

## **A Knowledge-based Approach for Decisions regarding Maintenance Contracting**

### **Abstract:**

In recent years, highway maintenance has consumed larger shares of the total public funding. Maintenance engineers are reevaluating their in-use policies to explore most cost-effective policies. The basic delivery systems for accomplishing maintenance activities include contracting and implementing with in-house resources.

Predominantly, some combination of these two policies represents a feasible and more cost-effective policy. Actually, this compromise involves the process of selecting candidate activities for contracting and determining proportions thereof.

This task represents the cornerstone for establishing the maintenance contracting program for a Department of Transportation. This task is usually done by senior maintenance engineers considering many factors, some of them are quantitative and some others are qualitative. Therefore, human expertise and knowledge are focal for making these decisions. The objective of this study is to develop a knowledge-based expert system that acquires, structures, and stores knowledge for making decisions regarding maintenance contracting. The knowledge for this particular domain was assembled by another study through numerous sources including a large number of state Department of Transportation. This paper describes the used decision model, sample of the implemented decision rules, and the structure and facilities of the developed prototype. Finally, the system presents an automated decision-making tool through which rational and consistent decisions regarding maintenance contracting can be made.