



U.S. Department  
of Transportation

Federal Highway  
Administration

# Spotlight on Pavement Density: North Dakota Department of Transportation Findings and Next Steps with the Dielectric Profiling System

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## Overview

The North Dakota Department of Transportation (NDDOT) plans to continue trialing the dielectric profiling system (DPS) after seeing how much information the technology can produce for assessing quality of paving mixtures and operations. DPS units use a ground-penetrating radar to assess the density of asphalt mixtures, a key indicator for pavement performance.

The agency plans further practice with the unit and data analysis before incorporating it into its pavement assessment program. The agency's current acceptance method is to obtain one set of cores for every 2,000-foot subplot. "I'm optimistic that after enough research, it can be used at least as a supplement to the traditional cores," says Jonathan Stork, NDDOT Materials & Research.

## Findings and Next Steps for DPS

Since acquiring the equipment in 2020, managing and analyzing the output from the DPS has so far been NDDOT's biggest challenge. The research team plans further study on ways to reduce the effort of managing the data. Other goals for the tool are to assess the performance of different asphalt mixes, compare DPS data to field-sampled cores, and compare the effects of mix production changes and other variables on dielectric sensitivity. NDDOT would like to gather useful information while a job is in progress, so that it allows the opportunity for a paving contractor to adjust operations in real time.

As part of a national transportation pooled fund study (Pooled Fund TPF-5 [443]), NDDOT will continue to share resources from other State highway departments on the new technology, including from the Federal Highway Administration (FHWA) and neighboring Minnesota Department of Transportation.

## NDDOT Suggestions for Other Agencies

- Delegate dedicated personnel to champion this effort and allow time and budget to do so. The research section was the proper place for this technology to be trialed.
- Take time to practice with the DPS system. Focus on collecting during consecutive days on one project, rather than spending short periods on several different projects. Be patient with the research process.
- Budget for and invest in spare batteries for the DPS pushcart to extend time in the field. Also, an improved GPS system is recommended to compare DPS readings more precisely at the locations where cores are extracted from the pavement.

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*In North Dakota with a DPS unit.  
Source: FHWA*

For more information on DPS and related technology contact  
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This equipment and more are available on loan at the MATC.  
<https://www.fhwa.dot.gov/pavement/asphalt/matc/equipment-loan-program.cfm>

The dielectric profiling system series shares information on pavement testing programs.

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