

*“If we knew what we were
doing, it wouldn’t be called
research.”*

Albert Einstein



Meeting Challenges for Energy and the Environment

Western States Regional In-Place Recycling Conference

September 13, 2012

Ontario, CA

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DeIDOT

Construction Materials Recycling

- ◆ AASHTO/FHWA-NAPA Survey
- ◆ Why Recycle?
- ◆ Impediments to Implementation
- ◆ Overcoming Obstacles
- ◆ Research Activities
- ◆ DelDOT Experiences
- ◆ Take-Home Assignment

AASHTO Recycled Materials Survey

- ◆ Conducted through AASHTO SOM List Serve.
- ◆ Sent end of December 2010.
- ◆ Various questions related to RAP, RAS, RCA.
- ◆ 45 state responses plus West Federal Lands and Ontario.
- ◆ Some data used is from 2007/2008 survey due to lack of responses.

AASHTO Survey (cont)

◆ Main Survey Questions

- Allowance of recycled materials (RAP, RAS, RCA) per specifications?
- Contractors actual usage of recycled materials?
- Special testing/handling procedures?
- Research needs, major concerns/obstacles for increased usage of recycled materials?

Since 2007/2008 Survey...

- ◆ RAP % *allowed* by percentage has stayed pretty consistent for DOT's.
- ◆ For RAP *utilization* by contractors, it appears the 20-30% usage has increased the most with all other percentages staying pretty much the same.
- ◆ *New survey scheduled for Fall of 2012*

FHWA-NAPA Survey

- ◆ Covers use of Recycled Asphalt Pavement (RAP), Reclaimed Asphalt Shingles (RAS), and Warm Mix Asphalt (WMA) in 2009 and 2010.
- ◆ Asphalt industry is countries #1 recycler.
- ◆ Conserve raw materials, conserve energy, cut emissions (from production plant and paving operations).

FHWA-NAPA Survey (cont)

◆ RAP

- 56M tons in 2009, 62.1M tons in 2010 used in HMA/WMA.
- Estimated 19 million barrels of asphalt conserved.
- 96% producers use RAP.
- Less than 1% RAP sent to landfills.

FHWA-NAPA Survey (cont)

◆ RAS

- 702k tons in 2009; 1.1M tons in 2010 (57% increase)
- Estimated 1.5 million barrels of asphalt conserved.

◆ WMA

- 19.2M in 2009; 47.6M in 2010 (148% increase)

Survey available at:

www.AsphaltPavement.org/RAP-RAS-WMA_Survey

Why Recycle?

- ◆ Psychological – “feel good”
- ◆ Environmental sustainability – *ward off “help” from external sources*
- ◆ Environmental benefits – no land filling
(*difficult to find, costly disposal*)
- ◆ Save finite natural resources
- ◆ Value of in-place materials

Why Recycle? (cont)

- ◆ Engineering benefits: *in-place better than new virgin materials?*
- ◆ Lower greenhouse gas emissions (less trucking)
- ◆ It makes **cents.... (and \$\$)!**

“Success is measured by your ability to maintain enthusiasm between failures.” Winston Churchill

Impediments to Implementation

- ◆ Misconceptions
- ◆ Bad (past) experiences
- ◆ Lack of knowledge
- ◆ Regulatory challenges
- ◆ Department (Agency)/Contractor willingness
- ◆ Lack of national standards (AASHTO)

Overcoming Obstacles

- ◆ Outreach/marketing
- ◆ Educate
 - Research work (FHWA, AASHTO, NCHRP, TRB, Industry, University, etc).
- ◆ Highlight state's/contractor's successes
- ◆ Perception
 - Recycled material \neq inferior material
- ◆ Fear of failure
- ◆ Conservative agencies/contractor's

Overcoming Obstacles (cont)

◆ Partnerships

- Recycled Materials Resource Center (RMRC)
- Industry (NAPA, ACI, PCA, ARRA, etc)
- Federal Agencies – FHWA, EPA
- AASHTO
- Planners, Designers
- Materials/Construction groups
- University Researchers
- Elected Officials/Public

Overcoming Obstacles (cont)

- ◆ Communication
- ◆ Partners have the same goals
 - Quality product
 - Specification conformance
 - Environmentally sensitive
- ◆ Be proactive
- ◆ Seek innovation

Research Activities

- ◆ RMRC
- ◆ FHWA RAP ETG
- ◆ EPA Green Highway Partnership (GHP)
Mid-Atlantic Specification Harmonization
- ◆ AASHTO, NCHRP, TRB

“The greatest gap in life is the one between knowing and doing.” Dick Biggs

GHP Harmonization Materials

- ◆ Foundry Sand
- ◆ Recycled Asphalt Pavement
- ◆ Fly Ash/Bottom Ash
- ◆ Scrap Tires
- ◆ Steel Slag
- ◆ Scrap Shingles

DeIDOT Experiences

◆ Materials

- Recycled Asphalt Pavement (RAP)
- Recycled Asphalt Shingles (RAS)
- Ground Granulated Blast Furnace Slag (GGBFS)
- Warm-Mix Asphalt (WMA)
- Recycled Concrete Aggregate (RCA)
- Fly Ash (embankment, concrete)
- Tires (embankment, HMA)

DelDOT Experiences (cont)

◆ Pavement Systems

- Cold-in-Place Recycling (CIPR)
- Full-Depth Reclamation (FDR)
 - ◆ Saves natural resources
 - ◆ Reuse good materials
 - ◆ Less trucking (GHG savings)

DelDOT Mission Statement

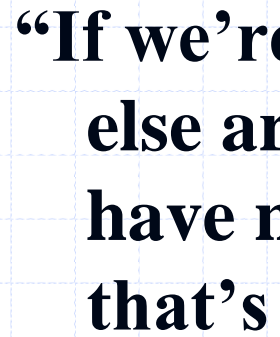
The Mission of the State of Delaware's Department of Transportation is to provide a safe, efficient, and *environmentally sensitive* transportation network that offers a variety of convenient, and cost-effective choices for the movement of people and goods.

Take-Home Assignment

- ◆ *Take something you've heard today, and try to implement it in your state.*
- ◆ Don't research something to death trying to find a reason for something not to work.

“Failure is the opportunity to begin again, more intelligently.”

Henry Ford



“If we’re here to make a difference – and why else are we here – we have to do things that have never been done before. To many people that’s a risk. To me it’s an adventure.”

Gwen Edwards

Thank you for your time and attention

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