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# **Update on ARRA Activities & BARM II**

**2015 Rocky Mountain West  
Pavement Preservation Partnership Meeting  
Bozeman, Montana**

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Technical Director  
Asphalt Recycling & Reclaiming  
Association**

# *Asphalt Recycling & Reclaiming Association [www.ARRA.org](http://www.ARRA.org)*

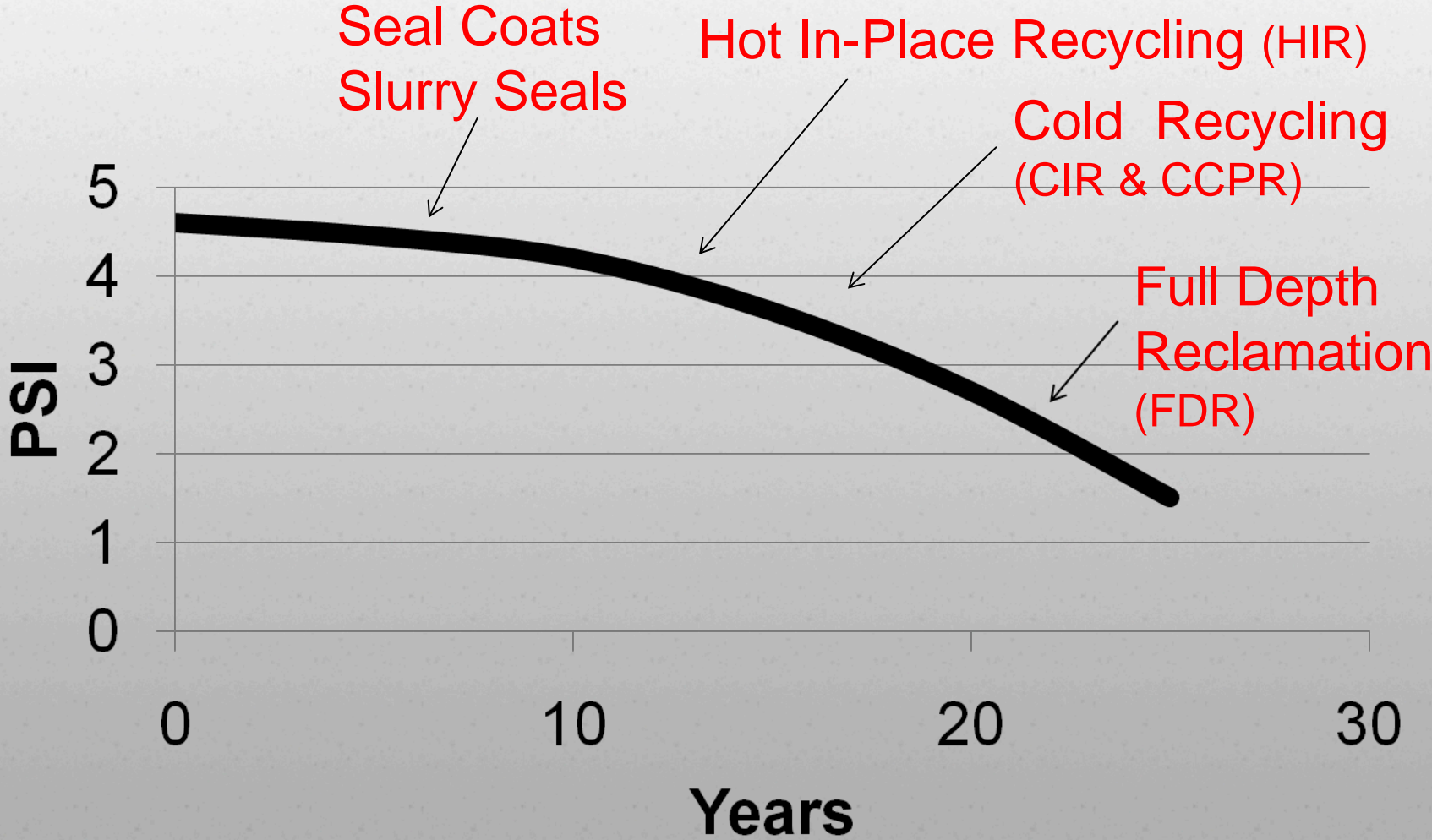
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## ▶ **Industry Segments**

- **Cold Planing**
- **Hot In-Place Recycling**
- **Cold Recycling**
  - **CIR & CCPR**
- **Full Depth Reclamation**
- **Soil Stabilization**



# Pavement Management



# Recycling & Reclaiming Strategies

| M&R            | Strategy           | Method | CP | HIR | CR | FDR |
|----------------|--------------------|--------|----|-----|----|-----|
| Construction   | New                |        |    |     |    |     |
|                | Reconstruction     |        | X  |     |    | X   |
| Rehabilitation | Major              |        | X  |     | X* | X   |
|                | Structural Overlay |        | X  | X*  | X* | X*  |
| Maintenance    | Minor              | PP     | X  | X   | X  |     |
|                | Preventative       |        | X  | X   | X  |     |
|                | Routine            |        | X  |     |    |     |
|                | Corrective         |        | X  | X   | X  |     |
|                | Catastrophic       |        | X  |     |    |     |

\*With HMA Overlay

PP = Pavement Preservation

# *In-Place Recycling*

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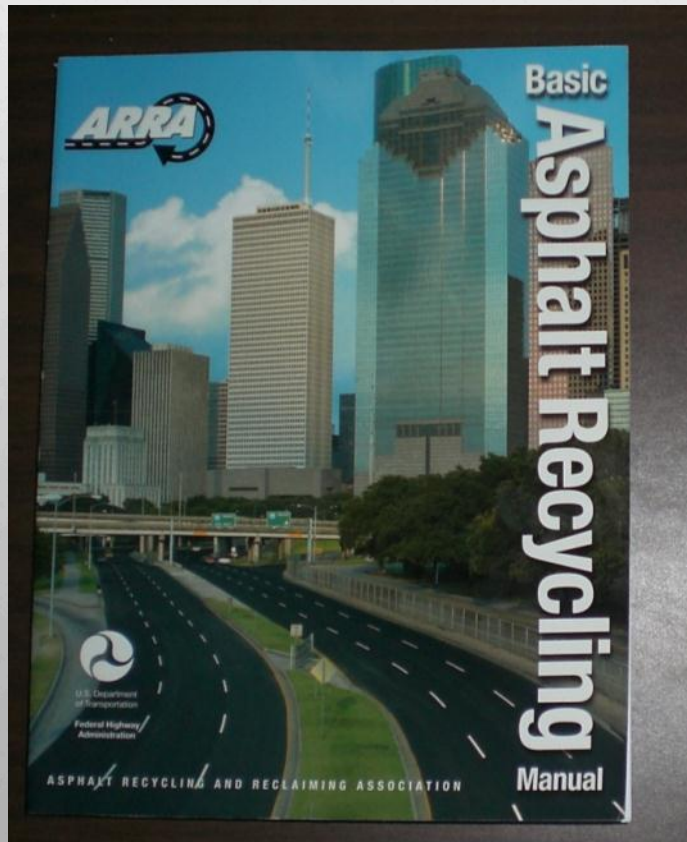
- ▶ **20-50% cost savings compared to conventional M&R techniques**
- ▶ **Environmentally Friendly**
  - Reuse existing materials
  - Reduced binder consumption
  - Reduced trucking
  - 30-80% reduction green house gases



# *Basic Asphalt Recycling Manual*

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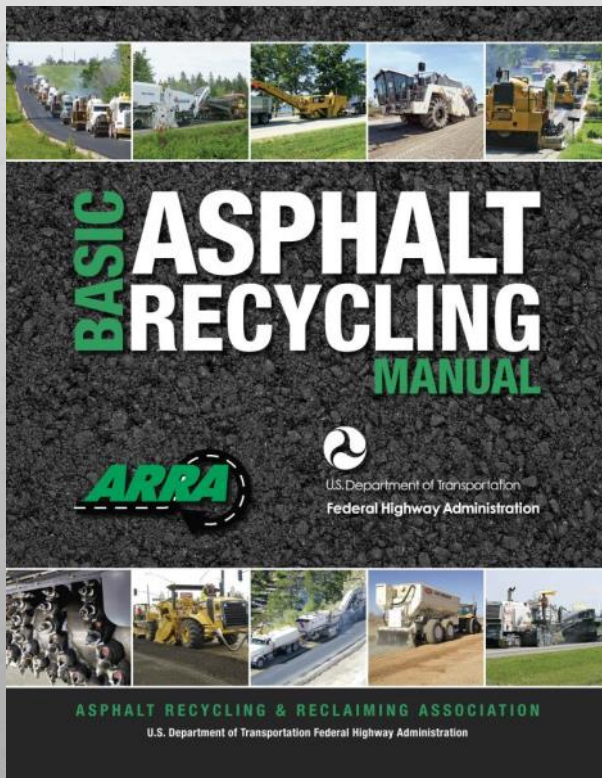
1st Edition



- ▶ **Published in 2001**
- ▶ **Served industry well over past 14 years**
- ▶ **Numerous innovations and improvements in**
  - **Equipment**
  - **Materials**
  - **Methods**
- ▶ **Time for a complete rewrite of the original document**

# BARM II

- ▶ **Completely rewritten**
- ▶ **All new color photos (117)**



- ▶ **Divided 6 Parts**
  - Introduction
  - Cold Planing
  - Hot In-place Recycling
  - Cold Recycling
  - Full Depth Reclamation
  - Appendix



# ***BARM II***

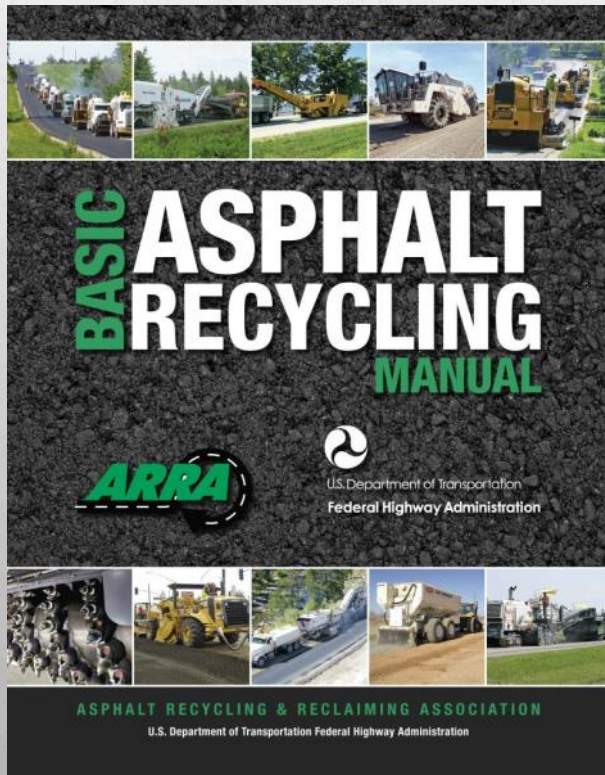


- ▶ **Part 2: Cold Planing**
- ▶ **2 Chapters**
  - **Cold Planing Construction**
  - **Cold Planing Specifications**





# BARM II



- ▶ **Parts 3-5 on HIR, CR & FDR - Chapters on:**
  - **Detailed Project Analysis**
  - **Mix Design**
  - **Construction**
  - **Project Specifications and Inspection**

# Part 3: Hot In-place Recycling

## Chapters 6-9



Surface Recycling



Remixing



Repaving





# Part 4: Cold Recycling

## Chapters 10-13

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Cold In-place (CIR)



Cold Central Plant (CCPR)



# Part 5: Full Depth Reclamation Chapters 14-17

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Pulverization & Mechanical

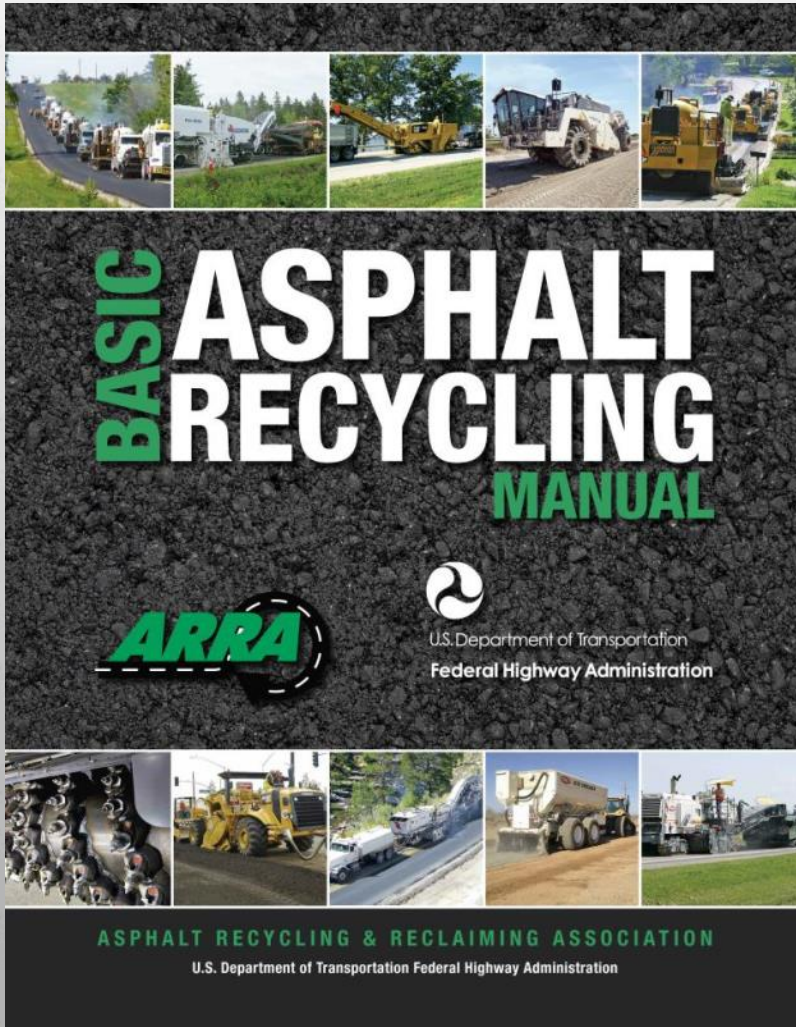
Cementitious



Bituminous



# BARM II



- ▶ Available from ARRA members
- ▶ Available on ARRA website under “Shop”
- ▶ Available ARRA booth

# *ARRA Best Practice Guidelines*

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- ▶ **100 Series - Recommended Construction Guidelines**
- ▶ **200 Series - Recommended Mix Design Guidelines**
- ▶ **300 Series - Recommended Quality Control Sampling and Testing Guidelines**
- ▶ **400 Series – Recommended Project Selection Guidelines**

# Guidelines may be downloaded at [www.arra.org](http://www.arra.org) under the resources and Guidelines tabs.

The screenshot shows the ARRA website homepage. At the top left is the ARRA logo. To the right are social media icons for Facebook and Twitter, and a 'Member Login' link. A dark navigation bar contains the following menu items: HOME (highlighted in green), ABOUT US, MEETINGS, RESOURCES, MEMBERS, JOIN, SHOP, and CONTACT. A vertical dropdown menu is open under 'RESOURCES', listing: THE ARRA SEMINAR KIT, INDUSTRY ARTICLES – ONLINE, INDUSTRY MAGAZINE ARTICLES, INDUSTRY SEGMENTS, INDUSTRY TRAINING COURSES, LINKS, NEWSLETTERS, POCKET GUIDES, **GUIDELINES** (highlighted in green), and PRESS RELEASES. Below the navigation bar, there are three main content areas. The left area features a photo of a white tanker truck in a field and text about asphalt recycling. The middle area features a photo of a white tanker truck in a field and text about promoting methodologies. The right area features a photo of a crowd at a trade show and a logo for 'World of Asphalt 2015 SHOW & CONFERENCE VISIT US AT BOOTH 3604'. Below that is a banner for 'PPRA 2015 FALL MEETING NIAGARA FALLS, ON, CANADA OCT 13 - 15, 2015' with a 'CLICK HERE FOR DETAILS' button. At the bottom, there is a section for 'ARRA 2014 NEWSLETTER ADVERTISERS' with logos for BLS and CATERPILLAR. A 'SAVE THE DATE' section is partially visible at the bottom left.



# *TC3 Training Resources*

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- ▶ ***TCCC Inspector Training for Cold In-Place Recycling (CIR) Web Based***  
**FHWA-NHI-134114 – [www.tccc.gov](http://www.tccc.gov)**
- ▶ **HIR Class: Just finished review of final draft, should be available soon.**
- ▶ **FDR class: Review of first draft due next week. Should be available first of next year.**



# Additional Training Classes

## ▶ Asphalt Pavement In-Place Recycling Techniques (NHI 131050)

- Two brief web-based training modules
- Two days classroom instruction

**Is asphalt in-place recycling the right choice for your next low-, medium-, or high-volume roadway project?**

Learn more about this viable treatment method by hosting or attending a training session!

**Asphalt Pavement In-place Recycling Techniques (NHI 131050)**



All photos credit Virginia Department of Transportation

**Did you know that ANY organization can request to host this training?**

Whether you represent a Federal, State, or local transportation agency, contractor, or industry group, you can host this course! Get a more robust understanding of how to select the right project and use the right methods for successful in-place recycling. NHI 131050 Asphalt In-place Recycling Techniques is a highly engaging and interactive course; you'll explore current technologies by participating in small and large group activities.

Two brief Web-based training modules introduce recycling methods, typical equipment, and appropriate types of distress to treat with the techniques. Then a qualified FHWA instructor facilitates a two-day classroom course that helps you focus on the environmental stewardship, economic savings, and engineering benefits of recycling techniques and prepares you to help your agency select techniques and identify key construction specification requirements.

**TARGET AUDIENCE:**

The course is particularly suited to State and local transportation agency personnel who are responsible for selecting and designing asphalt in-place recycling projects, writing effective specifications, or inspecting projects during their construction. Contractors, consulting engineers, and industry representatives involved in in-place recycling also benefit from this course.



NHI is accredited by the International Association for Continuing Education and Training (IACET) to offer CEUs. NHI is accredited by IACET to offer 1.3 CEUs for this program.

If you have questions about this NHI training, please contact NHI at [nhicustomerservice@dot.gov](mailto:nhicustomerservice@dot.gov) or 877.558.6873.



# Additional Training Classes

- ▶ **ARRA Cold Milling & In-Place Recycling Workshops**
  - **One day classroom workshops**
  - **Delivered to your agency**
  - **Cover 1 or all 4 ARRA disciplines**

The Asphalt Recycling & Reclaiming Association's

## **Cold Milling & In-Place Recycling Workshops**



Need additional information on In-Place Recycling? Have a limited travel budget or unable to cross state lines for training? ARRA is developing a series of 1-day workshops that we can bring to your agency focusing on:

- Cold Planing
- Hot In-Place Recycling
- Cold Recycling (Both in-place and central plant)
- Full Depth Reclamation

These Workshops can be tailored to meet your specific needs and can cover all, a portion, or an individual ARRA discipline. Course content for the in-place recycling disciplines will cover:

1. Overview of the discipline or disciplines
2. Project selection criteria
3. Mix design procedures
4. Pavement/Thickness design procedures
5. Construction best practices
6. Quality Assurance and Specifications



Workshop content is based on the Second Edition of ARRA's *Basic Asphalt Recycling Manual* and ARRA's *Best Practice Guidelines*, which were developed with input from FHWA.

To learn more or to schedule a Workshop contact:

*Stephen A. Cross, PhD, PE*  
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405.334.3243  
[steve.cross@okstate.edu](mailto:steve.cross@okstate.edu)

# *Current Research*

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- ▶ **2016 TRB Sunday Workshops**
  - **Full Depth Reclamation**
  - **Cold Recycling**
- ▶ **NCHRP 9-51 Study**
  - **Dynamic modulus**
  - **Flow number**
- ▶ **NCAT test sections**
- ▶ **Virginia I-81 Study**



# *Needed Research*

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- ▶ **Documentation of performance**
- ▶ **Field test to determine adequate initial curing**
- ▶ **Better quality control tests and testing protocols**



# Thank You

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