



## CP Road Map E-News May 2011

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.

### New Moving Advancements into Practice (MAP) Brief

Moving Advancements into Practice (MAP) Briefs describe promising research and technologies that can be used now to enhance concrete paving practices.

[MAP Brief 7-2: Partial-Depth Repairs for Concrete Pavements](#) has recently been published under [CP Road Map Track 7: High-Speed Concrete Pavement Rehabilitation and Construction](#).

[Download MAP Brief 7-2](#) (973 kb pdf).



### News from the Road

News from the Road highlights research around the country that is helping the concrete pavement community meet the research objectives outlined in the CP Road Map.

#### Illinois Center for Transportation investigates impact of early-entry saws on concrete pavement durability

In January 2011, the Illinois Center for Transportation published *Evaluation of the Long-Term Durability of Joints Cut Using Early Entry Saws on Rigid Pavements*. This investigation was integrated into an active construction project along Illinois Route 59 in Plainfield, IL that consisted of three 300-foot test cells, each containing 20 joints. During construction, paving and sawing operations were observed and documented, and the FHWA HIPERPAV® analysis tool was used to assess the potential for early-age cracking. Core samples were also taken from the joints and subjected to a battery of tests including freeze-thaw testing, petrographic analysis, and susceptibility to salt scaling. The lack of damage in the areas adjacent to the joints suggest that early-entry sawing is a viable approach for concrete pavements. However, a broader study evaluating long-term performance under different traffic conditions, maintenance practices, and a variety of other factors is recommended before a general adoption of early-entry sawing.



[Click here to download the report.](#)

This work is contributing to research objectives outlined in [CP Road Map Track 6: Innovative Concrete Pavement Joint Design, Materials, and Construction](#).

#### Wisconsin study examines deleterious effects of fine particles in concrete aggregates

The Wisconsin Department of Transportation (WisDOT) recently published a report that examined the

influence of microfine particles on concrete properties. Currently, WisDOT has a Standard Specification in place to regulate the maximum allowable amount of microfines in order to maintain concrete workability, strength, and durability. However, WisDOT is currently unable to differentiate between the mineralogy of different microfines, which can in turn affect concrete properties. Furthermore, there is often a mismatch between laboratory and field performance, likely due to the nature of the microfines and concrete curing conditions. In this study, aggregate samples were obtained from 28 locations and analyzed for their mineralogy and clay content. The impact of total clay content on concrete physical properties, mechanical properties, chemical properties, and microstructure was also measured in order to advance knowledge of the role of clays in concrete performance. Microfines were divided into two categories: dolomitic and igneous. Igneous sources were shown to exhibit the largest occurrence of deleterious effects. The researchers concluded that, although the current WisDOT Standard Specification results in acceptable concrete performance under optimal conditions, it is recommended that a more advanced approach to microfine evaluation be considered in the future.

[Click here to download the report.](#)

This research can be categorized under [CP Road Map Track 1: Performance-Based Concrete Pavement Mix Design](#).

### **Texas researchers seek to prevent horizontal cracking in continuously reinforced concrete pavements**

A recent report published by the Texas Department of Transportation (TxDOT) aims to identify the mechanism of horizontal cracking in continuously reinforced concrete pavement (CRCP). This report suggests that horizontal cracks are not due to structural deficiencies, but can be attributed to concrete material properties, environmental conditions during and immediately after placement, and longitudinal steel layouts. In order to investigate the cracking mechanism, numerical analysis and laboratory testing using a horizontal cracking frame were carried out. Furthermore, the influence of rebar temperature and water-to-cement ratio on the bond strength of the rebar were also investigated. Ultimately, the study concluded that longitudinal steel, concrete coefficient of thermal expansion (CTE), and concrete elastic modulus play a significant role in the development of cracks. In addition, it was found that the water-to-cement ratio significantly influenced the rebar-concrete bond strength, and rebar temperature should be monitored during placement.



[Click here to download the report.](#)

This research can be categorized under [CP Road Map Track 8: Long-Life Concrete Pavements](#).

### **WsDOT constructs and tests next generation concrete surface**

Recently, the Washington State Department of Transportation (WSDOT) constructed a test section of Next Generation Concrete Surface (NGCS) on I-82 near Sunnyside, WA. This 1,500 foot section was subjected to noise, friction, smoothness, and wear measurements as documented in the April 2011 report, *Evaluation of Long-Term Pavement Performance and Noise Characteristics of the Next Generation Concrete Surface*. This project is part of a continuing effort by WSDOT to test new methods of decreasing noise generated by highway facilities. Prior to installation of the NGCS, dowel bar retrofit, panel replacement, and conventional diamond grinding were carried out. Afterwards, post-construction noise measurements were conducted using the on-board sound intensity (OBSI) test method, which confirmed a noticeably quieter surface than the previous section. Friction measurements were also very favorable, as expected with a newly ground surface.



[Click here to download the report.](#)

This project is meeting research objectives outlined in [CP Road Map Track 4: Optimized Surface](#)

## Updates from the States: Federal Highway Administration's Turner-Fairbank Highway Research Center

The Federal Highway Administration's (FHWA's) Office of Research, Development, and Technology (RD&T) is located at the Turner-Fairbank Highway Research Center (TFHRC), a federally owned and operated national research facility in McLean, Virginia. This world-class facility houses more than 20 laboratories, data centers, and support facilities, and conducts applied and exploratory advanced research in vehicle-highway interaction, nanotechnology, and a host of other types of transportation research in safety, pavements, structures, human-centered systems, operations and intelligent transportation systems, and materials.



[Read on for more information about concrete pavement research at the Turner-Fairbank Highway Research Center...](#)

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The [National Concrete Pavement Technology Center](#) at [Iowa State University](#) provides operations support services to the CP Road Map program.  
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