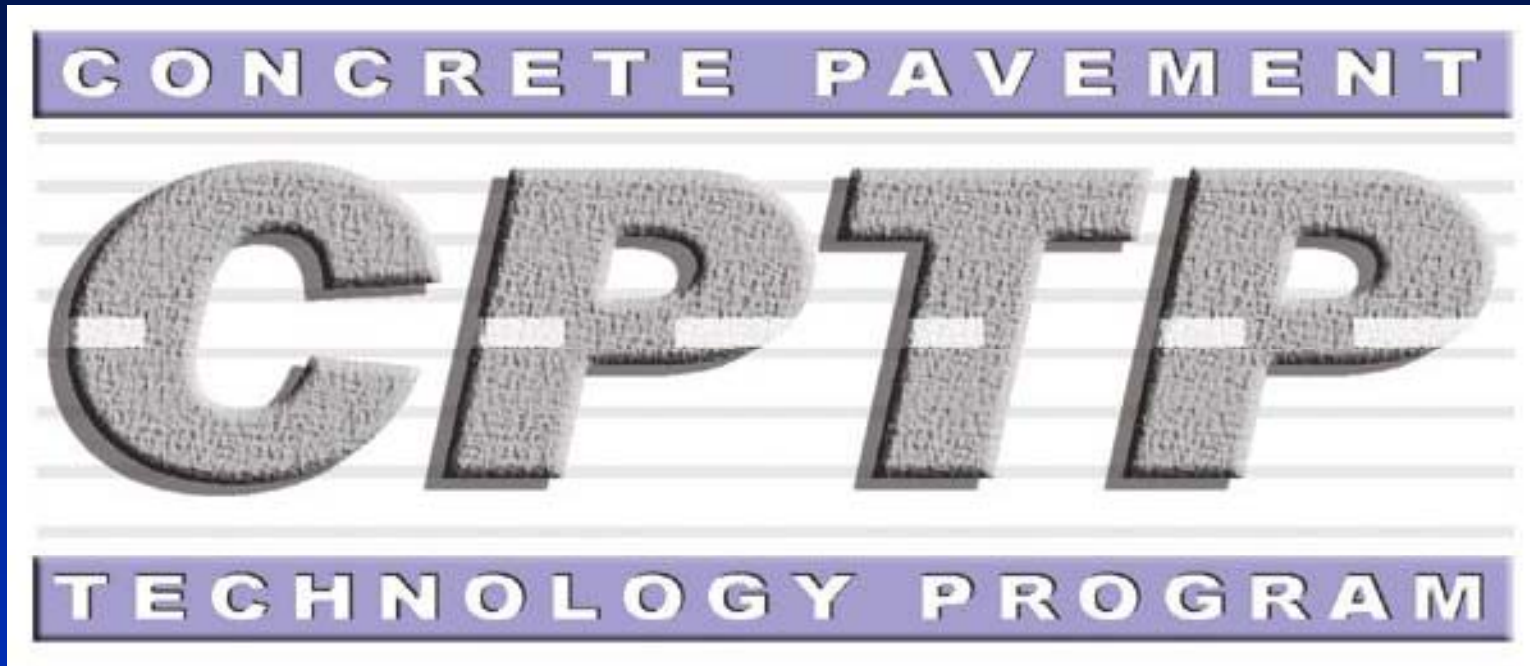


Concrete Pavement Technology Program



Georgia PCCP Conference

October 14, 2008

Angel Correa

FHWA Resource Center, Atlanta

What is CPTP?

- ▶ Coordinated effort to improve the long-term performance and cost effectiveness of concrete pavements for Federal-Aid highways
- ▶ Goals
 - Reduce user delays associated with PCCP construction
 - Reduce overall costs for constructing, repairing & rehabilitating PCCP
 - Improve long term PCCP performance
 - Foster innovation in PCCP technology

CPTP Focus Areas

- Advanced Designs
- Improved Materials
- Improved Construction Processes
- Rapid Repair & Rehabilitation
- Enhanced User Satisfaction
- Trained Workforce

Stakeholder Expectations from CPTP

- ▶ Products must be ready for implementation
- ▶ Utilize pooled funding to support new technologies
- ▶ Challenge industry to provide a quality product
- ▶ Technologies should result in long-lasting new construction & repair/rehabilitation
 - Cost-effectiveness
 - Minimize extended lane closures

Stakeholder Expectations from CPTP

- ▶ Produce simple “fact sheets” on specific products
- ▶ Rapid construction & R&R – Get in ASAP, get out AQAP, stay out ALAP
- ▶ Trained agency/industry workforce
- ▶ Rapid response to hot issues/needs of PCCP technology

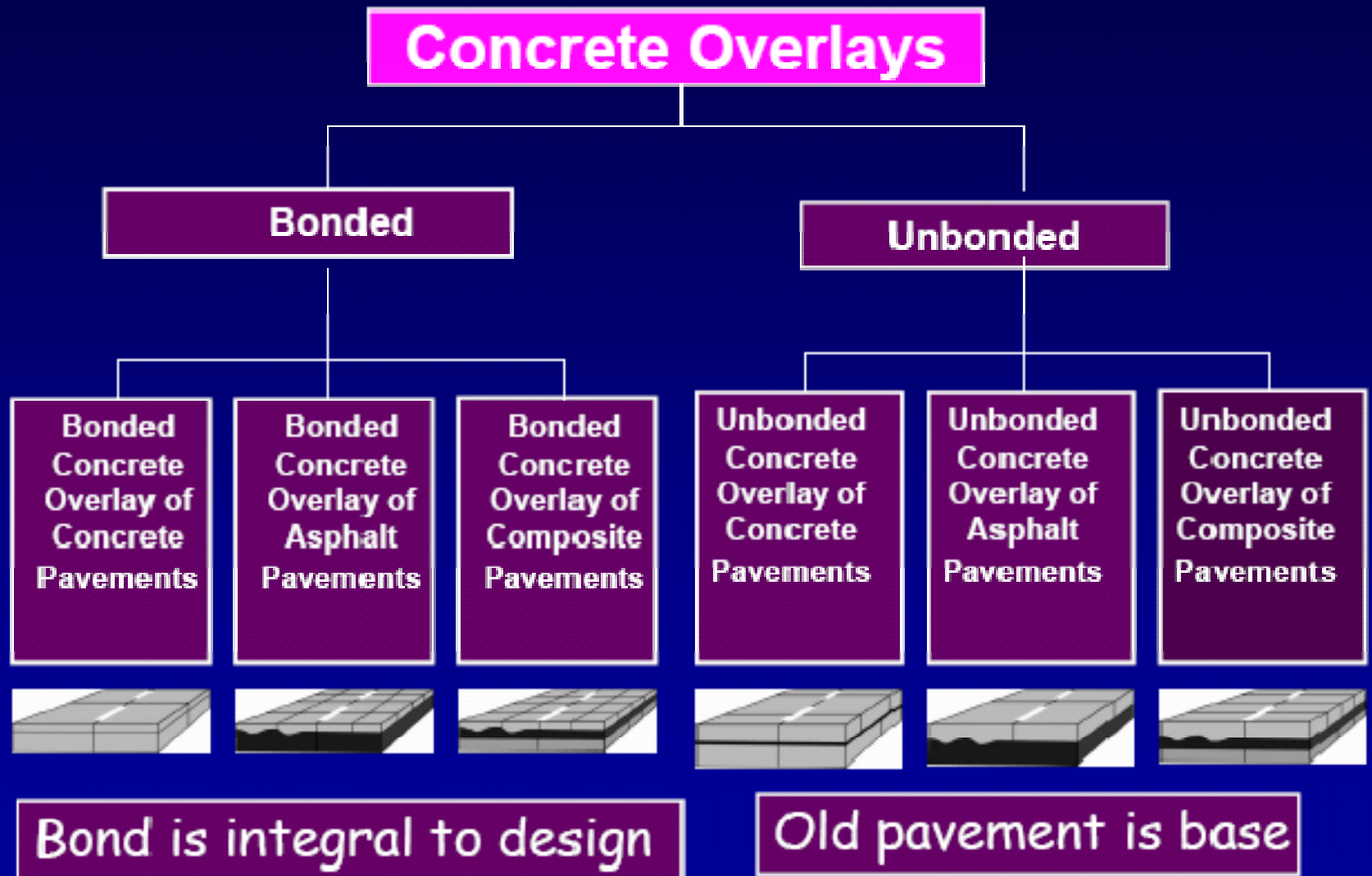
CPTP Projects – Status

- ▶ Most projects completed
- ▶ Recently completed
 - Concrete mix optimization guidelines (COMPASS)
 - Influence of joint sealing
- ▶ Key projects still in progress
 - Smoothness criteria for PCCP
 - Precast pavement demos
 - Profile data evaluation & surface texture
 - Mobile Concrete Lab – T2 effort
 - CPTP implementation – T2 effort
- ▶ CP RoadMap – oversight contract (CP Tech Center)

Concrete Overlays Program

- ▶ To promote technology transfer activities related to concrete overlays
- ▶ Jointly conducted by FHWA CPTP and the NCPTC
 - Concrete Overlays Guide developed by NCPTC
 - Concrete Overlays workshop presented by CPTP
 - Concrete overlays field application program supported by NCPTC

Family of Concrete Overlays

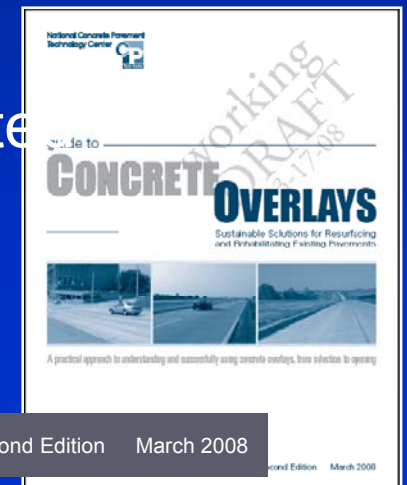


Concrete Overlay Guide

A 75-page “Guide to Concrete Overlay Solutions”

- For Field Application Program
- Overview of Overlay Families
- Overlay types and uses
- Six Overlay Summaries
- Evaluations & Selections
- Design Section
- Miscellaneous Design Details

- Overlay Materials Section
- Work Zones under Traffic
- Key Points for Overlay Construction
- Accelerated Construction
- Project & Specifications Considerations
- 10,000 to be printed



Concrete Overlay Workshop

- Welcome, Introductions, Workshop Objectives
- Overview of Concrete Overlay Guide
- Pavement Fundamentals (ACP, PCCP, Overlays)
- Existing Pavement Evaluation
- Technical Discussion:
 - Concrete Overlay Design, Construction & Materials
- Special Considerations - transitions, etc
- Concrete Overlay Success Stories
- LCC Considerations
- Maintenance of Traffic
- FHWA/NCPTC Concrete Overlay Demonstration Program

Concrete Overlay Field Application Program

- ▶ **Objectives**
 - **Increase Awareness**
 - **Spread Knowledge**
 - **Strengthen Confidence**



Concrete Overlay Field Application Program

- Up to six to eight different states, will be guided through the concrete overlay - candidate project selection; design; construction process.
- States will be provided with the opportunity to develop in-house expertise on overlays through:
 - A Workshop on the new overlay guide.
 - Site visits of each state candidate project by an expert team
 - Tech support during design & construction

The FHWA Precast Concrete Pavement Program

Precast Concrete Pavement Concepts

- ▶ Intermittent repairs – plain concrete panels
 - Full-depth or full panel replacement
- ▶ Continuous Applications (longer length/larger area)
 - Conventional jointed systems
 - Prestressed panels – fewer active joints



The Prestressed Precast System (Developed at U of Texas)



The Full-Depth Repair System (The Michigan Method)



PCCP Best Practices Workshops

- ▶ Two-day customized workshop on Best Practices for Concrete Pavements
- ▶ To-date, over 20 US agencies & MTO have taken advantage of this and other specialty CPTP workshops
 - AL (2), AZ, CA, DE, FL (3), GA, HI, IN, IA, KY, ME, MN, MO, NC (2), MN, OH (2), PA (3), UT, VA, WA (2), WI, WV
- ▶ Workshop covers
 - Fundamentals, Design, Concrete materials
 - Construction, MRR, Construction QA/QC
 - European & US DOT Best Practices

Topical Presentations – Best Practices

- ▶ Range of Best Practices presentations available; customized to meet agency needs. Examples include:
 - Accelerated Construction Techniques
 - Concrete Overlays Update
 - Precast Concrete Pavements Update
 - US State DOT Best Practices
 - PCCP Surface Characteristics – Needs & Directions
 - Concrete - Concrete Materials & Durability
 - MEPDG Considerations
 - Concrete Pavement Design Features
 - PCCP Construction Traffic Management

Equipment Demonstration & Loan

Dowel Bar Alignment
Using "MIT Scan-2"



- 3 loan units available
- Loaned (1-month) to over 15 State DOTs
- Training provided

Equipment Demonstration & Loan

Slab Thickness
Using "MIT Scan T2"



State DOTs Using CPTP
Demo/Loan Program
- 2008:

Iowa
Nebraska
Delaware
Minnesota

Two units available for 2-week loan periods

CPTP Update

*Released at about
1 year interval – 6
updates published*

Provides information
on CPTP product
availability, field trials,
and implementation
experiences

Safer, Smoother, Quieter, Longer Lasting

CONCRETE PAVEMENT

CPTP

TECHNOLOGY PROGRAM

Concrete Pavement Technology Update



Concrete Overlays—An Established Technology With New Applications

The need for optimizing preservation and rehabilitation strategies used to maintain the Nation's highway pavements has never been greater. Concrete overlays have a long history of use to preserve and rehabilitate concrete and asphalt pavements, and many of the practices are well established. However, of recent origin are techniques that use thinner concrete overlays with shorter joint spacing. Field experience over more than 15 years with the thinner concrete overlays under a range of traffic and site conditions has demonstrated their viability as a cost-effective solution to extend the service life of deteriorated asphalt and concrete pavements.

The Federal Highway Administration (FHWA) has initiated several activities to support technology transfer related to concrete overlays. These activities include reviews, on a regional or statewide basis, of current applications of concrete overlays, identification of gaps in technology, and assistance in developing a program—jointly with State departments of transportation (DOTs) and industry—for technology transfer and demonstration projects. FHWA is assisting with organization of meetings at the State and regional levels to help coordinate concrete overlay technology transfer activities.

Overview of Concrete Overlays

Concrete overlays offer a broad range of applications for preserving and rehabilitating asphalt, concrete, and composite pavements. Concrete overlays can be designed for a range of traffic loading to provide long performance lives, 15 to 40+ years, to meet specific needs. Well-designed and well-constructed concrete overlays require low maintenance and can have low life-cycle costs. Applications include the following:

- Over existing asphalt pavements
 - Bonded overlay of asphalt pavements
 - Unbonded (directly placed) overlay of asphalt pavements
- Over existing concrete pavements
 - Bonded overlay of concrete pavements
 - Unbonded (separated) overlay of concrete pavements
- Over existing composite pavements
 - Bonded overlay of composite pavements
 - Unbonded (directly placed) overlay of composite pavements

Bonded overlays are typically thin, 2 to 6 in. (50 to 150 mm) in thickness. When bonded to a milled asphalt surface, the overlay panels are typically 8 by 8 ft (2.4 by 2.4 m) or less in dimension.

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 U.S. Department of Transportation
Federal Highway Administration

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Topical Conferences (practice-oriented)

- ▶ International Topical Conferences
 - Denver – 2005: Whitetopping (Concrete overlays of ACP)
 - Chicago – 2006: best Practices for Long-Life Concrete Pavements
 - Atlanta – 2007: Optimizing Paving Concrete Mixtures & Accelerated Concrete Pavement Construction & Rehabilitation
- ▶ Typically ~180 to 200 attendees
- ▶ Very good attendance by State DOT personnel
- ▶ Proceedings & CD developed



Next Topical Conferences

- ▶ National Conference on Preservation, Repair & Rehabilitation of Concrete Pavement s, St. Louis, Missouri,
 - April 2009

Other CPTP Products

- ▶ HIPERPAV software and training workshop
 - Included in spec by Ohio DOT
- ▶ PRS – demo projects conducted in WI, FL, IN, TN
 - Being implemented by WIDOT
- ▶ Protocol for concrete coefficient of thermal expansion test
- ▶ Protocol for evaluating concrete materials compatibility
- ▶ Thin bonded concrete overlays – support for evaluating Colorado's successful 6 by 6 by 6 system
- ▶ Guidelines for dowel bar alignment testing

CPTP Related Activities

- ▶ FHWA Highways for life program
 - Precast pavement concrete overlay projects
- ▶ FHWA CP Roadmap activities
- ▶ FHWA ASR program
 - Developing test protocols & guidelines
- ▶ Long-life concrete pavements (implementation activities)
 - Two-lift construction
 - Geo-fabric interlayer for unbonded overlays
- ▶ MEPDG implementation support
- ▶ Best practices for CRCP design. Construction & M&R

Future Activities/Directions

- ▶ FHWA will continue to support improvements in concrete pavement technology, working in partnership with States, industry and academia
- ▶ And, will continue to support timely implementation of promising new technologies through several on-going programs

QUESTIONS?