



U.S. Department of Transportation
Federal Highway Administration

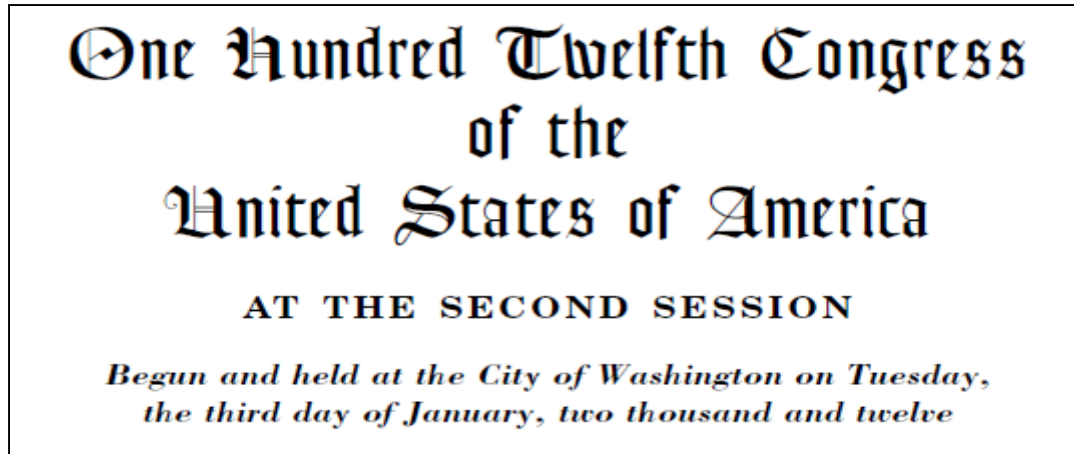
FHWA UPDATE

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*FHWA Office of Asset Management, Pavements, and
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Moving Ahead for Progress in the 21st Century (MAP-21)



- "...promote, implement, deploy, demonstrate, showcase, innovate pavement technologies, practices, performance, and benefits."
- "The goals of the accelerated implementation and deployment of pavement technologies program shall include –

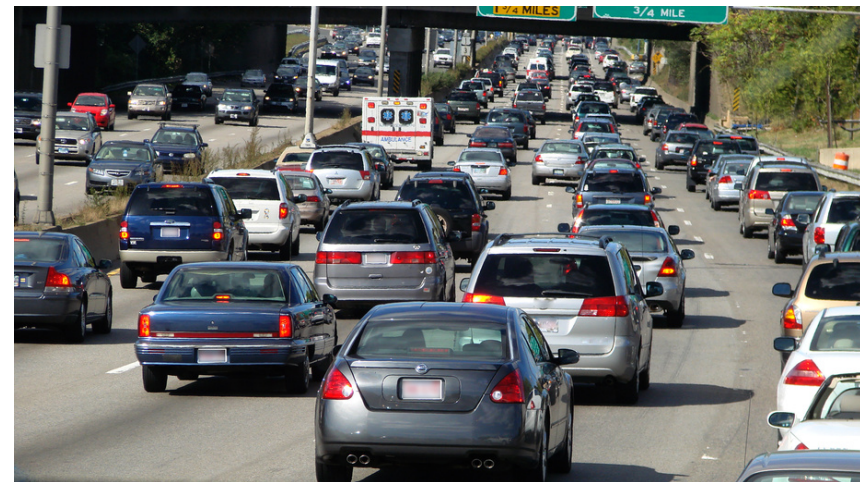
Goals of MAP-21 Pavement Implementation & Deployment

- Cost-effective design, materials, recycled materials, and practice to extend pavement life
- Reduce initial cost and life-cycle cost of pavements accelerated construction
- Design criteria and specs for practices, products, materials
- Technology transfer



FHWA Pavement Program Areas

- Pavement Design and Analysis
- **Materials**
 - Performance Concrete Mixtures
- Quality Assurance
- **Construction**
 - Concrete Overlays
- Technical Capacity
- **Sustainability**



Performance Concrete Mixtures

- Develop draft through the FHWA-CP Tech Center Cooperative Agreement
- Implement the adoption of performance engineered concrete mixtures.
 - 2 years: Develop a draft AASHTO (provisional) specification
 - 4 years: Parallel testing with States using draft specification
 - 6 years: AASHTO ballots provisional specification for performance engineered concrete mixtures

Outcome from First ETG Meeting

HARDENED CONCRETE	PLASTIC CONCRETE (Agency)	PREQUALIFICATION	
		Agency	Contractor
1. Mechanical properties: modulus, abrasion	Identity properties 1. Unit weight	Evaluation → →	← ← Design
2. Freeze/thaw	2. Air properties	All ingredients MRD	Compatibility
3. Permeability	3. Water ratio	Mixtures	Aggregate system
4. Volume change	4. Workability placeability paveability		Mixture properties
			Quality Plan

Concrete Overlays

- Through the FHWA-CP Tech Cooperative Agreement establish a comprehensive concrete overlays program.
 - Technical assistance
 - Planning, design, construction
 - Specifications
 - Synthesis of Performance
 - Training



Sustainability

- FHWA Sustainable Pavements Program
 - Sustainable Pavements Reference Manual
- Use phase most controversial
 - Roughness and macrotexture
 - Tire-pavement noise
 - Stormwater runoff
 - Pavement thermal performance (urban heat island)
 - safety
- Publication anticipated Fall 2014
- Training through webinars and workshop at 2015 TRB

TOWARDS SUSTAINABLE PAVEMENT SYSTEMS A REFERENCE DOCUMENT

Draft Final Report



Prepared Under:
Task Order DTFH61-10-D-00042-T-12001



Federal Highway Administration

Office of Asset Management
1200 New Jersey Avenue, SE
Washington, DC 20590

February 2014

Life Cycle Assessment (LCA)



- Life Cycle Cost Analysis (LCCA)
 - Evaluation of the total economic worth of a usable project segment
 - FHWA RealCost
- Sustainability Rating Systems
 - List of sustainability best practices with an associated common metric
 - FHWA INVEST, Greenroads, Envision, GreenLITES, LEED
- **Life Cycle Assessment (LCA)**
 - **Quantifies environmental impact over the full life cycle of a product or system**

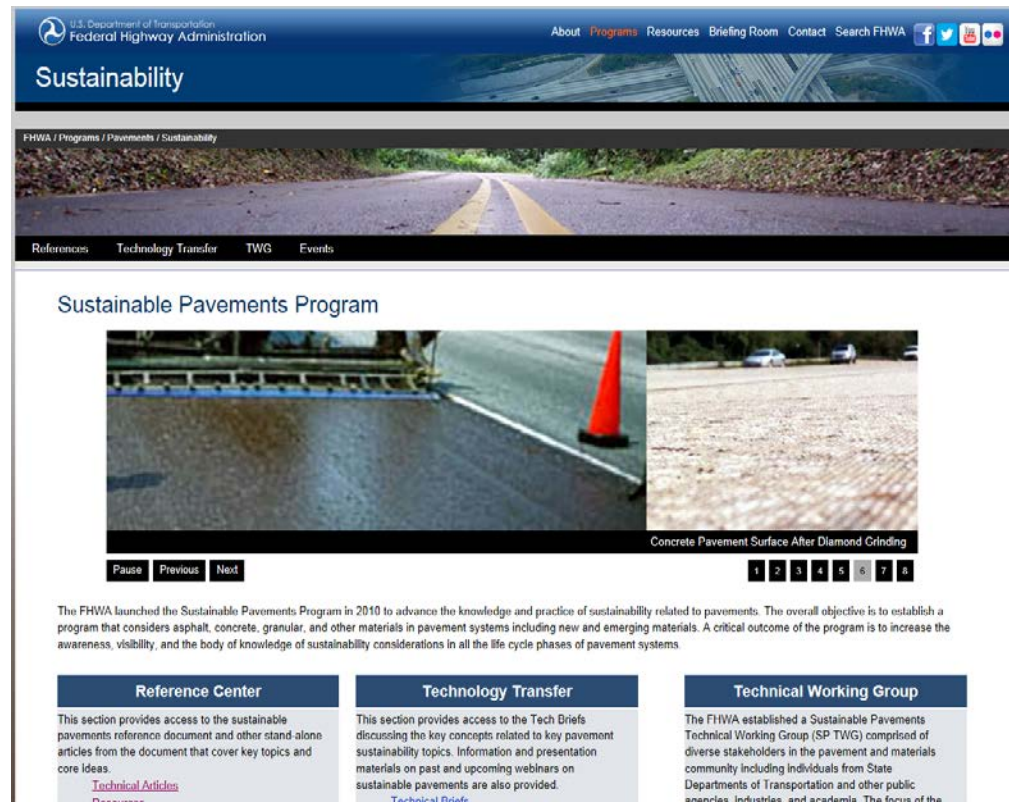
Sustainability Technology Transfer

- Tech Briefs

- “Pavement Sustainability”
- “Life Cycle Assessment”
- “Climate Change and Pavements”
- “Asphalt Pavement Sustainability”
- “Concrete Pavement Sustainability”

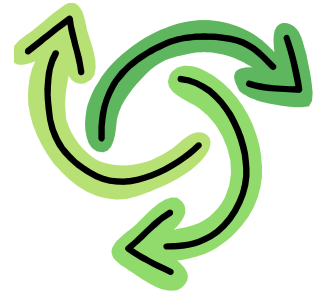
- Updated Website

- Reference Center



<http://www.fhwa.dot.gov/pavement/sustainability/>

Advancing Concrete Recycling



- Advance the use of recycling in concrete pavement through the FHWA-CP Tech Center Cooperative Agreement
- Re-establish the Concrete Recycling ETG
- Expand the RCA Deployment Plan
 - Broader than the use of RCA in concrete pavement
- Tech Briefs

Goal is to increase the use of recycled materials into concrete pavement

SHRP2 Update – Concrete Pavement Products



SHRP2 Implementation Assistance

Round 4



Renewal:

- **R05: Precast Concrete Pavement**
- R06A: Nondestructive Testing Technologies to Identify Bridge Deck Deterioration
- R06C: Using IR and GPR for Uniformity Measurements on New HMA Layers
- **R06E: Tools to Improve PCC Pavement Smoothness During Construction**
- R06G: Mapping Defects in or Behind Tunnel Linings
- R09: Managing Risk in Rapid Renewal
- R10: Innovative Strategies for Managing Complex Projects
- R19A: Designing & Preserving Bridges to Achieve a 100-Year Service Life
- **R21: New Composite Pavement Systems**

R06E



Capacity:

- C03/C11: Economic Analysis Tools
- C10: Integrated Travel Demand Modeling

R21



Reliability:

- L02/05/08: Reliability Data and Analysis



Safety:

- Concepts to Countermeasure – Research to Deployment Using the SHRP2 Safety Database

Real-Time Smoothness Measurements on PCC Pavements (R06E)

BENEFITS:

- SHRP2 Solution provides real-time information for process control of smoothness
- Allows for immediate adjustments to equipment and operations
- Minimizes pavement grinding and remediation
- Better quality control
- Potentially better long-term performance

PRODUCTS:

- Equipment loan field trials (showcase at 1)
- Workshops
- Model Specifications
- Case studies
- Synthesis of contractor experience



R06E



Non-Destructive Testing Tools

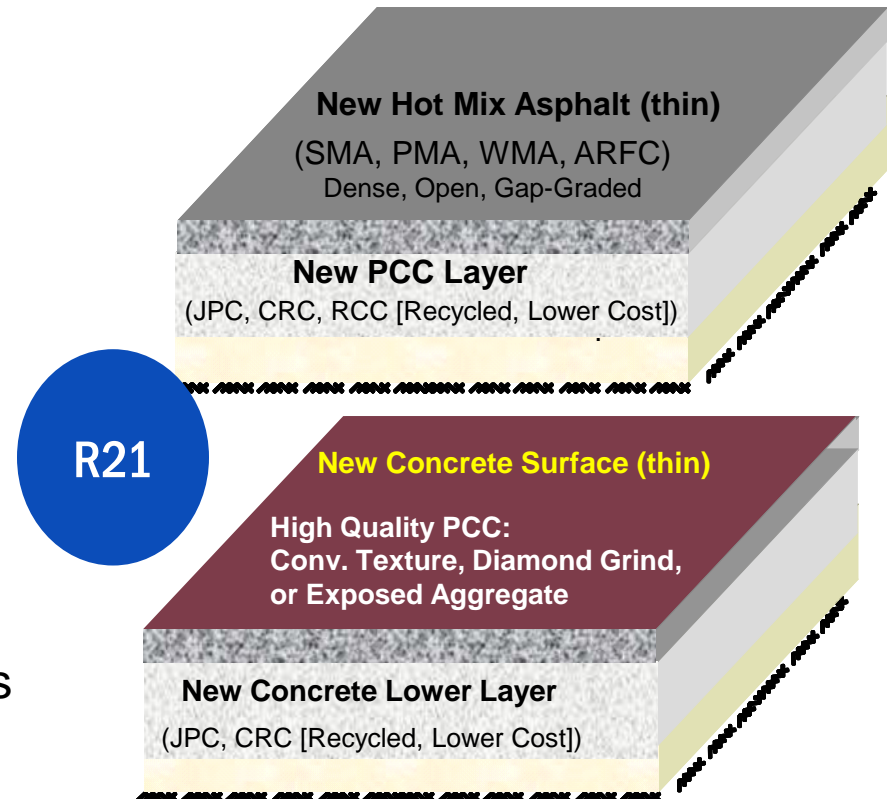
New Composite Pavement Systems (R21)

- 1. HMA/PCC (New-Hot Mix Asphalt over New Concrete)**
- 2. PCC/PCC (New Concrete over New Concrete)**

BENEFITS:

- Provides long-life with excellent surface characteristics, but also allows for repaid renewal when needed.
- Economical, sustainable pavement structures that use can use recycled materials or locally available materials.

PRODUCTS: Up-to-date design & technical guidelines to greatly advance the state of practice. Includes detailed recommendations for DARWIN-ME design guide.



New Composite Pavement Systems (R21)

Two (2) Lead Adopter Incentives announced:

- TN DOT
 - \$180k direct funding to offset additional cost to pilot 2-lift concrete
 - Construction planned in Fall 2014
- TX DOT
 - Up to \$300k direct funding to offset cost of to pilot 2-lift concrete
 - Construction proposed sometime in 2015

Technical Assistance:

- AP Tech contracted to provide support (technical assistance, training (4-hr workshops), peer exchange, organize a showcase, documentation of results, facilitate user group conf. calls, marketing & outreach)
- Contract supports up to 5 agencies
- **If more agencies are interested in technical support to include the workshop**, contact Kurt Smith with AP Tech; or Tom Yu or Steve Cooper with FHWA

Precast Concrete Pavement (R05)

Report - “Precast Concrete Pavement Technology”

http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2_S2-R05-RR-1.pdf

- Products from Project R05
 - Guidelines for PCP design, fabrication, & installation;
 - Guidelines for project selection;
 - Guidelines for PCP system acceptance;
 - Findings from field testing of 15 PCP projects in US;
 - Model Specifications/Jointed & Prestressed PCP Systems:

<http://www.trb.org/StrategicHighwayResearchProgram2SHRP2/Pages/R05-Model-Specifications-718.aspx>

Precast Concrete Pavement (R05) - Round 3 Implementation Assistance Program

- 5 Lead Adopters with funding & technical assistance:
 - Hawaii
 - Illinois Tollway
 - Kansas
 - Texas
 - Wisconsin
- 10 Agencies offered technical assistance:
 - Alabama
 - California
 - District of Columbia
 - Louisiana
 - Maryland
 - Michigan
 - Missouri
 - New Jersey
 - New Mexico - Pueblo of Tesuque
 - Utah

Precast Concrete Pavement (R05)

Technical Assistance

- 1-day best practices workshop
 - Hawaii, Nevada, Alabama (delivered)
 - Florida (scheduled in late September)
- Technical briefings
 - Senior agency management
 - At regional meetings
- Technical review – project plans & specifications
- New application/system open houses
- Precast concrete pavement databases (PCI & NPCA)
- Webinars (TRB webinars – October 8 & 20, 2014)
- TRB sessions (two sessions at Jan. 2015 annual meeting)
- For more information contact Sam Tyson with FHWA

The Look Ahead – SHRP 2 Round 5



RENEWAL

- 3D Utility Location Data Repository (R01A)
- Performance Specifications for Rapid Renewal (R07)
- Railroad-DOT Mitigation Strategies (R16)
- Service Limit State Design for Bridges (R19B)

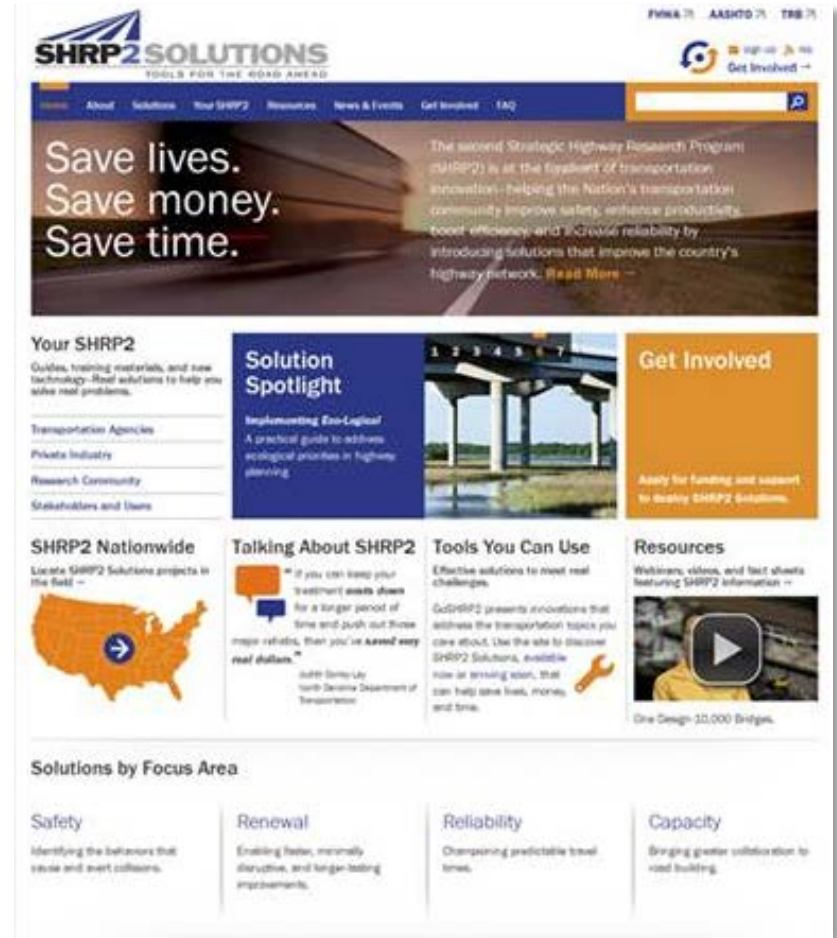


CAPACITY

- Capacity Process Bundle (C02/08/09/12/15)

Round 5 Application Timeline

- Round 5 Application Period
Jan 16-Feb 13, 2014
- Announcement Webinars
Planned for Dec 2014
- More information and
apply online at
www.fhwa.dot.gov/goshrp2



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