A New Fact of Life...

It is no longer enough that infrastructure works, that it is constructed on time and within budget...or even that it lasts...it now must be SUSTAINABLE.
What do we mean by “Sustainable”?

“...to meet the needs of the present without compromising the ability of future generations to meet their own needs.”

World Commission on Environment and Development, 1987
What is Envision?

- Envision is a tool, which itself is part of a system, to help us evaluate the sustainability of civil infrastructure.

- That system includes:
  - A self assessment checklist
  - The Envision rating tool
  - A credential program for individuals
  - A project evaluation and Verification program
  - A recognition program for sustainable infrastructure
What Makes Envision Unique?

- It applies to civil infrastructure
- It includes design, planning, construction and maintenance elements
- It is applicable at any point in an infrastructure project's life cycle
- It speaks to the triple bottom line: social, economic and environmental goals
- It is designed to keep pace with a changing concept of sustainability
The Audience for Envision?

Public and Private Sector
Infrastructure Developers and Owners
Why will agencies and companies want to use Envision?

Because it will improve their performance...and

public confidence in their performance
How Will it Help Them?

- By causing them to think about sustainability in an organized fashion that is consistent with their community values and priorities.

- Envision is not prescriptive...it helps decide outcomes, not strategies.

- It is a powerful planning tool for whole systems and, simultaneously, an individual project evaluator.
AND...

- It includes metrics to help identify and measure the value of an investment in sustainable infrastructure over the life of the project...and allows decision makers to make decisions about that value at the point of procurement...where it matters.
Benefits of Being an ENV SP

- Demonstrate competence in using ISI Sustainability System
- Required for a project to qualify for ISI recognition
- Provide guidance to project team to enhance project sustainability
- Use designation in resume and business card
- Qualified to submit projects for ISI recognition
What types of infrastructure will Envision rate?

**INFRASTRUCTURE CATEGORIES**

**ENERGY**
- Geothermal
- Hydroelectric
- Nuclear
- Coal
- Natural Gas
- Oil/Refinery
- Wind
- Solar
- Biomass
- Other

**WATER**
- Potable water distribution
- Capture/Storage
- Water Reuse
- Storm Water Management
- Flood Control
- Other

**WASTE**
- Solid waste
- Recycling
- Hazardous Waste
- Collection & Transfer
- Other

**TRANSPORT**
- Airports
- Roads / Highways
- Bikes / Pedestrians
- Railways
- Public Transit
- Ports
- Waterways
- Other

**LANDSCAPE**
- Public Realm
- Parks
- Ecosystem Services
- Other

**INFORMATION**
- Telecommunications
- Internet / Phones
- Satellites
- Data Centers
- Sensors
- Other
60 Credits in 5 Categories

**QUALITY OF LIFE**
Purpose, Wellbeing, Community

**LEADERSHIP**
Collaboration, Management, Planning

**RESOURCE ALLOCATION**
Materials, Energy, Water

**NATURAL WORLD**
Siting, Land & Water, Biodiversity

**CLIMATE AND RISK**
Emission, Resilience

THE ENVISION™ RATING SYSTEM
Applications Using Envision

Over 150 Projects that we know about

• Water and wastewater treat plants
• Pipelines
• Brownfield restorations
• Airport upgrades
• Highway interchanges
• Light rail facilities
• Wetlands development
Agencies Using Envision

- City of Dallas
- Port of Long Beach
- City of Chicago
- New York City DEP
- County of Los Angeles
- San Diego Airport
- Cape Cod Planning Authority
- California Water Resources Department
envision™ Scoring Allocation 10

809 total points

- Climate and Risk: 15%
- Quality of Life: 22%
- Natural World: 25%
- Leadership: 15%
- Resource Allocation: 23%
- 809 total points
## Anytown Sewer Rehabilitation Project

**Current Project Step:** ASSESSMENT

<table>
<thead>
<tr>
<th>Credit</th>
<th>Credit Intent and Metric</th>
<th>Is this Required for the Project?</th>
<th>Level Of Achievement</th>
<th>Score</th>
<th>Possible Points</th>
<th>Upload</th>
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<tbody>
<tr>
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</table>

### QUALITY OF LIFE

#### QL.1.1 Improve community quality of life.
Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.

deals / guidance

<table>
<thead>
<tr>
<th>Applicability</th>
<th>Score</th>
<th>Possible Points</th>
<th>Notes:</th>
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<tbody>
<tr>
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<td></td>
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<td></td>
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</tr>
</tbody>
</table>

#### QL.1.2 Stimulate sustainable growth and development.
Support and stimulate sustainable growth and development, including improvements in job growth, capacity building, productivity.

<table>
<thead>
<tr>
<th>Applicability</th>
<th>Score</th>
<th>Possible Points</th>
<th>Notes:</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Enhanced</td>
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</table>
### Automatic Scoring Summary

#### Anytown Sewer Rehabilitation Project

**Current Project Step: ASSESSMENT**

<table>
<thead>
<tr>
<th>Credit Category</th>
<th>Applicable Points</th>
<th>Points</th>
<th>Innovation Points</th>
<th>Total Points Pursued</th>
<th>Percentage of Available Points</th>
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<tbody>
<tr>
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<tr>
<td>LEADERSHIP</td>
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<td>17%</td>
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<tr>
<td>RESOURCE ALLOCATION</td>
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<td>50</td>
<td>1</td>
<td>51</td>
<td>38%</td>
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<tr>
<td>NATURAL WORLD</td>
<td>188</td>
<td>121</td>
<td>4</td>
<td>125</td>
<td>64%</td>
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<tr>
<td>CLIMATE AND RISK</td>
<td>122</td>
<td>46</td>
<td>0</td>
<td>46</td>
<td>38%</td>
</tr>
<tr>
<td><strong>Total Project Points</strong></td>
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<td><strong>266</strong></td>
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<td><strong>272</strong></td>
<td><strong>38%</strong></td>
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</tbody>
</table>

#### Envision™ Scores

![Graph showing Envision™ Scores withCredit Category: QL, LD, RA, NW, CR with points distribution for each category]
# Guidance Manual 12

## Envision Tool Portal

- Guidance Manual Home

## QL1.1 IMPROVE COMMUNITY QUALITY OF LIFE

**INTENT:**

Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.

**METRIC:**

Measures taken to assess community needs and improve quality of life while minimizing negative impacts.

## Levels of Achievement

<table>
<thead>
<tr>
<th>IMPROVED</th>
<th>ENHANCED</th>
<th>SUPERIOR</th>
<th>CONSERVING</th>
<th>RESTORATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(2) Internal focus. The project team has located and reviewed the most recent and relevant community planning information. Some, but not systematic outreach to stakeholders and decision makers has taken place. Some relatively easy, but not particularly important or meaningful changes made to the project. No significant adverse community effects are caused by the project (A, B, C).</td>
<td>(5) Community linkages. More substantive efforts to locate, review, assess and incorporate the needs, goals and plans of the host community into the project. Most potential negative adverse impacts of the project on the host community are reduced or eliminated. Key stakeholders are involved in the project decision-making process. (A, B, C)</td>
<td>(10) Broad community alignment. All relevant community plans are reviewed and verified through stakeholder input. The project team works to achieve good project alignment with community plans, recognizing that the scope of the project is a limiting factor. Potential negative impacts on nearby affected communities are reduced or eliminated. (A, B, C)</td>
<td>(20) Holistic assessment and collaboration. The project makes a net positive contribution to the quality of life of the host and nearby affected communities. The project team makes a holistic assessment of community needs, goals and plans, incorporating meaningful stakeholder input. Project meets or exceeds important identified community needs and long-term requirements for sustainability. Remaining adverse impacts are minimal, mostly accepted as reasonable tradeoffs for benefits achieved. The project has broad community endorsement. (A, B, C)</td>
<td>(25) Community renaissance. Through rehabilitation of important community assets, upgraded and extended access, increased safety, improved environmental quality and additional infrastructure capacity, the project substantially reinvigorates the host and nearby communities. Working in genuine collaboration with stakeholders and community decision-makers, the project owner and the project team scope the project in a way that elevates community awareness and pride. Overall quality of life in these communities is markedly elevated. (A, B, C, D)</td>
</tr>
</tbody>
</table>

## Description

This credit addresses the extent to which the project contributes to the quality of life of the host community; the community in which the constructed works is situated and directly affects. This determination is based on how well the project team has identified and assessed community needs, goals and objectives, and incorporated them into the project. Relevant community plans are assumed to be a viable expression of those needs, goals, objectives and aspirations. In a real sense, they are the community’s expression of their desired quality of life.
Stage 1 Checklist – 60 Questions
Available this Spring 2014

- **Yes/No**-Has an action been done or an outcome achieved? For example, “Person appointed”, “Policy issued” or “Brownfield land used instead of greenfield”.

- **Objective**-Each objective starts with an imperative statement, further explained and amplified by one or more questions.

- **Measures**-Provided for each objective. These will be used as a basis for the evidence or as justification for answering question in the affirmative.

- **Guidance**-Each of the objectives and measures will be associated with the applicable guidance designed to assist the user.

- **Scoping out**-Some of the objectives may be scoped out (deleted), not considered or counted if they are not applicable to the project.

- **Output**-Checklist users will get a bar graph that represents the number of questions they answered yes to. The score will give users an idea of how many sustainability factors were considered and/or incorporated into the project.
1. Quality of Life

QL. Preserve Historic and Cultural Resources

Intent: Preserve or restore significant historical and cultural sites and related resources to preserve and enhance community cultural resources?

Metric: Summary of steps taken to identify, preserve or restore cultural resources.

Has the project team worked with the community and required regulatory and resource agencies to identify cultural resources?

Has the project team conducted a feasibility analysis to understand the possibilities of incorporating preservation or enhancement of historic and cultural resources into the project?

Has the project team worked with cultural stakeholders to develop a sensitive design and approach, with the ultimate goal of avoiding all cultural resources or fully preserving the character-defining features of that resource?
Stage 2 Scoring System

• Same Objectives as in Stage 1
• Same “Scoping Out” or “Excluded” as Stage 1
• Some Objectives cannot be Excluded
• Level of Achievement Scoring (up to 5 levels)
  • Improved
  • Enhanced
  • Superior
  • Conserving
  • Restorative
• Guidance Manual
• Assessors to score
• ISI-SP certified assessors
## Project Credits 19

### Quality of Life
- **QL1.1** Community Quality of life
- **QL1.2** Stimulate Sustainable Growth
- **QL1.3** Local Skills
- **QL2.1** Public Health and Safety
- **QL2.2** Noise and Vibration
- **QL2.3** Light Pollution
- **QL2.4** Mobility and Access
- **QL2.5** Alternative Transportation Modes
- **QL2.6** Site Accessibility
- **QL3.1** Historic and Cultural
- **QL3.2** Views, Local Character
- **QL3.3** Public Space
- **QL0.0** Innovation

### Leadership
- **LD1.1** Effective Leadership
- **LD1.2** Sustainability Management System
- **LD1.3** Collaboration
- **LD1.4** Stakeholder Involvement
- **LD2.1** By-Product Synergy
- **LD2.2** Integration
- **LD3.1** Long Term Monitoring and Maintenance
- **LD3.2** Regulatory/Policy Conflicts
- **LD3.3** Extend Useful Life
- **LD0.0** Innovation

### Resource Allocation
- **RA1.1** Embodied Energy
- **RA1.2** Procurement
- **RA1.3** Recycling
- **RA1.4** Regional Materials
- **RA1.5** Divert Waste
- **RA1.6** Reduce Material Export
- **RA1.7** Deconstruction
- **RA2.1** Reduce Energy Consumption
- **RA2.2** Renewable Energy
- **RA2.3** Monitor Energy Systems
- **RA3.1** Water Availability
- **RA3.2** Water Consumption
- **RA3.3** Monitor Water Systems
- **RA0.0** Innovation

### Natural World
- **NW1.1** Prime Habitat
- **NW1.2** Wetlands
- **NW1.3** Prime Farmland
- **NW1.4** Geologic Hazards
- **NW1.5** Floodplains
- **NW1.6** Steep Slopes
- **NW1.7** Greenfields
- **NW2.1** Storm water
- **NW2.2** Pesticides
- **NW2.3** Water Contamination
- **NW3.1** Biodiversity
- **NW3.2** Invasive Species
- **NW3.3** Disturbed Soils
- **NW3.4** Maintain Water Functions
- **NW0.0** Innovation

### Climate and Risk
- **CR1.1** Greenhouse Gas Emissions
- **CR1.2** Air Pollutants
- **CR2.1** Climate Threat
- **CR2.2** Traps and Vulnerabilities
- **CR2.3** Long-term Adaptability
- **CR2.4** Short-term Hazards
- **CR2.5** Heat Islands
- **CR0.0** Innovation
Stage 2 Example – Natural World

Section NW 1.2 Protect Wetlands and Surface Waters

Intent: Protect, enhance and restore areas designated as wetlands, shorelines, and water bodies by providing natural buffer zones, vegetation and soil protection zones.

Metric: Size of natural buffer zones established around all wetlands, shorelines and water bodies.

- Improved: 1 point
- Enhanced: 4 points
- Superior: 9 points
- Conserving: 14 points
- Restorative: 18 points
Stage 2 Guidance Example

Improved
(1) Avoid development or buffer > 50 feet. Avoid development on sites that contain or are located within 50 feet of wetlands, shorelines or water bodies. Additionally, if applicable, establish a vegetation and soil protective zone (VSPZ) for an area within 50 feet of any wetland areas, shoreline, or water body or within setback distances from wetlands prescribed in state or local laws and or regulations, whichever is more stringent...

Enhanced
(4) Buffer > 100 feet
Superior
(9) Buffer > 200 feet
Conserving
(14) Buffer > 300 feet
Restorative
(18) Aquatic and wetland restoration. In addition to points awarded for buffering, project may earn up to 5 points for restoring previously degraded buffer zones to a natural state.....
Stage 2 Guidance

**Description:** Wetlands, shorelines and water bodies provide a number of important ecological services, including mitigating flooding, improving water quality, and providing wildlife habitat. A buffer zone around wetlands and other water bodies plays particularly important roles in:

- Protecting wildlife habitats, providing connected habitat

**Advancing to Higher Achievement Levels:** Benchmark and Performance Improvement...

**Evaluation Criteria and Documentation:** If the site contains wetlands or water bodies, has the project team established a vegetation and soil protection zone (VSPZ) to provide a natural zone unaffected by development that maintains a buffer equal to a specified distance?

**Sources:** Adapted from *The Sustainable Sites Initiative*, US Army Corps of Engineers Guidance on Delineating wetlands

**Related Credits:** QL 3.2 Preserve Views and Local Character
         NW 1.1 Preserve Prime Habitat
Stage 2 Example – Quality of Life

Section QL 2.5 Encourage Alternative Modes of Transportation

Intent: Improve accessibility to non-motorized transportation and public transit. Promote alternative transportation and reduce congestion.

Metric: The degree to which the project has increased walkability, use of public transit, non-motorized transit.

<table>
<thead>
<tr>
<th></th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved</td>
<td>1</td>
</tr>
<tr>
<td>Enhanced</td>
<td>3</td>
</tr>
<tr>
<td>Superior</td>
<td>6</td>
</tr>
<tr>
<td>Conserving</td>
<td>12</td>
</tr>
<tr>
<td>Restorative</td>
<td>15</td>
</tr>
</tbody>
</table>
Stage 2 Guidance Example

Improved
(1) Transit access. The constructed works allows for walking distance and pedestrian accessible to multi-modal transportation......

Enhanced
(3) Non motorized or transit friendly. Location encourages the use of transit or non-motorized transportation, e.g. walking or cycling...

Superior
(6) Non motorized and transit friendly. The constructed works is located in a place and configured in such a way that encourages use on non-motorized transportation and transit for access...

Conserving
(12) Public transportation enhancements. The project enhances public transportation facilities or implement programs to encourage use of public and non motorized transportation...

Restorative
(15) Reviving transportation options. The project is designed...that rehabilitates pathways, bikeways, rail..that were unused or in disrepair...
Stage 2 Example - Leadership

Section LD 1.4  Provide for Stakeholder Involvement

Intent: Establish sound and meaningful programs for stakeholder identification, engagement and involvement in project decision making.

Metric: The extent to which project stakeholders are identified and engaged in project decision making. Satisfaction of stakeholders and decision makers in the involvement process.

- Improved: 1 point
- Enhanced: 5 points
- Superior: 9 points
- Conserving: 14 points
- Restorative: no rating
Stage 2 Guidance Example

Improved
(1) **Information Transfer.** A limited program established for stakeholder communication and information transfer....Some planning and commitment to action, actions taken based on input received.

Enhanced
(5) **Active engagement and dialog.** ...Lead person works with stakeholder groups to understand communication needs, potential for involvement. Active engagement and dialog planned....

Superior
(9) **Open to wider community.** Engagements expand to wider community, people and relevant groups that are effected by or have interest in the project...

Conserving
(14) **Community relationship building.** ...buy-in that the process for making project decisions is fair and equitable.....Feedback programs are designed to give complete, credible feedback regarding communications....

Restorative
(0) None
Stage 2 Example – Resource Allocation

Section RA 1.3 Use Recycled Materials

Intent: Reduce the use of virgin materials and avoid sending useful materials to landfills by specifying reused materials, including structures, and material with recycled content.

Metric: Percentage of project materials that are reused or recycled.

<table>
<thead>
<tr>
<th>Rating</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improved</td>
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<tr>
<td>Enhanced</td>
<td>5</td>
</tr>
<tr>
<td>Superior</td>
<td>11</td>
</tr>
<tr>
<td>Conserving</td>
<td>14</td>
</tr>
<tr>
<td>Restorative</td>
<td>no rating</td>
</tr>
</tbody>
</table>
Stage 2 Guidance Example

Improved
(2) 5% to less than 20%. 5% to less than 20% by weight or volume of the materials used are from reclaimed or recycled materials.

Enhanced
(5) 20% to less than 50%

Superior
(11) 50% to less than 80%

Conserving
(14) 80% or more

Restorative
(0) None

Note: Mechanical, electrical, and water equipment, and their components may be excluded from the calculations.
Stage 2 Example – Climate and Risk

Section CR 1.1 Reduce Greenhouse Gas Emissions

Intent: Conduct a comprehensive life-cycle carbon analysis and use this assessment to reduce the anticipated amount of net greenhouse gas emissions during the life cycle of the project, reducing project contribution to climate change.

Metric: Life-cycle net carbon dioxide equivalent (CO2e) emissions.

- Improved: 4 points
- Enhanced: 7 points
- Superior: 13 points
- Conserving: 18 points
- Restorative: 25 points
Stage 2 Guidance Example

Improved
(4) Life-cycle carbon assessment. A comprehensive life-cycle carbon assessment has been undertaken in order to estimate the carbon emissions due to materials extraction and processing, material transportation...and project maintenance and operation including vehicle traffic.....

Enhanced
(7) 10 to 40% reduction

Superior
(13) 41 to 80% reduction

Conserving
(18) Carbon neutral. (does not produce any net carbon emissions or 100% reduction)

Restorative
(25) Net carbon negative. ...sequesters more carbon than it produces....Extensive use of renewable energy and carbon sinks.
## Scoring Summary 31

### "Prairie Waters Project"

### Section Totals Summary

<table>
<thead>
<tr>
<th>Section</th>
<th>Maximum Possible Score</th>
<th>Section Points</th>
<th>Innovation Points</th>
<th>Total Points Earned</th>
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<tr>
<td>QL</td>
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<td>LD</td>
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<td>11</td>
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<td>RA</td>
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<td>29</td>
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<tr>
<td>NW</td>
<td>203</td>
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<td>8</td>
<td>54</td>
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<tr>
<td>CR</td>
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<td><strong>108</strong></td>
<td><strong>14</strong></td>
<td><strong>122</strong></td>
</tr>
</tbody>
</table>

### Envision™ Section Scores

- **QL**: 155 points (155 points achieved, 0 points unachieved)
- **LD**: 121 points (121 points achieved, 0 points unachieved)
- **RA**: 182 points (127 points achieved, 55 points unachieved)
- **NW**: 203 points (175 points achieved, 28 points unachieved)
- **CR**: 122 points (100 points achieved, 22 points unachieved)
Challenges To Sustainability

- State Law
- Local Rules
- LEED
- Ignorance
- Inertia
Cost Considerations

- Envision Cost Module
- Life-Cycle Cost
- Benefit of Rating
- Cost of Rating
Harris County

- LID
- Terminology
- Public Works and Infrastructure Department
- Harris County Flood Control District
- Harris County Toll Road Authority
- Next Steps
METRO

- Light Rail
- Park and Ride
- Next Steps
City of Houston

- ISI Member
- ENV SP
- Complete Streets
- Next Steps
What Can You Do?

- ENV SP
- Promote Sustainable Infrastructure
- Lobby Local Officials
A Presentation for

By D. Wayne Klotz, P.E., D.WRE, ENV SP
June 24, 2014

Thank You