

The FHWA Sustainable Pavements Program

Gina Ahlstrom- *Pavement Engineer, FHWA Office of Pavement Technology*



U.S. Department of Transportation
Federal Highway Administration

US DOT has defined Liveability as...

- Providing more transportation choices
- Expand location and energy efficient housing choices
- Improve economic competitiveness of neighborhoods
- Target federal funding toward existing communities
- Align federal policies and funding
- Enhance the unique characteristics of all communities

Sustainable Transportation can be defined as...

- *Sustainable Transportation* can be defined as providing exceptional mobility and access in a manner that meets development needs without compromising the quality of life of future generations. A sustainable transportation system is safe, healthy, affordable, renewable, operates fairly and limits emissions and the use of new and non-renewable resources.

FHWA Sustainable Highways Tool

IN-VEST

Infrastructure Voluntary Evaluation Sustainability Tool

- A web-based self-evaluation tool for measuring sustainability over the life-cycle of a transportation project or program – from system and project planning through design and construction, to operations and maintenance.



Materials

Design

Liveability

Planning

Sustainability

Pavements

FHWA Sustainable Pavements Program Goals

- Support the US DOT goals for liveability and sustainable transportation.
- Increase the body of knowledge regarding “sustainability” aspects of asphalt and concrete materials in pavement design, construction, and maintenance.
- Increase the use of “sustainable” technologies and practices in pavement design, construction, and maintenance.



Current Program Framework

- 1) Establishment and Coordination of a Sustainable Pavements Technical Working Group (TWG)
- 2) Development of Guidelines for a Sustainable Pavements Program
- 3) Evaluation and Assessment of Existing Tools
- 4) Technology Transfer and Deployment



Subject to funding availability

FHWA Contract Awarded

- A Contract was awarded to Applied Pavement Technology, Inc (AP Tech) in September 2010.
- Contract base period is 24 months.
- 3 Option years (12 months each).
- FHWA outlines task areas and issues tasks as the need arises.

Key Personnel

- Contraction Officer's Technical Representative
 - Gina Ahlstrom, FHWA-Office of Pavement Technology
- Contractor Key Staff
 - Kurt Smith, AP Tech
 - Tom VanDam, AP Tech
 - Kathryn Zimmerman, AP Tech
 - Imad Al-Qadi, University of Illinois at Urbana-Champaign
 - John Harvey, University of California Pavement Research Center
 - Steve Muench, University of Washington

Subcontractors

- University of Illinois at Urbana-Champaign
- University of California Pavement Research Center
- University of Washington
- Virginia Tech University
- University of New Hampshire
- The Right Environment
- CH2M HILL

Current Program Framework

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1) Sustainable Pavements Technical Working Group (SP TWG)

- TWG is composed of stakeholders in State DOT's, academia, industry, and other government agencies.
 - 20 members and approximately 85+ friends.
- Goal is for FHWA to gather feedback on the technical aspects of the Program.



Vision for the SP TWG

- Provide feedback and input to FHWA on aspects of sustainability and how it relates to pavements and materials.
- Review documents and deliverables.
- Formation of task groups focused on specific discussion topics.



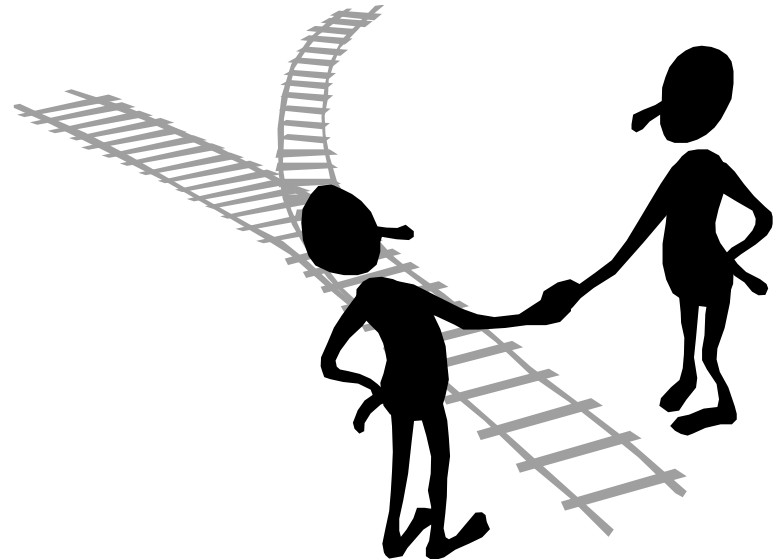
Current Status of the SP TWG

- Current funding allows for SP TWG to meet twice per year through 2012.
- First meeting was held in May 2011.
- Nearly 50 people in attendance; members and friends.
- Majority of the agenda focused on discussing sustainability, the state-of-the-knowledge, opportunities, and challenges.
 - Concrete industry perspective
 - Asphalt industry perspective
 - Agency perspective
 - Pavement assessments

SP TWG Meeting Outcomes

What do you get when you put an Agency Representative, an Academic, a Concrete Industry Representative, and an Asphalt Industry Representative together in a room?

- Common thoughts among all:
 - Longevity is key
 - Reduce, Reuse, Recycle
 - Cost is a challenge
 - Increased knowledge base needed



SP TWG Outcomes- Materials

Attributes considered to reduce environmental and social impacts

Concrete Perspective

- Use of SCMs, ACMs, and admixtures
- Mixture optimization
- Optimized foundations
- Pervious concrete

Agency Perspective

- Strategic use of materials to become less dependant on foreign sources (homeland security)
- Maximize use of in-place recycling
- Materials that improve surface characteristics

SP TWG Outcomes- Construction

Attributes considered to reduce environmental and social impacts

Concrete Perspective

- 2-lift concrete pavement
- Modular concrete pavement
- Concrete overlays
- Supplementary and adequate curing
- Advanced equipment technologies
- Contracting mechanisms (warranties, PRS, etc.)

Agency Perspective

- Maintain accessibility for the public
- Adopt best practices and monitor protocols for materials, waste, and fleet operations
- Industry buy-in for innovative practices

SP TWG Outcomes-Preservation, Rehabilitation, and Recycling

Attributes considered to reduce environmental and social impacts

Concrete Perspective

- Surface renewal (grinding)
- Concrete overlays
- Longer design life
- Recycled pavement as an aggregate source
- Higher volume of recycled materials and industrial by-products

Agency Perspective

- In-place recycling and stabilization methods
- Leadership in preservation strategies
- Comprehensive asset management program (including utilities) to optimize funding

SP TWG Outcomes- Barriers

Existing barriers to current sustainability efforts

Concrete Perspective

- Lack of standards and specification
- Resistance to change
- Lack of performance history
- Risk

Agency Perspective

- Poor initial experience
- Slow and steady mindset, reluctant to change
- Lack of knowledge transfer due to travel constraints
- Blue sky research with little applicability

What is Next for the SP TWG?

- Compile feedback gathered at the SP TWG meeting in May.
- FHWA will formulate a framework for the FHWA Sustainable Pavements Program.
- Gather feedback on the framework.
- Put the plan into action!



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- 2) **Development of Guidelines for a Sustainable Pavements Program**
- 3) Evaluation and Assessment of Existing Tools
- 4) Technology Transfer and Deployment

2) Development of Guidelines

- Develop guidelines for the design and construction of sustainable pavements utilizing concrete materials.
- Develop guidelines for the design and construction of sustainable pavements utilizing asphalt materials.



What do we know today about sustainable pavements?

Current Program Framework

- 1) Establishment and Coordination of a Sustainable Pavements Technical Working Group (TWG)
- 2) Development of Guidelines for a Sustainable Pavements Program
- 3) **Evaluation and Assessment of Existing Tools, Materials, and Practices**
- 4) Technology Transfer and Deployment

3) Evaluation and Assessment of Existing Tools

- Assessment of existing tools, which determine the carbon footprint of pavement systems, rating systems, and life cycle assessments (LCA).
 - Limitations
 - Boundaries
 - Practical use



Evaluation of Sustainable Materials

- Physical properties
- Performance
- Guidelines for use and specifications
- Life cycle cost



Evaluation of Design and Construction Practices



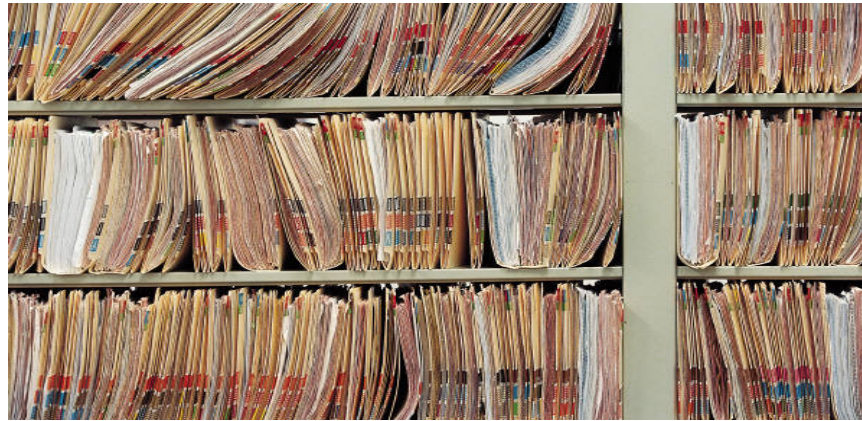
- Design guidance
- Construction considerations
- Impacts to other processes or practices
- Performance

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- 3) Evaluation and Assessment of Existing Tools
- 4) **Technology Transfer and Deployment**

4) Technology Transfer

- Move the information from paper to practice.



- Provide tools to stakeholders to enhance the sustainability of our pavement systems.

Questions and Answers

Gina Ahlstrom

gina.ahlstrom@dot.gov

202-366-4612