

ASPHALT AND GRANULAR THICKNESS

Case Study



 **Sensors &
Software**

Roadmap survey

Asphalt thickness and fill depths can be determined with ground-coupled GPR at highway speeds without the need for closing lanes. The SmartTrailer results show how easy it is to pinpoint anomalously thin and thick sections and changes in construction practice.

Pavement structure data on the CPATT (Centre for Pavement and Transportation Technologies) test road at the University of Waterloo was acquired at speeds of 40 to 80 km/h (30 to 50 mph). The SmartTrailer configuration enables rapid acquisition of surface coupled GPR. All data were collected

using a vehicle odometer at a user-defined spatial interval. DMI and GPS provide precise positioning.

Using the integrated GPS data, the CPATT test road is marked in red and yellow on the following Google Earth map.

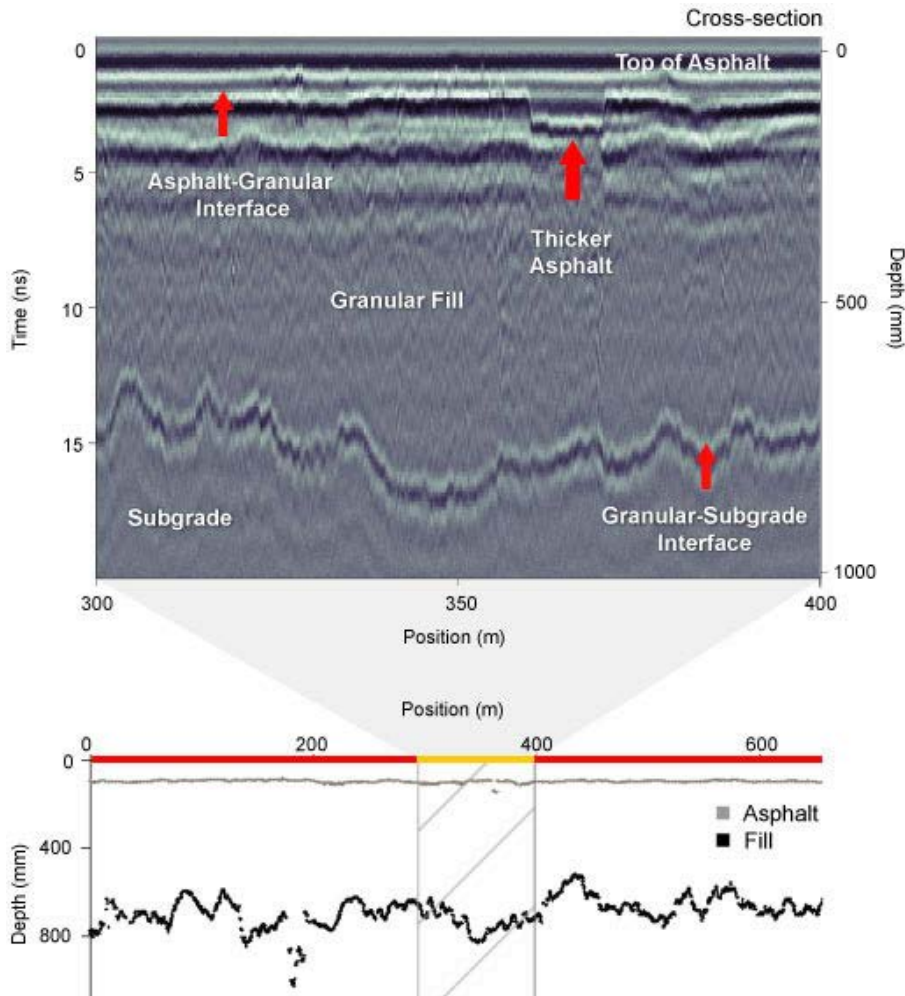
continued on page 2

2 ASPHALT AND GRANULAR THICKNESS



Google Earth map showing the 700 m long CPATT test road

The below figure shows a 100 m section of data (yellow line in the Google Earth map above). The section shows asphalt over granular, above the subgrade. The asphalt-granular and granular-subgrade boundaries are clearly visible. A short section of thicker asphalt (Asphalt 2) is evident between 360 m and 364 m.



Interface depths for the CPATT road. The corresponding GPR data section from 300 m to 400 m is shown above

The data in the cross-section are a subset of the full 700 m CPATT test road. RoadMap automated horizon analysis generated for the full test road are shown in the previous image.

GPR travel times were converted to depth by calculating velocities from feature responses in the data itself, and by correlating with core thickness data. An example of a layer thickness summary report is shown in the table below.

Layers	Average Thickness (mm)	Standard Deviation (mm)	Number of Measurements
Asphalt 1	97	5	3376
Asphalt 2 (360 m - 364 m)	142	3	18
Granular	592	67	3146

Table 1: Layer thickness statistics

Sensors & Software Inc.

1040 Stacey Court
 Mississauga, ON
 Canada L4W 2X8

+1 905 624 8909

+1 800 267 6013

sales@senssoft.ca

www.senssoft.ca

**subsurface
 imaging
 solutions**