



# The Brightest Ideas from Sustainability's Frontier

Asphalt Sustainability  
Conference West

October 13-14, 2015 • Portland, Ore.  
Portland Marriott Downtown Waterfront



# Marriott Portland Downtown Waterfront Hotel, Portland, OREGON, USA



# Delegates

- ▶ 125 registered delegates
- ▶ Representing 32 States in USA, Canada, Mongolia and South Africa
- ▶ South African delegation
  - ▶ George Mturi CSIR BE
  - ▶ Werner Kruger Much Asphalt
  - ▶ Herman Marais Much Asphalt
  - ▶ Riaan Odendaal Much Asphalt
  - ▶ Wynand Nortje National Asphalt
  - ▶ Gerhard Fourie SANRAL
  - ▶ Sasheen Rajkumar SANRAL



# Educational Sessions

- ▶ Opening Remarks Sustainability: Today and Tomorrow
- ▶ THEME 1 - Building on Sustainability
- ▶ THEME 2 - Sustainability in Practice for the Asphalt Industry
- ▶ THEME 3 - Measuring the Sustainability of Asphalt



# What is Sustainability?



UNITED NATIONS  
PLANET EARTH - SOL SYSTEM

*“Meet[ing] the needs of the present without compromising the ability of future generations to meet their own needs”*

*—World Commission on Environment and Development, 1987*

# Opening Remarks

## Sustainability: Today and Tomorrow - Michael Cote, The Lane Construction

### Asphalt-related numbers

NAPA founded in 1955. 1200 member companies.

**4000** asphalt plants in the U.S. **300,000** jobs supported.

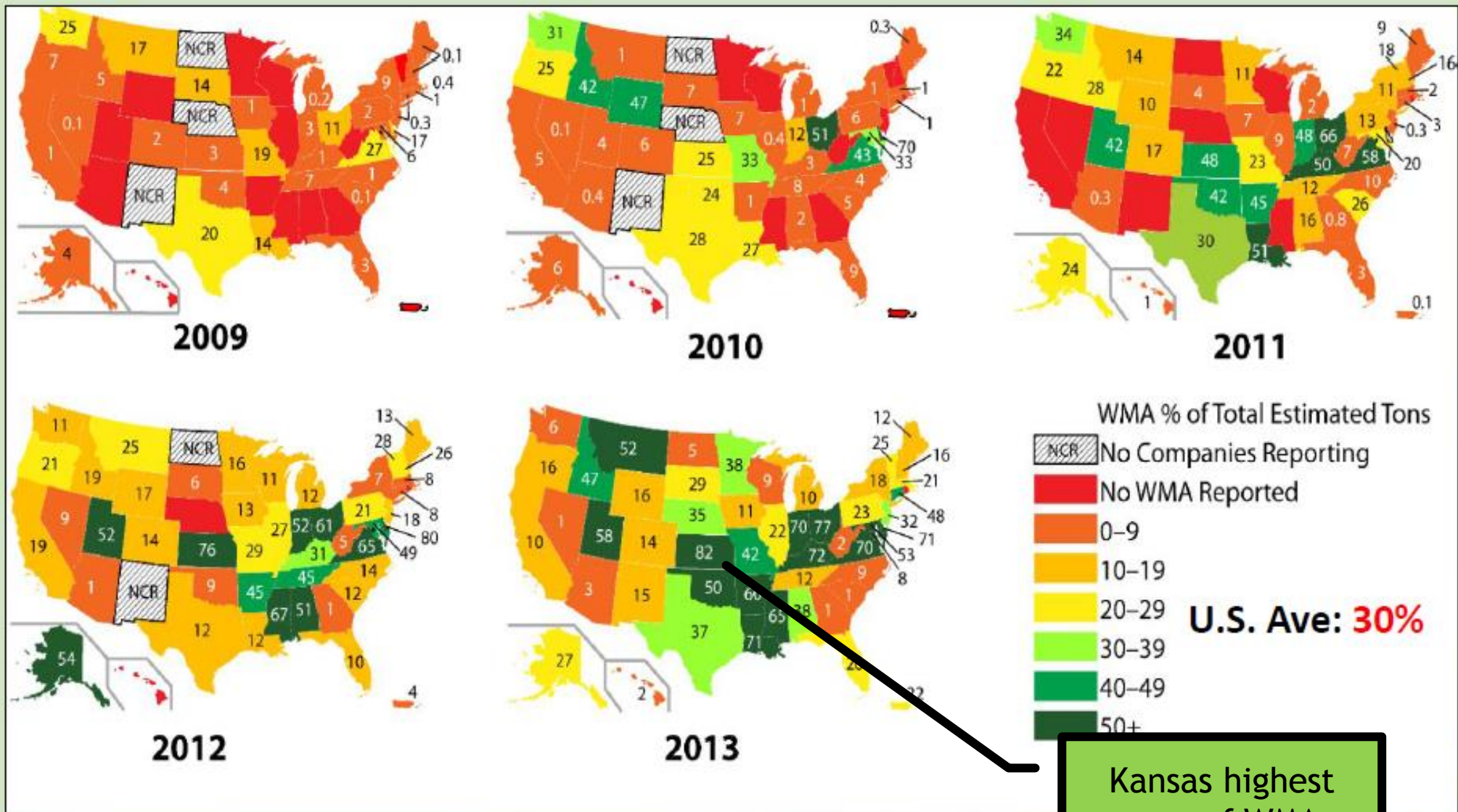
**2.6 million** miles of paved roads in the U.S.

**94%** are paved with asphalt.

Asphalt recycling saves **21 million** barrels of oil per year.



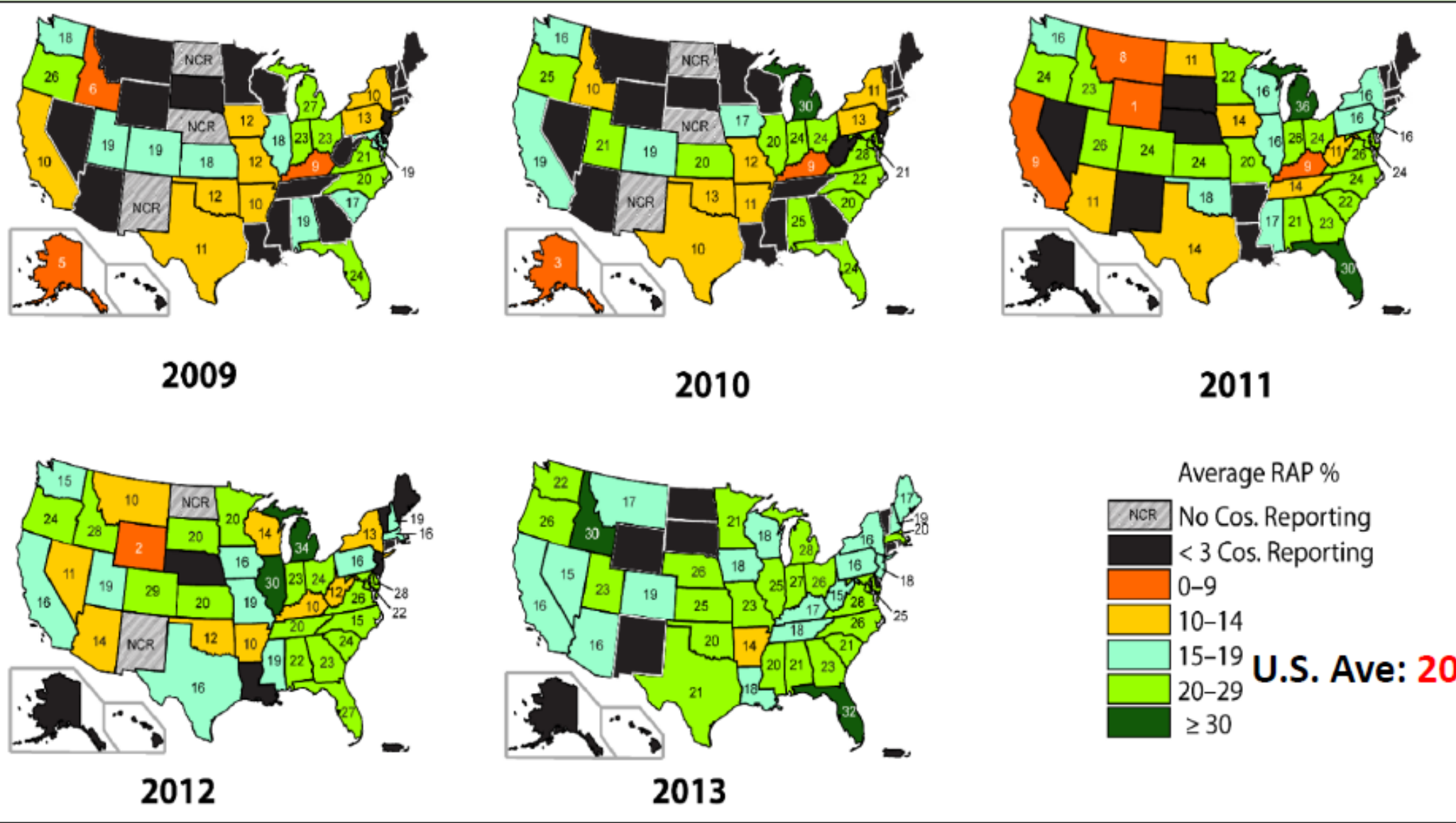
# USA - Increase in use of WMA



Kansas highest user of WMA  
82% of total Tons



# USA - Increase in use of RAP





# Sustainable Asphalt

- ▶ Sustainable pavements - Key to sustainable transport infrastructure:

- Warm Mix Asphalt
- Porous Pavements
- RAP (Reclaimed Asphalt Pavement)
- Quiet, Smooth
- RAS (Reclaimed Asphalt Shingles)
- Perpetual
- Tyre Rubber
- 100% Recyclable

- ▶ Improving pavement performance & durability makes it more sustainable

# Sustainability - Impact of Roads

## Why Does It Matter?

- U.S. highway system provides:
  - Movement of freight/commodities
  - Access and mobility to schools, services, work, etc.

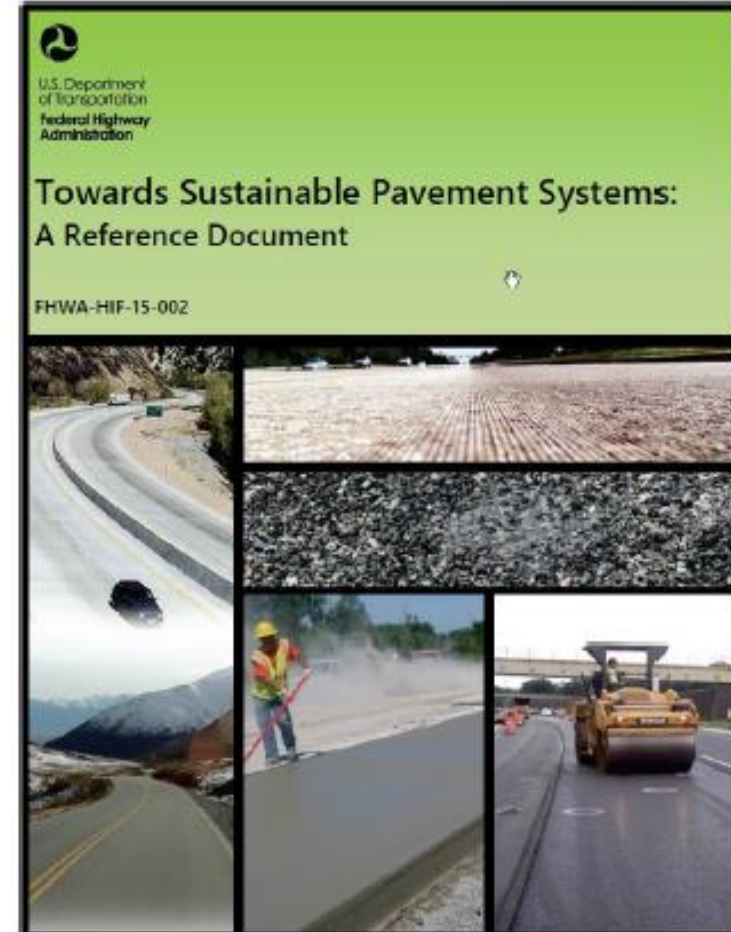
- Statistics (2010)
  - 4 million miles public roads
  - 3 trillion vehicle-miles traveled
  - 169 billion gallons of fuel consumed



- Pavements integral part of the system

# “Towards Sustainable Pavements: A Reference Document”

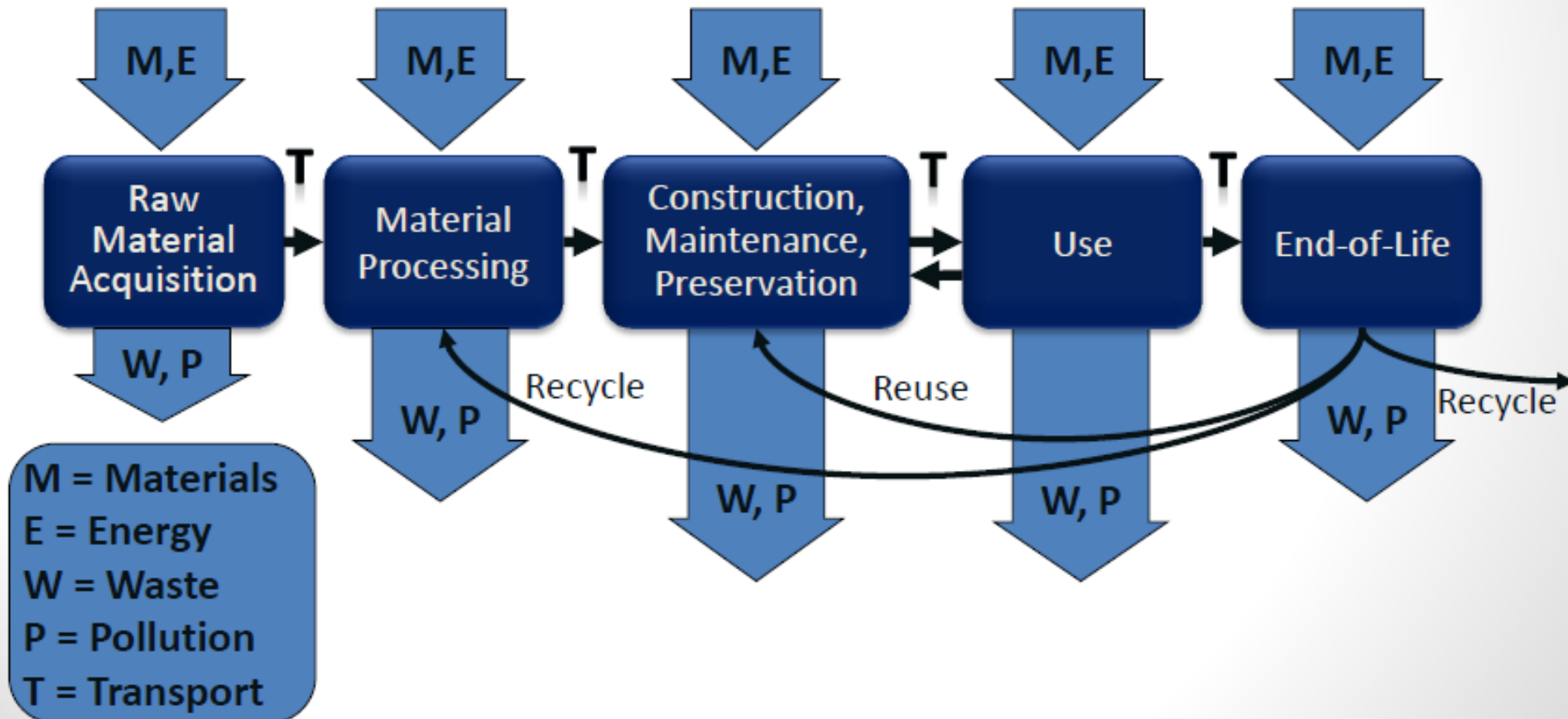
- Published February 2015
- Available on FHWA web site
- Hardcopies available



[www.fhwa.dot.gov/pavement/sustainability](http://www.fhwa.dot.gov/pavement/sustainability)

# Technical Guidance: Life Cycle Assessment

- Life Cycle Assessment examines the environmental flows occurring at each stage



# The Purpose of an LCA

- LCA is a structured evaluation methodology that quantifies the environmental impacts over the full life cycle of a product or system, including impacts that occur throughout the supply chain.
- LCA can be used for a variety of purposes
  - Identifying opportunities to improve environmental performance; Benchmarking
  - Inform and guide decision-making for policy, planning, or design
  - Support environmental claims or EPD

# Concluding Remarks

- Sustainability remains an emerging field
  - No single activity makes pavements more sustainable
  - Opportunities exist in all life cycle phases
  - Consider trade-offs & context sensitivity
- FHWA program working to provide guidance and information for practitioners
  - Reference Document
  - Life Cycle Assessment
  - Tech Briefs
  - Webinars
  - Web page
  - Outreach events





### What is Greenroads?

An independent 3<sup>rd</sup> party sustainability rating system for transportation design and construction. It awards points for more sustainable practices and can help quantify and communicate the sustainable attributes of a transport project.

It is like LEED® for roads.

# Greenroads - Implementation

- ▶ Contractors have a substantial role to play
- ▶ Road owner has a policy (requirement) on Greenroads
- ▶ Bid documents and specifications geared for Greenroads
- ▶ Greenroads alternative provided by contractor



# Japan High-RAP Scan Tour

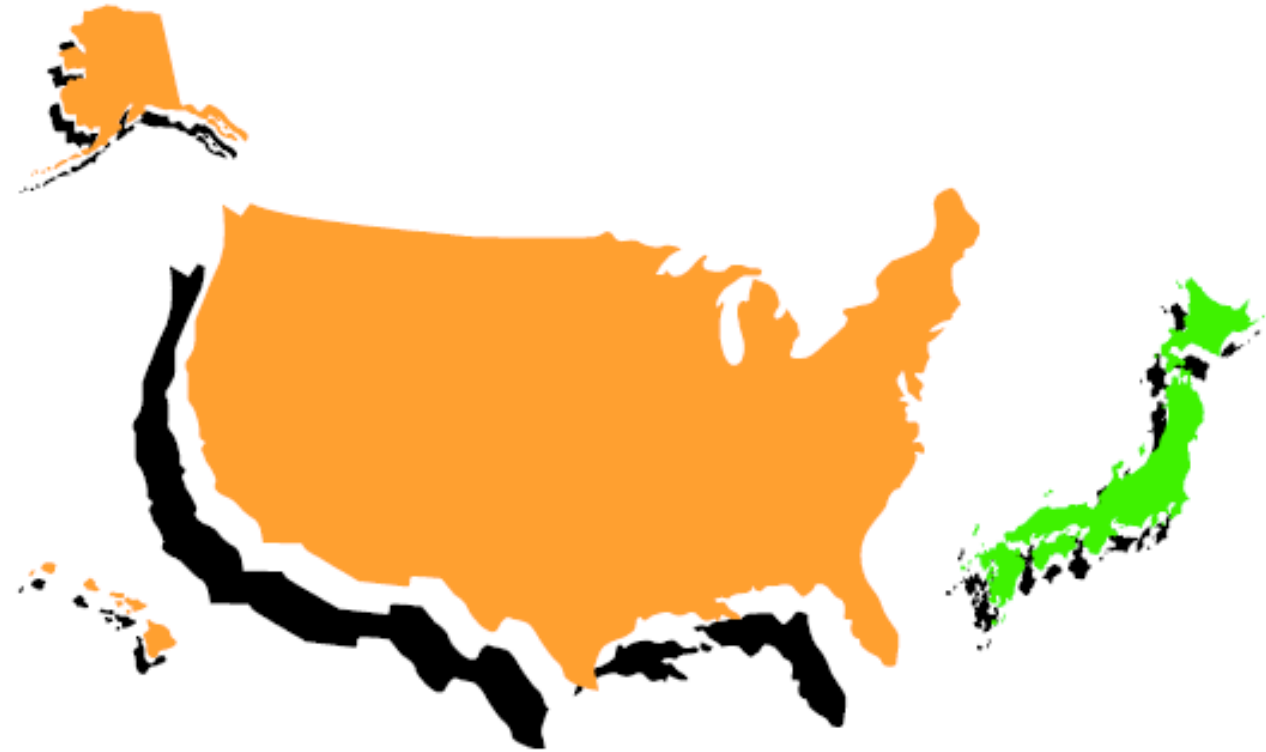
December 1-10, 2014

C:\Users\MMCote\Documents\Japan Scan Tour 2014\Later  
iphone pics Japan\PC103493.JPG



# Size and scale compared to U.S.

- Japan has roughly half the population and only about 4% of the land area of the U.S.
  - ▣ Production is about 50 million tons with about 1,000 plants
- United States production is 350 million tons with about 3,000 Plants



# Asphalt in Japan Versus U.S.

## Advanced

- Recycling over 45% RAP and use of rejuvenators
- Performance-based specifications
- Workmanship & Safety

## Lagging Behind

- Batch plants with low production
- Small projects with high unit costs
- Mix designs and materials

# RAP Processing Facility



# We can do more in the US with RAP

- We should not be afraid of high RAP mixtures
- If properly designed and incorporated – they can provide equal or greater performance



# Adding Life to Pavements

## What are long-lasting pavements?

- Similar to the perpetual pavement concept.
- Asphalt pavement designed and built to last longer than 30 to 50 years without requiring major structural rehabilitation or reconstruction is readily achievable.
- Not a new concept in that long-lasting pavements have been discussed and researched for some time and **exist all around us.**

# Using Tires to Make Better Asphalt Roads



National Asphalt Pavement Association  
Sustainability Conference West  
Portland, OR

Robert B. McGennis, P.E.  
Technical Manager - Asphalt  
HollyFrontier Refining & Marketing LLC  
Phoenix, AZ

# Summary: Impressions & Reflection - South African point of view

- ▶ Use of RAP and WMA - Are we lagging?
- ▶ Greenroads - Implementation strategies
- ▶ Life-Cycle Assessment (LCA) and environmental product declarations (EPDs) - still a long way to go
- ▶ Improve sustainability of asphalt plants
- ▶ Bitumen Rubber a sustainable product with benefits
- ▶ Sustainability remains an emerging field





