



STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

RICK SNYDER
GOVERNOR

KIRK T. STEUDLE
DIRECTOR

January 30, 2012

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 Field Services, 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

Pavement Demonstration Program Status Report January 2012

Background

Public Act 259 of 2001 allows the Michigan Department of Transportation (MDOT) to construct up to four demonstration projects per year that are not subject to a Life-Cycle Cost Analysis (LCCA). The LCCA process is a tool for selecting the lowest cost pavement design over the expected service life of the pavement. By law, the LCCA process must include historical information for initial construction, maintenance costs, and performance (service life). This information may not be available for new pavement designs, precluding them from being chosen as alternatives. 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 for trying new and innovative ideas.

Potential advantages of pavement demonstration projects include increased service life, improved customer benefits, 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 these partners reach a consensus that a project would make a good candidate, the project goes to MDOT's Engineering Operations Committee (EOC) for formal approval. Once approved, the project becomes part of the Pavement Demonstration Program.

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

Project List

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

Table 1. Pavement Demonstration Project List							
FY Let	Route	Region	County	Location	Description	Pavement Costs	
						HMA	Concrete
2003	I-75 NB	North	Ogemaw	Ski Park Road to Roscommon County Line	Low volume unbonded overlay		\$1,980,000
2003	M-84 SB	Bay	Bay/Saginaw	Pierce Road to Delta Road	Perpetual pavement	\$700,000	
2004	M-3	Metro	Wayne	St. Aubin to McClellan	Thin unbonded overlay		\$2,200,000



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Table 1. Pavement Demonstration Project List

FY Let	Route	Region	County	Location	Description	Pavement Costs	
						HMA	Concrete
2005	M-13	Bay	Bay	Mary Drive to North Street	Low volume concrete		\$1,200,000
2005	I-96 WB	Metro	Wayne	M-39 to Schaeffer Road	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 Road 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 inch of Hot Mix Asphalt (HMA).

Latest Survey: The unbonded concrete overlay continues to show signs of pumping, which usually indicates the presence of water that has infiltrated the pavement structure and is not properly draining out. To help prevent water infiltration, a maintenance project was let in 2011 to seal the previously unsealed transverse joints, corner cracks, and longitudinal cracks. A draft report on the causes of the distresses found in this pavement has been received as part of the research project with the University of Michigan titled "Improved Performance of the Concrete Overlays." The report is currently being reviewed by MDOT.

Centerline cracking on the southbound pavement has a few locations showing signs of delamination (top layer coming off). Overall, the pavement appears to be in the same condition as last year's survey.

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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 was a significant increase in the total amount of cracking for both directions. The northbound roadway (standard section) increased from 335 to 848 feet of cracking. The southbound roadway (perpetual section) increased from 7 to 218 feet. Many of the cracks on the southbound roadway are short, which would indicate they have initiated since the last survey. In addition, many of the cracks on the southbound roadway are at core holes (locations removed for thickness checks during construction) and near the beginning or ending points of curb and gutter.

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: Overall, the number of 5 x 5 foot concrete panels that have a crack increased from 233 to 345 – a 48 percent increase. This continues a trend of yearly increases in new cracking. Of the 345 panels, 210 are on southbound and 135 on northbound. The sealed sections are exhibiting fewer cracks than the unsealed (143 vs. 202), while the drainable HMA interlayer is exhibiting fewer cracks than the dense-graded HMA (134 vs. 211).

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: Very little has changed from previous yearly surveys. A few of the cracks noted in last year's survey near the Pinconning River have gotten worse. These cracks were caused by heavy equipment used during work on the bridge at Pinconning River.

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.



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Latest Survey: The only thing of note during this survey was the paving joint between lanes in a few areas was beginning to open up. This is typically a construction-related problem and not a problem with the design.

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: Very little has changed since the last survey. A small area of new joint spalls was noted. A couple of cracks previously noted have widened.

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.

M-1 (Woodward Avenue): This project is a 4-inch unbonded concrete overlay similar to the M-3 project. It was constructed in 2010 and does not contain test sections. All joints were sealed and the same HMA interlayer (drainable open-graded HMA) was used throughout.

Latest Survey: A total of 68 of the 5 x 5 foot panels have a crack in the first survey since construction.

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