Sustainability and INVEST
FHWA Talking Freight Webinar
September 19, 2012

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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
• 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

Beta Test Version
- Released Fall 2010
- Over 700 comments from AASHTO, EPA, SMEs, others

Pilot Test Version
- Released Fall 2011
- Over 1200 comments from pilot test participants, SMEs, FTA, others

Version 1.0
- Release expected October 2012

Available on the web for public review and use
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

- Montana DOT (4 projects)
- Oregon DOT
- Western Federal Lands
- Washoe County, NV
- Central Federal Lands
- Monterey County, CA
- Nevada DOT
- Nevada DOT
- Utah DOT
- Arizona DOT
- City of Peoria, AZ
- Ohio DOT
- Western Federal Lands
- Montana DOT (4 projects)
- Oregon DOT
- Ohio DOT
- Pioneer Valley Planning Commission
- Maryland DOT
- D.C. DOT
- North Carolina DOT
- Nashville Area MPO
- Georgia DOT
- Puget Sound Regional Council
- North Central Texas Council of Governments

Legend:
- PD Criteria Testing
- OM Criteria Testing
- SP Criteria Testing
- Independent test of Beta/Pilot version

Federal Highway Administration, U.S. Department of Transportation
Sustainable Highways Program
PD Pilot: TAMC - Rte 156th W. Corridor Realignement

- 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

**Criterion Details**

**PD-6 Tracking Environmental Commitments**

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**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.

**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.
Changes for INVEST 1.0 (cont.)

- Providing ability to record notes or comments within INVEST

- **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.
Changes for INVEST 1.0 (cont.)

- Added a workspace area for users to see and edit multiple projects
<table>
<thead>
<tr>
<th>PD-1</th>
<th>Economic Analyses</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD-2</td>
<td>Lifecycle Cost Analysis</td>
</tr>
<tr>
<td>PD-3</td>
<td>Context Sensitive Project Development</td>
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<tr>
<td>PD-4</td>
<td>Highway and Traffic Safety</td>
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<td>PD-5</td>
<td>Educational Outreach</td>
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<tr>
<td>PD-6</td>
<td>Tracking Environmental Commitments</td>
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<td>PD-7</td>
<td>Habitat Restoration</td>
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<td>PD-8</td>
<td>Stormwater</td>
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<td>PD-9</td>
<td>Ecological Connectivity</td>
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<td>PD-10</td>
<td>Pedestrian Access</td>
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<td>PD-11</td>
<td>Bicycle Access</td>
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<tr>
<td>PD-12</td>
<td>Transit &amp; HOV Access</td>
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<tr>
<td>PD-13</td>
<td>Freight Mobility</td>
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<tr>
<td>PD-14</td>
<td>ITS for System Operations</td>
</tr>
<tr>
<td>PD-15</td>
<td>Historical, Archaeological, and Cultural Preservation</td>
</tr>
<tr>
<td>PD-16</td>
<td>Scenic, Natural, or Recreational Qualities</td>
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<tr>
<td>PD-17</td>
<td>Energy Efficiency</td>
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<tr>
<td>PD-18</td>
<td>Site Vegetation</td>
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</tbody>
</table>
## Version 1 Project Development Criteria

<table>
<thead>
<tr>
<th>PD-19</th>
<th>Reduce and Reuse Materials</th>
</tr>
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<tbody>
<tr>
<td>PD-20</td>
<td>Recycle Materials</td>
</tr>
<tr>
<td>PD-21</td>
<td>Earthwork Balance</td>
</tr>
<tr>
<td>PD-22</td>
<td>Long-Life Pavement Design</td>
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<tr>
<td>PD-23</td>
<td>Reduced Energy and Emissions in Pavement Materials</td>
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<tr>
<td>PD-24</td>
<td>Contractor Warranty</td>
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<td>PD-25</td>
<td>Construction Environmental Training</td>
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<tr>
<td>PD-26</td>
<td>Construction Equipment Emission Reduction</td>
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<tr>
<td>PD-27</td>
<td>Construction Noise Mitigation</td>
</tr>
<tr>
<td>PD-28</td>
<td>Construction Quality Control Plan</td>
</tr>
<tr>
<td>PD-29</td>
<td>Construction Waste Management</td>
</tr>
</tbody>
</table>
## PD-13 Freight Mobility

<table>
<thead>
<tr>
<th>Goal</th>
<th>Enhance mobility of freight movements, decrease fuel consumption and emissions impacts, and reduce freight-related noise.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Points</td>
<td>1 – 7 points</td>
</tr>
<tr>
<td>Requirements</td>
<td><strong>1 – 7 Points:</strong> 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.</td>
</tr>
</tbody>
</table>

Table on following slide...
<table>
<thead>
<tr>
<th>Points</th>
<th>Feature</th>
<th>Recommended Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>No-idling policy and signage (no-idling policy within certain parameters, such as outside air temperature)</td>
<td>• Implementation and appropriate number consistent with project setting.</td>
</tr>
</tbody>
</table>
| 1      | Construct new rest area or rest stop or expand existing rest area or rest stop | • Provides a significant number of new truck parking spots at or within a reasonable distance to a rest area.  
• Region near proposed rest area experiences extensive interstate shoulder, interchange shoulder, and/or off-road, non-assigned parking by tractor-trailers. |
| 2      | Safety improvements specifically for freight (e.g. additional safety signage, speed warnings systems for hills, other intelligent transportation system solutions) | • Implementation and appropriate number consistent with project setting.  
• Meet requirements in the AASHTO Highway Capacity Manual such that there are no height, weight or turning radius restrictions for freight vehicles. |
| 2      | Physical or otherwise constructed grade, alignment, or other design adjustments for truck safety, mobility, and the reduction of freight-related noise | • Implementation and appropriate number consistent with project setting.                                                                                   |

Continued on following slide…
## PD-13 Freight Mobility (continued)

<table>
<thead>
<tr>
<th>Points</th>
<th>Feature</th>
<th>Recommended Requirements</th>
</tr>
</thead>
</table>
| 3      | **Construct new dedicated truck delivery parking areas or repurpose an existing parking area for truck delivery-only.** | • Speeds 35 miles per hour or less (local traffic)  
• Accommodate 40-foot delivery trucks  
• Accessible within the project site (i.e. located in a parking lane on a local street)  
• Financed with project budget  
• Appropriate signage (type and number) within project Area |
| 3      | **Automated Weigh-In-Motion station**                                    | • Accessible within the project site (i.e. located along the right-of-way), or in close proximity to the roadway |
| 4      | **Virtual Weigh-In-Motion stations**                                     | • Accessible within the project site (i.e. located along the right-of-way)  
• Within close proximity to the roadway project right-of-way. |
| 4      | **Construct a new electrified rest stop or electrify an existing rest stop** | • Minimum five (5) electric hookups per stop.  
• Accessible within the project site (i.e. located at a highway exit)  
• Within close proximity to the roadway project right-of-Way. |
| 5      | **Construct a new or convert an existing mixed-traffic lane to a truck-only lane** | • Minimum density of 10% truck traffic (Hansen et al., 2008)  
• Minimum volume of 1300 trucks per hour per lane (Hansen et al., 2008) |
Version 1 System Planning Criteria

SP-1  Integrated Planning: Economic Development and Land Use
SP-2  Integrated Planning: Natural Environment
SP-3  Integrated Planning: Social
SP-4  Integrated Planning: Bonus
SP-5  Access & Affordability
SP-6  Safety Planning
SP-7  Multimodal Transportation and Public Health
SP-8  Freight and Goods Movement

SP-9  Travel Demand Management
SP-10  Air Quality
SP-11  Energy and Fuels
SP-12  Financial Sustainability
SP-13  Analysis Methods
SP-14  Transportation Systems Management & Operations
SP-15  Linking Asset Management and Planning
SP-16  Infrastructure Resiliency
SP-17  Linking Planning and NEPA
### Goal
Implement a transportation system plan that meets freight access and mobility needs while also supporting triple bottom line sustainability principles.

### Points
1-15 points

### Requirements

**2 points. Engage Stakeholders:**
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.

**4 points. Freight Mobility Needs**
- 2 points: Consider multimodal freight mobility needs in the LRTP.
- 2 points: Include and monitor sustainability-related freight mobility performance measures in planning documents.

Continued on following slide...
### Requirements Con’t.

<table>
<thead>
<tr>
<th>4 points. Freight Reliability</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 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.</td>
</tr>
<tr>
<td>• 2 points: Include and monitor sustainability-related freight reliability performance measures in planning documents.</td>
</tr>
</tbody>
</table>

### 4 points. Intermodal Freight Connectors:

<table>
<thead>
<tr>
<th>4 points. Intermodal Freight Connectors:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• 2 points: Provide for planning, evaluating, maintaining, and improving intermodal freight connectors at all levels.</td>
</tr>
<tr>
<td>• 2 points: Include and monitor sustainability-related performance measures for intermodal freight connectors in planning documents.</td>
</tr>
</tbody>
</table>
Version 1 Operations & Maintenance Criteria

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

- INVEST 1.0 will be released on October 10th
- 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
www.sustainablehighways.dot.gov

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