

Focus on Research

Research Funds Provide Support for NHDOT Initiatives

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Wildlife Vehicle Collisions

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



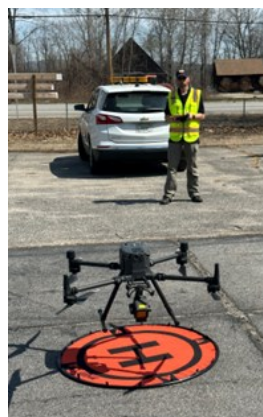
Link: <https://www.nh.gov/dot/org/projectdevelopment/materials/research/projects/42372i.htm>

Findings from this project were presented at the International Conference on Ecology and Transportation (ICOET) in Burlington, VT, June 2023, presentation titled “*Reducing WVC in the Space-Time Continuum*”.

In September 2022 the NH Research Advisory Council approved Part 2 of the WVC research effort. This follow up project will explore identified hot spots through field monitoring techniques including the use wildlife cameras, roadside mortality surveys, and scent/track stations, and develop guidance documentation.

Principal Investigator: Amy Villamagna, PSU

NHDOT Champion: Rebecca Martin, Environment



An Unmanned Aircraft Systems (UAS) Program Plan for New Hampshire

A UAS program plan that outlines the organizational structure and program requirements to support implementation of this technology is being developed. Geared toward facilitating deployment of UAS in the day-to-day operations at NHDOT, tasks will include review of existing research, technology needs, budgetary requirements, and development of an internal policy and safety plan.

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

Principal Investigator: WSP USA, Inc.

NHDOT Champion: Carol Niewola, Aeronautics



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Engineered Log Jam Monitoring results in Cost Savings for NHDOT

A first for New Hampshire, an engineered log jam (ELJ) was incorporated into a steambank stabilization project along NH 16 in Errol, NH. The ELJ provided the benefit of a natural instream structure and cost savings over a conventional system. The layered installation included log members, with and without root balls, stone ballast, and a surface landscaping. NHDOT Research engaged the University of New Hampshire to perform the required pre- and post-construction monitoring and documentation. The final report for the project documents the hydrologic and environmental aspects of the ELJ and is available via the following link.



**University of
New Hampshire**
College of Engineering
and Physical Sciences

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

Principal Investigator: Dr. Tom Ballestero, UNH

NHDOT Champion: Tobey Reynolds, Asst. Director of Project Development

Bus Stops and Passenger Amenities in Public Highway Rights-Of-Way

New Hampshire public transit providers have bus stops, transit amenities, and way finding signage within public highway rights of way (ROW), including state-maintained ROWs. This project provided for researching and formalizing the process by which a transit provider can receive approval to implement stops and other transit amenities. Procedures and tools for evaluating and managing the installation and maintenance of these facilities were developed. The project final report includes an overview of existing systems, best practices, and a summary of the design sprint that led to the recommendations.



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

Principal Investigator: Cambridge Systematics, Inc.

NHDOT Champion: Shelley Winters, Director of
Aeronautics, Rail & Transit



Every Day Counts (EDC) Round 7

EDC Round 7 (2023-2024) is underway. The following two initiatives were identified for advancement at the New Hampshire EDC Caucus.



◆ **Enhancing Performance with Internally Cured Concrete (EPIC²)**

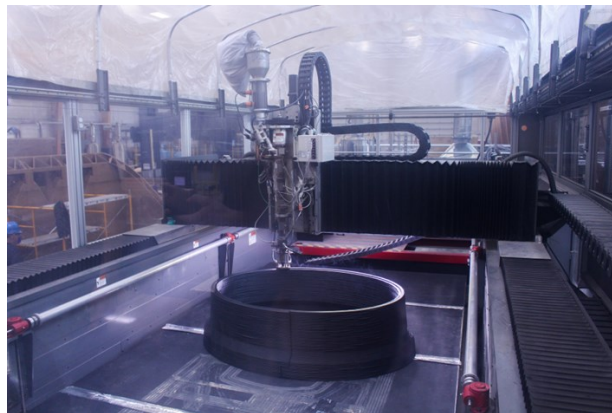
NHDOT Bridge Maintenance will partner with UNH to pursue EPIC² as part of an upcoming NHDOT/UNH SPR2 research project. The impact of internally cured concrete will be assessed through demonstration bridge deck and curb projects.

◆ **Strategic Workforce Development**

This initiative is a continuation from EDC-6 and will involve exploration of partnerships with stakeholders, on-the-job training opportunities, and practices that other entities are using that could benefit New Hampshire.

State Transportation Innovation Council (STIC)

Building on a Maine DOT research project, 2021 STIC funding provided for the inclusion of a culvert diffuser in a NHDOT project. The design incorporates an alternate solution for a pipe rehabilitation project in Exeter, NH. The design includes a 3D printed diffuser at the outlet, providing an estimated 40 percent increase in outlet capacity. The innovative method of 3D printing was used to manufacture the diffuser at the Advanced Structures and Composites Center and Transportation Infrastructure Durability Center (TIDC) at the University of Maine, Orono, ME.



3D printing of the culvert diffuser at the University of Maine in Orono, ME
Source: TIDC

The New Hampshire STIC and FHWA has approved two 2023 projects.

◆ **BMD of Asphalt Pavement through IDEAL-CT and IDEAL-RT Testing**

NHDOT Bureau of Materials and Research successfully applied for 2023 STIC funding for the purchase of a testing equipment to be used to introduce the Bituminous Unit to asphalt Balanced Mix Design practices. Technicians will be able to perform tests in the laboratory to examine how variation of a mix design characteristic may improve cracking performance without introducing a detrimental amount of rutting.

◆ **Workforce Outreach Strategy for Public Works**

Associated with EDC-7, Strategic Workforce Development, this UNH Technology Transfer Center (UNH T2) and NH LTAP project will develop and purchase a trade show booth designed to raise awareness of public works and transportation careers. The booth will be made available to municipalities for area events.

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*“Persist and
persevere, and
you will find
most things
that are
attainable,
possible.”*

Philip Stanhope
(1694-1773)

14th Earl of Chesterfield
British statesman
and Diplomat

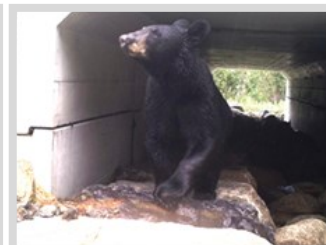
New Hampshire
DOT
Department of Transportation

Culvert Replacement Improves Wildlife Connectivity

The invert of the box culvert contains flat stones for the wildlife shelf and round stones with gravel infill for stream simulation.

Habitat fragmentation threatens the long-term sustainability of wildlife populations. In 2009, NHDOT and The Nature Conservancy (TNC) began addressing landscape connectivity across northern Vermont and New Hampshire. This project helped restore aquatic connectivity in the Connecticut River Valley by replacing a deteriorated culvert across US 3 in Stratford, NH, a high priority site for Eastern brook trout and multiple mammal species that reside in the area.

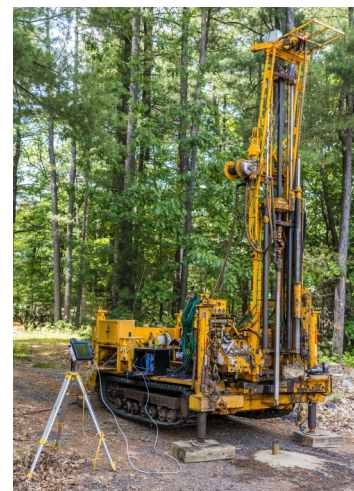
The bottom of the culvert was specifically designed to provide for aquatic passage through a low flow channel and for mammal passage via a wildlife shelf. Six months of wildlife camera trap monitoring confirmed that the culvert is regularly used by small mammals under US 3, enhancing safe passage for aquatic and terrestrial species and safety for drivers. This project was presented at the EDC Round 7 Summit Showcase held in February 2023.

***National Impact of Measurement While Drilling (MWD) Research***

Knowledge gained from a NHDOT/UNH research project supports an MDW Users Group, established in collaboration with FHWA in October 2021, and contributed to 2023 TRB workshop, “Exploring Measurement While Drilling for Transportation Projects”. MWD is a geotechnical exploration technique where, in real time and continuously, drilling operations and performance are monitored and data is recorded during the drilling process.

Link to MWD Users Group information:

[Measurement While Drilling \(MWD\) Users Group - DFI](#)



NHDOT Research Unit Website:

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