

COMPARING THE FWD AND TSD PARAMETERS USING THE LIMIT OF AGREEMENT (LOA) METHOD

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ABSTRACT

The falling weight deflectometer (FWD) and the traffic speed deflectometer (TSD) are two (2) pavement structural evaluation devices which are non-destructive. The FWD measures deflections through the dropping of a load while stationary whereas the TSD measures the deflection velocity while travelling at speeds of up to 80 km/h. The deflection velocity is then converted into the deflection slope and subsequently into deflections by means of numerical integration. Since the TSD takes measurements while in motion, it does not require traffic accommodation during testing as opposed to the FWD, which is a huge advantage on high mobility routes. The base layer index (BLI), middle layer index (MLI) and lower layer index (LLI) are three (3) important parameters calculated by making use of the deflection bowls. These parameters, together with the maximum deflection are used in the benchmarking analysis to estimate the life, the behavior states and condition of pavement layers. The benchmarking methodology is established for the FWD and there has not been any work done for the TSD. It is important to know whether the TSD deflections can be used interchangeably with that of the FWD. This paper uses the limit of agreement (LOA) methodology to compare the deflection parameters namely maximum surface deflection, BLI, MLI and LLI obtained from the two (2) devices by making use of five (5) South African National Roads Agency Soc Limited (SANRAL) national roads.