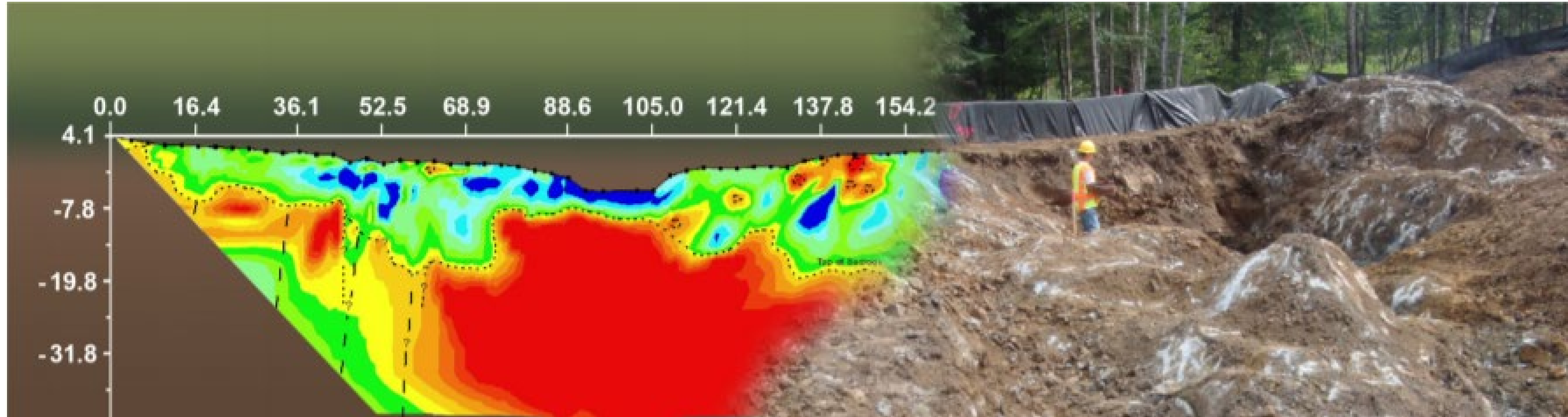


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## Introduction

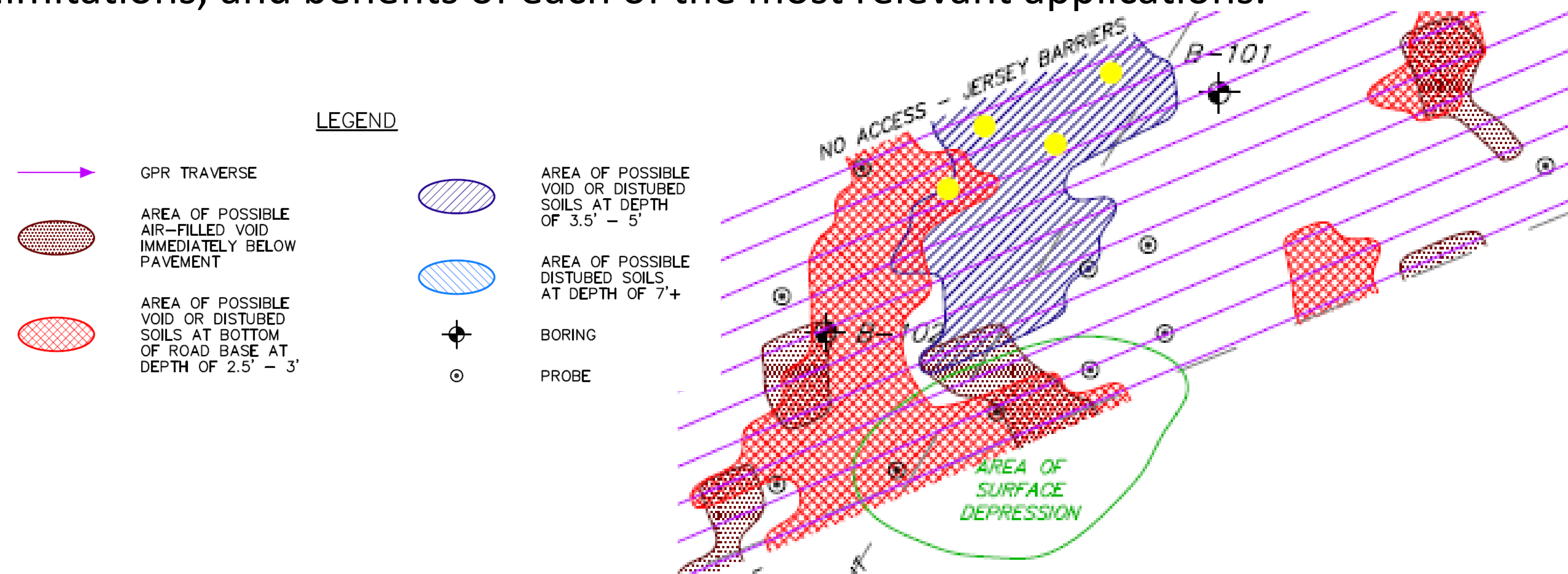
FHWA is encouraging State DOT's to increase their awareness and usage of **underutilized technologies, including geophysical techniques**, to supplement information obtained during traditional subsurface exploration programs. By optimizing geotechnical site characterization with proven, effective exploration methods and practices, **we can mitigate risks and improve reliability of information.**



**Figure 1:** Geophysical profile showing variability in bedrock surface, confirmed during excavation

## Increasing Awareness

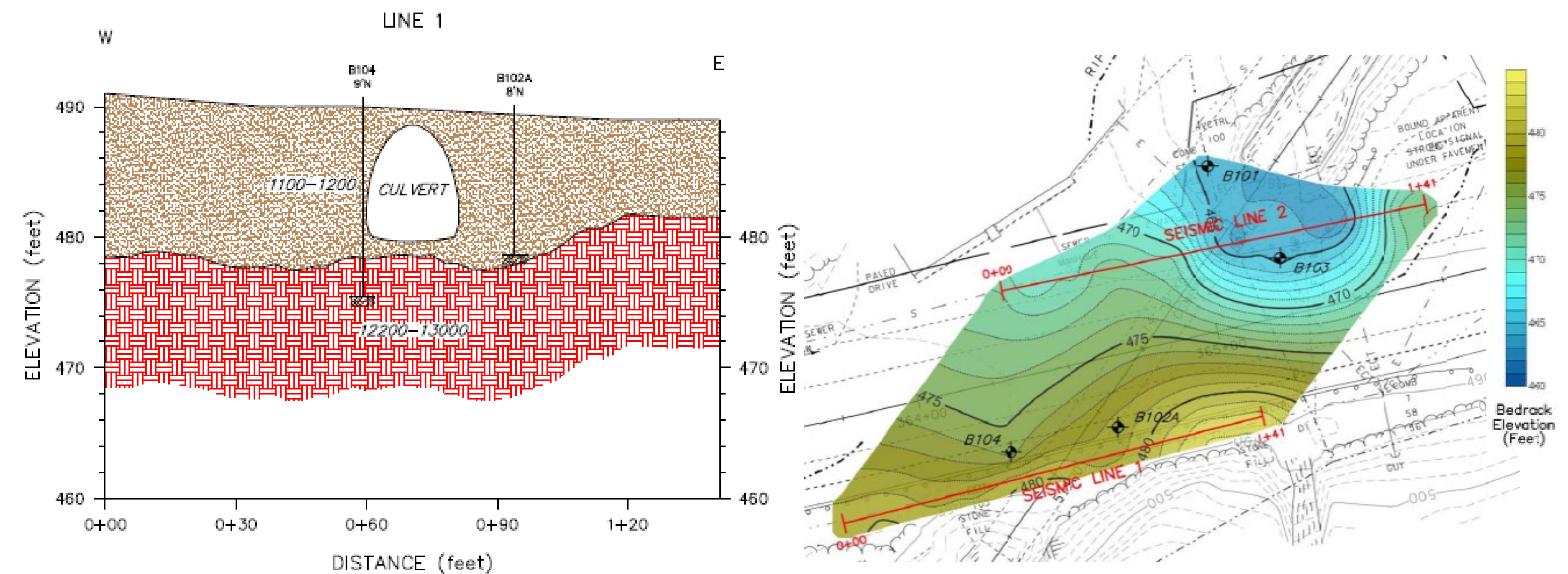
Objective is to educate VTTrans staff on geophysical tools and the various applications where technology can be deployed. The Geotechnical Section is hoping to develop an in-house manual that provides guidance and outlines risks, limitations, and benefits of each of the most relevant applications.



**Figure 2:** Output of results from Ground Penetrating Radar (GPR) survey performed to identify voids below roadway

## In-house Surveying

Research is being conducted into **Multichannel Analysis of Surface Waves (MASW)** survey equipment with the goal of performing seismic data acquisition in-house, which would **improve profiling of bedrock elevations during subsurface investigations.**



**Figure 3:** Results of seismic refraction survey (left) and combined GPR/seismic refraction survey (right) profiling bedrock elevation under existing roadway

## Potential Impacts and VTTrans Benefits

- **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.

## More Information

FHWA EDC-5 A-Game website:

[https://www.fhwa.dot.gov/innovation/everydaycounts/edc\\_5/geotech\\_methods.cfm](https://www.fhwa.dot.gov/innovation/everydaycounts/edc_5/geotech_methods.cfm)

NCHRP Synthesis 484: Influence of Geotechnical Investigation and Subsurface Conditions on Claims, Change Orders, and Overruns:

<http://www.trb.org/Publications/Blurbs/173907.aspx>