Pavement Economics Committee

NAPA Initiatives

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PAPA’s 59th Annual Conference
January 29, 2019
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
SAFEGAURD

PARTNERSHIPS

TRANSFORM
The Process and the Partnership
Research & Technology

Pavement Economics Committee
- Four Task Groups

Other Research
- NCAT
- Asphalt Institute

Research Road Map

Market Research & Communications

Go to Market Task Group
- Research
- Communications
- Market Research
- Brand Management

Deployment Activities

Deployment Task Group
- National Initiatives
- Regional Councils:
  - Northcentral
  - Northeast
  - Southeast
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

PEC Task Groups

- Mixture Quality & Performance
- Legislative
- Life-Cycle Cost Analysis
- Life Cycle Assessment
Project Initiatives
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
- Overlay design
- Condition Survey
- NDT
- Cost Module
- LEA Module
- UI/UX Update

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

The PAVEInstruct learning module is a web-based pavement design education system with video instruction by leading industry experts. PAVEInstruct accompanies PAVEXpress, a web-based software created to design flexible and rigid pavements using AASHTO T-36. This education module in PAVEInstruct correlates with the design modules in PAVEXpress and provide technicallly sound pavement design and instruction.


62,000+ Users Worldwide and in All 50 States
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
Structural Design Guidelines for Porous Asphalt Pavements

POROUS PAVEMENT STRUCTURAL DESIGN
New Modules

• Metrification
• Simplified LCCA Tool
• PerRoad
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
Competitive Environment

- US Congress
- White House
- US DOT
- FHWA
- EPA
- OMB
- GAO
Pavement Life-Cycle Cost Studies Using Actual Cost Data

A SYNTHESIS

LIFE-CYCLE COST ANALYSIS: A POSITION PAPER

AMERICA RIDES ON US

Asphalt.
• 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.
Material-Specific Discount Rate

Frequently Asked Questions:

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.
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
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. 183**—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

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BEST PRACTICES FOR DETERMINING LIFE CYCLE COSTS OF ASPHALT PAVEMENTS

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

NCAT Report 17-xx
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
Thin Asphalt Overlays for Pavement Preservation
Asphalt Pavement Industry Survey on
Recycled Materials and Warm-Mix Asphalt Usage
2017
Information Series 138
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
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 4\textsuperscript{th} quarter of 2019

• Report accuracy counts on strong industry support / participation
NAPA Talks
Webinars

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

www.AsphaltPavement.org/webinar
[ PAVING THE FUTURE ]
February 12-14 • Indianapolis, IN, USA

www.worldofasphalt.com
Thank you!