pavement design and reduce maintenance costs.

WHAT IS THE NEED?

As research funds become tighter, pooling the funds for common research objectives becomes the most efficient way to conduct research. California has 9 climate zones and research into pavement designs and maintenance in all of these climate zones can be prohibitive. The National Road Research Alliance (NRRRA) pooled fund provides an opportunity to provide research in cold climate zones (e.g. California's mountains and high deserts) that would otherwise receive little attention. Designs and maintenance strategies that extend the life of the pavement and reduce the upkeep would be an important component in our system preservation.

WHAT ARE WE DOING?

Primary objectives of the NRRRA are:

- Conduct structured construction, field testing and evaluation using the MnROAD cold weather facility
- Evaluate pavement materials, equipment and methods under real-world conditions
- Establish industry standards and develop performance measures for improving pavement performance
- Develop and/or revise specifications and recommendations
- Study and promote innovative techniques and technologies that will save agencies money, improve safety and increase efficiency
- Support technology transfer by developing practical field guides, best practices, and training curriculum to promote the results of research projects



DRISI provides solutions and
knowledge that improves
California's transportation system

- Conduct cost-benefit analysis to ensure that new technologies, materials or methods contribute to operational efficiencies
- Support the exchange of information and ideas through collaborative research efforts that provide opportunities for public agencies to share experiences
- Identify and prioritize common road related research needs to address regional and national issues that are built on existing efforts, such as Federal Highway Administration's (FHWA's) portland cement concrete (PCC) and hot-mix asphalt (HMA) Roadmaps as well as the Foundation for Pavement Preservation Roadmap
- Fund high priority, readily implementable research projects through research contracts and university partnerships
- Leverage knowledge, skills, and resources from participating partners to advance pavement research and implementation efforts while developing the workforce of the future
- Support technology transfer that highlights the implementation of research results and the associated benefits.

WHAT IS OUR GOAL?

The goal of this project is to gain more knowledge on pavement behavior in trafficked and cold weather sections. The results will be used to improve M-E design methods for California pavements. The ultimate goal is to increase the understanding of physical processes in pavements and to minimize the need to use empirical factors to cover critical processes affecting pavement performance that are not well understood.

WHAT IS THE BENEFIT?

The California Department of Transportation (Caltrans) is looking to expand the use of M-E methods for pavement design and rehabilitation. Compared to empirical methods, the M-E method is better at accommodating new materials and construction processes. The transition to M-E design helps Caltrans design more cost-effective pavements and accomplish the mission of providing an efficient transportation system to enhance California's economy and livability. M-E methods account for local conditions such as climate, traffic, and material and can therefore optimize pavement designs for the specific conditions. Data from trafficked and cold weather sections will improve Caltrans pavement models in California's mountains and high deserts.

WHAT IS THE PROGRESS TO DATE?

The research team has completed the following:

- Caltrans' Pavement Program participated in the various subtask groups (e.g. flexible, rigid, bases, preservation, etc.) and brought back data associated with the field tests.
 - Participation in the subtask groups allows Caltrans to have input on future test sections of interest to the Department
- Added test sections for:
 - Mix Rejuvenator Synthesis (Phase-I)
 - Mix Rejuvenator Test Sections (Phase-II)
 - Mechanistic Load Restriction Decision Platform for Pavement Systems Prone to Moisture Variations
 - Environmental Impacts on the Performance of Pavement Foundation Layers
 - Permeability of Base Aggregate and Sand
- Improve material inputs into mechanistic design properties for reclaimed HMA Roadways (Phase-II)