If you think the problems we create are bad, just wait until you see our solutions.
Benefit of In-Place Recycling to State Highway Programs

Midwestern States Regional In-Place Recycling Conference

September 10, 2013
Shaumburg, Illinois
Topics

- Role of sustainability/recycling
- Customer wants/needs
- DOT’s mission
- Benefits/Successes
- Future challenges
“If you are not failing every now and again, it’s a sign you’re not doing anything innovative.”

Woody Allen
Sustainability .... defined

Economic development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

Making Sustainability Work, Marc J. Epstein (p 20)
Recycling .... Drivers for Environmental Stewardship

- National and International focus on energy, climate change, and sustainability.
- State and National focus on waste reduction, pollution prevention, and recycling.
- Escalating costs of energy, labor, and materials.
- Traffic congestion and delays.
- Environmental effects of mining, processing, transporting materials.
Customer Wants/Needs

- Safe
- Reliable
- Smooth
- Efficient
- Congestion-free
- With options
DelDOT Response

As a transportation agency, the obligation of DelDOT is to provide a safe and effective transportation network that promotes, and efficiently facilitates, movement of people and goods for the benefit of citizens and commerce.
DelDOT Mission

Excellence in Transportation (Vision)

- **Every Trip** - Strive to make every trip taken in Delaware safe, reliable and convenient for people and commerce.

- **Every Mode** - Provide safe choices for travelers in Delaware to access roads, rails, buses, airways, waterways, bike trails, and walking paths.

- **Every Dollar** - Seek the best value for every dollar spent for the benefit of all.

- **Everyone** - Engage customers and employees with respect and courtesy to deliver services.
Excellence in Transportation (Goals)

- Minimize the number of fatalities and injuries on the system
- Build and maintain a nationally recognized system benefiting travelers and commerce
- Provide every traveler with access and choices to the transportation system
- Provide every customer with the best service possible
- **Minimize the environmental impact of the state's transportation system**
- Achieve financial sustainability through accuracy, transparency and accountability
- Develop and maintain a place where talented and motivated employees love to work and can be national leaders in transportation
Sustainability - Benefits/Successes

Benefits:
1. Engineering
2. Economics
3. Environmental

Ultimate savings to the travelling public, our customers!
Benefits/Successes (cont)

Engineering

- Recycled/reclaimed material ≠ inferior material
- Can impart beneficial engineering properties
- Quality of existing, in-place materials; new road material = old road material
- Stabilized base for future preservation treatments
Benefits/Successes (cont)

**Economics**

- Saves $
  - Construction costs
  - Import/export costs
  - Reduces user delay
# Pavement Preservation Costs

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Cost per Centerline Mile</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Treatment*</td>
<td>$10,000</td>
</tr>
<tr>
<td>* Utilize Department forces for placement</td>
<td></td>
</tr>
<tr>
<td>Microsurfacing</td>
<td>$50,000</td>
</tr>
<tr>
<td>Surface Treatment to Asphalt Conversion</td>
<td>$225,000</td>
</tr>
<tr>
<td>Asphalt Overlay</td>
<td>$300,000</td>
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<tr>
<td>Mill + Asphalt Overlay</td>
<td>$500,000</td>
</tr>
<tr>
<td>FDR + Asphalt Overlay</td>
<td>$370,000</td>
</tr>
</tbody>
</table>
Benefits/Successes (cont)

Environment

- Reduce GHG
- Within existing footprint (no new ROW needed, no utility involvement, no new storm water, etc)
- **Utilize existing materials** (no new mining, no removal of existing materials, no transportation costs for import/exporting materials, less trucking)
DelDOT Methodology

- Recycling/reclamation considered in scoping/planning stage
- Exploratory work (cores, borings)
- Final determination (surface area of patching)
- Design
- Construct
- Monitor
DelDOT’s Benefits

3E’s:

- Reduced initial cost
- Reduced environmental impact
- Increased engineering benefits:
  - More rapid construction
  - Stabilized base (for future structural overlay’s)

Increased usage, increased contractor participation
AASHTO’s Vision for the 21st Century

Triple Bottom Line to encourage sustainable development

1. Robust economic growth
2. Better-than-before health of the environment
3. Improved quality of life
Future Challenges

- Recycling/Sustainability is NOT going away
- Life Cycle Cost Analysis (LCCA)
- Life Cycle Assessments (LCA)
- New materials, technology, equipment
- Institutional barriers

“If you’re upset about failing, you haven’t failed enough.”

Meredith Whitney
FHWA’s Sustainable Pavement Technical Working Group

- Industry, Government Agencies, Academia
- Reviewing sustainable pavement practices
- DRAFT Report is under review now
Recycling Efforts

Recycling (2011):

- Glass: 3 million tons/year
- Aluminum cans: 1.5 – 2.0 million tons/year
- Paper/paperboard: 45 million tons/year (63% recycled rate)
- RAP: 66.7 million tons (99% recycled rate)
- RAS: 1.2 million tons

*Asphalt Pavement Magazine – July/August 2013*
Recycling Efforts (cont)

- Recycling of metal, paper, plastic, glass, textiles, rubber, electronics is up 40% since 2009 according to the Institute of Scrap Recycling Industries, Inc.


- In 2010, 130 metric tons of scrap worth $77 billion was manufactured into spec grade commodities.

*Public Works Magazine - July 2011*
Recycling Efforts (cont)

2012 Summer Olympics*

- Olympic Delivery Authority (ODA) goals for site work (former brownfield area):
  - 80% soil reuse.
    - 2 million tons of contaminated soil was treated and reused.
  - 90% reuse/recycling of other construction materials
    - 98% from demolition and site clearance were reclaimed (including 8 buildings dismantled and reused elsewhere and reuse of RCA in new bridges).

*Civil Engineering Magazine - July/August 2012
Recycling Efforts (cont)

2014 World Cup (Brazil)*
- 12 stadiums to be constructed
  - Targeting LEED standards
  - Collecting rainwater and treating for re-use
  - **Goal: 25% recycling of construction materials**

*Engineering News Record - August 27, 2012
The shingles off an average sized house supplies enough material to pave about 200 ft. of highway ...
Thank you for your time and attention

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“Don’t follow the rules. If everybody followed the rules, nothing would change, and without change there is no progress.” Sir Richard Branson