



RESEARCH SERVICES SECTION

TECHNICAL SUMMARY

Technical Liaison:

Michael Sheehan, Olmsted County
sheehan.michael@co.olmsted.mn.us

Administrative Liaison:

Clark Moe, Mn/DOT
clark.moe@dot.state.mn.us

Principal Investigators:

Michael Marti, SRF Consulting Group
Dave Rettner, American Engineering
Testing
Dan Wegman, SemMaterials, L.P.

PROJECT COST:

\$19,422



Workshop participants discuss case studies like this one requiring rehabilitation of a pavement with severe, 1.5-inch deep rutting.



Putting Research into Practice: Training Module for Pavement Rehabilitation Selection

What Was the Need?

Maintenance engineers have to decide appropriate ways to rehabilitate damaged pavement and sidewalks. Options available for concrete pavements are different from those for asphalt pavements. Many favored options involve recycling techniques, not only for environmental reasons but to save money on materials as well as hauling and processing costs, and to shorten construction time. Three key options are:

- **Overlay.** The quickest, least expensive and, ultimately, least durable solutions typically involve overlays, which can include a number of options, such as hot-mix asphalt mill and overlay, in which crews grind down 1 or 2 inches of asphalt and replace it with a new HMA layer; fracture and overlay, in which crews fracture pavement slabs to specified sizes and then overlay with HMA or concrete; and concrete on bituminous overlay, in which the surface is repaired and overlaid, or milled down and overlaid. With concrete overlays, joints are cut and, in some cases, dowel bars are used in the new joints.
- **Full Depth Reclamation.** This method requires crews to pulverize existing pavement and use it as a base course for new pavement.
- **Cold-In-Place Recycling.** A method used on low-volume asphalt roads, cold-in-place recycling requires reclaiming the top 2 to 4 inches of pavement in a new, cold-mixed asphalt layer placed over 1 inch of original asphalt.

Various approaches are detailed in specifications and guidelines, but the methods are not easy for engineers to sort through and compare. In January 2008, Mn/DOT and the Local Road Research Board released a [report on pavement rehabilitation](#); this report, combined with a [previous manual from 2006](#), provided Mn/DOT with guidelines for rehabilitation. Creating materials to present the insights of these reports in a classroom setting would help maximize their utility.

What Was Our Goal?

This implementation effort was to draw on completed research, including key Mn/DOT reports and the most current information from around the country, to develop a training module that would guide city and county engineers throughout Minnesota in evaluating pavement repair needs and selecting the most appropriate and cost-effective rehabilitation method. A course on this topic would have the added benefit of providing a venue for continuously updating best practices on a topic that continues to evolve. Training would then occur through Minnesota's Local Technical Assistance Program.

What Did We Implement?

The main Mn/DOT reports used to create the training were:

- "[Pavement Rehabilitation Selection](#)" (2008-06), which presented a decision tree for selecting pavement rehabilitation recycling techniques, focusing on the three options described above
- "[State Aid Concrete Pavement Rehabilitation Best Practices Manual 2006](#)" (2006-31), which is a concise, definitive handbook that helps city and county engineers select cost-effective rehabilitation methods for concrete roads with low traffic volumes

How Did We Do It?

Investigators drew upon these reports as well as work from various national and industry

“This new workshop helps city and county engineers by streamlining the process of determining what rehabilitation methods best suit pavement or sidewalk repair.”

–Michael Sheehan,
County Engineer,
Olmsted County

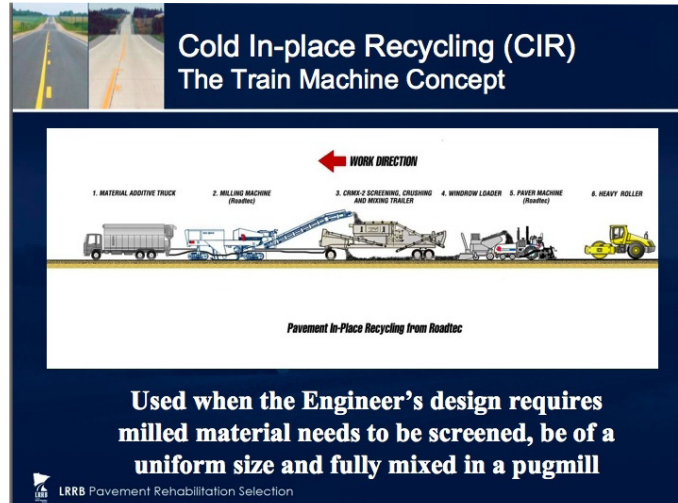
“This new course is a companion to the LTAP class on pavement preservation. When the roadway can no longer be fixed, the Pavement Rehabilitation Selection course shows what engineers can do.”

–Michael Marti,
Principal, SRF Consulting
Group

Produced by CTC & Associates for:

Minnesota Department
of Transportation
Research Services Section
MS 330, First Floor
395 John Ireland Blvd.
St. Paul, MN 55155-1899
(651) 366-3780

www.research.dot.state.mn.us



Instructors explain best practices such as the train machine concept, illustrated on this workshop slide, where crews work with machines in caravan to recycle old asphalt into a rehabilitated pavement.

transportation sources and consultation with technical experts to create course presentations and materials for a six-hour, one-day training course for engineers.

A pilot workshop was conducted June 25, 2008, at the Hennepin County Maintenance facility in Medina for about two dozen city and county engineers. Investigators Dave Rettner and Dan Wegman led the class while other team members gathered feedback about the training materials.

What Was the Impact

The training session is divided into four parts:

- **Background Information.** Defines terms, sets goals and identifies resources. (15 minutes)
- **Understanding the Problem.** Focuses on assessing pavement problems, including strength, base and subgrade condition, and drainage. (45 minutes)
- **Rehabilitation Techniques.** Reviews techniques for rehabilitating asphalt and concrete pavement structures. (3.5 hours)
- **Making a Decision.** Describes decision-making tools and approaches, and includes three case studies for use in group exercises. (90 minutes)

What's Next?

Minnesota LTAP will be using the training module developed in this project for a new pavement rehabilitation selection course, which will be coupled with LTAP's existing pavement preservation training. The two courses will alternate year to year.

Three workshop sessions, all led by Rettner and Wegman, have been scheduled: Grand Rapids, Feb. 24, 2009; Mankato, Feb. 26, 2009; and Medina, Feb. 27, 2009.

This Technical Summary pertains to LRRB's Research Implementation Committee's product 2008RIC04, "Training Module for Pavement Rehabilitation Selection," delivered June 2008. This presentation document can be accessed at <http://www.lrrb.org/tools.aspx>. The training program will be offered by the Minnesota LTAP and is listed at <http://www.mnltap.umn.edu/Events/>.

The central reports used to develop this training course were LRRB-produced Reports 2008-06, "Pavement Rehabilitation Selection," published January 2008, and 2006-31, "State Aid Concrete Pavement Rehabilitation Best Practices Manual 2006," published September 2006. They can be accessed in full at <http://www.lrrb.org/PDF/200806.pdf> and <http://www.lrrb.org/PDF/200631.pdf>, respectively.