Let’s Talk About…

What our customers want

Research projects and implementation

A partnership for innovation in asphalt pavements
Built Upon Science

Research & Technology

PEC Activities
- Pavement Design
- Pavement Type Selection
- Environmental Sustainability
- Best Quality & Competitiveness
- Pavement Preservation
- Legislative

Other Research
- Asphalt Institute
- NCAT

Future Research

Market Research & Communications
- Market Research & Plan Development
- Communications Plan
- Advertising Campaigns
- Website(s)
- APA Brand Management
- APA Product Finalization & Archives (Asphalt Vault & Toolkits)
- Agency Contract(s) Management
- Editorial Placement
- Creation of Marketing Materials

Deployment Activities
- Customer (SAPA) Support (including non-SAPA States)
- National Accounts Program
- Field Resource Team Leadership & Coordination
- Trade Shows
- Speaking Engagements
- Perpetual Pavement Awards
- Deploy Research and Marketing Materials

Accelerated Deployment of Proven Technologies
A Survey of Pavement Officials And the Driving Public

What Do Our Customers Want?

The APA is a partnership of the Asphalt Institute, National Asphalt Pavement Association and the State Asphalt Pavement Associations.
## Survey Participants

<table>
<thead>
<tr>
<th>Survey</th>
<th>Who</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver Preference Survey</td>
<td>US Drivers, 18+</td>
</tr>
<tr>
<td></td>
<td>Regional Oversamples</td>
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<tr>
<td></td>
<td>Trucker Oversample</td>
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<tr>
<td>Driver Survey</td>
<td>US Drivers, 18+ who drive 50+ miles per week</td>
</tr>
<tr>
<td>In-Depth Interviews DOT’s, Public Works</td>
<td>Appointed Officials, Engineers, Architects, Developers, Owners and Concessionaries, and Other Key Stakeholders</td>
</tr>
<tr>
<td>Survey DOT’s, Public Works</td>
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</table>
WHAT MATTERS TO DRIVERS?
Common Roadway Issues Experienced in the Past Year

- Potholed, cracked, broken or crumbling pavement: 79%
- Road Noise: 48%
- Water in the roadway: 47%
- Joints: 46%
- Ruts: 38%
- None of these: 10%
Drivers – Satisfaction Indicators

- Smooth: 58%
- Quiet: 11%
- Better grip: 6%
- Lasts longer: 5%
- Easier to maintain: 5%
Priorities When Building/Rebuilding Roads

- Costs with reg. maintenance: 58%
- Public safety: 56%
- Ability to be repaired quickly: 42%
- Smooth road surface: 28%
- Effective storm water mgmt.: 18%
- Cost of reconstruction: 14%
- Sustainable construction: 13%
- Likelihood for pavement failure: 11%
- Ability to be built quickly: 11%
- Ability to quickly add lanes: 10%
- Locally produced products: 7%
- Low road noise: 6%
Priorities When Building/Rebuilding Roads

- 47%: Lasts with regular maintenance
- 51%: Public safety
- 35%: Ability to be repaired quickly
- 31%: Smooth road surface
Roadway Spending Priorities

1. PERFORMING MAINTENANCE & REPAIRS
   Gen Pop: 79% most important
   Truckers: 68% most important

2. INCREASING CAPACITY
   Gen Pop: 63% second most important
   Truckers: 56% second most important

3. BUILDING NEW ROADS
   Gen Pop: 68% least important
   Truckers: 56% least important

- Maintaining Existing Roads
- Building New Roads
WHAT MATTERS TO DECISION MAKERS?
Key Findings – In-Depth Interviews

• Shrinking infrastructure funding.
• Pavement innovation is key to reducing costs.
• Speed of construction was a primary asphalt differentiator.
• Pavement decision makers have positive perceptions of asphalt pavement industry.
• Agencies take into account driver and stakeholder opinions.
Challenges to Meeting Priorities

- Funding: 48%
- Affordability: 13%
- Poor workmanship: 11%
- Long-term performance: 10%
Our Customers Want

• Durable, Long-Lasting pavements.

• Reduced Costs Through Pavement Innovations.

• A Smooth, Quiet and Safe Pavement that can be Maintained.

• To Minimize Construction-Related Delays.

• Funding for Maintenance and Capacity Expansion.
America depends on high-performing, safe roads.

LEARN MORE
Asphalt Industry’s Investment

Six NAPA–SAPA Task Groups

- Best Quality & Competitiveness
- Environmental Sustainability
- Legislative
- Pavement Design
- Pavement Preservation
- Pavement Type Selection
LCCA Issues in Washington

- **MAP-21**
  - Mandate LCCA, Alternative Bid, and MEPDG
- **Financial Services Appropriations Bill**
  - Mandate Material-Specific Discount Rates
- **Water Resources Development Act**
  - Mandate LCCA on Corps Projects
- **MAP-21 Reauthorization**
  - LCCA on all Federal-Aid Highway Projects
- **Ready Mixed Concrete Check-Off**
Pavement Type Selection & Pavement Design Deliverables

- Optimized Pavement Design & Materials Selection
- Determining Service Life based on Comparable IRI Values
- www.ncat.us
Next webinar is Thursday, October 16th at 2:30 PM EST
The webinar is free and PDHs are available.
Sustainable Asphalt Technologies

- Porous Asphalt
- Warm Mix Asphalt (WMA)
- Reclaimed Asphalt Pavement (RAP)
- Ground Tire Rubber (GTR)
- Recycled Asphalt Shingles (RAS)
- Perpetual Asphalt Pavement
Environmental Product Declarations

Environmental Facts

Functional unit: 1 metric ton of asphalt concrete

<table>
<thead>
<tr>
<th>Environmental Impact</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Primary Energy Demand [MJ]</td>
<td>$3.9 \times 10^3$</td>
</tr>
<tr>
<td>Renewable [MJ]</td>
<td>$3.9 \times 10^3$</td>
</tr>
<tr>
<td>Non-Renewable [MJ]</td>
<td>$3.5 \times 10^2$</td>
</tr>
<tr>
<td>Global Warming Potential [kg CO$_2$-eq]</td>
<td>79</td>
</tr>
<tr>
<td>Acidification Potential [kg SO$_2$-eq]</td>
<td>0.23</td>
</tr>
<tr>
<td>Eutrophication Potential [kg N-eq]</td>
<td>0.012</td>
</tr>
<tr>
<td>Ozone Depletion Potential [kg CFC-11-eq]</td>
<td>$7.3 \times 10^{-9}$</td>
</tr>
<tr>
<td>Smog Potential [kg O$_3$-eq]</td>
<td>4.4</td>
</tr>
</tbody>
</table>

Boundaries: Cradle-to-Gate
Company: XYZ Asphalt
RAP: 10%

Source: PE International, Values are for illustration purposes only.
Asphalt Industry EPD Program

Learn more about:

- Program Goals and Objectives
- Product Category Rules
- PCRs Under Development by NAPA/SAPAs
  - Asphalt Mixtures
PVI & MIT Review

• Coming soon: Review of Model-Based Pavement-Vehicle Interaction Simulation for Life Cycle Assessment of Pavements from a Pavement Design Perspective

• NAPA Webinar: Where the Rubber Hits the Road: PVI Re-examined
IRI Database for Smoothness & Emissions

Emissions Estimator

The Project Emission Estimator (PE2) will have the capability of benchmarking life cycle emission estimates associated with construction, maintenance, and use of the roadway. This page outlines the steps taken to illustrate the concept of a pavement life cycle along with the inputs needed to create one in PE2.

General Information

Generalized Roadway Speed:
- 35 mph
- 70 mph

Average Daily Traffic (ADT):

Project Length (in miles):

Number of Lanes:

Build Life Cycle

Instructions

1. Define the first intervention strategy:
   - This will define the initial construction (material, batch plant, and hauling/construction equipment) and work zone emissions in year 1.
   - Currently, choices limited to any one of the reconstruction, rehabilitation, or maintenance projects investigated by researchers at Michigan Technological University (MTU).
   - Duration days of the project will also be defined to estimate relative work zone traffic emissions.

2. Define the second intervention strategy (intervention year):
   - Repeat step two, until preservation strategy is achieved and end-of-life has been attained.
   - Use phase will be measured yearly throughout the life cycle and quantified in the life cycle emission report.

Job:

Job Type:

Intervention Year:

Project Duration:

Add Intervention
Reflective Pavements and Urban Heat Island

Do reflective pavement mandates make sense?

Legislative efforts to mandate reflective pavements have been introduced in some areas, but the scientific evidence doesn’t clearly support the use of reflective pavements to address the urban heat island effect. While these pavements do redirect some energy from a pavement’s surface, much of it ends up interacting with buildings, pedestrians, and cars — leading to potential unintended negative consequences.

Unintended Consequences
A Research Synthesis Examining the Use of Reflective Pavements to Mitigate the Urban Heat Island Effect

by Jiachuan Yang, Zhihua Wang, Ph.D.; and Kamal E. Kaloust, Ph.D., P.E.,
Arizona State University National Center of Excellence for SMART Innovations

Environmental Sustainability
Best Quality and Competitiveness

Deliverables

• High Binder Replacement for Recycled Materials
  • Draft Synthesis
  • Webinar: Improved Sustainability & Performance with High RAP and RAS Usage

• Education and Training Program
  • LCCA and Innovative Technologies
Thinlays: The Pavement Preservation Tool of Choice
NAPA Position on Thin Asphalt Overlays for Pavement Preservation

http://www.asphaltpavement.org/ThinIsIn
Other PEC Projects

- Develop Thinlays with High Recycled Content
- Asphalt’s Speed of Construction for Cost Effectiveness

Download a copy: http://goaspha.lt/1grtlLy
FHWA/Industry Partnership

- $2.5 million Cooperative Agreement for the Advancement of Innovative Asphalt Technologies
- Partnership provides a mechanism to advance implementation of innovations
- Agreement is for 5 years, FY 2014–2018
Deliverables

- FY2014–15 Deliverables Include
  - Recycled Materials & WMA Survey (2013)
  - RAP Management Best Practices
  - Recycled Tire Rubber Best Practices
  - High Binder Replacement Mixtures Synthesis
  - Pavement Economics & LCCA Webinar
Available Online:

- LCCA for Pavements
- What, How, and Why of EPDs
- Porous Asphalt Pavement
- Thinlays for Pavement Preservation
- Sustainability 101: The What, Why, And How of Sustainability for the Asphalt Industry

COMING UP!
PaveXpress: A Simplified, Online Pavement Design Tool
October 16th at 2:30 PM EDT
JUST ADDED:
Tour the New Orleans Lager & Ale Brewing Co.
- a Sustainable Brewery!

Asphalt Sustainability Conference
November 4-5, 2014 • Omni Royal Orleans, New Orleans, LA
www.asphaltpavement.org
THANK YOU

asphaltpavement.org

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@AudreyRCopeland
What do we value?

• Decision Makers
  – Cost over life-cycle
  – Performance
  – Long-life – quality of ride over life

• Driver Perception Survey
  – Smooth, Safe, Quiet
  – Service
    • Well-maintained
    • Delays & construction timing
  – Quality of drive
Total Estimated Tonnage: 351 million

Tons of RAP Used in Asphalt Mixtures: 68 million

National Average RAP Use: 20%

Tons of RAS Used in Asphalt Mixtures: 2.3 million

Tons of WMA: 106 million
  • Chemical Additive: 12%
  • Plant Foaming: 87%
THE BIG THINGS - NOW

- PAVEMENT TYPE SELECTION
- PAVEMENT DESIGN & MATERIALS
- SUSTAINABLE PAVEMENTS
- PRESERVATION