WARRIP

WESTERN AUSTRALIAN ROAD RESEARCH AND INNOVATION PROGRAM

An Evaluation of the Traffic Speed Deflectometer (TSD) for Main Roads Western Australia

INVESTIGATING THE POTENTIAL USE OF TRAFFIC SPEED DEFLECTOMETER DATA

AN INITIATIVE BY:

THE GOVERNMENT OF WESTERN AUSTRALIA

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AN EVALUATION OF THE TRAFFIC SPEED DEFLECTOMETER FOR MAIN ROADS WESTERN AUSTRALIA

Main Roads assessed the repeatability of the traffic speed deflectometer (TSD) across numerous sites in WA. This validation exercise aims to ensure Main Roads can optimise the TSD data collection.

Background

The TSD was developed by Greenwood Engineering, Denmark, in the early to mid-2000s, to assess the functional and structural performance of a road network at normal highway speeds (80 km/h) (Rasmussen, Krarup & Hildebrand 2002). Appropriate use of the TSD may provide significant benefits to the Main Roads data collection program, ensuring Main Roads are able to make best use of the investment in their data collection program.

Approach

- Reviewing data collection programs undertaken by New Zealand and other Australia state road agencies
- Reviewing how collected data may be used
- Data collection with the TSD and post-processing of the data in Western Australia
- Providing recommendations to maximise the use of TSD data collected to enhance pavement asset management operations and deliver a sustainable framework for long-term strategic planning.

Calibration of TSD

Prior to the trial, the equipment was calibrated against a 'ground truth' data set that is traceable back to national standards. Local calibration were also performed to ensure consistency of measurement.

For a longer-term contract, a benchmarking site would need to be established locally following consultation with Main Roads. A calibration would then be performed every six weeks to ensure that any issues are identified as early as possible and that the impact on any data collected in the interim is minimised.

ARRB TSD (NOW INTELLIGENT PAVEMENT ASSESSMENT VEHICLE (IPAVE))

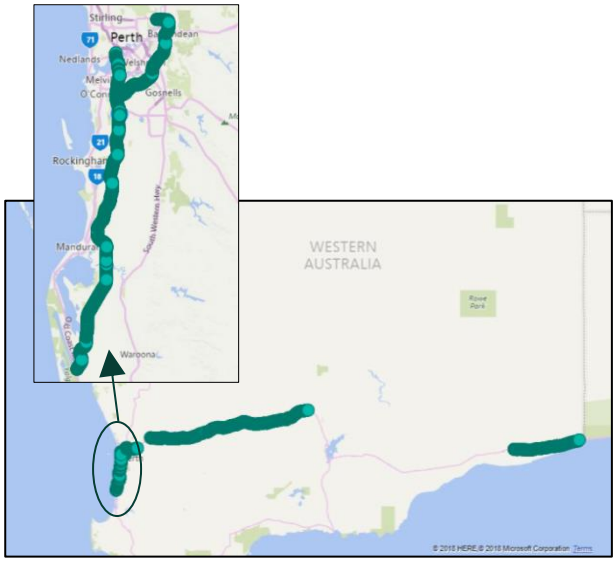
TSD data use

- identify weak pavement areas
- estimate remaining pavement life and pavement layer thickness
- develop future maintenance programs
- pavement rehabilitation design.

TSD Data Collection in WA

The TSD surveyed approximately 900 km of Main Roads' road network (TSD 900) between 7 November and 13 November 2016. The data was post-processed using the Hawkeye Toolkit, providing linear geo-referencing information, event tagging and road section identification.

LOCATION OF TSD 900 WITHIN WESTERN AUSTRALIA



The trial indicated there is significant potential to derive benefits from TSD collected data.

Collecting functional and structural condition data simultaneously saves time and money.

Road agencies may be able to assess the level of risk that the road network is carrying in terms of pavement condition.

The full benefits may be achieved by harnessing the historical structural and functional performance data across WA.

FUTURE CONSIDERATIONS

1. **Benchmarking past, current and future network performance data to ensure Main Roads maximise the TSD and other emerging technologies.**

2. **Reviewing, collating and analysing the data store to enhance pavement asset management operations.**

3. **Working with Main Roads on upcoming projects to provide clear direction regarding improvements**

References

Rasmussen, S, Krarup, J & Hildebrand, G 2002, 'Non-contact deflection measurement at high speed', in AG Correria & FEF Branco (eds), Proceedings of the 6th international conference on the bearing capacity of roads, railways and airfields, Lisbon, Portugal, pp. 53-60.