Review of Pavement Performance Indicators: Measurements, Applications, and Limitations.

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Abstract. Assessment of pavement performance is required for efficient pavement management, maintenance, and rehabilitation planning. Governments and agencies use pavement performance indicators (PPIs) to track deterioration, optimize maintenance, and provide road safety. The indicators are classified according to expression, complexity, and purpose of evaluation, such as structural, functional, and safety indicators. As the pavement structure worsens, the rate of deterioration in functional and safety conditions increases. Accordingly, in this paper, structural indicators are accorded due emphasis, which are direct measures of pavement condition. Structural Condition Index (SCI) is one widely applied index to quantify pavement strength. Structural measurement techniques such as the Falling Weight Deflectometer (FWD) and Traffic Speed Deflectometer (TSD) aid in structural assessment. The Structural Strength Index (SSI) also aids in optimizing decision-making by providing a numerical value of load-carrying capacity. Future developments focus on machine learning, predictive modeling, and GIS software for more advanced pavement assessment.

 Keywords—Pavement performance, Structural Condition, FWD, SCI, and SSI.