

**State of Wisconsin/Department of Transportation**  
**RESEARCH PROGRESS REPORT FOR THE QUARTER ENDING: December 31, 2005**

<b>Program: SPR-0010(36) FFY99</b>	<b>Part: II Research and Development</b>
<b>Project Title:</b> An Asset Management Approach for Drainage Infrastructures & Culverts	<b>Project ID:</b> 06-08
<b>Administrative Contact:</b> Nina McLawhorn	<b>Sponsor:</b> MRUTC
<b>WisDOT Technical Contact:</b> Jason Bittner	<b>Approved Starting Date:</b> 1/1/06
<b>Approved by COR/Steering Committee:</b>	<b>Approved Ending Date:</b> 12/31/06
<b>Project Investigator (agency &amp; contact):</b> Michigan State University – Center for Underground Infrastructure Research and Education, Mohammad Najafi, <a href="mailto:Najafi@msu.edu">Najafi@msu.edu</a>	

**Description:** This project provides asset management procedures for drainage infrastructure systems that draw from programs pertaining to bridges and buried pipes. The first and most important step in an asset management initiative is the establishment of asset inventory and asset conditions. The focus this research therefore will be on geospatial inventory and condition assessment in a format compatible with the routine procedures of field operators and inspectors as well as existing DOT asset management procedures such as those employed in NBI and PONTIS. Field protocols and operational business rules for inventory data collection and management and inspection of drainage infrastructures in terms of type of data to be collected, frequency of inspection, and analysis and reporting mechanisms will be developed. Such protocols and business rules will be reviewed and then tested in small pilot studies for field efficiency verification.

Total study budget	Current FFY budget	Expenditures for current quarter	Total Expenditures to date	Percent Complete
\$145,257	\$145,257	\$20,000	\$2,000	1%

**Progress This Quarter:**

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

- An oversight committee was put together.
- The kickoff meeting was held on October 6, 2005 and minutes of meeting were sent to meeting participants.
- To work on this project, from January 2006, two graduate assistantships will be provided: one at Michigan State University and another one at University of Cincinnati.
- During a meeting with Mr. Peter Funkhouser of MDOT, a detailed plan for the project was discussed.
- We will participate at the reception at TRB, which will be held on Tuesday, January 24<sup>th</sup> at the Bird Cage in the Omni Shoreham Hotel from 5:30 to 7:30 pm, with providing a poster for the project.
- A meeting is scheduled for Thursday, January 19, at University of Cincinnati to coordinate the efforts between MSU/CUIRE and University of Cincinnati.

**Work Next Quarter:**

The following work has been scheduled for next quarter:

1-Review of existing literature and conduct a national survey of best practices on drainage structures and culvert asset management efforts among the 50 state (specially the Midwestern states) DOTs and 10 Canadian provinces. This review will include study of drainage structures by size, age, installation data, material type, soil condition, climate, traffic frequency, and loading. We will also develop an optimal classification methodology for MDOT and ODOT inventory.

2-Review of various hydraulic, land-use changes and mechanical factors affecting the deterioration of drainage structures. Collected information will be checked against MDOT and ODOT documented history of failed, repaired, as-built and replaced drainage structures and culverts.

3-Review of existing inspection, data analysis and reporting methods for drainage structures and culverts and study of the modifications to be brought to buried pipes technologies to be implemented on drainage structures and culverts.

**Circumstances affecting progress/budget:**

Due to late signing of contract and availability of funds, the project start date has been pushed back to January 1, 2006.

**Gantt Chart:**

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

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2-Review of various hydraulic, land-use changes and mechanical factors affecting the deterioration of drainage structures. Collected information will be checked against MDOT and ODOT documented history of failed, repaired, as-built and replaced drainage structures and culverts.

3-Review of existing inspection, data analysis and reporting methods for drainage structures and culverts and study of the modifications to be brought to buried pipes technologies to be implemented on drainage structures and culverts.

4-Develop an inventory and inspection protocols and business rules for MDOT and ODOT engineers and field operators.

5-Synthesize the research findings into a platform for a decision support system for culvert inspection, rehabilitation, maintenance, and asset management.

6-Project review

7-Perform pilot studies in Michigan and Ohio to validate the protocol and decision support platform

8-Collaborate with MDOT and ODOT engineers to write a section on inventory and inspection to be added to current best practices and business rules manuals.

9-Write a final report documenting all research findings.

10-Write several papers and articles to disseminate research results specifically for use of other Midwest states.

11-Offer educational workshops for MDOT and ODOT personnel to present results of this important research. Submit final report.