

# Federal Government Perspective

## Buy Clean Policies and Environmental Product Declarations (EPDs)



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# Acronyms

- *EO*      *Executive Order*
- *EPD*      *Environmental Product Declaration*
- *DOTs*      *Departments of Transportation*
- *GHG*      *Green House Gas Emissions*
- *LCA*      *Life Cycle Assessment*
- *PCR*      *Product Category Rules*
- *CC*      *Climate Challenge*
- *ACLCA*      *American Center for Life Cycle Assessment*
- *SPP*      *Sustainable Pavements Program*



# FHWA's Vision for Pavements & Materials

*Ensure that pavements are designed, constructed, preserved, and maintained to accommodate current and predicted traffic needs and consider economic, environmental, and social impacts and burdens throughout the pavement's life cycle.*



## SPP Vision:

Sustainable thinking is embraced throughout the life-cycle of all publicly-owned pavements in the United States.



# SPP Mission:

To advance the knowledge and practice of designing, constructing, and maintaining more sustainable pavements through:


- Stakeholder engagement
- Education
- Development of guidance and tools





# The Pursuit of Sustainable Pavements

Designing, constructing, and maintaining pavement systems which minimize **environmental impacts** while maximizing **economic benefits** and ensuring **equitable social outcomes**.



# Sustainable Pavements Technical Working Group (SPTWG)

- Stakeholders from highway agencies, academia, and industry.
- Role of SPTWG:
  - Share information on pavement sustainability
  - Provide input to FHWA on sustainability
  - Review documents and deliverables
  - Assist in pilot studies and implementation





# SPP Progress



## Characterizing Pavement Sustainability and Understanding Current Practices

### Life-Cycle Assessment I: Understanding Concepts

- ✓ [Pavement LCA Framework Document](#)
- ✓ [Tech Brief: Pavement Life-Cycle Assessment](#)

## Life-Cycle Assessment II: Application to Pavement Systems, Environmental Product Declarations, and Product Category Rules



- ✓ [Pavement LCA Tool](#)
- ✓ [Tech Brief: Life-Cycle Thinking](#)
- ✓ [Tech Brief: Data Needs for Pavement LCA](#)
- ✓ [Tech Brief: Environmental Product Declarations](#)

## Resiliency of Pavement Systems

- ✓ [Tech Brief: Climate Change Adaptation for Pavements](#)
- ✓ [Peer Exchange on Pavement Resiliency](#)
- ✓ [Pavement Resiliency Summary Report](#)

## PHASE 1: STATE OF KNOWLEDGE

## PHASE 2: IMPLEMENTATION

2011

2012

2013

2014

2015

2016

2017

2018

2019

2020

2021

## Documenting Sustainability Considerations in Pavement Systems

- ✓ [Sustainable Pavements Reference Document](#)
- ✓ [Tech Brief: Pavement Sustainability](#)
- ✓ [Tech Brief: Sustainability Considerations for Asphalt Pavements](#)
- ✓ [Tech Brief: Sustainability Considerations for Concrete Pavements](#)
- ✓ [Webinar Series I: Towards Sustainable Pavement Systems](#)

## Developing a Road Map for the Sustainable Pavements Program

- ✓ [Sustainable Pavements Program Road Map](#)

## Implementing Sustainability Concepts and Practices

- ✓ Case studies, video clips, newsletters, and flyers highlighting sustainable technologies and practices
- ✓ [Webinar Series II: Concepts, Practices, Evaluation and Assessment](#)
- ✓ [Deploying Pavement LCA Tool](#)



# Attaining Sustainability is an “all-hands-on-deck” effort

We can't solve problems by using the same kind of thinking we used when we created them.

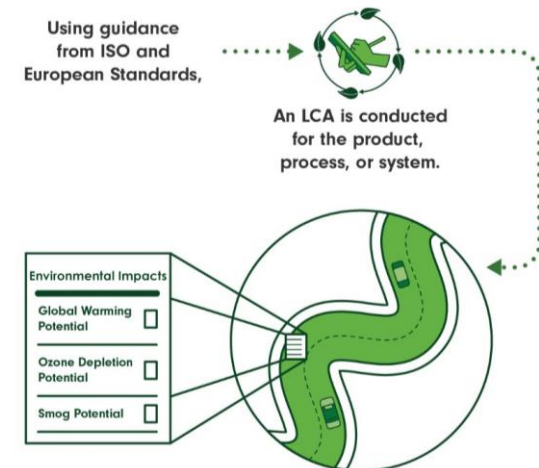


Source: OpenClipart-  
Vectors from Pixabay

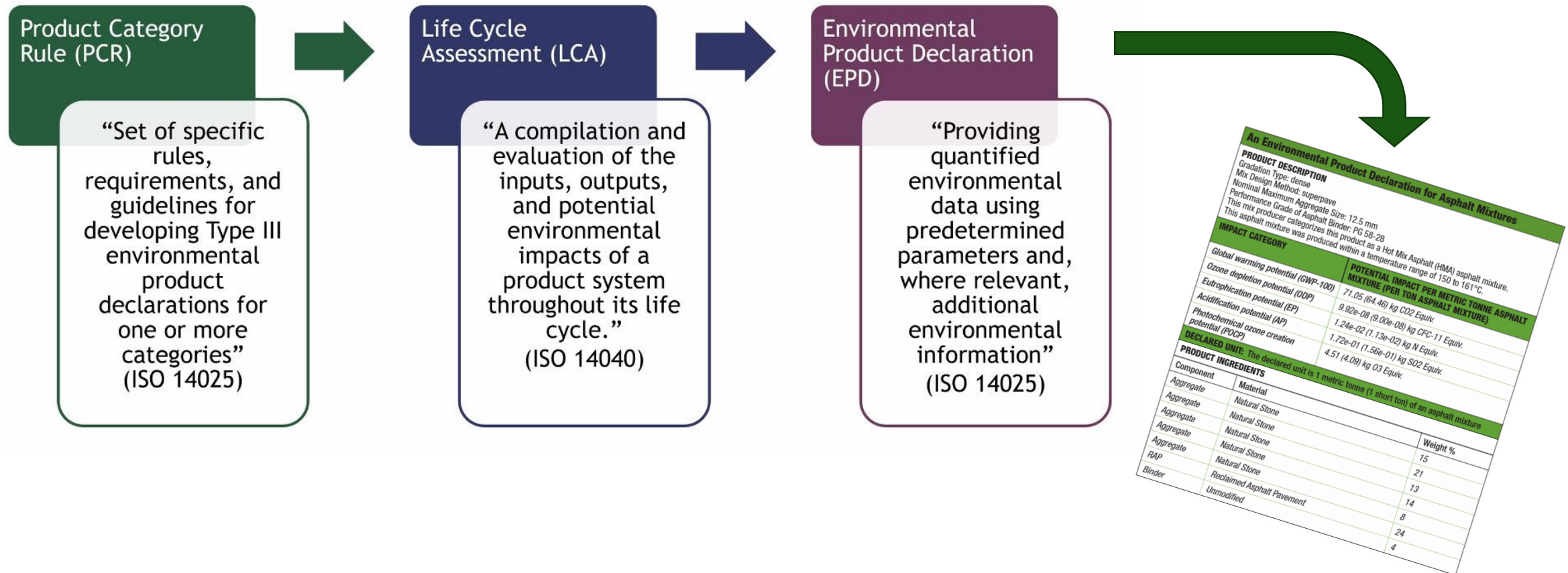


# Environmental Product Declarations (EPDs)

- Communicate environmental impacts of material or product
- Express the results of an LCA
- Developed with stakeholder input
- Follow industry standards described in the PCR
- EPDs are not required by Federal law or regulation



# EPD Program





# Sample EPDs

## An Environmental Product Declaration for Asphalt Mixtures

### PRODUCT DESCRIPTION

Gradation Type: dense  
Mix Design Method: superpave  
Nominal Maximum Aggregate Size: 12.5 mm  
Performance Grade of Asphalt Binder: PG 58-28

### ENVIRONMENTAL IMPACTS

#### Declared Product:

Description: Exterior 4000 PSI

### IMPACT CATEGORY

### POTENTIAL IMPACT PER METRIC TONNE ASPHALT MIXTURE (PER TON ASPHALT MIXTURE)

*Global warming potential (GWP-100)*

*71.05 (64.46) kg CO<sub>2</sub> Equiv.*

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7.15E-6

0.95

*Acidification potential (AP)* 1.72e-01 (1.56e-01) kg SO<sub>2</sub> Equiv.

*Photochemical ozone creation potential (POCP)* 4.51 (4.00) kg O<sub>3</sub> Equiv.

Eutrophication Potential (kg N-eq)

0.24

**DECLARED UNIT:** The declared unit is 1 metric tonne

### PRODUCT INGREDIENTS

Component	Material	
Aggregate	Natural Stone	
Aggregate	Natural Stone	
Aggregate	Natural Stone	
Aggregate	Natural Stone	14
Aggregate	Natural Stone	8
RAP	Reclaimed Asphalt Pavement	24
Binder	Unmodified	4

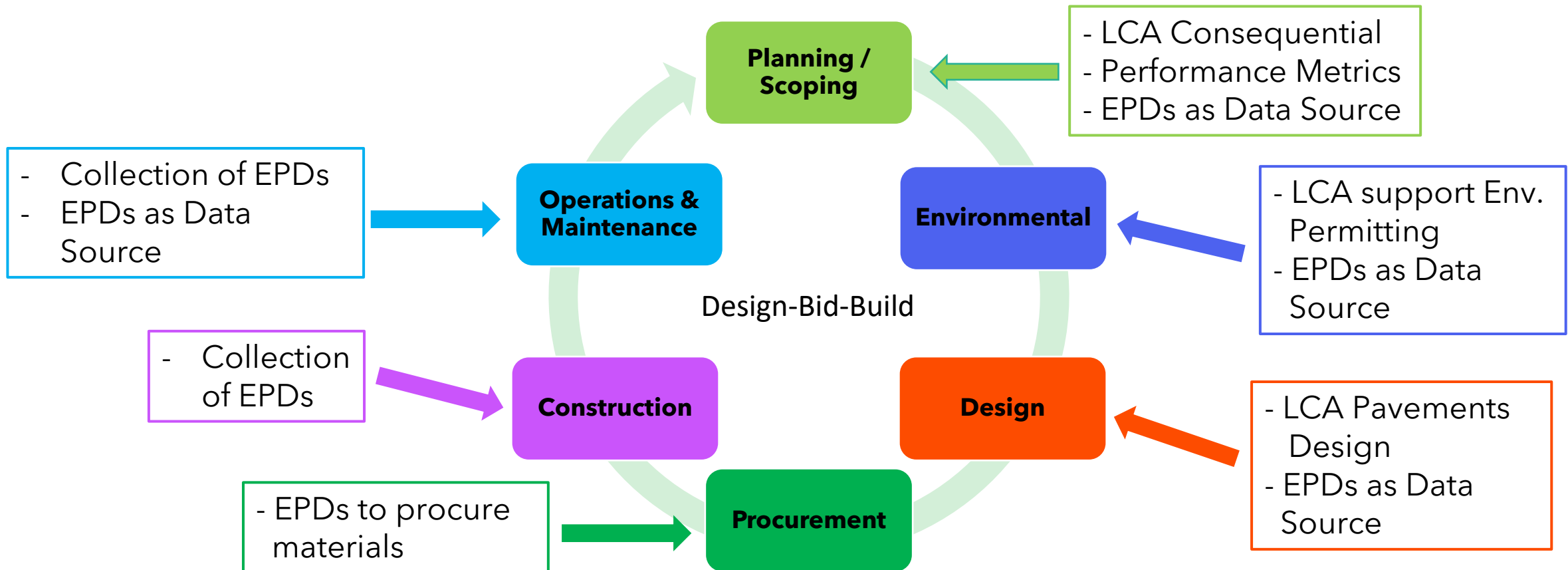
**Declared Unit:** 1 m<sup>3</sup> of concrete

Global Warming Potential (kg CO<sub>2</sub>-eq)

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**Product Components:** natural aggregate (ASTM C33), Portland cement (ASTM C150), fly ash (ASTM C618), batch water (ASTM C1602), admixture (ASTM C494), admixture (ASTM C260)

# Uses of EPDs and LCA throughout the Project Development Process



# Sustainability Initiatives in the Spotlight



**EO 14057**  
specified goal of  
Net Zero Federal  
Procurement



**25 States  
(+2 Locals)  
Participating**  
35+ projects from  
27 agencies  
\$7.1M




**Inflation  
Reduction Act**  
**\$2 Billion for FHWA**  
Low-carbon  
transportation  
materials grants





**EDC-7**  
EPDs for  
Sustainable  
Project Delivery


# Sustainability Initiatives in the Spotlight


**U.S. DOT STRATEGIC GOALS**  
As reflected in its Strategic Plan, FHWA derives its direction from the six U.S. DOT Strategic Goals.


**Safety**  
 Make our transportation system safer for all people. Advance a future without transportation-related serious injuries and fatalities.

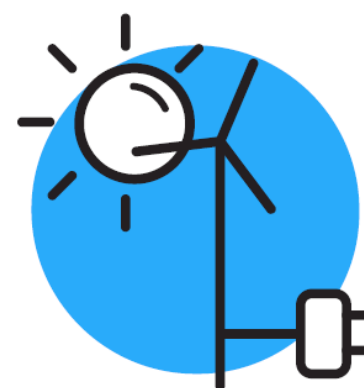
**Economic Strength and Global Competitiveness**  
 Grow an inclusive and sustainable economy. Invest in our transportation system to provide American workers and businesses reliable and efficient access to resources, markets, and good-paying jobs.

**Equity**  
 Reduce inequities across our transportation systems and the communities they affect. Support and engage people and communities to promote safe, affordable, accessible, and multimodal access to opportunities and services while reducing transportation-related disparities, adverse community impacts, and health effects.

**Climate and Sustainability**  
 Tackle the climate crisis by ensuring that transportation plays a central role in the solution. Substantially reduce greenhouse gas emissions and transportation-related pollution and build more resilient and sustainable transportation systems to benefit and protect communities.

**Transformation**  
 Design for the future. Invest in purpose-driven research and innovation to meet the challenge of the present and modernize a transportation system of the future that serves everyone today and in the decades to come.

**Organizational Excellence**  
 Strengthen our world-class organization. Advance the Department's mission by establishing policies, processes, and an inclusive and innovative culture to effectively serve communities and responsibly steward the public's resources.



## Climate and Sustainability

“...Substantially reduce greenhouse gas emissions and transportation-related pollution and build more **resilient** and **sustainable** transportation systems...”

Source: [FY2022-26 USDOT Strategic Plan](#)



## US DOT - Policy Statement on Buy Clean Initiative Embodied Carbon Working Group



# Carbon Reduction Program

## 23 U.S.C. 175

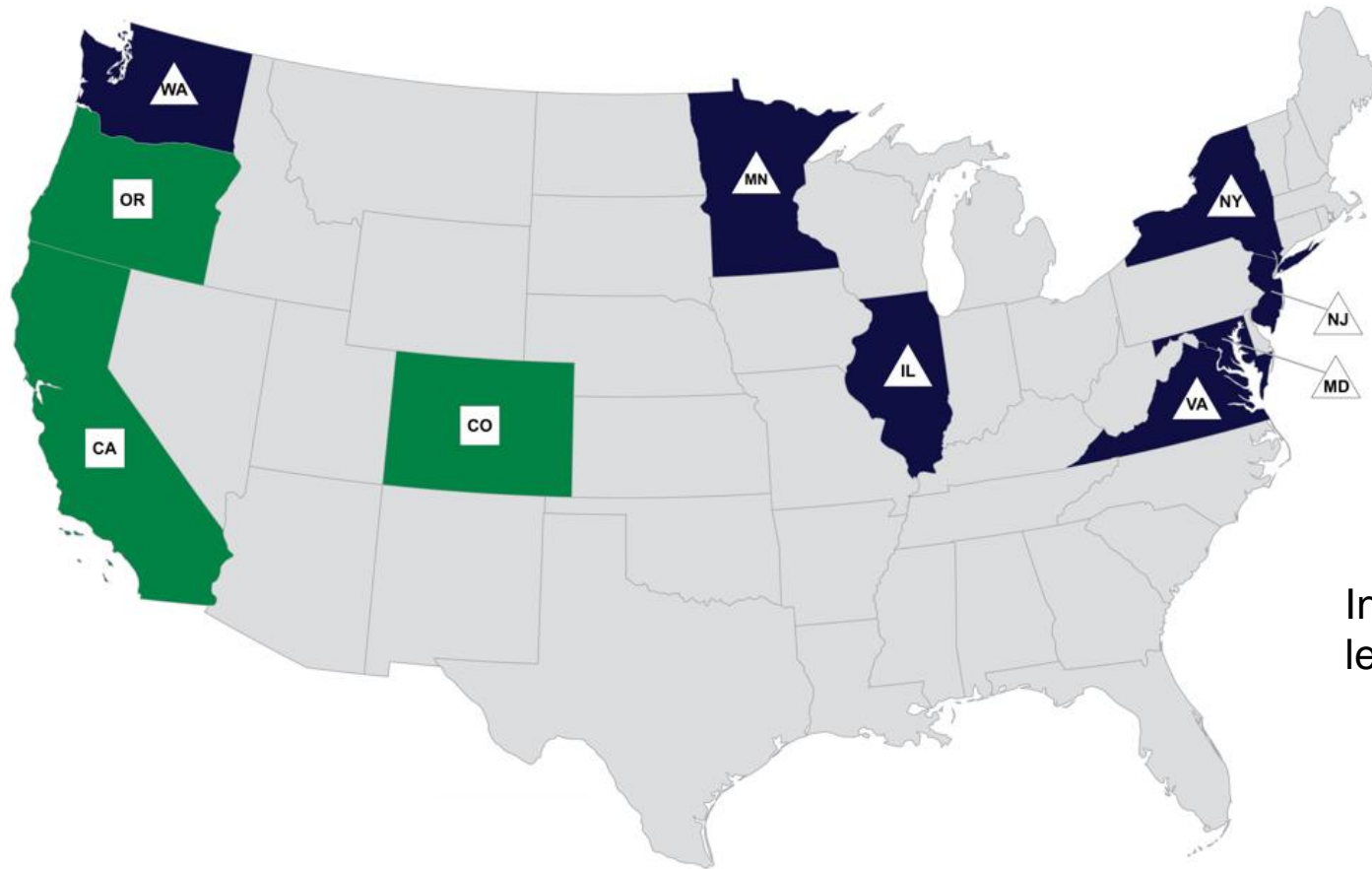
### Program Purpose:

The BIL establishes the Carbon Reduction Program (CRP), which provides funds for projects designed to reduce transportation emissions, defined as carbon dioxide (CO<sub>2</sub>) emissions from on-road highway sources.

# Inflation Reduction Act of 2022 (Pub. L. No. 117-169) - [link](#)

Section No.	Agency	Funding	Title	Expiration Date
60112	EPA	\$250M	Environmental Product Declaration Assistance	Sept. 30, 2031
60116	EPA	\$100M	Low-Embodied Carbon Labeling for Construction Materials <ul style="list-style-type: none"> <li>Identify and label construction materials with lower embodied GHG</li> <li>Production, Use, and Disposal</li> </ul>	Sept. 30, 2026
60503	GSA Federal Buildings Fund	\$2.15B	Use of Low-Carbon Materials	Sept. 30, 2026
60506	DOT FHWA	\$2B	Low-Carbon Transportation Materials Grants <ul style="list-style-type: none"> <li>Use of construction materials and products that have substantially lower embodied GHG Production, Use, and Disposal</li> </ul>	Sept. 30, 2026

# STATE level initiatives



Information collected from State legislative websites.



States that legislated green public purchasing



States that have considered green public purchasing legislation in past 2 years

# FHWA Climate Challenge: Quantifying the Emissions of Sustainable Pavements

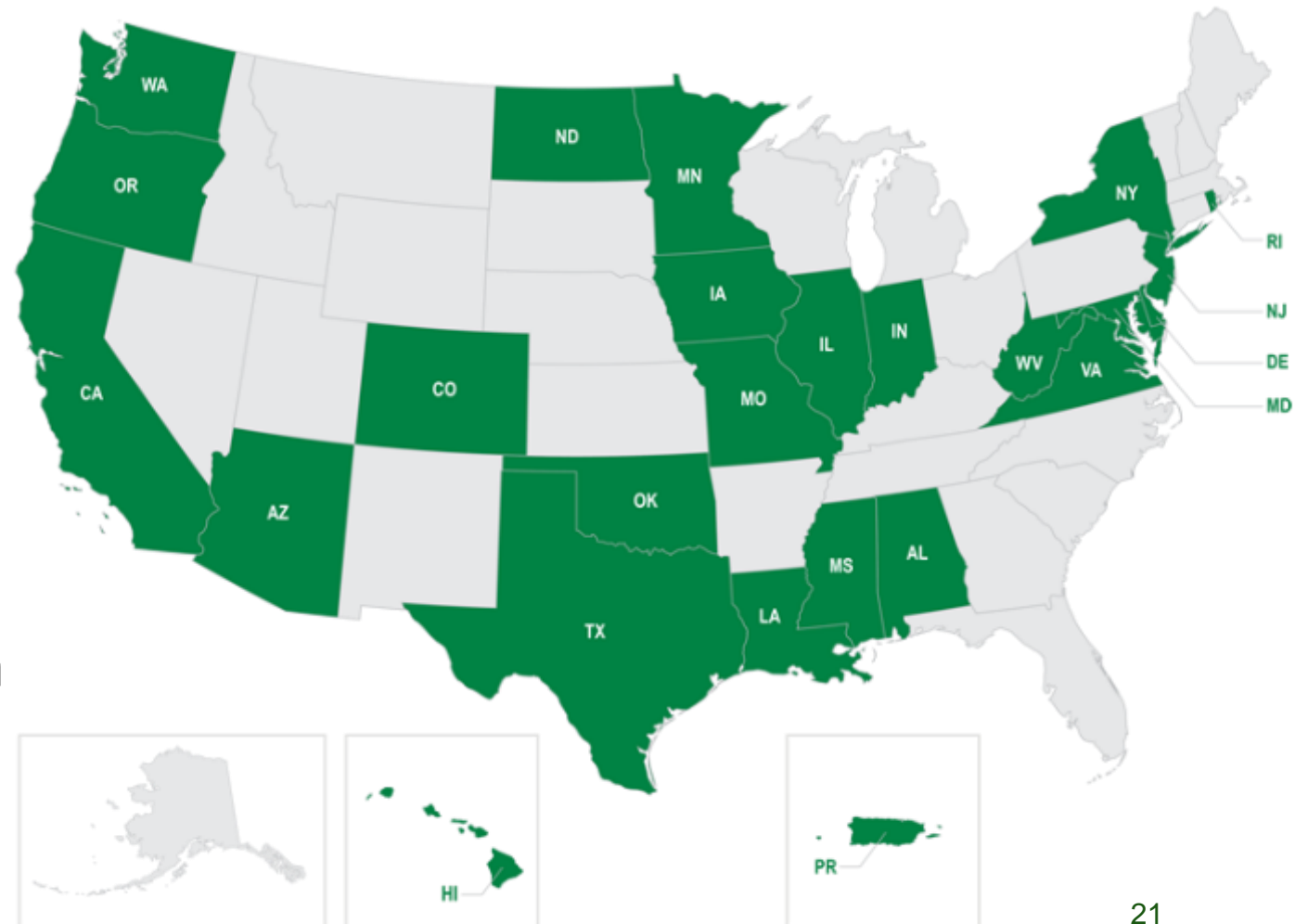
State DOTs and other public agencies explore the use of LCA and EPDs as a standard practice to inform pavement material and design selection for enhancing sustainable pavement practices and quantify the emissions and impacts of those practices.



For the latest information, visit <https://highways.dot.gov/climatechallenge>

# Climate Challenge Participants

- 30+ proposals from 27 agencies (including 2 local agencies)
  - Education, implementation, benchmarking, fundamental research projects
- Providing technical and funding (\$7.1 million) assistance
- +7 DOTs are exploring Buy Clean Policy through its projects
  - WA, MN, IN, NY, DE, MD, PR



# CC: Types of project – Asphalt and Concrete

## Asphalt

AL  
AZ  
CO  
HI  
IL  
LA  
MS  
NJ  
OK  
PANYNJ  
OR  
VA  
WV

## Concrete

City of Seattle  
Iowa  
TX

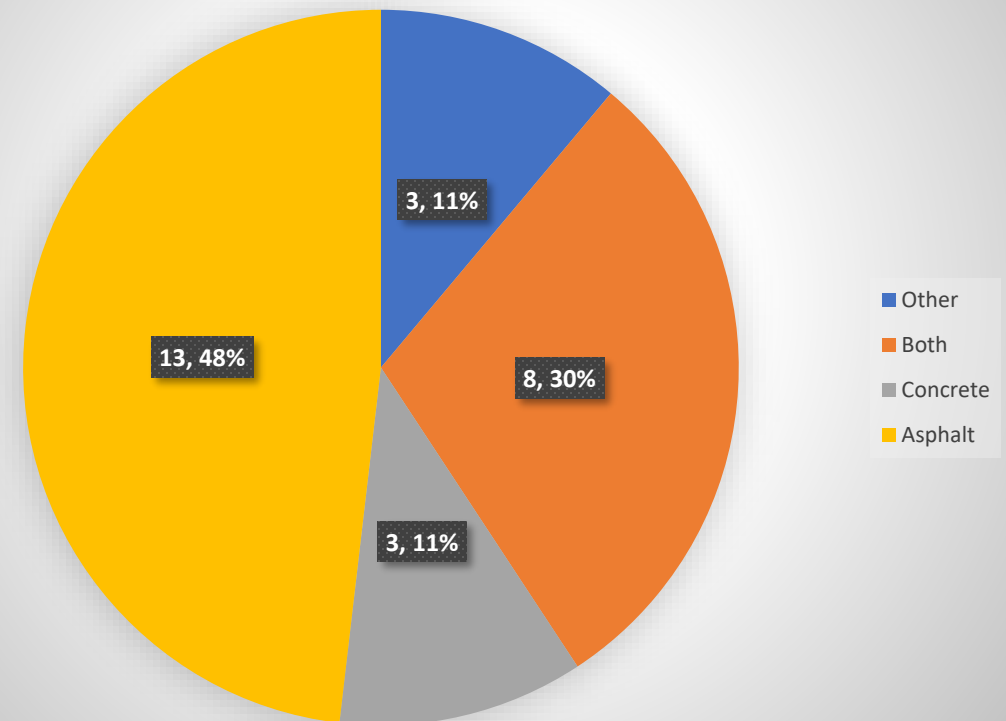
## Both (Concrete and Asphalt)

CA  
DE  
IN  
MD  
MO  
MN  
NY  
WA

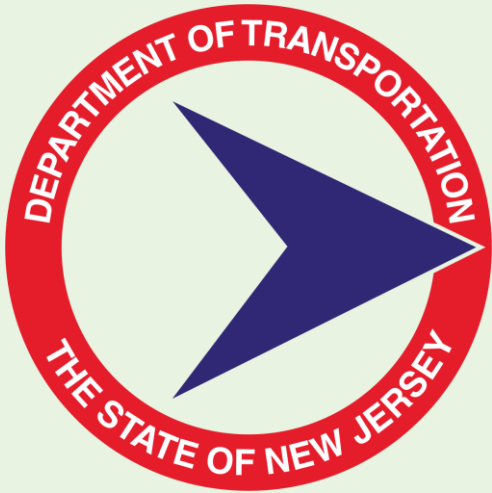
## Other

ND  
PR  
RI

**Climate Challenge Projects: Asphalt vs Concrete**



# New Jersey DOT



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***Project 1: Utilization of EPDs and LCAs to Promote Sustainability in New Jersey's Pavements***

***Project 2: Improve Sustainability of Asphalt Pavement Overlay in New Jersey***

## Project Goals:

Project 1: To utilize EPDs and LCAs to promote consideration of sustainability in maintaining NJDOT's pavement infrastructure.

Project 2: To improve sustainability and reduce carbon emission of asphalt pavement overlays in New Jersey

## Project Tasks:

- **Project 1:** (1) Conduct literature review, (2) define goals and scope of the comparative LCA analysis, (3) data collection and analysis, and (4) results and Interpretation.
- **Project 2:** (1) Experiences and lessons of using FHWA LCA Pave Tool, (2) quantification method for carbon emission at use phase of pavement, and (3) recommendations to use LCA in decision making of pavement overlays.



# Resources

- <http://www.fhwa.dot.gov/pavement/sustainability>



## Education

Pavement LCA Framework

Webinars

Tech briefs, studies

Technical articles



## Research

LCA fit in transportation decision-making

EPDs in Green Public Procurement

LCA of recycled plastics in pavements

LCA of ground tire rubber in pavements



## Deployment

LCAPave Tools

Pilot projects with State DOTs

Mobile Pavement Technologies Centers

Informing pre-engineering with ICE Tool



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<http://www.fhwa.dot.gov/pavement/sustainability>

# Thanks!



Image source: [Pixabay open-source image](#)

<http://www.fhwa.dot.gov/pavement/sustainability>