A Comparison Between Rapid Pavement Tester and Falling Weight Deflectometer

Arman Hamidi

Ph.D. Candidate

Norwegian University of Science and Technology (NTNU)

Trondheim, Norway

ABSTRACT: Four roads in the Norwegian road network were measured using Falling Weight Deflectometer (FWD) at three different temperatures. The relationship between surface deflections (at nine different radial distances) and surface temperature was established. As a result, FWD master curves were obtained for each data point. The same roads were also measured using Rapid Pavement Tester (Raptor). The surface temperature during Raptor measurements was substituted into FWD master curves and FWD equivalent deflections were obtained. Using this method, the effect of temperature difference was eliminated. It was shown that Raptor is capable of detecting structurally weak spots on the road network. However, it underestimates deflections in comparison to FWD. A refinement was then made on Raptor data to make deflections from the two devices more comparable. It was shown that refining Raptor data can substantially increase the consistency between Raptor and FWD in determining bearing capacity.