U.S. Department of Transportation
Federal Highway Administration

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Spotlight on Pavement Uniformity: Maine Department of Transportation
Working with a Paver-Mounted Thermal Profiler

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For more information on PMTP and related technology, contact Monica Jurado Pavements & Materials Engineer, FHWA Resource Center, monica.jurado@dot.gov

This equipment and more are available on loan at the MATC. https://www.fhwa.dot.gov/pavement/asphalt/matc/equipment-loan-program.cfm

The PMTP series shares information on pavement testing programs.

To access the full series, visit https://www.fhwa.dot.gov/pavement/asphalt/matc/technical-documents.cfm

Background

The Maine Department of Transportation (MaineDOT) received a Paver-Mounted Thermal Profiler (PMTP) in 2015 through the second Strategic Highway Research Program (SHRP2) R06C. MaineDOT was interested in exploring whether this technology can help improve pavement quality assessment and increase service life.

PMTP systems provide two-dimensional infrared thermal maps of the newly laid asphalt mat behind the paver. Segregated, or nonuniform, areas tend to show up colder than the surrounding compacted hot mix asphalt (HMA) mat.

The agency has observed that the technology is easy to use, provides immediate feedback on pavement quality, and can highlight issues in the new asphalt mat and with operations. "As a department, we see huge value in the equipment and the data," says Dale Peabody, MaineDOT Director, Research & Innovation. "I think some contractors see that as well."

Findings and Observations

MaineDOT has run the profiler on 20 to 30 projects since 2015, scanning for 2 or 3 days on each project. Most activities were to demonstrate and promote the equipment and data to contractors and other agency staff. The agency evaluated the PMTP on various types of projects, such as night paving where a material transfer vehicle is being used. For two projects in 2018 and at least one in 2021, the pavement contractor supplied, installed, and operated the PMTP equipment.

PMTP on I-95 in Houlton, ME. Photo: MaineDOT

The MaineDOT research team observed these benefits:

- Provides a good picture of pavement uniformity, especially when paired with other technology like the dielectric profiling system, which MaineDOT has been testing separately. A more uniform pavement at the outset potentially avoids costly maintenance and repair over the long term.
- Provides instant feedback. "You can sit in your office and know what's going on in the field," says Ulrich Amoussou-Guenou, MaineDOT Transportation Engineer II. "You can see that the paver is stopped for a half-hour." Someone can then contact the project inspector if a sublot looks incorrect.
- Fairly easy to set up.
- Gives insight on problem areas on a project. MaineDOT noticed that more paver stops on some projects correlated with more variability in the mat, for example.

MaineDOT cites as a limiting factor that its equipment could be sturdier. The cables can loosen when the paver bounces or get pinched in heat. Knowledgeable staff must be in the field to adjust the cables, calibrate the system, and keep it working properly.

MaineDOT's Suggestions for Other Agencies

- Try the equipment and write specifications for it, no matter how large your department.
- Take training from the device's vendor. Also, seek out support and resources available from the FHWA Mobile Asphalt Technology Center (MATC).
- Engage with the State's contractors.