Midwestern Pavement Preservation Partnership
Meeting Minutes
Indianapolis, Indiana
February 1-3, 2006

Wednesday, 1 February 2006

1:00 p.m. – 2:00 p.m. "Setting the Stage"

Dave Levi, Moderator

Mr. Levi opened the meeting by welcoming the attendees and inviting them to take advantage of the occasion by making new contacts and sharing their resources.

Mr. Levi then introduced Mr. Corey Carr, Chief of Staff of the Indiana Department of Transportation (INDOT) who also welcomed everyone to Indiana.

Corey Carr, INDOT

Mr. Carr described Indiana as the crossroads of America and cited traffic statistics, emphasizing the added wear and tear imposed on highways by trucks and reflected on what the truck statistics could be in the states and provinces of the attendees. According to Mr. Carr, the low visibility of pavement preservation put it at somewhat of a disadvantage in the competition for scarce resources. Indiana's Governor Mitch Daniels had recently announced a major road improvement program whose focal points were speed and action.

Mr. Carr also thanked the Federal Highway Administration (FHWA) and praised its Indiana Division for the considerable help it had provided to Indiana. In addition, he thanked Mr. Larry Galehouse of the National Center for Pavement Preservation (NCPP) and his team for their recent review of Indiana's pavement preservation program. Finally, Mr. Carr invited the attendees to explore downtown Indianapolis with its fine restaurants.

Mr. Levi then introduced Mr. Robert Tally, FHWA's Indiana Division Administrator.

Robert Tally, FHWA

Mr. Tally also welcomed everyone to Indiana and endorsed Mr. Carr's remarks about Indianapolis. Under Governor Mitch Daniels' leadership, INDOT was being transformed and the Indiana Legislature was considering a public / private partnership proposal, referring to the proposal to turn the Indiana Toll Road over to a private Spanish / Australian consortium.

Mr. Tally urged the wise use of assets and mentioned his own agency's increased involvement with pavement preservation while working with its partners. As an example, Mr. Tally mentioned the combined efforts of state and federal officials,

local agencies, academia, and private contractors participating in this meeting. Mr. Tally concluded his remarks by acknowledging the pioneering efforts of the NCPP in furthering the cause of pavement preservation.

Mr. Tally was followed by Mr. Jon Rice of the National Association of County Engineers (NACE).

Jon Rice, NACE
Mr. Rice also thanked everyone for their attendance and described the pavement preservation efforts in Kent County, Michigan, where he serves as Managing Director of the Kent County Road Commission (KCRC). Mr. Rice displayed a Pavement Condition Index (PCI) distribution for his road system and said that his County's use of pavement preservation had produced a substantial improvement in the quality of the roads. Over the next 10 years, the KCRC plans to reduce the expansion proportion of its expenditures from 45% to 29% while increasing preservation from 34% to 49%. The KCRC's goal was to have 70% of its system at a PCI of at least 70 by 2016.

Following Mr. Rice was Mr. Gerry Eller, Executive Director of the Foundation for Pavement Preservation (FP2).

Gerry Eller, FPP
Mr. Eller encouraged the formation of partnerships with industry. He then described the FP2 – its founding in 1992, its Board of Directors, and its role in establishing the NCPP at Michigan State University (MSU). As the pioneering partnership, Mr. Eller felt that the FP2 had an opportunity to set the standard for others following. In the past, our reluctance to form partnerships between public and private entities may have contributed to the situation in which we now find ourselves. We need to change our paradigm from "*design, build, and re-build*" to "*design, build, preserve, and re-build*". Unfortunately, some contractors have a problem with the new direction.

Our partnership has validity and more credibility because it promotes a balanced set of interests. In the face of significant and permanent reductions in public agency employment, we need to recruit the services of private industry. Partnerships can also promote uniformity of specifications. For example, why are there such radical specification changes at state boundaries? Partnerships can also help with the dearth of technically competent contractors in remote areas and promote better understanding with legislators and public officials.

We should all be ambassadors for pavement preservation and explain its concepts to officials and the public. Mr. Eller encouraged the MPPP to maintain its links with the FP2 and he felt that by working together, the two organizations could influence national policy.

Mr. Eller then challenged the audience.

- Be the first to develop pavement preservation performance specifications,
- Raise the quality of pavement performance contractors, and
- Contribute ideas and start a pavement preservation research program.

Finally, Mr. Eller encouraged agencies to formally plan pavement preservation projects and include them in their Statewide Transportation Improvement Program (STIP) documents together with program years and budgets.

Mr. Levi then stated his agreement with the speakers and declared that the stage had been set.

2:00 p.m. – 3:30 p.m. "Addressing the Needs" Bill Flora, Moderator

Jim Sorenson, FHWA

Mr. Sorenson stated that the previous speakers had been right on target and that he intended to talk about pavement preservation from a federal perspective. First, he reminded the audience that agency roles had been changing significantly. As recently as 50 years ago, there was no Interstate System and it took weeks to cross the country by highway. While it was true that federal revenues built the roads, they did not, nor were they meant to maintain them. Instead, there was an agreement between the federal and state agencies that the federal investment would be maintained by non-federal resources. The federal role was to provide construction finance and technical assistance. Mr. Sorenson said it was interesting to note that the whole Interstate System had been built using revenues derived from a 4 cent/gallon federal fuel tax.

In 1976, Congress enacted the Federal-aid Highway Act to finance resurfacing, restoration, and rehabilitation (3R) to be followed in 1981 by the addition of the fourth "R", reconstruction to initiate the Interstate 4R Program. In 1991, Congress passed the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) which increased the stewardship of the System and required partnerships with the states. This posed a unique challenge for the states, e.g. Texas DOT has 26 districts. ISTEA terminated the Interstate 4R Program and changed the focus to maintenance. Interstate certification was abolished but the requirement for stewardship continued.

Along with the state highway agencies, the American Association of State Highway and Transportation Officials (AASHTO) 's Subcommittee on Maintenance has also been changing, moving in the direction of pavement preservation. When we write performance specifications, we should build on the experience of others and write the specifications collectively. Although State DOTs have not had maintenance specification books, Mr. Sorenson believed they would have them for preservation within 5 to 10 years.

Mr. Sorenson also warned that work force development will become essential – already, half of the expertise within state highway agencies has been lost to retirement and there will be another 50% turnover in the next 5 years. While we urgently need to do training and certification, we must develop the right training. This is one of the MPPP's foundational pillars. For comparison, each year the NHI presents about 1,000 training courses and trains about 30,000 students.

Mr. Sorenson regretted that research needs had not been included as a platform in ISTEA and he mentioned the need for a separate platform for preservation. The FHWA will help here by developing a 5 to 10 year road map to chart preservation. The time for pavement preservation is now – we need action, not just talk. There is already an academic commitment as evidenced by the pavement preservation courses being offered by the University of Illinois and Louisiana State University.

Mr. Sorenson was followed by Mr. Larry Galehouse, Director of the NCPP.

Larry Galehouse, NCPP

Mr. Galehouse described the services provided to the MPPP by the NCPP.

- Day-to-Day Activities
  - Manage Partnership Operations
  - Assure Participation & Collaboration
  - Implement Task Operations
  - Partnership Promotion
- Manage Operations
  - Establish & Maintain Website
  - Prepare Mailings & Communications
  - Administrative Support
  - Financial Accounting (Manage Pooled Funds)
- Assure Participation
  - Pre-Meeting Coordination & Management
  - Meeting Site Logistics
  - Speaker(s) / Moderator Arrangements
  - On-site Meeting Coordination
- Implement Task Operations
  - Meeting Proceeding Report
  - Financial Reporting (Quarterly)
  - Optional Directed Activities

Mr. Galehouse then briefed the attendees on highlights of the FHWA's Pavement Preservation Technical Assistance Program. In this program, the FHWA provides support and technical assistance to State departments of transportation (DOTs) seeking to develop, expand, or improve their programs for pavement preservation.

Each appraisal is approximately 80 hours of program review and includes:

- Interviews of key personnel,

- An oral closeout meeting, and
- A written report containing observations and recommendations.

Each appraisal is conducted in partnership with the FHWA Division Office and the State DOT. Topics covered in the interviews include:

1. Program Implementation
2. Public/Key Decision Maker/Legislator – Relations
3. Pavement Management System
4. Project Selection
5. Preservation Treatments
6. Business Process
7. QC/QA
8. Training
9. Materials
10. Performance Monitoring
11. Research & Development

Lee Gallivan, FHWA Indiana Division
Mr. Gallivan described the activities of the Transportation Curriculum Coordination Council (TCCC) and explained how the TCCC could help with preservation training.

Mr. Gallivan reminded the audience of the importance of having qualified personnel such as materials testers and inspectors to ensure high quality construction. In fact, qualified (trained) personnel are required to be used on federally financed highway projects.

The TCCC, which is financed by a pooled fund, consists of representatives from five regional certification groups; the AASHTO Subcommittees on Construction, Maintenance, and Materials; the FHWA/NHI; industry groups; and academia. The TCCC's Mission is to coordinate training and certification efforts, establish a national core curriculum, and develop training materials. By focusing on five program areas (construction, materials, maintenance, safety, employee development) and four skill levels, the TCCC has developed a comprehensive curriculum that is dynamic and adaptable by State DOTs for their training programs.

Mr. Gallivan was followed by Ms. Katie Zimmerman of Applied Pavement Technology, Inc.

Katie Zimmerman, AP Tech
Ms. Zimmerman began by thanking the MPPP for inviting her to speak at the meeting. She then posed the question "What's needed in pavement management?"

A pavement management system (PMS) certainly must contain information about an agency's pavements, but it must also be able to perform analyses, generate and optimize strategies, and report results.

Agencies sometimes have internal communications problems which result in a failure to get the right information into the PMS. Not only must an agency be able to store pavement data in its PMS, but the data must be able to support PMS recommendations upon which the agency will base its strategic decisions.

In the past, some agencies tracked pavement performance categorically by family, but now there is a trend toward tracking individual pavement performance if such tracking can be supported by the data collected. Treatments can be used for different purposes such as prevention versus short-term stop-gap measures.

Ms. Zimmerman stated a need for prioritization or optimization tools that could

- Select projects within anticipated budget constraints,
- Project budget needs to meet performance targets, and
- Predict the long-term consequences of adopting various strategies.

A PMS should also be able to report:

- Current and projected conditions,
- Planned work activities,
- Long –term consequences of various strategies, and
- Progress toward and agency's goals.

The information derived from a PMS must be able to influence an agency's policies and practices. Finally, Ms. Zimmerman described the following pavement management trends:

- QC/QA in data collection,
- Use of remaining service life (RSL),
- Matching projects to pavement management recommendations,
- Incorporating preventive maintenance treatments into the models, and
- Use of pavement management information to support the new M-E design programs.

4:00 p.m. – 5:00 p.m. "Innovation"

LaDonna Rowden, Moderator

Ms. Rowden welcomed everyone to the session and introduced the first speaker, Minnesota DOT's Jim McGraw, who provided an update on an NTPEP Joint and Crack Sealant Evaluation.

Jim McGraw, Minnesota DOT

Mr. McGraw began by describing AASHTO's National Transportation Product Evaluation Program (NTPEP). He explained NTPEP's purpose, viz., *"…to pool the physical and professional resources of State DOTs to coordinate national*

evaluation on proprietary, engineered products of common interest, including a wide array of highway safety products, construction and maintenance materials."

Next, Mr. McGraw took the audience on a tour of NTPEP's website (www.ntpep.org), including its interactive database, demonstrating the wealth of information available from the online evaluation reports.

Mr. McGraw then described the first NTPEP field evaluation of concrete joint sealers which has been hosted by the Minnesota DOT since September, 2003. In this 3-year field and laboratory evaluation, 18 products from 9 manufacturers are being tested. Mr. McGraw described the various products and the ways in which they were being tested. He concluded his presentation by listing the advantages gained by his agency in hosting such a demonstration, which include

- Quick and inexpensive method for evaluating construction and maintenance products,
- Easy method to generate Approved Product Lists,
- Maintain currency on new technologies,
- Networking with National Experts, and
- Increasing expertise within the Minnesota DOT.

Mr. McGraw was followed by Leonard Frass of Saskatchewan Transportation.

Leonard Frass, Saskatchewan Transportation

Mr. Frass began by describing Saskatchewan's highway network and the increasing pressures to which it is being subjected. In particular, the closure of some rail lines and significant increases in truck traffic have placed enormous pressure on the Province's thin membrane surfaced (TMS) roads. The province has reacted by increasing the number of kilometers in the asphaltic concrete (AC) and granular parts of its system and with this shift has come an urgent need for new AC and granular treatments.

The Province applies major treatments such as overlays, microsurfacing, and full seals for some distresses while using minor treatments such as patching, sealing, and blading for others. The Province is particularly concerned with distresses such as

- Depressed transverse cracking,
- Localized rutting,
- Centerline cracking, and
- Block cracking / segregation.

To address the growing pressures on its highway network, Saskatchewan Highways and Transportation (SHT) developed a goal to *"… research, develop and implement more cost-effective methods for treating localized surface failures."* Associated with this goal is the objective to *"… develop an effective*

maintenance treatment focused on treating depressed transverse cracks (DTC), centerline cracking, localized rutting, and segregated surface areas."

Mr. Frass described SHT's success in developing a modified micro-patching mix material called TCM 8000 which consists of aggregate, CQS polymer, modified emulsion, water, set-retarding chemical, and Portland Cement. In summer 2002, SHT tested and field-validated the modified micro-patching mix whose application required the design and construction of specially modified equipment called the Transverse Crack Machine (TCM).

Mr. Frass reported that after three years, the micro-patches had performed well and he concluded his presentation by listing the treatment's following pros and cons.

- Pros:
    - Alternative treatment for cracking, segregation and localized rutting
    - Effective, efficient and flexible
    - Environmentally "friendly" (no heat required)
- Cons:
    - Testing required to determine the "right mix"
    - Aggregate availability and setting time.

Mr. Frass was followed by Tom Wood of the Minnesota DOT.

Tom Wood, Minnesota DOT

Mr. Wood described Minnesota DOT's success in developing a user-friendly alternative to tight blading with hot mix asphalt (HMA) as a pre-overlay treatment or as an alternative to thin overlays as a surface treatment.

In the past, the Minnesota DOT has encountered problems with tight blading. The material is less dense than a normal overlay lift, it does not readily flow into cracks and small potholes, it segregates as a result of temperature and aggregate variations, and it leaves a rough surface over which to pave.

Mr. Wood described "Flexible Liquid Tight Blading" as an alternative treatment using a material that

- Has a high AC content,
- Has a lower viscosity that allows it to flow into cracks, dips, and potholes,
- Is self-compacting and self-tacking,
- Allows the material to be placed only where needed,
- Is environmentally friendly,
- Is made at ambient temperature, and
- Whose by-product is water.

According to Mr. Wood, the Minnesota DOT has been able to modify regular micro-surfacing material by

- Increasing the total amount of emulsion by 20%.
- Increasing the total residual AC from 8.6% to 10.6%.
- Maintaining an AC to fines ratio of 1 to 1 and,
- Using a softer base AC to make the emulsion.

In addition to using the modified micro-surfacing material as a preparation for overlays, the Minnesota DOT has successfully used it as a leveling course and as a top surface treatment.

5:00 p.m. – 5:30 p.m. "Studies"

Kevin Kennedy, Moderator

Mr. Kennedy welcomed everyone to the session and introduced the first speaker, James Moulthrop of Fugro Consultants, LP.

James Moulthrop, Fugro Consultants LP

Mr. Moulthrop reported on the progress that had been made on a 14-state pooled fund study to improve mix designs for slurry surfacings. The study consists of the following three phases.

1. Literature review and work plan development.
2. Laboratory work.
3. Field validation, guidelines, and specifications.

Phase 1 is complete and final plans for Phases 2 and 3 have been prepared.

Mr. Moulthrop described problems with the present way of designing and applying slurry surfacings. The drawbacks are related to lack of data (aggregates and binders), the reproducibility of tests, and the inability to simulate real-world conditions (roads and traffic).

New tests are being developed for mixing, setting / curing, and abrasion / cohesion. Mr. Moulthrop described these test procedures and the related apparatus. He also showed and discussed a new "straw man" specification.

Finally, Mr. Moulthrop discussed Phase 3, including project selection, candidate field sites, monitoring, specifications, and training. Construction is planned for 2006 and 2 to 3 sites per Long Term Pavement Performance (LTPP) region are to be chosen.

Mr. Moulthrop was followed by Imad Al Qadi, Director of the Advanced Transportation Research and Engineering Laboratory at the University of Illinois.

Amad Al Qadi, ATREL

Mr. Al Qadi provided the attendees with an update on the Performance Specification Study for crack sealants. At the outset, Mr. Al Qadi made a clear distinction between cohesive and adhesive failures, i.e., material versus bonding

failures. He then proceeded to discuss current needs and the objectives defined by the sponsors.

The objectives led logically to a set of project tasks and test methods, including the use of a vacuum oven. Mr. Al Qadi then discussed bending beam rheometer (BBR) modifications and the selection of parameters, concluding with a description of the finite element modeling being used and the stress relaxation test.

Thursday, 2 February 2006

8:00 a.m. – 12:00 p.m. "Sharing Best Practices"

Dennis Watson, Moderator

Mr. Watson welcomed everyone to the morning session and called for volunteers to present "Sharing Best Practices". The first volunteer was Dave Levi, representing North Dakota.

Dave Levi, North Dakota

Mr. Levi began by presenting North Dakota's highway system statistics and a review of his State's design guidelines. North Dakota's old 3-R agreement with the FHWA allowed only one overlay per project before reconstruction. The State is now working with the FHWA to develop guidelines to permit the use of multiple surface treatments.

In 2005, North Dakota applied surface treatments such as thin overlays, seal coats, or micro-surfacing to 17.5% of its system. The State used micro-surfacing to correct 130 miles of roadway with depressed transverse cracks and had emulsion delivered to projects in 300 gallon totes. The cost of materials for the finished product was $800 per mile.

Mr. Levi was followed by Roger Olson of Minnesota.

Roger Olson, Minnesota

Mr. Olson presented the following highlights of Minnesota's program.

- Fog Sealing Shoulders
  - Research into effects of rumble strips
  - Value of polymer modified emulsions for fog sealing
- Flexible Micro Surfacing
- Updating Seal Coat Handbook
- NTPEP Crack Sealing Study
- Ultra-Thin Bonded Wear Course (UTBWC) (NovaChip)
  - Why is it not cracking?
- Sealer Binder Study (FHWA)

Minnesota placed a UTBWC over jointed concrete pavement on I-35 at Albert Lea, MN. They experienced much less reflective cracking (some from the top

down), but when the cracks did appear, they were about 2 inches downstream from the underlying joint.

Mr. Olson was followed by Thomas Anna of Missouri.

Tom Anna, Missouri
Mr. Anna discussed Missouri's Amendment 3 (Smoother, Safer, Sooner) Program. According to Mr. Anna, the Missouri DOT is not performing preventive maintenance. Instead, their focus is on the Amendment 3 Program which is expected result in smoother pavements, brighter stripes and signs, improved shoulders with rumble strips, and safer guardrail. Only 46% of Missouri's roads are in good condition.

Mr. Anna was followed by Jackie Vogel of Kansas.

Jackie Vogel, Kansas
Ms. Vogel described Kansas' Pavement Preservation Program which began in the early 1980s. The program, which uses a PMS, has dedicated funding and the support of top management.

Within the program, each location is considered independently for an appropriate preservation action with the understanding that "one size does NOT fit all". The program's major components include

- Rehabilitation,
- Substantial maintenance,
- Preventive maintenance, and
- Routine maintenance.

Current treatments applied by the Kansas DOT include

- Rout & Crack Seal
- Chip Seals
- 1"- 4" Overlay/Inlay
- Heater Scarification
- Cold In-Place Recycling
- Nova Chip
- Modified Slurry Seal
- Cold Milling
- PCCP Patching
- PCCP Dowel Bar Retrofit
- PCCP Slab Replacement
- PCCP Joint Repair
- Diamond Grinding

Ms. Vogel explained that the Kansas DOT had recently begun to use Nova Chip and 2" in-place surface recycling as part of their pavement preservation program.

Ms. Vogel was followed by Tom Lorfeld of Wisconsin.

Thomas Lorfeld, Wisconsin
Mr. Lorfeld began by presenting Wisconsin's highway system statistics and a description of his State's pavement maintenance practices. It was interesting to learn that Wisconsin's Counties perform all maintenance on state highways.

A main feature of the program is the Pavement Maintenance Manual, a practical, "how to" document that was developed in 2000 with county input. Since 1997, Wisconsin's maintenance efforts have been guided by a Pavement Maintenance Advisory Committee which has semi-annual, informal discussion meetings between Wisconsin DOT and County officials.

Wisconsin's pavement maintenance practices include

- Diligent crack sealing program at 3 years,
- Seal-coating 100-200 Miles/Year (centerline),
- Full depth joint repair $500K / year,
- Partial depth joint repair – minimal experience, and
- Dowel bar retrofit repair,
    - Let contracts with non-county contractors(not county)
    - Mixed results

Mr. Lorfeld also reported that as a result of the Wisconsin Legislature's repeal of the State's indexed fuel tax, the Wisconsin DOT will need to seek legislative approval of the fuel tax each year.

Mr. Lorfeld was followed by Aric Morse of Ohio.

Aric Morse, Ohio

Mr. Morse presented an outline of Ohio's preventive maintenance program and described the treatments used. He said that his department's top management still had lingering doubts about the cost effectiveness of preventive maintenance and committed only $10M per year to the statewide program.

Ohio has an extensive preventive maintenance research program involving over 300 test sections and Mr. Morse cited the following examples of ongoing and scheduled research.

- Crack Seals - Year 7 of a 10-year study,
- Thin Hot Mix Overlays - Year 4 of a 5-year study,
- Surface Repairs - Just started a 2-year study, and
- Micro-Surfacing and Chip Seals – To start in 2007 for 30 months.

Finally, Mr. Morse posed the following questions for which Ohio is seeking answers.

- Is there a need to seal cracks prior to applying chip seals?
- What aggregate gradations are used on the base applications of double chip seals?
- What are appropriate traffic levels for chip seals?
- How do other agencies apply chip seals on curves?

Mr. Morse was followed by LaDonna Rowden of Illinois.

LaDonna Rowden, Illinois
Ms. Rowden said that preventive maintenance in Illinois is still in its infancy and she outlined her department's limited program.
Specific funding is set aside for:

- Bituminous Surface Treatments (Seal Coats),
- Slurry Seals,
- Micro-Surfacing, and
- Cape Seals.

Other treatments covered under typical funding include:

- HMA Overlays,
- Crack Sealing, and
- Patching, etc.

For the Fiscal Years 2005 and 2006, Illinois has programmed

- 8 - Seal Coats,
- 3 - Slurry Seals,
- 22 - Micro-Surfacings,
- 2 - Cape Seals, and
- 3 - Half-SMART (0.75 inch Level Binder w/ Seal Coat).

Ms. Rowden was followed by Leonard Frass of Saskatchewan.

Leonard Frass, Saskatchewan
Mr. Frass began by presenting Saskatchewan's highway system statistics and a brief history of his Province's asset management activities dating back to approximately 1995. Each year, Mr. Frass' agency performs the following steps

1. Data Collection.
2. Model Development.
3. Network Level Scenarios.
4. Funding Request & Executive Direction.
5. Project Level Planning.
6. Maintenance Management.
7. Performance Measures.

Mr. Frass then showed Saskatchewan's asset management scheme, including the relationships between network level, project level, and day-to-day decisions. Within the Asset Management System, the following activities occur.

- Strategic Planning
    - Road Condition Targets (Level of Service)
    - Budget Funding Levels
    - Performance Measures
- Project Planning
    - Preservation Program(Engineering)
- Crew Operations

- Preservation and Allotment Planning

Mr. Frass mentioned the importance of performance measures in Saskatchewan's Asset Management System. These measures are used at all levels in preservation, they promote accountability, they are consistent, and they provide the vital linkage between outcomes and funding.

Mr. Frass was followed by Jon Watson of Montana.

Jon Watson, Montana
Mr. Watson started his presentation by saying that Montana had been performing pavement preservation since 1997. The program had strong management support and dedicated annual funding ranging from $40M to $55M. Guidelines for project development were linked directly to pavement management analysis.

Montana's pavement deterioration curves contain guidelines on the appropriate times to apply pavement preservation treatments, including a threshold trigger for reconstruction. Mr. Watson also displayed alternative long-term condition projections for Montana's Interstate System that clearly showed the superiority of the preservation approach over a major rehabilitation strategy.

Finally, Mr. Watson described chip seal variations used for heavy / turning traffic conditions, chip seal warranties, aggressive crack sealing, and isolation lifts which were a product of the aggressive crack sealing program.

Mr. Watson was followed by Kevin Kennedy of Michigan.

Kevin Kennedy, Michigan
Mr. Kennedy described his department's Capital Preventive Maintenance (CPM) program which has an annual baseline budget of approximately $85M. The program consists of:

- Pavement Sealing
  - Crack seals, chip seals, micro surface, ultra-thin overlays
- Functional Enhancements
  - HMA overlays, Mill and Resurface, Concrete Pavement Restoration
- Discretionary
- Emerging Technology
  - New treatments that are promising but their performance and cost effectiveness are unproven.

Michigan has several best practices including

- Warranty Decision Tree
  - Past Practice - If project certain type, include warranty
  - New Practice - Does project meet guidelines? Addresses scoping, design, and construction issues

- Contractor Quality Partnership
    - Contractors, Consultants, and MDOT
    - Identify Training Needs
    - Develop and implement a training program
    - Establish and implement certification requirements for personnel
    - Link certification requirements for contractor and consultant prequalification

Mr. Kennedy was followed by Dennis Watson of Manitoba.

Dennis Watson, Manitoba
Mr. Watson began by mentioning that Manitoba only receives an annual allocation of $10M to $20M for the $300+M of taxes that it sends to Ottawa. This means that the vast bulk of Manitoba's highway expenditures must come from within the Province. Mr. Watson then went on to describe Manitoba's highway network and it became clear that the province needed to provide roads over very large distances for a small population of about 1,000,000.

Manitoba's Pavement Management System is a sophisticated tool that combines network data, budgets, and condition targets to produce an optimized list of candidate projects. At the network level, the PMS uses Markovian Transition probabilities to model life cycle performance and linear programming (LP) operating within a benefit / cost framework to optimize the selection of projects.

Mr. Watson said that despite all of the analysis, the $15M that has been allocated for all preservation treatments in 2006 is inadequate and that the agency is falling behind in its preservation of the network as a whole. They are striving to obtain enough revenue to preserve the status quo.

Finally, Mr. Watson provided the following summary:

- Manitoba faces a challenge to provide a very low population density province with a highway network supporting large, heavy trucks, and
- Maximizing efficiency and effectiveness in pavement preservation is the prime objective.

Mr. Watson was followed by David Andrewski of Indiana.

David Andrewski, Indiana
Mr. Andrewski first mentioned that his agency was undergoing a major reorganization in which employees were being asked to justify programs and positions. In addition, Indiana's pavement preservation program had just been reviewed and evaluated under a program sponsored by the FHWA. He was pleased with the review and expected its recommendations to result in improvements.

To better guide and manage its pavement preservation efforts, Indiana DOT had formed a Pavement Steering Committee with the result that preservation was assuming a bigger role.

Indiana's current preservation treatments include:

- Mill & Fill
- Microsurface – Warranty Specification (3 years)
- Hot-In-Place Recycling – End Result Specification
- Chip Seals - One District Setting the Pace (Will try polymer-modified emulsions).

Mr. Andrewski also mentioned that Indiana had several concerns

- 4 Lane Divided PCCP - Joint & Crack Seal
- 4 Lane Divided 30 Year Old PCCP – Patch & Diamond Grind
- 5 Lane Urban Composite – Mill & Fill
- 6 Lane Hot-In-Place Composite

1:00 p.m. – 2:30 p.m. "Treatment Techniques" Jon Watson, Moderator

Colin Franco, Rhode Island DOT

Mr. Franco described Rhode Island's experience using crumb rubber in asphalt mixes. This was originally mandated by ISTEA and Rhode Island's Senator John Chaffee was behind the requirement. The process was originally used by Arizona, but it needed to be modified for use in areas that experience cold / wet winters. The new method actually results in the rubber dissolving in the asphalt.

Rhode Island's chronological experience with the use of crumb rubber was summarized by Mr. Franco as follows

- 1987 – Demonstration Project with Plusride
- 1991 – ISTEA Mandate – Research with crumb rubber – modified asphalt
- 1999 to 2005 – Crumb rubber used in RIDOT Pavement Preservation Program
    - Crack Seal
    - Chip Seal
    - Modified Asphalt Thin Overlay
- 2005 – Use of crumb rubber with warm asphalt technology in Rubber Chip Seal

Mr. Franco then described Rhode Island's preservation treatments and some of the problems that they had encountered such as bleeding at intersections, improper roller use, de-lamination, adhesion failure, streaking, and stone kick out.

The new generation of crumb rubber modified asphalt has improved properties such as

- Improved low temperature properties
- Increasing both ends of the binder PG grade

- Enhanced chemical bond between the asphalt and crumb rubber molecules due to the chemical bonding agent.

Rhode Island uses the improved asphalt mix in its Power Placed Elastomeric Surface Treatment (PPEST) and Mr. Franco showed several examples of this application together with statistics showing the State's increasing use of crumb rubber.

Mr. Franco was followed by Mike Eacker of Michigan.

Mike Eacker, Michigan DOT
Mr. Eacker listed and described Michigan's concrete preservation techniques which include:

- Full-depth repairs
- Joint spall repair
- Intermediate spall repair
- Longitudinal joint repair
- Dowel bar retrofit
- Diamond grinding
- Resealing transverse joints
- Resealing longitudinal joints
- Sawing and sealing cracks

Some of the full-depth repairs involve the use of pre-cast slabs. This technique was originally used with state maintenance forces and has since been extended to include 20 contractual repairs on two roadways. Mr. Eacker concluded by mentioning that Michigan is now a "plain concrete" state.

Mr. Eacker was followed by Larry Galehouse of the NCPP who provided a short demonstration of how to estimate whether a highway network is improving based on remaining service life.

Mr. Galehouse was followed by John Kochilla of Owens Corning and Scott Stone of Missouri.

John Kochilla, Owens Corning and Scott Stone, Missouri DOT
Mr. Kochilla made a presentation entitled "Pavement Maintenance Project Profile: Mitigation of Bumps in HMA Overlay – Route 29, Missouri"

Mr. Kochilla was followed by Mike Buckingham of Strawser, Inc. and Kevin Kennedy of Michigan.

Mike Buckingham, Strawser, Inc. and Kevin Kennedy, Michigan DOT
Mr. Buckingham described microsurfacing – what it is, the equipment used for its application, road preparation, etc. For a single course, the material is applied at a

rate of 15 – 35 pounds per square yard and for a double course, the rate is 28 – 50 pounds per square yard. Deep ruts should be filled individually.

Mr. Buckingham mentioned that microsurfacing applications sometimes fail due to materials, control of materials, paving too late in the season, or applying the treatment to the wrong roads.

Mr. Kennedy described the Michigan DOT's experience with microsurfacing.

3:00 p.m. – 5:00 p.m. "Team Breakouts"

Roger Olson, Instructor

Mr. Olson instructed the following teams before their individual breakout sessions.

- **Materials**
- **Research**
- **Training**
- **Specifications**
- **Policy**

Friday, 3 February 2006

8:00 a.m. – 9:30 a.m. "Preservation Issue Team Findings & Recommendations"

Roger Olson, Moderator

Materials

The team first posed the question of what level of material testing is needed and appropriate for preservation treatments. For chip seals, they felt that the aggregate clay content needed to be determined because the sand equivalency test was inadequate.

They then questioned whether base / sub-base repair should be regarded as preservation. To promote enhanced durability, they also felt that aggregates should be selected based on traffic volumes.

Another question that came up was how to warrant work that was not the top layer, e.g. warranting inter-layers. Finally, the team felt that crack sealing posed special problems due to sporadic performance and contractor issues.

Research

The team first brainstormed the following topics.

- Clearinghouse
- State of the practice
- Test section(s) for MnROAD (pooled fund)
- Remaining Service Life (RSL) (structural and functional)
- Condition indices
- QC / QA for maintenance
- Treatment effectiveness

- Treatment selection tools
- Project scoping / selection
- Network and project level strategy development
- Region-wide fix performance data
- Normalization of condition data to aid communication
- Literature search of Midwest preventive maintenance research and access for all
- Integration of pavement preservation into Asset Management
- Centralized versus de-centralized decision making
- Automated construction, inspection, and condition assessment equipment
- Expert system decision tools

After grouping and ranking the topics, the team recommended the following three priorities.

1. Development of an expert system with network and project level strategy development, project selection and scoping, and treatment selection tools (right fix for the right road at the right time).
2. Establishment of a clearinghouse for information regarding the state of the practice, specifications, manuals, etc. and a literature search and posting of Midwest preventive maintenance research. (Note that this flows out of the #3 effort.)
3. Collection of region-wide performance data for existing fixes (pavement condition before and with time after fix) with maybe additional test section(s) for MnROAD (pooled fund). Normalization of the condition data is needed to aid communication among agencies.

Training

The team discussed the following topics.

Contractor and Inspector Certification

- Need materials for technicians, project engineers, and contractors
- Joint effort between industry, agencies, FHWA, and AASHTO to set the curriculum
- Computer-based training with a testing component
- Provide supporting documentation for future reference
- Structure the materials so they can help agencies promote uniformity in treatment use among their districts or regions

Materials to Promote Pavement Preservation

- Need to convey
    - Benefits of pavement preservation
    - Cost-effectiveness of the treatments
    - Keys to successful programs

- Target upper management, designers, directors, and other decision-makers
- Limit length to 1 to 2 hours

University-Level Training

- Support the Foundation for Pavement Preservation in its efforts to develop a university course
- Model efforts to train faculty after the NCAT program
- Consider offering certificate programs in pavement preservation using these materials

Establish a Clearinghouse

- Include information on:
    - Training courses currently available (including industry and NHI courses)
    - Other technology transfer materials available (video tapes, toolbox, and so on)
    - Materials under development and expected delivery dates
- Consider using TCCC or the National Center as the clearinghouse

Incorporate Training into Partnership Meetings

- Offer 1 or 2 short courses as part of the partnership meetings
- Consider one technical course and one less technical course
- Topics could be selected from the feedback provided during the NCPP's reviews of state practice

Specifications

The team concluded that the creation of standardized specifications was their most important issue. Presently, individual preservation treatment specifications exist within agencies and at the NCPP. The team identified the following preservation treatments as requiring standardized specifications.

Milling and thin lift hot mix asphalt (HMA) Micro-surfacing Cold-in-place recycling Slurry seal Ultra-thin bonded wearing course Hot-in-place recycling	Chip seal Dowel bar retrofit Rout and crack seal Diamond grinding / milling Pavement stitching Under-seal / slab jacking

The team then proposed the following steps:

- Form an Expert Task Group (ETG) for each treatment.
- List information on the NCPP's website.
- Collect sample specifications from member agencies.

- Use the ETG to finalize the specifications whose types could include method, performance, and / or warranty.
- Use the NCPP as a clearinghouse for the specifications.

Policy
The team considered four aspects of policy – Contracting, Planning, Public Relations, and Internal relations.

Contracting Policy - 1
WHAT DO WE NEED?
- Contractor Certification
- Process Certification
- Performance Specifications
- Agency Participation

Action:
- Challenge industry to:
  - Develop process & contractor certification
- Challenge agency to:
  - Be open to single source supplier
  - Provide test sites
  - Oversee industry development of certification process

9:30 a.m. – 12:00 p.m. "Business Meeting" Dave Levi, Moderator

Election of Officers
Dennis Watson moved that the terms of the current officers be extended until the next MPPP meeting. The motion was seconded by Kevin Kennedy and passed by voice vote.

Directors

Public Agency
Leonard Frass, Asset Management Engineer with Saskatchewan Transportation was elected.

Local Agency
Ken Baker, Township MFT Engineer with McHenry County, Illinois was elected to the Executive Board. Mr. Baker agreed to explore the possibility of the National Association of County Engineers (NACE) and the American Public Works Association (APWA) joining the MPPP and to draft amendments to the By-Laws as needed.

Academia
Gilbert Baladi, Professor of Civil and Environmental Engineering at Michigan State University was elected.

Northeast Pavement Preservation Partnership (NEPPP)

A motion was made to allow the NEPPP to operate using the sponsoring and administrative services of this pooled fund. In the ensuing discussion, the MDOT representative expressed a willingness to take on the extra work that this would entail and to act as a pass-through for the funding, subject to gaining the approval of his Department's Contracts Section and FHWA's Michigan Division. The motion was approved unanimously.

Next Meeting
A motion was made and approved to have the next meeting of the MPPP in St. Louis, Missouri in late September or early October 2006,

Task Force Summary

Clearinghouse
State of the practice
Specifications
Materials
Procedures / Manuals
Literature
Education / Short Courses
Certification
Research Needs Statements

Expert System
Network and Project Level Strategies
Project Scoping Process
Guidelines for Distress Points and Indices

Tom Woods moved to establish committees to do the actual work. Gilbert Baladi seconded the motion which was passed by voice vote.

In the area of Specifications, the following volunteers agreed to lead the ETGs associated with the various treatments.

Treatment	ETG Leader
Milling and thin lift hot mix asphalt (HMA)	Dave Andrewski, INDOT
Micro-surfacing	Dave Andrewski, INDOT
Cold-in-place recycling	Tom Lorfeld, Wisconsin DOT
Slurry seal	LaDonna Rowden, Illinois DOT
Ultra-thin bonded wearing course	Missouri DOT and/or Kansas DOT
Hot-in-place recycling	Kansas DOT
Chip seal	Kevin Kennedy, Michigan DOT and / or Tom Wood, Minnesota DOT
Dowel bar retrofit	Dave Levi, North Dakota DOT
Rout and crack seal	Tom Roberts, Montana DOT

Diamond grinding / milling	Lee Gallivan, Indiana FHWA
Pavement stitching	Dave Levi, North Dakota DOT
Under-seal / slab jacking	Lee Gallivan, Indiana FHWA

Mr. Levi then solicited volunteers to serve on the various ETGs.

Evaluations
Mr. Levi urged all attendees to complete and return their meeting evaluations before leaving.

Industry Liaison
Mr. Sorenson mentioned that industry groups could form liaisons with the MPPP. Mr. Woods then moved the creation of an industry liaison. Mr. Watson seconded the motion which was passed by voice vote.

Adjournment
Mr. Watson moved to adjourn the meeting. Mr. Kennedy seconded the motion and the meeting was then adjourned.