



Project Summary

Texas Department of Transportation

0-6390: Asset Management for Safety and Operations

Background

The Texas Department of Transportation (TxDOT) manages a wide range of transportation safety and operations assets in order to respond to public and other outside interests. These assets include, but are not limited to pavements, pavement markings, raised pavement markers, structures, roadside signs, traffic signals, roadway illumination, traffic barriers, guard fences, attenuators, maintenance equipment, vehicles, intelligent transportation systems (ITS) equipment, traffic detection equipment, real estate, corporate data, and materials. Generally defined as a business process, asset management uses a decision-making framework that covers an extended time horizon. The asset management approach draws from best practices in economics, engineering, and business.

Today, growing congestion, limited resources, funding shortfalls, aging infrastructure, and an increasing focus on system performance impact transportation. If the current trends continue, state DOTs, as well as other public sector transportation agencies, will face increased system and budget needs with limited resources. At the same time, states will have to deal with increasing system complexity and increased public demands for accountability and levels of service. The application of asset management to transportation will allow agencies to meet these demands. An effective asset management framework is a balance of (a) goals, policies, and budgets, (b) technical information, and (c) integration—all connected via technology in the form of powerful computer systems capable of managing the breadth and depth of infrastructure information managed by a state DOT.

To assist TxDOT with the efficient management of its assets, this research:

- Identified strategies for defining asset management for safety and operations.
- Determined the best practices for applying asset management for safety and operations.
- Developed recommendations for implementing asset management and establishing associated performance measures for safety and operations within TxDOT.
- Developed a decision screening tool that TxDOT can use in its asset management efforts.

What the Researchers Did

Initially, researchers conducted an extensive review of the existing literature related to asset management, and highlighted the applications of asset management both within the United States and overseas.

Research Performed by:

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

Research Supervisor:

Beverly T. Kuhn, TTI

Researchers:

Jodi Carson, TTI
Debbie Jasek, TTI
Praprut Songchitruksa, TTI
LuAnn Theiss, TTI
Judith Mwakalong, PVAMU
Judy Perkins, PVAMU
Yonggao Yang, PVAMU

Project Completed: 4-30-11

This review also documented critical information related to contracting and data needs that play an integral role in a successful asset management program. The team then delved deeper into U.S. asset management practices to focus on safety and operations. The team identified a matrix of best asset management practices to serve as the framework for the remainder of the project.

In the next phase of the project, the research team conducted an assessment of asset management technology, including current tools and technologies used in Texas for processing and monitoring contracts and future tools that are on the horizon. The team then examined any impediments and implementation/institutional issues that may create challenges for the implementation of an asset management program.

What They Found

After evaluating the results of the research activities, the project team developed two products: the *Asset Management Guidebook* and the *Asset Management Screening Tool*. The *Asset Management Guidebook* is a document that TxDOT division and district personnel can use to help them define, develop, and implement asset management across all levels—particularly as it relates to establishing performance measures for safety and operations. It is a stand-alone product that contains easy-to-use, practical guidelines that staff can use to identify the best approach to asset management on three possible levels if feasible and practical: (1) total asset management for large urban areas encompassing multiple counties, (2) asset management of critical functions on a smaller regional scale—such as maintenance of roadside components excluding the pavement, and (3) asset management for specific types of assets—such as pavement markings or light emitting diode (LED) signal indications—that may be based on warranty specifications. The *Asset Management Screening Tool* is a software tool to facilitate the implementation of the Guidebook.

What This Means

A well-designed asset management system should be a critical component of TxDOT's plan for providing for the mobility of its customers, preserving the infrastructure already in place, planning for future improvements of that infrastructure, and being responsive and accountable to the public regarding the investment of their tax dollars. In short, asset management provides the best strategy for future preparedness in ensuring that TxDOT can meet its goals of reducing congestion, enhancing safety, expanding economic opportunity, improving air quality, and increasing the value of transportation assets. The *Asset Management Guidebook* and *Asset Management Screening Tool*, generated out of this research project, have the potential to help TxDOT meet those goals through effective management of its assets on a continuous and comprehensive basis.

For More Information:

Research Engineer - Wade Odell, TxDOT, 512-416-4730
Project Director - Larry Colclasure, TxDOT, 254-867-2800
Research Supervisor - Beverly T. Kuhn, TTI, 979-862-3558

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Research and Technology
Implementation Office
P.O. Box 5080
Austin, Texas 78763-5080
512-416-4730

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