

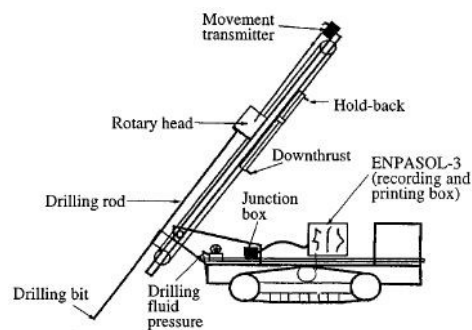
Focus on Research

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Update on NHDOT Research: New Projects Underway

“Measurement While Drilling” to Enhance Site Characterization

Geotechnical site characterization is typically based on subsurface borings where standard penetration tests (SPT) are performed at 5 to 10 foot intervals in depth. Measurement While Drilling (MWD) has the capability to continually measure and record drilling parameters during the boring operations that provides data when, combined with SPT, can produce a more thorough and accurate representation of subsurface conditions. Recognized as an underutilized site characterization tool, the FHWA EDC-5 initiative, Advanced Geotechnical Methods on Exploration (A-GaME), promotes MWD technology. NH will be evaluating the process through an upcoming SPR2 funded research project.



Typical instrumented rotary drilling rig.
Source: Gui, et al, 2002

For more information, visit:

<https://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/42372f.htm>



Principal Investigator: Jean Benoit, UNH
NHDOT Champion: Krystle Pelham



W11-3
Deer

Understanding Wildlife Vehicle Collisions

The scope or the cost of wildlife vehicle collisions (WVCs) in Hampshire is not fully understood. Through the review of available data and information from a variety of sources, this project will develop a mapping interface of WVC hot spots and summarize best management practices to effectively reduce WVCs in the NH.

For more information visit:

<https://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/42372i.htm>

Principal Investigator: Amy Villamagna, PSU
NHDOT Champion: Rebecca Martin

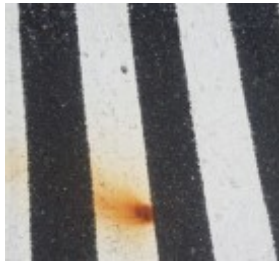


NHDOT Research Projects Strive to Improve Safety

Keeping Runway Pavement Markings White

The color of painted pavement markings at airfields is critical to the safety of airport users. White paint indicates a runway while yellow paint indicates a taxiway or aircraft parking. A previous research project determined that the staining was caused by the iron compounds in the pavement aggregate when exposed to air and water.

Various paint types, thicknesses, and additives were applied and monitored through field applications at the Laconia Municipal Airport. A stain resistant additive incorporated into the FAA specification P-620 Type II or III paint maintained the 'whiteness' of the runway pavement markings compared to paint with a rust inhibitor or no additive.



For more information, visit:

<https://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/26962t.htm>



Principal Investigator: John Gorham, Jacobs Engineering, Inc.
NHDOT Champion: Carol Niewola

Snowplow Push Frame Lighting - LED versus Halogen?

Does light-emitting diode (LED) bulbs on the push frame of snowplows provide a safety improvement over halogen bulbs? That's what highway maintainers in NH Maintenance Districts 1 and 3 wanted to find out. LED bulbs were installed on 17 plow trucks in each district and evaluated through surveys of the operators and the traveling public.



Plow operators reported:

- 98.5% better/much better visibility
- 97.8% better/much better peripheral visibility
- 70.4% less eye fatigue

No LED bulbs required replacement during the study period while halogen bulbs are typically replaced 1 to 2 times per storm. The study concluded that LED lighting improved visibility for

safer snowplow operations and resulted in reduced maintenance time and expenses.

For more information, visit:

<https://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/26962x.htm>

NHDOT Champion and Principal Investigator: Dan Fogg

Accelerated Innovative Deployment (AID) Grant for Dover, NH Update

Traffic signals at 17 intersections within Dover's Central Avenue corridor are now connected wirelessly to the City's central traffic server that consistently monitors traffic flow within the system and notifies staff when an issue arises along the corridor. The new technology also provides the ability to make real-time traffic signal programming changes within the system based on current conditions. The \$811,875 project is made possible from \$649,500 from FHWA's Accelerated Innovation Deployment (AID) Demonstration grants program administered by the NHDOT. The Automated Traffic Signal Performance Measures (ATSPM's) are the first deployed in the state and within Northern New England.



Part of the project's goal is to implement proven innovative strategies and methodologies for reducing the labor involved in managing the City's traffic signals on the north-south Central Avenue artery through automation. The new system will allow for continuous monitoring and adjusting. Part of the enhancements also includes integrating the City's central traffic management system with the NHDOT's. That will allow the Department to deploy emergency signal changes to aid traffic flow along the corridor in the event of a significant traffic accident on the Spaulding Turnpike.

Every Day Counts (EDC) Round 6 Update



Two FHWA EDC Round 6 initiatives that NHDOT plans to advance from the Development to the Demonstration stage are e-Ticketing and Targeted Overlay Pavement solutions (TOPS).

e-Ticketing: This EDC initiative seeks to improve the tracking, exchange and archiving of tickets for materials. The effort is currently focused on paving slips since some contractors already use e-Ticketing practices. NHDOT will work towards development of a centralized database and encourage e-Ticketing to the fullest extent possible.

TOPS: Selection of innovative pavement overlays can preserve NH roadways while maximizing the investment. The planned EDC Round 6 advancements are:

- **Stone Mastic Asphalt (SMA)** - specification development and a pilot project
- **Crack attenuating Mixture** - specification and consider a pilot project
- **HMA/High Performance Thin Overlay** - evaluate binder properties and monitor performance
- **Asphalt Rubber Gap Graded (ARGG)** - continue use, evaluate, revise specifications, and perform a project with the revisions
- **Bonded Wearing Course (BWC)** - continue use and monitor field performance



INNOVATIVE INITIATIVES

NH Partners in Research

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“You must be the change you wish to see in the world.”

*Mahatma Gandhi (1869-1948)
Indian lawyer, politician, social activist, and writer*



New England Transportation Consortium (NETC)

The 2021 NETC program includes the following projects:

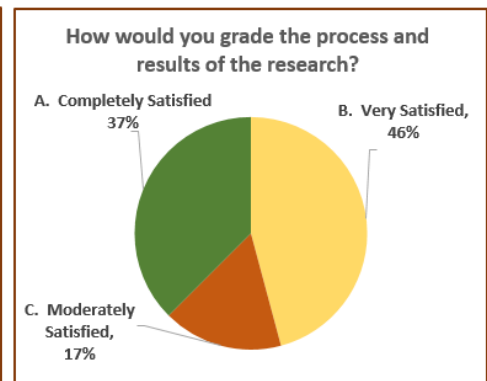
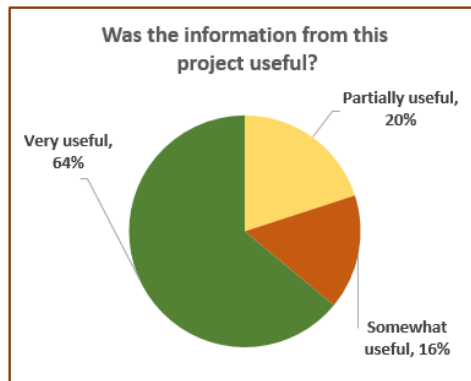
- NETC 21-1, Quality Review and Assessment of Pavement Condition Survey Vehicle Data Across New England
- NETC 21-2, Sustainable Biomass-Based Sealant for Service Life Extension of Concrete Structures and Pavements
- NETC 21-3, Initiating Seed Production for Effective Establishment of Native Plants on Roadsides in New England.



NHDOT’s **Arin Mills** will serve as the Technical Committee Chair for NETC 21-3. The project will investigate available resources for native seed and plant stock throughout the New England region focusing on the plant species identified in a 2016 NETC study, *Effective Establishment of Native Plants on Roadsides in New England*. The project will include a literature review of research on promoting pollinator habitat and a guide summarizing best practices. Follow these and other topics through the [NETC Website](#).

What is the Value of NHDOT Research?

Those who participated on an NHDOT research project’s Technical Advisory Group (TAG) since 2014 were recently surveyed about this experience. The participants were asked to rate knowledge gained, usefulness of the project, potential for implementation, whether the results of the project met their expectations, and the overall project outcome. Feedback from 25 responses, that spanned 14 research projects, is presented as follows:



84 percent found the research to be very or partially useful and 83 percent were very to completely satisfied with the project. Additionally, 65 percent of the responses categorized the results as either partially or fully implemented.

NHDOT Research Unit Website:

<https://www.nh.gov/dot/org/projectdevelopment/materials/research/index.htm>