Successes In Stewardship

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FHWA Resources Promote Implementation of More Sustainable Pavements

An increasing number of agencies, companies, and organizations are embracing principles of sustainability in managing their activities and conducting business, and the field of highway pavement is no exception. Design, construction, and maintenance of highway pavements can cause a wide variety of environmental impacts related to water quality and supply, stormwater management, air quality, heat absorption, and climate change. Taking steps to make pavement more sustainable can reduce waste, preserve the natural environment, lower greenhouse gas emissions, and reduce energy costs.

In 2010, the Federal Highway Administration (FHWA) launched the Sustainable Pavements Program to help advance the state of the practice in pavement sustainability. This program aims to increase the body of knowledge regarding sustainability of asphalt and concrete materials in pavement design, construction, and maintenance and to promote the use of sustainable technologies and practices related to pavements. A key goal of the program is to increase awareness, visibility, and implementation of sustainability considerations in all life cycle phases of pavement systems.

Resources Advance Conversation on Pavement Sustainability

A sustainable pavement is one that achieves its specific engineering goals while meeting basic human needs; using resources efficiently; and preserving or restoring surrounding ecosystems. For FHWA, a sustainable approach to pavements means that decisionmakers make balanced and efficient choices among environmental, economic, and social values—the triple bottom line of sustainability—that will provide the best benefits to the natural and human environments now and into the future.

The Sustainable Pavements Program promotes pavement sustainability through a variety of resources, including:

The Technical Working Group. The Sustainable Pavement Technical Working Group (SPTWG) brings together stakeholders from the U.S. Department of Transportation (DOT), State DOTs, local governments, the pavement industry, and academia. The SPTWG, which meets twice a year, provides technical input to FHWA program managers on sustainability practices related to pavement systems and materials. It also provides a forum for experts from different parts of the pavement community to share information on emerging best practices.

Warm-mix asphalt pavement construction is an example of a technology that can increase the sustainability of pavement systems. (Courtesy of FHWA)

Technology Transfer. Technological advances in pavement sustainability do not instantly make it into the toolboxes of practitioners. The Sustainable Pavements Program uses technical briefs (TechBriefs) and webinars to educate engineers about current best practices in pavement sustainability. The Sustainable Pavements Program has published two TechBriefs, an introduction to pavement sustainability and a guide to life cycle assessments of pavement systems. Both TechBriefs are designed for pavement professionals who may not have a background in environmental analysis.

The Reference Center. The reference center is a clearinghouse for studies and publications related to pavement sustainability that are referenced in *Towards Sustainable Pavement Systems: A Reference Document*. The reference center includes links to more than 200 publications about pavement sustainability that cover topics like urban heat islands, pavement recycling, and life cycle assessment.

New Reference Document Provides Latest Tools for Pavement Professionals

As sustainable pavement grows more popular, professionals need up-to-date technical information and guidance on best practices. Recognizing that existing reference materials were outdated or limited in scope, the FHWA Sustainable Pavements Program prepared a comprehensive reference document that provides the latest knowledge and information for designing, constructing, and maintaining sustainable pavement structures. The reference document builds on the work of the SPTWG as well as information in the TechBriefs and the reference center.

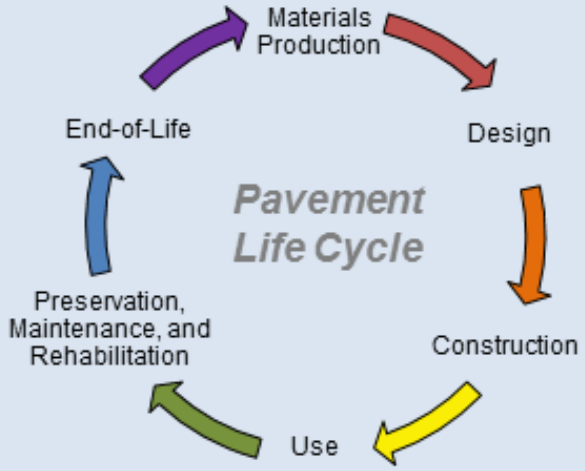
Released in March 2015, *Towards Sustainable Pavement Systems: A Reference Document* covers the entire pavement life cycle—from initial materials processing to end-of-life considerations. It also contains key information on pavement sustainability concepts, pavement sustainability and livable communities, and methods for assessing pavement sustainability.

The reference document is designed to help practitioners navigate the subject of sustainability while developing mixture designs, pavement structure designs, and construction, preservation, and maintenance techniques. It also contains relevant information for other pavement stakeholders, including those in private industry, academia, and all levels of government.

Sustainable Pavement 101

Key Concepts

- Consider environmental, social, and economic factors.
- Think about sustainability holistically, over the entire life of the pavement.
- Sustainability is context sensitive. Tailor the approach to the specific pavement application.



Six key pavement life cycle phases are considered for sustainability best practices. (Courtesy of FHWA)

Best Practices

Materials Production: Reduce use of virgin material by using recycled or reclaimed pavement. Use warm-mix asphalt technologies or reduce cement content to reduce greenhouse gas emissions.

Design: Incorporate life cycle assessment or sustainability ratings into the design process.

Construction: Minimize negative impacts and improve construction quality.

Use: Employ porous pavements for stormwater management.

Preservation, Maintenance, and Rehabilitation: Incorporate sustainability metrics into asset management systems. Use pavement maintenance/preservation methods known to extend pavement life while maintaining pavement smoothness.

End-of-Life: Consider the highest and best use of the pavement, and avoid landfilling.

FHWA's TechBrief on pavement sustainability and *Towards Sustainable Pavement Systems: A Reference Document* provide additional information about best practices at each life cycle stage.

The focus of the reference document is on proven techniques and technologies that engineers can implement today. FHWA plans to update the document as new technologies develop and new best practices emerge.

The Future of the Sustainable Pavements Program

Looking forward, the Sustainable Pavements Program is working on several initiatives to further advance sustainability in pavement systems, which are outlined below.

- A **webinar series** in the spring of 2015 will introduce *Towards Sustainable Pavement Systems: A Reference Document* and provide more detail about the major chapters of the document.
- Upcoming **TechBriefs** will focus on climate change and pavements; sustainability and asphalt pavements; and sustainability and concrete pavements.
- A **life cycle assessment framework** for evaluating the sustainability of pavement systems is currently under development. The framework, which is in its early stages, will provide guidance for transportation agencies on how to analyze the environmental impacts of pavement systems.

Sustainability for pavements is a journey and not a destination, and consequently the field of sustainable pavements is constantly advancing. FHWA and U.S. DOT are committed to improving the sustainability of highway pavement through guidance and resources that help transportation agencies better integrate sustainability considerations into pavement design, construction, and maintenance.

For additional information on sustainability considerations in pavement systems, including the *Towards Sustainable Pavements: A Reference Document*, visit the FHWA Sustainable Pavements Program web page.

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Look What's New!

- FHWA recently redesigned the Environmental Review Toolkit. The Environmental Review Toolkit is a one-stop resource for information and updates about transportation and environment. The redesign included improving the look and feel of the site to enhance the user experience. Click here to view the updated website.
- As part of the Every Day Counts initiative, FHWA is hosting a webinar on best practices in Programmatic Agreements (PAs). The webinar will be held on Tuesday, March 17, 2:30 pm – 4:00 pm (Eastern Time) and will showcase case studies on the benefits and costs resulting from certain existing PAs. To view more information, click here.

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