

DEFECT DIAGNOSIS AND IMPACT ON BRIDGE PERFORMANCE

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Abstract. *The data in bridge management systems in much of the United States are dependent on visual inspection. While this practice is described as objective because the data are numerical, the process to obtain the numerical rating is often subjective. In many instances the final numerical rating is a judgment made by the bridge inspector. A historical review of bridge inspection data reveals that ratings can be inconsistent, subjective, and incomplete. Nondestructive test data that yields consistent and objective measurements can enhance the existing bridge inspection and data management practices. Since the technologies to assess the entire bridge systems do not exist, a hybrid approach that combines visual and nondestructive test data is needed. Such an approach should relate the structure defects to system performance in a rational manner. Conventional inspection practices identify anomalies on the bridge surface. Subsurface imaging technologies such as ground penetrating radar (GPR), infrared thermography (IR), and acoustics (AC) can provide useful information about unrevealed problems or prerequisite conditions that can be indicators of future problems.*

The objective of this paper is to relate the defects that are detected by nondestructive subsurface sensing technologies to component / system performance and ultimately consistent measures of condition. The result is an improved set of measured data obtained from nondestructive testing and an enhanced approach to representing bridge system performance at the component system (component / system or system) level.