

Measuring sustainability achievements with INVEST and LCA tools

William R. Vavrik, Ph.D., P.E.

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What is Sustainability?

- ▶ The satisfaction of basic social and economic needs, both present and future, and the responsible use of natural resources, all while maintaining or improving the well-being of the environment on which life depends.
- ▶ To FHWA, sustainability comes from striking a balance between three key principles: economic, social, and environmental.



The Sustainability Triple Bottom Line

INVEST Goals



- ▶ Encourage implementation of sustainable practices
- ▶ Help agencies assess their level of sustainability implementation and identify areas for internal improvement (grade their own paper)
- ▶ Provide a framework for communicating with stakeholders and decision makers about sustainability
- ▶ Establish a method for identifying sustainable best practices in highway systems, projects, programs

What is INVEST?



INVEST

ECONOMIC • SOCIAL • ENVIRONMENTAL

FHWA's INVEST is located here: www.sustainablehighways.org

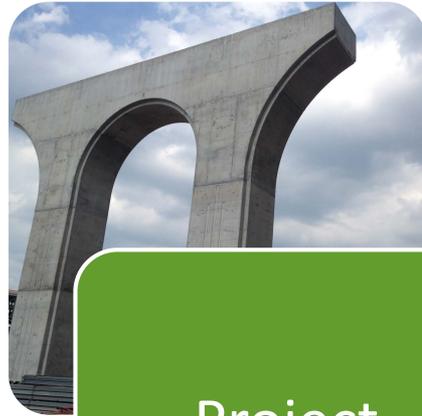
▶ FHWA's INVEST

- ▶ Infrastructure Voluntary Evaluation Sustainability Tool
- ▶ web-based self-evaluation tool for assessing sustainability over the life cycle of a transportation project or program
- ▶ from system and project planning through design and construction, to operations and maintenance.

Supporting the Entire Life Cycle



System
Planning &
Processes



Project
Development



Operations &
Maintenance

About INVEST

The screenshot shows the top navigation bar of the INVEST 1.0 website. It includes the U.S. Department of Transportation Federal Highway Administration logo, a user login status for 'Illinois Tollway', and a 'Logout' button. The main header features the 'INVEST' logo with the tagline 'ECONOMIC • SOCIAL • ENVIRONMENTAL'. Below the logo are navigation tabs for 'Home', 'Learn', 'Browse', and 'Score'. A search bar is located on the right side of the header. The main content area is divided into two columns. The left column features a large landscape image of a highway winding through a forested mountain range, followed by a 'Welcome to INVEST Version 1.0!' message and an 'Announcements' section. The right column contains a 'What do you want to do?' section with 'Learn' and 'Browse' options, and a vertical navigation menu on the far right listing various site sections like 'Home', 'Learn', 'Browse', 'Score', 'Glossary', 'FAQ', 'Case Studies', 'FHWA's Sustainable Highways Initiative', 'Provide Comments', 'Register', and 'Privacy'.

U.S. Department of Transportation
Federal Highway Administration

My Workspace Logged in as Illinois Tollway

Logout
Version 1.0

Home Learn Browse Score

search go

Home
Learn
Browse
Score
Glossary
FAQ
Case Studies
FHWA's Sustainable Highways Initiative
Provide Comments
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Privacy

Welcome to INVEST Version 1.0!

Announcements

The Federal Highway Administration (FHWA) is seeking to partner with State departments of transportation (DOTs), metropolitan planning organizations (MPOs), Federal lands, and local governments on utilizing INVEST 1.0, FHWA's voluntary self-assessment tool, to assess and enhance the sustainability of their projects and programs. For more information, see the [solicitation](#).

FHWA launched INVEST 1.0 on October 10, 2012. View the [one-page](#)

What do you want to do?

Learn

A guided tour through the INVEST website to learn about sustainable highways and integrating sustainability best practices into projects and programs.

Browse

Evaluate – Score – Improve

- ▶ Evaluate – Using the collaborative process can provide the most important outcome
- ▶ Score – Provides recognition for implementing sustainability best practices and identifying gaps
- ▶ Improve – Using the process to improve in practice and identify cost effective measures



INVEST: Sustainability throughout the Transportation Lifecycle



Affected Triple Bottom Line Principles



Voluntary • Private • Free • Flexible • Practical

Tollway and INVEST Implementation

- ▶ The Tollway selected INVEST based on:
 - ▶ Thorough evaluation of existing sustainability rating tools
 - ▶ INVEST is fully developed, vetted, provides an objective standard with which to measure, is free, and is a self-evaluation tool

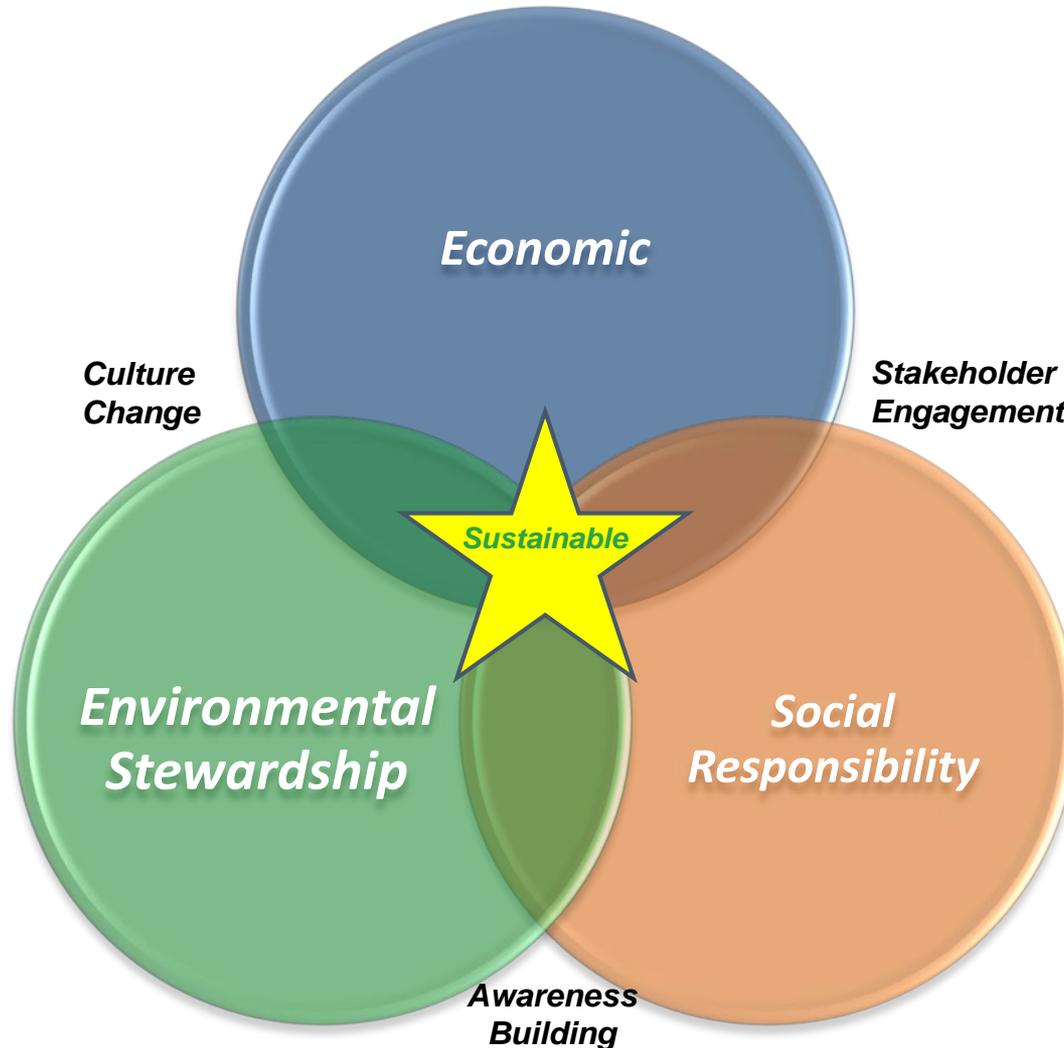
- ▶ INVEST is a tool that will help the Tollway:
 - ▶ Measure and prove that we're the "Cleanest and Greenest"
 - ▶ Evaluate past and present performance
 - ▶ Set a baseline against which future improvements can be measured
 - ▶ Identify and integrate of sustainable practices
 - ▶ Identify institutional and other barriers that may be preventing implementation of sustainable practices
 - ▶ Identify strengths regarding sustainability practices

Tollway Approach to INVEST Implementation

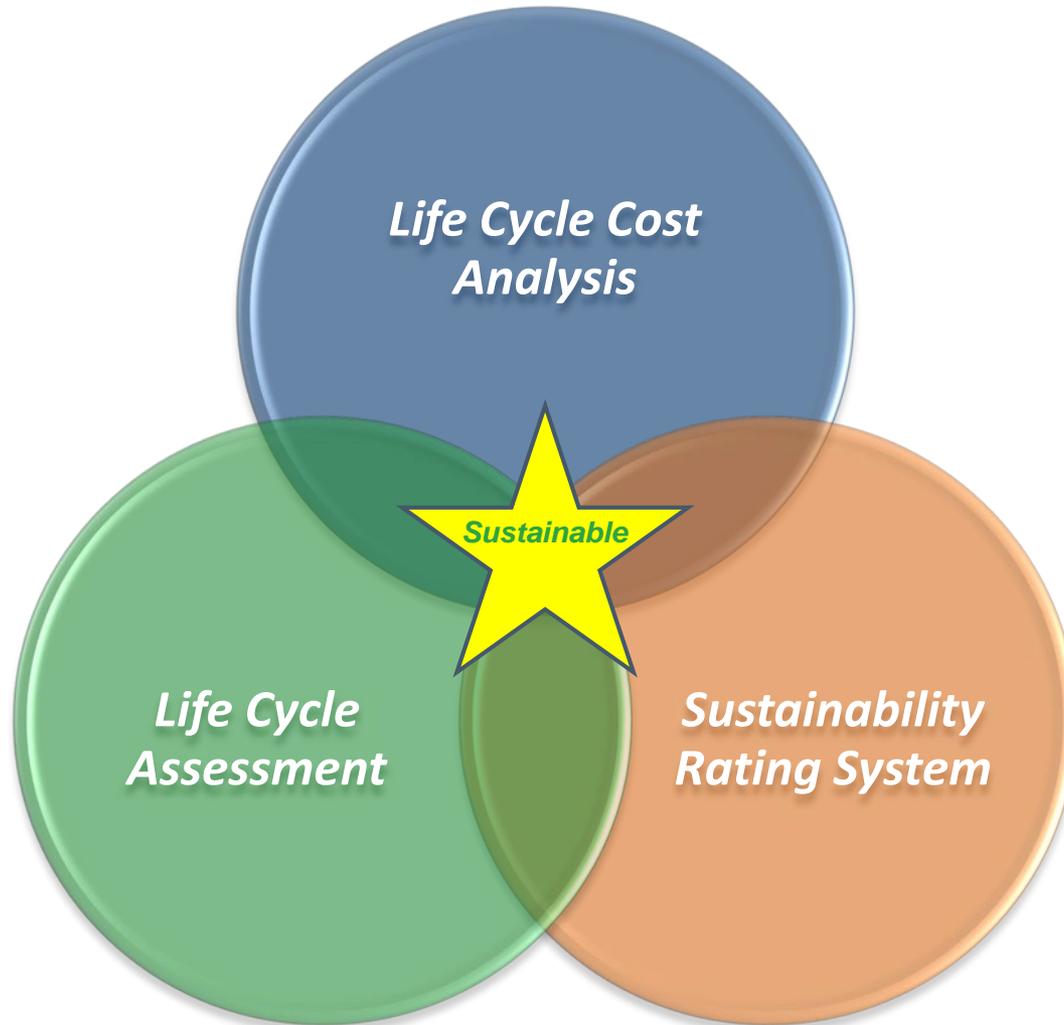
- ▶ Implementing all three modules
- ▶ System Planning & Operations and Maintenance Programs
 - ▶ Evaluating 3 baseline years and 2013
 - ▶ Will evaluate every year moving forward
- ▶ Project Development
 - ▶ Evaluating completed 22 projects to set baseline
 - ▶ Will evaluate all projects at 30% design, 95% design and completed construction moving forward

Sustainability Paradigm

The “Triple Bottom Line”



Sustainability Tools



What is Life Cycle Assessment (LCA)

- ▶ Compilation and **evaluation** of the inputs, outputs and potential **environmental** impacts of a product system throughout its **life-cycle** (ISO 14040, 1997)
- ▶ A **cradle-to-grave** approach for assessing industrial systems that **evaluates** all stages of a product's life and provides a comprehensive view of the **environmental** aspects of the **product** or **process** (EPA, 2006)

LCA is quantitative analysis

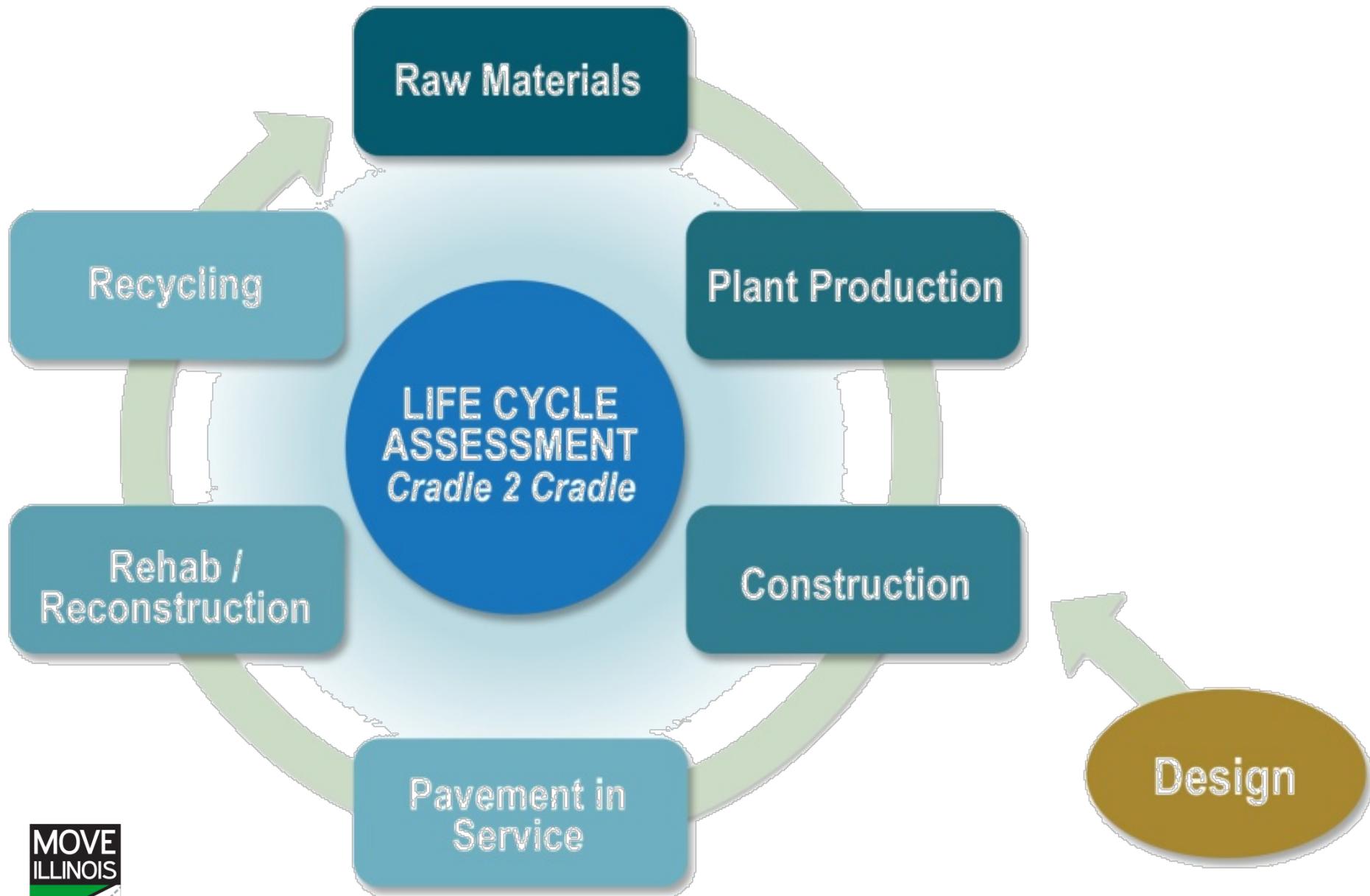
Why must we quantify?

- ▶ If it is not quantified, it is not valued
 - ▶ Without value, it won't get done
 - ▶ Without value, it cannot be improved upon
 - ▶ Without value, there is no incentive

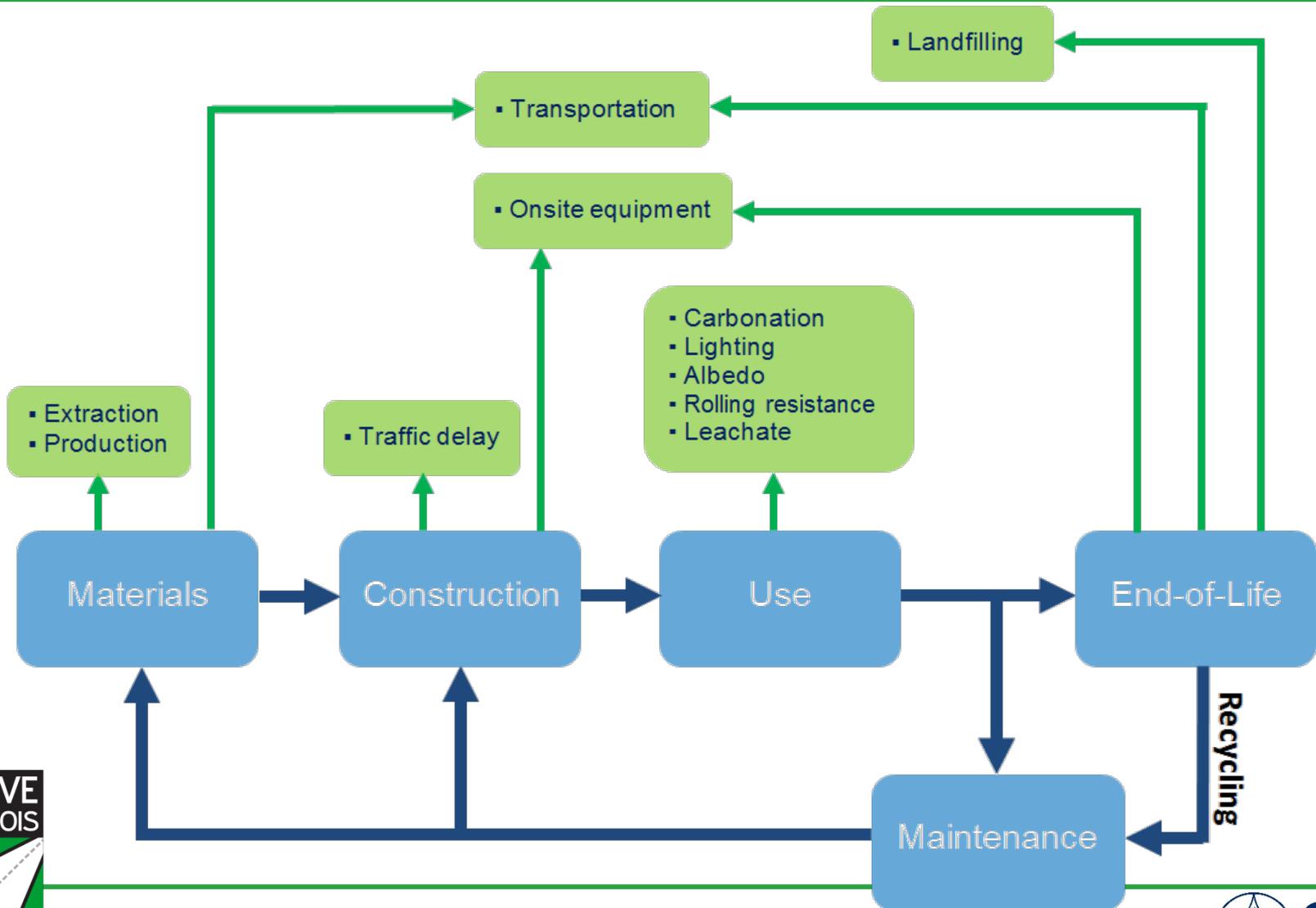


Difference between SRS and LCA

| Sustainability Rating System | Life-Cycle Assessment |
|--|--|
| Qualitative | Quantitative |
| Incorporates social, economic, and environmental aspects | Only environmental |
| Usually rates a system | Typically for a specific product (eg. pavement, car, etc.) |

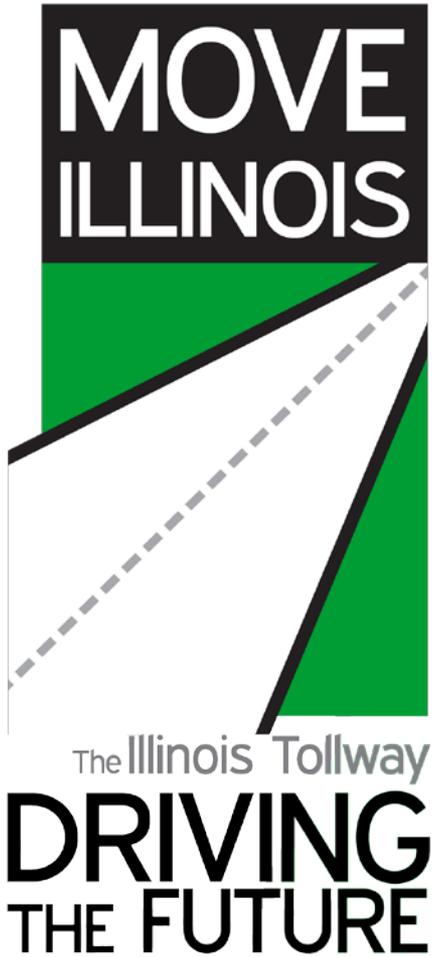


Pavement LCA



Where might it go?

- ▶ Agency establishes sustainability goal
- ▶ Design to sustainability goal
- ▶ Review of design against goal
- ▶ Construction given design standard & goal
- ▶ Contractor runs LCA with actual materials & construction procedures – Potential bonus for sustainable construction
- ▶ Review of construction against design standard & goal



THANK YOU
