



# INVEST

## FHWA's Sustainable Highways Initiative and Self-Evaluation Tool

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Office of Planning, Environment & Realty

OTEC Conference

October 2011 - Columbus, OH

# Agenda

- Overview of Sustainability and Highways
- Pilot Test Version of Self Evaluation Tool
- Website Walk-thru
- Pilot Testing
- Next Steps

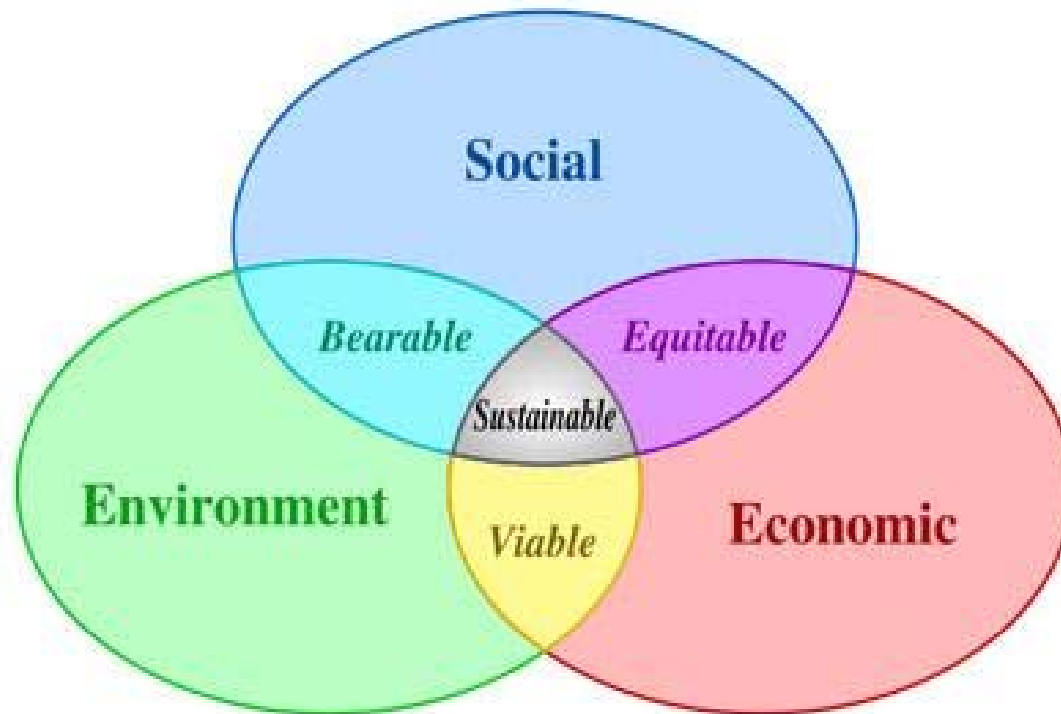


# What is a Sustainable Highway System?

- **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**

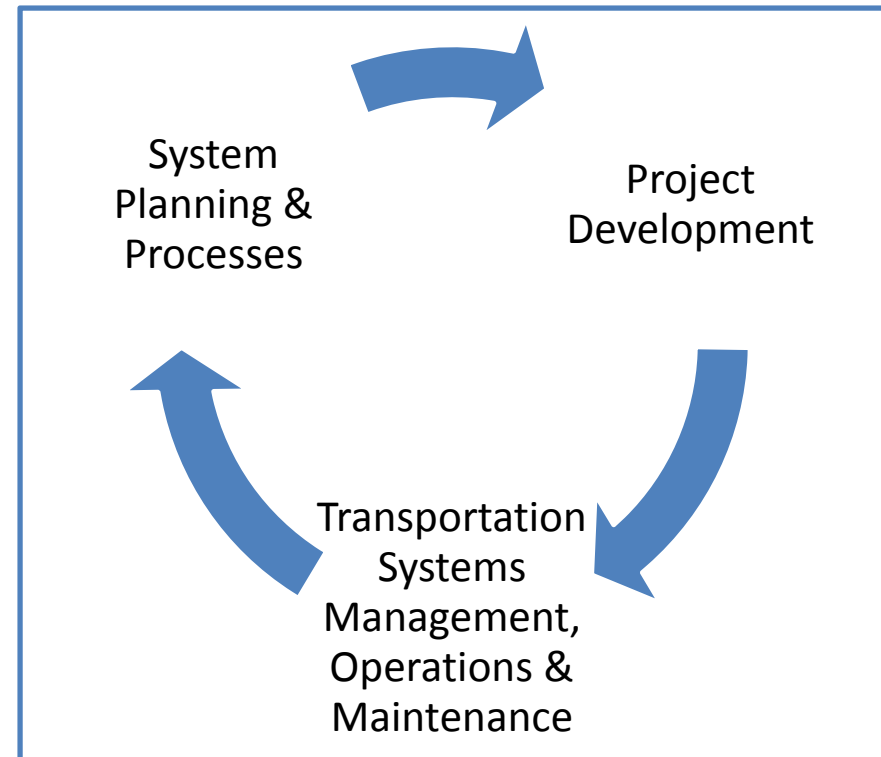


# The Triple Bottom Line



# 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



# What about Transit?

- Transit is part of system planning and project development
- Is fully considered as a partner in FHWA's activities prior to modal selection





# INVEST

(Infrastructure Voluntary Evaluation  
Sustainability Tool)

FHWA's Sustainable Highways  
Self-Evaluation Tool

# Overview of INVEST

- **Purpose and Goals of the Tool:**
  - Provide best practice information to enable transportation practitioners to incorporate sustainability into their projects and practices
  - Provide a VOLUNTARY method for practitioners to evaluate their transportation projects and to encourage progress in the sustainability arena
- **The Tool is not intended to compare states or MPOs and their projects or practices**
- **Not meant to encourage only compliance...but above and beyond**



# 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



# Significant Changes from Beta to Pilot Test Version

- **Focuses on the Project Development (PD) criteria only**
  - Beta Version included System Planning and O&M
- **Greatly simplifies criteria and scoring**
  - 1-page write-ups for each criteria
  - Combined or eliminated criteria (e.g., combined stormwater-related criteria)
- **Makes scoring smaller projects easier**
  - Basic Version - includes criteria that would be more appropriate for rehabilitation, resurfacing, and minor reconstruction projects.
  - Extended Version - includes larger number of criteria than basic version and is available to score larger reconstruction and new construction projects.
- **Reduces the Number of Criteria by Eliminating or Consolidating Criteria**
  - Basic Version = 20 Criteria
  - Extended Version = 30 Criteria



# Project Development Criteria

PD-1 Cost Benefit Analysis

PD-2 Highway and Traffic Safety

PD-3 Context Sensitive Project Development (or equivalent)

PD-4 Lifecycle Cost Analysis

PD-5 Freight Mobility

PD-6 Educational Outreach

PD-7 Tracking Environmental Commitments

PD-8 Habitat Restoration

PD-9 Stormwater

PD-10 Ecological Connectivity

PD-11 Recycle & Reuse Materials

PD-12 Create Renewable Energy

PD-13 Site Vegetation

PD-14 Pedestrian Access

PD-15 Bicycle Access

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



# System Planning Criteria

SP-1 Integrated Planning:  
Economic Development

SP-2 Integrated Planning:  
Environmental

SP-3 Integrated Planning:  
Community

SP-4 Accessibility

SP-5 Safety Planning

SP-6 Multimodal Planning

SP-7 Freight Planning

SP-8 Travel Demand  
Management

SP-9 Air Quality

SP-10 Climate Change  
Considerations

SP-11 Financial Sustainability

SP-12 Travel Forecasting  
Methods

SP-13 Congestion Management

SP-14 Linking Asset  
Management and  
Planning

SP-15 Linking Planning and  
NEPA



# Operations & Maintenance Criteria

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





## Website Walk-thru

[www.sustainablehighways.org](http://www.sustainablehighways.org)



Federal Highway Administration, U.S. Department of Transportation

# Sustainable Highways Self-Evaluation Tool

Pilot Test

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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.

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

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Home > Browse the Criteria

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## 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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Home > Scorecard

## Scorecard

### Scoring a Project

This Tool will allow you to create a project scorecard and self-evaluate projects. The first step is to login or register so that we can save your data for your future visits. Then you'll be prompted to start a Project Scorecard and be taken to the Self-Evaluation Tool.

The Pilot Test Version for the FHWA Sustainable Highways Self-Evaluation Tool has two Project Scorecards for evaluation of projects. The website has been set up to enable selection of the project type which pre-identifies applicable credits for consideration. The two project scorecards that are available for testing include:

#### 1. Basic Scorecard (20 Credits)

- Small reconstruction and bridge replacement projects that do not expand capacity of the roadway
- Preservation projects (3R) for extending service life of existing facilities and for safety enhancements
- Restoration projects (2R) for restoring pavement structure, ride quality, and spot safety

#### 2. Extended Scorecard (30 Credits)

- New construction projects for a new roadway facility or structure where nothing of its type currently exists
- Major reconstruction projects that add travel lanes to an existing roadway or bridge

↓ Download

All Credits

Basic Scorecard

Extended Scorecard

Project Score

0

Your Rating: Not Rated

Help Me Build It

Display All Credits

Show All

Show credits by triple bottom line

Project: **Test Project - Basic**

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

20

Your Rating: Not Rated

Help Me Build It

Display All Credits

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Select

Points



PD-01 [Cost Benefit Analysis](#)

0/3

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

Project:

Logged in as Mister Tester

[Logout](#)

[Pilot Test](#)

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

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

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[Basic Scorecard](#)

[Extended Scorecard](#)

[Project Score](#)

20

Your Rating: Not Rated

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Select



PD-01 [Cost Benefit Analysis](#)

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

Points

0/3

## PD-1: Cost Benefit Analysis

3 points



Basic



Extended

### Goal

Using the principles of cost benefit analysis, ensure that user benefits, including environmental and social benefits, exceed full life-cycle costs, including estimates of environmental and social costs.



Affected Triple Bottom Line Elements

### Requirements

**3 Points.** Conduct a cost benefit analysis for the project that shows the net present value (NPV) of expected user benefits exceeds life-cycle costs including social and environmental (e.g. air emissions or safety costs or benefits); and construction and maintenance costs where they can be quantified. For larger projects that reduce travel time, improve trip reliability, expand access to markets, or improve modal accessibility; the cost benefit analysis could be expanded to include broader jobs, income and Gross Domestic Product (GDP)-related benefits alongside user benefits.

As a requirement for receiving the cost benefit analysis points, a cost benefit or economic impact analysis for the project must be completed using minimum acceptable industry practices. Cost benefit analysis and economic impact analysis are different, yet complementary tools for evaluating economic impacts.

**Cost Benefit Analysis:** Cost benefit analysis assesses the user and agency benefits of projects and programs in comparison to their costs. It normally includes all direct user and agency costs and benefits that the agency is able to estimate, including operating costs, travel time costs, and often other impacts such as crash and pollution costs, but broader economic impacts are excluded in traditional benefit cost analysis. Cost benefit analysis is typically applied in transportation studies to identify the NPV of the societal benefits that can be associated with a project or program, net of the investment costs. This includes benefits that are not reflected in any monetary transaction. FHWA has developed two project-level cost benefit analysis tools including: 1) BCA.Net, which is a web-based benefit-cost analysis tool designed to support the highway project decision-making process; and 2) STEAM, which is a corridor and system-wide analysis tool that computes the net value of mobility and safety benefits attributable to regionally important transportation projects.

**Economic Impact Analysis:** Economic impact analysis is concerned with the monetary transactions that affect the generation of income in an area's economy due to the investment in the program or project. It does not include the travel time or other costs or benefits for which money is not exchanged, however, it includes indirect and induced impacts on business growth that are not included in benefit/cost analysis. However, it does include much broader estimates of impacts than direct impacts. It asks the question: "What does the economy of interest look like with or without a project or program?" as measured by the quantity of and the types of transactions that are forecasted to occur under each scenario. Impacts are shown by the change in jobs, in worker income, and in GDP or gross state product (GSP) that results in future years as a consequence of the transportation programs or projects.

### Sources

The project is considered to have met this credit if the requirements above can be reasonably substantiated through the existence of the results from a Cost Benefit/Economic Impact Analysis that includes documentation of techniques and underlying assumptions for any economic model(s) used to generate results.

FHWA Sustainable Highways Self-Evaluation Tool  
PD-1: Cost Benefit Analysis  
Pilot Test Version, April 2011

PD-1  
Page 1



Test Project - Basic

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Home | Test

Scorecard

Your Scorecard

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To score a question

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If you'd like

different Project

Project: T

Score



FD-01 Cost Benefit Analysis

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

Points

3/3

Help Me Build It

Display all Credits

Show All

Show Credits by title below

## PD-1 Cost Benefit Analysis



Details

Score

### Questions

**Using cost benefit analysis, does the net present value of expected users' benefits exceed full life-cycle costs?**

Yes (3 points)

No

Save

Project:

Logged in as Mister Tester



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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 <a href="#">Cost Benefit Analysis</a> 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 <a href="#">Highway and Traffic Safety</a> Safeguard human health by incorporating science-based quantitative safety analysis processes within project development that will reduce...	4/10

Project Score

23

Your Rating: Not Rated

Help Me Build It

Display All Credits

Show credits by triple bottom line principle

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

Select		Points
<input checked="" type="checkbox"/>	PD-01 <a href="#">Cost Benefit Analysis</a> 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 <a href="#">Highway and Traffic Safety</a> 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 <a href="#">Lifecycle Cost Analyses</a> Inform the decision-making process for the project through lifecycle cost analyses of key project features...	0/3
<input checked="" type="checkbox"/>	PD-05 <a href="#">Freight Mobility</a> Decrease the impacts from freight movements.	0/7
<input checked="" type="checkbox"/>	PD-06 <a href="#">Educational Outreach</a> Increase public, agency, and stakeholder awareness of roadway sustainability activities.	2/2
<input checked="" type="checkbox"/>	PD-07 <a href="#">Tracking Environmental Commitments</a> Ensure that environmental commitments made by the project are completed and	3/5

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All Credits

Basic Scorecard

Extended Scorecard

Project Score

23

Your Rating: Not Rated

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Display All Credits

Show All

Show credits by triple bottom line principle

Environmental

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To score a credit, answer the question and enter the number of points. You will receive a score and will indicate the number of points earned.

All your entered scores will be used to calculate your project score. To output a scorecard, click the Download Scorecard button. If you wish to download a scorecard for a specific credit, click the Download Scorecard button next to the credit.

If you'd like to view a different Project, click the Project: dropdown menu.

Select a Project:

PD-01

PD-02

PD-03

PD-04

Download

All credits

Project Scorecard

Home

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Score

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### PD-5 Freight Mobility



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Score

#### Questions

How many points has the project earned as outlined in Table 1?

- 1 Point(1 points)
- 2 Points(2 points)
- 3 Points (3 points)
- 4 Points (4 points)
- 5 Points (5 points)
- 6 Points (6 points)
- 7 Points (7 points)
- None



Home

Learn

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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 <a href="#">Cost Benefit Analysis</a> 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 <a href="#">Highway and Traffic Safety</a> 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 <a href="#">Lifecycle Cost Analyses</a> Inform the decision-making process for the project through lifecycle cost analyses of key project features.	0/3
<input checked="" type="checkbox"/>	PD-05 <a href="#">Freight Mobility</a> Decrease the impacts from freight movements.	5/7

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Project Score

28

Your Rating: Bronze

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Show credits by triple bottom line principle

Environmental

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- Learn
- Browse
- ▶ Score
- FAQ
- Feedback
- Privacy
- Register

# Thresholds by Project Category

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



# Thresholds for Operations & Maintenance

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





# INVEST

Pilot Testing and Next Steps

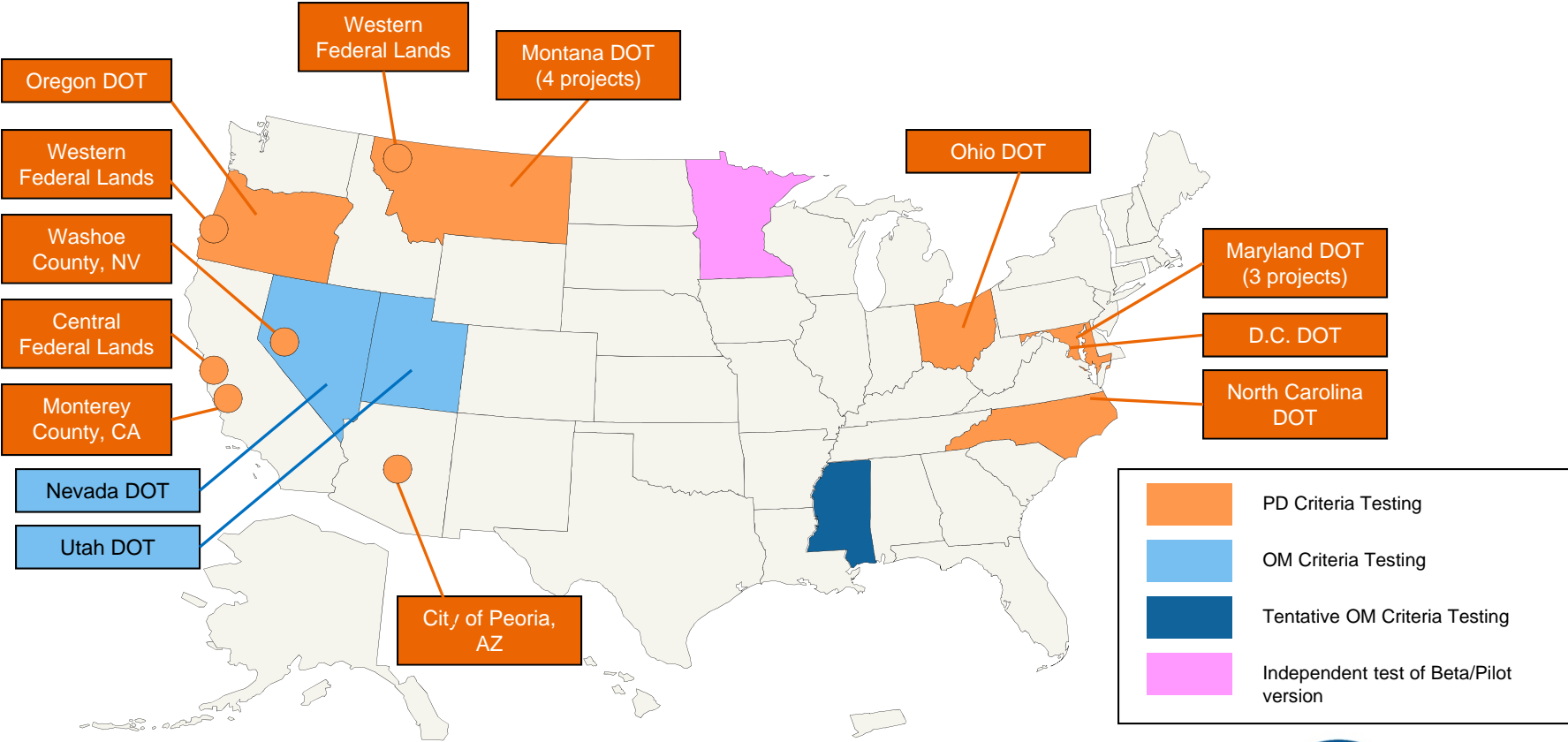
# Pilot Testing of INVEST

- 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



# INVEST Pilot Test Locations

Updated: September 21, 2011



# Pilot Testing Process

- Step 1 - Orientation and Kick-off
- Step 2 - Owner Organization & Team Identification
- Step 3 - Data Collection & Criteria Review
- Step 4 - Scoring Workshop
- Step 5 - Site Visit
- Step 6 - Feedback & Results Discussion



# 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](http://www.sustainablehighways.org)



# Thank You!

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