GREENWOOD TSD

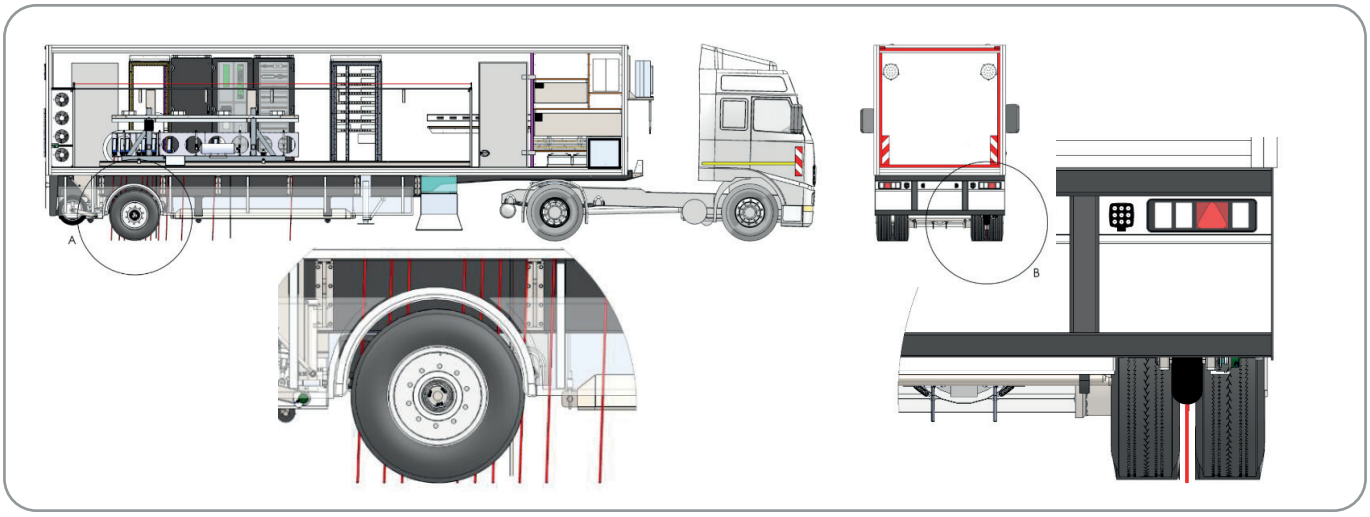
PROJECT LEVEL ASSESMENT ON THE WHOLE NETWORK

Greenwood TSD – the Traffic Speed Deflectometer is a well proven Rolling Wheel Deflectometer measuring pavement response to applied load. The TSD technology is developed by Greenwood Engineering and has initiated a paradigm shift in pavement engineering worldwide.

Greenwood TSD provides continuous bearing capacity results at project and network level while following the flow of traffic. The 4th generation TSD includes 1 or 2 systems of high freqency (250 kHz) Doppler lasers, each with 11 heads, measuring in the longitudinal centreline between the rear twin wheels with lasers behind and in front of the load axle. The standard configuration can be supplied with custom made solutions for even more structural or functional data. This makes each Greenwood TSD highly cost effective.

Technical Description

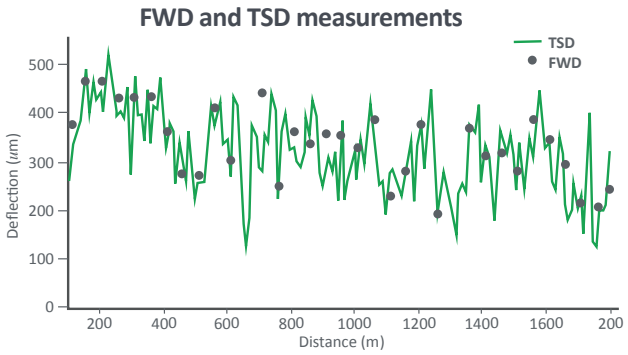
- TSD uses Doppler technology measuring in the longitudinal centreline between the rear twin wheels
- Special designed trailer and wheel hubs for measuring behind as well as in front of the load axle
- Servo system and inertial units continuously monitor and control the position of the Doppler sensors
- Equipment as Ground Penetration Radar (GPR), road surface profilers, Right Of Way camera (ROW), Surface Imaging System (SIS) with GE crack-detection, can be installed.



Data example

Since 2005 the state road network in Denmark has been measured with the TSD.

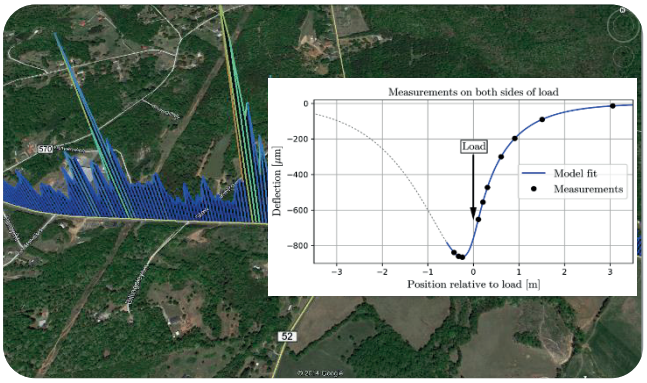
The figure shows a comparison between FWD and TSD measurements on highway E47 where the TSD gives a continuous line with all the peaks compared to the point related FWD. Highway E47 connecting Germany, Denmark and Sweden is a relatively stiff road with small deflections and even so, with a very good relation between measurements.



Output example

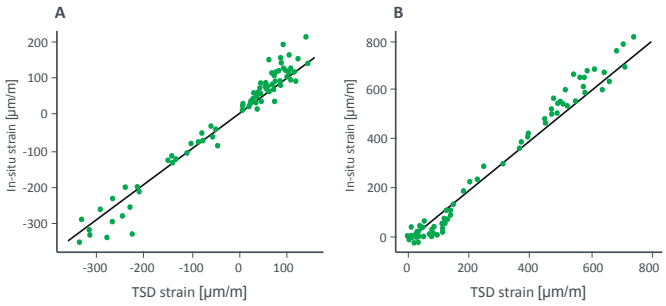
Output from TSD can be displayed in web-based map systems.

The example below allows the user to click on a position to see more project level details as full deflection bowl, SCI-300, area, and more.



Features

- A syncronized set of road data in one drive incl. road bearing capacity, road layer thickness, road surface crack mapping, etc.
- Visco-elastic back-calculation of e-moduli and strains, allowing for residual lifetime estimation and cost effective maintenance.
- High measuring capacity (low cost per measured km).
- Detailed information about road bearing capacity at project and network level.
- Continuous data with high accuracy and resolution.
- Results are repeatable and reproducible.
- Post processing software included.
- Replaceable ballast load allowing for measurements at various load levels.
- Low socio-economic cost as risk of accidents, risk of queues, CO2 air pollution etc. is minimised.



A.: In-situ peak transversal strains plotted versus TSD peak transversal strains. The line of equality is shown in black.

B.: In-situ peak vertical base course strains plotted versus TSD peak vertical base of course strains. The line of equality is shown in black.

TSD reference list

• Australia: ARRB Group • China: RIOH • China: Shanghai Municipality • Denmark: Danish Road Directorate • Germany: BASt,
• Germany: University in Wuppertal • Great Britain: Highways England • Italy: ANAS • Italy: Autostradeper l´Italia • Poland: IBDIM
• South Africa: SANRAL • South Africa: VNA • Sweden: ARRB Systems • USA: ARRB Systems • USA: FHWA / Pooled Fund Project

GREENWOOD ENGINEERING

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