

Developing Pavement Structural Deterioration Curves

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Abstract : A Structural Number (SN) can be calculated for a road pavement from the properties and thicknesses of the surface, base course, sub-base, and subgrade. Historically, the cost of collecting structural data has been very high. Data were initially collected using Benkelman Beams and now by Falling Weight Deflectometer (FWD). The structural strength of pavements weakens over time due to environmental and traffic loading factors, but due to a lack of data, no structural deterioration curve for pavements has been implemented in a Pavement Management System (PMS). International Roughness Index (IRI) is a measure of the road longitudinal profile and has been used as a proxy for a pavement's structural integrity. This paper offers two conceptual methods to develop Pavement Structural Deterioration Curves (PSDC). Firstly, structural data are grouped in sets by design Equivalent Standard Axles (ESA). An 'Initial' SN (ISN), Intermediate SN's (SNI) and a Terminal SN (TSN), are used to develop the curves. Using FWD data, the ISN is the SN after the pavement is rehabilitated (Financial Accounting 'Modern Equivalent'). Intermediate SNIs, are SNs other than the ISN and TSN. The TSN was defined as the SN of the pavement when it was approved for pavement rehabilitation. The second method is to use Traffic Speed Deflectometer data (TSD). The road network already divided into road blocks, is grouped by traffic loading. For each traffic loading group, road blocks that have had a recent pavement rehabilitation, are used to calculate the ISN and those planned for pavement rehabilitation to calculate the TSN. The remaining SNs are used to complete the age-based or if available, historical traffic loading-based SNI's.

Keywords : conceptual, pavement structural number, pavement structural deterioration curve, pavement management system

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