Project Information Form

Project Title	Development of a Prototype Evidence-Based Database and Planning Tool: Applying Performance Management Principles in Asset Management Program Development
University	Georgia Institute of Technology
Principal Investigator	Adjo Amekudzi
PI Contact Information	School of Civil & Environmental Engineering Georgia Institute of Technology Atlanta, GA 30332-0355 (404) 894-0404; adjo.amekudzi@ce.gatech.edu
Funding Source(s) and Amounts Provided (by each agency or organization)	UTC: $42,631
Total Project Cost	
Agency ID or Contract Number	
Start and End Dates	
Brief Description of Research Project	The purpose of this research is to develop an evidence-based planning tool and database that will help agencies to strategically plan the development of their asset management programs using accumulated experience to achieve high-performance output. The tool will allow agencies to contribute best practices and lessons learned as a means of identifying best practices for achieving performance outcomes with program maturity and pitfalls to avoid (i.e., lessons learned from agencies that have expended significant resources in asset management program development but not seen a high level of performance output); organizational processes that have been effective, analytical tools and supporting data that have proven effective, information technology tools that have proven effective and, just as important, elements of asset management programs that have not worked very well (i.e., worst practices). The latter elements may be reported anonymously; however, a knowledge base system that involves both best and worst practices with asset management can serve as a useful guidance tool for agencies

at different levels of maturity looking to end up with high-maturity, high-performance programs.

Specifically, the research will apply an evidence-based design (EBD) framework. EBD originated in the health care industry as a combination of evidence-based medicine and evidence-based practice. It is a process for creating health care buildings, informed by the best available evidence, with the goal of improving outcomes and continuing to monitor the success of design for subsequent decision making. EBD is a process for making optimal design decisions that incorporate credible case studies in the design of a similar system -- with strict requirements for the types of evidence that can be used. The use of EBD allows engineers to reduce the risk of innovation in one area of the project while experimenting in another area of the design (Whitmyer, 2010; Bones, Barrella and Amekudzi, Working Paper).

The goal of evidence-based design is to make empiric (i.e., practically observable) what was once intuitive and, in so doing, justify added expense with a proven advantage (Malone et al., 2007). For example, in the healthcare industry, people recognized that sunlight may have healing power, but it took years for that hypothesis to be tested. Several studies finally showed that sunlight results in increased performance of complex visual tasks, decreased depression among patients, decreased length of stay in hospitals, and many other benefits (Joseph, 2006). Based on these studies, hospitals try to incorporate sunlight in as many rooms as possible to both benefit patients and increase revenues (from room turnover). EBD designs or retrofits facilities with features proven to improve patient safety, accelerate healing, improve staff productivity, reduce energy consumption, etc. In the same way, several elements of TAMs have been known intuitively to bring benefits to agencies and system users. Adopting an evidence-based framework for the evolution of transportation asset management programs will involve evaluating the impacts that various programs, processes and tools adopted have had on actual program

performance, with the intention of isolating elements that show evidence of contributing to improved performance.

Specifically, the study has five main clusters of objectives as follows:

1. Conduct literature review on Evidence-Based Design and Performance Management. A large portion of this literature review has already been completed through an ongoing project on Organizational

Performance and Risk, as well as an ongoing unfunded Evidence-Based Design study. The review conducted in this project will add to and update the existing literature reviews.

2. Work with AASHTO and TRB (and potentially representatives of other professional organizations) to determine and refine key performance indicators for tracking asset management program performance.

This workshop will use guidance from the AASHTO Asset Management Guides (Vols. 1 and 2).

3. Design and conduct multiple case studies to collect best practices and lessons learned (i.e., worst practices) in asset management program development. These case studies will form the basis of an

evidence-based asset management program development database. The case studies will include Georgia DOT, Florida DOT and Alabama DOT.

4. Develop study to evaluate program maturity levels against key performance indicators using state DOT asset management programs. This may be done anonymously as desired by the study participants. The objective of this study will be to assess where programs are in terms of maturity and performance: high maturity/high performance; high maturity/low performance; low maturity/high performance and low maturity/low performance; to identify which (combinations of) asset management program elements (i.e., organizational processes, analytical tools, information technologies) seem to be linked more readily with high performance programs; and to identify reasons for high maturity/low performance programs.

5. Develop prototype evidence-based database and planning tool for performance-based planning of asset management program development to assist with the development of high maturity/high performance programs. We envision this database and planning tool as a knowledge base system that includes case studies of best practices and lessons learned; data on the key performance indicators for several asset management programs (that can be used to analyze the evolution of program performance compared with program maturity); core values of

	high maturity/high performance programs; and common mistakes that can affect performance output.
	These tasks are expected to lead to recommendations on how the prototype database and planning tool can be converted into a live and evolving database and tool that agencies can systematically contribute to (on a peerreview basis) in order to create an evolving decision support system that assists agencies with creating higherperformance asset management programs. This research can lead to a pooled-fund study
Describe Implementation of Research Outcomes (or why not implemented) (Attach Any Photos)	
Impacts/Benefits of Implementation (actual, not anticipated)	None yet.
Web Links • Reports • Project website	http://www.utc.gatech.edu/research/2084/details