



# Overview of NHI's New Training Course: Asphalt Pavement In-Place Recycling Techniques

**Midwestern States Regional In-Place Recycling**

Schaumburg IL

September 10, 2013

Presented by

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**Federal Highway Administration**

# Asphalt Pavement In-Place Recycling Techniques

## FHWA-NHI-131050



# Course Development

- Maintained the 2-day course length
- Completed in 2012
- Cooperative relationship between:
  - NHI
  - Applied Pavement Technology, Inc.
  - Industry (primarily ARRA)
  - Several State DOTs
- Pilot course hosted by MoDOT

# Purpose of Course

- Encourage the use of in-place recycling techniques
- Improve technology transfer regarding:
  - Pavement evaluation
  - Project selection
  - Pavement and mix designs
  - Construction details
- Help participants overcome barriers to implementation

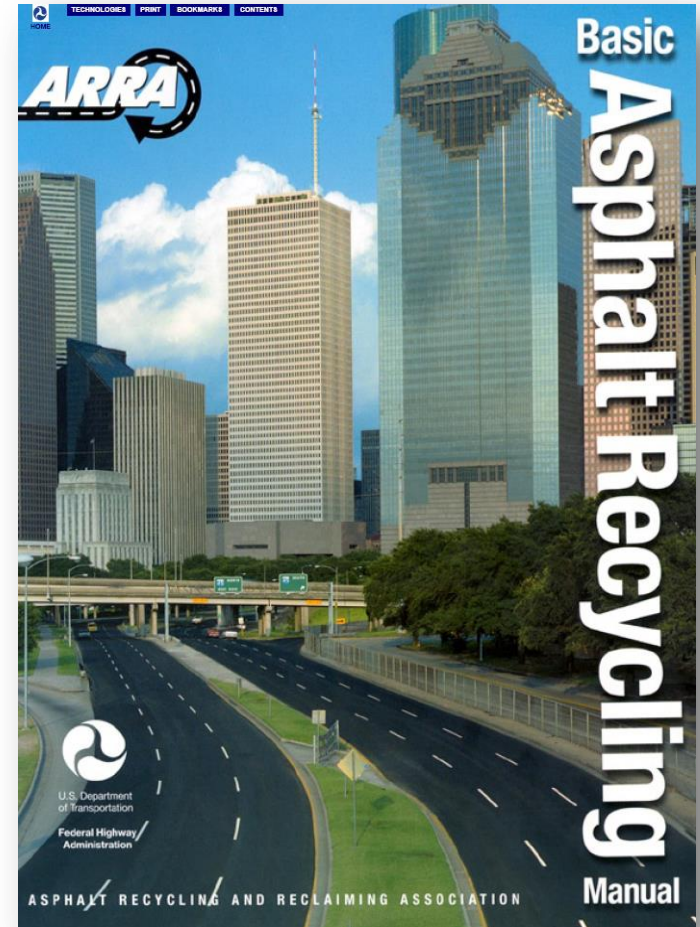
# Adult Learning Concepts

- Instructor-led training
- Designed interaction
- Variety of hands-on workshops
- Individual and group activities
- Pop quizzes



# Basis of Course

- *Basic Asphalt Recycling Manual (BARM)*
- NCHRP Synthesis 421, *Recycling and Reclamation of Asphalt Pavements Using In-Place Methods* (2011)



# In-Place Recycling Techniques Covered

- Hot In-Place Recycling (HIR)
- Cold In-Place Recycling (CIR)
- Full-Depth Reclamation (FDR)



# Course

## Learning Outcomes

Describe the **3Es** of recycling

Identify key factors contributing to the **selection** of the appropriate in-place recycling techniques

Identify key requirements for developing effective in-place recycling **specifications**

Demonstrate how to **select new materials and additives**

List steps to address **constructability** issues



# Course Organization

- Independent Study (IS) Modules
  - Pre-requisite taken prior to attending course
  - Web-based

IS-1

- Pavement Evaluation Overview

IS-2

- An Introduction to In-Place Asphalt Pavement Recycling Techniques

# Course Organization (cont)

## Module 1

- Introduction

## Module 2

- Selecting, Designing & Constructing
  - 2A: Selecting the Appropriate Recycling Technique
  - 2B: Materials & Mix Design
  - 2C: Developing Effective Construction Specifications
  - 2D: Construction & Project Control

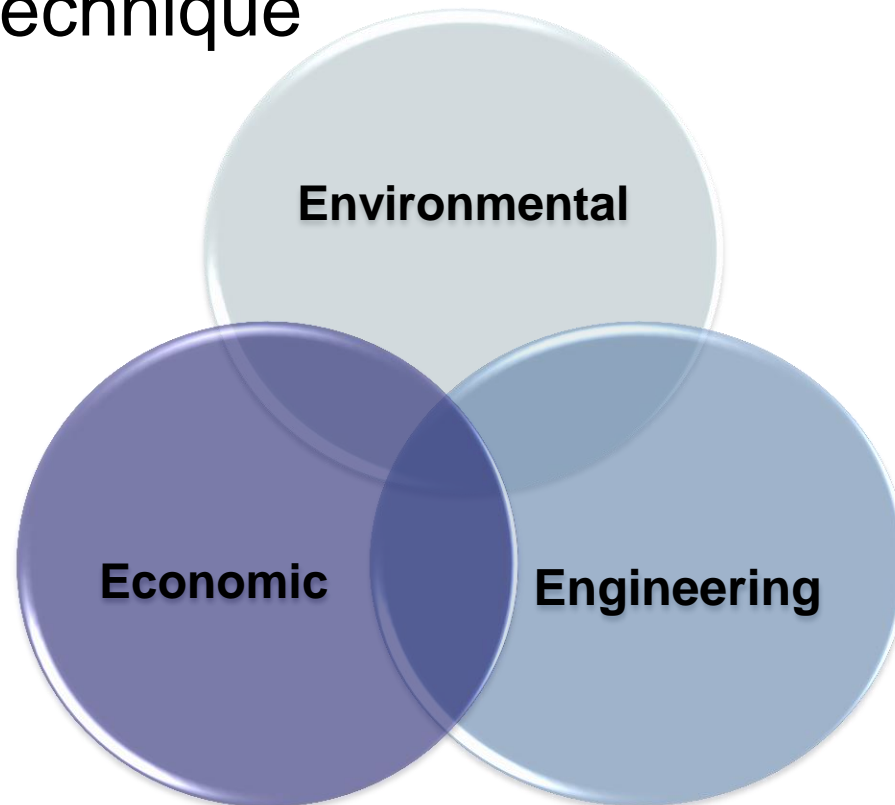
## Module 3

- Applying the Lessons Learned

# Module 1: Introduction

## Learning Outcomes

- Identify **3Es** of in-place recycling
- Describe the primary **differences** between each technique



# Lesson 2A: In-Place Asphalt Pavement Recycling Project Selection

## Learning Outcomes

- Demonstrate how **pavement conditions** can be used to select the appropriate in-place recycling technique
- Use 3Es to **justify** in-place recycling for a rehabilitation project



# Lesson 2A Workshop

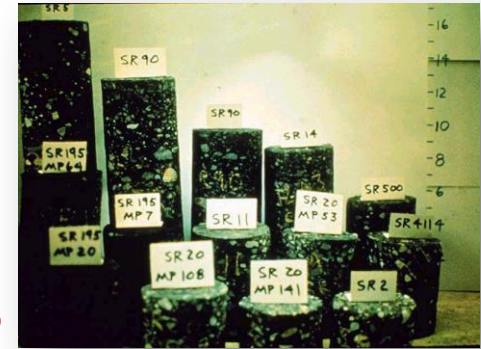
Purpose: *Evaluate project data to determine its candidacy for recycling*

- Group setting
- Provide info for 3 projects
- Present 3 items:
  - Recommend recycling method and technical justification
  - Recommend recycling methods that should not be selected (and why)
  - Discuss any non-technical information to justify treatment selection



# Lesson 2B: Materials/Mix Design for In-Place Recycling Projects

## Learning Outcomes



- Describe how the existing **pavement condition** might influence the design of the in-place recycling project
- Describe **material selection** and mix design factors that influence performance and constructability
- Describe how those factors influence **stabilization and additive selection**

# Lesson 2B Workshop

Purpose: *Provide opportunity to review project information and determine what additives and stabilization methods should be considered*

- Group setting
- 3 projects each
- Present 2 items:
  - Appropriate stabilization methods for each project
  - Identify all the additives that will be needed



# Lesson 2C: Developing Effective Specifications for In-Place Recycling Projects

## Learning Outcomes

- List the **basic requirements** that should be included in construction specifications for in-place recycling projects.
- Demonstrate how to critically assess the **strengths and weaknesses** of example specifications.





# Lesson 2C Workshop

Purpose: *Provide opportunity to evaluate strengths and weaknesses of several different types of specifications*

- Group setting
- Each group reviews 1 of 5 specifications
- Present strengths and weaknesses for assigned project



# Lesson 2D: Construction and Project Control

## Learning Outcomes

- Identify strategies for **quality assurance** of in-place asphalt pavement recycling projects
- Identify strategies for addressing **construction issues** impacting in-place recycling projects



# Lesson 2D Workshop

Purpose: *Provide opportunity to apply the lessons learned to address typical construction and project control issues that may arise in the field*

- Group setting
- Each group assigned 3 projects
- Identify the primary issue(s) that need to be addressed and feasible strategies to address the problem(s)

# Module 3 – Applying the Lessons Learned

Purpose: *Demonstrate ability to select appropriate recycling technique and materials for a given set of conditions*

- 1 project per group
- Answer 5 questions:
  - What type of in-place recycling?
  - What type of stabilization and additives?
  - What depth of recycling?
  - What other engineering factors?
  - What top 4 items to monitor?



# Assessment Exam

- A 20 question, multiple-choice, “open-book” exam
- At least 70 percent of the answers must be correct
- Continuing education units (CEUs) are earned with a passing score and 100 percent attendance

# Recent Course Presentations



- Harrisburg, PA (PennDOT)
  - Feb 28-Mar 1
- Portland, OR (ODOT and WSDOT)
  - May 14-15
- Newington, CT (CDOT)
  - May 29-30
- Washington, DC
  - One-day version for visiting Korean delegation
  - Jul 18

# To Request a Course...

- Go to [www.nhi.fhwa.dot.gov](http://www.nhi.fhwa.dot.gov) and follow the steps
- For questions about course, contact:
  - Steve Seeds ([sseeds@appliedpavement.com](mailto:sseeds@appliedpavement.com), 775-345-1999)
  - Lee Gallivan ([victor.gallivan@dot.gov](mailto:victor.gallivan@dot.gov), 317-605-4704)



# NHI 131050

## Questions?

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