SHRP2 SOLUTIONS
TOOLS FOR THE ROAD AHEAD

Utility Investigation Technologies (R01B)

Advancing technologies to help agencies detect subsurface utilities

Challenge

Many transportation agencies nationwide outsource subsurface utility detection to contractors/consultants. While there are numerous qualified subsurface engineering firms throughout the country, agencies and their partners may not be abreast of the rapidly advancing technologies. Some agencies also struggle with scoping the work needed for subsurface utility detection, and measuring the performance of the outcomes. Education and tools are needed to help agencies scope utility locating work appropriately, and to encourage contractors/consultants to use the best available technology.

Solution

Advanced technologies were explored that contribute to a multi-sensor approach that offers subsurface utility engineers and geophysical service providers the best chance at completely and accurately detecting, locating, and characterizing subsurface utilities.

Two advanced utility identification technologies will be tested by agencies as part of their Proof of Concept pilots. The first is Multi-Channel Ground Penetrating Radar (MCGPR). Due to attenuation of MCGPR signals in clay or otherwise conductive soils, only a portion of the United States is suitable for effective MCGPR work according to the Natural Resources Conservation Service of the United States Department of Agriculture. See the NRCS soil suitability for GPR, and please note that actual site conditions in built-environments may vary from the NRCS maps.

The second utility technology is Time Domain Electromagnetic Induction (TDEMI), which can work in highly conductive soils and identify metal utilities or utilities that are installed with a metal tracer wire.

What is most successful, is the combination of a variety of geophysical technologies to obtain a more complete and accurate assessment of underground utilities. Limitations in the technologies indicate that careful considerations needs to be taken in regard to soil type, the terrain and other geophysical attributes to determine which technologies of a multi-sensor system are proper for each applicant's implementation.

Agencies that apply for implementation assistance will receive technical assistance to help develop their ability to implement Subsurface Utility Engineering (SUE) technologies to improve the return on investment, and establish standard means and methods to incorporate SUE across agency departments and among stakeholders.

Benefits

Knowing the location, depth, and important attributes of utilities enables more efficient and productive coordination with utility owners during the design process helps minimize utility conflicts, and can save lives, money, and time through the sustainable application of SUE technologies.

Save Lives

Prevent serious injuries or loss of life by minimizing accidental strikes with high pressured gas, electrical lines, or other dangerous utilities by accurately identifying the utility location.

Save Money

Eliminate or reduce costly utility relocations, or costs related to delays from construction or from loss of utility services.

Save Time

Minimize delays in project delivery from utility strikes and relocations during construction and enables agencies to identify utility conflicts earlier in the process.

RENEWAL

One of four SHRP2 focus areas, Renewal products help transportation organizations rapidly build and restore highway infrastructure that lasts longer while minimizing user disruption and delay.

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Visit: www.fhwa.dot.gov/GoSHRP2
Learn more about products, case studies, and implementation assistance.

The Implementation Assistance Program

Implementation assistance is available to help State departments of transportation (DOTs), metropolitan planning organizations (MPOs), and other interested organizations deploy SHRP2 Solutions. A range of opportunities is available to raise awareness of SHRP2 Solutions and to encourage early adoption of these products. Application periods are offered approximately twice per year. Each product selected for implementation assistance has the potential to deliver more efficient, cost-effective programs to meet the complex challenges facing transportation today.

How can you learn more?

Visit: www.fhwa.dot.gov/GoSHRP2

- Additional product information
- Information about how this product is being used in the field
- Contact information for peers who are familiar with this product
- Links to research reports

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About SHRP2 Implementation

The second Strategic Highway Research Program (SHRP2) is a partnership of the Federal Highway Administration (FHWA), the American Association of State Highway and Transportation Officials (AASHTO), and the Transportation Research Board (TRB). TRB completed the research, and now FHWA and AASHTO are jointly implementing the resulting SHRP2 Solutions that will help the transportation community enhance productivity, boost efficiency, increase safety, and improve the reliability of the Nation's highway system.