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

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The free, web-based **PaveXpress** pavement design tool now has more than 25,000 users in 157 nations, two-thirds of which are in the U.S. About 5,000 people are returning PaveXpress users. PaveXpress has been introduced to pavement engineers by about 65% of SAPAs. Washington State and West Virginia have approved the use of PaveXpress as an official decision tool, and several other states are evaluating its use. [www.PaveXpressDesign.com](http://www.PaveXpressDesign.com)

Through the PEC and NAPA’s cooperative agreement, we developed a suite of resources for the **Increased Use and Proper Management of RAP**. In 2016, more than 76.9 million tons of RAP was used in new asphalt mixtures, helping save more than $2 billion compared to the use of virgin materials and diverting nearly 50 million cubic yards of material from landfills. [www.RecycleAsphalt.info](http://www.RecycleAsphalt.info)

PEC reviews of **pavement–vehicle interaction (PVI) research** and the CSHub PVI model demonstrate that concrete’s claims for deflection as a major influence on fuel economy are not supported by the research. The claims are not recognized by FHWA or state DOTs, and PEC research has reinforced the role of pavement smoothness as the most important PVI factor when it comes to fuel economy. [www.ThinkSmoother.com](http://www.ThinkSmoother.com)

NAPA and the SAPAs are leading the asphalt industry in quantifying environmental impacts, ensuring asphalt mixture producers are ready and able to meet future demand for **Environmental Product Declarations** from public- and private-sector projects. Seven SAPAs report an interest in EPDs in their state and more than half expect to see demand grow in the coming years. The Emerald Eco-Label EPD tool is both ISO 14025 and EN 15804 compliant, ensuring asphalt mixtures can deliver a full credit under LEED v4. [www.AsphaltPavement.org/EPD](http://www.AsphaltPavement.org/EPD)

Almost 90% of SAPAs report using **Thinlays** or a version of thin asphalt overlays in their states. Properly designed Thinlays provide clear life cycle cost benefits compared to other preservation treatments, as well as the ability to strengthen a road’s structure to cope with changing traffic needs. [www.ThinlayAsphalt.org](http://www.ThinlayAsphalt.org)

Through the lobbying services of the **PEC Legislative Project**, NAPA’s grassroots efforts, and the successful deployment of PEC research, since 2012, all proposed federal mandates that would legislatively influence pavement-type decisions to the benefit of the concrete industry were successfully defeated. [www.AsphaltPavement.org/GovAffairs](http://www.AsphaltPavement.org/GovAffairs)

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PEC research has developed a suite of technical reports designed to improve pavement design, including a definitive state of the practice for MEPDG implementation, recommendations for AASHTO 93 structural layer coefficients, and recommended maximum thickness ranges for pavement designs to avoid costly overdesigns. After implementing a recommended change to its structural layer coefficient, the Alabama Department of Transportation realized an 18% savings in its pavement costs. These resources have been integrated with PaveXpress and PerRoad software, and three states have changed their structural layer coefficient for thinner layers and about nine states are considering changing their coefficient.

Until 2016, ASCE did not offer flexible pavement design courses to their membership of civil engineers. The PEC funded the development of a two-day Flexible Pavement Design and Rehabilitation course that ASCE now offers as part of its continuing education program. www.ASCE.org/education_and_careers/

A near-complete Pavement Type Selection project is tentatively showing that states may underestimate asphalt pavement’s initial service life in their LCCA inputs. Many states assume an initial service life of 10–15 years for asphalt pavements; however, this project shows an average service life of 17.5 years based on hundreds of pavements analyzed.

PEC support helped update PerRoad software to version 4.4, which now allows the tool to perform a conventional mechanistic-empirical (M-E) design to directly compare to Perpetual Pavement designs. PerRoad uses M-E design philosophy to estimate stresses and strains that would prove detrimental for fatigue cracking or structural rutting. The software can also use strain distribution or a single endurance limit strain value to design a Perpetual Pavement. www.AsphaltRoads.org/PerRoad

A white paper, Understanding LCCA, has been developed to outline the complexities involved with life-cycle cost analysis (LCCA). NAPA supports the proper use of LCCA as a tool used to inform decisions, but recognizes the potential for LCCA to be used to improperly skew engineering decisions. The white paper outlines NAPA’s position on the use of LCCA, along with principles for the proper application of LCCA in line with FHWA policies. The PEC LCCA Task Group is also finalizing an LCCA guidance report and will soon begin a project on pavement end-of-life considerations and LCCA.

Porous asphalt pavements have been shown to help improve water quality and stormwater management, making them an important tool for sustainable, resilient infrastructure. NAPA has developed an FHWA TechBrief on full-depth porous asphalt pavements, and a soon-to-be-published structural design guide for porous pavements will help expand their use for low-volume roadways. www.PorousAsphalt.net
The PEC Going Forward

To increase project impact and improve operational efficiencies, in 2018 the Pavement Economics Committee has been realigned into four task groups. The below list shows how the previous seven task groups fit within the new PEC task group structure.

- **Mixture Quality & Performance**
  - Best Quality & Competitiveness
  - Pavement Preservation
  - Private Sector Markets & Local Roads

- **Life Cycle Cost Analysis**
  - Pavement Design
  - Pavement Type Selection

- **Life Cycle Assessment**
  - Environmental Sustainability

- **Legislative**

Each Task Group is co-chaired by a leader from NAPA’s producer membership and a State Asphalt Pavement Association state executive.

For more information about the Pavement Economics Committee or to get involved with a task group, contact Dr. Audrey Copeland, NAPA Vice President for Engineering, Research & Technology, at audrey@asphalt Pavement.org or call 301-731-4748.
Past Research Update Reports

2014

2015

2016

2017

2018

www.AsphaltPavement.org