Sustainable Infrastructure Rating System

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GHD Inc.
Topics

- What is “Sustainability”?
- Why is it important?
- Why do we need a rating system?
- What are the benefits?
- What is ISI?
- What are its products/services?
- How do you get involved/get started?
- Demonstration
- What next?
What is Sustainability?
What is Sustainable Civil Infrastructure?

- Sustainable civil infrastructure provides environmental, economic and societal well-being, now and for the future (ASCE)

- Policies, approaches and investments that consistently provide effective systems over the long term with adequate operations, maintenance and replacement (USEPA)

- Sustainability in public works means seeking a balanced approach (APWA)
  - for a vibrant community today and tomorrow, and
  - it is accomplished by the efficient delivery of infrastructure
  - in an environmentally and socially responsible way that
  - ensures the best economic choice in the long term
Deteriorating Infrastructure

ASCE 2009 U.S. Infrastructure Report Card

2009 Grades

Aviation: D
Bridges: C
Dams: D
Drinking Water: D-
Energy: D+
Hazardous Waste: D
Inland Waterways: D-
Levees: D-
Public Parks and Recreation: C-
Rail: C-
Roads: D-
Schools: D
Solid Waste: C+
Transit: D
Wastewater: D-

America's Infrastructure GPA: D
Estimated 5 Year Investment
Need: $2.2 Trillion

Natural Capital

Impacts

Produced Capital

Eco-system services

Energy, water, materials
We Are Not In Balance!

Insufficient investments to maintain, restore, enhance

Ecosystem damage

Excessive energy, water, materials consumption.
Deterioration of eco-system services.

Insufficient investments to build and maintain

Infrastructure deterioration

ISI Rating System is aimed at redressing the imbalance ... and ultimately eliminating it
Sustainability and Rating Systems?

- **Sustainability is not achieved by a uniform model** or single approach because of the varying contexts, environments, community/stakeholder/physical needs;

- **Technology and performance efficiency are enablers** to achieve desired outcomes but the public interest is met through behaviors and informed decisions;

- **A rating system:**
  - Creates a framework of objective measures;
  - Provides guidance that can influence performance goals and approaches;
  - Promotes project resilience, balance and strategic focus.
LEED address the complete lifecycle of buildings:

- Homes
- Neighborhood Development (in pilot)
- Commercial Interiors
- Core & Shell
- New Construction
- Schools, Healthcare, Retail
- Existing Buildings Operations & Maintenance
What About Infrastructure?

- No overall sustainable infrastructure rating system
  - Many sector-specific

- Infrastructure presents a different challenge compared to buildings:
  - Building design and construction - usually controlled by a single organization
  - Public Nature of Infrastructure Projects affects/ benefits macro ecosystems, communities, and regions; Must Consider
    - public stakeholder expectations and support;
    - Environmental responsibility;
    - Impact on public life;
    - And, the use of public funds – sustainability needs to pay for itself!
Why do we need a rating system? What are the benefits?

“Doing Things Right”

- Sustainable Design
  - Performance Contributions
  - Process/Tools
    - Collaborative Delivery
    - Technological Improvements
  - Performance Improvements
    - Higher Performance Goals
  - Integrated Solutions
  - Pathway Contributions
    - Transform Program Delivery

“Doing the Right Things”
There Is A Need For a Rating System

- An Overarching and Accepted Rating System for Civil Infrastructure
- Adapting to a Whole New Operating Environment
- Meet the Market Demand for Products to Assist us in Defining Sustainable Infrastructure and Discussing Trade-Offs.
Attributes Of ISI Rating System

- Recognizes two distinct aspects for delivering a sustainable project (after FIDIC and CEEQUAL)
  - Performance contribution: Did you do the project right?
  - Pathway contribution: Did you do the right project?

- Expands the opportunities for improving sustainable performance:
  - Throughout the project life cycle
  - Additional stakeholder collaboration
  - Extends sustainable performance goals
  - Restoration of resources and natural systems

- Provides for third party verification
What are the Benefits of Rating Your Projects?

- Right Thing to Do
- Following Procedures and Measuring Results always produces better results
- Stakeholder Support Allows More Efficient
  - Project Delivery
  - Project Timing
  - Permitting
  - Use of Fiscal Resources
- Makes Long Term Economic Sense
We Are Building 2050 Today!

Therefore we better get it right!

Rating system overview: system rationale

NHJES Annual Conference

October 6, 2011
What is ISI and what are its products/services?

envision™
■ 501 (c ) (3) Partnership
   Founding Partners
   - APWA  Center for Sustainability
   - ASCE  Committee on Sustainability
   - ACEC  Green Scorecard

■ ISI Formation
   - National Standard for Sustainable Infrastructure
   - Sustainable Civil Infrastructure Projects

■ Focus – Civil Infrastructure Rating Tool
ISI Mission Statement

- To transform tomorrow’s infrastructure [through ISI’s products and services]
- Enable ecologically responsible, healthy and prosperous environments that improve the quality of life
- Serve as an Industry resource to promote sustainability in infrastructure development and re-development
ISI Core Products and Services

- Rating System - envision™
- Verification of Projects - Awards and Recognition Program at Performance Levels
- Sustainability Professional Accreditation
- Verifier Accreditation
- Interface of Owners, A/E, Agencies, Practitioners, Stakeholders…
- Communications/Education on Rating System
Goals for envision™ Rating System

- Should become recognized as a National Standard for Sustainable Achievement
- Should guide practitioners, owners, stakeholders in the framing of infrastructure solutions
- **Sustainability must be affordable**
- Keep it simple, practical, adaptable and usable
envisio™

The Rating System
## Characteristics of envision™

- **Scalable according to complexity and size**
- **One system for all types of civil infrastructure**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>1</td>
<td>Overall Guidance and Checklists</td>
<td>Provides understanding of sustainability and triple bottom line accounting and application to infrastructure projects. Single Purpose, local projects</td>
</tr>
<tr>
<td>2</td>
<td>Assessment and Recognition</td>
<td>Step by step process for owner or engineer to perform self-assessment and to indicate areas where improved benefits could be achieved. Basis for ISI verification</td>
</tr>
<tr>
<td>3</td>
<td>Single Purpose Projects and Existing Project Assessment (future)</td>
<td>Larger or more complex projects in planning stages and where individual areas of excellence can be highlighted.</td>
</tr>
<tr>
<td>4</td>
<td>Decision Support (future)</td>
<td>Allows balancing of various elements of a project to optimize performance and investment. Facilitates resolution of differing opinions or approaches with stakeholders or regulatory needs.</td>
</tr>
</tbody>
</table>
Sustainability Vectors

“Doing Things Right”

Sustainable Design

- Performance Contributions
  - Process/Tools
    - Collaborative Delivery
  - Technological Improvements
    - Higher Performance Goals
  - Integrated Solutions

- Pathway Contributions
  - Transform Program Delivery

“Doing the Right Things”
Sustainability Rating System:

Supporting Materials

- Why Infrastructure Sustainability Improvement?
- System Overview
- How does it work?
- Background Case for Action
- Key Sources and References
- Who’s involved?

Guidelines on Sustainability and Infrastructure

Decision Support: Deciding on the Right Project

Decision Support: Project Performance

Rating System

- Project Contribution and Setup
- Historic Environment
- Ecology & Biodiversity
- Project Management
- Landscape
- Energy & Carbon
- Community & Stakeholder Engagement
- Land Use
- Resource Management
- Neighbors communities
- Water Resources
- Transport

Outcome Metrics

10/28/2011
Five Degrees of Performance

- **Basic**
  - Performance that is above conventional, but not by much. Encouraging, but mostly limited improvement in sustainable performance.

- **Improved**
  - Sustainable performance that is on the right track but not particularly remarkable. Indications that superior performance is within reach.

- **Superior**
  - Sustainable performance that is noteworthy, but falls slightly short of sustainable. Point scores are designed to provide incentives for achieving sustainable or restorative performance.

- **Sustainable**
  - Performance that has achieved essentially zero impact. May be combined with restorative if restoration is not applicable.

- **Restorative**
  - Performance that restores natural or social systems. Such performance receives the highest award possible, and is celebrated as such. Not applicable to all objectives.
System Components

- 75 objectives in 10 categories and 34 subcategories
- Five degrees of performance achievement
  - Improved to restorative
  - Linked to numeric score
- Two components of sustainability contribution
  - Pathway (effectiveness)
  - Performance (efficiency)
- Expanded scope of awards and recognition
- Integration with decision-support tools (Stage 4); conflict resolution and informed consent
Sustainability Metrics

**ECONOMIC**
- Funding source and financing
- Land value
- Life cycle cost
- Operational and maintenance cost ratios
- Return on assets (flood prevention)
- Indirect economic impacts
- Resource protection

**ENVIRONMENTAL**
- Water quality
  - Nutrients and other pollutants
  - Pollutants’ effects
  - Erosion prevention
  - Water source importance
- Ecology
  - Biodiversity-rich habitats managed
  - Land use
- Environmental policy and expenditure
- Environmental impact of design

**SOCIAL**
- Customer perception of benefit
- Aesthetics/recreation
- Health and safety
- Educational and cultural opportunities
- Public engagement
- Acceptable risk

Source: AwwaRF, 2008
### Rating System Primary Criteria

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<th>Section</th>
<th>Weight (%)</th>
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<tr>
<td>1 Pathway</td>
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<tr>
<td>2 Project Strategy &amp; Management</td>
<td>10.6</td>
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<tr>
<td>3 Community: Long &amp; Short Term Effects</td>
<td>10.7</td>
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<tr>
<td>4 Land Use &amp; Restoration</td>
<td>8.9</td>
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<td>5 Landscapes</td>
<td>7.0</td>
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<td>6 Ecology &amp; Biodiversity</td>
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<td>7 Water Resources &amp; Environment</td>
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<td>8 Energy &amp; Carbon</td>
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<td>9 Resource Management Including Waste</td>
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<td>10 Transportation</td>
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<td><strong>TOTAL</strong></td>
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How Do We Interpret Sustainable Performance?

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<th>Level of Performance</th>
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<tr>
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<td>Basic</td>
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<tr>
<td>Efficiency</td>
<td>Improved</td>
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<tr>
<td></td>
<td>Superior</td>
</tr>
<tr>
<td></td>
<td>Sustainable</td>
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<tr>
<td></td>
<td>Restorative</td>
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NHJES Annual Conference

October 6, 2011
Levels of Achievement

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<th>Basic (0)</th>
<th>Improved</th>
<th>Enhanced</th>
<th>Superior</th>
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<th>Restorative</th>
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<td>Deficiencies</td>
<td>Advancing to the next level. What improvements or additional efforts need to be made to merit a higher achievement level</td>
<td>Advancing to the next level.</td>
<td>Advancing to the next level.</td>
<td>Advancing to the next level.</td>
<td>Advancing to the next level.</td>
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**Additional Guidance**

- Discussion
- Definitions
- Measures
- Guidance on evidence

- Technologies and strategies
- Related objectives
- Sources
- References
How do you get involved/get started?

Enter the system

Stage 1 or 2?

Stage 1

Stage 2

Pursue award?

No

Use Stage 1 spreadsheet to explore, assess

Use Stage 2 spreadsheet and guidance manual to rate informally

Yes

Register project with ISI

Exclusions

- Review objectives
- Propose objectives to be excluded

Assessment

- Gather evidence and score
- Submit to verifier

Verification

- Verifier reviews
- Site visit
- Fill evidence gaps

Ratification

- Submit documentation to ISI
- Resolve scoring questions

Submit for award

- Award review

Rating system assessment and verification process (Source: W.A. Wallace)
Project Use of envision™ and Verification

- Professionals should seek training and certification in broad sustainability principles
- Various training opportunities but ISI will certify users competence in applying envision™ tools
- Use envision™ to enhance project performance
- Owners may apply for recognition of envision™ achievements and performance through third party verification – (Stage 2 and higher applications)
- Professional standards requirements for accredited sustainability professionals and verifiers
### ISI Envision Stage 2: Scoring & Evidence-capture Spreadsheet

#### SECTION TOTALS SUMMARY

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<thead>
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<th>Section Number</th>
<th>Section Title</th>
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<th>Max score after scoping-out</th>
<th>Initial Assessment</th>
<th>Verified Score</th>
<th>Ratified Score</th>
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Max scoring after scoping and Assessor scoring points

![Graph showing max scores](attachment://graph.png)
DEMONSTRATION
## Downloadable Documents

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<th>Description</th>
<th>Type</th>
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<tr>
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ISI 2011 Schedule

- Public Comment Period  - 7/5/11 – 11/18/2011
- Version 2.0 – January 2, 2012
- Training
- Professional Accreditation  - Fall 2011
- Sustainability Professionals (ISI-SP)
- Verifiers appointed by ISI Board
- Project Recognition Program (details this Fall)
- Membership (Open Currently)
Membership Opportunities

- Membership Types
  - Charter Members
  - Sustaining Members
  - Other – Agencies/Institutions

- Visit
  www.sustainableinfrastructure.org
  for additional membership details.
How do you get involved/get started?

- Public Comment Period Open
  Version 2.0 Release in January 2012
  Get Projects Ready!

- Accreditation
  - Sustainability Professionals (ISI-SP)
  - Verifiers

- Recognition Program (details this Fall)

- Training

- Membership (Open Currently)
QUESTIONS

www.sustainableinfrastructure.org

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