Integrating INVEST into Project-Level Planning Tools - STAQS 2019 Sustainability and Resilience Session

August 21, 2019
Metro Atlanta Facts

- 5,900 square miles (20 counties/100+ municipalities)
- 3.6 million jobs (2019)
- 5.7 million in population (2019)
- 42% white, 58% non-white by 2040
- 170 million daily vehicle miles traveled
- 250,000 daily transit boardings
INVEST (Infrastructure Voluntary Evaluation Sustainability Tool)

The Sustainability Triple Bottom Line

System Planning (State or Regional) & Processes

Project Development

Operations & Maintenance

https://www.sustainablehighways.org/
How to Access INVEST

• Web-based

• Criteria is provided

• Scoring is web-based (need a login)

• Prior case studies provided

• FHWA - Office of Natural Environment (HQ)
Scope of ARC Implementation
INVEST Round 3 Implementation Assistance

1. Project Development Module (v. 1.2)

2. $50,000 federal grant assistance, plus ARC in-kind match

3. Completed in Summer 2019

Project Development

The Project Development (PD) module includes 33 criteria that are generally organized from planning to design to construction, with the exception of PD-30 through PD-33 which were added for INVEST Version 1.2. This section includes all of the criteria for evaluating sustainability within a project. Using this section, you can:

- Review all the criteria that are included in the Project Development module;
- Use the filters on the right side tool bar to filter criteria by scorecard;
- Download individual criterion write-ups (when browsing specific criteria); and
- View the Case Studies and Criterion Examples specific to each criterion (a feature only available online, not within the PDF.)

Visit the INVEST 1.3 Library to download the PD Compendium (all criteria within the PD module.)

All Scorecards

- PD-01 Economic Analyses
  Using the principles of benefit-cost analysis (BCA) or economic impact analysis (EIA), provide evidence that the benefits, including environmental, economic, and social benefits, justify the full life-cycle costs.

- PD-02 Lifecycle Cost Analyses
  Reduce life-cycle costs and resource consumption through the informed use of life-cycle cost analyses of key project features during the decision-making process for the project.
<table>
<thead>
<tr>
<th>Economic Analysis</th>
<th>Life Cycle Cost Analyses</th>
<th>Context Sensitive Project Development</th>
<th>Highway and Traffic Safety</th>
<th>Educational Outreach</th>
<th>Tracking Environmental Commitments</th>
<th>Habitat Restoration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stormwater Quality and Flow Control</td>
<td>Ecological Connectivity</td>
<td>Pedestrian Facilities</td>
<td>Bicycle Facilities</td>
<td>Transit</td>
<td>Freight</td>
<td>ITS for System Operations</td>
</tr>
</tbody>
</table>

- Historic, Archaeological, and Cultural Preservation
- Scenic, Natural, or Recreational Qualities
- Energy Efficiency
- Site Vegetation, Maintenance and Irrigation
- Reduce, Reuse and Repurpose Materials
- Recycle Materials
- Earthwork Balance
- Reduced Energy and Emissions in Pavement Materials
- Permeable Pavement
- Construction Environmental Training
- Construction Equipment Emission Reduction
- Construction Noise Mitigation
- Construction Quality Control Plan
- Construction Waste Management
- Low Impact Development
- Infrastructure Resiliency Planning and Design
- Light Pollution
- Noise Abatement

- Organized from planning, to design, to construction, to efficiency
- Use each criterion to evaluate sustainability within an individual project
- FHWA provides scoring methodology for each criterion
Implementation Objectives

- Non-traditional approach: explore the 33 PD criteria and integrate into pre-existing ARC decision support tools (where feasible)

- Goal was to enhance the ARC tools to account for sustainability as comprehensively as INVEST

- ARC tools evaluated:
  - Project Environmental Screening Tool
  - Project Risk Assessment Tool (deliverability)
  - TIP Solicitation Application - Project Deliverability Assessment
  - TIP Project Evaluation Framework (performance based)
Work Performed & Analysis
Key Activity

1. Compared ARC tool criteria with INVEST PD criteria to identify consistencies and gaps

2. Documented matched and unmatched criteria, to assess whether PD criteria could be added to any of the four tools

3. Explained why certain INVEST PD criteria could not be incorporated

4. Recommended new INVEST PD criteria

5. Investigated incorporating social equity/environmental justice
ARC Project Environmental Screening Tool Description

1. Brownfields
2. Groundwater Recharge Areas
3. FEMA Floodplains
4. Small Water Supply Watersheds
5. Historical Resources
6. Wetlands
7. Hazardous Sites
8. Rural Areas
9. Metro River Protection Act Corridor
10. Undeveloped Land
11. Impaired Streams
12. Darter Habitat
13. Trout Streams
14. Endangered Species Habitat
15. Existing Greenspace

- GIS overlay, featuring ESRI ModelBuilder Extension
- Calculates acreages for each RTP/TIP project for each data layer (within 100-ft. buffer)
Findings

- 22 of 33 PD criteria did not match PEST criteria
- 11 of 33 PD criteria matched (1-to-many)
- 2 of 15 PEST criteria did not match PD criteria
- PEST scores are not actionable enough for local project stakeholders
- Incorporating a sustainability analytical function within a screening tool was challenging because the two purposes are incompatible from a GIS-overlay and scoring perspective
- Inadequate sustainability data in the region
ARC Project Environmental Screening Tool Recommendations

- Consider a wider range of datasets for screening
- Improve data quality for better screening
- Provide a project “fact sheet” that makes the screening output more actionable and tangible to local sponsors (no scores)
  - Significance
  - Regulatory Framework
  - Information Resources and Contact Info
- Separate sustainability analysis from a screening analysis because the output is somewhat incompatible
### Project Risk Assessment Tool Description & Comparison

#### Description

- Developed just prior to applying to INVEST
- Designed to assess delivery risk under Federal PDP
- Investigated possible consolidation of the RAT with the PEST, to also include appropriate PD criteria
- Converts responses to a risk score

#### Findings

- Risk scores are too arbitrary
- Difficult to compare deliverability risks with sustainability benefits

<table>
<thead>
<tr>
<th>No Risk</th>
<th>Low Risk</th>
<th>Medium Risk</th>
<th>High Risk</th>
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<tbody>
<tr>
<td>0</td>
<td>Impacts to wetlands, streams, or open waters (ponds/lakes) likely but are considered temporary (example – need to build jetty for construction of bridge)</td>
<td>Permanent impacts to wetlands, streams, or open waters (ponds/lakes) are likely but not significant (example – need to build jetty for construction of bridge)</td>
<td>Permanent impacts to wetlands, streams, or open waters (ponds/lakes) likely and impacts will be significant</td>
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*ECONOMIC • SOCIAL • ENVIRONMENTAL*
Project Deliverability Assessment Tool Description & Comparison

Description

• This is not a true tool, but a questionnaire used to gauge project readiness

• Sections:
  o Environmental Screening
  o Project Design Information
  o Budget and Schedule

Findings

• The PDA criteria do not match any of the INVEST PD criteria

• PDA is not meant to address the merits of a project (i.e., sustainability)
### TIP Project Evaluation Framework Description & Comparison

- Performance based prioritization process
- Matches appropriate performance criteria with each possible project type
- Includes cultural & environmental resource component
- Does not include sustainability criteria; and is non-prescriptive
- Conducting an FHWA-funded Resiliency Planning Study to identify needs and recommended strategies

#### Atlanta Region’s Plan Goals

<table>
<thead>
<tr>
<th>Performance Criteria</th>
<th>Project Types</th>
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<tbody>
<tr>
<td>Bicycle</td>
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<tr>
<td>Pedestrian</td>
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<tr>
<td>Trail</td>
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<tr>
<td>Roadway Asset &amp; Management</td>
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<td>Roadway Management &amp; Expansion</td>
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<td>Roadway Transportation System &amp; Management</td>
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<td>Transit Expansion</td>
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<tr>
<td>Transit Asset Management and System</td>
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<tr>
<td>Misc. Emissions Related Projects</td>
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#### World Class Infrastructure

- Mobility & Congestion
- Reliability
- Network Connectivity
- Multimodal
- Asset Mgt. & Resiliency

#### Healthy Livable Communities

- Safety
- Air Quality & Climate Change
- Cultural & Environmental Resources
- Social Equity
- Land Use Compatibility

#### Competitive Economy

- Goods Movement
- Employment Accessibility
General Observations and Recommendations

• Develop a modular analytical process to help streamline the associated data, analytical methodology, and output

• Difficult to apply all 33 PD criteria to every RTP/TIP project type
  - Not all PD criteria are relevant to certain project types (e.g., light pollution for a transit bus route expansion)
  - Certain PD criteria are mostly applicable to activity outside of the planning process (e.g., construction erosion, or recycling)

• Difficulty in conflating a screening/assessment analysis with a sustainability analysis (sustainability is too context sensitive)

• PD criteria do not account for environmental justice or hazardous waste/brownfield mitigation
Next Steps for ARC

• Work with FHWA to finalize and post case study on INVEST website

• Populate Screening Tool Fact Sheets for each RTP/TIP project (improve automation and make it web-based)

• Develop an Equity analytical module

• Develop a Sustainability analytical module and include sustainability criteria in TIP Project Evaluation Framework

• Conduct INVEST System Planning for Regions (SPR) scoring on the updated RTP (2020)

• Work with Georgia DOT to establish a centralized data management/stewardship process
ARC Contact Info

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