

A SIMPLIFIED APPROACH FOR THE ESTIMATION OF HMA DYNAMIC MODULUS FOR IN SERVICE PAVEMENTS

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ABSTRACT

Structural condition and performance of an existing flexible pavement strongly depends on the in-situ properties of asphalt layers material. Non Destructive Testing (NDT) systems, such as Falling Weight Deflectometer (FWD), enable the assessment of the pavement structural condition. Hot mix asphalt (HMA) layers moduli can be estimated through backcalculation procedures. Since asphalt mix is a viscoelastic material, its behavior is expressed through the dynamic modulus (E^*), a key parameter which is determined, in case of an existing pavement, in the laboratory by testing cores extracted in the field. Given that, on the one hand coring is a destructive and time-consuming procedure and on the other that cores must be of a certain height in order to proceed with the laboratory testing, the need for estimating HMA E^* for in service pavements with NDT ensues. The present research is concentrated on the feasibility of backcalculation procedures to assess the E^* , by investigating the relation between the backcalculated in-situ moduli and the laboratory determined E^* . Towards this goal FWD testing was applied at several locations along a newly constructed pavement section, in order to estimate the asphalt layers modulus through backanalysis approach. Based on the backanalysis and laboratory results moduli were evaluated comparatively and the evaluation results seem promising in terms of estimating the E^* of in service pavements.