



CP Road Map E-News May-June 2012

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, 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 [May-June 2012 MAP Brief, Multi-Year Concrete Overlays Program: What We Have Accomplished and Learned](#), has recently been published. This MAP brief summarizes the activities of the multi-year Concrete Overlays Program and highlights critical lessons learned that are helping agencies across the country design and construct successful concrete overlay solutions.

[Download the May-June 2012 MAP Brief.](#)



Review of the CP Road Map: Past, Present, and Future

This issue of the CP Road Map E-News reviews the past, present, and future of the CP Road Map.

The CP Road Map is a strategic national plan for concrete pavement research. It seeks to provide timely solutions and accelerate the adoption of proven new and emerging technologies that help the concrete pavement community meet the paving needs of today and challenges of tomorrow. In short, the CP Road Map is guiding the industry toward a new generation of concrete pavements for the 21st century.

History of the CP Road Map

The project to develop the CP Road Map began in 2001 through an agreement between the Innovative Pavement Research Foundation and the National Concrete Pavement Technology Center (CP Tech Center) at Iowa State University. In 2003, FHWA initiated a new agreement with the CP Tech Center to complete the work, with the Transportation Research Board (TRB) Committee for Research on Improved Concrete Pavements acting as the project advisory panel. Twenty percent of funding for the project was provided by Iowa State University and the CP Tech Center partners.

The team gathered face-to-face input from the highway community during major brainstorming and feedback sessions. Participating stakeholders included state and local transportation departments, FHWA, ACPA, PCA, contractors, materials suppliers, university researchers, and private concrete testing laboratories. [Click here for an illustration of the steps taken during the development of the CP Road Map.](#)

CP Road Map Content

FHWA requested a strategic research plan outlining up to a decade of integrated activities, including research, technology development and implementation, and technology transfer, with ample details to guide technical panels in implementing the plan. The CP Road Map, therefore, is a synopsis of research needs

outlined in problem statements and organized into 12 tracks of research based on stakeholder input (see list below).

The 12 research tracks focus on research with the highest potential payback. Each track has its own budget, begins with a framing study or organizational summary, and includes specific research/implementation activities. Several tracks are integrated. For example, reducing mix performance variability (Track 1) requires equipment advances (Track 5). Validating and calibrating mix design models (Track 1) requires enhanced data (Track 9). In addition, each research track was organized into subtracks of research problem statements that clearly define the tasks that must be performed to produce a desired product or achieve a desired objective.

The CP Road Map has evolved along with the industry. As areas for improvement have been identified, the CP Road Map has been updated and the track structure revised to better reflect current needs. The 2nd (current) edition of the CP Road Map was published in 2012. It

- Reflects current industry practices and research completed to date.
- Incorporates items originally referenced only in database tables into the formal track structure.
- Introduces a variety of new subtracks and problem statements.
- Maintains cohesiveness with problem statements that are cross-referenced between multiple tracks.
- Omits the original "phasing" structure to remove the impression that certain research can occur only after other research has been completed.

Other than updates to select problem statements, no major changes were made to Tracks 2, 4, 5, and 6 in the 2nd edition. The current track structure is listed below. The thumbnail links connect to summaries of research accomplishments and focuses to date. (You can find detailed problem statements for each track on the [CP Road Map website](#).)

[Track 1 - Materials and Mixes for Concrete Pavements](#)




[Track 2 - Performance-Based Design Guide for New and Rehabilitated Concrete Pavements](#)



[Track 3 - Intelligent Construction Systems and Quality Assurance for Concrete Pavements](#)

Track 3 – Intelligent Construction Systems and Quality Assurance for Concrete Pavements


<p>Laboratory and Field Evaluation of Concrete Paving During Construction</p> <p>Track 3 – Intelligent Construction Systems and Quality Assurance for Concrete Pavements</p> <p>The research utilized several techniques to evaluate early performance from both a material selection and process perspective. Laboratory and field testing were conducted to evaluate the impact of a concrete paving system on early performance. The field testing was conducted on a test track.</p>	<p>Evaluation of the Reliability Method for Flexural Strength Prediction of Concrete Pavement</p> <p>Track 3 – Intelligent Construction Systems and Quality Assurance for Concrete Pavements</p> <p>The objective of this work presented in this report is to provide laboratory and field information regarding the accuracy and feasibility of the reliability method for the measurement of concrete flexural strength of pavement slabs.</p>
<p>Construction and Traffic Analysis of Intersecting Pavement</p> <p>Track 3 – Intelligent Construction Systems and Quality Assurance for Concrete Pavements</p> <p>Construction of a concrete pavement structure is a complex process involving many variables. The process is often controlled by the contractor. The contractor is responsible for the quality of the construction. The contractor is also responsible for the safety of the construction. The contractor is also responsible for the cost of the construction.</p>	<p>Evaluation, Refinement and Development of Concrete Pavement Technology</p> <p>Track 3 – Intelligent Construction Systems and Quality Assurance for Concrete Pavements</p> <p>This research seeks to evaluate and refine concrete pavement technology. The research seeks to evaluate and refine concrete pavement technology. The research seeks to evaluate and refine concrete pavement technology. The research seeks to evaluate and refine concrete pavement technology.</p>



[Track 4 - Optimized Surface Characteristics for Safe, Quiet, and Smooth Concrete Pavements](#)

Track 4 – Optimized Surface Characteristics for Safe, Quiet, and Smooth Concrete Pavements



<p>Modeling the Role of Portland Cement Concrete Pavement in the Washington State Department of Transportation (WSDOT) Road Network</p> <p>Track 4 – Optimized Surface Characteristics for Safe, Quiet, and Smooth Concrete Pavements</p> <p>The research was conducted by the Washington State Department of Transportation (WSDOT) in collaboration with the University of Washington. The research was conducted by the Washington State Department of Transportation (WSDOT) in collaboration with the University of Washington.</p>	<p>Field Performance of High Friction Surfaces</p> <p>Track 4 – Optimized Surface Characteristics for Safe, Quiet, and Smooth Concrete Pavements</p> <p>This research seeks to evaluate the field performance of high friction surfaces. The research seeks to evaluate the field performance of high friction surfaces. The research seeks to evaluate the field performance of high friction surfaces. The research seeks to evaluate the field performance of high friction surfaces.</p>
<p>Model of Pavement Performance in Extreme Conditions</p> <p>Track 4 – Optimized Surface Characteristics for Safe, Quiet, and Smooth Concrete Pavements</p> <p>This research seeks to evaluate the performance of concrete pavement in extreme conditions. The research seeks to evaluate the performance of concrete pavement in extreme conditions. The research seeks to evaluate the performance of concrete pavement in extreme conditions. The research seeks to evaluate the performance of concrete pavement in extreme conditions.</p>	<p>Field Performance of High Friction Surfaces</p> <p>Track 4 – Optimized Surface Characteristics for Safe, Quiet, and Smooth Concrete Pavements</p> <p>This research seeks to evaluate the field performance of high friction surfaces. The research seeks to evaluate the field performance of high friction surfaces. The research seeks to evaluate the field performance of high friction surfaces. The research seeks to evaluate the field performance of high friction surfaces.</p>



[Track 5 - Concrete Pavement Equipment Automation and Advancements](#)

Track 5 – Concrete Pavement Equipment Automation and Advancements



<p>Design of a Concrete Paving Machine</p> <p>Track 5 – Concrete Pavement Equipment Automation and Advancements</p> <p>This research seeks to design a concrete paving machine. The research seeks to design a concrete paving machine. The research seeks to design a concrete paving machine. The research seeks to design a concrete paving machine.</p>	<p>Evaluation of Longitudinal Joints in Concrete Pavement</p> <p>Track 5 – Concrete Pavement Equipment Automation and Advancements</p> <p>This research seeks to evaluate the performance of longitudinal joints in concrete pavement. The research seeks to evaluate the performance of longitudinal joints in concrete pavement. The research seeks to evaluate the performance of longitudinal joints in concrete pavement. The research seeks to evaluate the performance of longitudinal joints in concrete pavement.</p>
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[Track 6 - Innovative Concrete Pavement Joint Design, Materials, and Construction](#)

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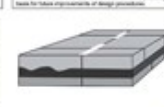
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[Track 7 - Concrete Pavement Maintenance and Preservation](#)

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<p>Modeling the Role of Portland Cement Concrete Pavement in the Washington State Department of Transportation (WSDOT) Road Network</p> <p>Track 7 – Concrete Pavement Maintenance and Preservation</p> <p>The research was conducted by the Washington State Department of Transportation (WSDOT) in collaboration with the University of Washington. The research was conducted by the Washington State Department of Transportation (WSDOT) in collaboration with the University of Washington.</p>	<p>Report of Practical Findings: Improved Overlay Design Parameters for Concrete Slab Rehabilitation</p> <p>Track 7 – Concrete Pavement Maintenance and Preservation</p> <p>This report provides practical findings on improved overlay design parameters for concrete slab rehabilitation. The report provides practical findings on improved overlay design parameters for concrete slab rehabilitation. The report provides practical findings on improved overlay design parameters for concrete slab rehabilitation. The report provides practical findings on improved overlay design parameters for concrete slab rehabilitation.</p>
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[Track 8 - Concrete Pavement Construction, Reconstruction, and Overlays](#)

Track 7 – Concrete Pavement Maintenance and Preservation

Track 8 – Concrete Pavement Construction, Reconstruction, and Overlays

Report of Practical Findings, Improved Design Design Parameters for Concrete Roadways
Integrative Pavement Research Program
 The Integrative Pavement Research Program (IPRP) is a cooperative effort by the Federal Highway Administration (FHWA), FHWA's research centers, and state DOTs to address the most significant pavement research needs. The program is designed to address the most significant pavement research needs in the United States and to provide a national research program for the FHWA and state DOTs.

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[Track 9 - Evaluation, Monitoring, and Strategies for Long-Life Concrete Pavements](#)

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Track 10 – Concrete Pavement Foundations and Drainage

Analysis of Continuously Reinforced Concrete Pavement Behavior Using Information in the Right Pavement Database
 Track 2017
 To assess the performance of CRCP pavement in the field and identify information that will be required for the optimization of the design parameters (CRCP design parameters), FHWA conducted a research study based on its right pavement database. Research objectives and outcomes from the study will be published in a report.

Characterization of Stress Aggregates for Subgrade Retention and Subgrade
Track 10 for Transportation
 The central objective of this project was to characterize strength, stiffness, and deformation behavior of three crushed and uncrushed aggregate materials commonly used in Florida for subgrade retention and subgrade. The project also aimed to determine the relationship between aggregate strength and stiffness, and aggregate strength and stiffness. The project was funded by FHWA's Strategic Highway Research based on both secondary and field performance.




[Track 10 - Concrete Pavement Foundations and Drainage](#)

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[Track 11 - Concrete Pavement Economics and Business Management](#)

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Track 12 – Concrete Pavement Sustainability

Life Cycle Cost Analysis of Overlays
 Track 2017
 This project presents the results of a Life Cycle Cost Analysis (LCCA) report comparing full depth grinding and repair overlay. The performance comparison was based on annual maintenance in the field and other factors such as pavement loading. Costs were collected from industry and California construction cost reports and are presented using California LCCA procedures based on use of the Federal Highway Administration's (FHWA) software RoadEst.

Using Required Elements in NDOT's Transportation Infrastructure – Manual of Practice
 Track 2017
 This document is a manual of practice (MOP) document in using required concrete aggregates (CRCA) in the State's transportation infrastructure. It provides information on the selection, procurement, and production of CRCA and the use of CRCA in base layers, surface paving layers, and concrete paving layers.



[Track 12 - Concrete Pavement Sustainability](#)

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CP Road Map Progress and Products

An operations support group (OSG) for the CP Road Map helps

agencies and industry partners meet their research goals through track team leaders and technical working groups. Funded by Transportation Pooled Fund TPF-5(185) and managed by the National CP Tech Center, the OSG also tracks national concrete pavement research, which helps Federal, State, industry, and academic partners work together to leverage resources and avoid costly duplication of research activities.

Work under TPF-5(185) has been conducted under five task orders covering the following CP Road Map implementation activities:

Website - A website has been developed and maintained to facilitate coordination and communication of CP Road Map activities. Content includes program information and news, status of current work, and research publications to aid implementation of completed work. The website will continue to be updated and become even more user friendly, especially with regards to research collaboration.

E-News - The E-News is an electronic newsletter distributed via email and accessible from the CP Road Map website that highlights research from around the world that is helping the concrete pavement community meet the objectives outlined in the CP Road Map. Each issue includes links to publications of interest and highlights a research agency, including work that the agency has sponsored or conducted. In addition to the FHWA Turner-Fairbank Highway Research Center (TFHRC), the figure above shows States whose concrete pavement research programs have been highlighted.

Database - The original CP Road Map database was created as a tool to assist in the development of the CP Road Map plan, and the National CP Tech Center has augmented this database with research that is ongoing or completed since that time. The database includes work conducted under sponsorship of the FHWA, NCHRP, pooled fund studies, and the concrete paving industry, as well as international work. [Click here for an example of the information contained within the database.](#)

MAP Briefs - Each E-News issue is accompanied by a Moving Advancements into Practice (MAP) brief. The MAP brief highlights a specific research effort and its products and discusses implementations of the findings from that research. Previous MAP brief topics include the following:

- [Multi-Year Concrete Overlays Program: What We Have Accomplished and Learned,](#)
- [Concrete Pavement Sustainability: State-of-the-Practice](#)
- [Full-Depth Repairs for Concrete Pavements](#)
- [Precast Concrete Pavements](#)
- [Introducing the CP Road Map, Second Edition](#)
- [Full-Depth Reclamation of Asphalt Pavements with Cement](#)
- [Potential Materials Incompatibilities in Concrete Pavements](#)
- [Partial-Depth Repair for Concrete Pavements](#)
- [Preventing Joint Deterioration in Concrete Pavements: A Summary of Current Knowledge](#)
- [Fly Ash as a Supplementary Cementitious Material in Concrete Mixtures](#)
- [Intelligent Compaction for Concrete Pavement Bases and Subbases](#)
- [Smart Cure: An Integral Part of an Intelligent Construction System](#)
- [Deleterious Chemical Effects of Deicing Solutions on Concrete Pavements](#)
- [Stringless Concrete Paving](#)
- [Roller-Compacted Concrete Pavements](#)
- [Two-Lift Concrete Paving](#)
- [Job-Specific Optimization of Paving Concrete with COMPASS](#)
- [Diamond Grinding to Reduce Tire-Pavement Noise in Concrete Pavements](#)
- [Use of Nonwoven Geotextiles as Interlayers in Concrete Pavement Systems](#)



States whose concrete pavement research programs have been highlighted in the CP Road Map E-News

Executive Advisory Committee - The committee was established to provide overall guidance and coordination of CP Road Map activities. The committee meets 3-4 times per year, most recently in April 2012, and its responsibilities include fostering research integration within and between the CP Road Map's tracks, suggesting/promoting innovative technology transfer and training activities, and evaluating the progress of the CP Road Map.

Track Team Meetings - The OSG has provided planning and facilitation services for various track teams led by track coordinators. These teams are dedicated to establishing track priorities, developing project objective statements for each track's priority projects, and developing funding mechanisms for each priority project.

The Future of the CP Road Map

The future of the CP Road Map will build off of its successes to date. With funding on the horizon, the E-News and MAP Briefs will emerge again in short order. State DOT participation, particularly that of the National Concrete Consortium, will be a vital part of future of the CP Road Map. Interaction with the states will yield a contemporary listing of research that is recently completed or just getting underway. As with most everything that is conducted under the CP Road Map, work will be organized under the research Tracks. Other sources of information will also continue to be queried, including TRB project statements. The goal is to contribute to augment the CP Road Map database, which then serves as a valuable resource for identifying research in progress as it relates to research needs.



Finally, outreach efforts will continue to be an important part of the CP Road Map. The industry will continue to be exposed to the value that the CP Road Map provides. In the end, this will help facilitate an efficient and comprehensive concrete pavement research program.

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- [Rob Rasmussen](#), The Transtec Group, Program Specialist
- [Jesse Kwilosz](#), The Transtec Group, Program Specialist
- [Sabrina Shields-Cook](#), National Concrete Pavement Technology Center, Editor

Newsletter archives to 2012

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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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