



## CP Road Map E-News November-December 2011

The **CP Road Map E-News** is the bi-monthly 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.

The [November-December 2011 MAP Brief: Precast Concrete Pavements](#) has recently been published. This MAP brief describes the changes and updates made to the CP Road Map, 2nd edition.

[Download the November-December 2011 MAP Brief](#) (248 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.

#### Colorado DOT evaluates tie bar system for longitudinal joints

The September 2011 report *Evaluation of Longitudinal Joint Tie Bar System* evaluates the longitudinal tie bar system currently used by the Colorado Department of Transportation (CDOT). Initial field surveys throughout the state showed longitudinal joint problems, such as wide joint openings and faulting, on major highways. The research team conducted field tests at various sites to analyze joint performance; testing included deflection testing and MIT Scan testing. Results indicated excessive joint movement in many places, with some slabs performing as poorly as non-tied slabs, in addition to possible evidence of dowel bar misalignment. Furthermore, an assessment of CDOT's current specifications and practices revealed that the current tie bar design approach is similar to other states but has inherited conservative aspects of the 1993 AASHTO Design Guide. Based on these findings, the researchers proposed an improved tie bar design procedure based on mechanistic-empirical concepts. This procedure includes design tables that take into account different combinations of pavement base types, concrete mixtures, and climatic conditions. However, more rigorous experimental and field testing is recommended before this new procedure is implemented.



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

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

#### FHWA publishes tech brief on the impact of coefficient of thermal

## expansion in concrete pavement design

An FHWA Concrete Pavement Technology Program Tech Brief, *Coefficient of Thermal Expansion in Concrete Pavement Design*, describes the influence of the coefficient of thermal expansion (CTE) in concrete, test methods used to determine its value for design purposes, and its effect on the prediction models within the Mechanistic-Empirical Pavement Design Guide (M-E PDG). This tech brief provides an overview of how the CTE affects changes in concrete volume in response to temperature changes, especially during daily and seasonal temperature cycles. In addition, AASHTO and U.S. Army Corps of Engineers (USACE) test methods designed to determine the CTE are discussed. Within the M-E PDG, the CTE has a significant effect on critical response computations, as well as slab cracking, pavement roughness, and joint faulting predictions. As a result, it is very important that the CTE is carefully considered during the design process. It is also important to point out that the M-E PDG models utilize CTE data from the older AASHTO TP 60-00 test procedure, which was discovered to produce unreasonably high CTE values. Pavement designers are now advised to make the appropriate adjustments when using CTE values from the newest AASHTO test method.

[Click here to download the tech brief.](#)

This research can be categorized under [CP Road Map Track 2: Performance-Based Design Guide for New and Rehabilitated Concrete Pavements](#).

## Washington State DOT investigates studded tire wear on concrete pavements

The recent report *Studded Tire Wear on Portland Cement Concrete Pavement in the Washington State Department of Transportation (WSDOT) Route Network* explores the impact of studded tire wear on WSDOT roads. In this study, the researchers assessed tests that are able to indicate a pavement's potential resistance to studded tire wear and techniques developed to mitigate this type of wear, which has been shown to have a distinct effect on pavement condition. One effect of studded tire wear is wheel path depressions, which increase the potential for hydroplaning and generate unwanted steering feedback. In addition, worn wheel paths often increase tire-pavement noise. Fortunately, diamond grinding has been shown to greatly reduce the effects of studded tire wear, and the report recommends that WSDOT continues its current practice of designing for an extra inch of pavement thickness to account for future thickness loss due to grinding. As far as predicting concrete pavement performance against studded tires, certain aggregate tests have shown promise, including the Nordic Abrasion, LA Abrasion, and Micro-Deval tests. The researchers also recommend that new material types, including surface overlays known as resin modified pavements, and adoption of a hardness specification program similar to Alaska's are considered in the future.



[Click here for additional information about this study.](#)

This research is helping to fill knowledge gaps outlined in [CP Road Map Track 4: Optimized Surface Characteristics for Safe, Quiet, and Smooth Concrete Pavements](#).

## National CP Tech Center publishes technology deployment plan for the use of recycled concrete aggregate

A cooperative agreement between the National Concrete Pavement Technology Center and FHWA resulted in a published report that provides a technology deployment plan to educate and train State DOT and industry personnel on the use of recycled concrete aggregate (RCA) in new concrete paving mixtures. This report discusses the benefits associated with the use of recycled concrete aggregate and illustrates how the use of RCA closely aligns with the FHWA Every Day Counts initiative, designed to identify and deploy innovation methods that promote highway infrastructure sustainability. An extensive literature search revealed the numerous benefits of RCA, including expedited construction schedules, conservation of

resources, and reduced waste. In addition, a survey of State DOT practices was conducted to accurately determine the current use of RCA and reveal barriers that currently limit the use of RCA based on perceived compliance, quality, and production issues. The technology deployment plan attempts to overcome these hurdles through the establishment of a technical working group (TWG) that serves as the governing, guiding body of four main programs: outreach and communication, training, technical support, and demonstration projects. Together, these programs will work to develop clear and comprehensive educational tools, guidelines, and specifications.

[Click here to read the technology deployment plan.](#)

This work is meeting research needs identified in [CP Road Map Track 12: Concrete Pavement Sustainability](#).

## Updates from the States: Illinois

In the State of Illinois, concrete pavement research is largely conducted as a joint effort between the Illinois Department of Transportation (IDOT) and the Illinois Center for Transportation (ICT). Illinois also collaborates with a number of organizations to meet its research needs, including the Concrete Pavement Technology Center (CP Tech Center), and is an active participant in various Transportation Pooled Fund (TPF) studies. The Physical Research Section of IDOT, which resides within the Central Bureau of Materials and Physical Research (BMPR), is responsible for pursuing the use of innovative technologies that provide high-quality facilities and reduce life-cycle costs.



[Read on for more information about concrete pavement research in the State of Illinois...](#)

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- [June 2011](#)
- [May 2011](#)
- [April 2011](#)
- [March 2011](#)
- [February 2011](#)
- [January 2011](#)
- [November 2010](#)
- [October 2010](#)
- [September 2010](#)
- [August 2010](#)
- [July 2010](#)
- [June 2010](#)
- [May 2010](#)
- [April 2010](#)

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

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