



**Concrete Thinking**  
for a sustainable world



Portland Cement Association



# Sustainable Concrete Paving: Industry Initiatives

John Melander

# Key Initiatives

- Sustainable development
- Paving
- Advocacy

**What?**

**Why and why now?**

**What are we doing?**

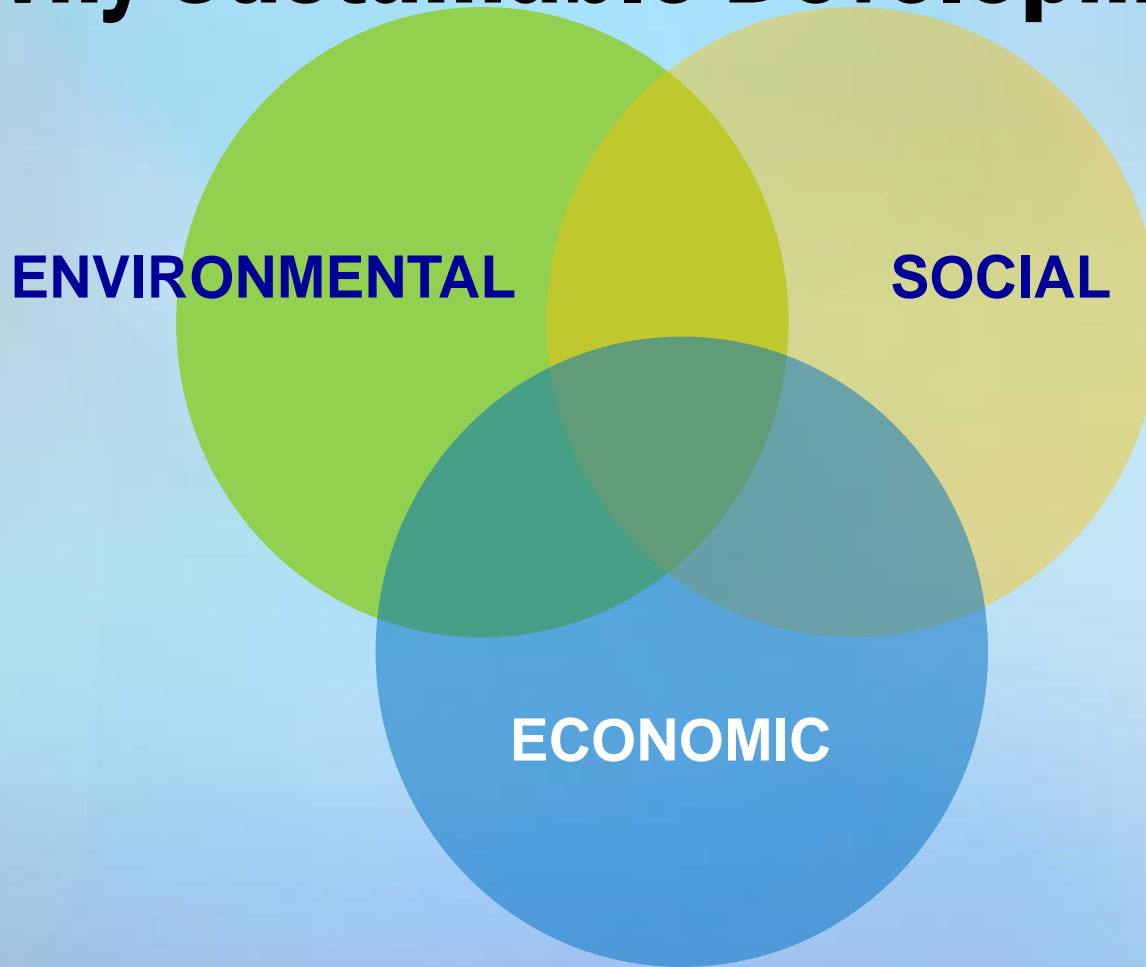
# What is sustainable development?

- "Development that meets the needs of the present without compromising the ability of future generations to meet their own needs." *World Commission on Environment and Development's Report Our Common Future (Oxford University Press, 1987).*

*Paradigm shift –*

*We have not inherited the world from our forefathers – we have borrowed it from our children – ancient proverb*

# Why Sustainable Development?



**PEOPLE – PLANET - PROFIT**

# Why Now?

## Natural Drivers

- Global warming
- Limited resources
  - Water
  - Energy
  - Land

*“There is no away”*



# Concrete - Essential in every Market



# Big Industry Footprint

After water, concrete is most widely used material in the world

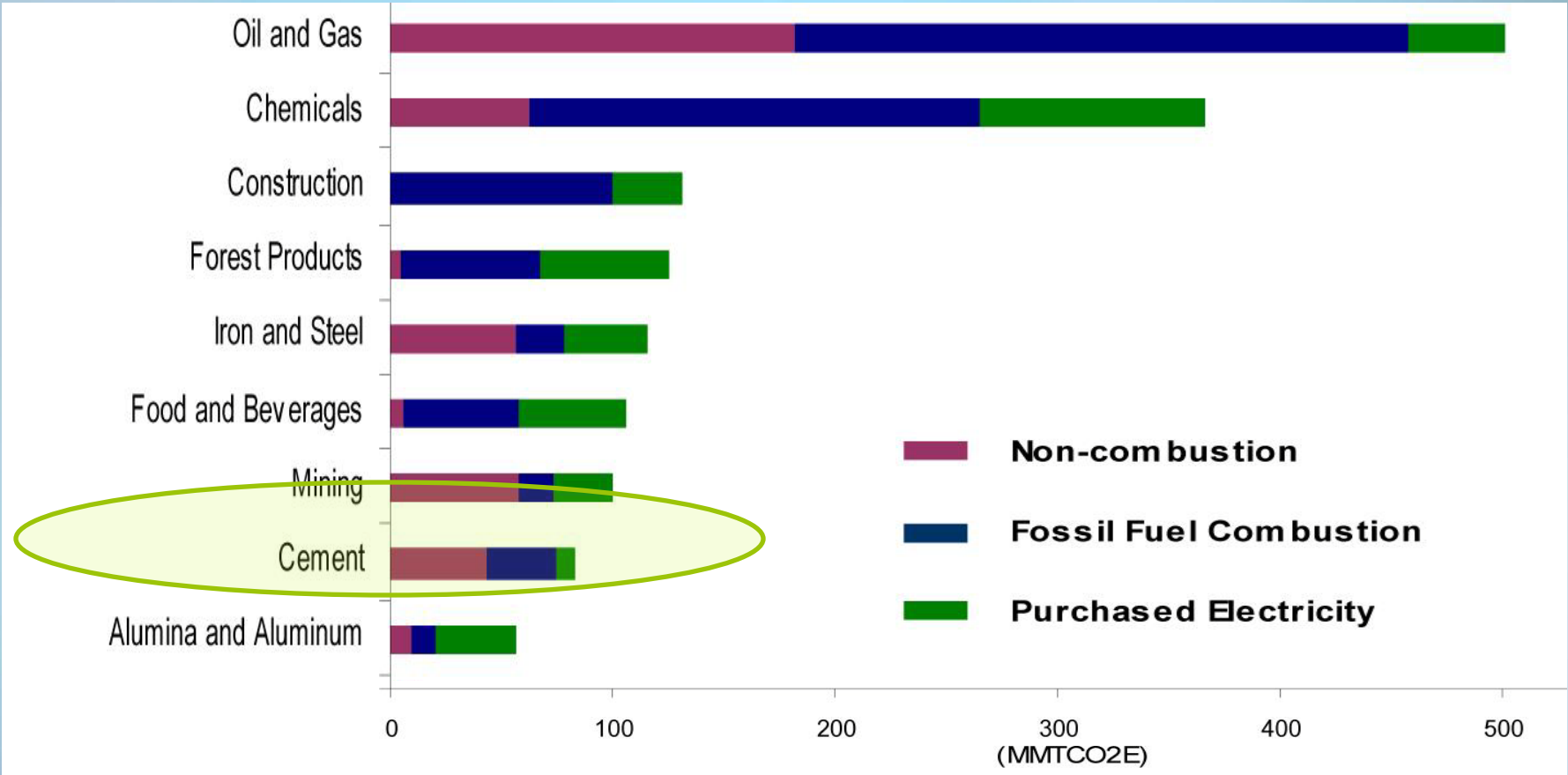
2x more than plastic, steel, aluminum, and wood, combined

CO<sub>2</sub> from cement mfg:

- Global = 5%
- U.S. < 1.5%



# How Big Are We?



**U.S. EPA, “Quantifying Greenhouse Gas Emissions from Key Industrial Sectors in the United States, 2008 report**



# What have we done and what are we doing?

## Cement Industry Action Plan - Voluntary Code of Conduct (Established in 1991)

1. Health and Safety
2. Reduce emissions (land, water and air)
3. Responsibly manage wastes
4. Energy and material conservation
5. Alternative fuel and material solutions
6. Mine in an environmentally sound manner
7. Collaborate with stakeholders

# Industry Improvement Results

Energy Use  37%

Cement Kiln Dust  75%



# Improvement Results

**Alternative Fuels**

**65%** of plants

**Alt. Materials**

**45%** of plants

# Continuous Improvement Goals

- By 2020 the following reductions:
  - Reduce carbon dioxide - **10% \***
  - Reduce energy use – **20% \***
  - Reduce cement kiln dust – **60% \***
- Environmental Management Systems
  - **75% of member plants by 2010**

\* from a 1990 benchmark

# Annual Reporting

Portland Cement Association					
		<b>REPORT ON SUSTAINABLE MANUFACTURING</b>			
		<b>2008</b>			
<b>1</b> CEMENT, CONCRETE, & VOLUNTARY GOALS	<b>2</b> SUSTAINABLE PRACTICES	<b>3</b> ENVIRONMENTAL PERFORMANCE	<b>4</b> COMMUNITY INVOLVEMENT	<b>5</b> WORKPLACE HEALTH & SAFETY	<b>6</b> SUSTAINABLE CONCRETE CONSTRUCTION
					LETTER FROM THE CHAIRMAN
					CONTENTS

[www.cement.org/smreport08](http://www.cement.org/smreport08)

# Joint Industry Sustainability Initiative

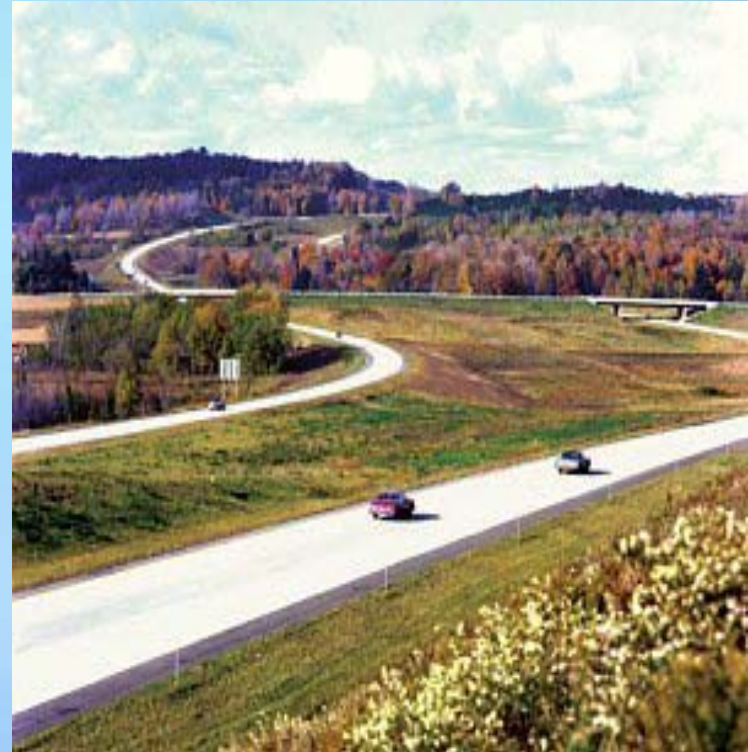
- Develop common vision of industry sustainability
- Pool resources and minimize duplication to implement vision
- Back-up sustainability messages with facts
- Coordinate communication

# 8 Social Values of Concrete Structures

1. Resource Efficiency
2. Safety/Protection
3. Financial Responsibility
4. Operational Continuity
5. Longevity/Durability
6. Byproducts Reduction
7. Esthetics
8. Societal Connectivity



# Why Concrete Paving?



**Concrete is the economical and sustainable choice to meet our growing demands for transportation infrastructure**



# “Concrete Roads and Roast Beef”

Advertising campaign for streets and roads brought concrete benefits home for dinner

*Saturday Evening Post, 1919*

## Concrete Roads and Roast Beef

**T**HIS load of roast beef—live stock from farms in the vicinity of Indianapolis, Ind.—is on its way over one of the **concrete roads** of Marion County to the Indianapolis stockyards.

Before the combination of motor trucks and **concrete roads** existed in Marion Co., farmers in the vicinity of Indianapolis had to sell live stock to dealers, who bought enough cattle in the neighborhood to make a cartload for shipment to Indianapolis.

What the **concrete roads** leading to Indianapolis have done for stock raisers is best told by Joseph Jackson, one of the prominent farmers of Lebanon, Indiana.

*Read What He Says:*

“During the past few seasons **concrete roads** have enabled me to ship live stock direct to the yards by motor truck, eliminating the middle man and saving me two profits.”

“It also saves shrinkage in weight of the stock, caused by knocking it up and following down freight cars, and I can ship as often as I like, since roads for the trucks, not horse wagons, to get together a cartload, which often makes it necessary to include animals still under full weight.”

“Shipping by truck would be expensive over poor roads and often impossible. One can cover one can keep horse tracks going all year long, with the best wear and tear and with a minimum of gasoline.”

“**Concrete roads** and motor trucks are not, will be hereafter a great aid to the farmer shipping produce and live stock to market.”

S. E. Raub, President of the Belt Railroad & Stockyards Co., Indianapolis, also has something to say about shipment of the stock by motor truck to Indianapolis. *Read his letter, too.*

You see that roast beef may depend on concrete roads—that roads are a great factor in regular distribution of food products.

Read again the second paragraph of Mr. Jackson’s letter above. It gives some of the reasons why

*Concrete Roads PAY*

**PORTLAND CEMENT ASSOCIATION**

ATLANTA   BOSTON   CHICAGO   CINCINNATI   CLEVELAND   DETROIT  
 HOUSTON   KANSAS CITY   LOS ANGELES   MEMPHIS   NEW YORK   PHILADELPHIA  
 PITTSBURGH   RICHMOND   ST. LOUIS   ST. PAUL   WASHINGTON

**CONCRETE FOR PERMANENCE**

**W.S.S.**  
 WASHINGTON STATE  
 LUMBER PROMOTION  
 COMMISSION

# “The Sweetest Ride Yet”

Celebrity spokes-  
persons pitched  
concrete for the  
Interstate system

Bob Hope, *Saturday  
Evening Post*, 1959

February 25 (U.S. 50) near Coonville, Miss., it's new-type concrete . . . the sweetest pavement for smooth driving.

**“How flat can a highway be?  
Travel this new-type concrete  
as I did—you’ll see!”**

Says BOB HOPE,  
popular motion picture star,  
now starring in “Alas Jesse James”  
in De Luxe Color  
released through United Artists

“Flat jokes, I can do without. But when it comes to highways—the flatter the better, I don’t know how they get new-type concrete so flat and smooth-riding, but I like it. Makes driving easy, really relaxing. When I hear about all the miles of it as the Interstate System, man, I’m ready to roll!”

Two miles or two thousand—every ride is a pleasure trip on new-type concrete.

Quiet and comfortable. Needs a thump, laid continuously. It has only tiny, smooth-in cushion spaces you can’t hear or feel.

You get a smooth-riding surface that freezing and de-icers won’t roughen. Billions of interstate drivers prefer it. They’re put into new-type concrete by a unique process called “air entrainment.”

Then, too, specially designed subbases keep this pavement firm and level. No waves or ripples. Laid flat, concrete stays flat!

New-type concrete has a life expectancy of 50 years plus—with up to 60% less upkeep cost than asphalt. Yet initial expense is moderate. Concrete is one of the best friends a taxpayer can have!

And what could be safer? Wet or dry, concrete’s grippy surface gives dependable skid resistance. At night, its light color gives you far better visibility than on any dark surface.

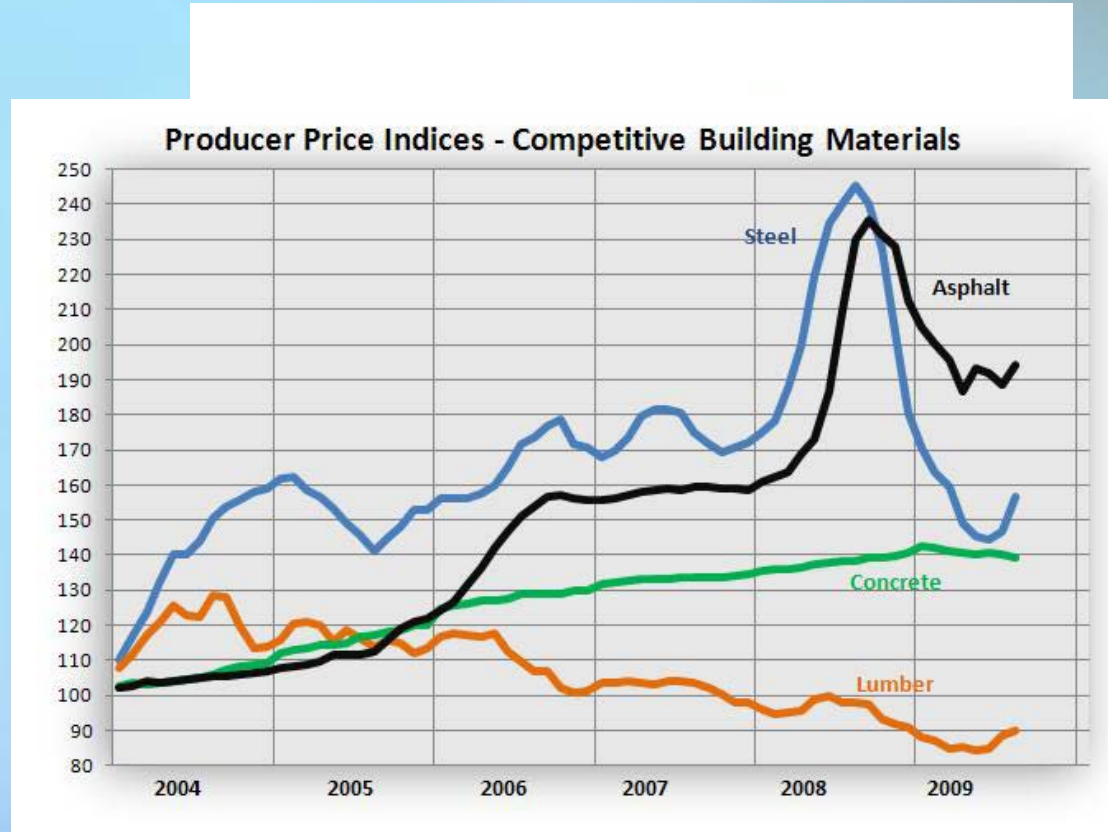
Look for new-type concrete on new Interstate System highways. It’s the preferred pavement!

**NEW-TYPE  
Concrete**

**PORTLAND CEMENT ASSOCIATION**  
A national organization to improve and extend the uses of concrete.

# Concrete Paving: Why Now?

- Infrastructure renewal
- Asphalt pricing
- Sustainable public works



throughout the economy and is the foundation of durable, sustainable economic activity.

**Sustainable:** the manufacturing of cement, the main ingredient of concrete, uses recycled materials and domestic waste as energy sources.

When America uses concrete, we pour strength into our recovery.

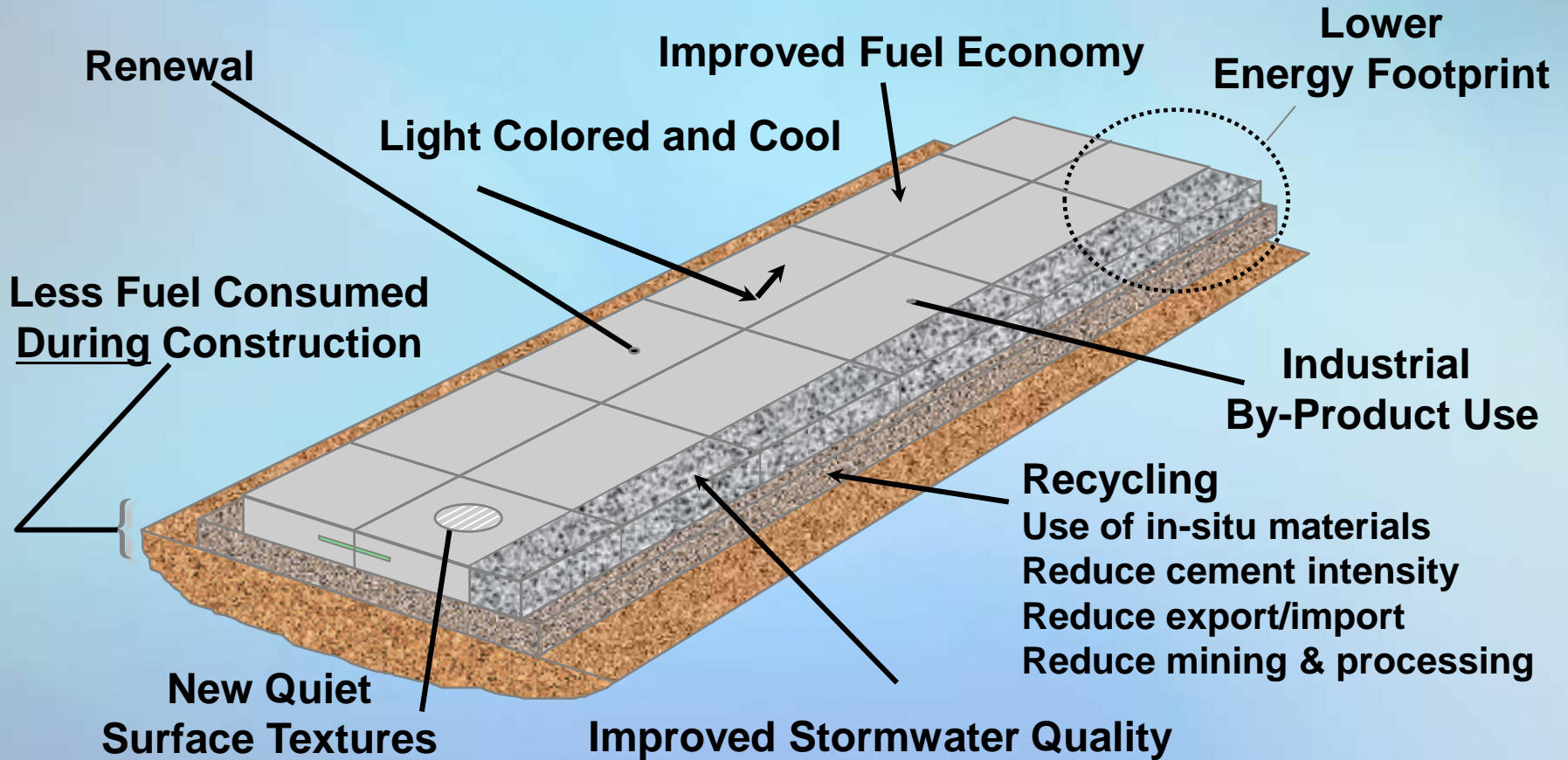
# What are we doing?

- **Sustainable Paving Strategies**
  - **Longevity and Lifecycle Cost**
  - **Reduced Energy Use**
  - **Reduced Greenhouse Gas Emissions**
  - **Use of In-Situ Materials**
  - **Recycling and Waste Reduction**
  - **Reduced Land Disturbance**
  - **Water Quality and Stormwater Runoff**

# **Durable = Sustainable**

- **Optimal material utilization– less waste from replacement**
- **Lower maintenance costs and construction congestion**
- **Lower total cost of ownership**
- **Long life = smaller eco-footprint**

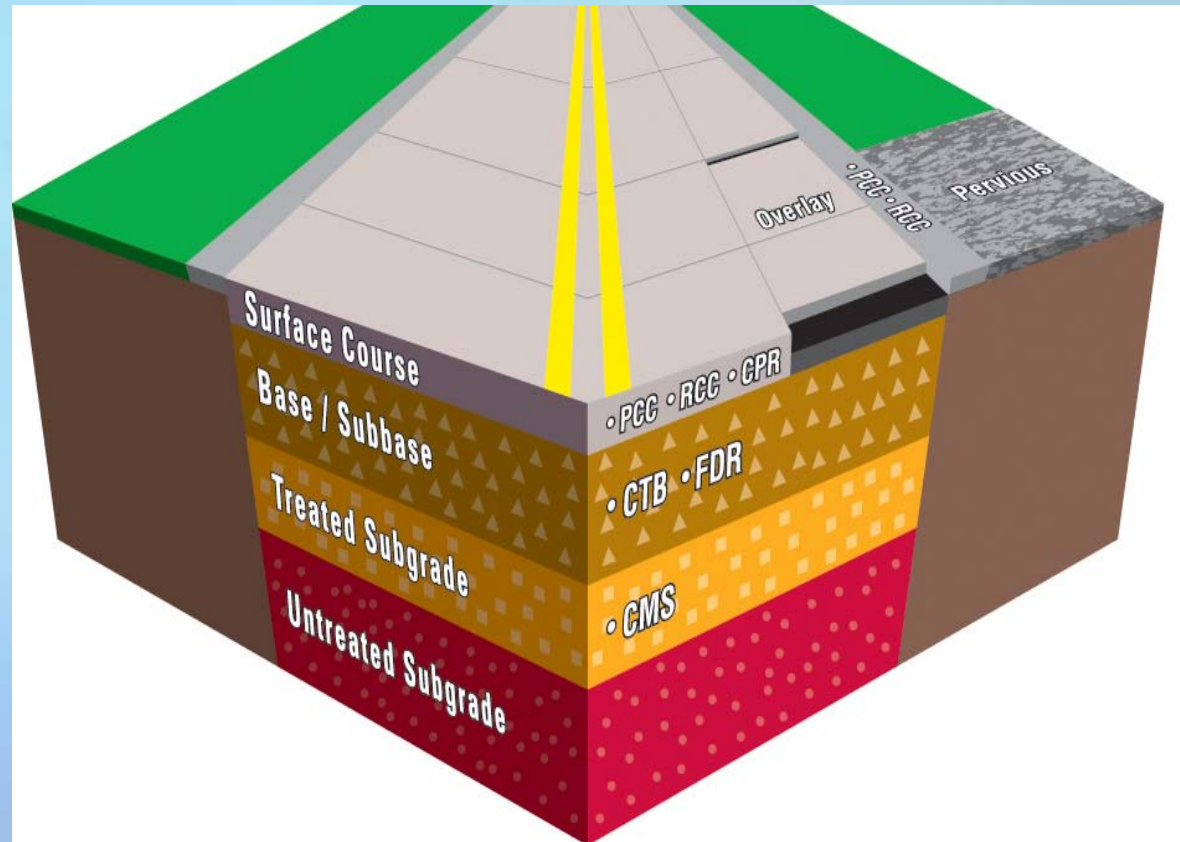
# Sustainable Benefits Beyond Longevity



# More than a surface solution

## Integrated Pavement Solutions

- Roller-Compacted Concrete
- Full-Depth Reclamation
- Cement-Treated Base
- Cement-Modified Soil
- Pervious
- Pavers
- Parking Decks



# Advocacy

- Global Climate Change
- NESHAP
- Surface Transportation Authorization

## Why and Why Now?

Legislative/Regulatory Issues Impact Our Future





The background of the slide is a close-up photograph of various cement and aggregate materials. On the left, there is a pile of fine, light-colored powder. In the center and right, there are larger, dark brown, rounded particles, likely aggregates or clumps of cement. The lighting is dramatic, highlighting the textures and colors of the materials.

# Role of Cement Standards and Technology

Enhance Cement and Concrete Performance and Use

Advance our Sustainable Development Goals

Enable Optimization of Manufacturing Technology



**Questions ?**