VERMONT
AGENCY OF TRANSPORTATION

FACT SHEET

2018 Research Symposium & STIC Annual Meeting

Implementation of Intelligent Compaction for Pavement Construction in Vermont

RESEARCH PROJECT TITLE

Implementation of Intelligent Compaction for Pavement construction in Vermont

STUDY TIMELINE

January 2108 – December 2019

INVESTIGATORS

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VTRANS CONTACTS

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This fact sheet was prepared for the 2018 VTrans Research and Innovation Symposium & STIC Annual Meeting held at the State House in Montpelier, VT, on **September 12, 2018** from **8:00 am– 1:00 pm**.

Fact sheets can be found for additional projects featured at the 2018 Symposium at

http://vtrans.vermont.gov/planning/research/2018symposium

Additional information about the **VTrans Research Program** can be found at http://vtrans.vermont.gov/planning/research

Additional information about the **VTrans STIC Program** can be found at http://vtrans.vermont.gov/boards-councils/stic

Problem Statement

Poor compaction of roadway base and sub-base can cause various types of deterioration/failure, which can consequently increase the cost of maintenance and rehabilitation. Non-uniformity and inconsistency of compaction are the most prevalent problems associated with conventional compaction techniques. The density-based QC and QA practices for compaction evaluation (spot tests) typically cover less than 1% of the compacted area. Therefore, it is highly desirable to transition from the current density-based acceptance practice to stiffness-based inspection practice. Intelligent compaction (IC) is an innovative technology that can optimize the construction time, improve uniformity and consistency of compaction, and provide a system wide stiffness-based inspection practice. Additionally, IC implementation allows for real-time monitoring and making informed decisions on proper course of action during compaction. The goal of this study is to assess the suitability of IC implementation in Vermont projects and provide recommendations that can be incorporated into work-plans for local contractors.

Methodology or Action Taken

At the initial phase of the project, IC data from the Bethel-Stockbridge roadway reconstruction was analyzed using R statistic platform and Veda software. The main objective of this phase was to have a more advanced interpretation of IC data and addressing the challenges of identifying a meaningful correlation between IC measurement values (ICMVs) and conventional spot-test measurements. In the second phase of the project (on-going), IC tests and spot test measurements (DCP and NG) are being conducted at VT 117 road.

IC Roller Testing

DCP Testing

Next Steps

Upon completion of the current phase, the collected data will be analyzed to evaluate the IC roller performance and compare the spot test results with IC data by developing correlations. Then, guidelines and recommendations will be provided for VTrans and local contractors that can be helpful in future implementation of IC.

Potential Impacts and VTrans Benefits

The proposed research will provide the Agency with: (1) better understanding of IC implementation in pavement construction; (2) gaining confidence and experience in the technology; (3) more quantitative measures for implementing IC in future construction projects; (4) better assessment of improved pavement performance over time; and (5) a framework to incentivize contractors to use IC as a QC tool to improve the end product, which in turn helps the Agency to better serve the public.