

# RESEARCH, DEVELOPMENT & TECHNOLOGY TRANSFER QUARTERLY PROGRESS REPORT

Wisconsin Department of Transportation  
DT1241 4/2010

**INSTRUCTIONS:**

Research project investigators and/or project managers should complete a quarterly progress report (QPR) for each calendar quarter during which the projects are active.

<b>WisDOT research program category:</b> <input type="checkbox"/> Policy research <input type="checkbox"/> Wisconsin Highway Research Program <input checked="" type="checkbox"/> Other <input type="checkbox"/> Pooled fund TPF#		Report period year: 2010 <input type="checkbox"/> Quarter 1 (Jan 1 – Mar 31) <input type="checkbox"/> Quarter 2 (Apr 1 – Jun 30) <input type="checkbox"/> Quarter 3 (Jul 1 – Sep 30) <input checked="" type="checkbox"/> Quarter 4 (Oct 1 – Dec 31)
Project title: <a href="#">AASHTO Mechanistic-Empirical Pavement Design Guide Parametric Study</a>		
Project investigator: <a href="#">Steven Cramer</a>	Phone: 608-265-2001	E-mail: <a href="mailto:cramer@engr.wisc.edu">cramer@engr.wisc.edu</a>
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WisDOT contact: n/a	Phone: n/a	E-mail: n/a
WisDOT project ID: n/a	Other project ID: <a href="#">CFIRE 03-24</a>	Project start date: <a href="#">1/1/2010</a>
Original end date: <a href="#">3/31/2012</a>	Current end date: <a href="#">3/31/2012</a>	Number of extensions: 0

**Project schedule status:**

On schedule                     
  On revised schedule                     
  Ahead of schedule                     
  Behind schedule

**Project budget status:**

Total Project Budget	Expenditures Current Quarter	Total Expenditures	% Funds Expended	% Work Completed
\$18,000.00	\$11,629.00	\$12,895.00	72%	71%

**Project description:**

Higher quality in the construction of roads and highways has motivated the Wisconsin Department of Transportation (WisDOT) to move toward implementation of the new AASHTO Mechanistic-Empirical Pavement Design Guide (MEPDG). This guide is a powerful tool for the design of new and rehabilitation of pavement structures that provides engineers with a set of different models to predict future performance of the pavements. In particular, major contributors to the behavior and durability of the pavement such as climate, traffic, and materials characteristics, are integrated in a set of empirical models to obtain a precise outline of performance and durability of pavements. The potential benefits of using the MEPDG are to provide engineers and contractors with advanced tools, improvements in conservation, management, and conditions for users, and significant economic savings. Recently, the WisDOT contracted with the University of Wisconsin-Madison to begin collecting property information to support the use of this guide for rigid pavements.

This grant will provide a compliment to this study by 1) installing the MEPDG software (available from FHWA) for use within the University, 2) to exercise this software to identify all the required property and data inputs, 3) to make an initial assessment of the most sensitive inputs, 4) provide a written report that documents these findings.

**Progress this quarter** (includes meetings, work plan status, contract status, significant progress, etc.):

The MEPDG software has been installed. The MEPDG algorithm is partly empirical and partly mechanical. Input and output has been identified. We have focussed on the portland cement concrete pavement portion of this program. The primary variables are tensile strength, compression strength, modulus of elasticity, coefficient of thermal expansion, flexural strength

(also called modulus of rupture), unit weight, and Poisson's ratio. Analysis is mainly on new design of jointed plain concrete pavement, but also includes continuously reinforced concrete pavement and portland cement concrete overlays. By fixing all other inputs at typical values, the sensitivity results check quite well with the ones from other institutes. Study on MEPDG's component software, such as ISlab for structural model and the Enhanced Integrated Climatic Model for climatic effects is in process. Study on calibration procedure of distress models done by NCHRP is also conducted.

**Anticipated work next quarter:**

Completion of the sensitivity study and report preparation.

**Circumstances affecting project or budget:**

None

**Attach / insert Gantt chart and other project documentation**

FOR WISDOT USE ONLY

Staff receiving QPR:	Date received:
Staff approving QPR:	Date approved:

ID	Task Name	Duration	Start	2011												2012											
				May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb		
1	<b>Overall Project</b>	<b>393 days?</b>	<b>Thu 7/1/10</b>																								
2	Obtain and load MEPDG Program	21 days	Thu 7/1/10																								
3	Identify Program input and output	80 days	Fri 7/30/10																								
4	Identify program structure	90 days	Fri 11/19/10																								
5	Identify input and property sensitivity	120 days	Fri 3/25/11																								
6	Quarterly progress report #1	1 day?	Fri 10/8/10																								
7	Quarterly progress report #2	1 day?	Mon 1/3/11																								
8	Quarterly progress report #3	1 day?	Fri 4/1/11																								
9	Quarterly progress report #4	1 day?	Fri 7/1/11																								
10	Quarterly progress report #5	1 day?	Mon 10/3/11																								
11	Quarterly progress report #6	1 day?	Mon 1/2/12																								
12	Draft final report	50 days	Fri 9/9/11																								
13	Review and revise final report	20 days	Fri 11/18/11																								
14	Submit final report	10 days	Fri 12/16/11																								

Project: MEPDG CFIRE 100810.mpp Date: Fri 1/7/11	Task		Milestone		External Tasks	
	Split		Summary		External Milestone	
	Progress		Project Summary		Deadline	