

5.4.2

Using GIS to Support Multi-year Pavement MR&R Need Analysis

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Multi-year Pavement MR&R Need Analysis is an important component of a pavement management system for state departments of transportation to predict/estimate maintenance and rehabilitation needs based on historical pavement conditions. It can be used for budget planning and funding justification, and it is especially crucial when the available budget is shrinking for every state government. Incorporating GIS capability into the system will allow the state department of transportation to manage multi-year MR&R planning more effectively. For example, different adjacent projects with the same/similar treatment can be combined, and adjacent projects planned to be let in different years can be combined to reduce the mobilization costs. All of these are difficult to achieve using current methods; however, these functions and others can be achieved easily and efficiently by incorporating GIS functions.

This paper presents a GIS-based multi-year pavement rehabilitation planning system developed by Georgia Tech and implemented by the Georgia Department of Transportation (GDOT) that can perform multi-year, project-linked network pavement rehabilitation analyses subject to funding availability, minimum performance requirements, and other constraints. The system uses dynamic segmentation to create GIS maps and links them with the central Oracle database and network analysis results, thus allowing users to make changes to the rehabilitation plans directly on the GIS maps. Several examples using the actual historical pavement condition evaluation data from the GDOT are presented to illustrate the capabilities of the system.