



STATE OF MICHIGAN  
DEPARTMENT OF TRANSPORTATION  
LANSING

RICK SNYDER  
GOVERNOR

KIRK T. STEUDLE  
DIRECTOR

February 14, 2011

The Honorable John Pappageorge, Chair  
Senate Appropriations Subcommittee  
on Transportation  
Michigan State Senate  
P.O. Box 30036  
Lansing, Michigan 48909

The Honorable David Agema, Chair  
House Appropriations Subcommittee  
on Transportation  
Michigan House of Representatives  
P.O. Box 30014  
Lansing, Michigan 48909

The Honorable Tom Casperson, Chair  
Senate Transportation Committee  
Michigan State Senate  
P.O. Box 30036  
Lansing, Michigan 48909

The Honorable Paul Opsommer, Chair  
House Transportation Committee  
Michigan House of Representatives  
P.O. Box 30014  
Lansing, Michigan 48909

Dear Senators Pappageorge and Casperson, and Representatives Agema and Opsommer:

In accordance with Section 1i(4) of 2001 PA 259, enclosed is the Michigan Department of Transportation's annual report on the Pavement Demonstration Program.

If you have any questions regarding this report, please contact either me or Brenda J. O'Brien, Engineer of Construction and Technology, at 517-322-1085.

Sincerely,

Kirk T. Steudle  
Director

Enclosure

cc: Members of the Senate and House Transportation Committees  
Members of the Senate and House Appropriations Subcommittees on Transportation

# Michigan Department of Transportation Pavement Demonstration Program Status Report January 2011

## Background

Public Act 259 of 2001 allows the department to build up to four demonstration projects per year that are not subject to a Life-Cycle Cost Analysis (LCCA). The LCCA process is a tool to select the lowest cost pavement design over the expected service life of the pavement. The LCCA process must include, by law, historical information for initial construction and maintenance costs, and performance (service life). This information may not be available for new pavement designs, thereby precluding them from being chosen as an alternative. Also, new pavement designs and new technologies are generally more expensive than the standard methodologies, which may reduce their chance of being selected as the lowest cost alternative. The pavement demonstration legislation provides an avenue to try new and innovative ideas.

Potential benefits of pavement demonstration projects include improved service life and customer service, and lower maintenance costs. Future LCCAs may utilize cost, performance, and maintenance information from the demonstration projects.

## Project Selection

Candidate projects are a collaborative effort between central office pavement personnel, region personnel, and industry groups. Once the partners mentioned above reach a consensus that the project would make a good candidate, it goes to the Engineering Operations Committee (EOC) for formal approval. Once EOC approves the project, it becomes part of the Pavement Demonstration Program.

Extra costs for the demonstration project are funded by the region's rehabilitation and reconstruction budget.

## Project List

The following table contains a list of demonstration projects to date.

Table 1. Pavement Demonstration Project List							
FY Let	Route	Region	County	Location	Description	Pavement Costs	
						Hot Mix Asphalt	Concrete
2003	I-75 NB	North	Ogemaw	Ski Park Rd. to Roscommon Cty Line	low volume unbonded overlay		\$1,980,000
2003	M-84 SB	Bay	Bay/Saginaw	Pierce Rd. to Delta Rd.	perpetual pavement	\$700,000	
2004	M-3	Metro	Wayne	St. Aubin to McClellan	thin unbonded overlay		\$2,200,000
2005	M-13	Bay	Bay	Mary Dr. to North St.	low volume concrete		\$1,200,000
2005	I-96 WB	Metro	Wayne	M-39 to Schaeffer Rd.	perpetual pavement	\$4,800,000	
2006	M-99	Univ.	Jackson	Village of Springport	low volume concrete		\$100,000
2008	I-75 NB	North	Cheboygan	Topinabee Mail Rd. north for 2.37 miles	perpetual pavement over rubblized concrete	\$781,000	
2009	M-1	Metro	Wayne	Tuxedo to Chandler	thin unbonded overlay		\$931,000

NB = northbound; SB = southbound; WB = westbound

Below is a brief description of the status or condition of each project based on recent field visits.

I-75 Northbound (Ogemaw County): This project, constructed in 2003, is a 6-inch unbonded concrete overlay on the northbound direction only. It includes several test sections involving sealed and unsealed joints, 10 and 12 foot joint spacing, and transverse joints with and without load transfer bars. The southbound direction, constructed at the same time, was rubblized and overlaid with 6.5 inches of Hot Mix Asphalt (HMA).

**Latest Survey:** Several longitudinal cracks are being studied to determine their cause. Evaluation of these cracks is part of a research project with the University of Michigan titled "Improved Performance of Concrete Overlays." The Michigan Department of Transportation (MDOT) is currently awaiting delivery of a report from the University of Michigan determining the cause of the cracking. Following delivery of that report MDOT will write a full report on the status of this project. A few pavement repairs were completed in 2009 as part of MDOT's investigation of the cracking. Very little cracking is noted on the southbound (rubblize) project other than centerline cracking (between paving passes) that runs most of the length of the project.

M-84 Southbound: This project is a 6.5-inch HMA perpetual pavement completed in the fall of 2005. This was a two-lane road that was upgraded to a four-lane boulevard section and was built over a two-year period. The northbound direction contained a standard 6.5-inch HMA cross section and was built in 2004. The southbound contains the perpetual pavement, which is designed for a 40-year life. Polymerization of the HMA and a thicker base are expected to increase the service life over the standard cross section.

**Latest Survey:** There is no change in the cracking on the perpetual pavement side. The standard cross section side also has very little change in cracking amounts from the previous year.

M-3: This project is a 4-inch unbonded concrete overlay constructed in the fall of 2005. Normal unbonded overlays are 6 inches or thicker. This project contains four test sections involving a combination of sealed and unsealed joints with two different HMA bond breaking interlayer mixes. The HMA interlayer mixes are a normal dense-graded HMA and a more open-graded (drainable) HMA.

**Latest Survey:** In 2010, many 5 foot by 5 foot concrete panels were repaired. During the survey, 241 panels were counted as repaired. Most of the repairs were made to the southbound direction. Currently, the southbound direction has 59 panels with cracks and the northbound direction has 174 cracked panels. The cracked panels are approximately evenly split between the two interlayer mixes and between the sealed and unsealed sections. Assuming repairs were made to all of the cracked panels, the total number of cracked panels would have been 474. This represents a 47 percent increase over the previous year. Of the past four years, this is the first year the increase has been less than 65 percent.

M-13: This project is a low-volume concrete design constructed in the summer of 2005. The concrete is 6 inches thick compared to the normal 8 inches. Joints are spaced 5.5 feet in both directions and are unsealed. A dense-graded base was used instead of the normal open-graded base material.

**Latest Survey:** Several new cracks were noted just south of the Pinconning River. This is the area where heavy equipment was parked last year while work was being conducted on the bridge

(large culvert) at the Pinconning River. The remainder of the project appears to be in the same condition as the previous year's survey.

I-96 Westbound: This project is a 14-inch HMA perpetual pavement constructed in the fall of 2005. The eastbound direction was reconstructed with concrete. The concrete is a 20-year design while the perpetual pavement is a 40-year design; this is not a side-by-side comparison.

Latest Survey: No change from the previous year where a few minor cracks were noted.

M-99: This is the second low-volume concrete design project and is the same as the M-13 project, except the joints are spaced at 6 feet in both directions. It was constructed in summer/fall of 2006 and is approximately 800 feet in length.

Latest Survey: A few additional minor distresses from the previous year were noted bringing the total number of observed distresses to 32.

I-75 Northbound (Cheboygan County): This is another 40-year HMA perpetual pavement design constructed in the fall of 2008. For this project, the existing concrete pavement was rubblized (broken into smaller pieces resembling gravel) prior to the paving of the HMA. Rubblization is a standard fix; however, the HMA resurfacing is normally a 20-year design.

Latest Survey: No distresses were noted in the most recent survey. However, the longitudinal paving joints are very noticeable, which could be the start of potential raveling issues.

## **New Projects**

In 2010, a second thin unbonded concrete overlay was built on M-1 (Woodward Avenue) in Detroit between Tuxedo and I-94. The design is similar to the M-3 project, except one HMA interlayer was used and all joints were sealed.

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