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NAS Roundtable on Science and Technology for Sustainability

Examples of Innovative Public Sector Sustainability Indicators and Metrics:
FHWA's INVEST Tool

November 12, 2015

U.S. Department of Transportation
Federal Highway Administration

What is Sustainability?

The Sustainability Triple Bottom Line

FHWA Sustainable Highways Initiative

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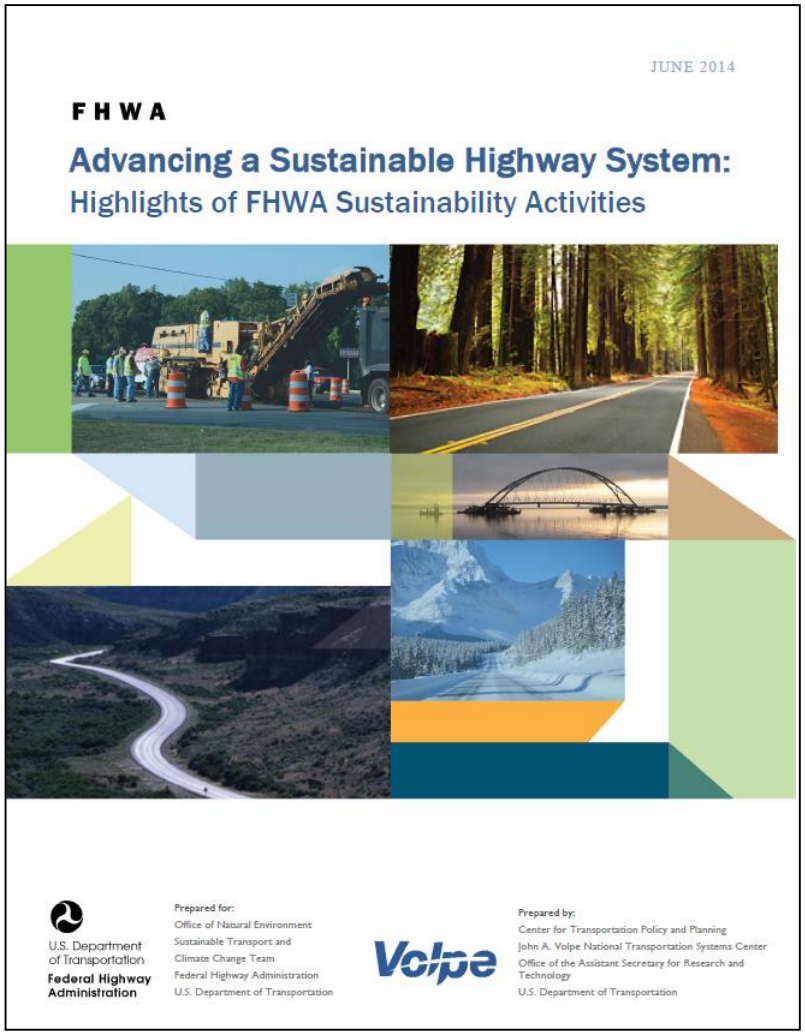
The Sustainable Highways Initiative supports programs and activities conducted across the Federal Highway Administration to facilitate balanced decision-making among environmental, economic and social values — the triple bottom line of sustainability.

Highlights of FHWA Activities

- Released in June 2014
- Showcases some of the ways in which FHWA is incorporating and embedding sustainability
- Highlights several agency initiatives and programs
- Serves as a resource to the public, transportation professionals, and those working within FHWA



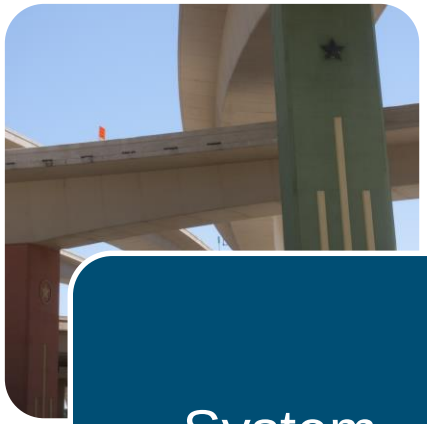
Why INVEST?

- Connects sustainability principles with action
- Measures sustainability specifically for transportation
- Helps stakeholders in the industry go above and beyond

Built for the Real World

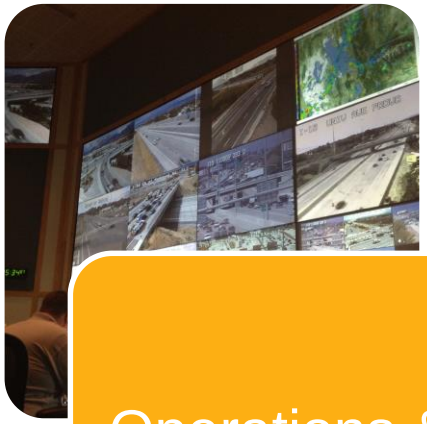
- Voluntary – Use it how and where the agency wants
- Private – Data belongs to the user
- Practical – Relates to projects and planning the agency does every day
- Free – No licenses and no limits

Supporting the Entire Life Cycle



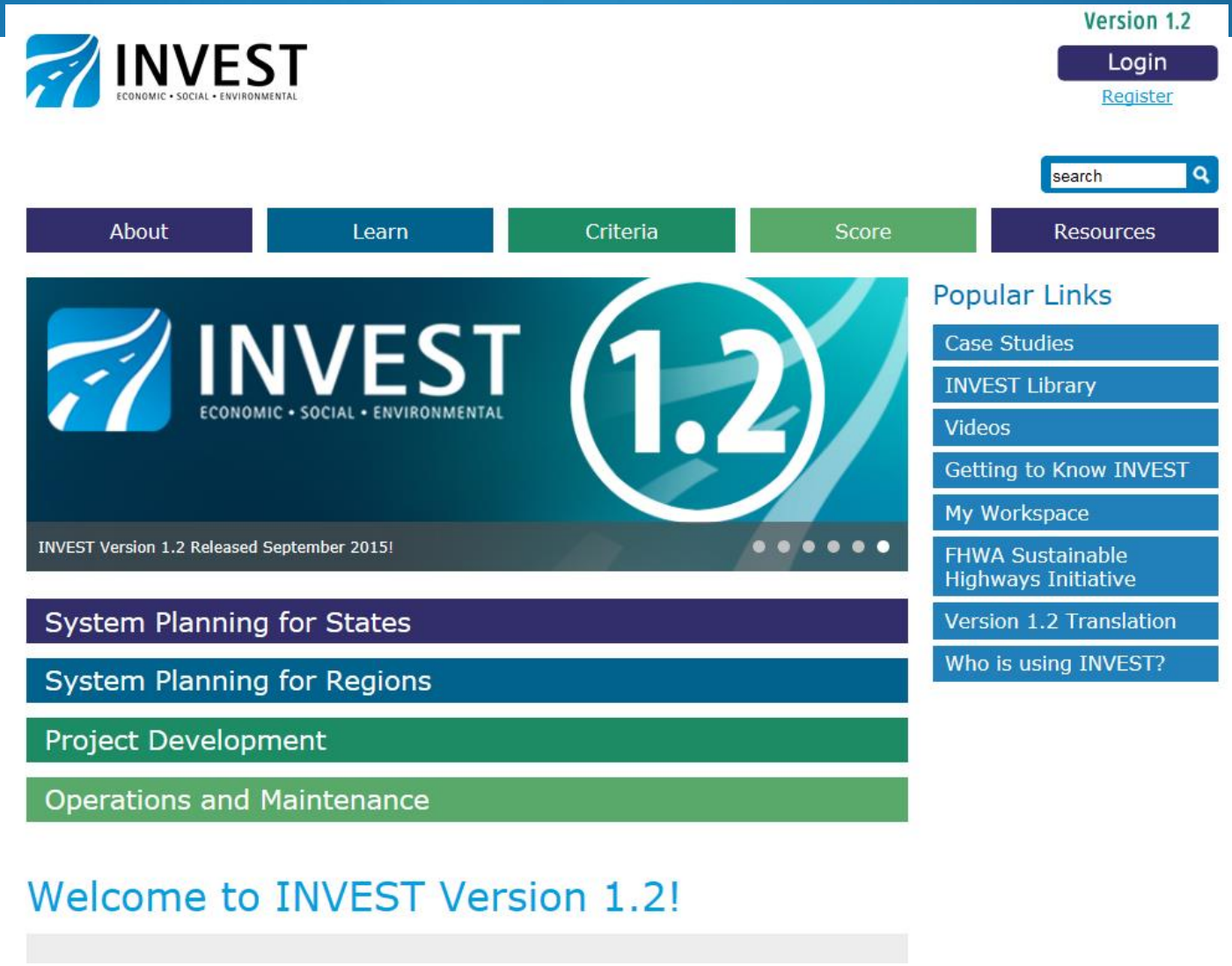
System Planning

Project Development



Operations & Maintenance

About INVEST



INVEST User Workspace

My Workspace

Scoring Tutorial

Start a new Project or Program

Continue Working on an Existing Project or Program:

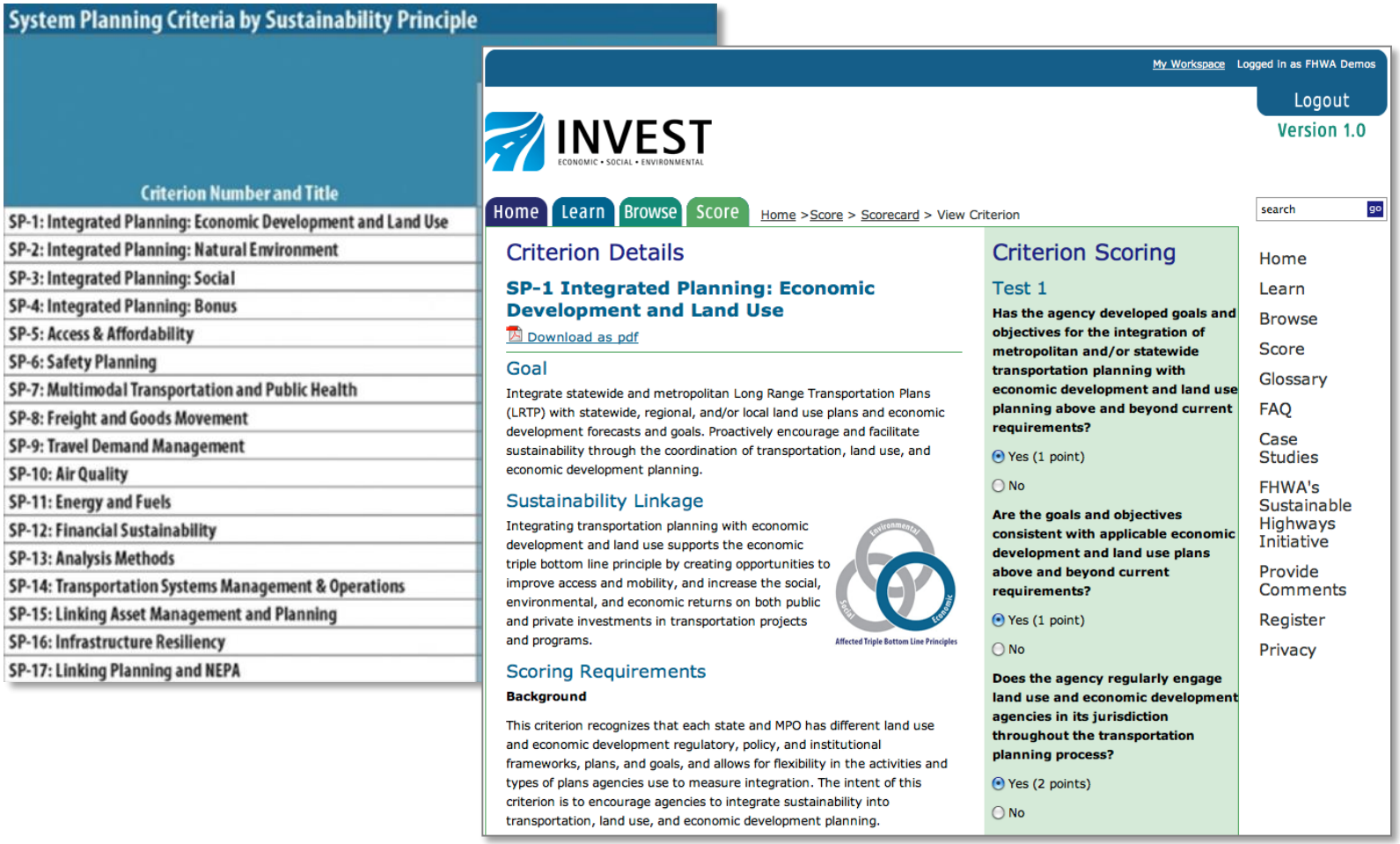
System Planning

Title		Version	Primary ID	Secondary ID	Year	Design Phase	Score	Status	Rating
Sample SP	ACTIONS ▸	1.1					0	○	●

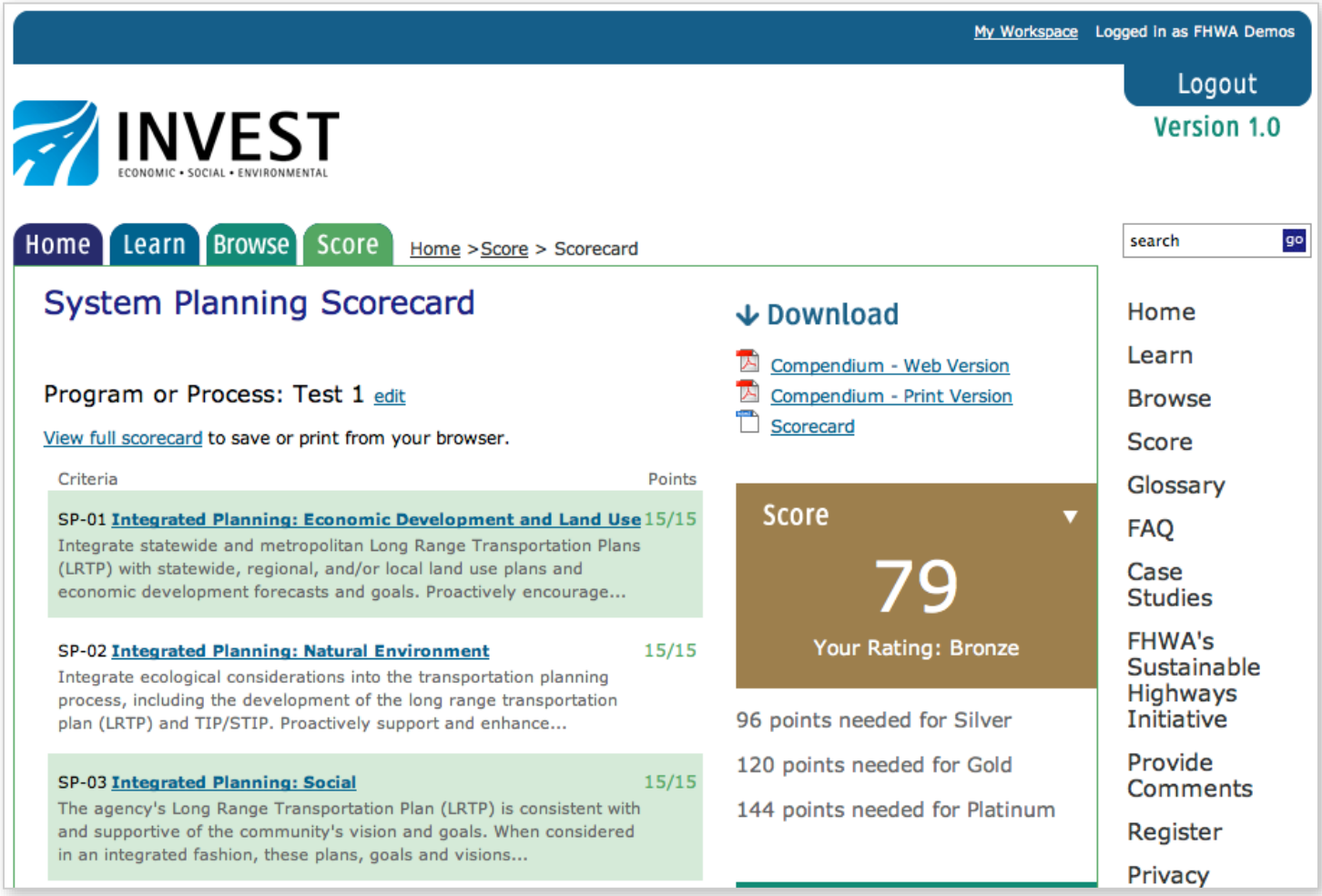
Project Development

Title		Version	Primary ID	Secondary ID	Year	Design Phase	Score	Status	Rating
CCG2 - George V. Voinovich Bridge	ACTIONS ▸	1.1					83	◑	○
Sample PD Custom	ACTIONS ▸	1.1					0	○	
Sample PD Paving	ACTIONS ▸	1.1					14	◑	●
Sample PD Rural Basic	ACTIONS ▸	1.1					0	○	●
Sample PD Rural Extended	ACTIONS ▸	1.1					0	○	●
Sample PD Urban Basic	ACTIONS ▸	1.1					0	○	●

Scoring in INVEST



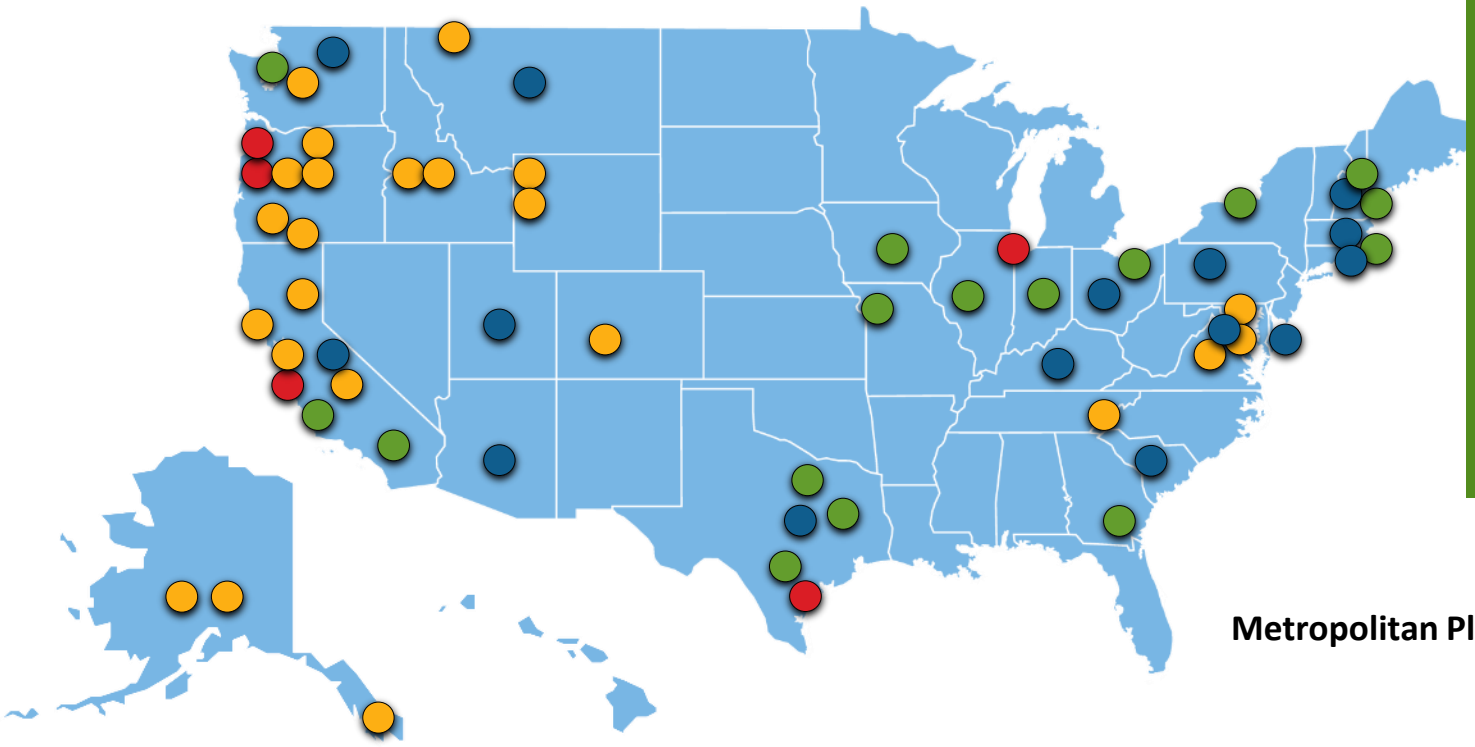
How INVEST Measures Sustainability



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 Usage



State DOT
Metropolitan Planning Org. (MPO)
Federal Lands Unit
Other

INVEST Usage By the Numbers

Entities that have informed FHWA they are using INVEST:*

- 15 State DOTs
- 16 MPOs
- 23 Federal Lands Units
- 5 other transport agencies in US (local, transit, tollway)
- 1 foreign government

* Since usage of the tool is confidential, we only know names of those entities that have informed us.

Website Statistics

- > 1500 registered users
- > 1600 projects or programs evaluated

Utah Department of Transportation

Maintaining a State-Wide Highway System

INVEST Role: Operations & Maintenance

- Traffic monitoring & coordination across 6K+ center-line miles of highways
- Key goals: preserve infrastructure, optimize mobility, improve safety, strengthen the economy
- Budget pressures driving need for more sustainable practices
- Used INVEST to ID inexpensive ways to promote sustainability, like better data about pavement conditions

Watch Video Case Study Here

Springfield, IL MPO

- Used INVEST PD module to develop conceptual design for Historic Route 66 corridor project showing locations for specific sustainability improvements (streetscape design, crosswalks, lighting, bus stops, public art).
- Demonstrated how the improvements would enhance the level of sustainability of the project as measured against the national benchmark of INVEST.
- Held workshop with city officials and state DOT; raised interest in implementing sustainability practices.
- Communicated INVEST criteria effectively and concisely through a visual format.

PD-15: Historical, Archaeological and Cultural Preservation

Goal: Preserve, protect or enhance cultural and historic assets, and/or feature National Byways Program (NSBP) historic, archaeological, or cultural intrinsic qualities in a roadway.

Prerequisite 2: Any portion of the project is along one of America's Byways, a State Scenic Byway, an Indian Tribe Scenic Byway, or other route that was designated or officially recognized as such because of its significant historical, cultural and/or archaeological features.

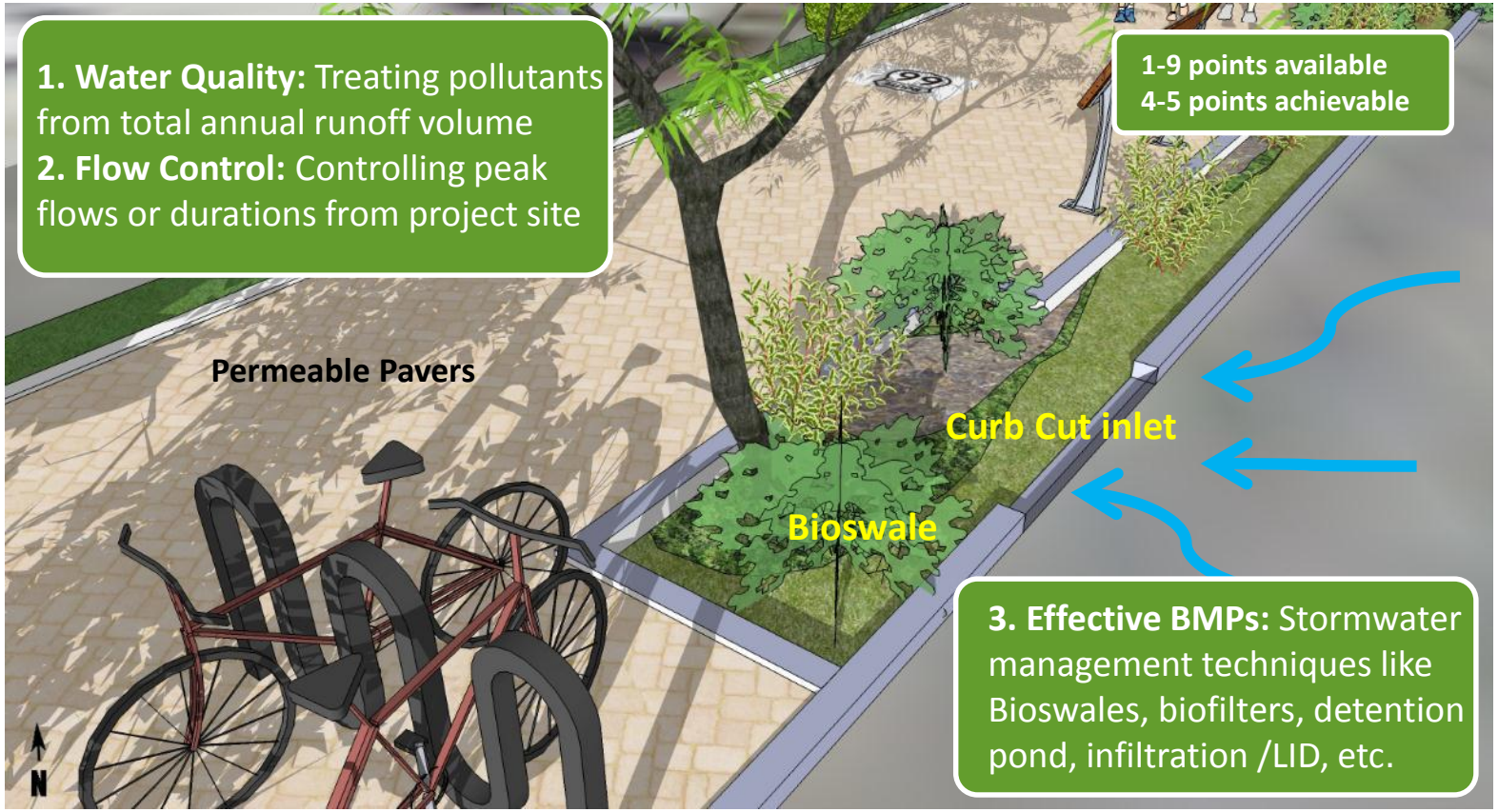
1. Enhance features: Protect, preserve, and/or enhance historic, archaeological, or cultural resources. This could be done through the installation of informational or interpretive facilities (e.g. Viewpoint, kiosk, sign for visitors detailing historical, archaeological or cultural significance.)

1-3 points available
3 points achievable

PD-8: Stormwater

Goal: Improve stormwater quality from the impacts of the project and control flow to minimize their erosive effects on receiving water bodies and related water resources, using management methods and practices that reduce the impacts associated with development and redevelopment.

Requirements: **1. Water Quality** **2. Flow Control** **3. Effective BMPs**



Washington State Department of Transportation

- Scored 3 corridor planning studies with INVEST SP module.
- Developed recommendations for making corridor planning at the agency more sustainable based on INVEST scoring.
- Integrated these recommendations into WSDOT's updated Practical Planning Guidelines.
- Will have positive impact on all future corridor studies.
- Used PD module to evaluate part of SR 520 Bridge Replacement and HOV program.

Locations of the three corridor planning studies

Utah Department of Transportation

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OM-12 Road Weather Management:

Implement Standard Operating Procedure for Snow and Ice Control (2 points)

- Salt reduction
- Anti-icing program
- Chemical storage BMPs
- Equipment calibration
- Fuel efficiency, planning and route optimization

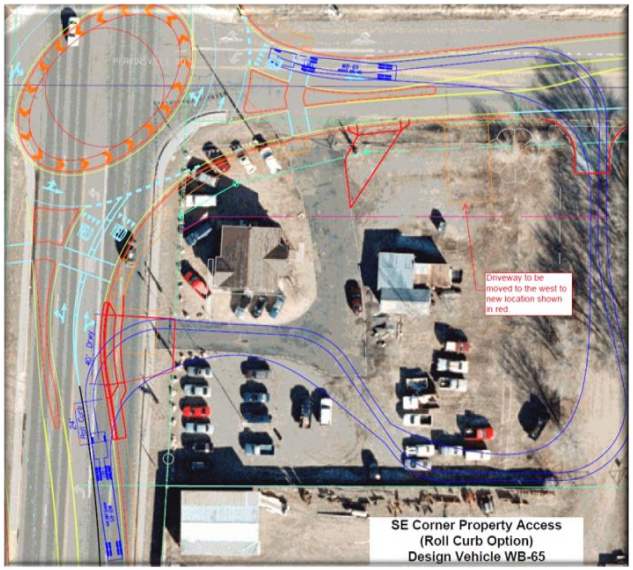
Utah Snow SOP highlights all 3 areas of sustainability:

- Saves $124,000 per year compared to standard practice (economic)
- Reduces the amount of salt used by 30 percent (environmental)
- Improves road safety and accessibility (social)

As part of the INVEST evaluation, UDOT developed a prioritized set of recommendations for improved sustainability. Included a recommendation to produce a snow removal decision support system, which would formalize the agency's current process.

Arizona Department of Transportation

- Scope:
  - Evaluated 20 planned or under-construction roundabout projects
  - Held training INVEST workshops with local governments
- Key Outcomes:
  - Integration into ADOT decision-making of a comprehensive platform for assessing programs and practices using a holistic sustainability lens.
  - Plans to improve management of waste streams from pavement preservation projects.
  - Improved freight mobility.
  - Integration of key ADOT partners into the transportation sustainability conversation.



Freight Considerations - State Route 89 and Perkinsville Road, Chino Valley, AZ
PD-13: Freight Mobility Score – 7/7

- 2 Points – Safety improvements specific to freight
- 2 Points – Design and construction adjustments specific to freight
- 3 Points – Construct dedicated truck delivery ingress and egress

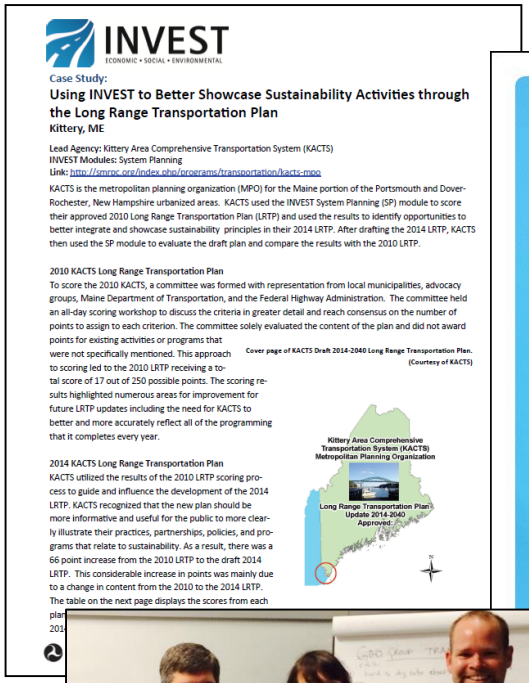
Overall, the project scored 41 points in INVEST, giving it a Silver rating.

TriMet

- Used INVEST on light rail project
- Saw INVEST as opportunity to use federally-tested set of metrics to assess effectiveness of TriMet sustainability strategies and their integration into the project.
- PD custom scorecard – achieved Gold
- Selected 7 of 14 OM criteria as applicable to transit project. Scored Bronze.
- TriMet recommendations resulting from INVEST:
  - Embed RFP process with sustainability language and expectations to ensure data collected and goals met
  - Use INVEST in synergy with other sustainability evaluation tools

Resources Available

- Case Studies
- INVEST Toolkit
  - Fact sheet
  - Presentation Slides
  - User Guide
  - Examples
  - Map
- Consultations
- Training
- Contacts with peers



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Case Study:

Using INVEST to Better Showcase Sustainability Activities through the Long Range Transportation Plan

Kittery, ME

Lead Agency: Kittery Area Comprehensive Transportation System (KACTS)
INVEST Modules: System Planning
Link: http://smrpc.org/index.php/programs/transportation/kacts-mpo

KACTS is the metropolitan planning organization (MPO) for the Maine portion of the Portsmouth and Dover-Rochester, New Hampshire urbanized areas. KACTS used the INVEST System Planning (SP) module to score their approved 2010 Long Range Transportation Plan (LRTP) and used the results to identify opportunities to better integrate and showcase sustainability principles in their 2014 LRTP. After drafting the 2014 LRTP, KACTS then used the SP module to evaluate the draft plan and compare the results with the 2010 LRTP.

2010 KACTS Long Range Transportation Plan

To score the 2010 KACTS, a committee was formed with representation from local municipalities, advocacy groups, Maine Department of Transportation, and the Federal Highway Administration. The committee held an all-day scoring workshop to discuss the criteria in greater detail and reach consensus on the number of points to assign to each criterion. The committee solely evaluated the content of the plan and did not award points for existing activities or programs that were not specifically mentioned. This approach to scoring led to the 2010 LRTP receiving a total score of 17 out of 250 possible points. The scoring results highlighted numerous areas for improvement for future LRTP updates including the need for KACTS to better and more accurately reflect all of the programming that it completes every year.

Cover page of KACTS Draft 2014-2040 Long Range Transportation Plan. (Courtesy of KACTS)

2014 KACTS Long Range Transportation Plan

KACTS utilized the results of the 2010 LRTP scoring process to guide and influence the development of the 2014 LRTP. KACTS recognized that the new plan should be more informative and useful for the public to more clearly illustrate their practices, partnerships, policies, and programs that relate to sustainability. As a result, there was a 66 point increase from the 2010 LRTP to the draft 2014 LRTP. This considerable increase in points was mainly due to a change in content from the 2010 to the 2014 LRTP. The table on the next page displays the scores from each pla
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INVEST: Sustainability throughout the Transportation Lifecycle

Affected Triple Bottom Line Principles

Voluntary • Private • Free • Flexible • Practical

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Try INVEST at:
www.sustainablehighways.org

Contact:

Mike Culp (michael.culp@dot.gov)
Connie Hill Galloway (connie.hill@dot.gov)
Tina Hodges (tina.hodges@dot.gov)
Heather Holsinger (heather.holsinger@dot.gov)
Rob Hyman (robert.hyman@dot.gov)

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Appendix: System Planning Criteria

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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

Appendix: Project Development Criteria

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

Appendix: Project Development Criteria

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- PD-19 Reduce and Reuse Materials
- PD-20 Recycle Materials
- PD-21 Earthwork Balance
- 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-27 Construction Noise Mitigation
- PD-28 Construction Quality Control Plan
- PD-29 Construction Waste Management

Appendix: Operations & Maintenance Criteria

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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