



# Project Summary

Texas Department of Transportation

## 0-6586: Review of Best Practices for the Selection of Rehab and Preventive Maintenance Projects

### *Background*

With finite resources and an extensive road network to maintain, the Texas Department of Transportation (TxDOT) personnel must select roadways to receive rehabilitation and preventative maintenance (Rehab/PM) treatments that are structurally sound, are capable of being opened to traffic quickly, are straightforward with construction methods addressing the main cause of distress and, most importantly, minimize the associated costs. TxDOT districts choose specific maintenance treatments for a variety of reasons. Many districts choose a specific maintenance treatment because it has always worked well in their districts, a high-level engineer has had a positive experience with that treatment, or because of material or contractor availability. Districts use various methods of selecting projects for Rehab or PM project funding each year. It is important to document all practices used by the districts to ensure that current practice and experience in making treatment project selection can be available for future use.

This research project focused on developing guidelines to aid TxDOT personnel in making optimal selections of Rehab/PM projects to meet tight funding. TxDOT district personnel have implemented various selection procedures, but there is a tremendous need to have a comprehensive, logical approach developed. The study objective was to determine best practices for selecting and prioritizing rehab/PM projects and to develop a simple effective prioritization tool to aid TxDOT personnel in making decisions.

### *What the Researchers Did*

The research team:

- Interviewed the decision makers in the 25 districts using a comprehensive questionnaire reflecting the PM/Rehab project selection. The questionnaire was divided into five sections to obtain information on: 1) individual's experience, 2) maintenance treatment activities most frequently used in the district, 3) person(s) engaged and time of the year when the selection process initiates, 4) factors and tools used by the district to assist in the selection, and 5) distress types warranting particular treatments and overall suggestions.
- Identified eight key project characteristics frequently used by districts in the selection process: 1) average condition score, 2) average distress score, 3) number of failures, 4) average ride score, 5) average maintenance expenditure, 6) skid number, 7) surface age, and 8) average annual daily traffic (AADT).
- Developed an Excel-based tool to assist district decision makers in prioritizing candidate projects for Rehab/PM funding.

### *Research Performed by:*

University of Texas at San Antonio (UTSA)

Texas Transportation Institute (TTI),  
The Texas A&M University System

### **Research Supervisor:**

Samer Dessouky, UTSA

### **Researchers:**

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**Project Completed:** 8-31-10

The candidate project information (including district, county, Highway, reference mark, etc) was entered. The key characteristics information was collected from the Pavement Management Information system (PMIS) database and entered for each project. Each key characteristic was assigned a weighting factor (1-100%) that reflected its significance in the final selection projects. The total summation of weight factors in each project category is 100%. The initial set of weighting factors was selected based on engineering judgment, however, they were adjusted if necessary to fine tune the tool for local conditions. The tool applied the weighting factors to the entered information to derive a total score for each project as a rehabilitation project and as a PM project. A comparison of total scores provided prioritization of the candidate projects.

One cycle of verification was conducted on the Excel-based tool using already planned treatment categories for current projects obtained during the district interviews. The planned treatments by districts were compared with the tool output. Selected districts were chosen to verify the tool. A successful match of at least 85% was revealed between planned treatments and tool output.

## *What They Found*

Researchers learned from the questionnaire that:

- Most districts use two or three treatment methods for their network based on good experience and performance in both treatment categories (PM and Rehab).
- Districts use a combination of tools and information sources along with visual inspection to prioritize their PM/rehab projects.
- Failures and structural deficiencies are the most critical factors that warrant rehab project selections while surface cracking, flushing (skid) and shallow rutting are the major factors to warrant PM project selections.

## *What This Means*

The developed Excel-based tool may assist district decision makers to select candidate treatment projects. However, it is not a substitute for sound engineering judgment, nor can it consider non-technical factors which impact selection decisions. Fine-tuning the tool weighting factors to reflect district local conditions is necessary prior to implementation.

### *For More Information:*

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