TECHNOLOGY DEPLOYMENT PROGRAM

National Concrete Pavement Technology Center

IOWA STATE UNIVERSITY
Institute for Transportation
A central mission of the National Concrete Pavement Technology Center (CP Tech Center) at Iowa State University is to accelerate the deployment of concrete pavement advancements.

To accomplish this, the center, with federal, state, and industry support, implements a national technology deployment program for the concrete paving community. Through this program, the center has helped train agency and industry personnel in almost every state and in Canada.

Since 2006, the center has accomplished the following:

• Completed more than 300 workshops, webinars, on-demand training, and presentations for more than 20,000 participants
• Published 22 major guides, manuals, and specifications
• Developed 55 technical briefs and summaries
• Conducted and reported the results of 44 research projects

Now the center, in cooperation with the Federal Highway Administration (FHWA) and American Concrete Pavement Association (ACPA), is pleased to announce its 2014/2015 technology deployment curriculum:

• Concrete overlays
• Concrete pavement preservation
• Concrete pavement joint rehabilitation
• CP Road Map-related topics

Your agency is invited to participate in one or more of these training opportunities described in this booklet.
How does the technology deployment program work?

This is not your usual “canned” training. No two training events are ever exactly the same.

When an agency indicates an interest in training, the CP Tech Center works closely with key staff to understand the organization’s specific needs and design a training agenda that meets those needs. The agenda may include, for example, a workshop, a printed manual, and a site visit.

A day in advance, staff from the CP Tech Center travel to the host state to meet with the agency and make final adjustments to the training delivery and schedule.

Why is the program successful?

The center’s training goal is to make the “new and different” seem almost ordinary and comfortable.

This is accomplished by

• Using knowledgeable, dedicated trainers who understand participants’ needs.
• Actively engaging participants—technicians, project supervisors, inspectors, engineers, and technical administrators—so they understand the nuts and bolts of technology advancements.
• Providing printed resources with concise dialogue and an abundance of illustrations and photographs that clarify the technical information.
• Employing multiple technology transfer strategies (workshops, on-demand training, technical briefs, manuals, project site visits, and/or other resources) that target agencies’ specific needs.

As a result, the CP Tech Center training activities consistently earn high evaluation ratings.

How to participate

Check out the training opportunities described in this booklet. For more information, or to schedule training, contact Dale S. Harrington, 515-290-4014, dharrington@snyder-associates.com, or Melisse Leopold, 515-964-2020, mleopold@snyder-associates.com.

Why would agencies want this training?

When making pavement construction or preservation decisions, highway agencies are accountable to taxpayers. So, agencies need information about the best technologies and innovative solutions that provide long service lives and low maintenance costs. And they need well trained personnel to implement those solutions skillfully.

The CP Tech Center can provide this information and training, and usually at no cost. Most funding for the technology deployment program has been secured through the FHWA, pooled fund projects, and/or national and state concrete pavement associations.
How is a project selected as a candidate for a concrete overlay?

How are decisions made about repairs needed prior to an overlay?

What design options are available and how do they work?

What are key construction issues in concrete overlay projects?

Concrete Overlay Field Application Program

The need for engineered preservation and rehabilitation strategies for maintaining the nation’s pavements has never been greater. Concrete overlays are cost-effective solutions for a wide variety of pavement conditions.

The overall objective of the Concrete Overlay Field Application Program is to increase awareness and knowledge about, and strengthen confidence in, concrete overlay applications among state DOTs, cities, counties, contractors, and engineering consultants by offering project-specific information and advice.

During the first phase of this program, 24 states directly benefited from this program through one or more services: workshops, site visits to evaluate potential overlay candidates, and consultation on projects regarding design or early construction. Now the program has been extended to a second phase, and the FHWA and CP Tech Center are inviting agencies to take advantage of these unique services.

Specific training topics include the following:

- Evaluation of existing pavements
- Overview of concrete options
- Concrete overlay design
- Materials and mixtures
- Strategies in work zones
- Construction of concrete overlays
- Reconstruction options
How the overlay training works

Each participating agency will have an opportunity to develop in-house expertise on overlays through its choice of services:

- **Site visits and remote meetings.** An expert team will visit potential overlay project sites and
  - Review evaluation data
  - Discuss design and construction elements
  - Discuss traffic control criteria and accelerated construction options
  - Prepare a report for each site and provide ongoing recommendations and guidance

- **A meeting with the highway agency’s upper management.** Potential benefits of concrete overlays will be discussed and the agency’s questions about issues specific to their state and/or potential overlay project will be answered.

- **Workshop on concrete overlay best practices.** The workshop content and length will be adjusted to fit each agency’s specific needs.

- **Seminar/presentation.**
  The workshop and seminar content will be based on the new third edition of the *Guide to Concrete Overlays: Sustainable Solutions for Resurfacing and Rehabilitating Existing Pavements* (2014). This guide was developed with extensive input and review by a technical advisory committee of state, federal, and industry experts.

**Past performance**

From 2008–2012, during phase one of this program, 28 field reports were written for the participating states, and 10 states constructed overlays.

**Expert team**

An expert team consisting of representatives from a state DOT, the CP Tech Center, and when possible industry and/or FHWA will be assigned to each participating agency. The number of team members will vary depending on each agency’s situation and information needs.

The expert team will meet with the assigned agency and share their knowledge about

- Overlay technology
- Project evaluation and selection
- Design details
- Construction traffic control suggestions
- Constructability issues

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What repair strategies are available to cope with increasing preservation needs?

How and when should pavement preservation treatments be implemented to save money and increase service life?

Concrete Pavement Preservation

A 1- to 1½-day workshop and related training materials on concrete pavement preservation have been developed under a cooperative agreement between the CP Tech Center and FHWA. Training materials include a manual, handouts, and online computer-based training modules. All materials were developed under the guidance of a technical oversight committee consisting of industry, state, and FHWA representatives. The materials address both optimizing performance and lowering the life-cycle cost of a concrete pavement.

Program content

Detailed information is presented on the following specific topics:

- Preventive maintenance and pavement preservation concepts
- Pavement evaluation
- Slab stabilization and slab jacking
- Partial-depth repairs
- Full-depth repairs
- Retrofitted edge drains
- Load transfer restoration
- Diamond grinding and grooving
- Joint resealing and crack sealing
- Strategy selection
Who should participate?
The workshop and related materials are for state DOTs, engineering consultants, materials suppliers, contractors, quality control personnel, and technicians.

Program materials
In September 2014, the CP Tech Center, with support from FHWA, published the second edition of the Concrete Pavement Preservation Guide. This 273-page manual is a comprehensive review of the state of pavement preservation practice. It serves as the primary technical document for the workshop and as the basis for presentation materials.

In addition to the face-to-face workshop, computer-based training (CBT) will soon be available online. The CBT consists of 11 modules, which will be hosted on the National Highway Institute's website, www.nhi.fhwa.

Past performance
From 2008 through 2014 the CP Tech Center has conducted 20 workshops, including five in 2014. Participant evaluations have been excellent.

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Long-Life Joints in Urban Areas

During the last several years, a problem has arisen involving deterioration of concrete at the joints on some pavements in cold weather states where deicing chemicals are routinely used. This durability concern is being addressed with a training program presented by the CP Tech Center and designed to meet the needs of specific agencies. It is available on a case-by-case basis, subject to funding availability.

Program content

This training is for municipalities experiencing premature joint deterioration in their concrete pavements that want to maintain their existing investment and prevent the recurrence of this problem on future projects.

The training focuses on the causes and prevention of premature joint deterioration, as well as mitigation practices to slow or stop existing deterioration. In particular, it covers joint distresses caused by improper air entrainment, joint detailing, or other construction practices as well as by inadequate materials and proportioning, freeze-thaw action, and material-related distresses.

Workshop agenda

Unique workshop agendas are developed for every workshop in order to best meet the needs of the participants.

What is causing joint deterioration in concrete pavements?
How can joint deterioration be prevented?
How and when can cost-effective repairs be made?
Workshop materials

The workshop materials include presentations and handouts based on current research information and corresponding technical guides, including the Guide for Optimum Joint Performance of Concrete Pavements (2012) and the new Thin Concrete Overlays: Solutions for Joint Deterioration in Cold Weather States (2014).

Past performance

From 2012 through 2014, the CP Tech Center has conducted nine workshops. Participant evaluations have been excellent.

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What concrete pavement training is needed in my state?
What innovative technologies are ready for deployment?
Who should participate in the training?

Training Opportunities through the CP Road Map

The Concrete Pavement Road Map (CP Road Map) is a national research plan consisting of 12 integrated research tracks and more than 250 research problem statements. The plan represents stakeholder-identified needs and priorities. It provides a systematic, collaborative structure for local, state, and national concrete pavement research programs to focus their investments.

The CP Road Map is resulting in technologies and systems that help the concrete pavement community meet the paving needs of today and anticipate the paving challenges of tomorrow. In short, the CP Road Map is creating a new generation of concrete pavements for the 21st century. Through the technology deployment program, the CP Tech Center can help agencies and industry understand and skillfully implement the latest advancements resulting from the CP Road Map.

CP Road Map training eligibility

Under the Next Generation Concrete Pavement Road Map Pooled Fund TPF-5(286), six pooled-fund members are eligible for training based on research conducted under the CP Road Map. These members are:

- FHWA
- Georgia DOT
- Iowa DOT
- Michigan DOT
- Oklahoma DOT
- Pennsylvania DOT
How CP Road Map training works

The CP Tech Center contacts pooled-fund member states to identify their interest in hosting a course. The center selects instructors and provides ready-to-use training materials that the center has developed.

All support costs (handouts, presenter fees, travel, etc.) are covered through the pooled fund. Host states furnish only the training facility and any meals for participants (states may decide to charge a nominal fee to cover these costs).

The CP Tech Center suggests that participating agencies partner with their corresponding ACPA state chapters to do the following:

- Select the training topic(s)
- Identify the audience (DOT, city, county, industry, consultants)
- Identify the desired training date
- Arrange the training venue
- Send out invitations (the CP Tech Center can provide a description of the training and a detailed agenda)
- Arrange for meals and break snacks

Training topics

The CP Tech Center is offering a curriculum of courses based on materials that the center has developed and are ready to use. Interested organizations can select any of the following topics or a mixture of topics for one training event:

1. Integrated Materials and Construction Practices for Concrete Pavement: A State-of-the-Practice Manual (the IMCP manual) (if desired, it is possible to focus on specific subjects in the manual)
2. Internal curing for concrete pavements
3. Concrete pavement preservation
4. Design and construction of concrete overlays
5. Roller-compacted concrete
6. 3D stringless paving
7. Concrete pavement recycling
8. Concrete pavement surface characteristics
9. Concrete mix proportioning
10. Quality in concrete paving processes (quality assurance)
11. Early-age cracking
12. Cement-based integrated pavement solutions

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