VERMONT
AGENCY OF TRANSPORTATION

FACT SHEET

Advanced Geotechnical Methods of Exploration (A-GaME) Implementation

PROJECT TITLE
Advanced Geotechnical Methods of Exploration (A-GaME) Implementation

STUDY TIMELINE
Dec 2019 – Ongoing

VTRANS CONTACTS
Stephen Madden, Geotechnical Engineer

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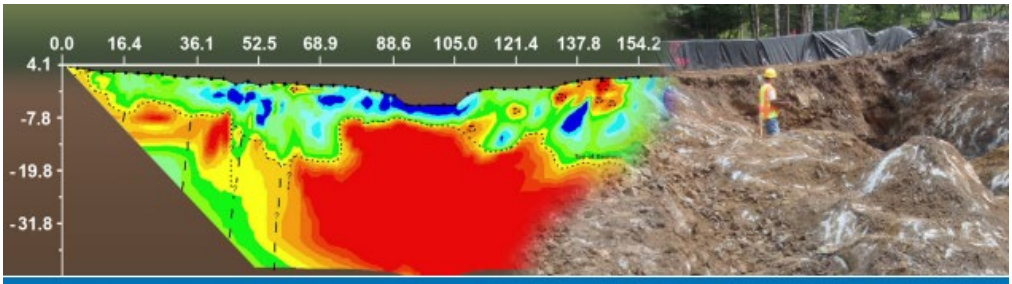
This fact sheet was prepared to highlight recent Accelerated Innovation Deployment (AID) Grants and State Transportation Innovation Council (STIC) Incentive Awards.

More information about the VTrans Research Program, including additional Fact Sheets, can be found at: http://vtrans.vermont.gov/planning/research

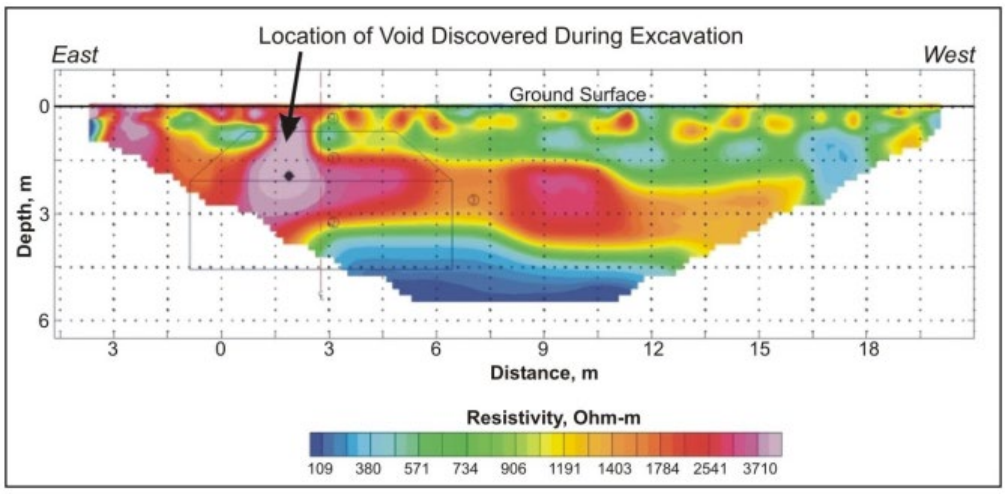
Introduction or Problem Statement

FHWA is encouraging State DOT's to increase their awareness and usage of underutilized technologies, including geophysical techniques, to supplement information obtained during traditional subsurface exploration programs. Differing site conditions due to variability of bedrock elevation, groundwater elevation, and stratigraphy profiles can result in increased risk and cost during construction. By optimizing geotechnical site characterization with proven, effective exploration methods and practices, we can mitigate risks and improve reliability of information. This AID grant focuses on assisting VTrans in bringing these underutilized technologies into our toolbox for use during the preliminary phase of a project.

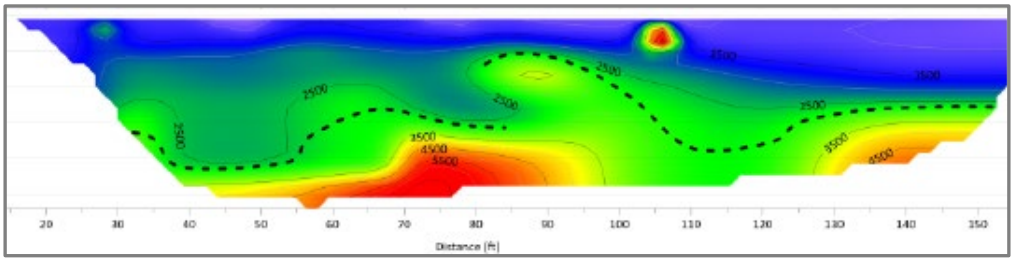


Geophysical profile showing variability in bedrock surface, confirmed during excavation.

[1]https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/advanced-geotech-factsheet.pdf



[2] https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/docs/advanced-geotech-slides.pdf



SEISMIC RIPPABILITY CROSS-SECTION

[3] VTrans project: Pittsford VTRY(12) Geotechnical Engineering Report, prepared by Terracon Consultants, Inc. 1/10/2019

Methodology or Action Taken

Research is ongoing into different Ground Penetrating Radar (GPR) antenna's that could potentially suit the Agency's needs as they relate to void detection, most likely caused by failing culverts. Vendor's have been asked to provide information on the equipment that they have available and discuss the potential applications, limitations, and costs. Independent contractors have been identified that can provide a workshop/training course for VTrans staff that demonstrates the capabilities of various equipment and tools.

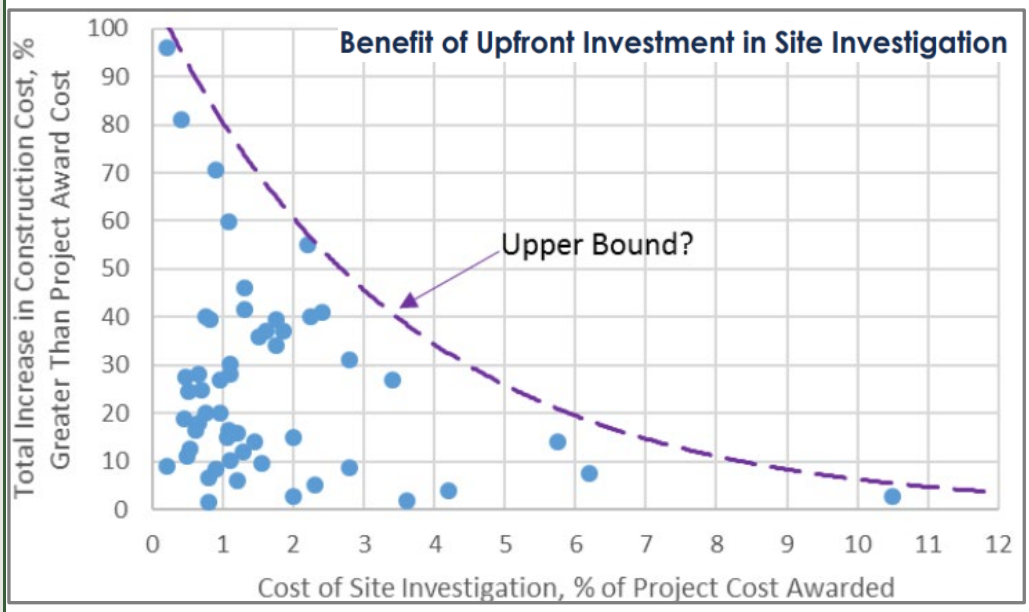
Conclusions or Next Steps

Objective is to educate VTrans staff on geophysical tools and the various applications where technology can be deployed (through workshops/peer exchange). The Geotechnical Section is hoping to develop an in-house manual that provides guidance and outlines risks, limitations, and benefits of each of the applications. Stephen Madden will act as VTrans 'A-GaME Champion' and will attend a National Champion Workshop hosted by FHWA, the purpose of which is to facilitate coordination amongst states, share experiences and success stories, and remove barriers to deployment and implementation.

Potential Impacts and VTrans Benefits

Up to 50 percent of major infrastructure projects experience cost or schedule impacts due to geotechnical related issues. Increased awareness of the capabilities of underutilized technologies should result in improved site characterization and identification of potential issues, and maximum return-on-investment from subsurface investigations.

- **Improved Quality** – Increasing confidence in site characterization reduces conservatism in design.
- **Reduced Risk** – Reduced uncertainty mitigates risk in design and construction. Making decisions with limited information can result in costly overruns and claims in construction.
- **Accelerated Project Delivery** – Well-scoped subsurface investigations provide more reliable basis for design and construction decision making, providing time and cost savings to the Agency.



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