



TECHNICAL SUMMARY

Questions?

Contact research.dot@state.mn.us.

Technical Liaison:

Joel Ulring, MnDOT
Joel.Ulring@state.mn.us

Principal Investigator:

Michael Marti, SRF Consulting Group, Inc.

LRRB PROJECT COST:

\$40,940



A fresh chip seal protects pavement from moisture and improves driving quality.



Putting Research Into Practice: Pavement Preservation Guidelines for Local Agencies

What Was the Need?

Pavement preservation—roadwork that improves or sustains pavement condition—remains key to cost-effective pavement management. Pavement preservation treatments allow transportation agencies to maintain pavement condition and extend pavement service life while minimizing maintenance needs.

MnDOT maintains flexible pavement preservation guidelines in the [MnDOT Pavement Preservation Manual](#), but many of the treatments described in the manual—such as ultra-thin bonded wearing courses or micromilling—often better suit high-volume roads than low-volume roads. These strategies don't always meet the scale and resources of locally managed road systems with extensive preservation needs.

Local road agencies seek pavement preservation strategies better tailored to low-volume roads and local budgets. Road managers need technical details, costs and benefits on a range of options for preserving low-volume pavements.

What Was Our Goal?

The Local Road Research Board (LRRB) sought to develop pavement preservation guidance for local road agencies. Designed to meet the needs of county and municipal road managers and agency budgets, the guidance would focus on treatments and benefits aimed specifically at low-volume roadway pavements.

What Did We Implement?

Investigators developed guidance for five selected treatments that address the needs of local transportation agencies. The treatments, which are included in the MnDOT Pavement Preservation Manual, are listed below from lowest to highest cost:

- **Rejuvenators.** Asphaltic or agriculturally developed liquid sprays are applied to distressed pavements. These products return some flexibility to asphalt roads that have become brittle from oxidation.
- **Scrub seals.** This treatment uses a sled fitted with brooms at different angles that scrub a polymer-modified rejuvenating emulsion into asphalt, followed by a fine aggregate in a product similar to a chip seal. These seals can return flexibility, toughness and durability to pavements.
- **Slurry seals (emulsion and aggregate).** Applied in a single pass, slurry seals treat raveling and oxidation, improve surface friction, seal pavement and fill minor irregularities.
- **Thinlays.** These thin asphalt overlays range from 5/8 inch to 1 inch thick. Thinlays can improve ride quality and address raveling, oxidation and minor cracking.

Local road agencies need affordable pavement preservation treatments to maintain pavement condition and performance. New guidance offers local agencies five lower-cost treatments that can be used to preserve pavements based on the type and severity of the pavement distress.

“This guidance provides a clear understanding of what pavement preservation treatments are available to local agencies, what’s involved in specifying them and the work involved in applying the treatments.”

—Joel Ulring,
Pavement Preservation
Engineer, MnDOT Office
of Materials and Road
Research

“Pavement preservation is always evolving. This recent LRRB project leverages the MnDOT Pavement Preservation Manual to provide local agencies with a quick reference guide to five relatively new preservation techniques.”

—Michael Marti,
Principal, SRF Consulting
Group, Inc.

Produced by CTC & Associates for:

Minnesota Department
of Transportation
Office of Research & Innovation
MS 330, First Floor
395 John Ireland Blvd.
St. Paul, MN 55155-1899
651-366-3780
www.mndot.gov/research



The new guidance for local agencies includes photographs of key construction steps for each pavement preservation strategy.

- **Cape seals.** This two-step treatment of a chip seal and a slurry or microsurfacing cover protects pavement from moisture, oxidation and raveling; fills ruts and some cracks; and improves ride quality and skid resistance.

Detailed descriptions of each treatment are provided in the updated manual and include specifications, applicable pavement conditions, costs, treatment procedures and photographs, crew needs and construction considerations. Minnesota local agencies that have experience using the treatment are also listed.

How Did We Do It?

Following a literature review of pavement preservation techniques suitable for local road systems, investigators worked with the Technical Advisory Panel to identify potential treatments and gather information about the technology, specifications, construction considerations and relative cost.

The project team also surveyed transportation agencies in 87 counties and approximately 150 cities in Minnesota to identify technologies used by these agencies and gather information about their experiences with the treatments. From this information, investigators selected five accessible techniques to add to the local agency preservation toolbox.

What Was the Impact?

Investigators worked with LRRB and MnDOT to incorporate the information into the MnDOT Pavement Preservation Manual. The revised manual was posted online in early 2020. Four treatments are presented in a chapter dedicated to local agencies. The fifth treatment—thinlays—is included in a discussion of flexible pavement treatments used statewide.

What’s Next?

The Minnesota Local Technical Assistance Program may develop training and workshops on techniques described in this study. Research on rejuvenators and other treatments will continue to identify products and practices that keep road crews and agency engineers abreast of the latest approaches and techniques.

This Technical Summary pertains to Report 2020RIC02, issued as a new Chapter 6, “Other Pavement Preservation Techniques—Local Government Focused,” of the MnDOT Pavement Preservation Manual in February 2020. The new chapter can be accessed as a standalone document at mndot.gov/research/reports/2020/2020RIC02.pdf.