

Strategies for Concrete Pavement Preservation

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Strategies for Concrete Pavement Preservation

- FHWA-sponsored project initiated 2017
- Team: APTech, NCE, PERC
- Objective: Develop guidelines focused on long-term preservation of concrete pavements
 - More effective management of concrete pavements over complete life cycle
 - Designing for long life
 - What treatments to apply and when?
 - Application of meaningful cost evaluation procedures

Background

- Concrete pavements are traditionally designed for limited life
 - Finite design period
 - Threshold levels of distresses at end of design period
- “Preservation” treatments are applied to address distress-oriented structural and functional deficiencies
- Underlying causes of problems may not be addressed



Alternative Approach

- Redefine “Concrete Pavement Preservation”
Strategy of extending concrete pavement service life for as long as possible by arresting, greatly diminishing, or avoiding pavement deterioration processes
- Accomplished through:
 - Long-life concrete pavement designs
 - Concrete pavement restoration treatments
 - Overlays to maintain structure and serviceability

IN SUM: Build long-life pavements
Proactively preserve pavement

Work Activities

- Literature search/interim report
- Site visits/case studies for 10 projects featuring:
 - » LLCP
 - » CPR
 - » PCC Overlays
- Development of Guideline Documents
 - » Preservation Strategies
 - » Cost Evaluation



Project Status

Completed Activity: Interim Report

- Contents
 - Concrete pavement preservation concepts
 - Evaluation of existing concrete pavements
 - Strategies for concrete pavement preservation
 - Engineering economic analysis and concepts for strategy selection

- Available at:

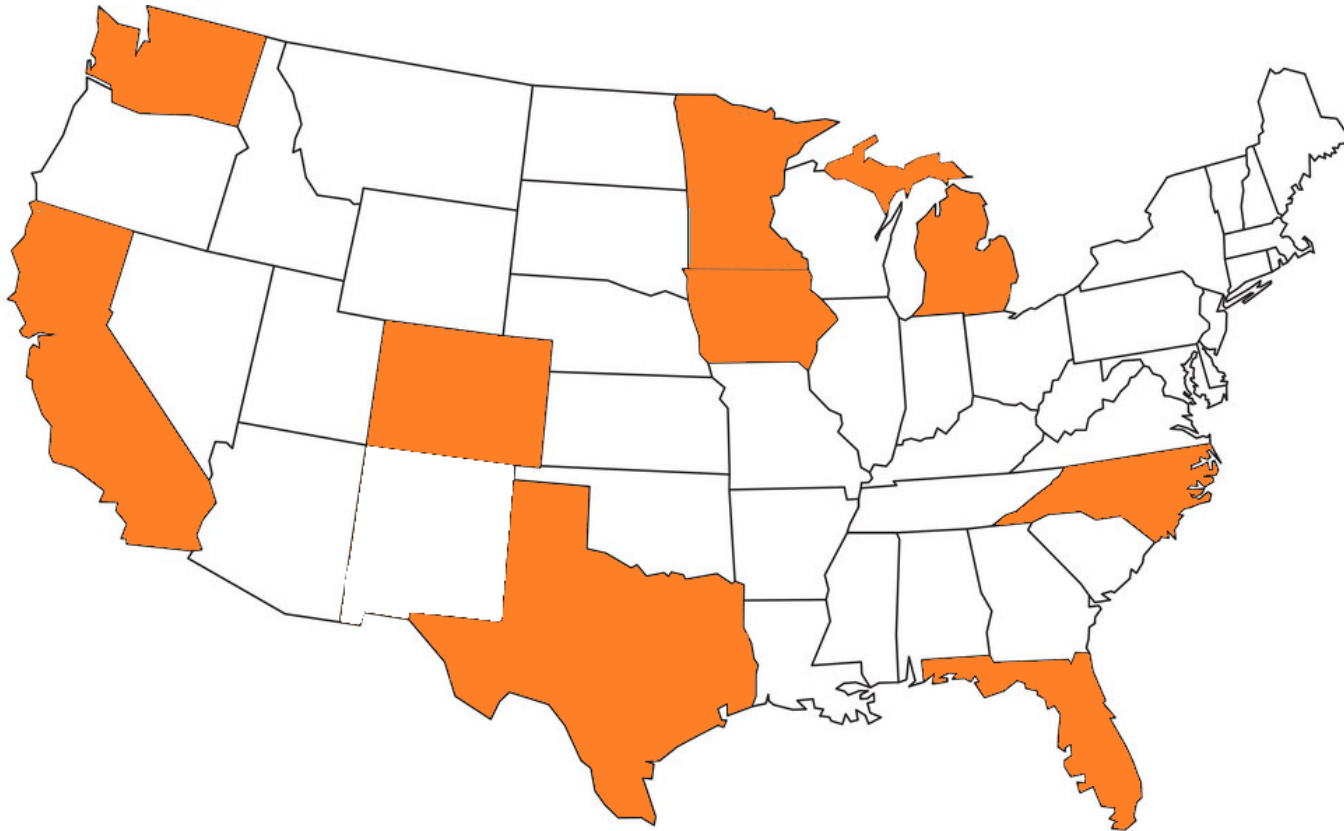
<https://www.fhwa.dot.gov/pavement/pubs/hif18025.pdf>



Project Status

Completed Activity: Site Visits

- 10 PCC pavement projects with good performance



Field Projects/Locations

State	Route	Project Type
Minnesota	I-35 W, Greater MSP	Long-Life Concrete Pavement (LLCP)
Iowa	US-20, Blairsburg	Concrete Pavement Restoration (CPR)
Michigan	US-41, Chassel	CPR
Michigan	US 23, Brighton	Unbonded PCC Overlay (UBOL) of PCC
Florida	US 1, Edgewater	UBOL of HMA
Colorado	I-70, Rifle	CPR
California	I-10, Ontario	CPR (70+ years of service!)
Washington	I-5, Olympia	CPR (50 years of service)
Texas	US 281, Wichita Falls	Bonded Latex-Mod CRC on CRCP
North Carolina	I-85, Durham	UBOL, CPR

LLCP



I-35W, Richfield, MN
(Const. 2000)

CPR



US 20, Blairsburg, IA
(Const. 1968, CPR 2014)



US 41, Chassel, MI
(Const. 1958, CPR ~2000)

Serial CPR



I-5, Olympia, WA
(Const. 1969, CPR 1996 [lane 1],
2010 [lane 2], 2014)

I-10, Ontario, CA
(Const. 1947, CPR x 4)



Serial CPR



I-70, near Rifle, CO
(Const. 1975-76, CPR 2003-05, 2014)

PCC Overlays



US 23, Brighton, MI
(UBOL over PCC Const. 1992)

US 1, Edgewater, FL
(UBOL over HMA, Const. 1988)



PCC Overlays



I-85, Granville Co., NC
(Unbonded Overlay of CRCP
CRCP Const. 1971
UBOL Const. 1997, DG 2010, Minor
CPR 2015)

US 281 Wichita Falls, TX
2002 Bonded CRC Overlay
of CRCP



Project Status

Current and Future Plans

- Case study reports on 10 field projects
 - Documenting performance and costs
- Guidelines for concrete pavement preservation (*focused on the “what” and “why”*)
 - Long-life pavement design and construction
 - Concrete pavement evaluation for feasibility
 - Identification of appropriate treatments
 - Creating composite pavements with overlays
 - Maintaining serviceability through CPR

Project Status

Current and Future Plans

- Cost evaluation guidelines
 - Conventional LCCA and DLMY for project- and network-level analyses
 - Considerations for selecting discount rate
 - Normalization for quality of service (traffic, IRI)
- Case study data trends
 - Value of doing long-life treatments
 - Impact of CPR, overlay timing on treatment cost-effectiveness

Project Timeline



Questions?



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