Pavement Economics Committee

NAPA Initiatives

Brett Williams

PAPA's 59th Annual Conference
January 29, 2019

NATIONAL ASPHALT
PAVEMENT ASSOCIATION

NAPA Overview

- Producer Members
  - 310 Companies
  - 532 Branches
  - 2015 Total member tons = 246 Million
  - 2015 Total estimated US tons ≈365 Million

- 275 Associate Members
  - Manufacturers
  - Material Suppliers
  - Consultants
  - Paving Companies

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STRATEGY
& EFFORTS

SAFEGAURD

PARTNERSHIPS

TRANSFORM

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The Process and the Partnership

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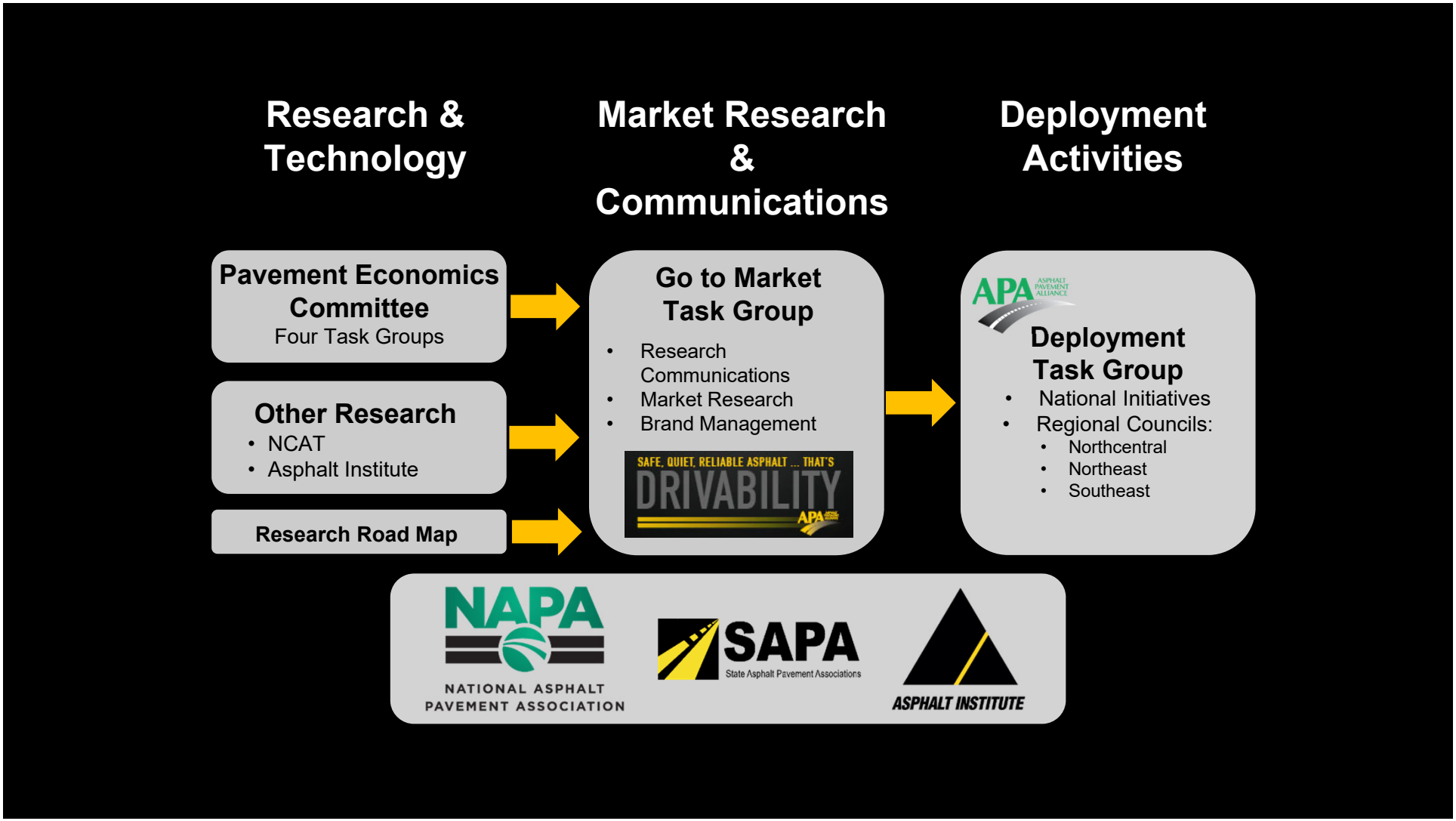
Research & Technology
Market Research & Communications
Deployment Activities
Pavement Economics Committee
Four Task Groups
Other Research
• NCAT
• Asphalt Institute
Research Road Map
Go to Market Task Group
• Research Communications
• Market Research
• Brand Management
SAFE, QUIET, RELIABLE ASPHALT ... THAT'S DRIVABILITY
APA ASPHALT PAVEMENT ALLIANCE
Deployment Task Group
• National Initiatives
• Regional Councils:
• Northcentral
• Northeast
• Southeast
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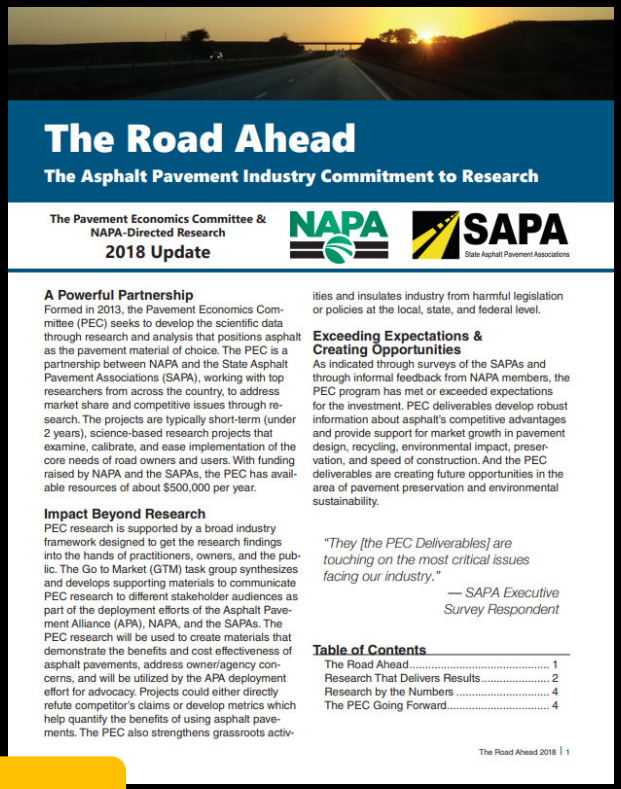
SAPA
State Asphalt Pavement Associations
ASPHALT INSTITUTE

Pavement Economics Committee

- **Financial** status
  - ≈$2.8 Million Approved
  - $2.2 Million Spent
  - 34 SAPAs Supported in 2018
- **Deliverables** status
  - 45 Projects Total
  - 35 Projects are Complete or Near Completion



The Road Ahead

The Asphalt Pavement Industry Commitment to Research

The Pavement Economics Committee & NAPA-Directed Research
2018 Update

NAPA SAPA State Asphalt Pavement Associations

A Powerful Partnership
Formed in 2013, the Pavement Economics Committee (PEC) seeks to develop the scientific data through research and analysis that positions asphalt as the pavement material of choice. The PEC is a partnership between NAPA and the State Asphalt Pavement Associations (SAPA), working with top researchers from across the country, to address market share and competitive issues through research. The projects are typically short-term (under 2 years), science-based research projects that examine, calibrate, and ease implementation of the core needs of road owners and users. With funding raised by NAPA and the SAPAs, the PEC has available resources of about $500,000 per year.

Impact Beyond Research
PEC research is supported by a broad industry framework designed to get the research findings into the hands of practitioners, owners, and the public. The Go to Market (GTM) task group synthesizes and develops supporting materials to communicate PEC research to different stakeholder audiences as part of the deployment efforts of the Asphalt Pavement Alliance (APA), NAPA, and the SAPAs. The PEC research will be used to create materials that demonstrate the benefits and cost effectiveness of asphalt pavements, address owner/agency concerns, and will be utilized by the APA deployment effort for advocacy. Projects could either directly refute competitor's claims or develop metrics which help quantify the benefits of using asphalt pavements. The PEC also strengthens grassroots activities and insulates industry from harmful legislation or policies at the local, state, and federal level.

Exceeding Expectations & Creating Opportunities
As indicated through surveys of the SAPAs and through informal feedback from NAPA members, the PEC program has met or exceeded expectations for the investment. PEC deliverables develop robust information about asphalt's competitive advantages and provide support for market growth in pavement design, recycling, environmental impact, preservation, and speed of construction. And the PEC deliverables are creating future opportunities in the area of pavement preservation and environmental sustainability.

"They [the PEC Deliverables] are touching on the most critical issues facing our industry."
— SAPA Executive Survey Respondent

Table of Contents

www.AsphaltPavement.org/PDFs/NAPA_Research_Update_2018.pdf

NAPA
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PEC Task Groups

- Mixture Quality & Performance
- Life-Cycle Cost Analysis
- Legislative
- Life Cycle Assessment

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SAPA State Asphalt Pavement Associations

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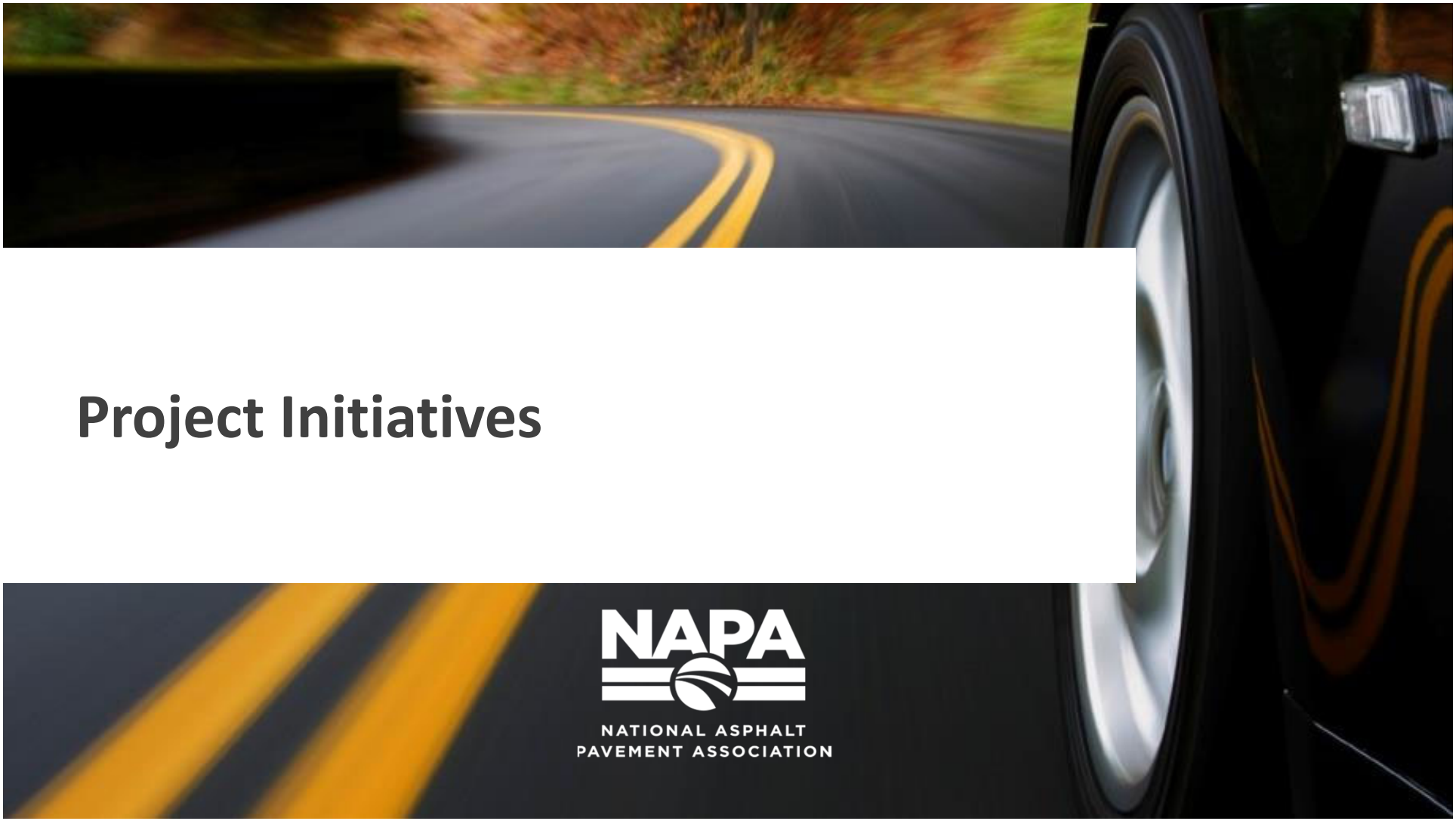

Project Initiatives

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PAVEMENT DESIGN
Simplified

Web-Based Pavement Design Tool

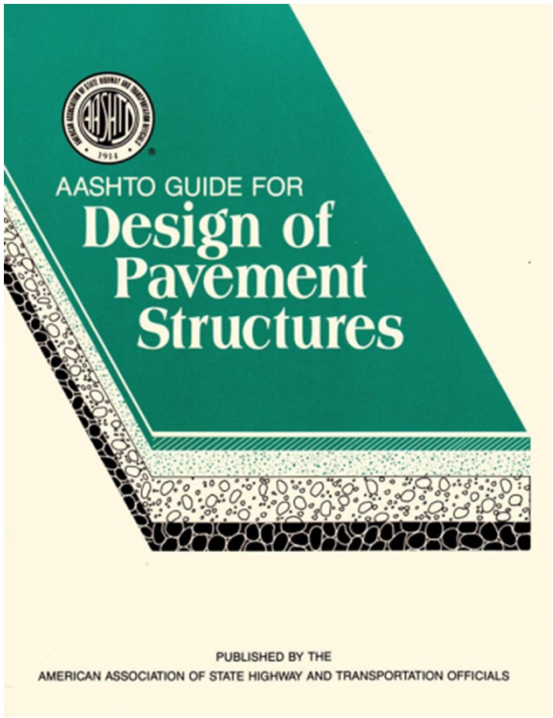
Designing the right pavement for the job just got easier thanks to PaveXpress, a free web-based pavement design tool for roadway and parking lot pavements.

Projects created in PaveXpress can be printed, shared, and saved, and design options can easily be evaluated in a side-by-side comparison. As a browser-based tool, PaveXpress is always up to date and can be accessed from any computer or mobile device, regardless of screen size or operating system.

PaveXpressDesign.com

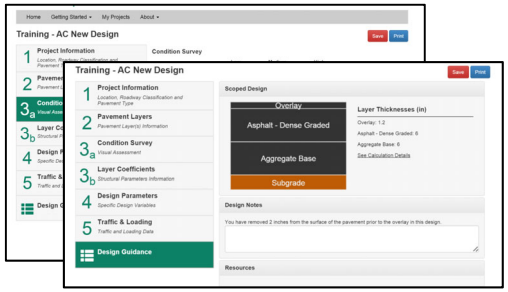
Approach: Technical

- Provide technically sound designs using:
  - Flexible: AASHTO ’93
  - Rigid: AASHTO ‘93 w/ ‘98 Supplement
  - Parking lot guidance (Flexible only)
- Use industry accepted standards and guidance
- Linkages to State and Local guidance
- Linkages to Pavement Interactive



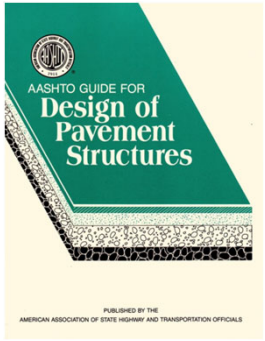
The evolution of PAVEXpress….

- New Flexible
- New Rigid
- Parking Lots

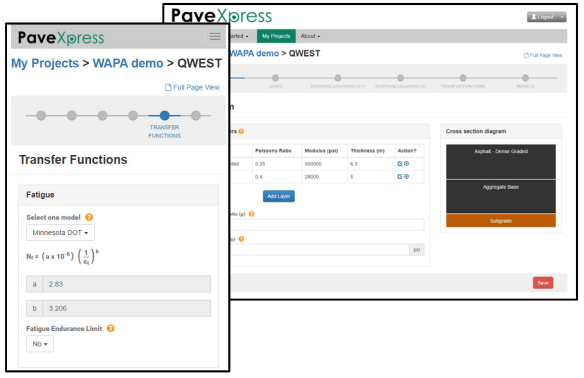


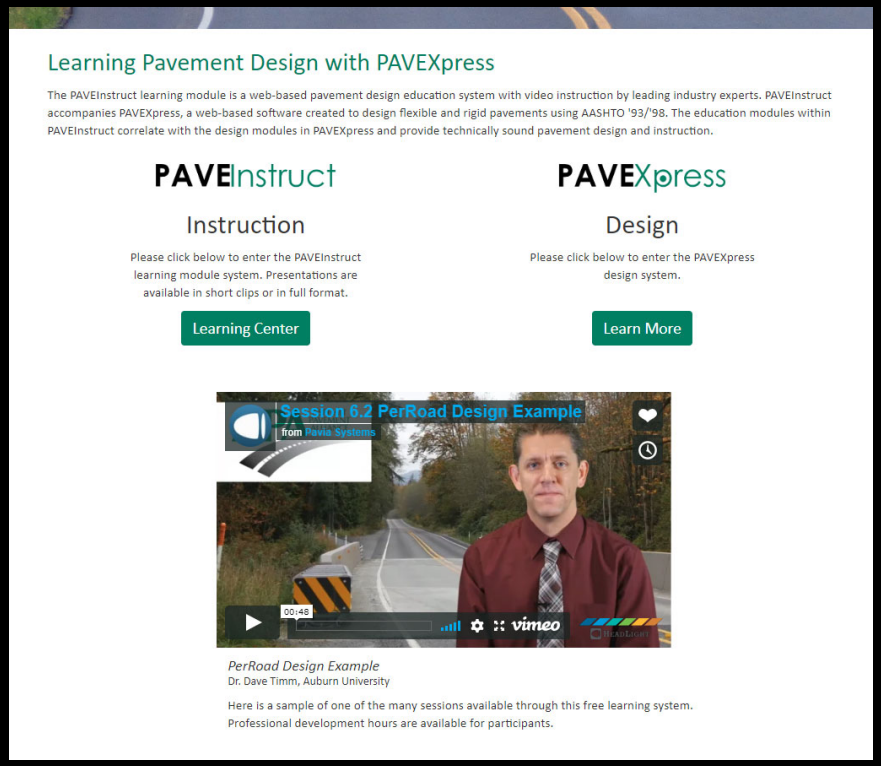
- Cost Module
- LEA Module
- UI/UX Update

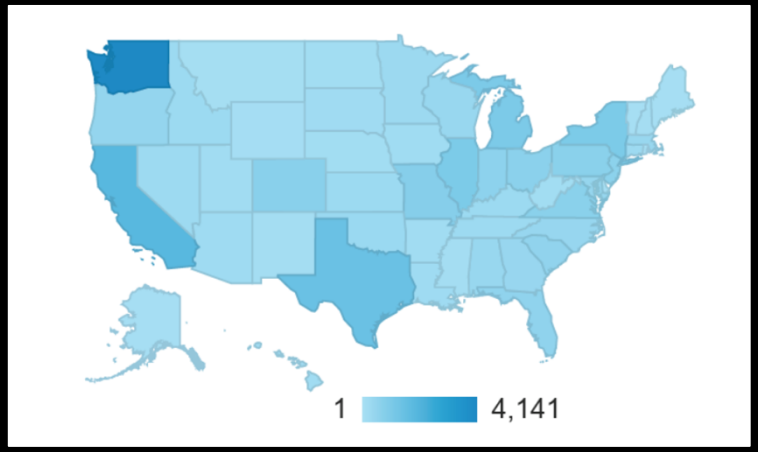
Newest modules:
LCCA framework (ie: RealCost)
Porous Asphalt Pavement Design



- Overlay design
- Condition Survey
- NDT



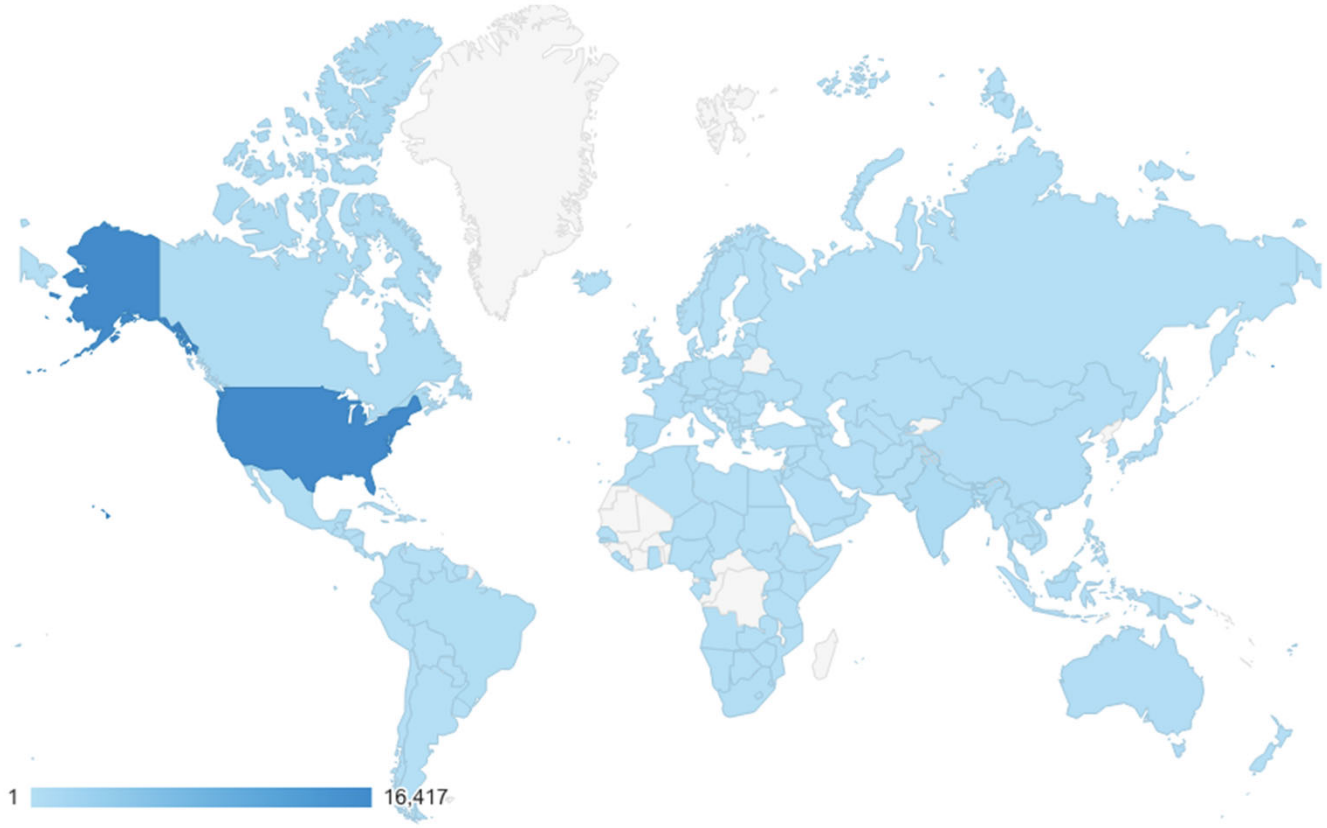




62,000+ Users Worldwide and in All 50 States

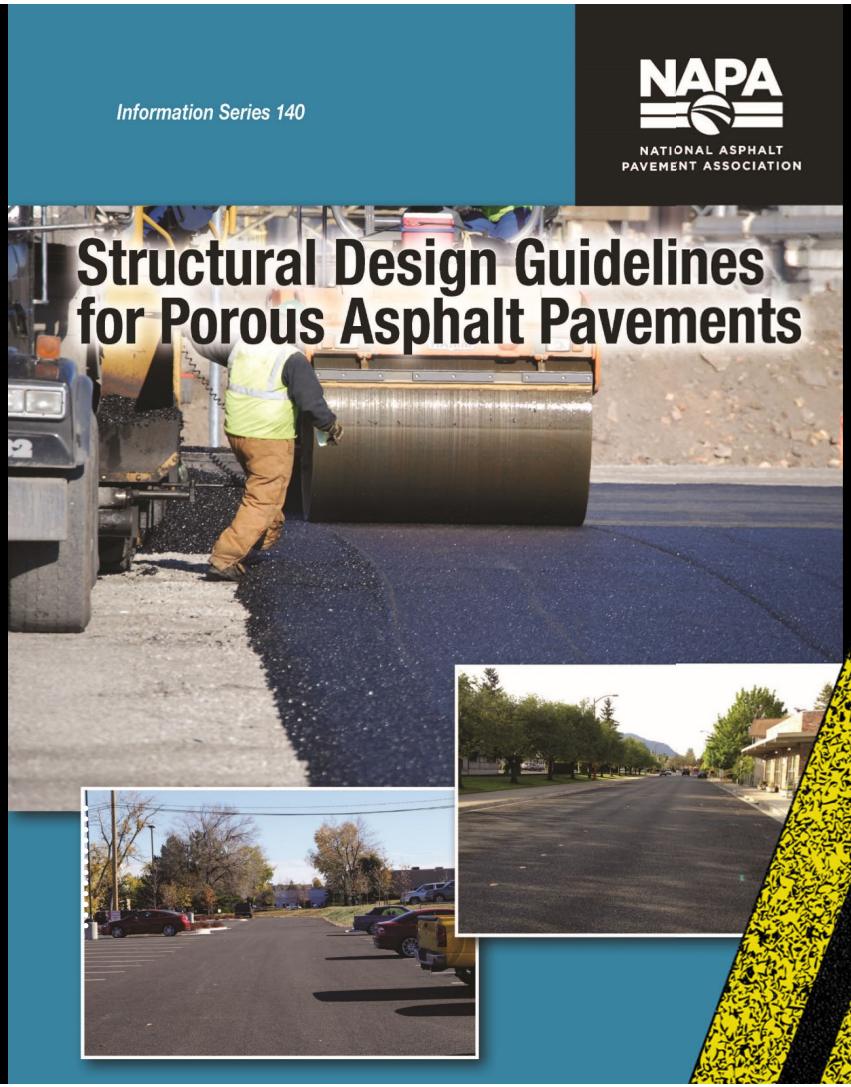
www.PaveInstruct.com / www.PaveXpress.com

Users from 157 countries -> 66% from U.S.



PAVEXpress Validation

- Gary Sharpe of Palmer engineering
  - Compares PAVEXpress to AASHTO
  - Program replicates AASHTO design with 95% accuracy
    - Deviations due to rounding and computations versus reading nomographs
- KDOT
  - Compared PAVExpress to Darwin



POROUS PAVEMENT STRUCTURAL DESIGN

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New Modules

- Metrification
- Simplified LCCA Tool
- PerRoad

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GOLIN

PerRoad Update (v4.4)

- Implement strain distribution design criteria within PerRoad.
  - Layered elastic analysis with a statistical analysis procedure to estimate stresses & strains within a pavement.
- Revise PerRoad to include mechanistic design of ALL pavements.

http://www.eng.auburn.edu/users/timmdav/PerRoad44.msi

Flexible Pavement Design Course

Website: mylearning.asce.org
Search: “Flexible Pavement Design”

Life Cycle Cost Analysis

National Level: 10 Examples

- MAP-21 – MEPDG, Alternative Bids, LCCA, GAO Report
- FY12 Commerce Appropriations Bill – Material-Specific Discount Rates
- FAST Act – Alternate Bids
- FY16 Transportation Appropriations Bill – Alternate Bid Guidance
- FY17 Transportation Appropriations Bill – MEPDG + LCCA Incentive
- FY18 Transportation Appropriations Bill – MEPDG + LCCA Incentive
- U.S. DOT INFRA Grant Program – LCCA Requirement
- FHWA LCCA Guidance Update
- Open Competition Proposal – Alternate Bids
- P3 Performance Warranties

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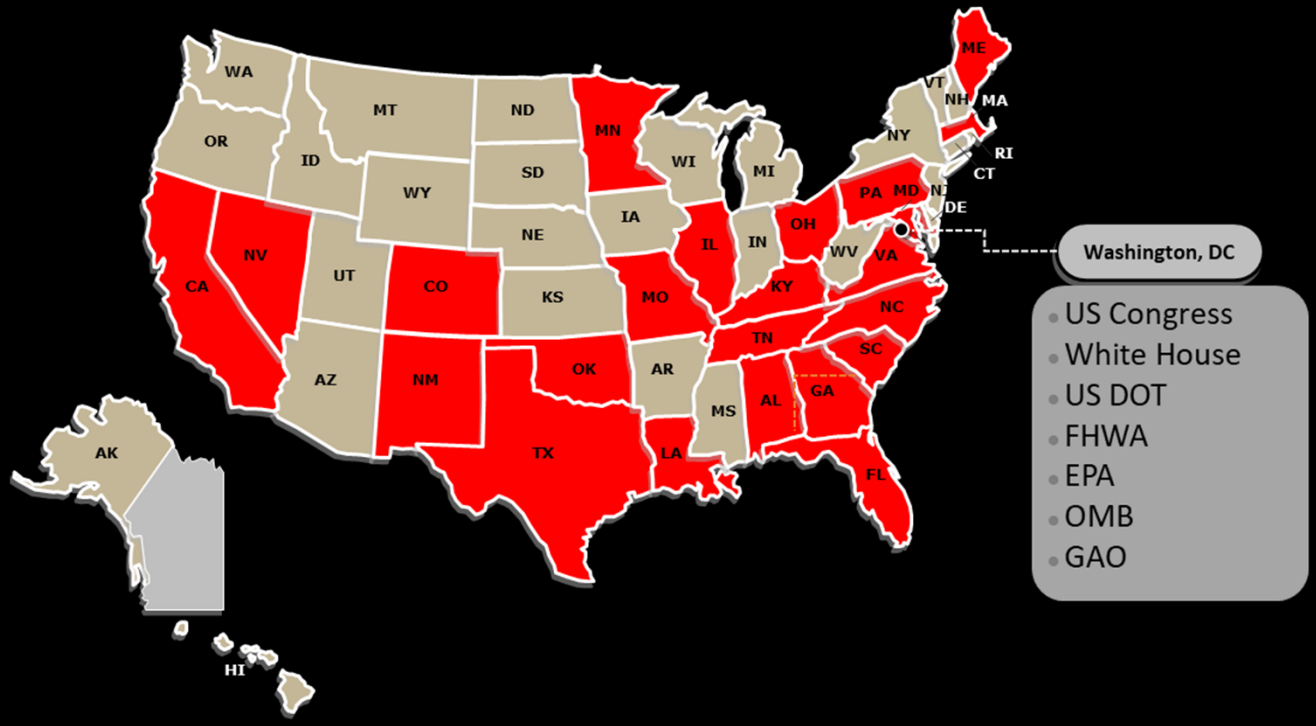
Competitive Environment



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Pavement Life-Cycle Cost Studies Using Actual Cost Data

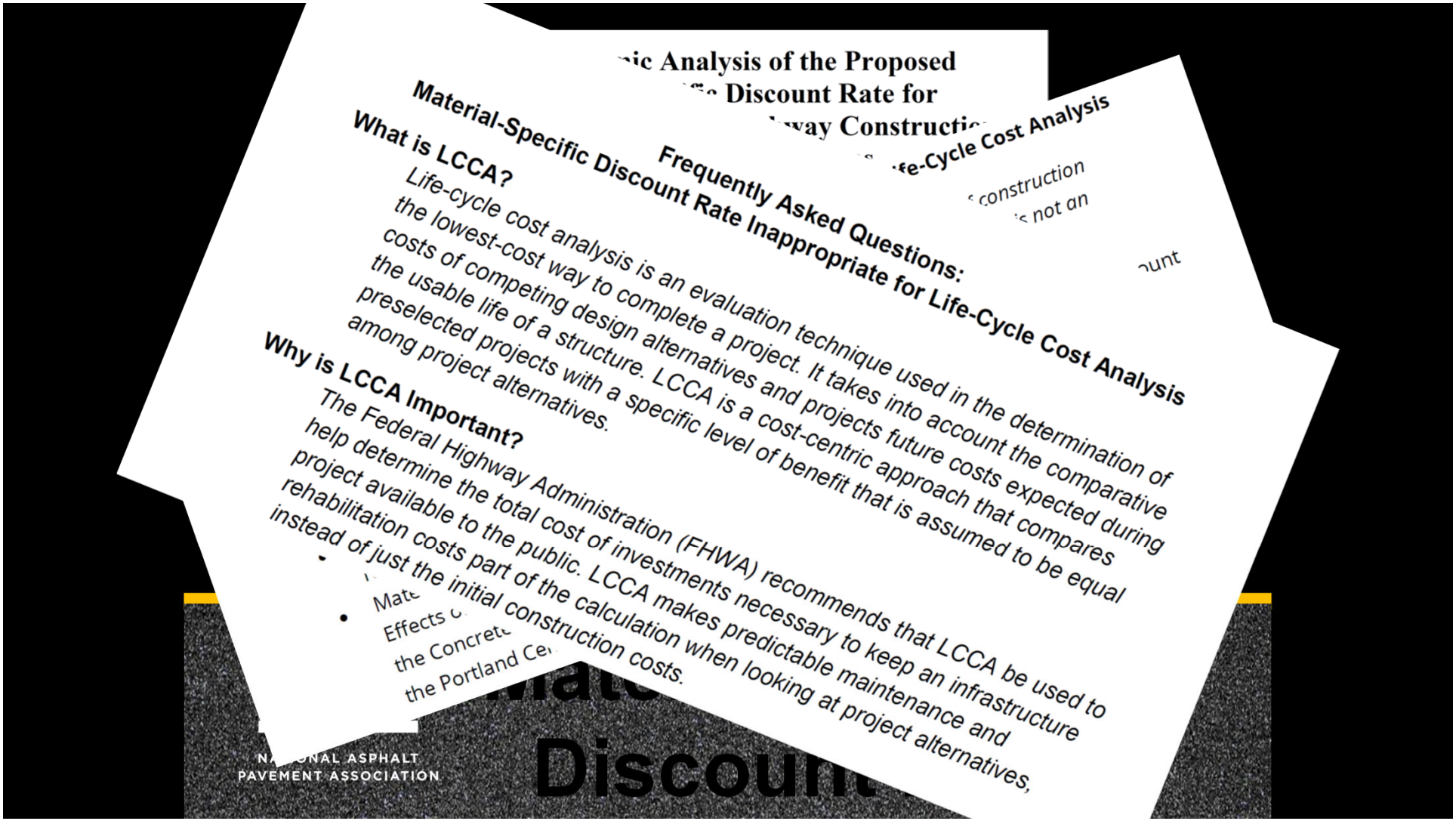
A SYNTHESIS

- Two main takeaways from this paper
  - Predicted performance life
  - Material specific discount rate

Life-cycle Cost Analysis Synopsis – Talking Points

- Life-cycle cost analysis (LCCA) is an important tool for use in decision making for large highway projects, although factors other than economics should also be considered.
- Only those cost factors affecting pavement should enter into LCCA performed to select a pavement type selection.
- Initial costs should be based on bid records over the last two or three years.
- Predicted pavement performance should be based upon actual data analyzed to reflect time to rehabilitation and reconstruction.

- **Other advantages of asphalt pavements include:**
  - Sustainability — They are 100 percent recyclable.
  - Perpetual Pavement design will result in reduced consumption of materials and less traffic congestion.
  - Low noise — Using a small aggregate size or open-graded friction course will reduce noise levels in sensitive areas.
  - Safety — Using open-graded friction course asphalt mixtures has proven to reduce wet-weather accidents and save lives.


ic Analysis of the Proposed
Discount Rate for
Frequently Asked Questions:
Material-Specific Discount Rate Inappropriate for Life-Cycle Cost Analysis
What is LCCA?
Life-cycle cost analysis is an evaluation technique used in the determination of the lowest-cost way to complete a project. It takes into account the comparative costs of competing design alternatives and projects future costs expected during the usable life of a structure. LCCA is a cost-centric approach that compares preselected projects with a specific level of benefit that is assumed to be equal among project alternatives.
Why is LCCA Important?
The Federal Highway Administration (FHWA) recommends that LCCA be used to help determine the total cost of investments necessary to keep an infrastructure project available to the public. LCCA makes predictable maintenance and rehabilitation costs part of the calculation when looking at project alternatives, instead of just the initial construction costs.
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Discount

Material-Specific Discount Rate

What are the three main points?

1. **NOT** a best practice
   - "Computational workaround"
2. Can't predict commodities and inflation
3. Other concerns
   - CSHub paper only inflates some materials and underestimates some costs associated with construction

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Legislative Initiatives

Federal and state lawmakers are being called upon to force the use of a flawed economic methodology. Instead of mandates, more study is needed.

✗ **H.R. 2434 —Financial Services & General Government Appropriations Bill** — *Mandates* material-specific discount rate in OMB's LCCA rule (OMB Circular A-94).

✓ **H.R. 3671 —Consolidated Appropriations Act, 2012** — Requires OMB, with industry experts, *review* LCCA potential use and procedures.

✓ **S. 1813 — Moving Ahead for Progress in the 21st Century Act (MAP-21)** — Authorizes GAO to *examine* LCCA best practices and discount rates. Anticipated products include a literature review, survey of state DOTs, and best practices report.

Not an Accepted Practice in Economics

In an effort by one industry to gain a competitive advantage in the highway construction marketplace, an untried, inaccurate method of calculating the discount rate has been proposed that may be used to unfairly rig the life-cycle cost analysis process.

- No known government or academic source endorses the use of a material-specific discount rate.
- Not mentioned in the literature except in the paper "The Effects of Inflation and Its Volatility on the Choice of Construction Alternatives," written by the Concrete Sustainability Hub at the Massachusetts Institute of Technology and funded by the Portland Cement Association.

*"Future inflation is highly uncertain... Economic analyses are often most readily accomplished using real or constant-dollar values." — **OMB***

Material-Specific Discount Rate:

Inappropriate for Life-Cycle Cost Analysis

For More Information,
To download a copy of NAPA Special Report 203,
visit www.asphaltpavement.org/SR203

Contact:
Audrey Copeland, Ph.D., P.E.
Vice President for Engineering, Research, & Technology
(301) 731-4748
audrey@asphaltpavement.org

Prepared by:
Jack Faucett Associates
www.jfaucett.com

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5100 Forbes Boulevard • Lanham, MD 20706-4407
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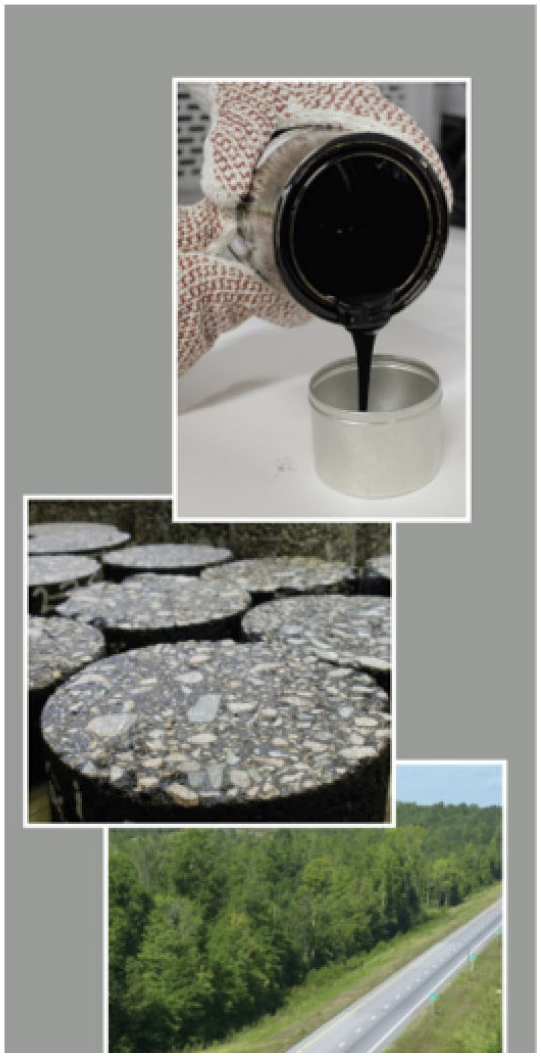

NCAT Report 17-xx

BEST PRACTICES FOR DETERMINING LIFE CYCLE COSTS OF ASPHALT PAVEMENTS

Dr. Fan Gu
Dr. Nam Tran, P.E.

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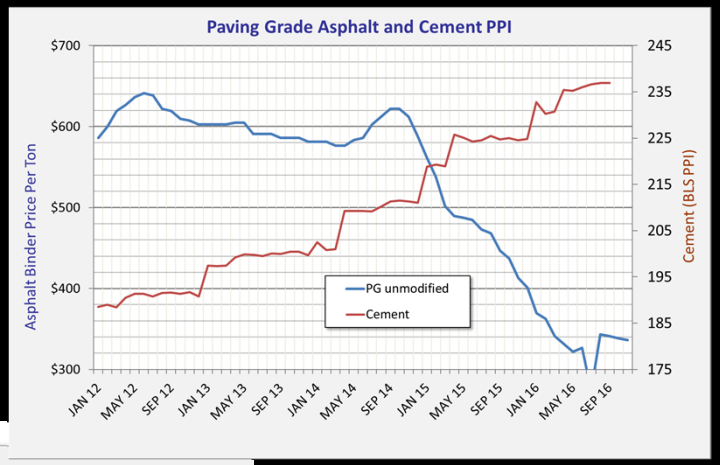
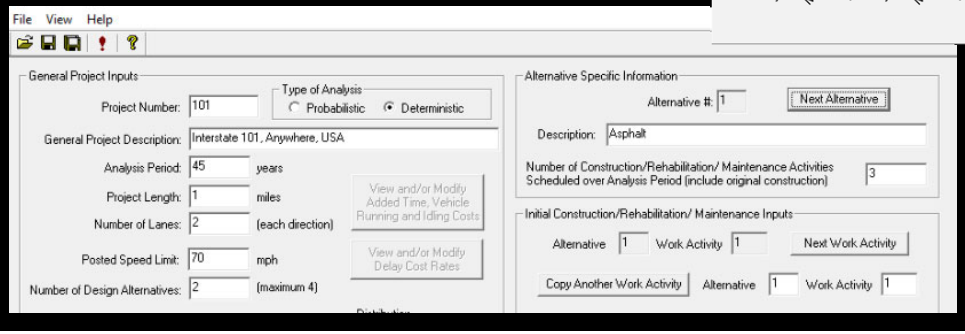
LCCA Educational Modules

- Life Cycle Cost Analysis training materials for state and local agency pavement engineers (or pavement type decision makers) and consultants.

- Three Customizable Modules
  - Each contains:
    1. PowerPoint presentations
    2. Participant workbook
    3. Instructor guide





Pavement
Preservation

THINLAY

SAFE. SMOOTH. DURABLE.

Thin Asphalt Overlays for Pavement Preservation

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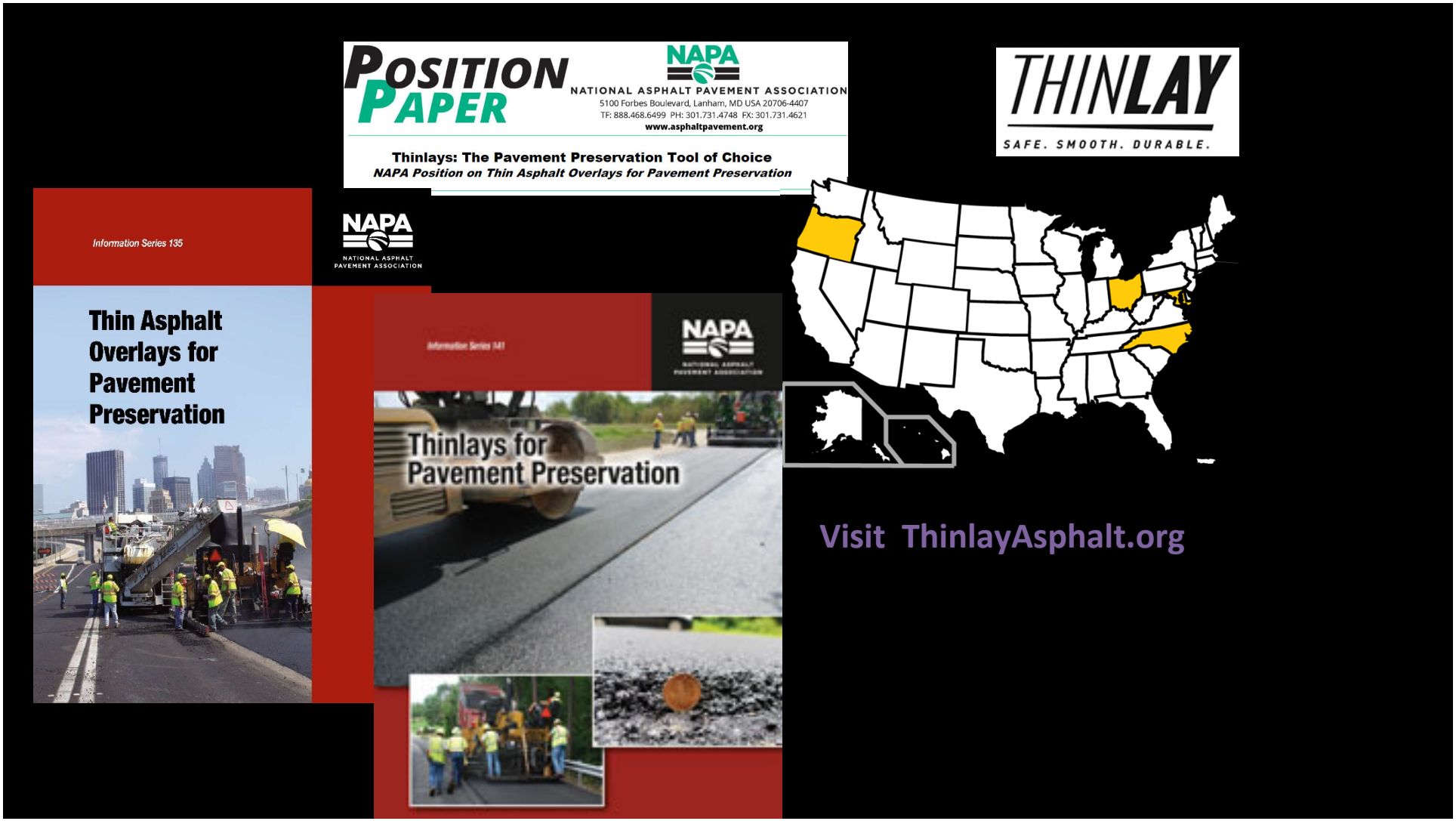
POSITION PAPER
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Thinlays: The Pavement Preservation Tool of Choice
NAPA Position on Thin Asphalt Overlays for Pavement Preservation
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Visit ThinlayAsphalt.org

ASPHALT PAVEMENT PRINCIPLES

Density and Durability

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Asphalt Pavement Industry Survey on

Recycled Materials and Warm-Mix Asphalt Usage 2017

Information Series 138

ASPHALT PAVEMENT IS **RECYCLED** AT A RATE GREATER THAN ANY OTHER PRODUCT

APA DriveAsphalt.org

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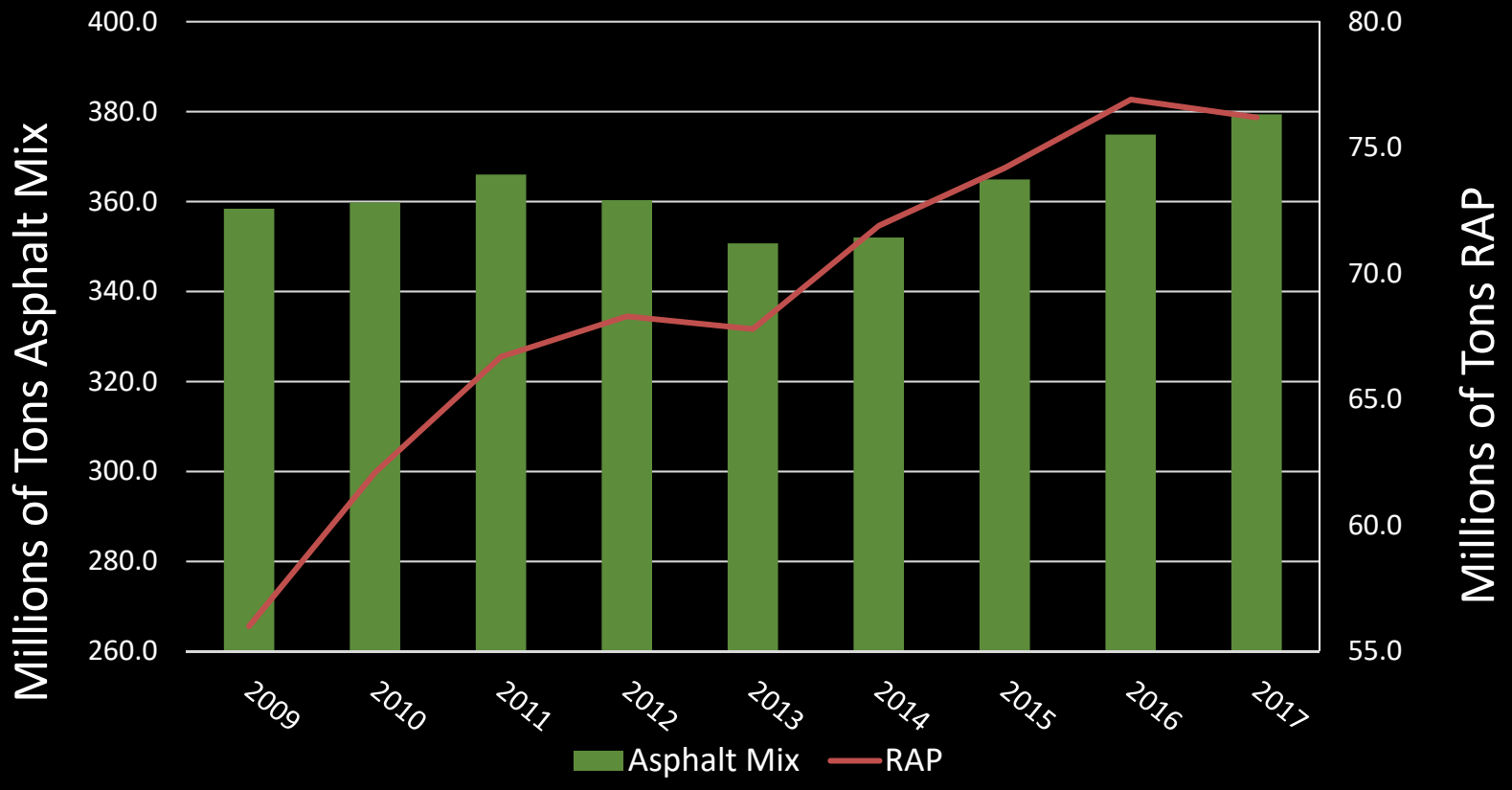
Asphalt Mix & RAP Tonnage



Summary

- Asphalt Industry remains the country's most diligent recycler
  - 99% of RAP being put into new pavements
- RAP use equated to saving  **2.2 Billion**
- 944,000 tons of RAS utilized in asphalt mix in 2017
- Industry continues to recycle other materials
  - Utilized more than 1.9m scrap tires
- WMA represented about 39% of asphalt market

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Current Survey

- FHWA continues to support
- Recycle/WMA Survey
  - 2018 Construction Season Data
  - Survey responses due between 01/01/2019 and 04/01/2019
  - Available on SurveyMonkey @ https://www.surveymonkey.com/r/2018_RMWMA_Survey
  - 2018 report completed by 4th quarter of 2019
- Report accuracy counts on strong industry support / participation

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• Back to Basics
• Best Practices in Paving
• Performance Under Pressure: Heavy Duty Pavements
• Safety in the Workplace
• Sustainability Specialization
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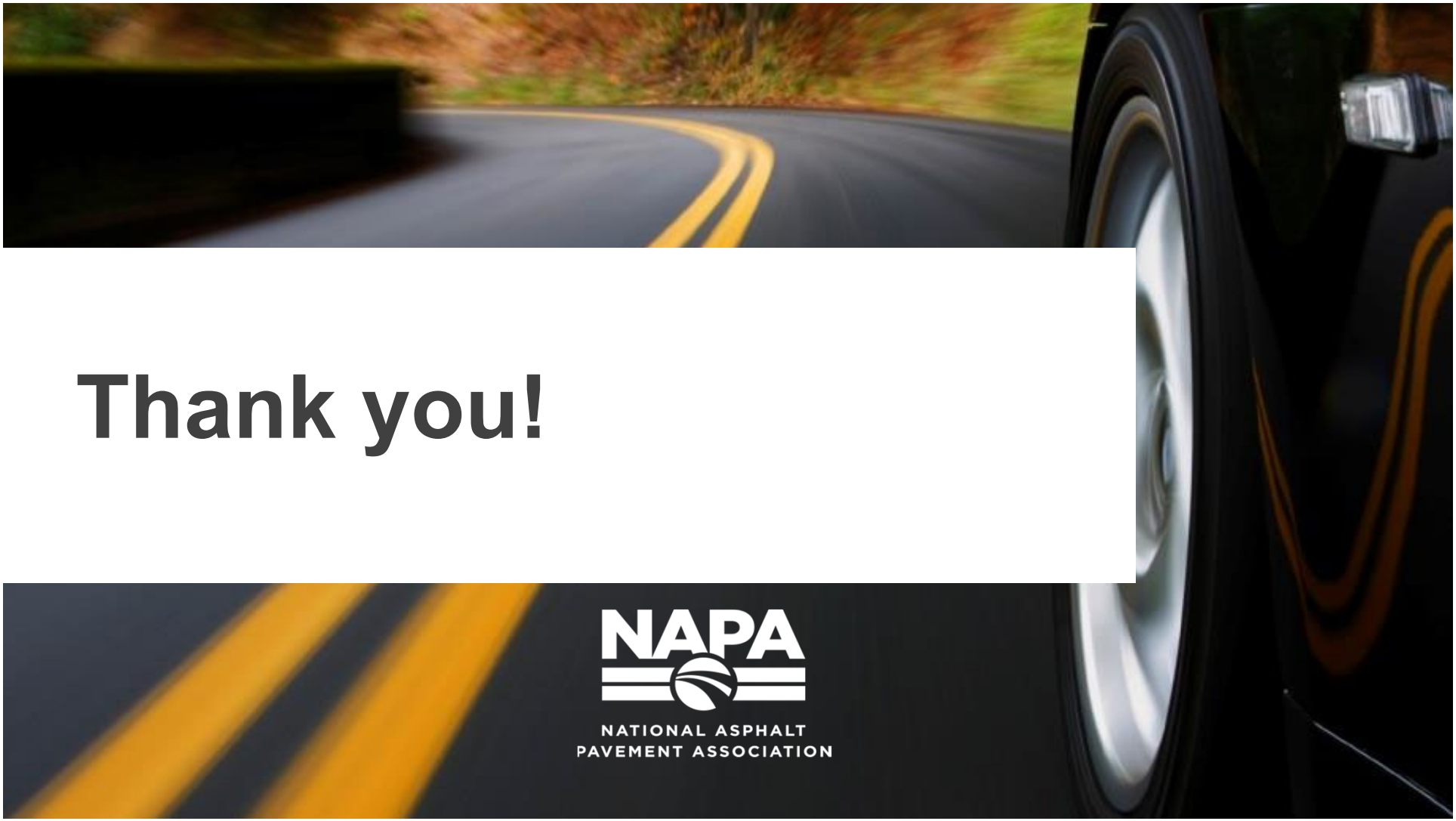

Thank you!