

Strategic Maintenance and Management for local government bridges in Japan

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ABSTRACT

The Japanese government concentrated on the construction of road infrastructures, including bridges, in the last century. Actually, over 135,000 bridges having spans of 15 meters or more were built on main highways. It indicates that government agencies turned to operating and managing road networks rather than building new networks. At this time, the number of deteriorated bridges has increased because of aging, deferred maintenance and some environmental impacts. The maintenance and renewal of the existing bridges have become increasingly important for the Japanese government in this century. However, there are some complex issues and challenges surrounding these bridge investments: Increased maintenance, replacement, and needed upgrade requirements strain limited budgets. In addition, transportation officials may need to compete for funding with other publicly supported programs, such as education. And furthermore, public skepticism of government has led to demands that government agencies should be more accountable and operate more like a private business. This is due to the fact that the road networks including bridges represent important investments that have to be carefully monitored. As a result, agencies are required to clearly report what is bought with public funds, how spending decisions are made, and what is accomplished.

This paper presents a novel strategic approach to preserve local government bridges in Japan. It assists decision-makers in determining how and when to make bridge investments such as maintenance and replacement. Concretely, the approach categorizes existing bridges into one of the following three long-range maintenance plans: maintenance very high level, maintenance high level, and maintenance medium level using renewal costs and social values of existing bridges. The social value of a bridge is assigned a score on a scale of 0 - 100 by some parameters such as road classification. In this study, the simulation of the proposed approach is demonstrated on a local government bridge stock.