

MATC Motivating Innovation Around the Nation: North Dakota

Introduction

In May 2021, the North Dakota Department of Transportation (NDDOT) together with the FHWA North Dakota (FHWA-ND) Division Office extended an invitation to the Mobile Asphalt Technology Center (MATC) to conduct a field site visit to an ongoing asphalt paving project.

The MATC visit was focused on providing assistance on testing and evaluating some of NDDOT's currently-used asphalt materials and mixtures particularly in light of the potential Balanced Mixture Design (BMD) implementation.

MATC Activities in North Dakota

- Conducted evaluations of NDDOT's standard mixes using BMD tests.
- Performed split sample comparison testing to determine asphalt content by ignition.
- Executed additional tests on mixture and materials including Volumetrics, Dynamic Modulus, Asphalt Binder Tester, and X-ray Fluorescence.
- Collaborated with NDDOT for side-by-side field testing using the Dielectric Profiling System.
- Demonstrated techniques such as Pulse Induction, Laser Texture Scanner, and Paver-Mounted Thermal Profiler.
- Hosted two Open Houses at the MATC facilities and one virtual event.
- Facilitated three virtual 'Lunch and Learn' sessions for NDDOT Central and District Laboratories, Dakota Asphalt Pavement Association, and Local Technical Assistance Program staff
- Reviewed and analyzed NDDOT asphalt specifications

After the visit, NDDOT expressed interest in the technologies and requested further assistance with technology from MATC. In response, MATC staff organized four additional follow-up events.



Source FHWA

MATC Visit Details

- North Dakota State Maintenance Yard, Mohall, North Dakota
- Timeline: September 12 through October 7, 2021
- Project: US-83
- Two standard North Dakota DOT mixtures were evaluated.

- Speaking at both the ND Asphalt Conference and the ND Transportation Conference
- BMD Implementation Workshop
- 2-Day Quality in the Asphalt Paving Process Workshop
- Specification review recommendations meeting

Additionally, the following were developed and donated.

- Development of two "Spotlight on Pavement Density: North Dakota" 1-pagers: <https://www.fhwa.dot.gov/pavement/asphalt/matc/technical-documents.cfm#sec2>
- Donated three types of asphalt testing equipment to the University of North Dakota



Source FHWA

Impact of the Visit:

The MATC showcased a variety of mixture and field evaluation technologies to both NDDOT and the contractor which hold promise as valuable assets for enhancing the future performance of asphalt pavements. The full effect of the MATC's visit is often realized over several years, given the nature of progress. Some notable impacts from the MATC visit to-date include:

- Technicians and engineers from the central and district office materials laboratories gained exposure to and training in BMD tests, which are now routinely utilized in the NDDOT lab.
- The visit highlighted the necessity of applying accurate correction factors when using the ignition oven to determine the asphalt content of Reclaimed Asphalt Pavement correctly.
- After the MATC visit, NDDOT initiated a request for a BMD Implementation Workshop from the FHWA Resource Center.
- Inspired by the MATC's initiatives, NDDOT is contemplating the adoption of BMD into its future specifications. The FHWA Resource Center is actively assisting NDDOT with their BMD implementation by offering technical support and feedback on their BMD validation efforts. Should these advancements prolong the lifespan of North Dakota's asphalt pavements by at least a year, the potential cost savings from implementing BMD could amount to approximately \$3.5 million dollars (based on an assumed expenditure of 50 million on new asphalt pavements each year).



Source: North Dakota DOT

"We appreciate the effort that the MATC team put into the trailer visit, spec review, conference presentations and the workshop last week. Our HMA specs and procedures need some updating and all the information we gained from this experience will be a huge benefit for ND! We look forward to working with the whole MATC team more in the future."

Tyler Wollmuth, PE, Assistant M&R Engineer NDDOT
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How can the MATC help in your state?

Learn more at www.fhwa.dot.gov/matc