

**Midwestern States
Regional In-Place Recycling Conference
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Bloomington, Minnesota**

The Road to Environmental Stewardship
Via
In-Place Pavement Recycling

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By AASHTO



Presentation Objectives



- Highlight the **Mission, Vision, & Services** of the Center for Environmental Excellence
- Highlight the **Drivers** for Environmental Stewardship in In-Place Pavement Recycling
- Highlight the **Environmental Aspects** of In-Place Pavement Recycling
- Highlight the **Industry Response & Potential Next Steps**

Center for Environmental Excellence by AASHTO

- **Mission:** Promote environmental excellence in the efficient delivery of transportation services.
- **Vision:** Member organizations have the tools and awareness necessary to be excellent stewards of the environment in carrying out their missions.



Center for Environmental Excellence by AASHTO

Primary Customer Service Areas

- **Information Sharing** -Website, Transportation/ Environmental Alert Newsletter, Meetings, Conference Calls, Conferences, & Peer Exchanges
- **Training** –Web Casts, Webinars, & Seminars
- **Technical Assistance** –On-call Technical Experts, Practitioner's Handbooks, & Problem-Solving Sessions



Drivers for Environmental Stewardship in In-Place Pavement Recycling

- **National & International Focus** on Energy & Climate Change & Sustainability
- **State & National Focus** on Waste Reduction, Pollution Prevention, & Recycling—"No Waste Philosophy"
- **Rapidly Escalating Costs** of Energy, Labor, & Materials
- **Traffic Congestion & Delays**
- **Environmental Effects** of Mining, Processing, Storing, & Transporting Virgin Materials



Environmental Aspects of In-Place Pavement Recycling

Definitions

- **Environment** -the aggregate of surrounding things, conditions, or influences.
- **Stewardship** -to hold something in trust for another or accountability without control or compliance.
- **Sustainable** -to create & maintain conditions, under which humans & nature can exist in productive harmony, that permit fulfilling the social, economic, & other requirements of present & future generations of Americans.



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key In-Place Recycling Process Activities

- Identify highway sections to pave;
- Develop pavement design;
- Develop, let, & award paving contract;
- Purchase materials & supplies;
- Mobilize equipment & personnel;
- Pave highway & maintain equipment;
- Perform quality control/assurance;
- Correct deficiencies; &
- Measure & document costs & benefits.



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Selecting Sections to Pave

- Avoid/minimize time periods with high traffic volumes to avoid/minimize social & economic impacts;
- Coordinate with local officials, businesses, & the public on the maintenance & protection of traffic & on connections to their highways; &
- Weather-avoid cold & wet periods.



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Doing Pavement Design

- Maintain emergency & public utility services;
- Protect sensitive receptors from vibration, dust, noise, water, & light pollution;
- Select bio-based, environmentally preferable, energy-efficient, water-efficient, & recycled-content products; &
- Eliminate & minimize waste materials.



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Developing, Letting, & Awarding Paving Contract

- Incorporate environmental stewardship measures into contract;
- Specify energy efficient & low-emission construction equipment & fuels; &
- Present environmental stewardship measures at pre-bid & pre-construction meetings.



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Purchasing Materials & Supplies

- Purchase bio-based, environmentally preferable, energy-efficient, water-efficient, & recycled-content products; and
- Require vendors to recycle/reuse containers.



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Mobilizing Equipment & Personnel

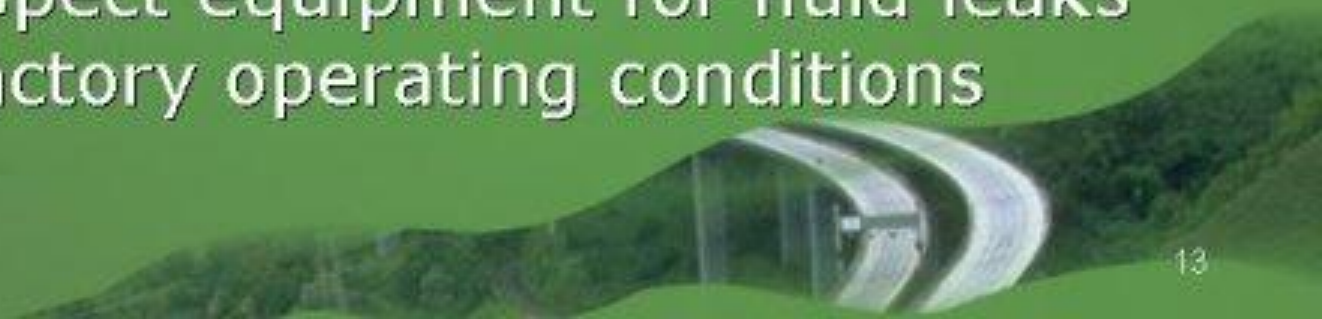
- Clean & inspect equipment for fluid leaks & unsatisfactory operating conditions;
- Train personnel on worker health & safety & environmental stewardship measures;
- Locate & develop environmentally sensitive staging & material storage areas.



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Paving Highway & Maintaining Equipment

- Maintain & protect traffic;
- Continuously observe & inspect paving operations for vibration, dust, noise, water, & light pollution impacts;
- Clean & inspect equipment for fluid leaks & unsatisfactory operating conditions



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Performing Quality Control & Assurance

- Check & document implementation of the environmental protection measures;
- Report deficiencies & recommend corrective action; &
- Check & document implementation of corrective action.

Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Correcting Deficiencies

- Is the deficiency a reoccurring problem which should be addressed by a paving procedure, material, or equipment change or personnel training?
- Has an environmental permit condition been violated which necessitates consultation with the permitting agency?
- Is cleanup or remediation necessary?



Environmental Aspects of In-Place Pavement Recycling-Cont.

Key Environmental Considerations While Measuring & Documenting Costs & Benefits

- What are the cost of the environmental measures of in-place pavement recycling in comparison with other paving methods?
- What are the environmental benefits of in-place pavement recycling as compared to other paving methods?



Potential Environmental Benefits of In-Place Pavement Recycling

- **Reuse & conservation** of pavement materials & reduced waste;
- **Reduced transport** of pavement materials & associated construction vehicle traffic impacts(air & noise) on neighbors & highway system;
- **Lower emissions** of volatiles with use of non-volatile materials; &
- **Avoid/minimize environmental impacts** of batch plants, quarries, & stockpiles.

The Industry Response to the Opportunities & Challenges

- FHWA Pavement and Materials Strategic Plan;
- FHWA Pavement Recycling Policy;
- Environmental Stewardship FALCON Team
- ARRA & Other Paving Industry Meetings, Seminars, Webcasts, Pilot/Demonstration Projects, Peer Exchanges, Technology Transfer, and Partnering;
- First Western States Regional In-Place Recycling Conference & Future Regional Conferences; &
- Research to continuously improve processes, materials, & equipment.



The Industry Response to the Opportunities & Challenges-Cont.

■ **AASHTO Vision for the 21st Century- "Triple Bottom Line" to Encourage Sustainable Development**

- Robust Economic Growth
- Better-than-before health of the environment
- Improved quality of life

"Today, the transportation sector's mission goes beyond ensuring mobility to achieving the larger societal goal of economic, social, & environmental sustainability."

John Horsley, Executive Director



ABOVE AND BEYOND



The Environmental and
Social Contributions
of America's
Highway Programs

January 2008

John Horsley,
Executive
Director
AASHTO



**“Today, more than ever
before, transportation
agencies are going
‘Above & Beyond’ Toward
Sustainable
Transportation.”**



"Above and Beyond shows how transportation make a real difference to our quality of life through investments in:

- Context sensitive solutions,
- Historic preservation,
- Recycling,**
- Clean air,
- Integrating transportation & land use
- Walking & biking trails
- Wetlands & water quality
- Wildlife preservation
- Sound barriers
- Scenic byways, &
- Wildflowers & native vegetation"





Recycling — Transportation Agencies “Go Green”

Did You Know?

Transportation agencies continue to be nationwide leaders in recycling, including reusing road-building materials and incorporating recycled products into the nation’s highway surfaces.



Industry Response-Texas DOT Recycling for Roadway

TXDOT Use of Recycled Materials for Roadways in 2006

- Recycled asphalt pavement-3.1 M Tons
- Recycled concrete aggregate-1.1 M Tons
- Fly ash-278,000 Tons
- Crumb rubber-12,700 Tons
- Glass traffic beads-12,000 Tons
- Compost-311, 000 cubic yards



Recycling Opportunities

Candidate Materials & Industrial By-Products

- Baghouse fines
- Blast Furnace Slag
- Coal bottom fly ash/boiler slag
- Coal fly ash
- Flue gas desulfurization
- Scrubber material
- Foundry sand
- Kiln dust
- Mineral processing wastes
- Municipal incinerator ash
- Nonferrous slags
- Quarry by-products
- Reclaimed asphalt pavement
- Reclaimed concrete
- Roofing shingle scrap
- Scrap Tires
- Sewage sludge ash
- Steel slag
- Sulfate wastes
- Waste glass

Potential Next Steps to Advance Environmental Stewardship in In-Place Recycling

- **Include an environmental stewardship component** in the planning, development, & implementation of in-place recycling programs;
- **Develop environmental performance measures/indicators** for in-place recycling;
- **Research & compare the costs, impacts, & benefits** of in-place recycling with other paving methods;
- **Research & publicize** environmental stewardship case studies/success stories;
- **Develop a practitioner's handbook** on how to plan, design, & construct in-place recycling programs/projects in an environmentally sound manner.



Potential Next Steps to Advance Environmental Stewardship in In-Place Recycling-Cont.

- **Engage AASHTO Standing Committee** on Environment members/State DOT environmental professionals on in-place recycling teams & in partnering initiatives;
- **Incorporate environmental stewardship concepts** into in-place recycling training;
- **Include an in-place recycling section** on the Center for Environmental Excellence Website

AASHTO Commitment

The Center for Environmental Excellence & AASHTO are ready to assist you in making the roads and transportation network and the environment “better than before” through in-place pavement recycling.



On Behalf of the Center for Environmental Excellence & FHWA Thank You

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