Putting Envision® to Work in Sustainable Planning Projects

NEWEA Annual Conference & Exhibition
January 27, 2016
Today’s Agenda

• Envision® Overview
• Steps for Planning with the Tool
• Case Study No. 1 – City of Oxnard, CA
• Case Study No. 2 – City of Kansas City, MO
• Closing
• Q & A
Why plan sustainably?

RESOURCES
Life supporting resources are decreasing …

Demand for resources is increasing …

DEMAND

- Sustainability is…
  "Meeting the needs of the present without compromising the ability of future generations to meet their own needs".

- Our economic, social and environmental systems must be resilient to short-term shocks, adaptable to longer-term change, healthy and functioning, and efficient in production.

Through innovation and integration the walls of the funnel can be opened.
Envision® Uniquely Addresses America’s Infrastructure

- Envision® applies to all civil infrastructure
- Addresses design, planning, construction and maintenance
- Applicable at any point in an infrastructure project's life cycle
- Speaks to the triple bottom line: social, economic and environmental goals
- Designed to keep pace with a changing concept of sustainability
Key similarities and differences between LEED® and Envision®

- LEED® v4
  - Focus on occupied buildings
  - Energy reduction is a major component of rating system

- Envision®
  - Focus on infrastructure, which impacts broad sections of community
  - Resource use and sustainable siting are major components
  - Stakeholder and community involvement also included

- Framework for sustainable thinking and design
  - Incentivize project teams to stretch toward sustainable goals
Envision®: 5 Categories, 60 Credits and Varying Levels of Achievement

5 Major Categories

- Quality of Life
- Leadership
- Resource Allocation
- Natural World
- Climate and Risk

Levels of Achievement

- Improved
- Enhanced
- Superior
- Conserving
- Restorative

No Negative Impact

Non-Linear Scale
# Envision® award levels

<table>
<thead>
<tr>
<th>Recognition Level</th>
<th>Minimum Applicable Points</th>
<th>Minimum in Each Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bronze</td>
<td>20%</td>
<td>No minimum category percentage required</td>
</tr>
<tr>
<td>Silver Award</td>
<td>30%</td>
<td>No minimum category percentage required</td>
</tr>
<tr>
<td>Gold Award</td>
<td>40%</td>
<td>No minimum category percentage required</td>
</tr>
<tr>
<td>Platinum Award</td>
<td>50%</td>
<td>No minimum category percentage required</td>
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</table>
Steps for Using Envision® in Project Planning

1. Perform Initial Assessment
2. Use Initial Assessment and Project Goals/Objectives to Inform Development of Evaluation Criteria
3. Revisit Initial Assessment to Identify Programmatic Credits versus Project/Plan Specific Credits
4. Set credit targets / goals that carry through to design / implementation phases
5. Develop Envision® Roadmap for Preliminary / Final Design and Implementation
Case Study No. 1: Planning Oxnard’s Future Water Supply
Project Background

Oxnard:
- 2010 US Census Population: 197,899
- Oxnard Plain → Agriculture
- Port Hueneme and Naval Base
- Water supplied from local groundwater and imported sources
- Has a WWTP that discharges to the Ocean
- Has an AWPF that produces recycled water
Purpose of Oxnard’s Public Works Integrated Master Plan (PWIMP)

- Develop a vision for the future
- Develop 25-yr Capital Improvement Plan (CIP)
- Develop the financial analysis and rate structure to support the PWIMP
## Initial Envision® Assessment for the PWIMP

<table>
<thead>
<tr>
<th>Category</th>
<th>Minimum Target for Points Achievable</th>
<th>Stretch Goal for Points Achievable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quality of Life</td>
<td>12%</td>
<td>26%</td>
</tr>
<tr>
<td>Leadership</td>
<td>26%</td>
<td>42%</td>
</tr>
<tr>
<td>Resource Allocation</td>
<td>26%</td>
<td>51%</td>
</tr>
<tr>
<td>Natural World</td>
<td>28%</td>
<td>43%</td>
</tr>
<tr>
<td>Climate and Risk</td>
<td>26%</td>
<td>56%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>23%</strong></td>
<td><strong>43%</strong></td>
</tr>
</tbody>
</table>
## Proposed Evaluation Criteria Based on Envision® Assessment

<table>
<thead>
<tr>
<th>Objective</th>
<th>Metric</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal #1: Provide compliant, reliable, resilient and flexible systems</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ability to implement in a timely manner</td>
<td>Implementation time (design + permitting + construction/start-up)</td>
<td>Years</td>
</tr>
<tr>
<td><strong>Goal #2: Investigate green and grey infrastructure with an emphasis on energy efficiency</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximize energy efficiency / sustainable energy use</td>
<td>Net non-renewable Energy use (Total E - E produced – Renewable E Purchased?)</td>
<td>kWh / year</td>
</tr>
<tr>
<td><strong>Goal #3: Manage assets effectively (economic sustainability)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximize cost / benefit ratio</td>
<td>Capital Costs</td>
<td>$ (Total Project Cost)</td>
</tr>
<tr>
<td></td>
<td>O&amp;M Costs</td>
<td>$ (O&amp;M costs) per year</td>
</tr>
<tr>
<td></td>
<td>Life-cycle costs</td>
<td>$ (Total Annual Costs) per year</td>
</tr>
<tr>
<td></td>
<td>Benefit / cost ratio</td>
<td>$ Benefits / $ costs</td>
</tr>
</tbody>
</table>
## Proposed Evaluation Criteria (cont.)

<table>
<thead>
<tr>
<th>Objective</th>
<th>Metric</th>
<th>Unit of Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal #4: Mitigate and adapt to potential impacts of climate change</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimize contribution to climate change through reduction/minimization of GHG emissions</td>
<td>GHG emissions</td>
<td>Metric tons of CO2 equivalent emissions per year</td>
</tr>
<tr>
<td><strong>Goal #5: Protect / enhance environmental / resource sustainability</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maximize sustainable water use</td>
<td>Potable Water Offset (Potable Water Used – Reuse)</td>
<td>MG per year</td>
</tr>
<tr>
<td></td>
<td>Groundwater Replenishment</td>
<td>MG per year</td>
</tr>
<tr>
<td>Maximize beneficial reuse of biosolids</td>
<td>Biosolids reused</td>
<td>Dry tons per year</td>
</tr>
</tbody>
</table>
Using the Envision® Identified Criteria to Compare Alternatives

<table>
<thead>
<tr>
<th>No.</th>
<th>Goal</th>
<th>1 – GW Treatment</th>
<th>2 – Combined GW &amp; ASR / IPR</th>
<th>3 – ASR / IPR</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
<tr>
<td>#1</td>
<td>Reliability / Redundancy</td>
<td>+</td>
<td>+++</td>
<td>++</td>
</tr>
<tr>
<td>#3</td>
<td>Lifecycle Costs</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>#2/4</td>
<td>Energy Use / GHGs</td>
<td>+</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>#5</td>
<td>Potable Water Offset</td>
<td>+++</td>
<td>++</td>
<td>+</td>
</tr>
<tr>
<td>#5</td>
<td>Groundwater Replenishment</td>
<td>+</td>
<td>++</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Water Quality</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Maximize GW Pumping</td>
<td>+++</td>
<td>+++</td>
<td>+++</td>
</tr>
<tr>
<td></td>
<td>Minimize Imported Water</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td></td>
<td>Local Control of Water Supply</td>
<td>+</td>
<td>++</td>
<td>+++</td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>18+</strong></td>
<td><strong>21+</strong></td>
<td><strong>20+</strong></td>
</tr>
</tbody>
</table>
Case Study No. 2: Kansas City’s Overflow Control Program
Sewer Separation / Green Infrastructure Project Overview

- Establish layout of new sanitary or storm sewer to provide sewer separation of 280 acres of combined sewer watershed
- Consider green infrastructure opportunities to improve water quality

Opportunities for Green Infrastructure:

- Improve water quality
- Enhance bike/walking path aesthetics
- Restore areas disturbed with community amenity
- Opportunity to educate public about green infrastructure – highly visible area
Envision® Incorporated into Each Project Step

**Envisioning Workshop**
- Established Goals/Objectives
- Reviewed Initial Assessment
- Proposed Evaluation Criteria

**Technical Analysis**
- Alternatives
- Costs
- TBL+
- Envision® Assessment
  - Strategies/Metrics
  - Timing of Proposed Credits

**Recommended Projects**
- Envision® Roadmap
  - Sustainable Strategies/Action Plans
  - Value Added Summary
Initial Envision® Assessment for Project as a Whole

- Quality of Life
- Leadership
- Resource Allocation
- Natural World
- Climate and Risk
- Total

Legend:
- Minimum LOA
- Stretch Goal LOA

Achievement Levels:
- Platinum
- Gold
- Silver
- Bronze
TBL+ Evaluation Criteria Derived from Envision® Assessment

**Societal**
- Aesthetic Impact
- Public Visibility / Education Potential

**Economic**
- Lifecycle Costs (capital, O&M and total annual)
- Gray Infrastructure Offset
- Property Value Benefit

**Environmental**
- Water Quality Improvement
- Storage/Peak Flow Shaving
- Habitat / Vegetation
- Air Quality Impact
- GHG Impact

**Technical**
- Site Grading Related to BMP Needs
- Ease of Constructability
- Obtaining Use of Land
- Site Disturbance Mitigation Potential
TBL+ Analysis of Green Infrastructure Alternatives

Recommended Projects

Normalized Benefit

- Path Bio-Retention Basin
- Path Bioswales
- Bioswale @ Park
- Bioretention @ Park
- Hot Spot @ Park
- Bioswale Along ROW
- Bioretention Along ROW
- Commercial Hot Spots
- Bioswale Private Property
- Re-Grade of Existing Bioswale Along Path

Legend:
- Environmental
- Community / Social
- Technical
- Non-Economic Subtotal
Creating the Envision® Roadmap for Preliminary and Final Design

• Identifying implementation strategies / metrics

• Understanding documentation needs
  – Additional studies
  – Drawings
  – Specifications

• Value Added Analysis
  – Consider Envision® credit points vs. estimated cost to implement
# Value Added Summary

<table>
<thead>
<tr>
<th></th>
<th>Standard Practice (Level 1)</th>
<th>Enhanced Sustainable Practice (Level 2)</th>
<th>Ultimate Sustainable Practice (Level 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Envision Points Achievable</td>
<td>107 - 154</td>
<td>205 – 293</td>
<td>215 – 320</td>
</tr>
<tr>
<td>% of Maximum Envision Points</td>
<td>16 – 23%</td>
<td>31 – 44%</td>
<td>32 – 48%</td>
</tr>
<tr>
<td>Projected Award</td>
<td>None – Bronze</td>
<td>Silver – Gold</td>
<td>Silver – Gold</td>
</tr>
<tr>
<td>Estimated Added Cost, % of total project</td>
<td>$25 – $45k</td>
<td>$115 – $185k</td>
<td>$200 - $300k</td>
</tr>
<tr>
<td>Estimated Added Cost, % of total project</td>
<td>~0.1%</td>
<td>~0.5%</td>
<td>~0.8%</td>
</tr>
</tbody>
</table>
Envision® Employed Early On Leads to Sustainable Decision Making

Are we doing the project right AND are we doing the right project?

• Envision® provides framework for doing both throughout a project’s planning and design

• At planning level, use to establish criteria for moving the project forward toward sustainable solutions

• At preliminary/final design, use to implement sustainable practices and meet sustainable goals
Questions?

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Examples of Envision™ Credits at the Programmatic Level

Quality of Life

QL 1.1 Improve community quality of life
Sustainable water supply and improved quality boosts overall quality of life throughout City

QL 1.2 Stimulate sustainable growth and development
Securing a sustainable water supply allows modest growth of the community to continue while preserving sufficient resources for all

Leadership

LD 1.1 Provide effective leadership and commitment
Create and uphold specific sustainability policies like Energy and Climate Action Plan

Pursuit and funding of GREAT Program

LD 1.3 Foster collaboration and team
Hold Project Visioning and Eco-Alternatives Charrettes involving project team and stakeholders
## Examples of Credits Specific to Water Supply Plan

### Resource Management

**RA 2.1 Reduce energy consumption**

Consider energy efficient pumps/strategies for all new conveyance facilities/ASR wells

**RA 3.1 Protect fresh water availability**

Use recycled water in ASR / IPR application to boost city’s water supply and reduce reliance on imports

### Climate and Risk

**CR 1.1 Reduce Greenhouse Gas Emissions**

Conduct GHG emissions analysis of project alternatives, both grey and green.

**CR 2.3 Prepare for long-term threats**

Addition of ASR / IPR provides a more sustainable water supply even in drought conditions
Key Envision® Credits to be Pursued Moving into Final Design

Leadership

LD 1.3 / 1.4 Foster Collaboration and Team and Stakeholder Involvement

Hold Project Visioning and Eco-Alternatives Charrettes involving project stakeholders

Quality of Life

QL 2.1 Enhance Public Health & Safety

Improving water quality and reducing CSOs in urban stream

QL 3.3 Enhance Public Space

Enhancing the existing Trolley Trail corridor using bioswales, rain gardens, and other public amenities (benches, public education tools)

Resource Allocation

RA 1.3 Use Recycled Materials

Maximize reuse of the existing system components to the extent possible
Key Envision® Credits to be Pursued
Moving into Final Design

Natural World

NW 2.1 Manage Stormwater
Use green BMPs to reduce stormwater quantity and improve water quality

NW 2.3 Prevent Surface and Groundwater Contamination
Eliminating CSOs into the urban stream which can contaminate the surface water

NW 3.4 Maintain Wetland and Surface Water Functions
Improve surface water function by enhancing water quality and habitat

Climate and Risk

CR 2.3 Prepare for long-term hazards
Addition of green infrastructure will provide added stormwater storage capacity, to handle larger storms and prevent flooding