

## **Infrasense Maps Conditions of Bridge Deck in New Haven, Connecticut Using Ground Penetrating Radar**

*Infrasense, Inc., a national leader in infrastructure nondestructive evaluations, recently carried out subsurface condition investigations for a bridge deck in New Haven, Connecticut. Ground penetrating radar (GPR) data was collected at driving speeds and then analyzed to quantify and map deterioration in the deck.*

([PRWEB](#)) December 13, 2016 -- Infrasense, Inc., a national leader in infrastructure nondestructive evaluations, recently carried out deterioration mapping for a bridge deck carrying Interstate 91 over the Amtrak railroad line in New Haven, Connecticut. The deterioration mapping was performed on the nearly 36,000 square foot bridge using vehicle-mounted high-speed ground penetrating radar (GPR) to scan without requiring lane closures and with no disruption to traffic flow. The GPR data was used to produce deterioration maps and to locate cores for compressive strength testing and chloride sampling. The results of GPR scanning, core compressive strength testing, and chloride sampling provided a comprehensive condition assessment of the bridge deck, including deterioration quantities. These results will be used to plan future rehabilitation efforts.

Ground penetrating radar (GPR) data is collected at highway speeds to estimate rebar depth, corrosion conditions and deteriorated concrete. The GPR data is collected in a series of lines spaced 3 feet transversely across the width of the deck, with each line representing a cross sectional slice of the deck at a particular offset. Decks in good condition consist of strong and uniform radar reflections from the rebar. GPR data with weak and inconsistent reflections indicate rebar-level deterioration in the bridge deck. Infrasense uses its own proprietary software to analyze and map this data to provide comprehensive results for its clients.

Infrasense has previously performed bridge deck condition evaluations using high-speed GPR on other complex bridges and interchanges in Connecticut. In early 2015, Infrasense performed bridge deck condition evaluations on [the Sisson Avenue interchange](#) on I-84 outside of Hartford using high-speed GPR. In 2014, Infrasense scanned [the complex "Waterbury Stacks,"](#) including numerous ramps connecting I-84 and Route 8, without any disruption to normal traffic flow.

[A 2012 study](#) carried out by an independent consultant for MnDOT evaluated the accuracy of Infrasense's GPR results provided to the Minnesota DOT. The study compared the predicted quantities for 12 decks surveyed by Infrasense against subsequent construction repair quantities. The study found that, on average, Infrasense's predicted deterioration quantities were within 3.5 % of the documented construction quantities.

Ground penetrating radar surveys provide transportation agencies with accurate and comprehensive bridge deck condition information, enabling effective preservation, rehabilitation, and replacement decisions. With large bridge deck inventories, highway agencies have primarily relied on visual inspection at the network level. Since the mechanisms of deterioration occur below the surface, their manifestations are not readily seen in the visual inspections. As a result, visual deck assessments are often inaccurate, and do not provide a sound basis for planning repair and rehabilitation.

Traditionally, highway agencies have employed sounding (chain or hammer) to identify delaminated areas for project-level rehab. Although sounding has proven reliable, the labor and closures required for a sounding survey makes it prohibitive for obtaining data of a large number of decks. Also, sounding is not effective when there is an asphalt overlay. In response to these limitations, a number of highway agencies have utilized



alternative methods such as ground penetrating radar.

#### About Infrasense, Inc.

Since 1987, Infrasense, Inc. has applied state-of-the-art technologies to address the most difficult challenges in subsurface scanning. Infrasense's engineers are able to nondestructively extract critical information from a diverse range of structures. In addition to providing ongoing subsurface evaluation services to clients across the country, the firm has also conducted numerous research programs to advance the field of subsurface detection and non-destructive evaluation.



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