

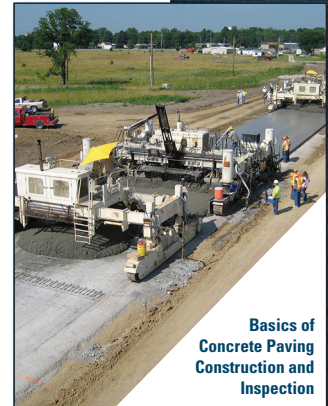
# TRAINING OPPORTUNITIES FOR TTCC STATES

All workshops can be arranged to meet the needs of the agency. Each workshop can be delivered in ½ day to full day formats, including combinations of multiple workshops.

## INSPECTORS' WORKSHOP

Intended for inspectors as well as engineers, this workshop provides guidance and instruction on the basics of concrete paving. The training material highlights the importance of quality, discusses key safety issues, and overviews concrete materials and properties, paving operations, testing, and overall inspection practices. The workshop is beneficial as a refresher course for those experienced in concrete paving but also presents less experienced participants with the fundamentals needed to prepare for an upcoming paving project. Topics include the following:

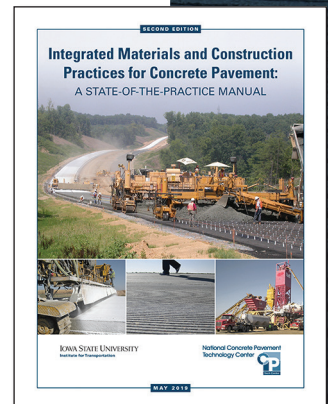
- Why is inspection necessary?
- What is quality assurance (QA) for concrete paving?
- What is concrete?
- What do you need to start a project?
- What kinds of equipment are used?
- What happens before you start paving?
- What happens when you are finally paving?
- What is the inspector's role?
- What do you look for in urban paving?
- What about all the other road building stuff?
- What kind of paperwork do you need to fill out?



## INTEGRATED MATERIALS AND CONSTRUCTION PRACTICES FOR CONCRETE PAVEMENT (IMCP) WORKSHOP

This workshop is based on the second edition of the CP Tech Center's comprehensive training tool and reference guide, *Integrated Materials and Construction Practices for Concrete Pavement: A State-of-the-Practice Manual*. The workshop highlights the key points of the manual to help engineers understand concrete pavement construction as an integrated system involving several practices that affect each other. The workshop also helps practitioners understand and implement technologies, tests, and best practices to identify materials, concrete properties, and construction practices that optimize concrete performance. Topics include the following:

- Sustainability
- Design of concrete pavements
- Materials
- Cement hydration basics
- Fresh concrete properties
- Hardened concrete properties
- Mixture design and proportioning
- Construction of concrete pavements
- Quality and testing
- Troubleshooting



## CONCRETE CURING WORKSHOP

Curing is fundamental to successful construction and performance of concrete pavements and bridge decks. This workshop covers the basics of curing for these applications. Topics include the following:

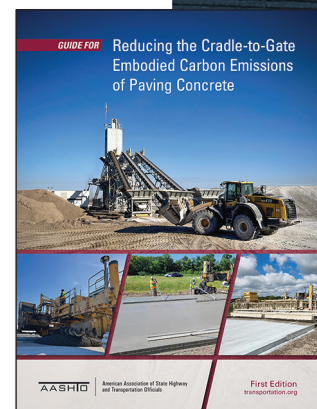
- Concrete materials
- Concrete hydration
- Shrinkage
- Curing types and methods
- When, how, and how much?



## SUSTAINABLE CONCRETE PAVEMENTS WORKSHOP

This workshop is based on the latest guidance related to concrete pavement sustainability, including the AASHTO *Guide for Reducing the Cradle-to-Gate Embodied Carbon Emissions of Paving Concrete*. The workshop provides a clear, concise, and cohesive discussion of pavement sustainability concepts and of recommended practices for maximizing the sustainability of concrete pavements. It also includes an update on recent developments in the sustainable pavement arena, including embodied carbon concepts, use of environmental product declarations (EPDs), and life-cycle assessment (LCA). Topics include the following:

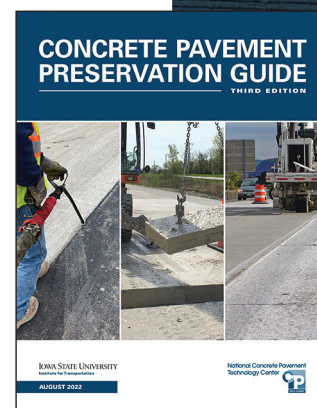
- Design of sustainable concrete pavements
- Sustainable concrete pavement materials
- Construction considerations
- Impact of the use phase
- Concrete pavement renewal
- End-of-life recycling strategies
- Tools to quantify pavement sustainability



## CONCRETE PAVEMENT PRESERVATION WORKSHOP

This workshop is based on the third edition of the CP Tech Center's *Concrete Pavement Preservation Guide*. The material presented in the workshop presents strategies for both optimizing the performance and lowering the life-cycle cost of concrete pavements. Topics include the following:

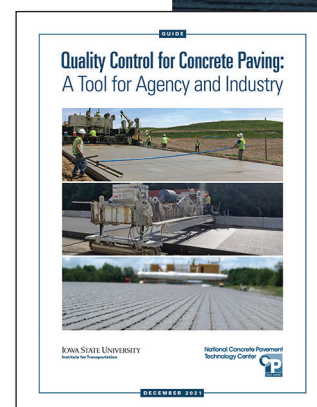
- Preventive maintenance
- Evaluation of concrete pavement
- Slab stabilization and slab jacking
- Partial-depth repairs
- Full-depth repairs
- Retrofitted edge drains
- Load transfer restoration
- Diamond grinding and grooving
- Joint and crack sealing
- Overlays (new addition to the guide)
- Strategy selection



## QUALITY CONTROL FOR CONCRETE PAVING WORKSHOP

This workshop is based on the CP Tech Center guide *Quality Control for Concrete Paving: A Tool for Agency and Industry*. The material in this workshop can help both contractor and agency personnel become familiar with the components of comprehensive quality control (QC) plans for concrete paving projects, improve existing QC programs and plans, appropriately incorporate QC requirements into specifications, and understand the elements of an agency's QA program and why contractor QC is an important part of that program. Topics include the following:

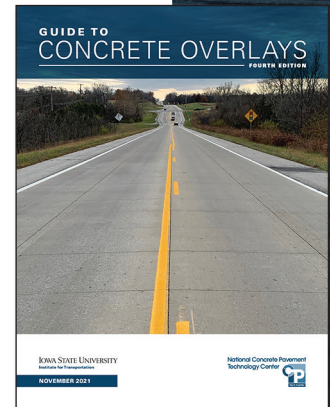
- Common agency QC requirements
- Tools, processes, and procedures to meet these requirements
- Continuous improvement activities
- Efficiency, productivity, profit, and safety benefits of good quality control



## CONCRETE OVERLAYS WORKSHOP

This workshop is based on the fourth edition of the CP Tech Center's *Guide to Concrete Overlays*. The material in this workshop aims to increase the technical proficiency of experienced engineers in the use of concrete overlays on existing asphalt, composite, and concrete pavements; provide less experienced participants with the essential knowledge to address the needs of various types of concrete overlay projects; and help all participants recognize the versatility of concrete overlays. Topics include the following:

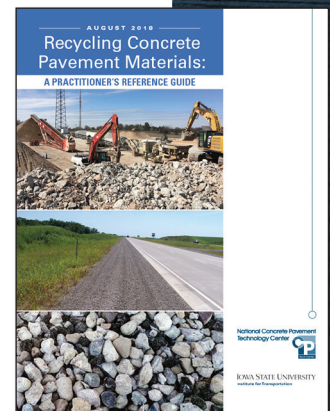
- Project evaluation and selection
- Design details and procedures
- Construction and maintenance of traffic
- Recent case studies that exemplify project selection and construction for various overlay types
- Current information on continuously reinforced concrete pavement overlays, geotextile separation layers, and fiber reinforcement



## RECYCLING CONCRETE PAVEMENT MATERIALS WORKSHOP

This workshop is based on the CP Tech Center's *Recycling Concrete Pavement Materials: A Practitioner's Reference Guide* and its accompanying tech brief. Both publications provide comprehensive resources that can help practitioners determine whether recycled concrete aggregate (RCA) is a good match for a project, what applications make the most sense, and how to specify and perform field inspections. Topics include the following:

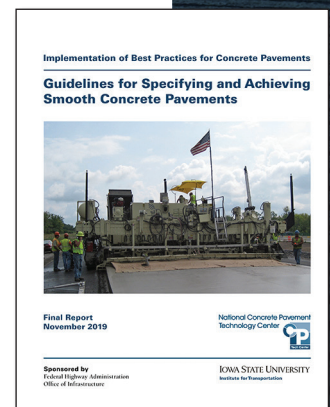
- Engineered nature of RCA
- Breadth of applications for RCA
- Usage and performance expectations of RCA
- Production of RCA
- Mixture design basics when using RCA
- Quality control when using RCA
- Potential benefits of using RCA



## SPECIFYING AND ACHIEVING SMOOTH CONCRETE PAVEMENTS WORKSHOP

Agencies aim to implement reasonable specifications regarding smoothness limits and incentive/disincentive levels. Likewise, contractors attempt to account for the impacts that various construction factors, such as the concrete mixture, paving equipment, and paving crew, have on pavement smoothness. This workshop, based on the CP Tech Center's *Implementation of Best Practices for Concrete Pavements: Guidelines for Specifying and Achieving Smooth Concrete Pavements*, outlines best practices that can help agencies and contractors specify and build smooth concrete pavements. It also highlights real-time smoothness technology and showcases field trials. Topics include the following:

- Specifications and design
- Construction of smooth concrete pavements
- Measurement of smoothness





## PERFORMANCE ENGINEERED MIXTURES (PEM) WORKSHOP

Recent developments in concrete testing technologies have yielded methods that are better predictors of long-term performance than traditional measurements of concrete acceptance such as strength, slump, and air content. The Performance-Engineered Concrete Paving Mixtures program assists states in the adoption of test methods and technologies that will help them deliver on the promise of long-term concrete durability. This workshop details the various components of the PEM program, including the suite of tests that better predict long-term performance of concrete pavements. Topics include the following:

- The philosophy and goals of AASHTO R 101 and the PEM program
- Implementing PEM concepts and test methods in practice, including specifications, training, and quality assurance
- PEM test methods for strength, workability, transport properties, and cold weather resistance



## DESIGN AND CONSTRUCTION OF CONCRETE ROUNDABOUTS WORKSHOP

The construction of roundabouts has surged in the U.S. in recent decades. Roundabouts offer many benefits to agencies and the traveling public, and concrete pavements are an important component of the paved areas within roundabouts. This workshop covers the basics of design and construction of concrete pavements for roundabouts. Topics include the following:

- Intersection safety and geometry
- Interactive jointing exercise
- Concrete pavement design
- Design of concrete pavements for other types of intersections
- Joint layout and design
- Construction staging



## CONCRETE BATCH PLANTS WORKSHOP

This workshop includes an overview of concrete batch plants, including what agencies should be looking for during visits and inspections. Based on agency needs and industry coordination, the workshop may include a tour of a concrete batch plant. Topics include the following:

- Concrete materials
- Calculating w/cm ratio
- Jobsite safety
- Testing at the batch plant
- Basics of concrete batch plants

