



Does Preservation Matter: The Role of Pavement Preservation in Pavement Life

AASHTO Subcommittee on Maintenance

Des Moines, Iowa

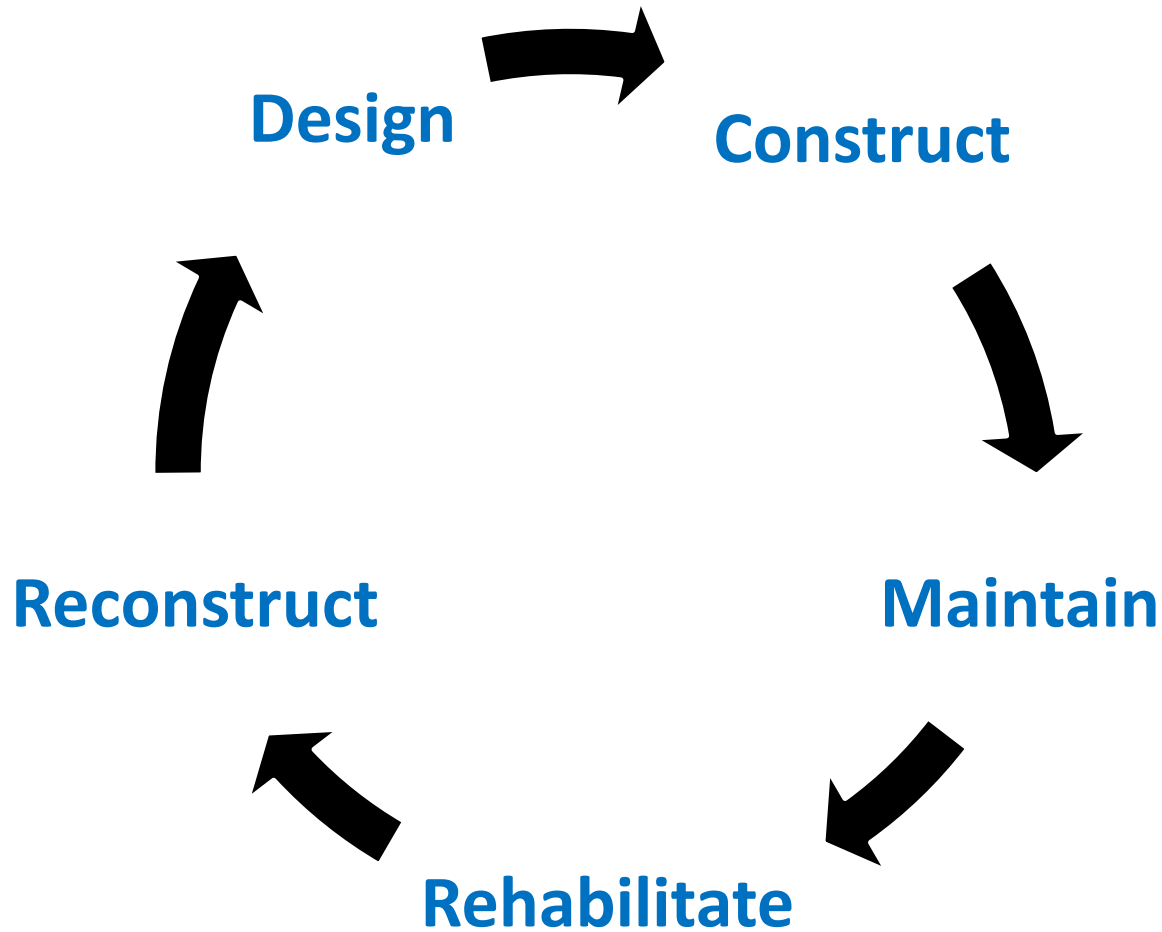
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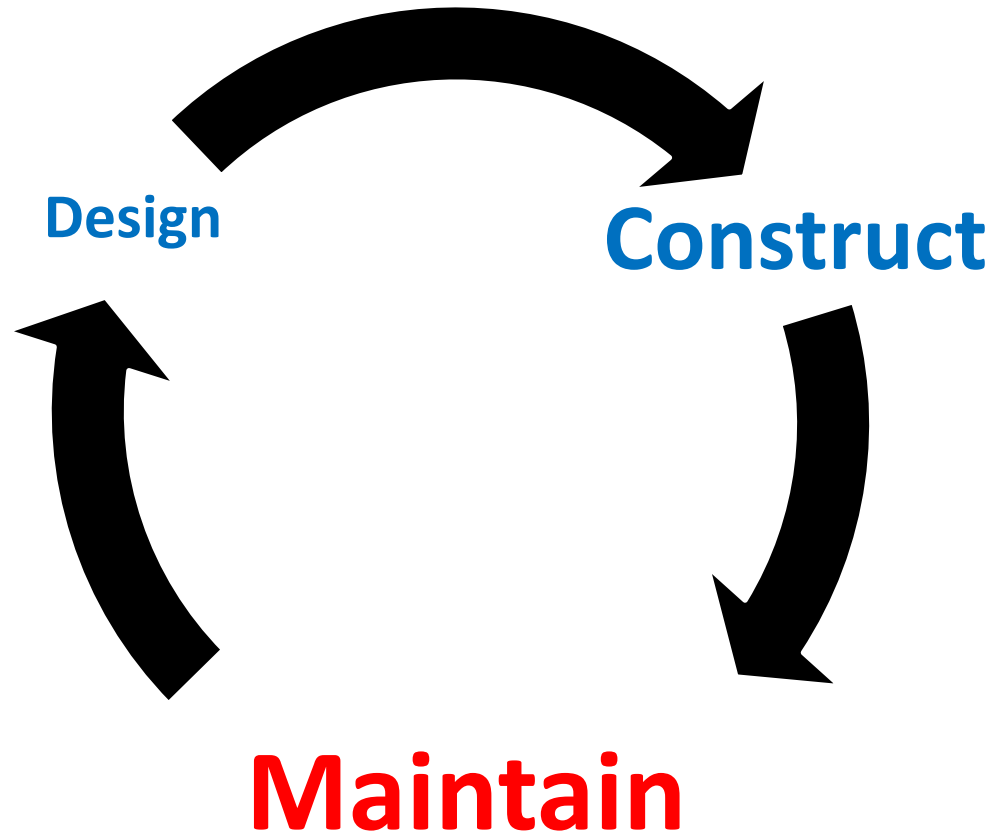


providing engineering solutions to improve pavement performance

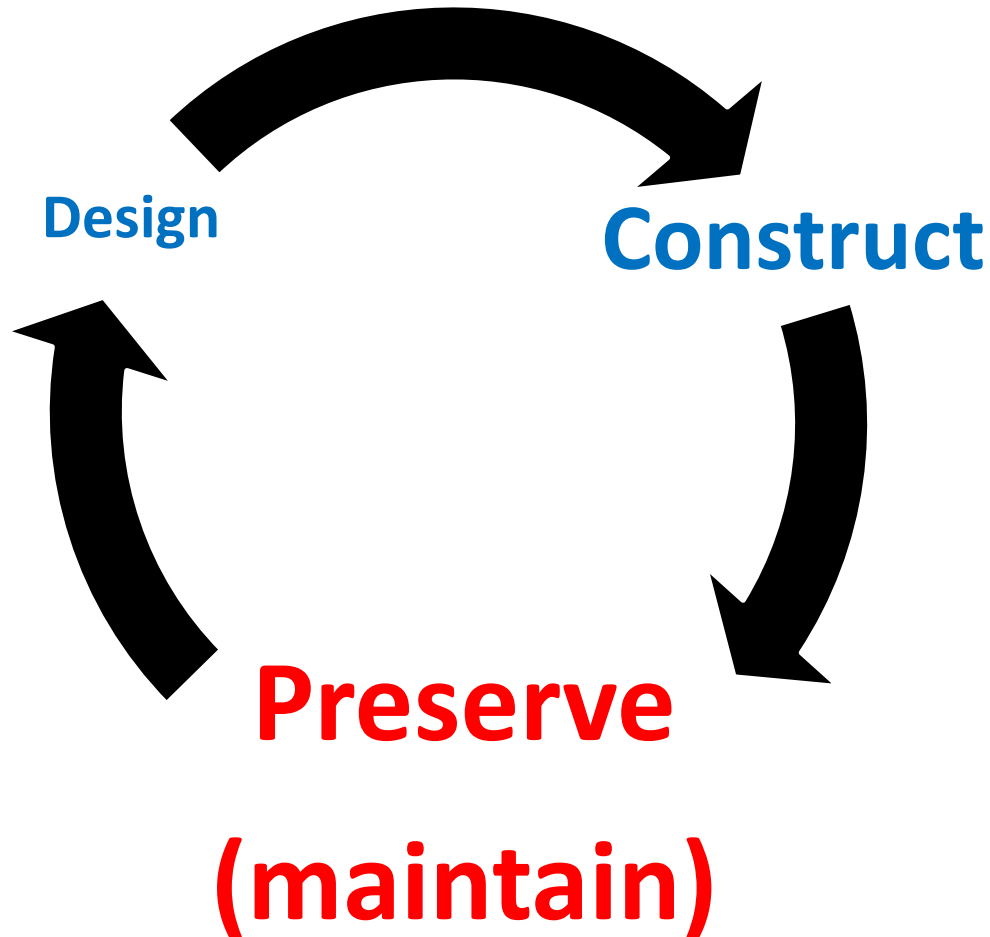
It's a Pavement's Life: An Overview



It's a Pavement's Life: What's Important



It's a Pavement's Life: Our Focus



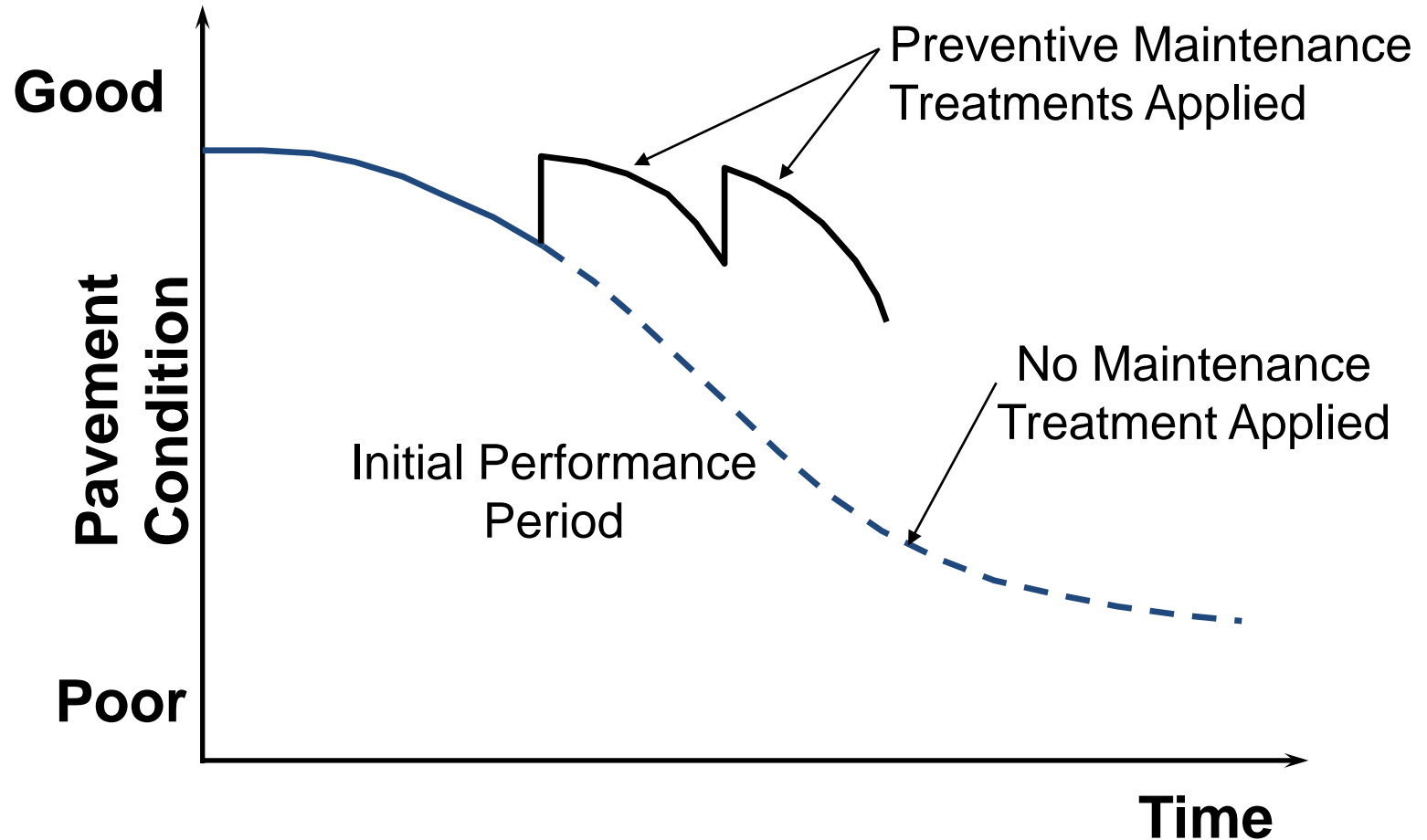
Support for Pavement Preservation



- Anecdotal and small scale studies
- State and regional comparisons of treatments in SPS-3
- Construction reports
- Industry



A Preservationist's Perspective



NCHRP 1-48 Background



- *Incorporating Pavement Preservation into the MEPDG*
- Study started in July 2010
- Objective: Develop procedures for incorporating pavement preservation treatments into the MEPDG analysis process



MEPDG and Preservation (in quotes)



- Preservation programs and strategies are policy decisions which are not considered directly in the distress predictions
- Preservation treatments applied to the surface of hot-mix asphalt (HMA) layers early in their life may have an impact on the performance of flexible pavements and HMA overlays
- Consider the impact of these programs in establishing the local calibration coefficients or to develop agency-specific values



NCHRP 1-48 Approach and Deliverables



- Identify and recommend procedures that would be integrated into MEPDG models and software
- Prepare a chapter on pavement preservation in a format consistent with the MEPDG



Brief History of Partial Failures



- NCHRP 14-14: Optimal Timing of Pavement Preventive Maintenance
- NCHRP 1-48



Featured Approaches



- Approach 1—Development of Pavement Preservation Response Models and Distress Transfer Functions
- Approach 2—Local Calibration using Pavement Preservation Performance Results
- Approach 3—Adjustment of Pavement Distress and Corresponding Life by Modification of Pavement Materials and/or Structure Properties



Approach 1



- Construct and monitor conditions of pavement preservation test sections
- Analyze data and develop performance models

Climate Zone	Preservation Treatment	Flexible Pavements	
		Conventional HMA	Full-Depth HMA
		Moderate Traffic Routes	Interstate Routes
1 (Wet, Hard Freeze and Spring Thaw)	(0) Untreated control	Site 1	Site 2 (chip seals excluded)
	(1a) Chip Seal @ Yr 4		
	(1b) Chip Seal @ Yr 6		
	(2a) Thin HMA OL @ Yr 4		
	(2b) Thin HMA OL @ Yr 6		
2 (Wet, Freeze-Thaw Cycling)	(0) Untreated control	Site 3	Site 4 (chip seals excluded)
	(1a) Chip Seal @ Yr 4		
	(1b) Chip Seal @ Yr 8		
	(2a) Thin HMA OL @ Yr 4		
	(2b) Thin HMA OL @ Yr 8		



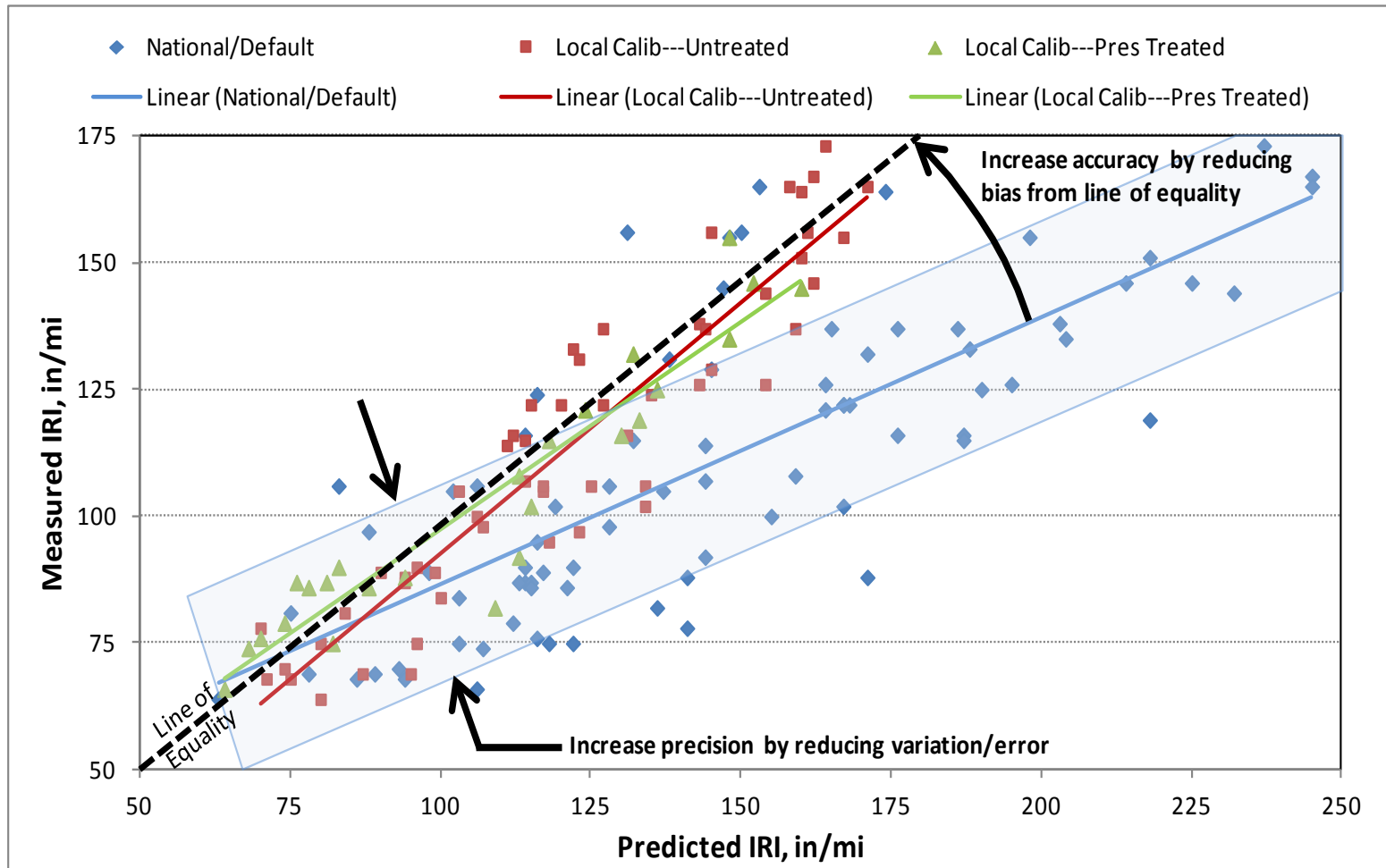
Approach 2



- Collect condition and other data on existing preservation-treated pavements
- Conduct design analyses for those pavement structures (minus the treatments) using *Pavement ME Design* software
- Perform local calibration of MEPDG performance models using *AASHTO Local Calibration Guide* procedure (predicted vs. actual distress/smoothness)



Approach 2



Approach 3



- Perform baseline pavement design (original untreated pavement) using *Pavement ME Design*
- Perform preservation-treated design that incorporates impacts of preservation treatment on pavement material properties and structure
 - Design input changes to layer moduli, thicknesses, moisture infiltration and thermal absorption properties.
 - “Adjusted/effective” performance curves



Moving Forward



- NCHRP Report 810: Consideration of Preservation in Pavement Design and Analysis Procedures

http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_810.pdf

- Presents details of proposed approaches
- Works examples of the implementation of each approach using agency data



So Does Preservation Matter?



- Where is it done? Why (underlying conditions)?
- Is it properly applied?
- How does it affect performance?
 - Immediately
 - Over time
- What did it cost?
- What factors make a difference (e.g., quality of construction, materials, environment, traffic)



A Caution



- Accountable organizations insist that expenditures provide benefits
- Many organizations are spending more and promoting pavement preservation
- Are preservation funds at risk if models used for pavement design show no benefit from preservation?



Thank You!



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