



R-23: Using the Existing Pavement In-Place and Achieving Long Life



U.S. Department of Transportation
Federal Highway Administration

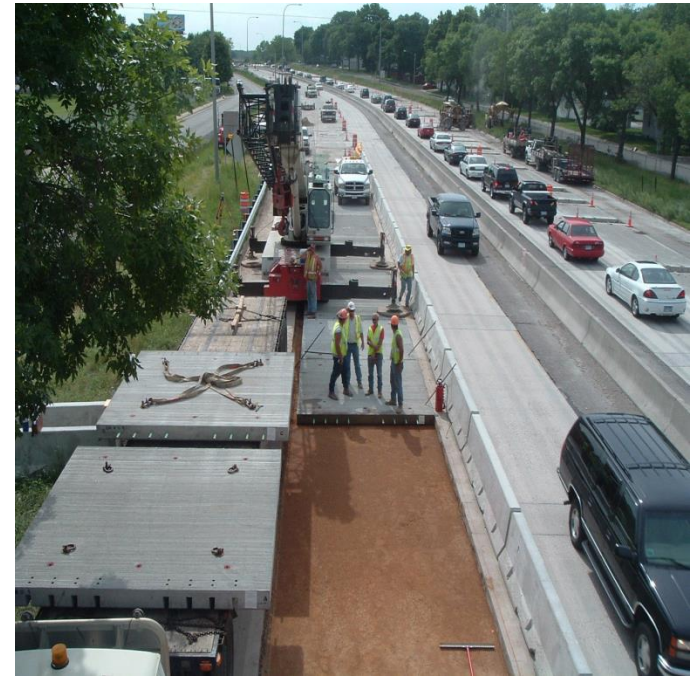


TRANSPORTATION RESEARCH BOARD

OF THE NATIONAL ACADEMIES

Agenda

- Background
- Project Goal & Objectives
- How can you assist?
- Questions?



Pavement Design, Construction, Preservation-Related Projects

R02. Geotech Solutions

R05. Modular Pavement

**R21. Composite
Systems**

**R23. Using Existing
In-place Pavement &
Achieving Long Life**

**R26. Preservation
Approaches**

**R15. Integrating Utility and
Transportation Agency
Priorities***

R07. Performance Specs

R06. High-Speed NDT*

R06-B: Evaluating Applications of Field Spectroscopy Devices to Fingerprint Commonly Used Construction Materials

R06-C: Using Infrared and High Speed Ground Penetrating Radar for Uniformity measurement on New HMA Layers

R06-D: NDT to identify Delimitations between HMA Layers

R06-E: Real-time Smoothness Measurement During PCC Pavement Construction

R06-F: Evaluation of Continuous Deflection Devices

Background: "The Curve"



Pavements in the USA



- The majority of interstate and primary system pavements in the USA were designed on the basis of a 20- to 25-year initial service life.
- ***WHY? Built for Connectivity!***
- Many have performed well for much longer, even with traffic volumes and loadings far exceeding design expectations – and now need to be rebuilt.
- ***R23: Rebuilt for Sustainability!***

Long-Life Pavements



- **Major Goal for FHWA for Decades!**
- **R23 Brings previously scattered information together in one place.**
- **R23 Meets the 3 E's**
 - **Good Engineering**
 - **Good Economics**
 - **Good Environmental Stewardship**
- **There are many technical requirements to properly evaluate the potential incorporation of existing materials into long-life pavement sections.**

R23 Benefits

Helps state DOTs make better decisions with regard to pavement renewal projects by using existing pavement as part of the design where appropriate. Departments of transportation, drivers, highway workers, contractors, and taxpayers will benefit from:

- **Time savings** based on rapid reuse of existing materials;
- **Cost savings** from reduced need for new pavement and a shorter construction phase;
- **Safety benefits** due to reduced exposure of travelers and construction workers to potential work zone hazards;
- **A better return on investment** for the public based on a longer pavement service life; and
- **Reduced environmental footprints**, based on decreased production of pavement.

R-23 Products

Product

Features



Pavement Guidelines Tool: Interactive Decision Matrix

A web-based application to provide access to products and facilitate use of decision matrix



Project Assessment Manual

A comprehensive guide to data collection and analyses needed for decision-making.



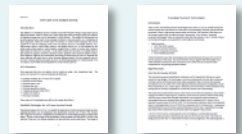
Best Practices: Flexible and Rigid

A key element to long lasting pavements; although, the concept of best practices is not new.



Guide Specifications

Specifications are seldom provided for research focus areas.



LCCA, Emerging Technologies

Not new, but packaged for straightforward use and knowledge gain.

R-23 Products: How it all fits together

	Assessment	Scoping	Design	PS&E
Pavement Guidelines Tool	✓ Interactive decision matrix for identifying and selecting pavement renewal strategies		Use Standard State Design Process (ie: AASHTO Pavement ME, PerRoad, StreetPave, etc.)	✓ access to resources
Project Assessment Manual	✓ Guidelines for data collection, testing, etc. required for assessment and scoping			
Best Practices: Flexible and Rigid		✓		✓
Guide Specifications				✓
LCCA, Emerging Technologies		✓		

Opening Screen from Interactive Software

SHRP 2 R23

Guidelines for Long Life Pavement Renewal

v1.0 beta



Introduction

Click to learn about this scoping tool. The tool provides a convenient method for inputting information about an existing pavement and scoping both flexible and rigid long life renewal options for that pavement.



Resources

Click to learn about content that aids the use of this scoping tool.



Start Program

Click to assess initial renewal options for existing pavement.

Screenshot of Web-Based Interactive Program

New Load Save Exit Print

Resources Help

Created: 2013-05-16

Updated: 2013-05-16

Example Stripping

1 Project Info
Description

2 Existing Section
Current State

3 Proposed Section
Proposed State

4 Section Distress
Current Distress

5 Renewal Options
Renewal

6 Selection Summary
Design

Renewal Design

Existing	Proposed	Recommended Design
		Renewal Type Flexible
		Design Period 40 years
		Design ESALs 42 million
		Subgrade MR 10,000 psi
		Pre-existing Pavement or Base Modulus 30000 psi
		Actions Remove and replace existing HMA because of stripping or other materials related distress then overlay with HMA. For stripping this may be limited to the striped layers and for top down cracking it will be limited to the top 2 inches of HMA.
		Pavement Removed 4"
		Existing Pavement 11"
		Estimated Total Design Thickness 12"
		New Pavement 7"
		Added Elevation 3"

Flexible Best Practices

Guide Specification

Back

Save

Agency Participation and Contribution

- Illinois Tollway Authority (ITA)
—Steven Gullien
- Michigan Department of Transportation (MDOT)
—Michael Eacker
- Minnesota Department of Transportation (MnDOT)
— Shongtao Dai
- Missouri Department of Transportation (MoDOT)
—John Donahue, William Stone
- Texas Department of Transportation (TxDOT)
— Magdy Mikhail
- Virginia Department of Transportation (VDOT)
—Trenton Clark, Alex Teklu
- Washington Department of Transportation (WsDOT)
—Jeff Uhlmeyer

R23 – Using Existing Pavements In-Place to Achieve Long Life

Objective of the Product (R23):

- Develop reliable procedures that identify when existing pavements can be used in place and the methods necessary to incorporate the original material into the new pavement structure while achieving long life.
- SHRP 2 has defined long-life pavements as those lasting in service for 50 years or longer without needing major rehabilitation.
- This effort concentrated on understanding the state of the art of rapid renewal approaches currently used, both nationally and internationally, to construct long-lived pavement for high-volume roadways.

R23 – Using Existing Pavements In-Place to Achieve Long Life



Draft Implementation Plan Highlights

Draft Strategic Goals



Goal 1: Support the adoption of R23 products to lower the cost and extend the life of highway pavements. 15 to 20 highway agencies have adopted the R23 tools by December 2016.

Goal 2: Establish a framework for using R23 products to increase the long-term system performance and meet MAP-21 and existing agency performance measures by December 2016.

5 Step Implementation Process



Step 1: Communication and Outreach

Step 2: Assessment of Agency Needs

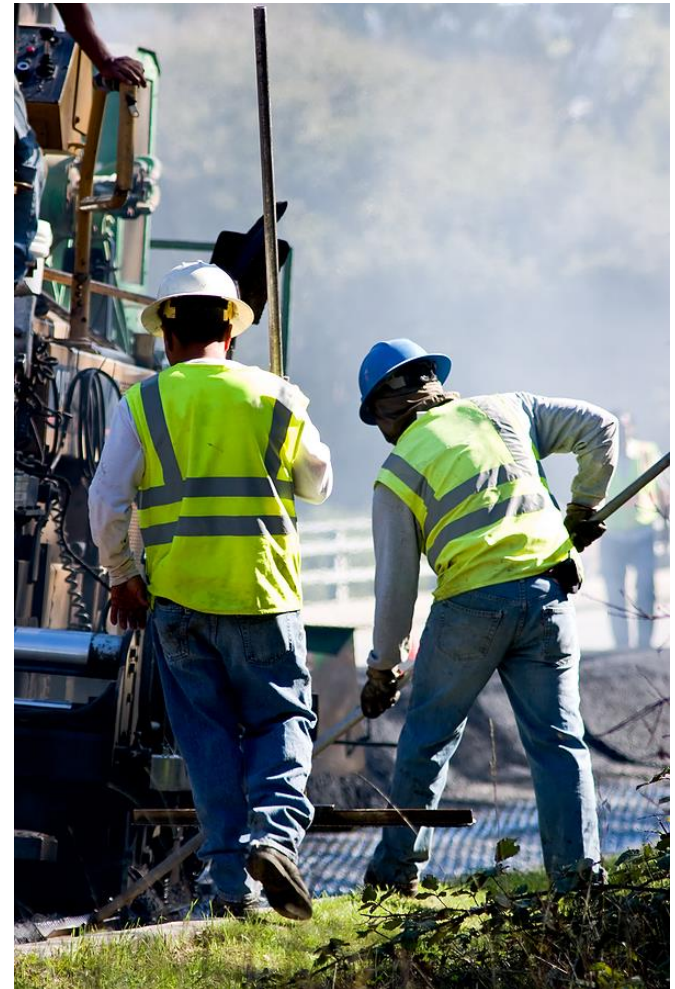
Step 3: Development of Agency Plans

Step 4: Targeted Usage

Step 5: Full Implementation

Approach May Vary with Product

- **There are 5 Products:**
 - Software Tool
 - Project Assessment Manual
 - Best Practices Manuals
 - Guide Specifications
 - LCCA and Emerging Technologies
- **Maturity may vary by:**
 - Agency
 - Industry
 - Product



How can you assist?

- **Carry the message back** to your meetings, Divisions, DOTs, colleagues and peers
- **Communication & encourage participation** in technical transfer opportunities
- **Encourage state participation** for the next round of implementation assistance
- **Volunteer** Deployment Support is always welcome



Questions?

SHRP2 R23: Using Existing Pavement in Place and Achieving Long Life

<http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2prepubR23Report.pdf>

<http://144.171.11.40/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=2174>

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