Ground Penetrating Radar

REAAA Young Presenter Competition 2008

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Unsealed Roads are important

Southland LTCCP

• “roading network to provide a smooth and comfortable ride”

• “roads are maintained to an appropriate standard”
Why is Fulton Hogan investigating the use of Ground Penetrating Radar (GPR)?

• Pavement layer information largely unknown

• Roading aggregates becoming scarce and expensive

• Fulton Hogan is dedicated to sustainable practices
Current Practice
Current Research Project

- Imported 2 GHz horn antenna, cable and mounting frame from USA

- Two trials undertaken with GPR Consultant using analysis computer owned by NZ supplier
Current Research Project

- Investigate the best setup configuration of equipment
- Cost comparison with other methods of getting pavement depth information such as potholing
The setup

- **Calibration – aka “the jump”**
- **Aluminium plate**
- **Antenna**
- **Fibreglass rails and gusset**
- **Support poles**
- **Ratchet straps to stabilise antenna**
- **Control cable to unit in vehicle**
- **Mounting frame fixed into draw bar slot**

This thing won’t bounce with Neil on it.

300-400mm

This thing won’t bounce with Neil on it.
How GPR Works?

- Transmitting Antenna
- Direct-Coupling
- Surface reflection
- Base reflection
- Receiving Antenna

Running course
Base
Testing in progress
Raw data
Interpretation of data
Profile of road section
Verifying metal depths
Accuracy of GPR readings

Graph showing test hole data vs GPR interpretation for Longbush South Road. The graph compares the base of gravel from test holes with the base of gravel from GPR at various distances. The difference between test holes and GPR is also shown below the main graph.
Where to from here?

• More research required

• Getting good results

• Data collection fast, interpretation slow and requires specialist skills

• Process more data obtained from field trials in Southland

• Location of data collection needs to be agreed upon

• WATCH THIS SPACE