

## **ABSTRACT**

### **A New Model for Infrastructure Service Life with Applications to Bridge Assessment and Management**

Julius Chang

Michael J. Garvin

Service life is a critical, yet somewhat nebulous consideration in the management of infrastructure assets. While it is often defined in terms of deterioration and time to physical failure, infrastructure service life is also defined by non-physical factors such as increasing loads and alternate levels of evaluation. A new conceptual model is presented that defines infrastructure service life as a function of physical and non-physical factors. The model reflects, for example, the idea that an asset can be evaluated at different performance levels, with accompanying trade-offs in moving from a lower level to a higher one. In addition, the model recognizes that alternative performance evaluation techniques can influence a decision-maker's perception of serviceability and remaining service life. Several applications illustrate how the model may be used to offer a fresh perspective on bridge service life, a key consideration given the trend toward ever-increasing truck loads. Results described have a number of implications for policy-making and infrastructure asset management.

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