![i-Probe logo]

National Center for Asphalt Technology and i-Probe carry out Data Collection Studies

The National Center for Asphalt Technology in Auburn, Alabama conducts test track experiments with i-Probe to evaluate i-Probe's pavement scanning accuracy and correlation of outputs to other road roughness indices.

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The National Center for Asphalt Technology (NCAT), which operates its own test track in Opelika, AL for asphalt pavement research, hosted an experimental evaluation of i-Probe technology on October 8. The objective of the experiment was to assess the accuracy of i-Probe's Smart Road Monitoring Connected Vehicle (SRMCV) data collection capability and identify the correlation between i-Probe's native output unit for measuring pavement condition and other common indices.

The experimental trials consisted of driving the SRMCV around the test track multiple times at varying speeds—20 mph, 40 mph, and 55 mph—while scanning the test track surface for pavement roughness. A baseline reading was carried out at each speed using NCAT's own laser-based inertial profiler inspection vehicle, which is the typical equipment used for measuring pavement condition. This baseline data would then be compared to i-Probe's readings to determine the correlation. Additional trials were also carried out on a nearby stretch of open road that is paved in concrete to determine any differences from the readings of the asphalt-paved test track surface.

The most common index for measuring roughness is the International Roughness Index (IRI). IRI is calculated based on cumulative vertical displacement of a simulated single car wheel (*quarter-car*) model with suspension system divided by distance traveled. IRI is a mathematical model of how a typical passenger vehicle will react to a particular road surface profile.

i-Probe's primary data collection method is through the accelerometer found in all modern cars. This sensor detects the inertial movement of the vehicle in all directions. Road roughness is determined by

Laser profiler (left) and i-Probe SRMCV test vehicle (right)

isolating only vertical movement, and assigning a score based on the magnitude of vertical displacement. This measurement is known as *ride quality*. The lower the score, the smoother the road.

Although both indices capture the same information, the differing calculation methodologies can be problematic. Road management agencies in the US are required to report road conditions to the federal government based on IRI. Being able to output and integrate data within the same index standard is vital to the instrumentality of i-Probe. This experiment was intended to ascertain this correlation as a first step to data integration.

SRMCV test vehicle on the NCAT test track.

"The purpose of this experiment is to evaluate the accuracy, reliability, and consistency of the new pavement sensing technology offered by i-Probe which is based on pre-installed sensors on modern passenger vehicles under controlled conditions on the test track. The new technology will be benchmarked against conventional inspection methods, laser-based profilometers, to ensure consistent alignment with the current pavement evaluation standards. Both datasets will be analyzed side-by-side to determine whether the new sensing technology can complement the existing pavement inspection while maintaining measurement quality," said Dr. Daisuke Oshima, President and CEO of i-Probe.

NCAT and i-Probe are currently reviewing the data collected from the trials and may announce the results within this year.

The **National Center for Asphalt Technology (NCAT)** was established in 1986 as a partnership between Auburn University and the National Asphalt Pavement Association (NAPA) Research and Education Foundation to provide practical research and development to meet the needs of maintaining America's highway infrastructure. NCAT was created to ensure this industry's ability to provide pavements that are durable, sustainable, quiet, safe and economical. NCAT works with state highway agencies, the Federal Highway Administration and the highway construction industry to develop and evaluate new products, design technologies and construction methods that quickly lead to pavement improvements.

i-Probe Inc. (IPI) is one of the world's first providers specializing in collecting and analyzing Big Data obtained from vehicle sensors to provide infrastructure condition information services. IPI services include pothole/crack detection, pavement roughness condition monitoring, and deterioration alerts, which come with map overlay and are generated from continuous monitoring. IPI in partnership with Honda are carrying out several vehicle-based road asset assessment pilot projects in the U.S.

CONTACT:

i-Probe Inc.
Paul Hamoy
p.hamoy@i-probe-inc.com

NCAT
Jason Nelson
nelsoja@auburn.edu