

**State of Wisconsin/Department of Transportation**  
 RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: September 30, 2008

<b>Program: SPR-0010(36) FFY99</b>		<b>Part: II Research and Development</b>	
<b>Project Title:</b> Use of Trenchless Technologies for Comprehensive Asset Management of Culverts and Drainage Structures		<b>Project ID:</b> MRUTC 07-15 (0092-08-30)	
<b>Administrative Contact:</b> Jason Bittner		<b>Sponsor:</b> MRUTC	
<b>WisDOT Technical Contact:</b> Shiv Gupta		<b>Approved Starting Date:</b> November 1, 2006	
<b>Approved by COR/Steering Committee:</b>		<b>Original End Date:</b> October 31, 2007	
<b>Project Investigator (agency &amp; contact):</b>		<b>Current End Date:</b> October 31, 2008	
		<b>Number of Extensions:</b> 2	

**Percent Complete:** 95%

**Request a No Cost Time Extension (Please Select One):**  YES  NO

**Reason for No Cost Time Extension:**

**Project Description:**

DOT's and cities in the US are facing severe and rising needs of renewing heavily deteriorated infrastructure. Further challenges for DOT's are the wide geospatial distribution of infrastructure assets and environmental exposure. While the challenge is well understood, appreciated and addressed, budget allocations and resources limitations represent a major barrier to a comprehensive asset management program. Culverts have the peculiarity of being characterized as both buried pipes in small diameters with no access and worker entry and larger ones with possibility of manual inspection and repair/renewal. As such, asset management procedures for culverts are a complex issue, and can benefit a great deal from an optimal asset management program that incorporates new trenchless technologies. Trenchless technologies are not disruptive to transportation systems and provide safer construction operations for both workers and the general public. If they are used at appropriate application, they provide a new design life to existing culverts and drainage structures that may double or triple the original design life of these assets. However, trenchless technologies are many and some of these methods are new, and while viable, have little field performance history in culverts and transportation systems. Each method has its own capabilities and limitations, and can be applied in certain existing conditions to be effective. Lacking is a comprehensive multi-scale engineering study that would be conducted for decision making at upper management level. Therefore, this project provides a comprehensive study and decision making procedures for asset management using trenchless technologies to address the construction, renewal, renovation, and inspection of culverts and drainage infrastructures.

**Progress This Quarter:**

(Includes project committee mtgs, work plan status, contract status, significant progress, etc.)

- Finalized analyzing the industry survey results.
- Finalized identifying the characteristics of trenchless technologies and their application to culvert asset management.
- Finalized the database and decision support systems.
- Held a meeting with industry representatives in conjunction with ASCE Pipelines 2008 in Atlanta.
- A poster on the topic of Use of Trenchless Technologies for a Comprehensive Asset Management of Culverts and Drainage Structures was presented at the National Center for Freight and Infrastructure Research and Education (CFIRE) Mid-Continental Transportation Research Forum at the University of Wisconsin – Madison, on Thursday, August 14, 2008.
- Finalize the draft final report.

**Work Next Quarter:**

Complete the final report with comments from advisory committee. Print and deliver to MRUTC.

**Circumstances Affecting Progress/Budget:**

**Gantt Chart:**

Task/Month	1	2	3	4	5	6	7	8	9	10	11	12
1	X	X	X									
2		X	X	X	X							
3			X	X	X	X	X	X				
4				X	X	X	X	X	X			
5					X	X	X	X	X			
6					X	X	X	X	X	X		
7										X	X	X

**Task 1** – Review literature and case studies. We will seek information from American Public Works Association as well as we will solicit information from other state DOT’s.

**Task 2** – Review factors affecting culvert deteriorations.

**Task 3** – Review and survey existing trenchless technology methods with potential use for renewal of culverts and drainage structures and identify capabilities and limitations of each of these methods.

**Task 4** – Develop inspection, asset management and maintenance requirements of renewed culverts with trenchless technology methods.

**Task 5** – Develop modification requirements in existing trenchless technologies to be used in culverts and drainage structures.

**Task 6** – Collaborate with ODOT and MDOT to establish a database and decision support system for selection of appropriate trenchless technology methods.

**Task 7** – Develop course modules for culvert asset management using trenchless technologies using comprehensive engineering and management procedures. Offer two workshops for ODOT and MDOT personnel. This task also includes technology transfer through paper publications and presentations at TRB and national and regional conferences.