ADVANCEMENTS IN ASPHALT SUSTAINABILITY

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2016 Arizona Pavements/Materials Conference
Nov. 16, 2016

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Takeaways

- Sustainability in NAPA
- Current Challenges in Sustainability for Pavements
- Industry Research Projects

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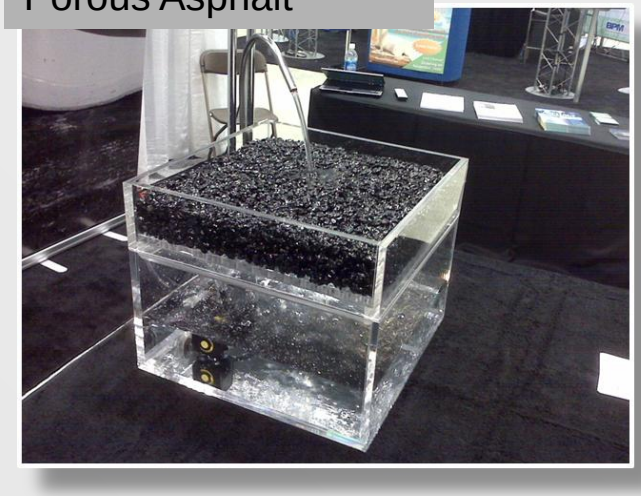
Innovative Asphalt Technologies

Porous Asphalt



Reclaimed Asphalt Pavement (RAP)

Ground Tire Rubber (GTR)

Warm Mix Asphalt (WMA)

Perpetual Asphalt Pavement

Recycled Asphalt Shingles (RAS)

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Recent Events

2010 – FHWA Sustainable Pavements Program

2012 – Industry Roadmap Mission

To improve asphalt pavement design, material, and **sustainable** technologies to ensure the continued delivery and performance of economical, safe, **quality** pavements.

2014 – Diamond Achievement Sustainable Commendation Added

& NAPA Sustainability Committee Created

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Industry Research Fund

7 NAPA-SAPA Task Groups

$1 Million Program

Funded by NAPA & SAPAs with 100% SAPA Participation

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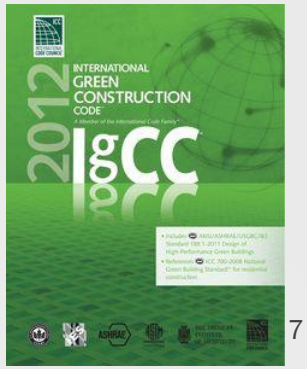
SAPA
State Asphalt Pavement Associations

THE TEAMS

- Pavement Design
- Pavement Type Selection
- Best Quality and Competitiveness
- Pavement Preservation
- Environmental Sustainability
- Legislative
- *NEW!* Private Sector Markets & Local Roads

Challenges - New Era of Transparency

- Transitioning to Credits that Require Measurement of Environmental Performance
- Cities, States, and Federal Govt. Adopting



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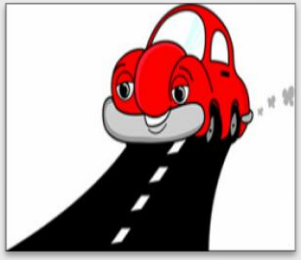
Pavement Life Cycle Assessment

LCA

Inputs – Materials, Energy, Water

Recycle/Reuse

Raw Material	Production	Construction	Use	End of Life
				
• Aggregates • Admixtures • Asphalt Binder • Transport	• Fuel • Water • Equipment	• Transport • Paving	• Vehicle Operation • UHI • Stormwater Runoff • Maintenance/ Workzone congestion	• Landfill • Recycle

Outputs – Solid Wastes, Emissions to Air, Emissions to Water

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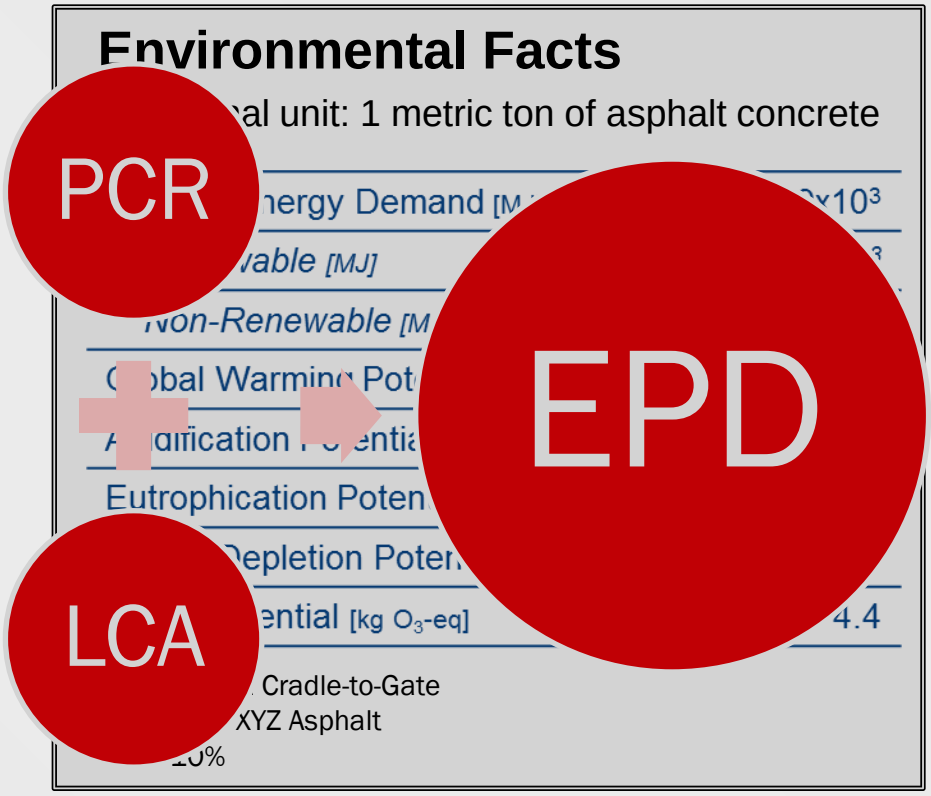
Environmental Product Declarations

EPD declares quantified environmental data for a defined product

- Fair
- Comparable
- Third Party Reviewed
- Credible



Source: PE International, Values are for illustration purposes only.

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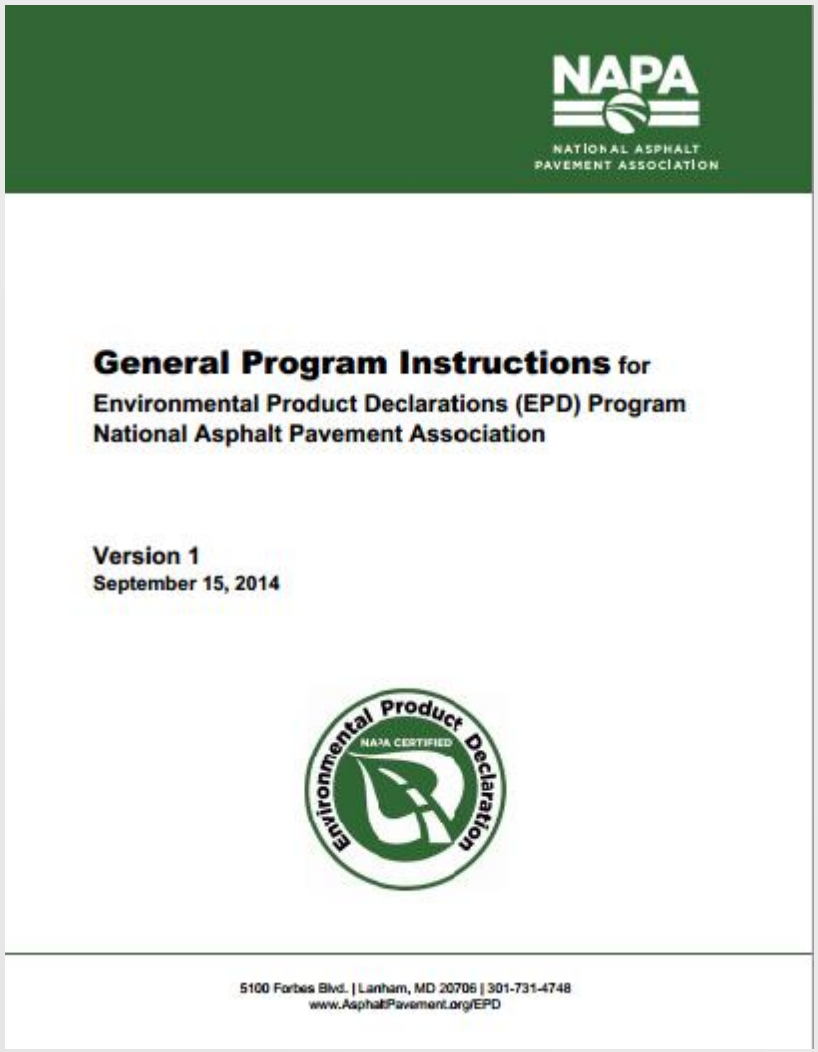
NAPA EPD Program



- Program Overseen by the Sustainability Committee
  - Created in Sept. 2014
  - International Standards
- PCR Asphalt Mixtures
  - Product: - **1 US Ton**
  - Mix-specific and plant specific
  - Meeting DOT specifications

www.asphaltpavement.org/epd

NAPA EPD Program Goal

- Benchmark environmental performance
- Communicate environmental performance transparently

Therefore PCR

- Prescribes Public Data
- No Proxies

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EPD Delivery

1. Identify Program Operator
2. Identify or Develop a PCR – Program Operator $
3. Conduct LCA study – LCA Consultant $
4. Development of EPD – LCA Consultant $
5. Verification of EPD & LCA study – 3rd Party Reviewers $
6. Publish EPD – Program Operator $

NAPA EPD Tool

Challenge: Current Process is Timely

CREATE PLANT

Create Plant: Use this page to enter the data for a new plant. This will in turn populate the data needed to specify mixes, and create an EPD. All data is private and secure.

Plant Name:	Test Plant 5	
Total Tonnage Produced:	210,000	Ton/yr
Natural Gas Usage (yearly):	80,268	MCF/yr
Natural Gas Usage (daily):	321	MCF/day
Electricity Usage (yearly):	617,240	kW/yr
Electricity Usage (daily):	1,691	kW/day
Onsite Generator Fuel Type:	CHOOSE ONE	
Onsite Generator Fuel Usage:		Gal/yr

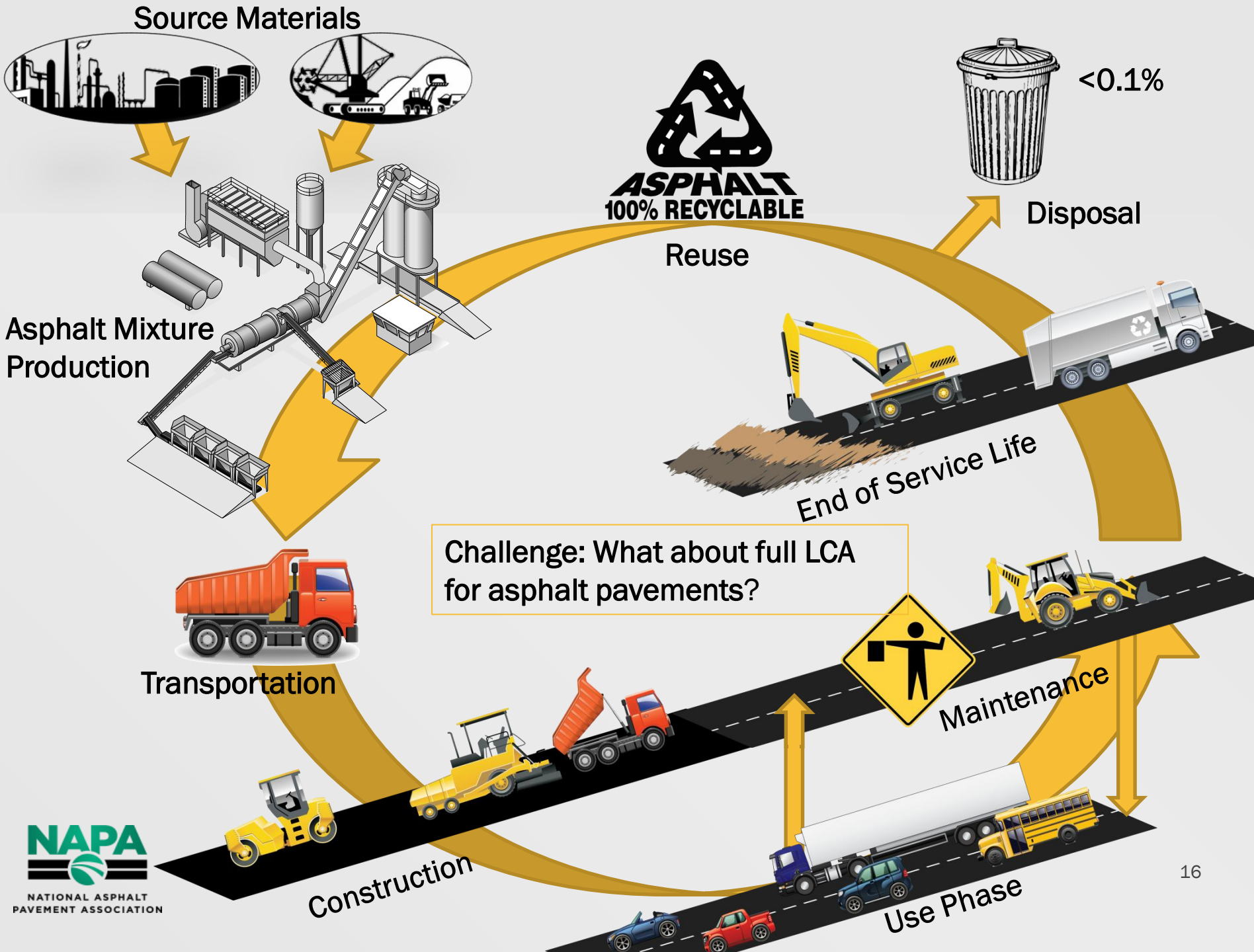
Need help? Download our Guide to Plant Data HERE.

trisIGHT

Mix Page: Complete an incomplete mix by choosing Edit, or create an EPD for a particular mix by choosing Make EPD. Want to create a new mix? Go to the NEW MIX page.

Mixes	Plant	Status	Actions			
Mix 1A	#44 Georgia	Incomplete	Make EPD	Edit	Delete	
7-42C	#7	Complete	See EPD	Edit	Delete	
Mix 1B	#44 Georgia	Complete	Make EPD	Edit	Delete	
Mix 1C	#44 Georgia	Complete	Make EPD	Edit	Delete	

trisIGHT



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Surface texture

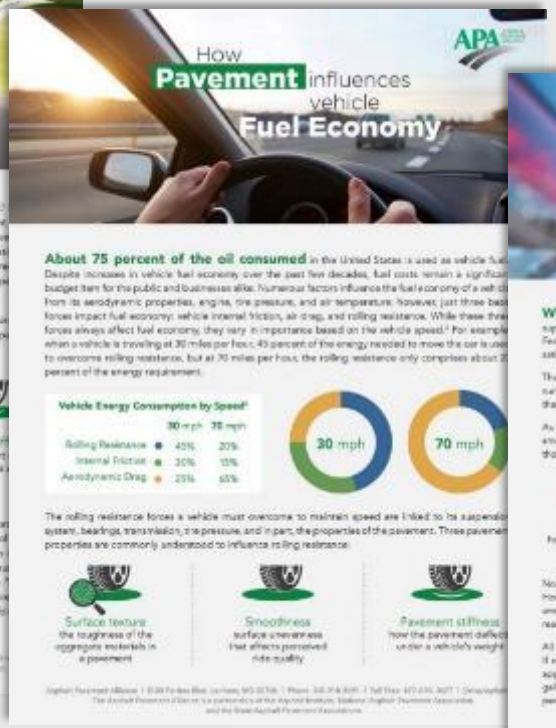
the roughness of the aggregate materials in a pavement

Smoothness

surface unevenness that affects perceived ride quality

Pavement stiffness

how the pavement deflects under a vehicle's weight



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PAVEMENT HEALTH ANALYSIS TOOL

IRI Explorer

www.IRIExplorer.com

- **Utilizes LTPP Data**
- **Free**
- **Web Based, Customizable**
- **Life-Cycle Emission Benchmarking**

Measuring Rolling Resistance

- Evaluating Equipment that Measure RR
  - Most equipment only simulates passenger cars
  - Couple of equipment in R&D phase for heavy vehicles
  - TUG – Most repeatable and robust but only simulates passenger cars
- In contact with Miriam Study Researchers

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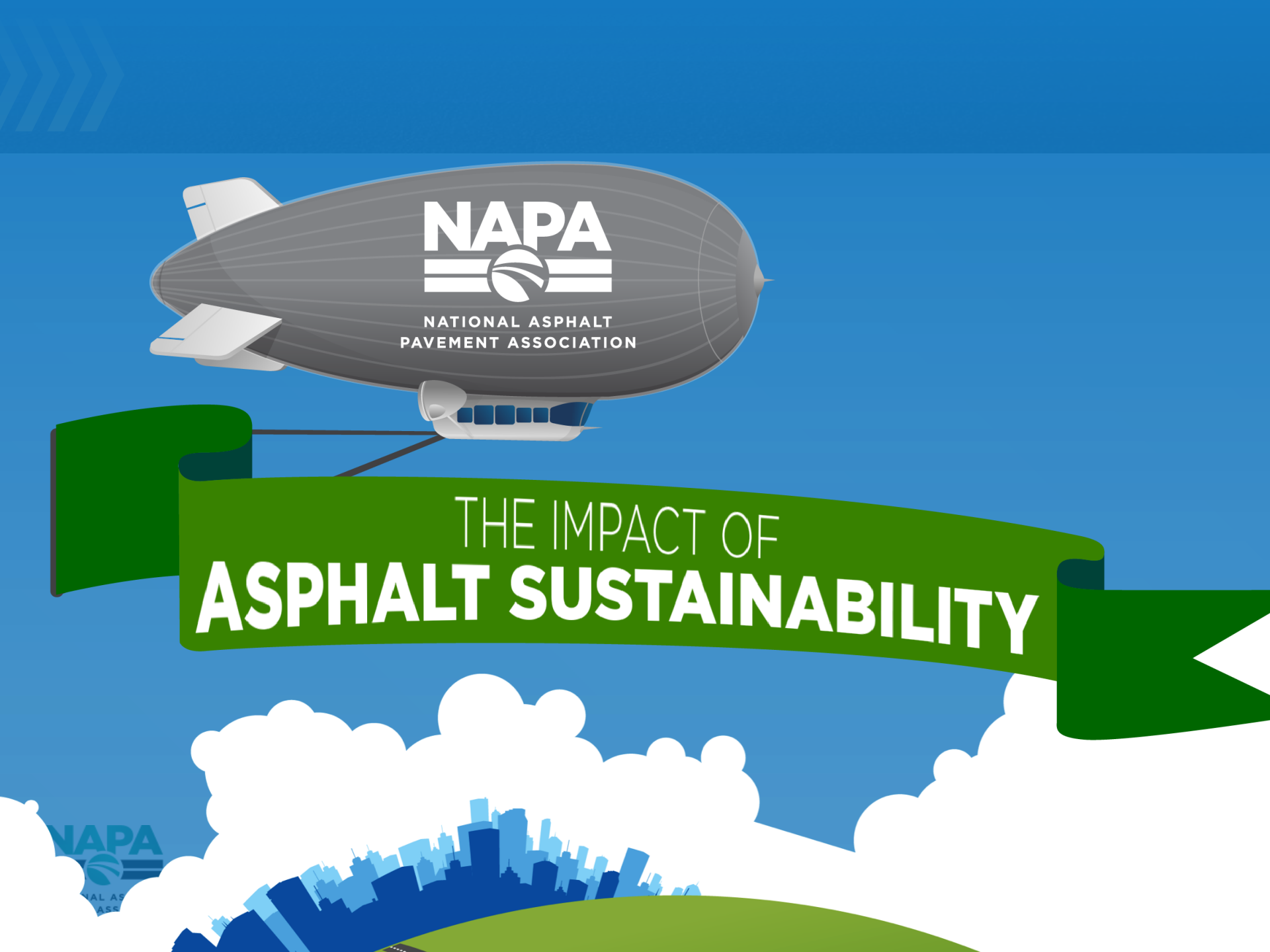
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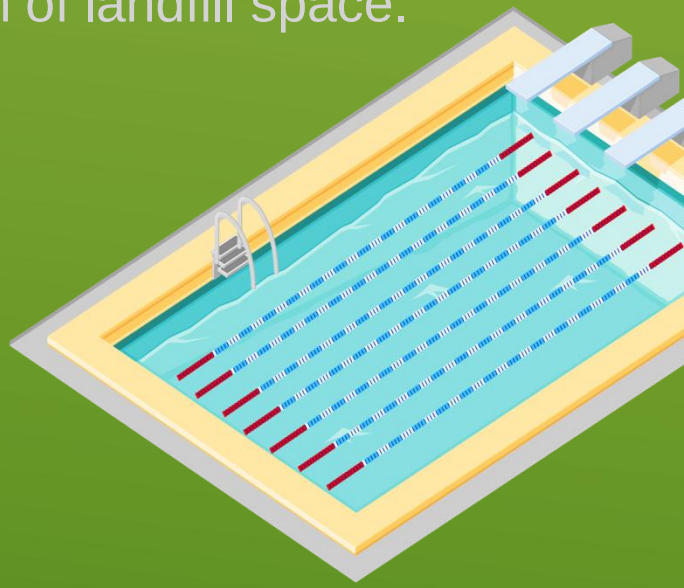
THE IMPACT OF
ASPHALT SUSTAINABILITY

Reuse of
old pavements
SAVES
13,500
Olympic-size pools
worth of landfill space.



About **4.16M**
scrap tires were used to
make quiet, rubberized
asphalt pavements.

About **1.9M**
tons of roofing shingles were put to use in new pavement mixes and other road-building uses.

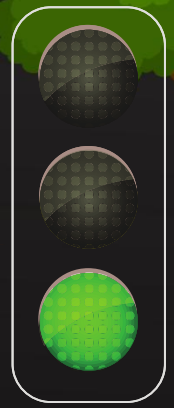
72M
tons of old pavements were put to use in new pavement mixes and other road-building activities.

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

$2.8B+ SAVINGS
from recycled materials compared to the cost of raw materials.

WARM-MIX ASPHALT
technologies have the benefit of reducing energy consumption which decreases the production of greenhouse gases.

32%+
Nearly a third of all asphalt pavement mixtures are produced using warm-mix technologies.



Specialization in Asphalt Sustainability Implementation Webinar Series

Drivers

- Legislative, Regulatory and Market

Opportunities

- Design, Construction and Maintenance of Porous Pavements
- Recycled Materials: Ground Tire Rubber
- Recycled Materials: RAP and RAS
- Sustainable Plant Operations

Tools

- FHWA Sustainable Pavements Program
- Green Rating Systems: Infrastructure
- Green Rating Systems: Buildings
- Creating a Successful Sustainability Program
- Environmental Product Declarations

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www.asphaltpavement.org/webinar

THANK YOU

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