BridgeScan

Complete Bridge Condition Assessment System

BridgeScan™ is a complete, affordable GPR system that provides an effective tool for quickly determining the condition of aging bridge decks, parking structures, balconies and other concrete structures. The system is also used to obtain accurate concrete cover depth on new structures. With BridgeScan, repair costs can be estimated correctly, saving time and money.

Typical Uses

- Bridge deck condition assessment
- Concrete cover depth on new structures
- Concrete inspection – locate metallic and non-metallic targets in walls/floors
- Measure slab thickness
- Void detection and location
- Inspection of other reinforced concrete structures

Acquire Data

- Identify areas of deterioration inside reinforced concrete within bridge decks, parking structures, balconies, etc.
- Obtain accurate concrete cover depth and overlay thickness

Deliver Results

- Convenient self-contained cart-based design
- Integration with GPS
- Application specific software for bridge deck condition assessments

Value

- Flexible system for concrete inspection and utility mapping applications
- Save money - Estimate structural condition accurately
- Two-year warranty

GSSI

www.geophysical.com

BridgeScan Solutions

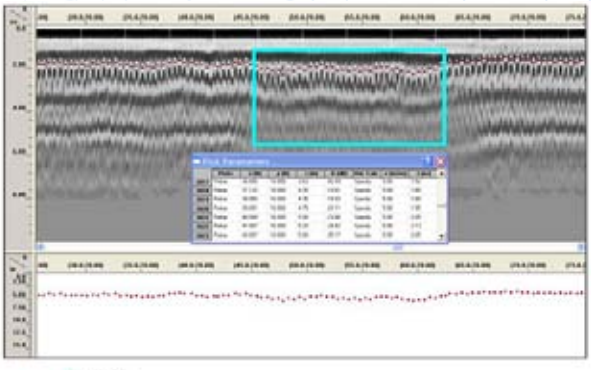
The American Society of Civil Engineers reported that as of 2009, 26% of the nation's bridges remain structurally deficient or functionally obsolete (ASCE, 2009).

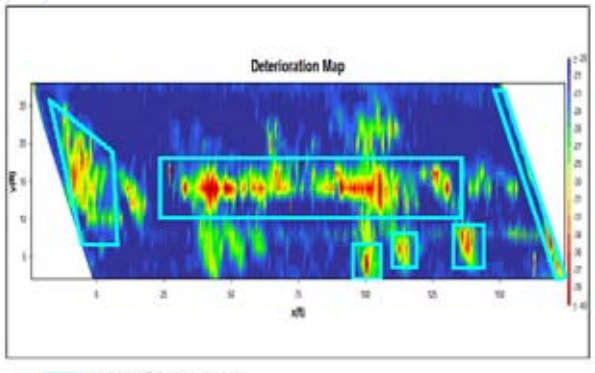
Traditional bridge deck inspection methods, like hammer soundings and chain dragging, rely on a person to interpret acoustical feedback to determine good and bad areas of concrete. Existing asphalt overlays must be removed prior to using these methods, and results vary depending on the operator's technique and interpretation of results. Assessment data normally consists of areas of the deck marked simply good or bad.

The application of GPR provides accurate condition assessment of bridge decks as well as other reinforced concrete structures. Hundreds of bridge decks have been evaluated using GPR.

Bridge Deck Condition Assessments

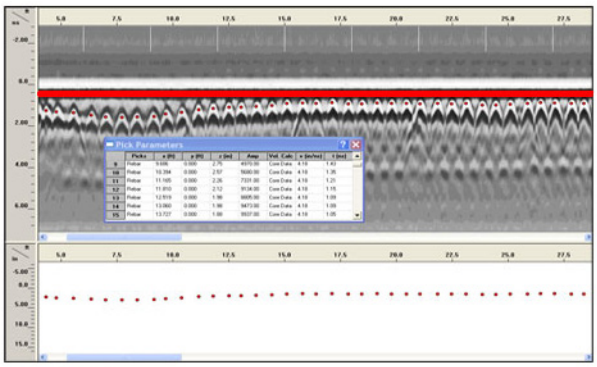
Engineers and transportation professionals need a reliable method to collect quantitative data on bridge decks. GSSI's BridgeScan is designed for bridge condition assessment, providing for accurate representation of the bridge data by automatically accommodating for bridge skew angle.





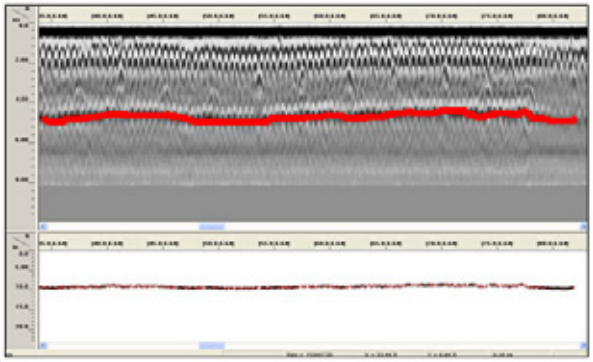
Concrete Cover Assessments

Engineers use concrete cover information to determine if reinforcement bars are protected from environmental effects. Transportation infrastructure professionals use BridgeScan to identify areas in which the cover is non-compliant.



Measure Bridge Deck Thickness

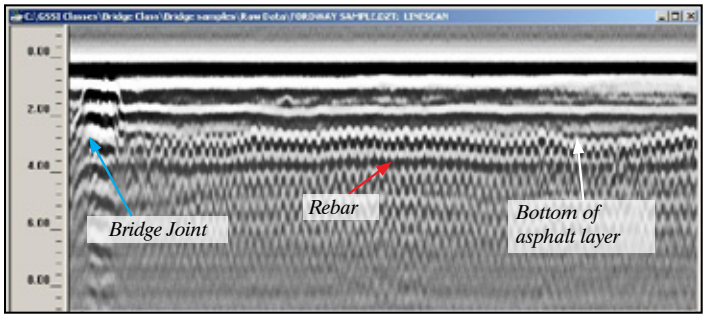
Ground penetrating radar provides a nondestructive technique for transportation professionals in evaluating bridge deck thickness. GPR can obtain reliable thickness measurements in minutes and eliminate the need to core.



BridgeScan Procedure

1 Data Collection

Collect the bridge data using a grid pattern and single lane closure.

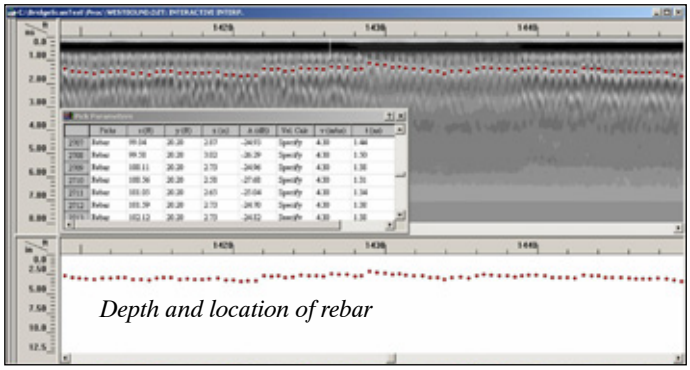


Raw data - asphalt overlaid bridge deck

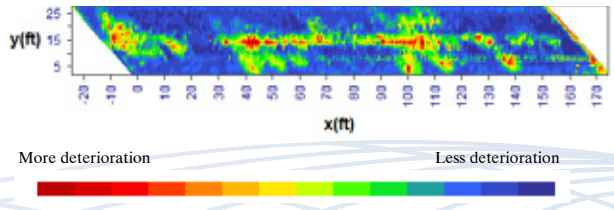
2 Data Processing

Interactive Interpretation Mode

Post-process the GPR bridge data in specially designed software to account for bridge skew angle.



Depth and location of rebar



3D BridgeScan data displayed with DPlot® software

BridgeScan Flexibility

The BridgeScan flexibility allows you to convert the system—no new data collection software needed. Use the same control unit for multiple applications.

Concrete Scanning and Inspection

Use ground penetrating radar to locate embedment within concrete structures prior to cutting or coring. Collect quantifiable data on rebar location and areas of delamination.

Utility Locating and Mapping

Construction professionals, utility locators and engineers can locate the depth and position of metallic and non-metallic pipes in real time using the GSSI UtilityScan. GPR can enhance one's overall understanding of subsurface targets and obstructions.

BridgeScan System Includes

- SIR-3000 control unit
- 1600 MHz antenna
- Survey cart with encoder wheel
- 2 meter control cable
- Transit case
- 2 batteries and charger
- AC adapter
- User manual
- Sunshade
- Training (at GSSI: NH or CA)

Control Unit Specifications

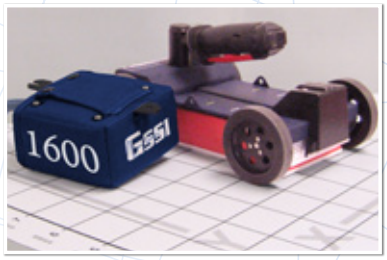
- Image Capacity: Internal: 500 2'x2' data images
- External Memory: Based on Compact Flash size
- Internal Memory: 2 GB
- Display: 8.4", full-color, 800x600 resolution
- 64K colors, clearly visible in sunlight
- Post-processing: On-screen
- Battery: Internal (3 hours), 10.8 VDC
- Ports: RS232, Compact Flash memory
  USB master & slave
- Environmental: Water-resistant

www.geophysical.com • sales@geophysical.com
12 Industrial Way • Salem, NH 03079-2837
Tel: (603) 893-1109 • Fax: (603) 889-3984

Bridge Deck Inspection Solutions

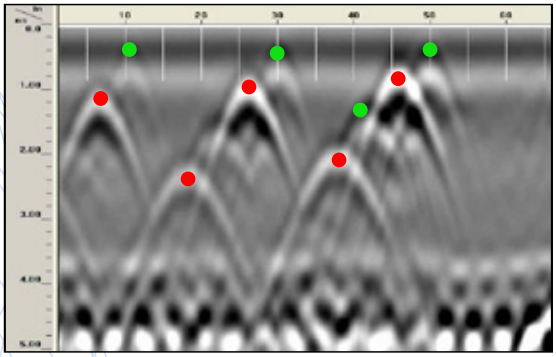
1600 MHz: General Purpose Antenna

The 1600 MHz is a high-resolution, all-purpose antenna used to inspect concrete structures to locate embedded rebar, post tension cables and conduits. It is used on bridge decks for condition assessment and to determine concrete cover.



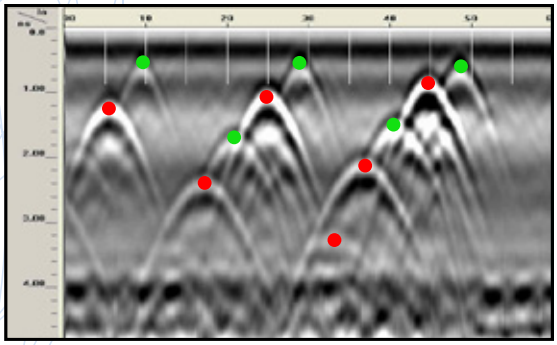
Depth Range: to 18 in (0.5 m)

1600 MHz



- Rebar
- PVC

2600 MHz



Concrete slab with rebar and PVC conduit, same slab for both data sets.

- Rebar
- PVC

Other Antenna Solutions

2600 MHz: High-Resolution Antenna

The 2600 MHz is an ultra-high resolution antenna used to inspect concrete structures to locate embedded rebar, post tension cables and conduits.
Depth range is to 12 inches (0.4 m).

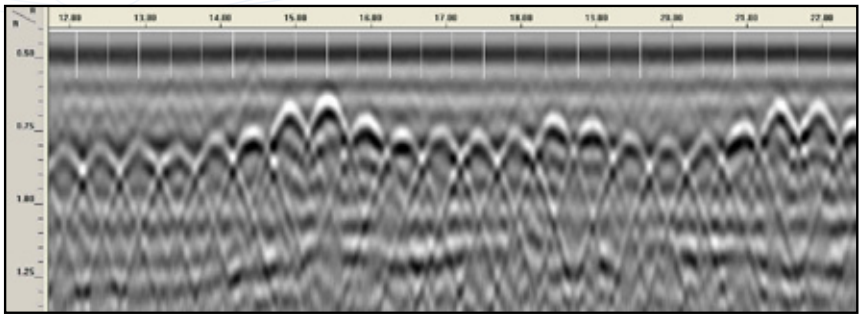
2000 MHz: Palm Antenna

The new Palm Antenna offers users the ability to reach tightly spaced areas that were previously inaccessible such as corners, against walls and around obstructions.

The Palm Antenna is compatible with the SIR-3000 and SIR-20 control units. The antenna includes a dedicated survey wheel, a replaceable skid plate, and removable handle to reduce antenna height, if necessary. The Palm Antenna weighs in at approximately one pound.

Depth Range: to 12 in (0.4 m)

2000 MHz Palm



6" spacing wire mesh in concrete.

www.geophysical.com

Software Solutions: Bridge Assessment

RADAN Software

RADAN™ is GSSI's post-processing software. With its modular design, this program allows users to select the processing functions that best suit their needs.

RADAN is Windows™ based, providing a familiar and easy-to-use environment for all levels of experience.

Map Bridge Deck Deterioration with RADAN's Bridge Assessment Module

RADAN's Bridge Assessment Module provides powerful post-processing features for GSSI's BridgeScan data. Features include:

Automatic File Management

- By design, combines all 2D files into a single 3D file for easy interpretation.

Ability to Coordinate Data

- Synchronizes all files based on location of bridge joint. This makes initial data collection quick and adds increased accuracy in survey area.

Easy Data Processing

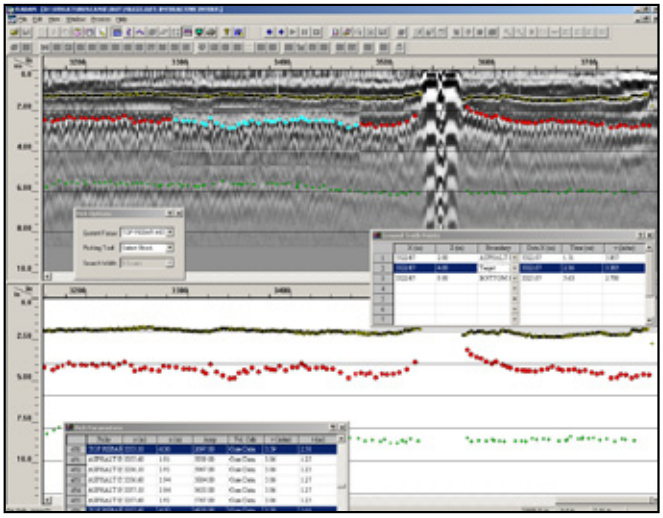
- Take some of the human error out of the equation with semi-automatic mapping of rebar locations and depths on simple concrete structures.
- Spreadsheet view of rebar data

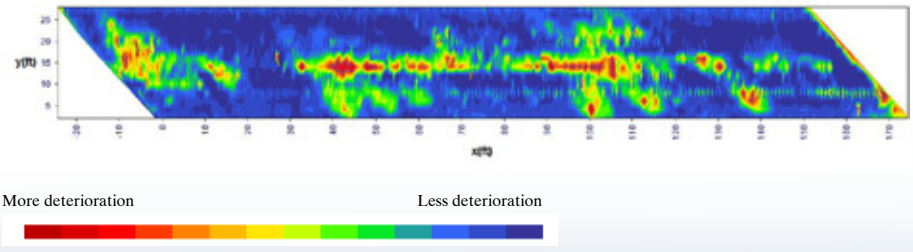
Software Integration

- ASCII output files - for simple integration with spreadsheets, contour mapping, and other software programs

Exclusively GSSI

- Software automatically accommodates and adjusts for bridge skew angle.





3D BridgeScan data displayed with DPlot® software

www.geophysical.com • sales@geophysical.com

12 Industrial Way • Salem, NH 03079-2837
Tel: (603) 893-1109 • Fax: (603) 889-3984