VERMONT
AGENCY OF TRANSPORTATION

FACT SHEET

2018 Research Symposium & STIC Annual Meeting

Radio Frequency Identification (RFID) Technology for Asset Management

RESEARCH PROJECT TITLE

Radio Frequency Identification (RFID) Technology for Transportation Asset Management

STUDY TIMELINE

September 2018 – February 2020

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

Introduction

Traffic signage management is an important part of transportation asset management from an inventory management perspective. Signage management involves several key steps, such as locating signs and guardrail end terminals, checking their physical integrity and replacing those compromised or damaged, and recording their attribute data, as well as taking any other necessary actions. To implement these steps, a unique ID is assigned to each sign to facilitate interrogation, recording, and management operations of the signage data effectively. Traditional barcoding technology is ineffective due to its labor-intensive operation, lack of remote sensing ability, and easy susceptibility to performance degrading contaminations. In this study, we are exploring using radio frequency identification (RFID) as a novel technique to overcome limitations and achieve higher efficiency and efficacy of the operations.

Methodology

This project will fulfill the following research objectives:

1) To investigate a vehicle-mounted RFID reader that performs remote RFID tag data interrogation from a moving vehicle.
2) To investigate a handheld RFID reader that provides the additional flexibility of close range traffic signage interrogation.
3) To investigate and evaluate RFID tags that can withstand harsh environmental conditions and can operate reliably on materials of different dielectric properties.
4) To investigate the effectiveness of remotely scanning RFID tags mounted on traffic signs, with a focus on guardrail terminals.
5) To develop a comprehensive database to support the RFID-based traffic signage management.

RFID kit and traffic sign scanning experiment

Conclusions and Future Steps

This project began in September 2018. We expect that this project will allow us to fully explore the capabilities of RFID technology in traffic signage management applications going forward.

Potential Impacts and VTrans Benefits

A successful completion of the project will advance the VTrans transportation asset management capabilities, reducing costs while enhancing the efficiency and efficacy of the transportation services. The developed techniques seek to overcome challenges stemming from *mobile* RFID systems and will have broad impacts beyond the State of Vermont.