

# Enhancing Linkages Between Universities and Small Businesses in EPSCoR Jurisdictions

## Alternative Method for Solid Waste Treatment “Cold In-Place Recycling Asphalt Mixtures and Pavements”

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# Solid Wastes

- Oil Spill Clean-Up Debris (OSCD)
- Vinyl Remnant
- Old Tire – Crum Rubber
- Reclaimed Asphalt Pavement (RAP)
- More to come

# OSCD

- Narragansett Improvement Company  
(NICO)

Providence, RI

Hot Mix Asphalt (HMA) Industry

VOC Requirement

The Late Mr. Kirk Everson, CEO

# Vinyl Remnant

- Natco Products  
West Warwick, RI  
Vinyl Industry  
Solid Waste Handling Cost  
Binder for HMA

# Old Tire - CRM

- Tilcon-Gammino Co.

Cranston, RI

USDOT ISTEA

Burning materials as well as

Component of HMA

The Late Senator John Chafee

# Cold In-Place Recycling (CIR)

- ⊕ Prof. K. Wayne Lee - Principal Investigator
- ⊕ Mr. Todd Brayton - Grad Research Assist.
- ⊕ Ms. Kristina Steen - Grad Research Assist.
- ⊕ Mrs. Gail Paolino - Clerical Assistant
- ⊕ Prof. David Gress - Project Manager
- ⊕ Mr. Jason Harrington - FHWA

# Pavement Recycling

 Began in 1915

 Large Increase in 1970's

 Benefits

 Conservation of Materials & Energy

 Preservation of the Environment

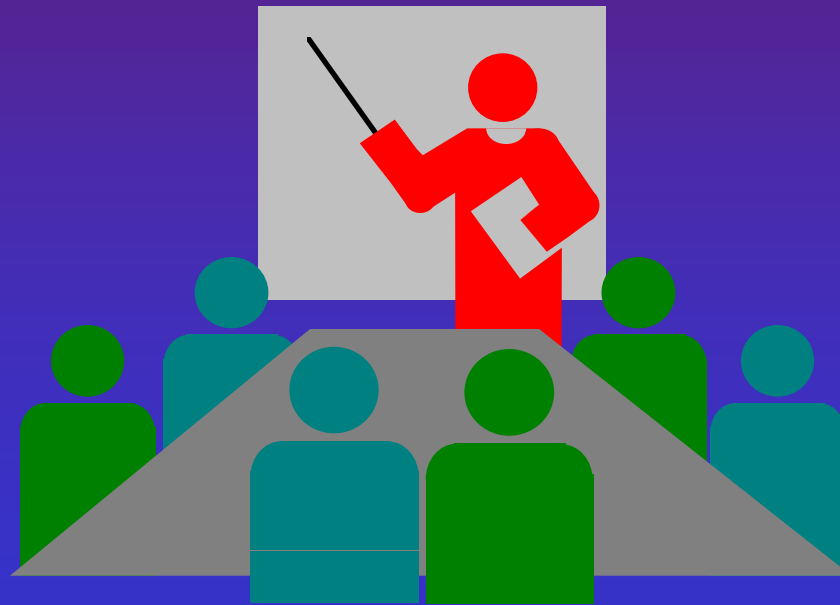
 Reduction in Cost

# Cold In-Place Recycling (CIR)

- ⊕ Cold In-Place Recycling Since Early 1980's
  - ⊕ Kansas, Oregon, New Mexico, etc.
- ⊕ Wide Variation in Procedures & Criteria
- ⊕ **Standard Mix-Design Needed**
- ⊕ Task Force No. 38
  - ⊕ AASHTO, ARTBA & AGC

# Objective

③ To Develop a Standard  
Mix-Design for the CIR Industry



# Project Tasks

- ④ Expert Task Group
- ④ Literature Review
- ④ Questionnaire Survey
- ④ Develop Work Plan
- ④ Evaluation of Existing Mix-Designs
- ④ Development of Mod. Superpave Mix-Design
- ④ Field Verification

# Cold In-Place Recycling Process

- ③ **Mill Existing Pavement (50 -100 mm)**
- ③ Screen & Crush RAP (25 -37.5 mm)
- ③ Mix with Additives
- ③ Spread & Compact





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# ETG Members

## ⊕ Industry

- ⊕ John Huffman
- ⊕ Ed Kearney
- ⊕ Alan James
- ⊕ Bob Joubert
- ⊕ Larry Ostermeyer
- ⊕ Todd Thomas

## ⊕ University/Research

- ⊕ Gary Hicks
- ⊕ Gerhard Kennepohl
- ⊕ Steve Cross
- ⊕ Bob McGennis

# ETG Members (cont.)

## ⊕ SHA/Locals

- ⊕ James Stokes
- ⊕ Dean Steward
- ⊕ Francis Manning
- ⊕ Charley Johnson
- ⊕ Dan Schact

## ⊕ FHWA

- ⊕ John Bukowski
- ⊕ Jim Sorenson
- ⊕ Jason Harrington
- ⊕ Tim Lewis

## ⊕ UNH

- ⊕ David Gress
- ⊕ Taylor Eighmy

# Research Limits

- ⊕ Partial-Depth CIR
- ⊕ Asphalt Emulsions Only
- ⊕ Superpave Gyrotory Compactor



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# Conclusions and Recommendations

- ⊕ Define Needs, e.g., Solid Waste Treatment
- ⊕ Identify Solutions, e.g., Construction Industries
- ⊕ Provide Tools, e.g., Procedures and Standards
- ⊕ Link Universities and Small Businesses

Thank You!

RI Transportation Research  
Center (TRC)

<http://www.uri.edu/cve/Transportation/>