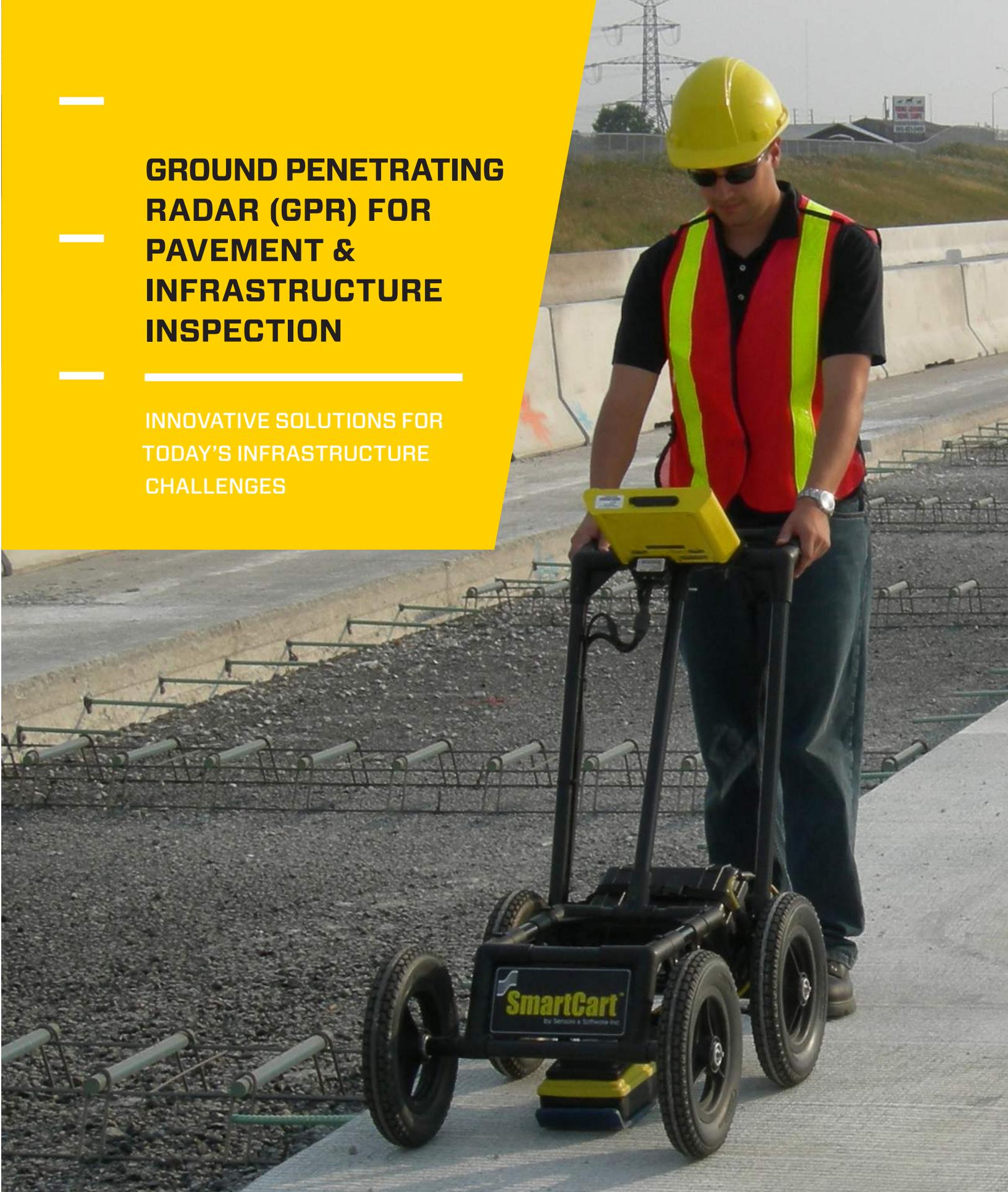

GROUND PENETRATING RADAR (GPR) FOR PAVEMENT & INFRASTRUCTURE INSPECTION

INNOVATIVE SOLUTIONS FOR
TODAY'S INFRASTRUCTURE
CHALLENGES



Enter Ground Penetrating Radar (GPR)

The Transportation Research Board (TRB) recently published several studies that tested non-destructive evaluation (NDE) technologies for road and bridge inspections. For many NDE applications, Ground Penetrating Radar (GPR) received the highest ranking.

GPR's ability to penetrate asphalt and concrete pavements as well as image subsurface structures uncovers invaluable information for asset management planning. GPR provides continuous subsurface imaging at a fine sampling interval to delineate the top and thickness of asphalt, base, and sub-base layers while accurately locating embedded objects such as rebar. This offers a major advantage over destructive, random, single spot coring. In fact, GPR images provide the means to greatly reduce costly coring by revealing complex subsurface conditions and features, allowing you to focus on the anomalous areas that may become problematic in the future.

By leveraging GPR, you're able to understand the local construction practice, determine pavement thickness, and locate variations in the base coarse, so that you can make informed decisions around maintenance and repair expenditures.

THE INFRASTRUCTURE CHALLENGE

Public and private infrastructure is in dire need of maintenance and repair. The first-ever report card on the state of the nation's infrastructure health, released in 2012, revealed that more than 50 per cent of municipal roads across the country are in "fair to very poor" condition. Moreover, our infrastructure is rapidly aging—the number of bridges on the National Highway System that surpassed the 50-year mark rose dramatically from 870 to 1,318 between 2006 and 2010. And with municipalities responsible for covering 60 per cent of their infrastructure costs, coming up with the funds necessary each year to replace and expand essential infrastructure is an ongoing challenge. As such, finding cost-effective, efficient methods for monitoring and rehabilitating existing infrastructure has become vitally important.

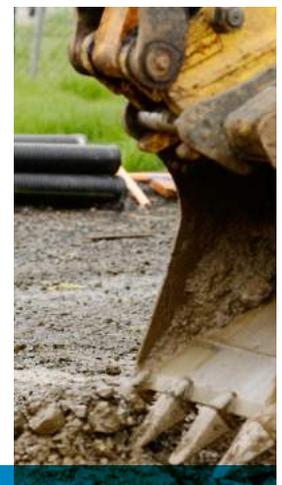
We offer a range of solutions for every pavement and bridge inspection requirement:

Our Road Map GPR solution allows for rapid, large scale infrastructure assessment such as on roads or highways

SmartChariot surveys are ideally suited to small to medium scale flexible analysis

SmartCart provides detailed analysis of any horizontal surface

Conquest is used to inspect the as-built condition of concrete floors, columns and walls



The GPR Advantage



SmartChariot™ is specifically designed to inspect roads and bridges at medium driving speeds and attaches to any vehicle with a hitch. The GPR system rides very close to the ground surface, providing the deepest penetration and highest resolution data possible. The SmartChariot holds up to 2 GPR systems and includes a mount to attach a GPS for geo-referenced data.



RoadMap™ collects single or multi-channel GPR data at highway speeds on roads, bridges and highways, so that costly road closures can be avoided. GPR systems deployed on the RoadMap trailer are ground coupled, providing the deepest penetration and highest resolution data possible.



Conquest™ creates detailed scans of concrete floors, decks, columns, walls and ceilings to locate embedded rebar, post tension cables, metallic and non-metallic conduits. You can also identify current-carrying power cables with PCD (Power Cable Detection) technology. Process and interpret high quality depth slice images directly onsite and communicate results wirelessly from the field to your office or directly to the client. Its re-sizeable handle makes it possible to collect data while standing or walking.



SmartCart™ is a versatile and configurable platform to deploy any Noggin™ or pulseEKKO PRO GPR system. You can perform detailed data collection for bridge deck deterioration mapping and pavement condition assessment. This rugged cart is designed to handle both smooth and rough terrains.

Key advantages of GPR for infrastructure inspection include:

- The US Transportation Research Board has ranked GPR as the most effective technology for delamination discovery, corrosion level detection, vertical crack recognition, and concrete degradation
- GPR offers a reliable method to prioritize and quantify projects, assess structural reliability and mitigate public safety concerns
- You can focus repair actions and costly destructive testing to where they are most effective
- GPR's versatility also allows you to detect voids or cavities under pavement and assess the thickness of pavement layers
- A once complex and expensive technology is now easy to use, effective and affordable

SOFTWARE

ENHANCED DATA ANALYSIS & REPORTING WITH EKKO_PROJECT

Once collected, data can be effectively analyzed using Sensors & Software's EKKO_Project program. EKKO_Project is an all-inclusive software solution for managing, displaying, processing and interpreting GPR data. It provides simple integration and analysis of GPS data. Advanced processes are automated, allowing for easy data viewing and reporting.

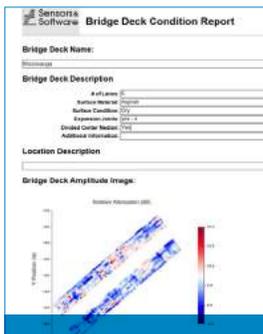
The Bridge Deck Condition Report delivers map images depicting the internal condition of bridges, parking decks and large concrete floors while the Pavement Structure Report displays cross sections of road and runway structures. Reports are generated in just a few simple steps for immediate distribution.

By adopting our infrastructure solutions, asset owners can effectively allocate scarce infrastructure resources and evaluate the effectiveness of maintenance efforts throughout the aging process.

Using EKKO_Project, you can:

EASILY DISPLAY RESULTS IN GOOGLE EARTH™

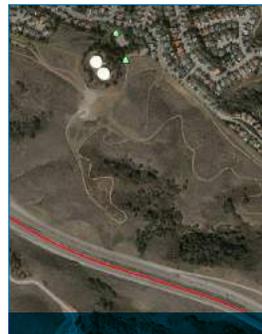
GET PDF REPORTS IN JUST A FEW CLICKS



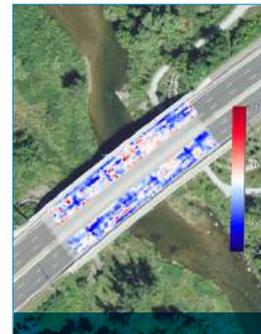
Create Bridge Deck
Condition Reports



Generate GPR Pavement
Structure Reports



Plot GPR survey lines in
Google Earth™



Display a Bridge Deck Attenu-
ation Map in Google Earth™

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