“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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DelDOT
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.
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 country's #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 ≠ 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
DelDOT 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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