

MOUNTAIN-PLAINS CONSORTIUM

RESEARCH BRIEF | MPC 22-466 (project 611) | July 2022

Field Performance of Asphalt Mixtures Based on Flexibility Index Results



the ISSUE

Pavement cracking continues to be an issue that affects the durability of highway infrastructure. While tests have been proposed, no threshold or limit has been developed.

the RESEARCH

This research is part of a continuous effort to develop mechanical tests that relate to the expected performance of asphalt mixtures once placed in the field. During a previous research project, asphalt mixtures of different compositions were collected from various locations across the state of Utah. The mixtures were brought to the lab and tested to determine their intermediate temperature performance using the Illinois Flexibility Index Test based on AASHTO TP-126. Based on the tests, it was found that asphalt mixtures sampled at the plant had a flexibility index (FI) between 3 and 20. This means that some mixtures were likely to show premature fatigue cracking.

To verify if the laboratory predicted performance matched the field performance, the locations where five different mixtures were placed were surveyed and their level of distresses was documented.



A University Transportation Center sponsored by the U.S. Department of Transportation serving the Mountain-Plains Region. Consortium members:

Colorado State University
North Dakota State University
South Dakota State University

University of Colorado Denver
University of Denver
University of Utah

Utah State University
University of Wyoming



Lead Investigator(s)

Pedro Romero
pedro.romero@utah.edu

Research Assistant(s)

A.S. Md. Asib, GRA, PhD
A. Mamun, PhD candidate

Project Title

Field Performance of Asphalt Mixtures Based on Flexibility Index Results

Sponsors | Partners

Utah Department of Transportation

USDOT, Research and Innovative Technology Administration

the FINDINGS

Researchers found that, out of the five sections surveyed, the one that had the lowest FI showed premature fatigue cracking. A different section also showed significant low-temperature cracking.

Based on these results and previous laboratory work, they concluded that the proposed mechanical testing at intermediate temperatures can be used to identify mixtures that might have poor cracking performance in the field. The tests can be used during the mix design process to prevent poor-performing mixtures from being placed in the field. However, because no other section showed any distresses, it is not known if a specific minimum FI can be developed at this time.

the IMPACT

Transportation agencies make significant investments to maintain highway infrastructure. Development of tests to eliminate materials with potentially poor performance can result in significant savings.

For more information on this project, download the Main report at <https://www.ugpti.org/resources/reports/details.php?id=1087>

For more information or additional copies, visit the Web site at 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.



This publication was produced by the Mountain-Plains Consortium at North Dakota State University. The contents of this brief reflect the views of the authors, who are responsible for facts and the accuracy of the information presented herein. This document is disseminated under the program management of the USDOT, Office of Research and Innovative Technology Administration in the interest of information exchange. The U.S. Government assumes no liability for the contents or use thereof.



NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost, Title IX/ADA Coordinator, Old Main 201, 701-231-7708, ndsuoaa@ndsuo.edu.