



Federal Highway Administration, U.S. Department of Transportation

Sustainable Highways Program



FHWA's Sustainable Highways Initiative And Self-Evaluation Tool

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Waste Management & Resource Efficiency Workshop - Portland, OR
July 26, 2011

Agenda

- Overview of Sustainability
- Introduction to INVEST tool
- Criteria Included in Pilot Test Version
- Website Walk-thru
- Pilot Testing
- Next Steps





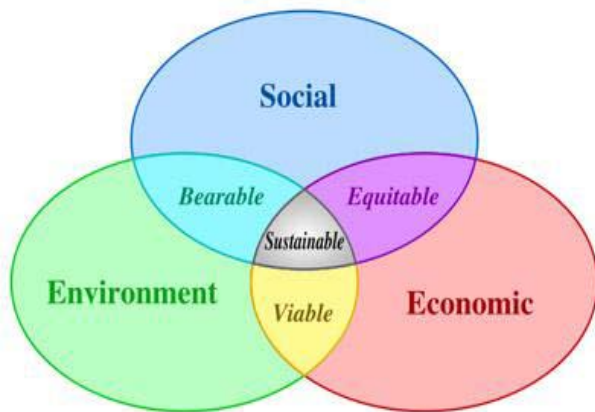
INVEST

(Infrastructure Voluntary Evaluation Sustainability Tool)

Overview of Sustainability

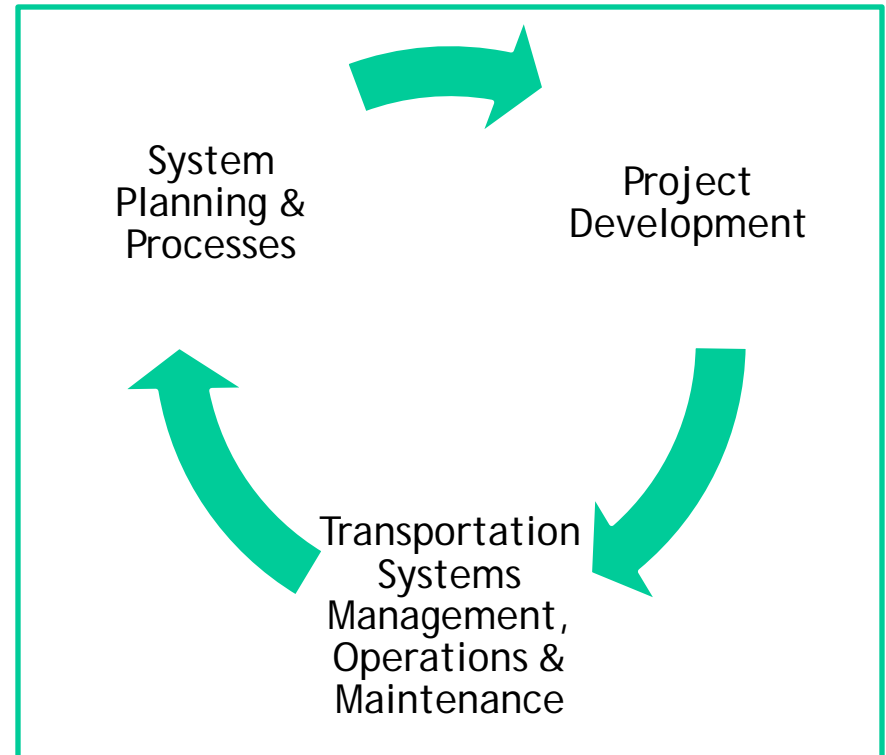
What is a Sustainable Highway System?

- Satisfies functional requirements
 - Fulfills transportation goals and needs
 - Addresses development and economic growth
- Avoids, minimizes, reduces impacts
 - Environment
 - Consumption of resources
- Addresses environmental, economic, and social equity dimensions (triple bottom line)
- Sustainability addressed throughout the project lifecycle



Sustainability and the Project Lifecycle

- For sustainability to be fully integrated into highway and transit programs, it must be considered throughout the project lifecycle
- Must address sustainability from planning through operations



Examples of Sustainable Practices

- **System Planning**
 - Integrated Planning
 - Mitigation banking
 - Fiscal planning
- **Project Development**
 - Cost Benefit Analysis
 - Construction Equipment Emission Reduction
 - Recycling and Reuse of materials
- **Operations and Maintenance**
 - Strong asset management
 - Roadside vegetation management





INVEST

(Infrastructure Voluntary Evaluation Sustainability Tool)

FHWA's Sustainable Highways Self-Evaluation Tool



Federal Highway Administration, U.S. Department of Transportation

Sustainable Highways Program

Sustainable Highways Tool

Working Title:

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



Federal Highway Administration, U.S. Department of Transportation

Sustainable Highways Program

INVEST Goals

- Encourage sustainable highway practices
 - Internal improvement
 - External recognition
- Help agencies measure sustainability and quantify tradeoffs
- Provide a framework for communicating with stakeholders about sustainability
- Establish a method for evaluating sustainable highway systems, projects, programs



Overview of INVEST

- Voluntary Web-based Tool
- Lists “sustainable criteria” based on best practices for three project phases:
 - Systems Planning
 - Project Development
 - Operations and Maintenance
- Each criterion assigned a point value based on expected sustainability impact
- In coordination with ASCE/ACEC/APWA effort
- Other sustainable highways tools used as references
 - (GreenLITES, I-LAST, Greenroads)



Ways INVEST Can be Used

- **Project Evaluation**
 - Single or multiple projects
 - Score project and/or inform SOP's, program-level
 - Proactive vs. retroactive
- **Programs and Processes**
 - Planning or O&M
 - Score and/or inform SOP's
 - Proactive vs. retroactive





INVEST

Criteria Included in Pilot Test Version



Criteria are organized in 3 phases

- **Project Development (PD)**
 - Concerned with the development of a specific project once the general need and proposal for a solution to a transportation problem have been programmed.
 - Involve environmental review, project planning, design, and construction decisions related to a specific project.
- **Operations & Maintenance (OM)**
 - Concerned with agency-wide practices, policies and procedures required for the overall functionality and efficiency of a highway network.
- **System Planning (SP) *coming September 2011***
 - Concerned with agency-wide management and planning of highway networks.
 - Typically involve the owner-agency having policies, procedures and systems in place to address them.



Project Development Criteria

PD-1	Cost Benefit Analysis	PD-9	Stormwater
PD-2	Highway and Traffic Safety	PD-10	Ecological Connectivity
PD-3	Context Sensitive Project Development (or equivalent)	PD-11	Recycle & Reuse Materials
PD-4	Lifecycle Cost Analysis	PD-12	Create Renewable Energy
PD-5	Freight Mobility	PD-13	Site Vegetation
PD-6	Educational Outreach	PD-14	Pedestrian Access
PD-7	Tracking Environmental Commitments	PD-15	Bicycle Access
PD-8	Habitat Restoration	PD-16	Transit & HOV Access



Project Development Criteria

- PD-17 Historical, Archaeological, and Cultural Preservation
- PD-18 Scenic, Natural, or Recreational Qualities
- PD-19 Low-Emitting Materials
- PD-20 Energy Efficient Lighting
- PD-21 ITS for System Operations
- PD-22 Long-Life Pavement Design
- PD-23 Reduced Energy and Emissions in Pavement Materials
- PD-24 Contractor Warranty
- PD-25 Earthwork Balance
- PD-26 Construction Environmental Training
- PD-27 Construction Equipment Emission Reduction
- PD-28 Construction Noise Mitigation
- PD-29 Construction Quality Plan
- PD-30 Construction Waste Management



PD-7 Tracking Environmental Commitments

Goal	Ensure that environmental commitments made by the project are completed and documented in accordance with all applicable laws, regulations and issued permits.
Points	1 - 5 points
Requirements	<p>3 points. Use a comprehensive environmental compliance tracking system for the project to identify how environmental commitments will be identified, tracked, fulfilled and verified throughout design and construction.</p> <p>2 points. Require that the principal project constructor has a documented EMS that meets or exceeds the standards set forth by ISO 14001:2004 and is in use on the project to track environmental commitments.</p>



PD-11 Recycle and Reuse Materials

Goal	Reduce lifecycle impacts from extraction and production of virgin materials.
Points	1 - 8 points
Requirements	Use recycled materials as a substitute for virgin materials or reuse existing materials or structural elements. Points can be earned for this criterion for both recycling and reusing and combined to a maximum of 8 points.



PD-30 Construction Waste Management

Goal	Utilize a management plan for road construction waste materials, and minimize the amount of construction-related waste destined for landfill.
Points	1 point
Requirements	The Owner shall require the Contractor to establish, implement, and maintain a formal Construction and Demolition Waste Management Plan (CWMP) during roadway construction.




Operations & Maintenance Criteria

OM-1	Sustainability Plan	OM-8	Traffic Control Infrastructure Maintenance
OM-2	Environmental Commitments Tracking System	OM-9	Snow and Ice Control
OM-3	Pavement Management System	OM-10	Work Zone Traffic Control
OM-4	Bridge Management System	OM-11	Transportation Management and Operations
OM-5	Maintenance Management System	OM-12	Safety Management
OM-6	Highway Infrastructure Maintenance	OM-13	Renewable Energy
OM-7	Roadside Infrastructure Maintenance	OM-14	Fuel Efficiency
		OM-15	Recycle and Reuse



OM-1 Sustainability Plan

Goal	Address resource and energy use, pollution generation, climate change and other aspects of sustainability in relation to the agency's internal operations.
Points	1 - 10 points
Requirements 	<p>Have a plan (2 points) The agency has an internal sustainability plan that includes goals, performance metrics, quantifiable targets, strategies, and actions designed to help meet the overall plan objectives.</p> <p>Measure performance (4 points) The internal sustainability plan contains the following components to measure performance: coordination, objectives, implementation, employee engagement, monitoring and tracking.</p> <p>Set and achieve goals (4 points)</p> <ul style="list-style-type: none">➤ Set quantifiable goals relating to the metrics above for the agency, including when these goals are to be achieved. (2 points)➤ Monitor progress towards goals for at least one year after goal establishment and show measurable advancement towards stated goals. (2 points)

OM-9 Snow and Ice Control

Goal	Plan, implement and monitor Snow and Ice Control methods and materials to reduce environmental impacts with continued or better level of service.
Points	1 - 10 points
Requirements	<p>The agency must have management tools and data to optimize the use of chemicals, apply appropriate treatments, and to monitor the effects of chlorides on the roadside vegetation and water sources, while maintaining safe roadway travel during winter months without unnecessary use of chemicals, fuel and emissions from plows and trucks applying chemicals.</p> <ul style="list-style-type: none">➤ Implement the standards of practice for snow and ice control (2 points)➤ Implement a Road Weather Information System (3 points)➤ Implement Materials Management Plan (2 points)➤ Implement a Maintenance Decision Support System (3 points)



System Planning & Processes Criteria (from Beta Version - will be revised)

SP-1	Comprehensive & Integrated Planning	SP-7	Professional Development
SP-2	Environmental Management System	SP-8	Travel Demand Management
SP-3	Context Sensitive Solutions	SP-9	Safety Management
SP-4	Equity Analysis	SP-10	Air Quality Management
SP-5	Integrated Transportation Land Use Planning	SP-11	Greenhouse Gas Emissions
SP-6	Multimodal Transportation	SP-12	Climate Change Effects
		SP-13	Noise Reduction Management Plan
		SP-14	Financial Sustainability





INVEST Website Walk-thru

www.sustainablehighways.org



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Sustainable Highways Self-Evaluation Tool

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Welcome!

Pilot Test Version of INVEST, the FHWA Sustainable Highways Self-Evaluation Tool

This website represents a significant revision of the FHWA Sustainable Highways Self-Evaluation Tool that was released as a Beta Version in the Fall of 2010. Called the "Infrastructure Voluntary Evaluation Sustainability Tool", INVEST is a practical, web-based, collection of best practices that allow states to integrate sustainability into their transportation projects. The use of the tool is voluntary and can be used

What do you want to do?

Learn

A guided tour through this website to learn about sustainable highways and integrating sustainability best practices into projects, programs, and processes.

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Sustainable Highways Self-Evaluation Tool

Pilot Test

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search go

- Home
- ▶ Learn
- Browse
- Score
- FAQ
- Provide Comments
- Privacy
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Home **Learn** Browse Score [Home > Learn](#)

Learn

This section is a guided tour through INVEST to learn about sustainable highways and integrating sustainability best practices into Project Development and Operations and Maintenance. You can:

- Learn more about [Sustainability](#) and [Sustainable Highways](#),
- Learn how [Context](#) influences sustainability, and
- Learn how to apply, incorporate, and implement sustainable highway criteria.

In the Browse and Score sections, you can:

- Download and [Browse](#) the sustainable highways criteria, and
- [Score](#) a Project, Program or Process.

[Start > What is Sustainability?](#)

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- [How is Sustainability Measured?](#)
- [What is This Tool?](#)
- [How Does It Measure Sustainability?](#)
- [How Are the Criteria Organized?](#)
- [How Are the Criteria Weighted?](#)
- [How Do I Score a Project?](#)
- [What Does the Score Mean?](#)
- [How Do I Score Agency Programs and Processes?](#)



Admin Begin: Test Extended

Logged in as Lisa Reid

Logout

Pilot Test

Federal Highway Administration, U.S. Department of Transportation Sustainable Highways Self-Evaluation Tool

Home Learn **Browse** Score [Home > Browse the Criteria](#)

search

Browse the Criteria

Select "Project Development" to browse complete set of criteria that can be used to evaluate sustainability within project planning, design, and construction.

Select "Operations and Maintenance" to browse the complete set of criteria that can be used to evaluate an Agency's programs and practices within Operations and Maintenance.

Beginning in September 2011, the complete set of "System Planning" criteria will be available to browse to evaluate an Agency's programs and practices within System Planning.

Project Development

Operations & Maintenance

System Planning

Available September 2011

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- Provide Comments
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PD-7 Tracking Environmental Commitments



Details

Goal

Ensure that environmental commitments made by the project are completed and documented in accordance with all applicable laws, regulations and issued permits.

Requirements

3 points. Beginning in project development, use a comprehensive environmental compliance tracking system for the project to identify how environmental commitments will be identified, tracked, fulfilled and verified throughout design and construction.

The environmental tracking system should include all regulatory and non-regulatory commitments that apply to the development work and additional properties, including surveys, borings, batch plants, staging, equipment storage, employee parking, and field offices; and land that is purchased, leased, occupied, or used for the work. At a minimum, the system should: identify commitments in a single list; identify an environmental compliance manager; ensure that environmental commitments are communicated from one phase of a project to another; leverage tracking mechanisms (such as databases, forms or lists); identify training needed for necessary design and construction staff; and provide periodic reports verifying the commitments have been fulfilled. The tracking system should be updated and maintained throughout the project development and any monitoring period.

2 points. Require that the principal project constructor (interpreted to be the prime contractor, design builder, or construction management firm) has a documented environmental management system (EMS) that meets or

Project: Test Project - Basic Go

Logged in as Mister Tester

Logout

Pilot Test



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Scorecard

Your Scorecard has been pre-filtered to show only the applicable credits for your Basic or Extended Project. Currently scored credits for your project are displayed below. To filter the credits or show all, use the Help Me Build It section.

To score a credit, click on the credit and go to the score tab. Answer the questions and the Self-Evaluation Tool will help add up your points. Your Total Score will be shown in the upper right hand box and will indicate if you have reached one of the achievement levels.

All your entries will be saved and available when you return.

To output a copy of your current scorecard, you may print the page. If you wish to download a PDF copy of a blank scorecard, click Download Scorecard to the right.

If you'd like to switch projects, select a project above to jump to a different Project Scorecard or create a new project.

Project: Test Project - Basic [edit](#)

Download

All Credits

Basic Scorecard

Extended Scorecard

Project Score

23

Your Rating: Not Rated

Help Me Build It

Display All Credits

Show All

Show credits by triple bottom line principle

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Select

Points



PD-01 [Cost Benefit Analysis](#)

3/3

Using the principles of cost benefit analysis, ensure that user benefits, including environmental and social benefits, exceed full...



PD-02 [Highway and Traffic Safety](#)

4/10

Safeguard human health by incorporating science-based quantitative safety analysis processes within project development that will reduce...

use the Help Me Build It section.

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If you'd like to switch projects, select a project above to jump to a different Project Scorecard or create a new project.

Project: Test Project - Basic [edit](#)

Select		Points
<input checked="" type="checkbox"/>	PD-01 Cost Benefit Analysis Using the principles of cost benefit analysis, ensure that user benefits, including environmental and social benefits, exceed full...	3/3
<input checked="" type="checkbox"/>	PD-02 Highway and Traffic Safety Safeguard human health by incorporating science-based quantitative safety analysis processes within project development that will reduce...	4/10
<input checked="" type="checkbox"/>	PD-04 Lifecycle Cost Analyses Inform the decision-making process for the project through lifecycle cost analyses of key project features.	0/3
<input checked="" type="checkbox"/>	PD-05 Freight Mobility Decrease the impacts from freight movements.	2/7
<input checked="" type="checkbox"/>	PD-06 Educational Outreach Increase public, agency, and stakeholder awareness of roadway sustainability activities.	2/2
<input checked="" type="checkbox"/>	PD-07 Tracking Environmental Commitments Ensure that environmental commitments made by the project are completed and documented in accordance with all applicable laws, regulations...	0/5
<input checked="" type="checkbox"/>	PD-08 Habitat Restoration Offset the loss and alteration of natural (stream and terrestrial) habitat caused by road construction. Restore and protect natural habitat...	3/3
<input checked="" type="checkbox"/>	PD-09 Stormwater Improve stormwater quality from the impacts of the project and control flow to	9/9

Basic Scorecard

Extended Scorecard

Project Score

23

Your Rating: Not Rated

Help Me Build It

Display All Credits

Show All

Show credits by triple bottom line principle

Environmental

filter clear

Score

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Select

Points

Help Me Build It

Display All Credits

- PD-01 [Cost Benefit Analysis](#) 3/3
Using the principles of cost benefit analysis, ensure that user benefits, including environmental and social benefits, exceed full...

- PD-02 [Safety analysis](#)

- PD-03 [Inform analysis](#)

- PD-04 [Decrease](#)

- PD-05 [Increase activity](#)

- PD-06 [Ensure social](#)

- PD-07 [Offset by road](#)

- PD-08 [Improve mobility](#)

- PD-10 [Provide mobility](#)

- PD-11 [Recycle and Reuse Materials](#) 0/6
Reduce lifecycle impacts from extraction and production of virgin materials.

- PD-14 [Pedestrian Access](#) 0/2
Promote walkable and wheelchair (wheelchairs, strollers, scooters) communities by providing pedestrian facilities within the project...

- PD-15 [Bicycle Access](#) 0/2

PD-7 Tracking Environmental Commitments



Details

Score

Questions

Has a comprehensive environmental tracking system been implemented and maintained?

Yes(3 points)

No

Did the principal constructor use an ISO 14001 EMS for environmental commitment tracking on this project?(2 points)

Save

Project: Test Project - Basic Go

Logged in as Mister Tester

Logout

Pilot Test



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Scorecard

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If you'd like to switch projects, select a project above to jump to a different Project Scorecard or create a new project.

Project: Test Project - Basic [edit](#)

Select		Points
<input checked="" type="checkbox"/>	PD-01 Cost Benefit Analysis Using the principles of cost benefit analysis, ensure that user benefits, including environmental and social benefits, exceed full...	3/3
<input checked="" type="checkbox"/>	PD-02 Highway and Traffic Safety Safeguard human health by incorporating science-based quantitative safety analysis processes within project development that will reduce...	4/10

Download

All Credits

Basic Scorecard

Extended Scorecard

Project Score

26

Your Rating: Bronze

Help Me Build It

Display All Credits

Show All

Show credits by triple bottom line principle

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Thresholds by Project Category

	Number of Points Required for Each Level	
	Basic Scorecard	Extended Scorecard
Total # of Points Possible	85	117
BRONZE (30%)	26-33	35-46
SILVER (40%)	34-42	47-58
GOLD (50%)	43-50	59-69
PLATINUM (60%)	51+	70+



Thresholds for Operations & Maintenance

	Number of Points Required for Each Level
Total # of Points Possible	150
BRONZE (30%)	45-59
SILVER (40%)	60-74
GOLD (50%)	75-89
PLATINUM (60%)	90+





INVEST

Pilot Testing and Next Steps



Pilot Testing of INVEST

- Testing will be done on the Project Development (PD), System Planning (SP) and Operations & Maintenance (OM) criteria
- Objectives for Conducting the Pilot Test
 - Provide input on how to make tool easier to use
 - Obtain input on further refinement to criteria
 - For calibration of scoring and achievement levels
- Schedule for Pilot Testing
 - July thru October 2011
- Funding available to defray costs of pilot testing



Pilot Testing Process

Task	Description	Duration
1	Solicitation and selection of Pilot Test projects and programs	4 weeks
2	Pilot Test owner coordination and agreement	2 weeks
3	Review Pilot Test instructions and participation in orientation webinar	2 weeks
4	Preparation, organization and material collection for agency workshop	2 weeks
5	Conduct pilot test self-evaluation workshop	1 day
6	Prepare summary of results and feedback	2 weeks
7	Participation in webinar on Pilot results and feedback	1 day



Next Steps

For Sustainable Highways Program

- Continue strong coordination within FHWA and with partners and stakeholders
- Create program structure, partner on key program/research gaps

For INVEST

- **Revise additional criteria**
 - Revise PD criteria - Complete, April 2011
 - **Revise O&M criteria - July (Live now)**
 - Revise System Planning criteria - August 2011
- **Pilot Testing**
 - Call for Pilot Projects (PD criteria)- Complete
 - Call for Pilots: (Planning, O&M) - end of July
- **Weighting & Scoring Review - ongoing**
- **Updates to Website - ongoing**
- **Version 1.0 Release - December 31, 2011**



www.sustainablehighways.org



Thank You!

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