

Federal Perspectives on CIR



U.S. Department of
Transportation

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U.S. Department of Transportation
Federal Highway Administration

Overview Agenda



- **Cold In-place Recycling (CIR)**

Proven Tool in both Preservation and Recycling Toolboxes

- **FHWA Recycled Materials Policy Overview**

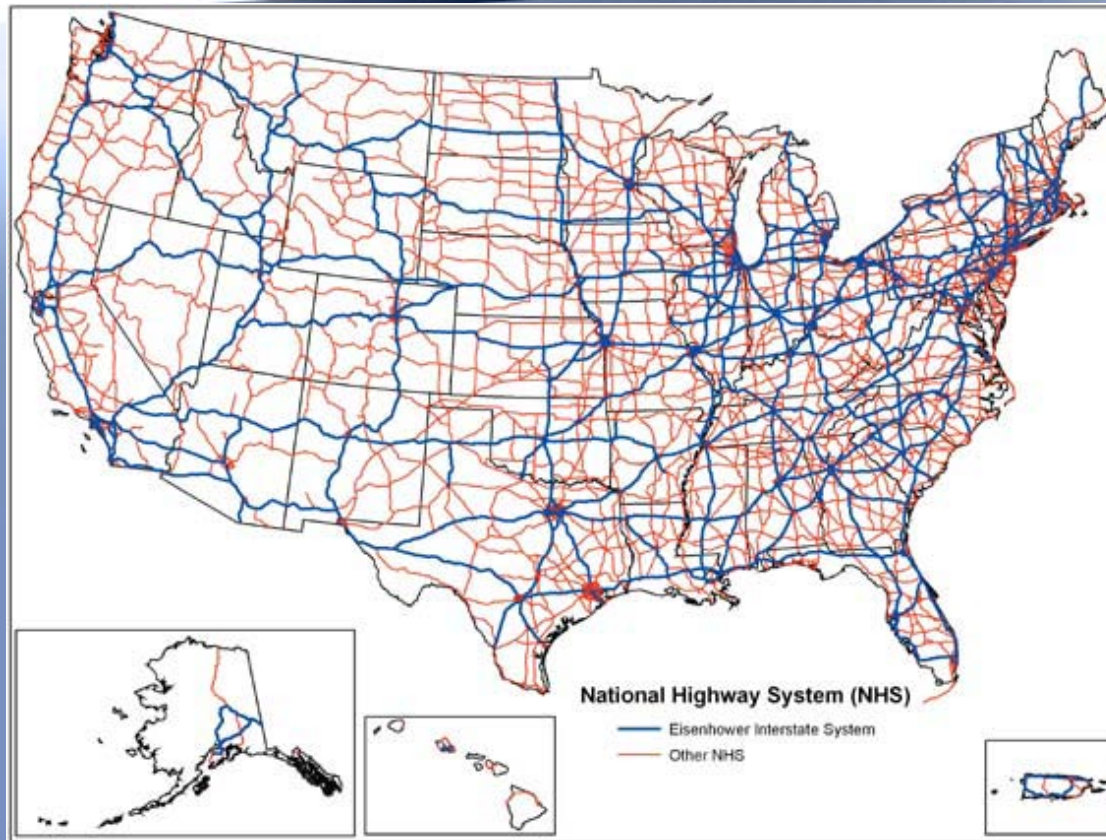
FHWA's "3 E's"

- **FHWA's INVEST Tool**

- **Partners, Additional Resources**

4 Million Miles of Roads

600,000 Bridges



160,000 mile National Highway System



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Statistics We Should Know:

Federal = 3%

State = 20%

Local = 77%

2/3 are Paved (1/3 Unpaved)

94% of Paved have an Asphalt Surface

EPA Mantra



- **REDUCE**

- Consume Less If Possible.

- **RECYCLE**

- Reuse Previously Produced Materials.

- **REUSE**

- Incorporate Materials Used in Other Manufacturing Processes Into the Work.

Why Recycle?



- **Reduce project costs**
- **Conserve materials**
- **High quality aggregates unavailable**
- **Dwindling landfill space**
- **Increased disposal cost**

PAVEMENT RELATED RECYCLING / REUSE TECHNOLOGIES



- **RECYCLING APPLICATIONS**
 - Reclaimed Asphalt Pavement (RAP)
 - Recycled Concrete Aggregate (RCA)
 - **In-Place Recycling**
- **REUSE APPLICATIONS**
 - FLY ASH / COAL ASH
 - TIRE RUBBER
 - SHINGLES (RAS)
 - SLAG
 - FOUNDRY SAND
- **Warm-Mix Asphalt**



Preservation Activities - Examples



Asphalt:

- Crack Sealing
- Fog Seals
- Slurry Seals
- Chip Seals
- Micro-Surfacing
- Thin Overlays
- **Cold In-Place Recycling**
- Hot In-Place Recycling

PCC:

- Joint Resealing
- Crack Sealing
- Spall Repair
- Dowel Bar Retrofit
- Full and Partial Depth Repair
- Diamond Grinding



Cold In-Place Recycling



Description

Milling, rejuvenating, and replacement of the top portion of the HMA surface (performed without heat)



Purpose

- Rework HMA to depth of 2 – 4 inches.
- Correct surface distresses.
- Improve profile, crown, and cross-slope.

FHWA / ARRA WORKSHOPS

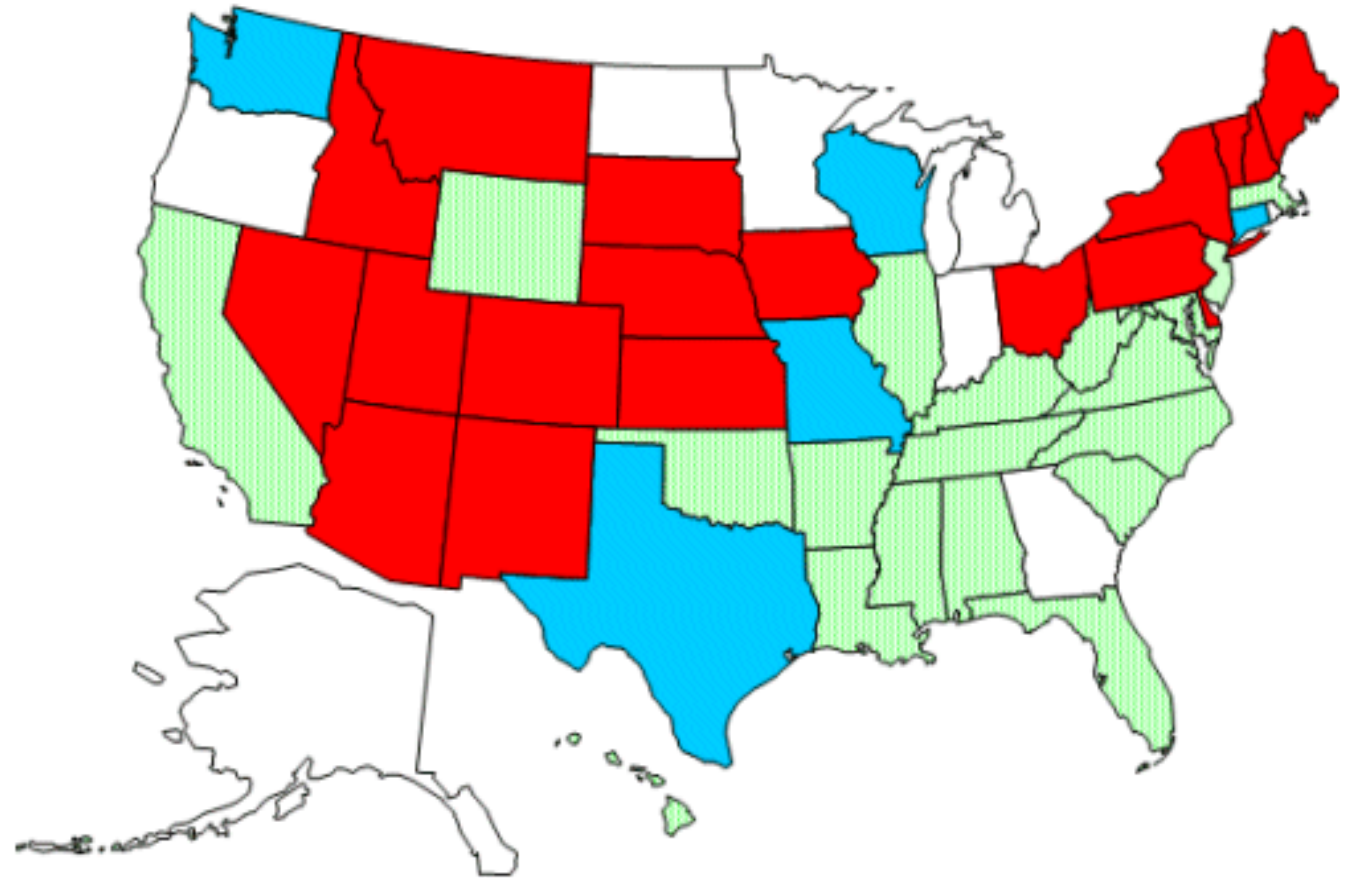


- 2008 – Salt Lake City, UT
- 2009 – Minneapolis, MN
- 2010 – Hersey, PA
- 2011 – Atlanta, GA

<http://www.pavementpreservation.org/conferences/regional-in-place-recycling-conferences/>

Cold In-place Recycling (CIR)

States Use of CIR



- Red - Use 4+ projects
- Blue - Low use - limited
- Green - No Use
- White - no response

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FHWA Policy - 2002



- **Recycled/Re-Use materials are viable resources**
- **Recycled materials should get 1st consideration**
- **Consider use of recycled materials early in the planning/design process**
- **Economic benefits should be considered in the material selection process**
- **Restricting the use of materials should be technically based**
- **Material should not adversely impact the environment and should perform as intended**

FHWA's "3 E's"



- **ENGINEERING**

- Use Good Engineering Design to Assure Long-Life Pavements.

- **ECONOMICS**

- Use Life-Cycle Cost Analysis for Project Selection.

- **ENVIRONMENT**

- Consider Recycling First
- Be Good Stewards of the Environment





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Sustainable Highways Self-Evaluation Tool

Home

Learn

Browse

Score



Welcome!

FHWA Sustainable Highways Self-Evaluation Tool

The Sustainable Highways Self-Evaluation Tool identifies characteristics of sustainable highways and provides procedures and techniques to help agencies and organizations apply and integrate sustainability best practices into highway and other roadway projects and programs within system planning, project development, and operations and maintenance. While the words "highway" and "roadway" are both used in this tool, the FHWA Sustainable Highways Self-Evaluations Tool is designed to be applied to all roadway projects, not just highways.

What do you want to do?

Learn

A guided tour through this website to learn about sustainable highways and integrating sustainability best practices into Systems Planning, Project Development and Operations & Maintenance.



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Key Websites – 1/2



- **FHWA Pavement Recycling –**
<http://www.fhwa.dot.gov/pavement/recycling/index.cfm>
- **FHWA INVEST Tool: “Infrastructure Voluntary Evaluation Sustainability Tool”**
<http://www.sustainablehighways.org/>
- **Asphalt Recycling and Reclaiming Association**
<http://www.arra.org>
- **Pavement Recycling and Reclaiming Center**
<http://prrcenter.org> (Cal Poly Pomona)

Key Websites – 2/2



- **FHWA Every Day Counts Warm Mix Asphalt**
<http://www.fhwa.dot.gov/everydaycounts/technology/asphalt>
- **Recycled Materials Resource Center -**
<http://www.recycledmaterials.org>
- **Green Highways Partnership**
<http://www.greenhighways.org>
- **USEPA Resource Conservation Challenge –**
<http://www.epa.gov/osw/consERVE/rrr/imr/index.htm>

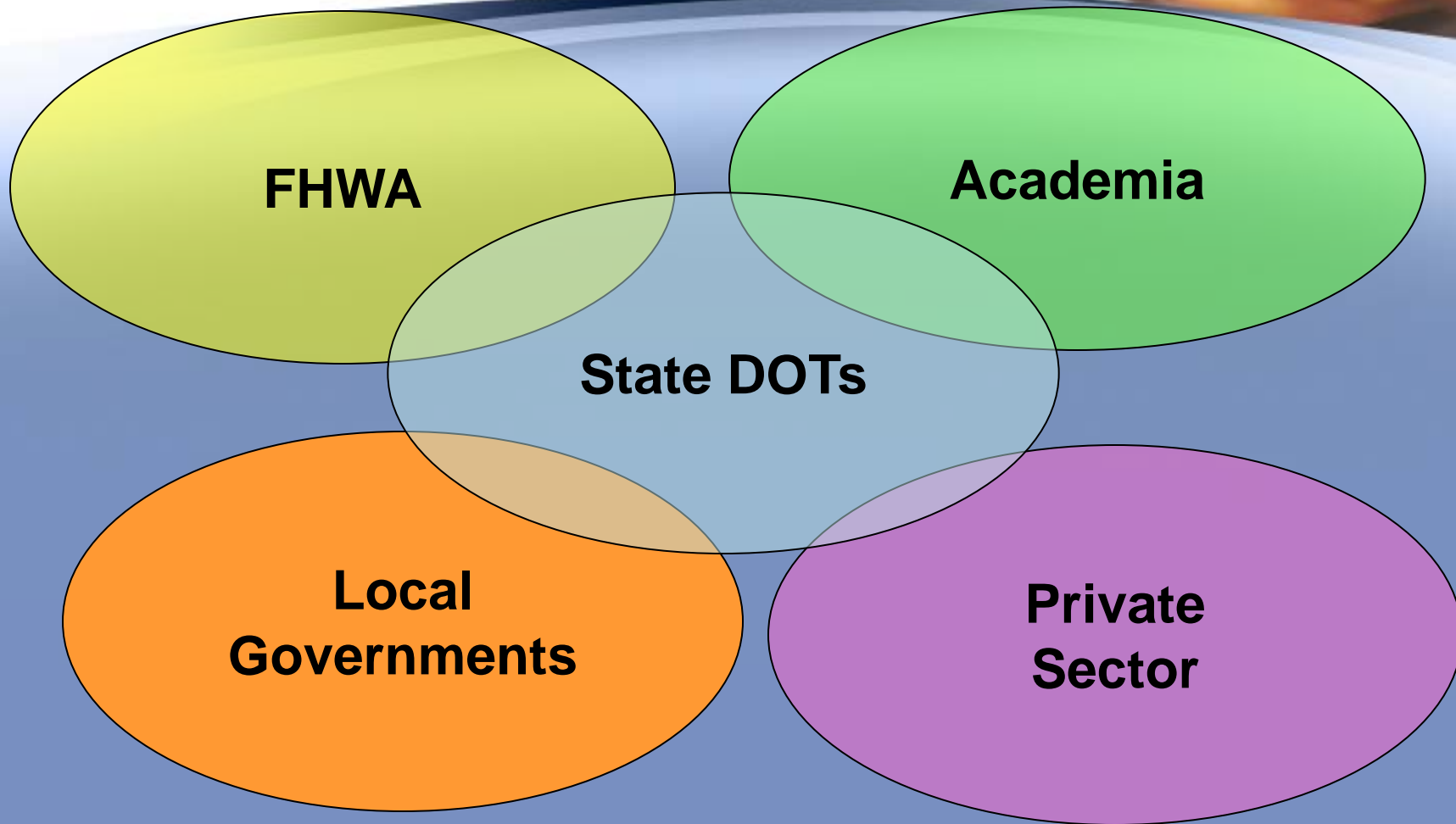
Many Ways of Going Green:



- Recycled Materials (RAP, RAS)
- Warm-Mix Asphalt (WMA)
- In-Place Recycling (CIR, HIR, FDR)
- Reuse of Industrial By-Products
 - Foundry Sands
 - Fly Ash
 - Slag
 - Tire Recycling
- Long-Life Pavements <Reduce Materials>
- Pavement Preservation <Reduce>
- Permeable Pavements
- Sustainability Measures



Partnerships Are Required



Partnerships are Required



- **1 FHWA**
- **52 State DOTs (including DC and PR)**
- **3,034 County governments;**
- **35,933 Municipal, Town and Township governments.**
- **4,140 Colleges and Universities**
- **_____ contractors/industry reps.**

FHWA Supports Pavement Recycling!



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It's Good to be GREEN!



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THANK YOU!



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