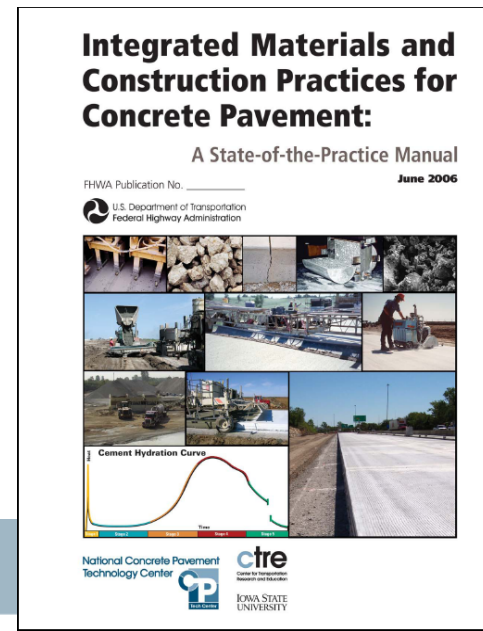


Integrated Materials and Construction Practices for Concrete Pavement: A State-of-the-Practice Manual

Training on Demand Program

National Concrete Consortium
Meeting
San Antonio, Texas

March 31, 2009



Establish an Interactive, Online, Training on Demand Program

- Training on Demand modules are being developed and made available on NHI and the CP Tech Center websites
- Users participate in online IMCP training at their convenience using Computer Based Interactive Training (CBIT)
- Users will access any one of the 9 training modules, listen to audio and visual presentations & answer questions at the end of the modules
- Two modules remain to be recorded
- Project to be completed by the end of May 2009



Training on Demand Modules

- Chapter 1 – Introduction (not included)
- Chapter 2 – Basics of Concrete Design
- Chapter 3 – Fundamentals of Materials Used for Concrete Pavements
- Chapter 4 – Transformation of Concrete from Plastic to Solid
- Chapter 5 – Critical Properties of Concrete



Training on Demand Modules

- Chapter 6 – Development of Concrete Mixtures
- Chapter 7 – Preparation for Concrete Placement
- Chapter 8 – Construction
- Chapter 9 – Quality and Testing
- Chapter 10 – Troubleshooting and Prevention



Training on Demand Module

Hardened Concrete Prosperities
Durability
Module

<http://fhwa.na3.acrobat.com/n134095mod1/>



Transportation Curriculum Coordination Council (TC³)

- Supported by FHWA and State Pool Funds
- Works with National Highway Institute to Develop Training on Construction, Materials, Maintenance, Safety, and Employee Development
- Establish Free Training Programs for Specific Courses
- The Transportation Pool Fund Solicitation No. 1205



CP Tech Center Coordination on Training

- Working with FHWA on a National Training Calendar
- Working with ACPA on the distribution of IMCP CDs
- Working with NHI/ TC³ to help provide concrete pavement technology to their efforts
- Providing National Training on concrete preservation, similar to the IMCP efforts
- Providing National Training on concrete overlays and encouraging state demonstration projects

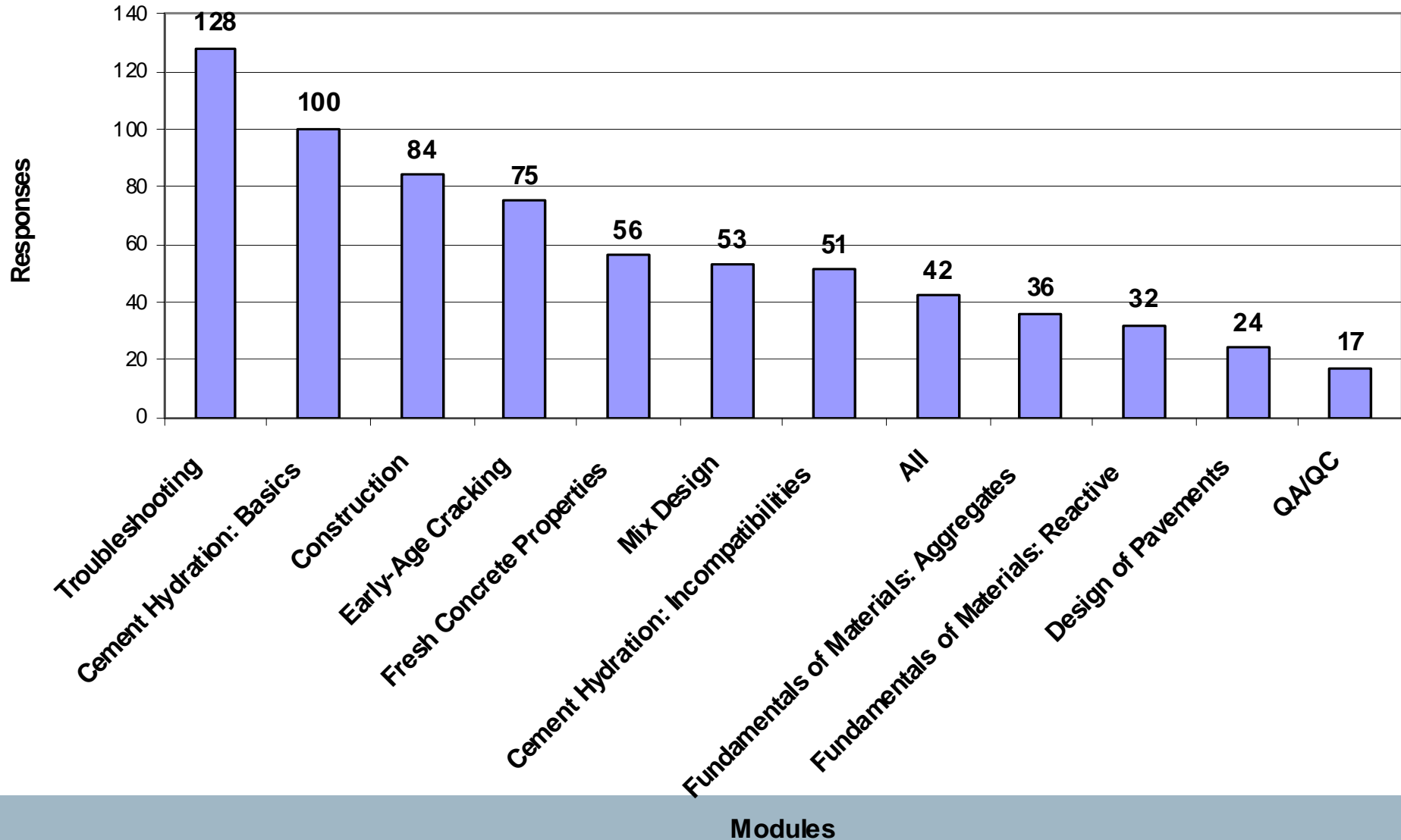


IMCP Workshop Rating

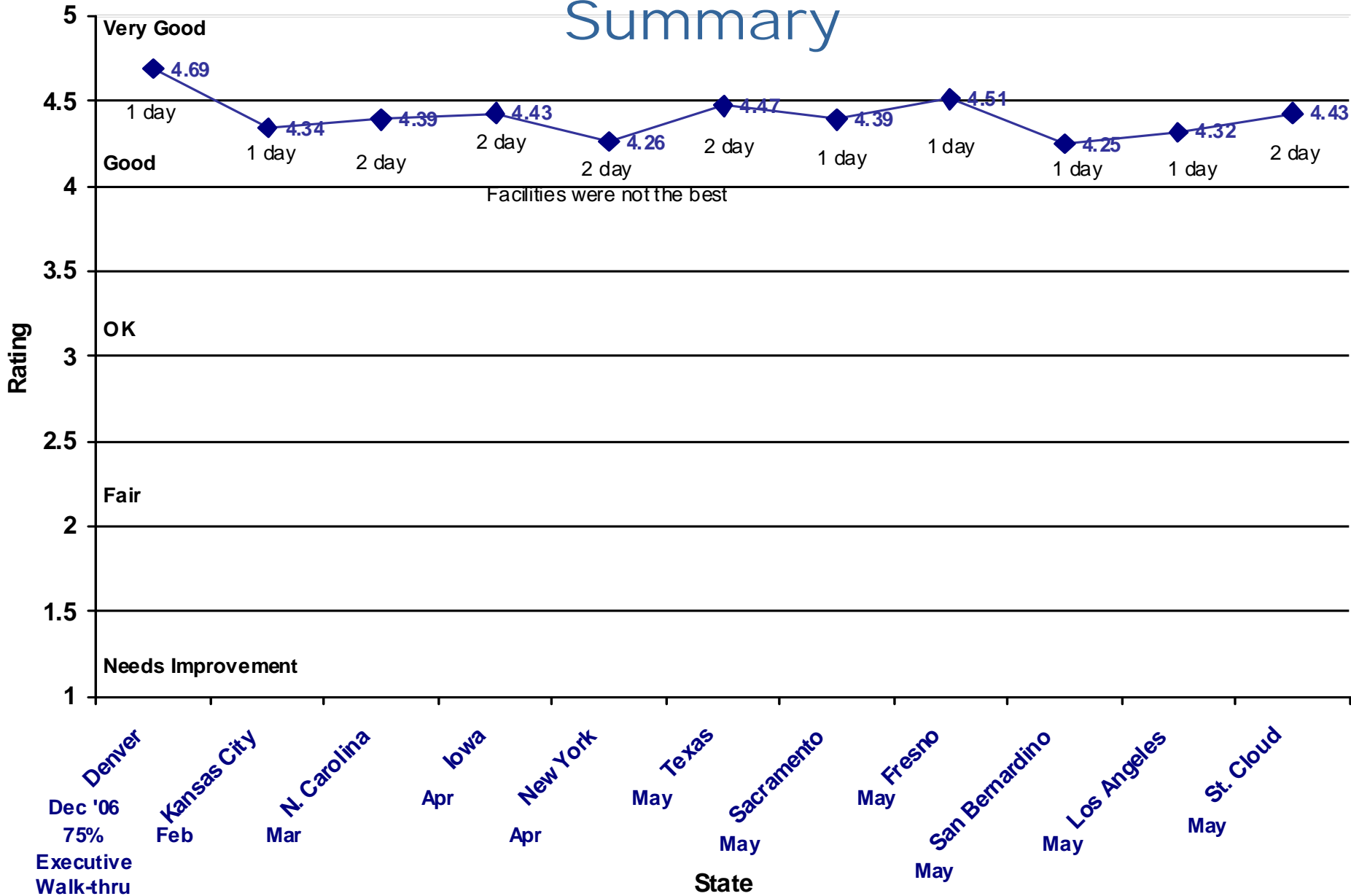
- 19 IMCP Workshops were held between February 2007 and February 2009 (9 one-day and 10 two-day workshops)
- 1,606 estimated participants attended the workshops
- Each workshop rated on the following scale:
 - (5) Very Good
 - (4) Good
 - (3) Ok
 - (2) Fair
 - (1) Needs Improvement
- Overall rating for 19 workshop program was 4.34



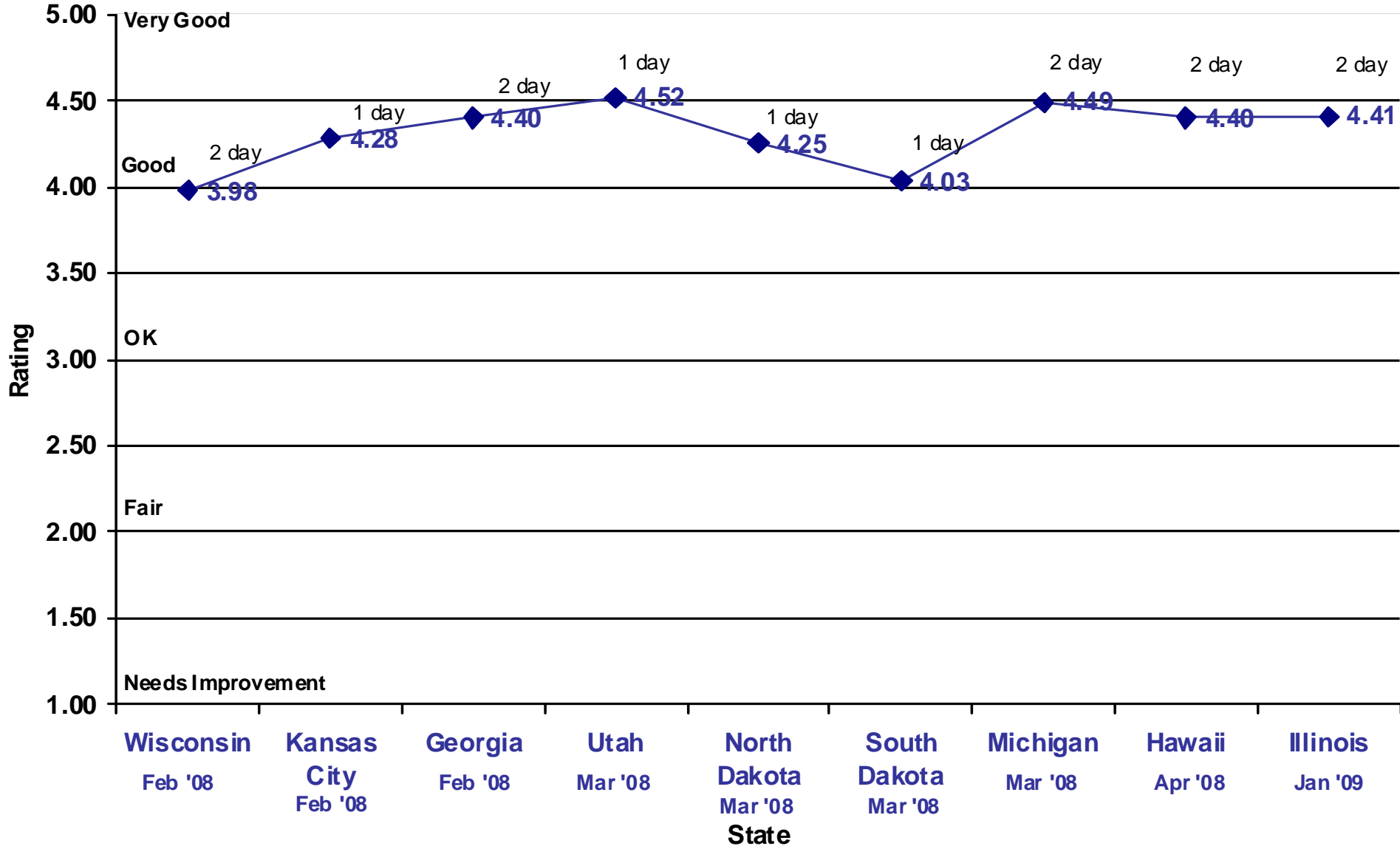
Summary of Most Helpful Modules



2007 IMCP Workshop Evaluation Summary



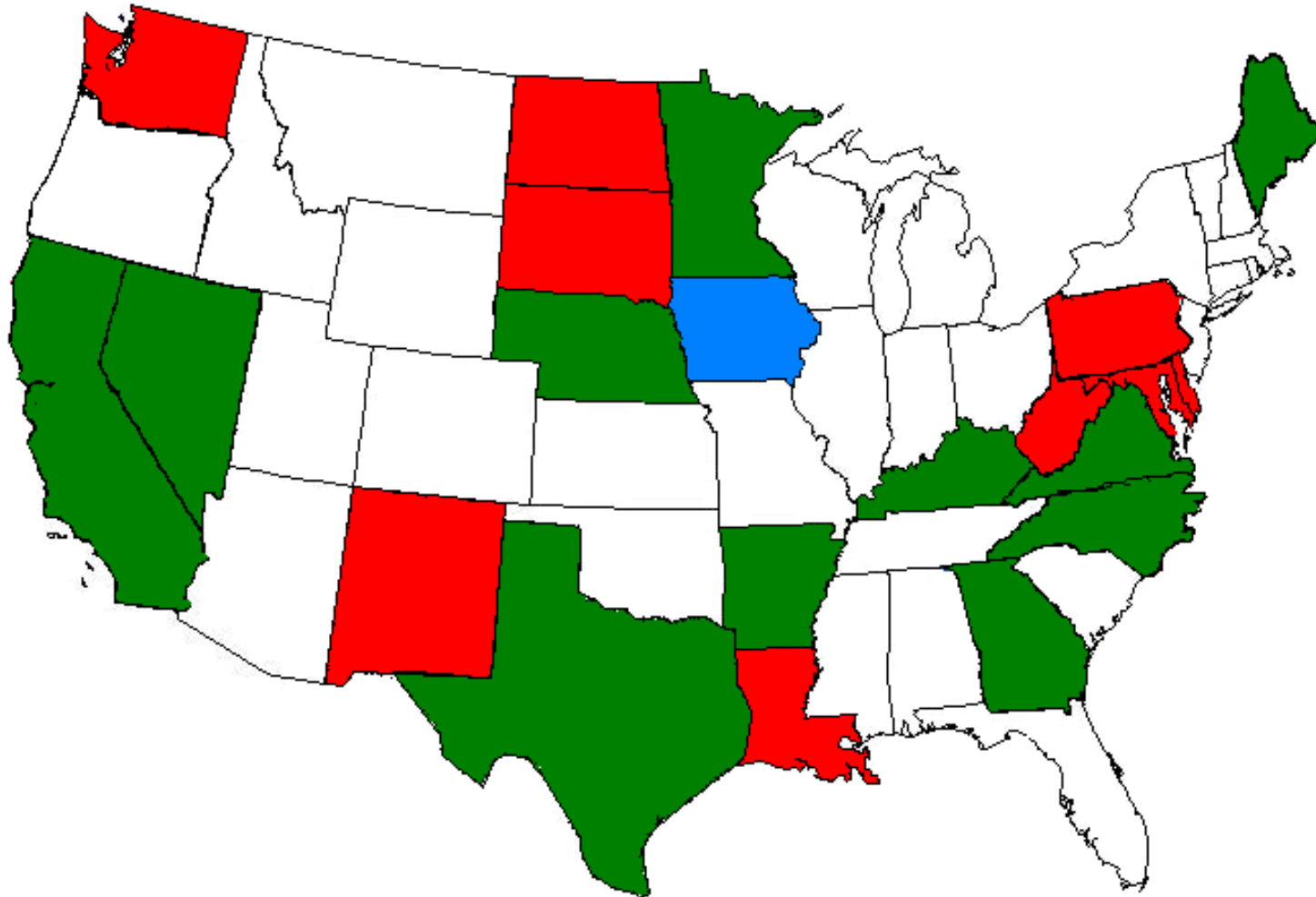
2008-2009 IMCP Workshop Evaluation Summary



Overlays Programs



Concrete Overlay Field Application States



Joined the Program

1. Delaware
2. Louisiana
3. Maryland
4. New Mexico
5. North Dakota
6. Pennsylvania
7. South Dakota
8. Washington
9. West Virginia

Interested States

1. Arkansas
2. California
3. Georgia
4. Kentucky
5. Maine
6. Minnesota
7. Nebraska
8. Nevada
9. North Carolina
10. Texas
11. Virginia

Iowa – 2009-2010
Field Application
Research Projects

Guide for Existing Concrete Overlay Design Methodology

- The AASHTO Guide and many of the other procedures have been in existence for over two decades
- Due to the lack of data on the interaction between the underlying pavement, interlayer, and concrete overlay, a conservative design approach is often taken, which results in suboptimal costs.
- Design programs are not always user friendly
- Programs take a significant amount of input



Guide for Existing Concrete Overlay Design Methodology

- Design confidence is obtained through
 - Experience with completed overlays
 - Knowledge of design parameters and software programs
 - Unfortunately this experience takes time to gain, and therefore few engineers have utilized concrete overlays as compared to asphalt overlays.



Guide for Existing Concrete Overlay Design Methodology

- What is needed is straightforward and simple guidance for concrete overlay design
- More specifically, guidance is needed in how to use the AASHTO and other design procedures that are most commonly used today
- Proper use of computer software
- With guidance, DOT's can rest assured that their concrete overlay designs are based on sound engineering fundamentals, and validated by field performance.



Guide for Existing Concrete Overlay Design Methodology

- **Step 1: Identify critical and sensitive design variables.**
 - Existing pavement system
 - Type (flexible, rigid, composite)
 - Condition / distress modes
 - Thicknesses
 - Soils and drainage
 - Design traffic (volume, % trucks, design life, risk)
 - Load transfer strategy
 - Others?



Guide for Existing Concrete Overlay Design Methodology

- **Step 2: Identify reasonable assumptions.**
 - Climate / seasonal variations
 - Traffic and load distributions
 - Strengths, moduli, other materials properties
 - Load transfer



Guide for Existing Concrete Overlay Design Methodology

- **Step 3: Document Design Process.**

- Publish Tech Brief(s) that describe this process along with the most sensitive variables requiring definition.
 - Characterization of the existing pavement
 - Bond (e.g., how bond affects overlay behavior, how the bond might change over time, and how a loss of bond might actually be a cohesive failure in the vicinity of the interface rather than the interface itself),
 - Traffic.



Guide for Existing Concrete Overlay Design Methodology

- **Step 4 & 5: Define sets of input and perform overlay designs for examples.**
 - 1986/1993 AASHTO Guide for Design of Pavement Structures
 - Interim M-EPDG,
 - Colorado DOT method,
 - Chapter of ACPA (to be incorporated into StreetPave)
 - Pooled fund TPF-5(165). (MnROADS)
 - After an analysis of these programs 2 will be recommended and carried forward which will include design examples and design procedures.
 - Commentary on other methods will be included, however examples and design procedures will not be presented for all.



Guide for Existing Concrete Overlay Design Methodology

- **Step 6: Develop draft guide.**
 - The guide will begin with the interim product consisting of the tech brief(s) developed in Task 3.
 - Two recommended programs, populated with the design examples including the necessary graphics work with design details.
 - Links to existing guides and accepted practices will be provided including the Guide to Concrete Overlays, pre-overlay repair manual (CPR bulletins), etc.



Guide for Existing Concrete Overlay Design Methodology

- **Step 7: Peer review draft guide**
 - Peer review will be ongoing throughout the entire project thru Technical Advisory Committee
 - The design guide will also be released to a select group of stakeholders in order to solicit their feedback
 - AASHTO Joint Technical Committee on Pavements.
 - State DOT Representatives
 - FHWA
 - NCHRP



Guide for Existing Concrete Overlay Design Methodology

- ***Task 8: Develop final guide.***
 - It is anticipated that an iterative process may be necessary with subsequent review cycles and revisions
 - Technology transfer materials will also be developed:
 - A dedicated training program
 - A web-friendly training document might be a possibility



Overview of Concrete Pavement Preservation Workshop

January 2009

- Workshops conducted in Colorado & Kentucky
- Workshops scheduled in Missouri & Utah
- Two openings available for state workshops

A 1½-day workshop on PCC Pavement Preservation with complementing reference documents, instructional material, and handouts has been developed under a cooperative agreement between the National Concrete Pavement Technology Center (CP Tech) and FHWA. The documents and workshops were developed under the guidance of a Technical Oversight Committee that consisted of industry, State DOT and FHWA representatives. The material developed used the current research products and state-of-practice and state-of-the-art maintenance and rehabilitation techniques (excluding resurfacing) for optimizing the service life of a pavement. The materials presented in the workshop consider both optimizing performance and lowering the life-cycle cost of a concrete pavement.

In February 2008, the Federal Highway Administration (FHWA) and Iowa State University's National Concrete Pavement Technology Center (CP Tech Center) published the *Concrete Pavement Preservation Workshop Participant Workbook Manual, Instructors Guide* and a 222 page Preservation Manual. The manuals serve as the technical documents and presentation materials for the 1 ½ day workshop on concrete pavement preservation.

Program Objective

The primary objectives of this project are to provide national training on the Concrete Pavement Preservation techniques and practices. The Preservation reference manuals purpose is to provide the most up-to-date information available on the design, construction, and selection of cost-effective concrete pavement preservation strategies. It concentrates primarily on strategies and methods that are applicable at the project level, and not at the network level, where pavement management activities function and address such issues as prioritizing and budgeting.



Detailed information is presented on seven specific concrete pavement preservation treatments:

1. Slab stabilization and slab jacking,
2. Partial-depth repairs,
3. Full-depth repairs,
4. Retrofitted edge drains,
5. Load transfer restoration,
6. Diamond grinding and grooving,
7. Joint resealing and crack sealing.

In addition, information is provided on preventative maintenance and pavement preservation concepts, pavement evaluation techniques and strategy selection procedures.



The *Concrete Pavement Preservation Workshop Reference Manual* and workshop is for State DOTs, engineering consultants, materials suppliers, contractors, quality control personnel, and technicians.



THANK YOU!

