



## Updates from the States: Wisconsin (July 2010)

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Wisconsin highway research and technology transfer is accomplished by way of various Wisconsin Department of Transportation (WisDOT) programs and DOT partnerships with state universities and industry organizations. The Midwest Regional University Transportation Center (MRUTC), the Transportation Information Center, the Wisconsin Traffic Operations and Safety (TOPS) Laboratory, and the Construction and Materials Support Center are some of the most recognized highway research partnerships/facilities in the state.

WisDOT research programs include the Wisconsin Highway Research Program (WHRP), the Policy Research Program, WisDOT Pavements and Materials Research programs, and the Pooled Fund program. The WHRP is focused on improving performance and longevity of pavements; whereas the Policy Research Program is focused on evaluating the technical merit of current policies and the impacts of those policies on the economy, safety, operations, and more. The WisDOT Pavements and Materials Research program is focused on projects that develop specifications and new technologies, include forensic evaluations, and carry out quality assurance and materials testing.

### Ongoing research

Wisconsin highway research projects currently underway can be categorized within the CP Road Map as follows:

- Reduction of Minimum Required Weight of Cementitious Materials in Concrete Mixes ([Track 1](#))
- Detecting Deleterious Fine Particles in Concrete Aggregates and Defining Their Impact ([Track 1](#))
- Demonstration of Cold Weather Concrete Paving ([Tracks 1](#) and [8](#))
- Performance Evaluation of Open Graded Base Course with Doweled and Nondoweled Transverse Joints on U.S.H. 18/151 and S.T.H. 29 ([Tracks 2](#), [6](#), and [10](#))
- Partial Depth Repair of Concrete Pavements WisDOT ([Track 7](#))
- Investigation and Application of Fractured Slab Techniques for PCC ([Track 7](#))
- Concrete Inlay for Continuously Reinforced Concrete Pavement Rehabilitation ([Track 7](#))

### Recently completed research

Research completed in the last two years includes the following:

- Concrete Pavement Rubblization: Survey of State Practice and Related Research ([Track 2](#); this report is highlighted below)
- Analysis of High Performance Concrete Pavement Sections Along I-90 Near Tomah, Wisconsin ([Tracks 8](#) and [12](#))
- Performance Assessment of Wisconsin's Whitetopping and Ultra Thin Whitetopping Projects Wisconsin Highway Research Program ([Tracks 2](#) and [10](#))
- Effects of Ground Granulated Blast Furnace Slag in Portland Cement Concrete ([Track 1](#))
- Portland Cement Concrete Pavements over Rubblized PCC ([Tracks 2](#) and [13](#))

- Status and Plans for Implementing 3D Technologies for Design and Construction in WisDOT ([Track 3](#))
- Evaluation of MMFX 2 Steel Corrosion-Resistant Dowel Bars on Jointed Concrete Pavements ([Track 6](#))
- Guidelines for Improving Full-Depth Repair of PCC Pavements in Wisconsin ([Tracks 7](#) and [10](#))
- Evaluation of Probing vs. Coring for Determination of PCC Thickness ([Track 11](#))

## Pooled Fund projects

The Pooled Fund program provides WisDOT the opportunity to combine financial resources with other states in an effort to achieve the same research goals. The following new and ongoing Pooled Fund projects are related to the CP Road Map.

- Characterization of Drainage Layer Properties for MEPDG ([Track 2](#))
- Investigation of Jointed Plain Concrete Pavement Deterioration at Joints and the Potential Contribution of Deicing Chemicals ([Track 6](#))
- Implementation of Concrete Pavement Mixture Design and Analysis (MDA) Track of Concrete Pavement Road Map ([Track 1](#))
- Evaluation of Test Methods for Permeability (Transport) and Development of Performance Guidelines for Durability ([Tracks 1](#) and [10](#))
- Development of Performance Properties of Ternary Mixes ([Tracks 1](#) and [10](#))
- PCC Surface Characteristics: Tire-Pavement Noise Program Part 3 - Innovative Solutions /Current Practices ([Track 4](#))
- Extending the Season for Concrete Construction and Repair, Phase III ([Tracks 7](#) and [12](#))
- Improving Foundation Layers ([Track 8](#))
- Technology Transfer Concrete Consortium ([Track 11](#))
- Recycled Materials Resource Center ([Track 13](#))
- Recycled Unbound Pavement Layers ([Track 13](#))

## Highlighted projects

The following section highlights specific research project reports by providing additional details and direct links for more information.

### **Analysis of High-Performance Concrete Pavement Sections**

Completed in February 2010, [Analysis of High Performance Concrete Pavement Sections Along I-90 Near Tomah, Wisconsin](#) documented field work evaluating the first high-performance concrete test sections built in Wisconsin. The report presents M-E PDG analysis for the respective sections. The sections evaluated as part of this report are expected to last more than 50 years. The Summary and Recommendations Section identifies expected performance differences for each section and sites the need for empirical data to support conclusions. This work analyzes construction materials for long-life pavements, and therefore can be categorized under [CP Road Map Track 8: Long-Life Concrete Pavements](#). The test section is the first of its kind in Wisconsin, thus this work can also be categorized under [Track 12: Advanced Concrete Pavement Materials](#).

### **Performance Assessment of Wisconsin's Whitetopping and Ultra Thin Whitetopping Projects**

Washington State University recently completed research for the Wisconsin Department of Transportation Division of Infrastructure Development Research Coordination Section. The report, [Performance Assessment of Wisconsin's Whitetopping and Ultra Thin Whitetopping Projects](#), catalogs all of Wisconsin's whitetopped (unbonded overlay) and ultrathin whitetopped (bonded overlay) concrete pavements. As a result, a database was developed that includes design, construction, and performance data for 18 projects built from 1995 to 2007. This project concluded that overlay projects in Wisconsin have comparable performance to those in other states. This report is an example of work related to [CP Road Map Track 2: Performance-Based Design Guide for New and Rehabilitated Concrete Pavements](#).

### **Concrete Pavement Rubblization**

[Concrete Pavement Rubblization: Survey of State Practice and Related Research](#) by CTC & Associates LLC

and the WisDOT Research & Library Unit reports the results of a survey taken of the AASHTO Subcommittee on Materials. The survey consisted of nine questions that ask for state-specific details with regard to rubblization. As a result of the survey, tables were created reporting state-specific values for structural coefficients and resilient modulus. This work can be categorized under the [CP Road Map Track 2: Performance-Based Design Guide for New and Rehabilitated Concrete Pavements](#).

### **Status and Plans for Implementing 3D Technologies for Design and Construction**

[Status and Plans for Implementing 3D Technologies for Design and Construction in WisDOT](#) is a report presented to WisDOT in May 2009 by Construction and Materials Support Center's Alan P. Vonderohe. The report documents the process for identifying all issues that must be addressed before WisDOT adopts 3D models as contract documents, eliminates traditional cross sections, uses DTMs to determine final quantities, and allows contractors to construct facilities directly from 3D models. The conclusion of this report suggests that that implementation of 3D modeling is feasible and should be pursued by WisDOT as long as any bias that would hinder small contractors or engineering firms can be prevented. An implementation plan and timeline for short-term goals is provided in the Appendices. This project can be categorized under [CP Road Map Track 3: High-Speed Nondestructive Testing and Intelligent Construction Systems](#).

### **Additional information**

For additional information, visit the following websites:

- WisDOT research reports: <http://on.dot.wi.gov/wisdotresearch/rip.htm>
- WHP: <http://www.whrp.org/research-areas/rigid/rigid-pavements.html>
- MRUTC: <http://www.mrutc.org>
- TIC: <http://tic.engr.wisc.edu/>
- TOPS: <http://www.topslab.wisc.edu>
- Construction and Materials Support Center: <http://cmssc.engr.wisc.edu>

### **About the CP Road Map E-News**

The **CP Road Map E-News** is the newsletter of the [Long-Term Plan for Concrete Pavement Research and Technology \(CP Road Map\)](#), a national research plan developed and jointly implemented by the concrete pavement stakeholder community. To find out more about the CP Road Map, or to get involved, contact Dale Harrington, [dharrington@snyder-associates.com](mailto:dharrington@snyder-associates.com), 515-964-2020.

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