

Building Sustainable and Cost Efficient Pavements

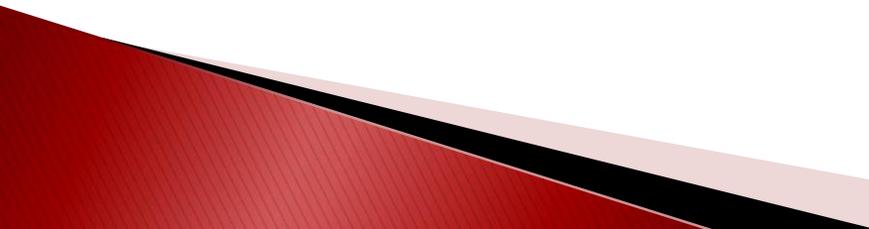
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What is “Sustainability”?

- *Sustainability is a requirement of our generation to manage the resource base, such that, the average quality of life that we ensure ourselves can potentially be shared by all future generations.*

or

- *Avoidance of the depletion of natural resources in order to maintain an ecological balance.*
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Triple–Bottom Line

- ▶ *Sustainability: a quality that reflects the balance of 3 primary components:*
 - *Economic*
 - *Environmental*
 - *Social*

Referred to as the “Triple–Bottom Line”

Resources

- ▶ *FHWA Report: “Towards Sustainable Pavement Systems: A Reference Document” (FHWA-HIF-15-002)*
- ▶ *FAST Act: Section 1428 – Use of durable, resilient, and sustainable materials and practices.*

Why Build Sustainable Pavements?

- ▶ *Transportation accounts for 27% of GHG emissions*
- ▶ *4 Million miles of public roads*
- ▶ *3 Trillion vehicle miles traveled (VMT) and*
- ▶ *169 Billion gallons of fuel (FHWA 2010)*
- ▶ *\$182.1 Billion total expenditures (FHWA 2008)*

As you can see, pavements are an integral part of the roadway network, and have the potential to deliver tremendous benefits to the “triple-bottom line”

Tools to Measure Sustainability:

Currently 4 tools or methods:

- ▶ *Performance Assessment*
 - ▶ *Life-cycle Cost Analysis (LCCA)*
 - ▶ *Life-Cycle Assessment (LCA)*
 - ▶ *Sustainability Rating Systems*
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- ▶ *But, we still must consider trade-offs (such as agency priorities, project, costs, impacts, duration and risks)*

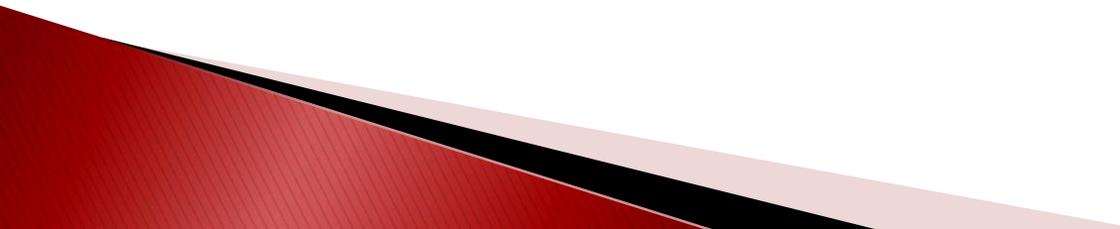
FHWA Policies

- *LCCA Policy – directs that pavements are designed in a cost effective manner. FHWA highly recommends project LCCA for both new and rehabilitated pavement projects to determine economic efficiency of competing pavement designs.*
- *LCCA Tools – RealCost*
- *Recycling Policy – requires recycled materials to be considered first but they must be engineered properly and meet the same performance*

How to Build Sustainability “Best Practices” for Pavements?

- ▶ **Consideration of the following:**
- ✓ **Materials** – impacts from acquisition thru processing, construction, use, and end of life
- ✓ **Aggregates** – reduced use of virgin materials, increased use of local materials, and use of (RCWMs) recycled, co-products, and waste materials
- ✓ **Improved procedures for pavement & rehabilitation design procedures**

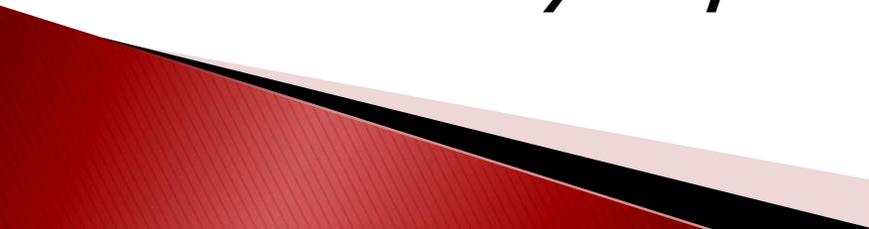
How to Build ...cont'd

- ✓ *Construction setup and operations*
 - ✓ *Use-Phase considerations*
 - ✓ *Maintenance and preservation treatments*
 - ✓ *End-Life considerations*
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Bottom Line

(23 CFR 626) Title 23 CFR 626 establishes the following requirement: "Pavements shall be designed to accommodate current and predicted traffic needs in a safe, durable, and cost-effective manner."

A critical outcome of the FHWA Sustainable Pavements Program is to increase the awareness, visibility, and the body of knowledge of sustainability considerations in all the life cycle phases of pavement systems.



Questions? Thank you!

