JENNIFER M. GRANHOLM
GOVERNOR

STATE OF MICHIGAN
DEPARTMENT OF TRANSPORTATION
LANSING

KIRK T. STEUDLE
DIRECTOR

March 9, 2010

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

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

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

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

Dear Senators Hardiman and Gilbert, and Representatives Gonzales and Byrnes:

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 John C. Friend, Engineer of Delivery, at 517-335-1697.

Sincerely,

Jacqueline G. Shearer
for Kirk T. Steudle
Director

Enclosure
BOHD:C&T:MJE:clc
cc: Members of the Senate and House Transportation Committees
Members of the Senate and House Appropriations Subcommittees on Transportation
bcc: Greg Johnson
Jackie Shinn
John Friend
Brenda O'Brien
Ron DeCook
Jeff Kraus
Vanessa Blaxton

Michigan Department of Transportation
Pavement Demonstration Program Status Report
February 2010

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. In addition, new pavement designs and 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 (HMA)	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. to Riggsville Rd.	perpetual pavement over rubblized conc	$800,000	

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 was rubblized and overlaid with 6.5 inches of Hot Mix Asphalt (HMA) at the same time. Several longitudinal cracks are being studied to determine their cause. Evaluation of these cracks is part of a research project recently started with the University of Michigan titled "Improved Performance of Concrete Overlays." Testing and visual evaluation occurred in November 2009. Sometime in the spring of 2010, the research project principal investigator will provide a determination of the cause of the cracks. Following delivery of that information, the Michigan Department of Transportation will write a full report on the status of this project. It is anticipated this report will be completed in late 2010. Very little cracking is noted on the southbound (rubblize) project, although the entire length of the centerline was overband crack filled to try to alleviate some deterioration between paving passes.

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. The project was visited in January 2010. The first cracks have appeared in the perpetual pavement, three cracks totaling 16 lineal feet in length. The standard section has 29 transverse cracks totaling 337 lineal feet. This is almost a 100 percent increase in the number of cracks (15) from last year's survey. Those previous 15 cracks were crack filled in a 2008 project. The 2008 project also included the ends of areas that were milled and resurfaced during original construction and some centerline cracking. These are considered construction related problems.

At this time, it appears that the thicker base and polymerization of the HMA is providing benefits in the reduction of temperature related transverse cracking.

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. This project was visited in February 2010 and 323 of the roughly 5- by 5-foot concrete panels have a crack. This is a 69 percent increase over the previous year and follows two consecutive annual increases of 75 percent. While this represents less than 1 percent of the pavement area on this project, the continued large percentage increases are a concern. Many of the cracks are around drainage structures (manholes), which are typically problem areas for cracking.

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. During a January 2010 visit to the project, nine 5.5 by 5.5 foot concrete panels have a crack, which is an increase of three over the previous year. It was also noted that some faulting (differential height) was occurring in a few short locations along the joint in the middle of the rightmost lane. This middle joint did not have tie bars whereas the joints between lanes

did. Numerous joint spalls have been noted since construction. Raveling (very slight deterioration) of the joints has also been noted since construction and is common with the early-age lightweight saws used for concrete pavements that are as thin as this one.

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. During a February 2010 visit to the project, three very faint cracks were found within a 15-foot section of the roadway. All three are parallel and at acute angles across the pavement.

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. Within a few weeks after concrete placement, several cracks were noted. It is believed these were due to late sawing of the joints. During a February 2010 visit to the project, a few minor distresses were noted, bringing the total number of observed distresses to 29. At this point, only one crack appears to be getting wider and has associated spalling. The remainder of the distresses appears to be stable.

I-75 Northbound (Cheboygan County): This is another 40-year HMA perpetual pavement design construction 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. A January 2010 site visit revealed that the pavement is in as-constructed condition with no distresses.

New Projects

In 2010, a second thin unbonded concrete overlay will be 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 will be used and all joints will be sealed.

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