AMERICA RIDES ON US

SUSTAINABILITY

Dan Staebell
Asphalt Pavement Alliance

sus·tain·able
adjective 
\(\text{sə-}\text{tā-nə-bal}\): able to be used without being completely used up or destroyed
: involving methods that do not completely use up or destroy natural resources
: able to last or continue for a long time

AMERICA RIDES ON US

Reuse / Recycle

• America’s leading Recycler
• The asphalt industry reuses and recycles nearly 75 million tons every year.
• United States Taxpayer saves nearly $2.0 billion dollars annually.
• Shingles, Tires, Glass, Fly ash, Steel Slag, etc. being recycled.

*NAPA Annual RAP Survey
Performance Perpetual

Perpetual Pavements are the Ultimate Sustainable Pavement
- Strength in layers
- "Because it's All about that Base"
- Surface maintain only
- Top layer remove and replace as needed.
- Reuse / recycle / Perpetual

Asphalt Facts = Sustainable

Quiet
Renewable
100% Recyclable
Smooth = Reduced Fuel Use

FACT #109
Porous asphalt is an environmentally friendly tool for stormwater management.

FACT #128
Asphalt is the quiet pavement.

FACT #25
The smoother the pavement, the lower a vehicle's fuel consumption.

WARM-MIX ASPHALT
- The benefit of reducing energy consumption which decreases the emission of greenhouse gases.

Economic Benefits

99%+ of the material removed from old asphalt pavements is reused in new pavements.

32%+ Savings
- Warm mix asphalt pavements are produced using waste-oil technologies.

$2.8B+ Savings
- Cold recycled materials compared to the cost of raw materials.
Is this Sustainability?

Emission Reductions

- Asphalt Plants are environmentally sound, reducing greenhouse gases.
- Since 1970, lowered emissions by 97% while increasing production 250%.
- EPA has removed Asphalt plants from Major Air Haz. Source.

It's All about the Message!
What is OUR Message!!
Growing Public Demand

81% Executive Corporate Leaders believe they need to adopt sustainability principals

44% Green nonresidential construction = $66 Billion

Market Growing

Green Building is Major Part of U.S. Nonresidential Starts

<table>
<thead>
<tr>
<th>Year</th>
<th>Residential</th>
<th>Commercial</th>
<th>Industrial</th>
<th>Nonresidential</th>
<th>Total</th>
<th>Market %</th>
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<tbody>
<tr>
<td>2006</td>
<td>$172B</td>
<td>$34B</td>
<td>$30B</td>
<td>$230B</td>
<td>$436B</td>
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<td>2007</td>
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<td>$35B</td>
<td>$30B</td>
<td>$240B</td>
<td>$451B</td>
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<tr>
<td>2008</td>
<td>$180B</td>
<td>$36B</td>
<td>$30B</td>
<td>$250B</td>
<td>$466B</td>
<td>6%</td>
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<tr>
<td>2009</td>
<td>$184B</td>
<td>$37B</td>
<td>$30B</td>
<td>$260B</td>
<td>$484B</td>
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<tr>
<td>2010</td>
<td>$188B</td>
<td>$38B</td>
<td>$30B</td>
<td>$270B</td>
<td>$505B</td>
<td>8%</td>
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<tr>
<td>2011</td>
<td>$198B</td>
<td>$40B</td>
<td>$30B</td>
<td>$290B</td>
<td>$558B</td>
<td>10%</td>
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<tr>
<td>2012</td>
<td>$214B</td>
<td>$45B</td>
<td>$30B</td>
<td>$325B</td>
<td>$639B</td>
<td>12%</td>
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<tr>
<td>2013</td>
<td>$236B</td>
<td>$50B</td>
<td>$30B</td>
<td>$365B</td>
<td>$721B</td>
<td>14%</td>
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<tr>
<td>2014</td>
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<td>$55B</td>
<td>$30B</td>
<td>$410B</td>
<td>$831B</td>
<td>15%</td>
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<tr>
<td>2015</td>
<td>$300B</td>
<td>$60B</td>
<td>$30B</td>
<td>$460B</td>
<td>$950B</td>
<td>16%</td>
</tr>
<tr>
<td>2016</td>
<td>$340B</td>
<td>$65B</td>
<td>$30B</td>
<td>$520B</td>
<td>$1,025B</td>
<td>17%</td>
</tr>
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Asphalt. AMERICA RIDES ON US
Sustainability Here to Stay
Grad students look into the future of impact issues...

93% of students say social/environmental issues are important to a business’ long-term success.

60% Essential
7% Important
33% Very Important

Students predict the most important issues for business to get right in the next ten years:
1. Climate & Energy (37%)
2. Sustainable Product Development & Marketing (22%)
3. Resource Conservation (19%)
4. Supply Chain Management (16%)
5. Human Rights & Fair Labor (10%)

Recent Legislation
Sustainability Language

FHWA Sustainability Technical Working Group

- Established 2010
- Mission: A critical outcome of the program is to increase the awareness, visibility, and the body of knowledge of sustainability considerations in all the life cycle phases of pavement systems.
- Meet Biannually
- FHWA-Consultants-Agency-Industry-Academia
- Asphalt / Concrete Industries strongly represented
Sustainable Pavements Technical Working Group
FHWA SP TWG

Infrastructure Green Rating Systems
- National, State, Local
- Rating Tool
  - Best practices
  - Earn Credits
  - Indicator of sustainability

New Era of Transparency
Material Credits
LEED 2009
- Recycled or Reuse Materials
LEEDv.4
- Environmental Product Declarations
Iowa LEED v4 Projects

- Miron Construction Cedar Rapids Office Cedar Rapids v4
- ISURP - Hub Office Ames v4
- Iowa Renewable Energy Training Center Hiawatha v4
- Building 440 Des Moines v4

https://www.usgbc.org/projects

Cause and Effect!

- Environmentally could we get better
  - Can't change what we haven't measured!
- Customer asks the question, "How environmentally friendly are you?"
- Competition provides information and data?
  - Ours is better than yours?

Other Viewpoints

"Life-cycle analysis (LCA) is emerging as a leading method of determining the environmental impact at both a macro and micro level in transportation projects in context of sustainability. The concrete pavement industry in particular is pushing for the increased use of this approach."

Sustainability measures key to long-lasting roads: Sustainability measures key to long-lasting roads.
Other Industries have Issues

Bottom Line: Market Share ▲ on EPD use & Environmental Focus – Possible?

- Can’t Participate if not measured?
- Best Product Available
- Industry = Excellent Story to Tell
- European Countries offer incentives or “requirements” for EPD’s
- USA Lowering Carbon Initiatives…. direction moving Up or Down?

Special Thanks:
Bill Rosener = APAI
Scott Schram = IDOT
Joseph Shacat = NAPA
What is Resilience?

• No common definition
  • AASHTO cited 8 definitions related to transportation infrastructure
  • Resilience.
    • ability to anticipate, prepare for, and adapt to changing conditions
    • withstand, respond to, and recover rapidly from disruptions.
  • Many faces of resilience
    • But none, by itself, represents the whole.

The elephant and the 6 blind humans

U.S. 2018 Billion-Dollar Weather and Climate Disasters
Hurricane Michael
10/2018

Resilience and Asphalt Pavements

Natural disasters
- Hurricanes, floods, earthquakes, landslides, tornadoses
- Damaged roads affect mobility
- Emergency services
- Access to medical care
- Food supplies
- Commerce
- With unexpected events, the key is to quickly restore service

I 29 Iowa March 2019
2/26/2020

America rides on us.

- Get to Work!
  - Debris Removal
  - Damage Assessment
  - Repair
  - Communicate

- Governor's Proclamation
  - Waive low bid procurement

- I-680 Crescent/I-29
  - Closed
  - Water Receded
  - Contractor Mobilized
  - Open
  - 3/14/19
  - 3/27/19
  - 3/30/19
  - 4/2/19

Asphalt saves the day!

Western Engineering Co.
Closed for 2nd time since repairs

This photo from traffic cameras in Nebraska City, taken Wednesday morning, shows Missouri River floodwaters once again inundating Iowa 2 between Interstate 29 and Nebraska City.

NEBRASKA DEPARTMENT OF TRANSPORTATION

Resilience – Earthquake Response

- 8 major transportation corridors severely damaged
- All 8 major roads repaired within 5 days

Anchorage, AK
December 1, 2019

Damage Happens

California – Earthquake Response

- Ridgecrest, CA –
  - July 4 & 5, 2019
- Back-to-back earthquakes damage Highway 178
- Temporary repairs completed within hours
- Permanent repairs completed less than 10 days later, within a single shift

Resilience – Hurricanes

- Orange, Texas after Hurricane Harvey – August 2017
Resilience – Speed of Construction
• Hurricane Michael severely damaged U.S. 98 in Franklin County, Florida (October 2018)
• 40-mile stretch of highway affected, 15 miles badly damaged
• Lanes were reopened to traffic after every shift


Resilience – Warm Mix to the Rescue
• Haul distances up to 8-10 hours can be used with warm mix technology
• What happens when local plants can’t operate?
• Use of warm mix studied after Hurricane Katrina
• Fine graded mixes are more easily compacted

Haul distances up to 8-10 hours can be used with warm mix technology
https://driveasphalt.org/resource-library/full-scale-testing-of-hot-mixed-warm-compacted-asphalt-for-emergency-paving

Resilience – Warm Mix to the Rescue
• 3-hr. haul distances
• Late season paving at high elevation
• Steep canyons with little sun and high winds
• Warm mix was key to getting the job done

3-hr. haul distances
https://www.roadsbridges.com/asphalt-paving-able-reconnect

Resilience – Will Roads require changing material designs?

- Climate models provide long-term expected temperature changes
- Potential: Adjust binder grades to accommodate predicted conditions
- Time scale of changes is decades
- Can be a part of routine maintenance overlays

Resilience and Asphalt Pavements

Climate change

- Coastal flooding, groundwater rise, hotter temperatures
- The key is to plan for expected changes

Similar Message

SUSTAINABLE HIGHWAYS INITIATIVE
NEW LIFE
RESILIENCY
**Message Forward & Asphalt Industry**

Moving Forward using Asphalt!!

1. Something WILL happen!
2. Nothing withstands loss of subgrade
3. Some fixes seen as temporary
4. Be Prepared
5. Speed of recovery **Critical**
6. Toolbox & versatility
7. **Value** ($) to repair.

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**Sustainability**

**YES WE CARE**

Thank You
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