



# **Sustainability and INVEST**

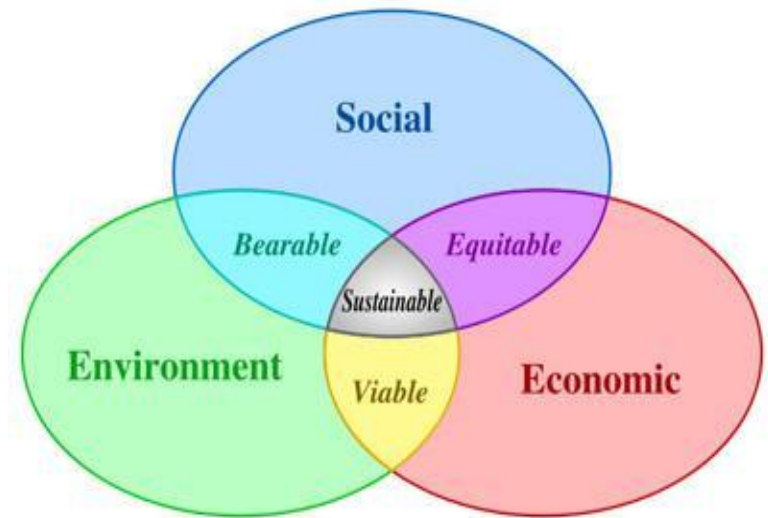
## **FHWA Talking Freight Webinar**

### **September 19, 2012**

Heather Holsinger  
FHWA - Office of Environment and Planning  
Sustainable Transport and Climate Change Team

# What is a Sustainable Highway System?

- Integral part of sustainable development
- Satisfies functional requirements
  - Fulfills transportation goals and needs
- Addresses development and economic growth
- Avoids, minimizes, reduces impacts
  - Environment
  - Consumption of resources



# Sustainability and FHWA

- Stress implementation of sustainable practices: sustainability = action
- Deliver the Federal Aid and Federal Lands Highway Programs in a more sustainable way
- Make wise investment decisions w/limited resources
- Encourage changes in professional practice
- Include sustainability throughout the decision making process
- Go beyond compliance
- Seek Balanced solutions - Not just a **GREEN** Initiative



# Sustainable Highways Initiative

- Promote coordination within FHWA and with other FHWA initiatives
- Strengthen engagement with DOTs and MPOs
- Coordination with partners:
  - ASCE, ACEC, APWA, AASHTO, AMPO, etc.
  - FTA, EPA and other Federal agencies
- Case Studies to highlight sustainable practices
- Website to serve as portal to access information on activities and available resources:  
[www.sustainablehighways.dot.gov](http://www.sustainablehighways.dot.gov)
- Develop tools: INVEST



# What is INVEST?

***INVEST* - Infrastructure Voluntary  
Evaluation Sustainability Tool**

A 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



# INVEST Structure and Criteria

- **Project Development (PD) Criteria**
  - Focus is on the development of a specific project once the general need and proposal for a solution to a transportation problem have been programmed
- **System Planning (SP) Criteria**
  - Focus is on agency-wide management and planning of highway networks
- **Operations & Maintenance (OM) Criteria**
  - Focus is on agency-wide practices, policies and procedures required for the overall functionality and efficiency of a highway network

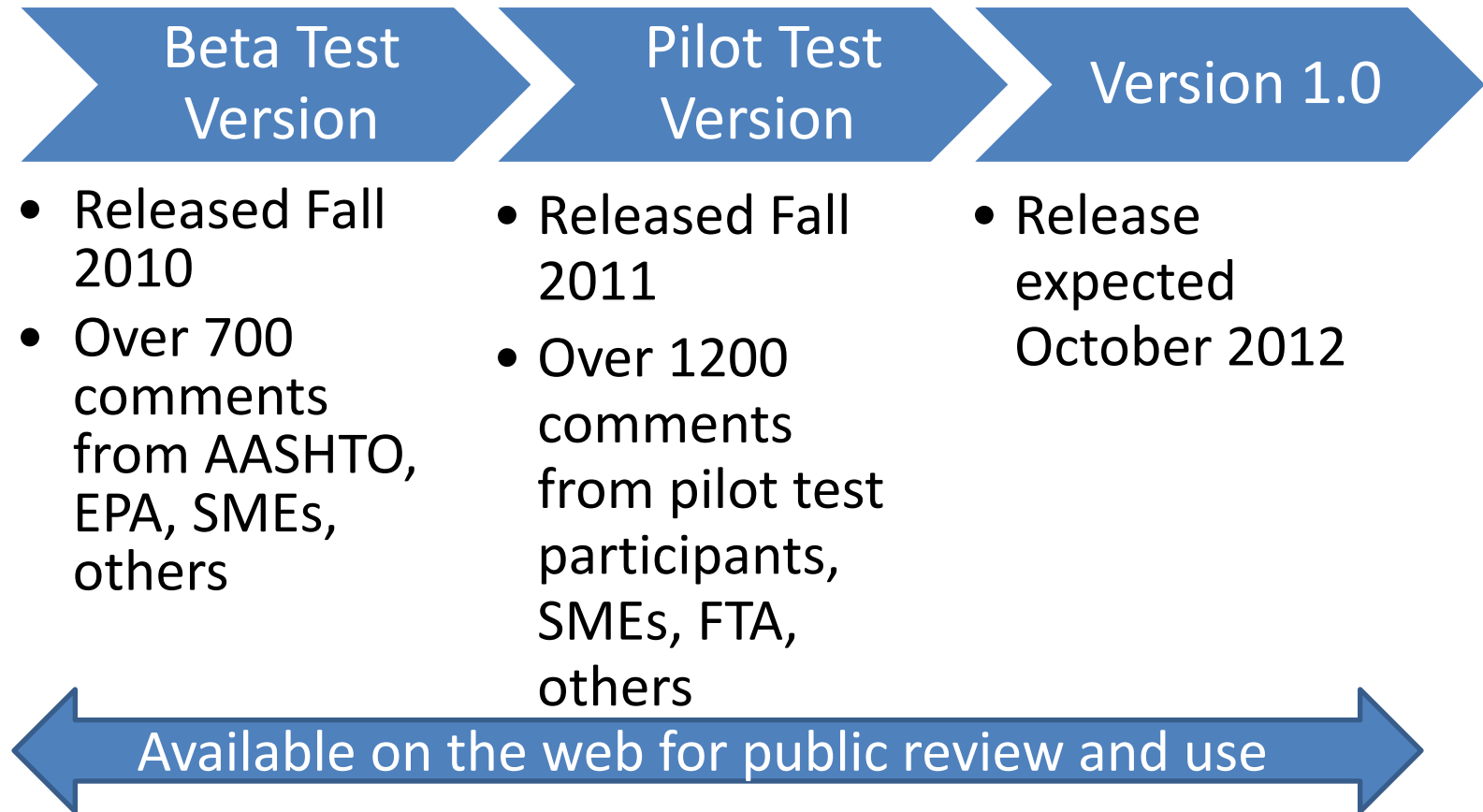


# INVEST Goals

- Encourage implementation of sustainable practices
- Help agencies assess their level of sustainability implementation and identify areas for internal improvement
  - Assess single or multiple projects
  - Prospective vs. retrospective
  - Planning or O&M programs and processes
- 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



# Evolution of INVEST



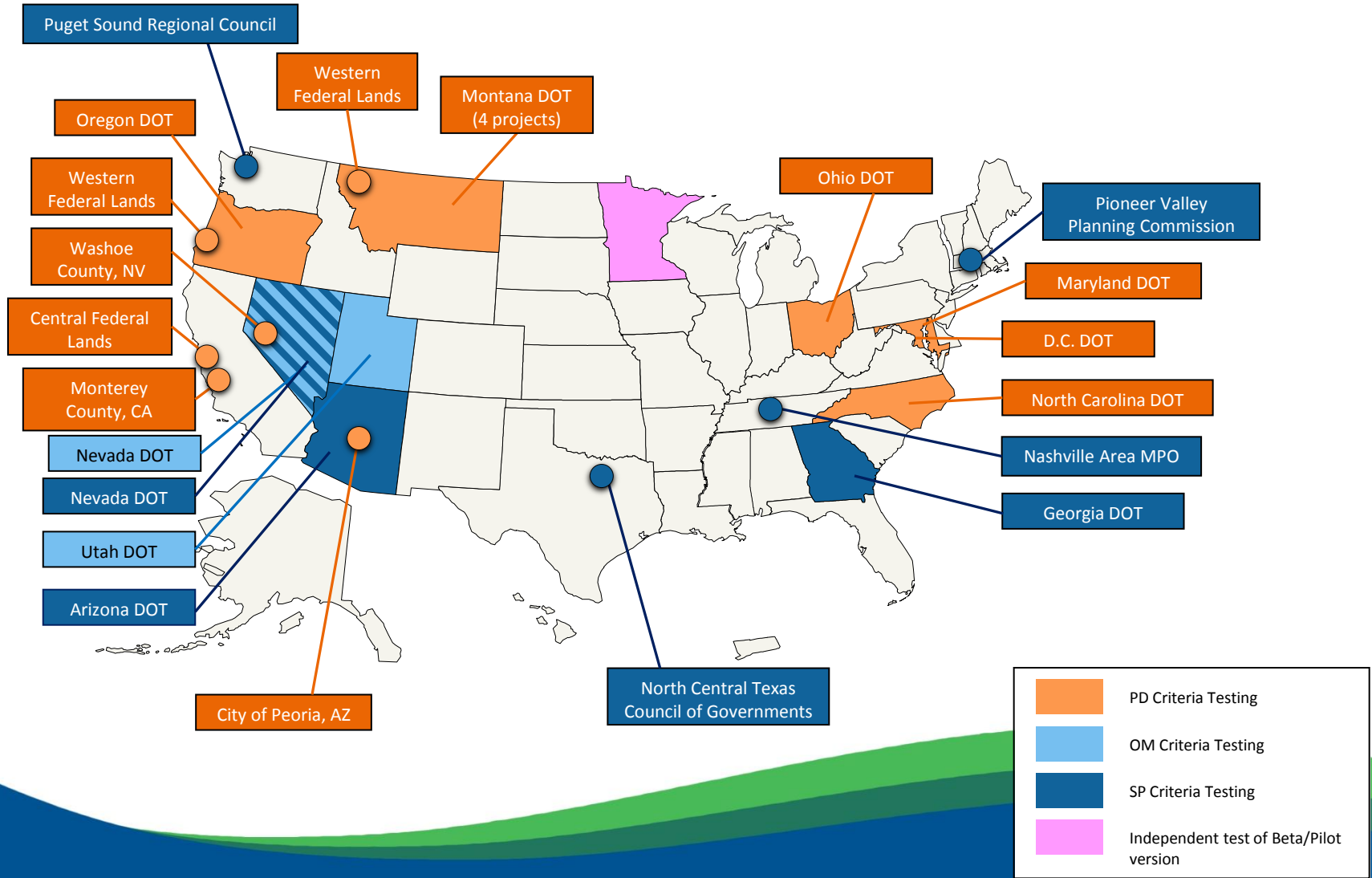


# Pilot Testing of INVEST

- Testing done on the Project Development (PD), System Planning (SP) and Operations & Maintenance (OM) criteria from July 2011 - February 2012
- Objectives were to obtain input on:
  - further refinements to the criteria
  - scoring and achievement levels
  - making the tool easier to use
- Process varied across pilot test agencies



# INVEST Pilot Test Locations



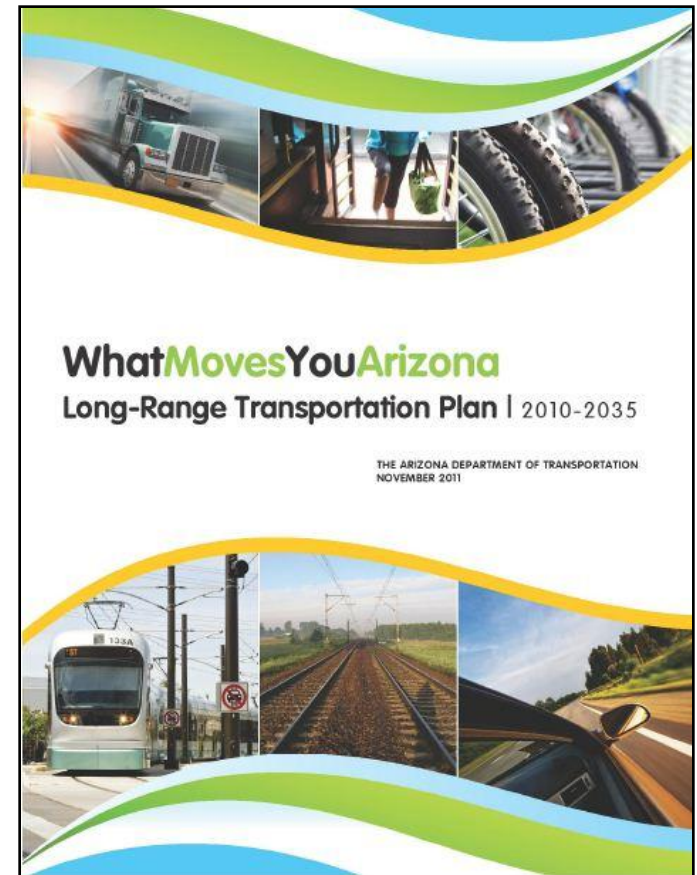
# PD Pilot: TAMC - Rte 156<sup>th</sup> W. Corridor Realignment

- Environmental document submitted
- Reviewed against current design + standard practices → scored Gold
- Team identified key ideas to incorporate more sustainable features that would get them to Platinum
- Evaluation will influence decisions on this project
- Will evaluate again in design and construction



# SP Pilot: Arizona DOT

- LRTP serves as both the principal high-level capital programming guide for ADOT and as documentation of broader statewide transportation investment needs.
- One of the best for financial sustainability
- Scoring difficult on several criteria where there is a lot of overlap with MPOs, including freight, air quality, energy and fuels, congestion, and resiliency
- Suggested giving examples of criteria requirements, addressing sometimes vs. always in scoring, raising the bar



# Lessons Learned from Pilots

- Overall pilot agencies were supportive and enthusiastic about INVEST
- Programmatic application most useful
- Pilot agencies suggested many good technical and contextual changes to the criteria and web interface
- Pilot agencies would like to see:
  - More information and a guide for using the tool
  - Additional examples of sustainable practices, case studies, etc.



# Changes for INVEST 1.0

- Significant changes to the criteria in all three modules
- More flexibility in selecting relevant PD criteria to address project concerns/context
  - urban vs. rural
  - large vs. small
- More opportunities for partial credit (i.e., gradation in point scale within criteria)
- Putting more emphasis on the process of using the tool and learning (not the score!)





# Changes for INVEST 1.0 (cont.)

- Improving web interface to make the scoring process easier to complete and clarify sustainability linkages

The screenshot shows the user interface of the INVEST Sustainable Highways Self-Evaluation Tool. At the top right, there are links for 'Admin', 'My Workspace', and 'Logged in as Lisa Reid', along with a 'Logout' button. The main header identifies the tool as 'Federal Highway Administration, U.S. Department of Transportation INVEST Sustainable Highways Self-Evaluation Tool'. Below the header is a navigation bar with 'Home', 'Learn', 'Browse', and 'Score' buttons, and a breadcrumb trail: 'Home > Score > View Criterion'. A search bar is located on the right side. The main content area is divided into two columns. The left column, titled 'Criterion Details', features a section for 'PD-6 Tracking Environmental Commitments' with a 'Download as pdf' link. It includes a 'Goal' section explaining the purpose of tracking commitments and a 'Sustainability Linkage' section with a diagram of the 'Affected Triple Bottom Line Principles' (Environmental, Social, Economic). The 'Scoring Requirements' section states that agencies are responsible for meeting commitments and that scoring is based on formal tracking systems. The right column, titled 'Criterion Scoring', contains a 'Test Project' section with two questions: 'Has a comprehensive environmental tracking system been implemented and maintained?' and 'Has the principal project constructor assigned an independent environmental compliance monitor who will provide quality assurance services and report directly to and make recommendations to the regulatory and Lead Agencies?'. Each question has radio buttons for 'Yes (2 points)' and 'No'. Below the questions is a 'Scoring Notes' section with a text area for recording assumptions and questions, and a 'Scoring Notes' section with a text area for recording notes.

Admin My Workspace Logged in as Lisa Reid Logout

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

Home Learn Browse Score Home > Score > View Criterion

search go

### Criterion Details

#### PD-6 Tracking Environmental Commitments

[Download as pdf](#)

#### Goal

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

#### Sustainability Linkage

Tracking commitments supports the environmental and social principles by ensuring that adherence to commitments made to stakeholders and the environment are consistently met throughout project development.

Affected Triple Bottom Line Principles

#### Scoring Requirements

**2-3 Points.** Agencies are responsible for meeting commitments made throughout the project to regulatory agencies, property owners, tenants, the community, and other stakeholders. This criterion requires the project owner to facilitate the tracking and compliance of commitments through a formal environmental compliance tracking system. Scoring for this requirement is based on the following, additive elements. The first element must be accomplished to earn the second.

- 2 Points.** Beginning in project development, use a comprehensive environmental compliance tracking system for the project and related facilities 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,

### Criterion Scoring

#### Test Project

**Has a comprehensive environmental tracking system been implemented and maintained?**

Yes (2 points)

No

**Has the principal project constructor assigned an independent environmental compliance monitor who will provide quality assurance services and report directly to and make recommendations to the regulatory and Lead Agencies?**

Yes (2 points)

No

#### Scoring Notes

Use this box to record your scoring assumptions, notes and questions. Will print with scorecard.

#### Scoring Notes

Track your scoring notes here. For example, "Based on May 2, 2012 Technical Report (attached)."

Home Learn Browse Score Glossary FAQ Provide Comments Register FHWA's Sustainable Highways Program Privacy

U.S. Department of Transportation  
Federal Highway Administration

# Changes for INVEST 1.0 (cont.)

- Providing ability to record notes or comments within INVEST

borings, batch plants, staging, equipment storage, employee parking, and field offices, as well as 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. For more information on environmental tracking systems, see [AASHTO's Center for Environmental Excellence](#).

- **Additional 1 Point.** The environmental tracking system has a formal mechanism to communicate commitments from transportation planning through design, construction and maintenance.

**2 Points.** The Owner shall require that the principal project constructor assigns an independent environmental compliance monitor who will provide quality assurance services and report directly to and make recommendations to the regulatory and Lead Agencies. The Independent Environmental Monitor should be a recognized expert or persons knowledgeable about natural resources protection and construction, and should report directly to regulatory agencies about problems observed during design review and construction phases, including, but not limited to, erosion and sediment control problems.

## Scoring Sources

The project is considered to have met this criterion if the requirements above can be reasonably substantiated through the existence of the following documentation sources (or equal where not available):

1. Documentation of environmental tracking system, including instructions on what is to be included and how the chain of documentation flows throughout the phases of projects.
2. Contact documents requiring the construction contractor to assign an independent environmental compliance manager.

## Upload Supporting Document(s)

## Next Actions

Use this box to record follow-up actions that your team wants to make related to meeting this criterion. Will print with scorecard.

### Next Actions

Record future actions here. For example, "Coordinate with HQ and ensure specifications meet requirements."

or [Cancel](#)





# Changes for INVEST 1.0 (cont.)

- Added a workspace area for users to see and edit multiple projects

The screenshot displays the user interface for the INVEST Sustainable Highways Self-Evaluation Tool. At the top right, there are links for 'Admin', 'My Workspace', and 'Logged in as Lisa Reid', along with a 'Logout' button. The main header includes the FHWA logo and the tool's name. Below the header is a navigation bar with 'Home', 'Learn', 'Browse', and 'Score' buttons, and a breadcrumb trail 'Home > My Workspace'. A search bar is located on the right side. The 'My Workspace' section contains a 'Scoring Tutorial' button and a 'Start a new Project or Program' button. Below these are instructions to 'Continue Working on an Existing Project or Program:' followed by two category headers: 'System Planning and Processes' and 'Project Development'. Each category lists several projects with their respective action buttons (Edit, Duplicate, Print-View, Score, Delete, Collaborate).

Admin My Workspace Logged in as Lisa Reid Logout

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

Home Learn Browse Score Home > My Workspace

search go

Home  
Learn  
Browse  
Score  
Glossary  
FAQ  
Provide Comments  
Register  
FHWA's Sustainable Highways Program  
Privacy

### My Workspace

Scoring Tutorial

Start a new Project or Program

Continue Working on an Existing Project or Program:

#### System Planning and Processes

<a href="#">TEST SP 8-31</a>	<a href="#">Edit</a>	<a href="#">Duplicate</a>	<a href="#">Print-View</a>	<a href="#">Score</a>	<a href="#">Delete</a>	<a href="#">Collaborate</a>
<a href="#">System Planning Test (wjb)</a>			<a href="#">Print-View</a>	<a href="#">Review</a>		<a href="#">Collaborate</a>
<a href="#">TEST 11/1</a>	<a href="#">Edit</a>	<a href="#">Duplicate</a>	<a href="#">Print-View</a>	<a href="#">Score</a>	<a href="#">Delete</a>	<a href="#">Collaborate</a>
<a href="#">Copy of System Planning Test (wjb)</a>			<a href="#">Print-View</a>	<a href="#">Review</a>		<a href="#">Collaborate</a>

#### Project Development

<a href="#">PS Urban Extended Test</a>			<a href="#">Print-View</a>	<a href="#">Review</a>		<a href="#">Collaborate</a>
<a href="#">Custom Test 5/2012</a>	<a href="#">Edit</a>	<a href="#">Duplicate</a>	<a href="#">Print-View</a>	<a href="#">Score</a>	<a href="#">Delete</a>	<a href="#">Collaborate</a>
<a href="#">Test Project</a>	<a href="#">Edit</a>	<a href="#">Duplicate</a>	<a href="#">Print-View</a>	<a href="#">Score</a>	<a href="#">Delete</a>	<a href="#">Collaborate</a>
<a href="#">custom</a>	<a href="#">Edit</a>	<a href="#">Duplicate</a>	<a href="#">Print-View</a>	<a href="#">Score</a>	<a href="#">Delete</a>	<a href="#">Collaborate</a>

# Version 1 Project Development Criteria

PD-1	Economic Analyses	PD-10	Pedestrian Access
PD-2	Lifecycle Cost Analysis	PD-11	Bicycle Access
PD-3	Context Sensitive Project Development	PD-12	Transit & HOV Access
PD-4	Highway and Traffic Safety	PD-13	Freight Mobility
PD-5	Educational Outreach	PD-14	ITS for System Operations
PD-6	Tracking Environmental Commitments	PD-15	Historical, Archaeological, and Cultural Preservation
PD-7	Habitat Restoration	PD-16	Scenic, Natural, or Recreational Qualities
PD-8	Stormwater	PD-17	Energy Efficiency
PD-9	Ecological Connectivity	PD-18	Site Vegetation



# Version 1 Project Development Criteria

PD-19	Reduce and Reuse Materials	PD-27	Construction Noise Mitigation
PD-20	Recycle Materials	PD-28	Construction Quality Control Plan
PD-21	Earthwork Balance	PD-29	Construction Waste Management
PD-22	Long-Life Pavement Design		
PD-23	Reduced Energy and Emissions in Pavement Materials		
PD-24	Contractor Warranty		
PD-25	Construction Environmental Training		
PD-26	Construction Equipment Emission Reduction		





# PD-13 Freight Mobility

<b>Goal</b>	Enhance mobility of freight movements, decrease fuel consumption and emissions impacts, and reduce freight-related noise.
<b>Points</b>	1 – 7 points
<b>Requirements</b>	<p><b>1 – 7 Points:</b> Implement one or more of the features in Table 1. Points for features are cumulative if roadways have more than one feature, however this criterion shall not exceed seven (7) points.</p> <p><b>Table on following slide...</b></p>



Affected Triple Bottom Line Principles



# PD-13 Freight Mobility (continued)

Points	Feature	Recommended Requirements
1	No-idling policy and signage (no-idling policy within certain parameters, such as outside air temperature)	<ul style="list-style-type: none"> <li>Implementation and appropriate number consistent with project setting.</li> </ul>
1	Construct new rest area or rest stop or expand existing rest area or rest stop	<ul style="list-style-type: none"> <li>Provides a significant number of new truck parking spots at or within a reasonable distance to a rest area.</li> <li>Region near proposed rest area experiences extensive interstate shoulder, interchange shoulder, and/or off-road, non-assigned parking by tractor-trailers.</li> </ul>
2	Safety improvements specifically for freight (e.g. additional safety signage, speed warnings systems for hills, other intelligent transportation system solutions)	<ul style="list-style-type: none"> <li>Implementation and appropriate number consistent with project setting.</li> <li>Meet requirements in the AASHTO Highway Capacity Manual such that there are no height, weight or turning radius restrictions for freight vehicles.</li> </ul>
2	Physical or otherwise constructed grade, alignment, or other design adjustments for truck safety, mobility, and the reduction of freight-related noise	<ul style="list-style-type: none"> <li>Implementation and appropriate number consistent with project setting.</li> </ul>

Continued on following slide



# PD-13 Freight Mobility (continued)

Points	Feature	Recommended Requirements
3	Construct new dedicated truck delivery parking areas or repurpose an existing parking area for truck delivery-only.	<ul style="list-style-type: none"> <li>• Speeds 35 miles per hour or less (local traffic)</li> <li>• Accommodate 40-foot delivery trucks</li> <li>• Accessible within the project site (i.e. located in a parking lane on a local street)</li> <li>• Financed with project budget</li> <li>• Appropriate signage (type and number) within project Area</li> </ul>
3	Automated Weigh-In-Motion station	<ul style="list-style-type: none"> <li>• Accessible within the project site (i.e. located along the right-of-way), or in close proximity to the roadway</li> </ul>
4	Virtual Weigh-In-Motion stations	<ul style="list-style-type: none"> <li>• Accessible within the project site (i.e. located along the right-of-way)</li> <li>• Within close proximity to the roadway project right-of- way.</li> </ul>
4	Construct a new electrified rest stop or electrify an existing rest stop	<ul style="list-style-type: none"> <li>• Minimum five (5) electric hookups per stop.</li> <li>• Accessible within the project site (i.e. located at a highway exit)</li> <li>• Within close proximity to the roadway project right-of-Way.</li> </ul>
5	Construct a new or convert an existing mixed-traffic lane to a truck-only lane	<ul style="list-style-type: none"> <li>• Minimum density of 10% truck traffic (Hansen et al., 2008)</li> <li>• Minimum volume of 1300 trucks per hour per lane (Hansen et al., 2008)</li> </ul>

# Version 1 System Planning Criteria

- |      |  |       |   |
|------|--|-------|---|
| SP-1 | Integrated Planning:<br>Economic Development and<br>Land Use | SP-9  | Travel Demand Management                          |
| SP-2 | Integrated Planning: Natural<br>Environment                  | SP-10 | Air Quality                                       |
| SP-3 | Integrated Planning: Social                                  | SP-11 | Energy and Fuels                                  |
| SP-4 | Integrated Planning: Bonus                                   | SP-12 | Financial Sustainability                          |
| SP-5 | Access & Affordability                                       | SP-13 | Analysis Methods                                  |
| SP-6 | Safety Planning  | SP-14 | Transportation Systems<br>Management & Operations |
| SP-7 | Multimodal Transportation<br>and Public Health               | SP-15 | Linking Asset Management and<br>Planning          |
| SP-8 | Freight and Goods Movement                                   | SP-16 | Infrastructure Resiliency                         |
|      |  | SP-17 | Linking Planning and NEPA                         |





# SP-8 Freight and Goods Movement

<b>Goal</b>	Implement a transportation system plan that meets freight access and mobility needs while also supporting triple bottom line sustainability principles.
<b>Points</b>	1-15 points
<b>Requirements</b>	<p><b>2 points. Engage Stakeholders:</b></p> <p>The agency regularly engages a wide variety of freight service providers, stakeholders, workers, and representatives in creating plans and programs to ensure freight activity supports vibrant and sustainable economic activity that fits well in the community.</p> <p><b>4 points. Freight Mobility Needs</b></p> <ul style="list-style-type: none"><li>• 2 points: Consider multimodal freight mobility needs in the LRTP.</li><li>• 2 points: Include and monitor sustainability-related freight mobility performance measures in planning documents.</li></ul> <p><b>Continued on following slide...</b></p>



Affected Triple Bottom Line Principles





# SP-8 Freight and Goods Movement (continued)

Requirements

Con't.

## **4 points. Freight Reliability**

- 2 points: Include in the LRTP or other appropriate plan specific provisions for maintaining and improving freight reliability and interconnectedness between freight modes for both inter- and intra-city freight, in ways that enhance sustainability.
- 2 points: Include and monitor sustainability-related freight reliability performance measures in planning documents.

## **4 points. Intermodal Freight Connectors:**

- 2 points: Provide for planning, evaluating, maintaining, and improving intermodal freight connectors at all levels.
- 2 points: Include and monitor sustainability-related performance measures for intermodal freight connectors in planning documents.

# Version 1 Operations & Maintenance Criteria

OM-1	Internal Sustainability Plan	OM-8	Bridge Management System
OM-2	Electrical Energy Efficiency and Use	OM-9	Maintenance Management System
OM-3	Vehicle Fuel Efficiency and Use	OM-10	Highway Infrastructure Preservation and Maintenance
OM-4	Reuse and Recycle	OM-11	Traffic Control Infrastructure Maintenance
OM-5	Safety Management	OM-12	Road Weather Management Program
OM-6	Environmental Commitments Tracking System	OM-13	Transportation Management and Operations
OM-7	Pavement Management System	OM-14	Work Zone Traffic Control



# Next Steps

- INVEST 1.0 will be released on October 10<sup>th</sup>
- Initiation of Deployment Program (PY13)
- INVEST Toolkits
- Monitor performance/impact of INVEST 1.0
- INVEST 1.X, 2.0...beyond



# Thank You!

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



## **FHWA Sustainability Initiative and INVEST Team Contacts:**

Michael Culp  
[Michael.culp@dot.gov](mailto:Michael.culp@dot.gov)

Connie Hill  
[Connie.hill@dot.gov](mailto:Connie.hill@dot.gov)

Heather Holsinger  
[Heather.holsinger@dot.gov](mailto:Heather.holsinger@dot.gov)



U.S. Department of Transportation  
Federal Highway Administration

