

Concrete Bridge Deck Deterioration Assessment Using Ground Penetrating Radar

Purpose of the Project

The purpose of the project is to expedite the use of ground penetrating radar (GPR) for concrete bridge deck inspection, and to automate the extraction, visualization, and documentation of bridge deck deterioration information with enhanced reliability and accuracy for TDOT’s bridge asset management.

Scope and Significance

The scope of the research project includes:

- Develop a protocol for GPR data collection and document the best practice of using GPR to survey concrete bridge decks.
- Develop tools to automate the detection, localization, and characterization of concrete bridge deteriorations from GPR scans based on signal and image processing techniques.
- Develop tools to visualize the bridge deck deterioration information extracted from GPR scans.
- Prepare workshops and training materials including user manuals for TDOT.

Expected Outcomes

The following are expected outcomes of this research project:

- This research expedites the use of GPR to rapidly and accurately assess concrete bridge deck deterioration, thus providing TDOT sufficient and timely information for preventive maintenance. The lifespan of bridges can be extended and life-cycle costs can be reduced.
- The developed tools will allow TDOT in-house staffs to process and interpret the collected GPR data with very limited manual efforts, which will significantly reduce the person-hours for processing non-intuitive GPR scans. It also eliminates the unnecessary outsourcing expenses. The developed tools can visualize the bridge deck information in an easy-to-understand manner to help TDOT to prepare and justify bridge maintenance strategies.
- The research products will help TDOT to strengthen TDOT’s leading role in bridge condition assessment and research innovation.

Time Period

The time period for the project is 24 months.

Contact Information

<p>Principal Investigator (PI): Shuai Li Department of Civil and Environmental Engineering University of Tennessee, Knoxville 851 Neyland Dr., Knoxville, TN. Phone:865-318-9372 Email: Sli48@utk.edu</p>	<p>TDOT Lead Staff: Brian Egli Structures Division Phone:615-532-2309 Email: Brian.Egli@tn.gov</p>
---	---