

HDR

Transit and Sustainability: Yes, Spoken in the Same Breath!

Purdue Road School
Wednesday March 7, 2018

HDR, Engineering, Inc.

John Lazzara

Jennifer Mitchell



Learning Objectives

- Explain the need for rating infrastructure
- Describe the various third-party rating systems available.
- List five main Envision infrastructure rating system credit categories
- Describe the benefits of using Envision as a project guidance tool
- Apply Envision to in-progress projects using the rating system



01 INTRODUCTION

02 THE NEED FOR RATING
INFRASTRUCTURE

03 THIRD-PARTY RATING
SYSTEMS

04 PROJECT EXAMPLES

05 THE FUTURE OF ENVISION

06 ENVISION AND ME

07 Q&A



01

Introduction

The Value of Measuring Sustainability

- Evaluate conceptual projects or alternatives
- Quantify soft benefits
- Meet sustainability goals
- Assess costs and benefits over a project's expected lifecycle
- Promote multi-modal transportation options
- Stakeholder's request it



How do we measure sustainability?



02 The Need For Rating Infrastructure

LEED® Transformed the Building Industry

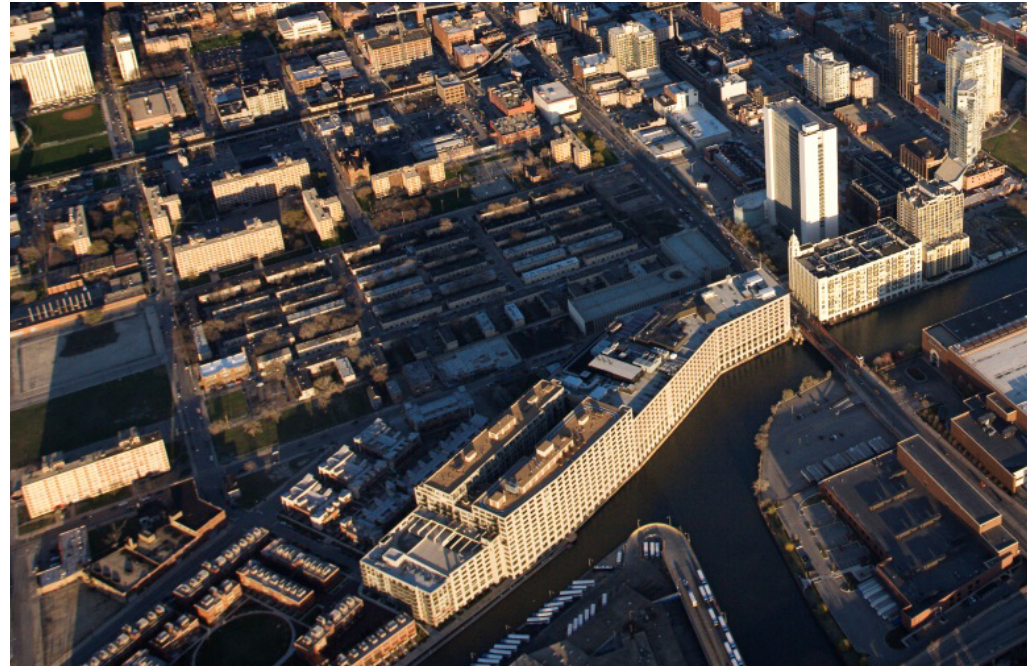
- Redefined building value
 - Building customers (owners, tenants, residents, the public) recognize value of building “green”
 - Low 1st costs = lower life cycle costs
- Developed value metrics
 - System for measuring, assessing and recognizing building performance
 - Better LEED-defined performance = higher value
- Created the brand
- Instituted LEED-ND



What about Infrastructure?

A different challenge than buildings:

- Building design and construction – usually controlled by a single organization
- Infrastructure projects are more public in nature and they affect or benefit macro ecosystems, communities and regions
- Infrastructure projects must consider:
 - Public stakeholder expectations and support
 - Environmental responsibility
 - Impact on public life
 - Use of public funds – sustainability needs to pay for itself!



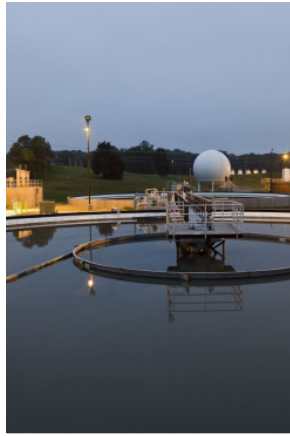
Need – System for all Civil Infrastructure

ENERGY



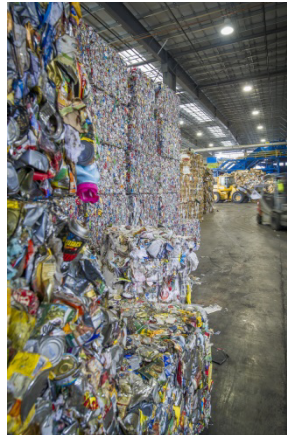
Geothermal
 Hydroelectric
 Nuclear
 Coal
 Natural gas
 Oil/refinery
 Wind
 Solar
 Biomass
 Other

WATER



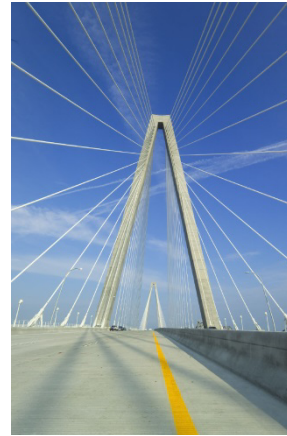
Water Supply
 Capture and storage
 Water reuse
 Stormwater management
 Pipelines
 Flood Control
 Other

WASTE



Solid waste
 Recycling
 Hazardous waste
 Collection and transfer
 Other

TRANSPORTATION



Airports
 Roads/highways
 Bike/pedestrians
 Railways
 Public transit
 Ports
 Waterways
 Other

LANDSCAPE



Public realm
 Parks
 Ecosystem services
 Community development
 Other

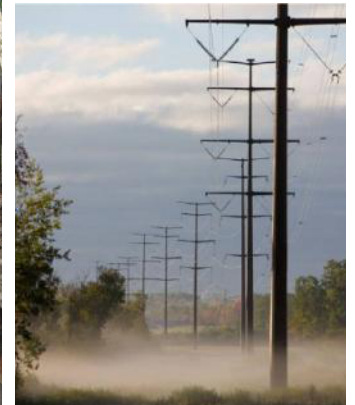
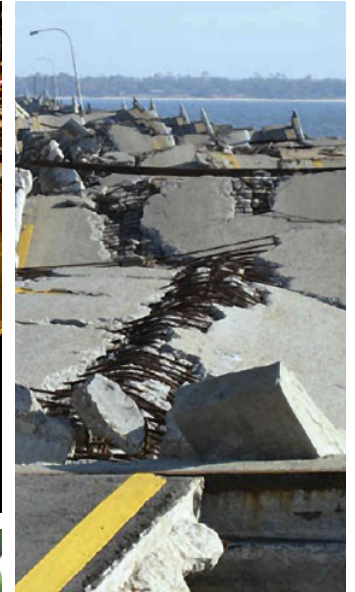
INFORMATION



Telecommunications
 Internet/phones
 Satellites
 Data centers
 Sensors
 Other

State of Infrastructure and Need for Rating

- North American infrastructure is in decline.
- We're building 2070 today with changing concepts of sustainability.
- Infrastructure must be designed to integrate into community, take into account changes in environment, be resilient, embrace resource conversation, etc.
- Need to be able to address and measure the triple bottom line impacts; social, economic and environmental.

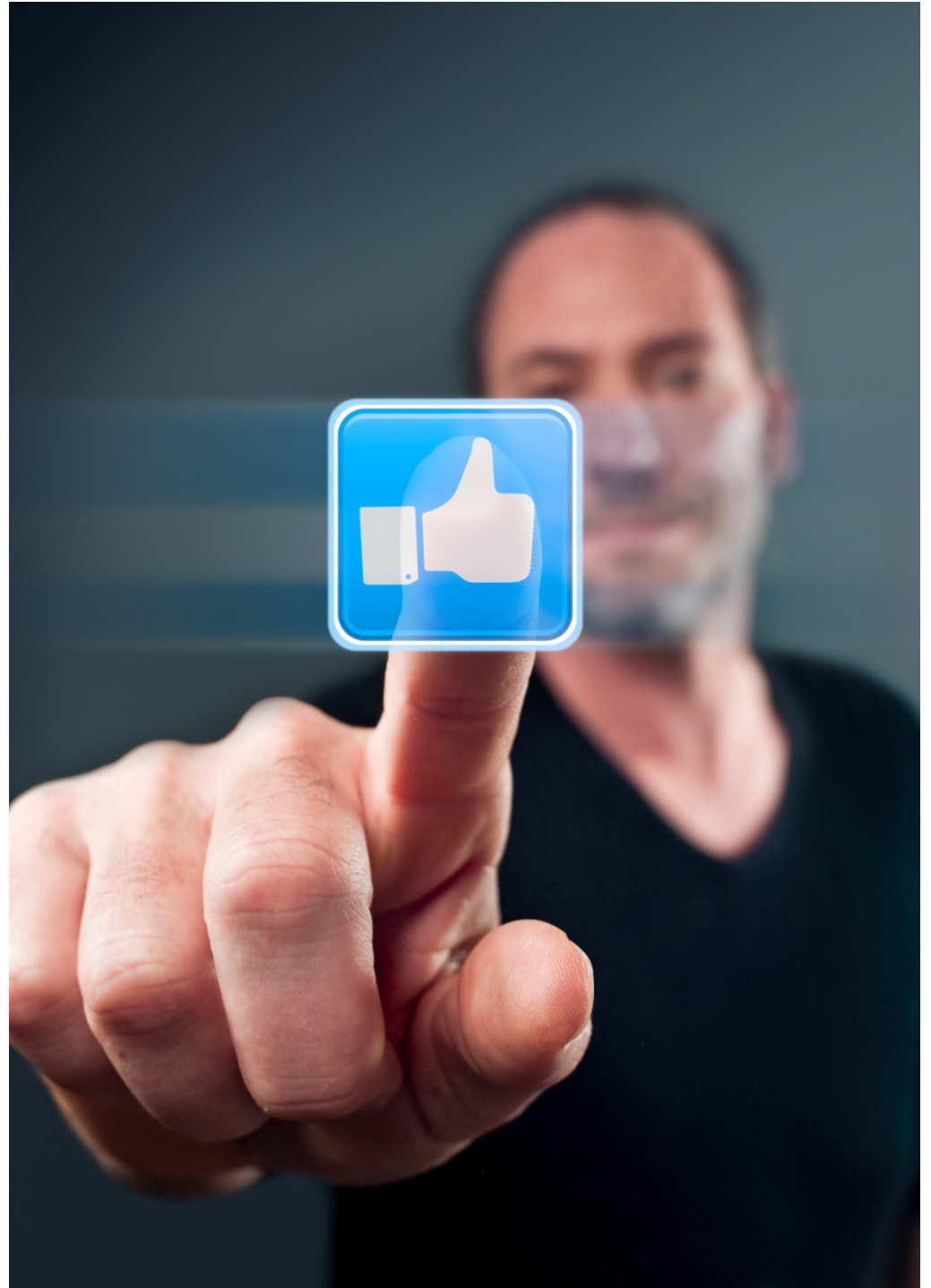




03 **Third-Party Rating Systems**

Third-Party Rating Systems

- LEED ND
- INVEST
- Greenroads
- Envision



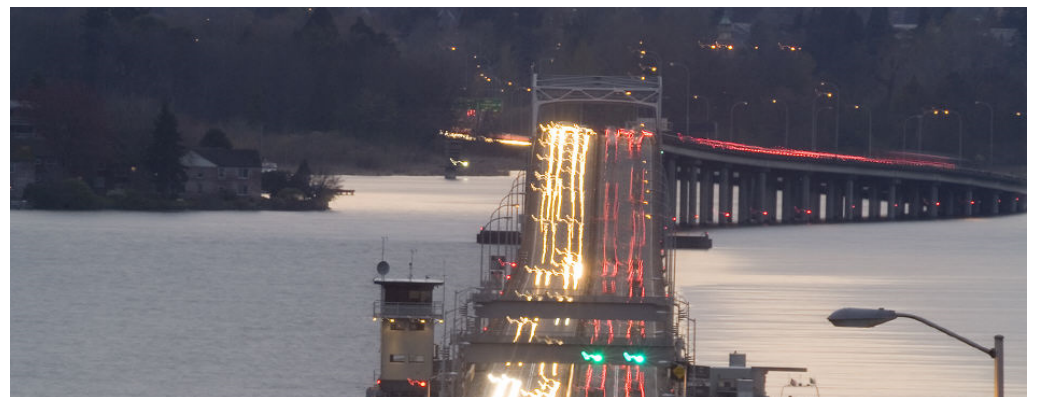


INVEST

A web-based **self-evaluation** tool that covers the full lifecycle of **transportation services**. [Infrastructure Voluntary Evaluation Sustainability Tool]

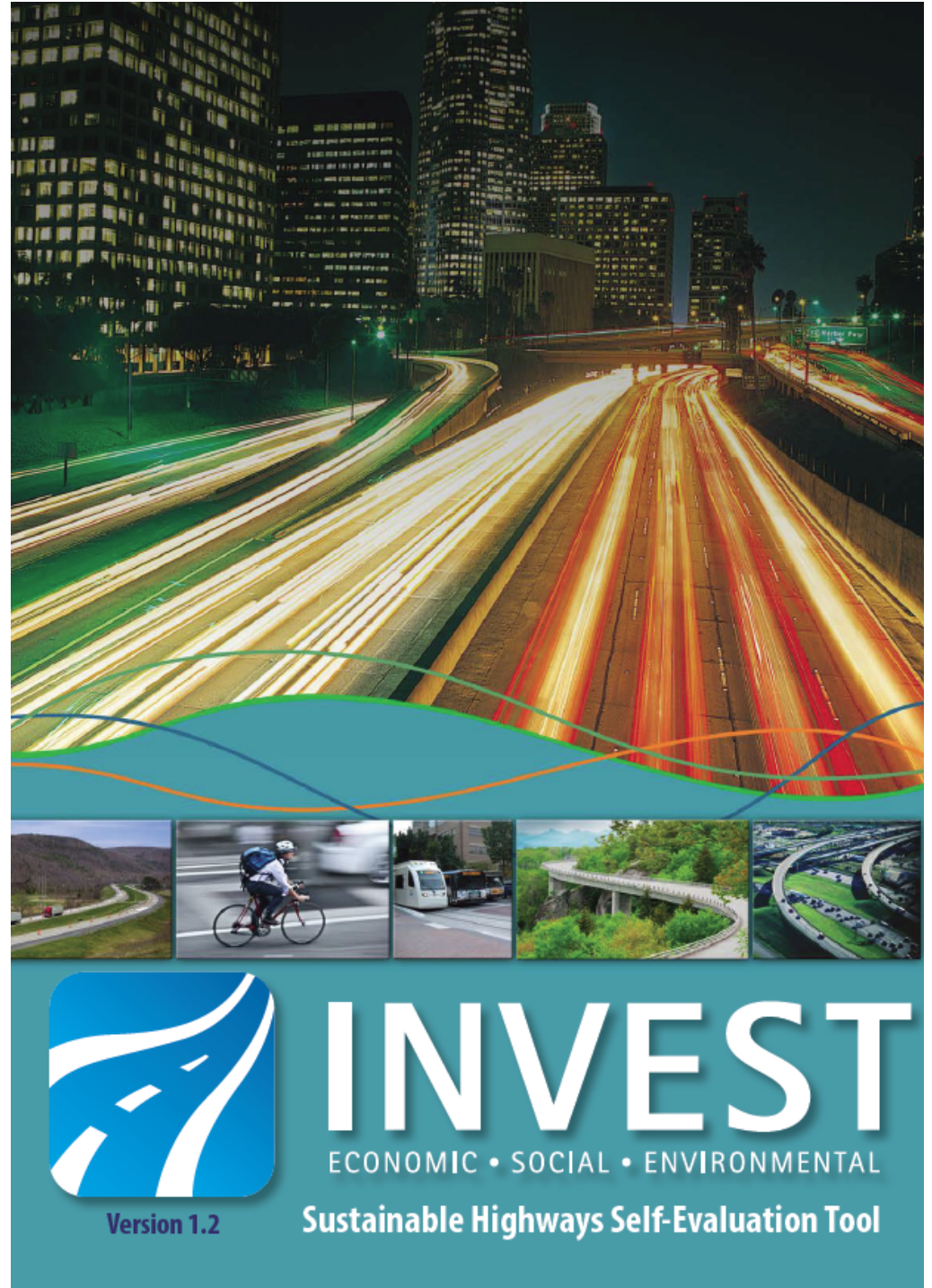
For FHWA, a sustainable approach to highways considers

- Access (not just mobility)
- Movement of people and goods (not just vehicles)
- Provision of transportation choices, such as safe and comfortable routes for walking, bicycling, and transit
- Efficient use of funding
- Incentives for construction quality
- Regional air quality and climate change
- Environmental management systems, among other considerations.




INVEST is...

- 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



INVEST Workspace

My Workspace
Logged in as



[Logout](#)
Version 1.2

Q

About

Learn

Criteria

Score

Resources

My Workspace

Scoring Tutorial

Start a new Project or Program

Continue Working on an Existing Project or Program:

System Planning for States

Title	↑	Version	Primary ID	Secondary ID	Year	Design Phase	Score	Status	Rating
Test 1	ACTIONS ▶						0	○	●

System Planning for Regions

Title	↑	Version	Primary ID	Secondary ID	Year	Design Phase	Score	Status	Rating
Test 2	ACTIONS ▶	1.2					0	○	●

Project Development

Title	↑	Version	Primary ID	Secondary ID	Year	Design Phase	Score	Status	Rating
Test 3	ACTIONS ▶	1.2					0	○	●

Operations and Maintenance

Title	↑	Version	Primary ID	Secondary ID	Year	Design Phase	Score	Status	Rating
Test 4	ACTIONS ▶	1.2					0	○	●

Source: sustainablehighways.org



Greenroads

Sustainability rating system used to measure and manage sustainability on transportation projects.

GREENROADS CREDIT CATEGORIES & INTENT



Project Requirements

Mandatory baseline activities to be considered "sustainable"



Environment & Water

Promote environmental best practices related to land use, habitat, water, and other ecological resources.



Construction Activities

Promote environmental, social, and economic best practices for construction beyond minimum compliance.



Materials & Design

Promote responsible practices for materials management to lower costs, extend service life, and reduce maintenance.



Utilities & Controls

Promote best practices for improved operations, improved mobility, efficient systems, and enhanced user experience.



Access & Livability

Promote best practices for improved quality of life—including safety, human health, accessibility, social justice, and placemaking.



Creativity & Effort

Promote practices that are unique and exceed performance expectations.

Greenroads v2 Project Checklist

Email

Send a complete copy of this checklist to yourself.

Your email

SEND

Print

PR-3 Low Impact Development

PR-4 Social Impact Analysis

PR-5 Community Engagement

PR-6 Lifecycle Cost Analysis

PR-7 Quality Control

PR-8 Pollution Prevention

PR-9 Waste Management

PR-10 Noise & Glare Control

PR-11 Utility Conflict Analysis

PR-12 Asset Management

Environment & Water

Attempting My Score

EW-1 Preferred Alignment
3 points

EW-2 Ecological Connectivity
1-3 points

EW-3 Habitat Conservation
1-3 points

EW-4 Land Use

MD-2 Recycled & Recovered Content
1-5 points

MD-3 Environmental Product Declarations
2 points

MD-4 Health Product Declarations
2 points

MD-5 Local Materials
1-5 points

MD-6 Long-Life Design
1-5 points

Utilities & Controls

Attempting My Score

UC-1 Utility Upgrades
1-2 points

UC-2 Maintenance & Emergency Access
1 point

UC-3 Electric Vehicle Infrastructure
1-3 points



Envision

Sustainable best practices and **rating system** for planning, designing, building and maintaining **civil infrastructure**.

Envision – a Collaborative Process

ENVISION DEVELOPERS



FOUNDING ORGANIZATIONS



What is Envision?

A system of tools for planning, designing, constructing, operating and rating civil infrastructure

- o A self-assessment Checklist
- o The Envision Rating Tool
- o A credential program for individuals
- o A project verification program
- o A recognition program

Pre-assessment Checklist

ENVISION		Y	N	NA		
Pre-Assessment Checklist						
10.00 QUALITY OF LIFE	PURPOSE	QL.1 Improve Community Quality of Life	0	0	0	0 of 0
		QL.2 Promote Sustainable Growth and Development	0	0	0	0 of 0
		QL.3 Develop Local Jobs and Capabilities	0	0	0	0 of 0
		QL.4 Enhance Public Health and Safety	0	0	0	0 of 0
		QL.5 Promote Home and Shelter	0	0	0	0 of 0
	WELLBEING	QL.6 Promote Employment	0	0	0	0 of 0
		QL.7 Promote Community Mobility and Access	0	0	0	0 of 0
		QL.8 Encourage Materials Minimization and Conservation	0	0	0	0 of 0
		QL.9 Promote Site Accessibility, Safety and Biosecurity	0	0	0	0 of 0
		QL.10 Promote Historic Cultural Resources	0	0	0	0 of 0
QL.11 Promote Water and Land Conservation	0	0	0	0 of 0		
QL.12 Enhance Public Space	0	0	0	0 of 0		
		TOTAL	0	0	0	0 of 0
11.00 COLLABORATION	ENVIRONMENTAL	EN.1 Promote Effective Leadership and Governance	0	0	0	0 of 0
		EN.2 Establish a Risk Management System	0	0	0	0 of 0
		EN.3 Promote Collaboration and Transparency	0	0	0	0 of 0
		EN.4 Promote Sustainable Investment	0	0	0	0 of 0
	FINANCIAL	EN.5 Promote Sustainable Energy Opportunities	0	0	0	0 of 0
		EN.6 Promote Sustainable Integration	0	0	0	0 of 0
		EN.7 Plan for Long-term Resilience and Maintenance	0	0	0	0 of 0
		EN.8 Address Contracting Regulations and Practices	0	0	0	0 of 0
EN.9 Establish Early Life	0	0	0	0 of 0		
		TOTAL	0	0	0	0 of 0
12.00 MATERIALS	ENERGY	MA.1 Reduce Net Embedded Energy	0	0	0	0 of 0
		MA.2 Support Sustainable Procurement Practices	0	0	0	0 of 0
		MA.3 Use Recycled Materials	0	0	0	0 of 0
		MA.4 Use Regional Materials	0	0	0	0 of 0
		MA.5 Select Green Procurement Practices	0	0	0	0 of 0
	WATER	MA.6 Reduce Greenhouse Gas Emissions	0	0	0	0 of 0
		MA.7 Promote Water Conservation and Recycling	0	0	0	0 of 0
		MA.8 Promote Energy Conservation	0	0	0	0 of 0
		MA.9 Promote Sustainable Procurement	0	0	0	0 of 0
		MA.10 Promote Water Conservation	0	0	0	0 of 0
MA.11 Promote Water Conservation	0	0	0	0 of 0		
		TOTAL	0	0	0	0 of 0
13.00 SITE	LAND & WATER	SI.1 Preserve Prime Habitat	0	0	0	0 of 0
		SI.2 Protect Wetland and Surface Water	0	0	0	0 of 0
		SI.3 Avoid Sensitive Geology	0	0	0	0 of 0
		SI.4 Avoid Sensitive Seismicity	0	0	0	0 of 0
		SI.5 Avoid Land Use Development on Steep Slopes	0	0	0	0 of 0
	NEEDS/DEVELOPMENT	SI.6 Promote Sustainable Procurement	0	0	0	0 of 0
		SI.7 Manage Resources	0	0	0	0 of 0
		SI.8 Promote Sustainable Procurement	0	0	0	0 of 0
		SI.9 Promote Sustainable Procurement	0	0	0	0 of 0
		SI.10 Promote Sustainable Procurement	0	0	0	0 of 0
		TOTAL	0	0	0	0 of 0
14.00 COMMUNITY ENGAGEMENT	EMERGENCY	CE.1 Promote Sustainable Site Assessment	0	0	0	0 of 0
		CE.2 Promote Sustainable Site Assessment	0	0	0	0 of 0
		CE.3 Assess Social Trust and Vulnerability	0	0	0	0 of 0
		CE.4 Promote Sustainable Site Assessment	0	0	0	0 of 0
		CE.5 Promote Sustainable Site Assessment	0	0	0	0 of 0
	RESILIENCE	CE.6 Promote Sustainable Site Assessment	0	0	0	0 of 0
		CE.7 Promote Sustainable Site Assessment	0	0	0	0 of 0
		CE.8 Promote Sustainable Site Assessment	0	0	0	0 of 0
		CE.9 Promote Sustainable Site Assessment	0	0	0	0 of 0
		CE.10 Promote Sustainable Site Assessment	0	0	0	0 of 0
		TOTAL	0	0	0	0 of 0

Envision Rating Tool

QL.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.

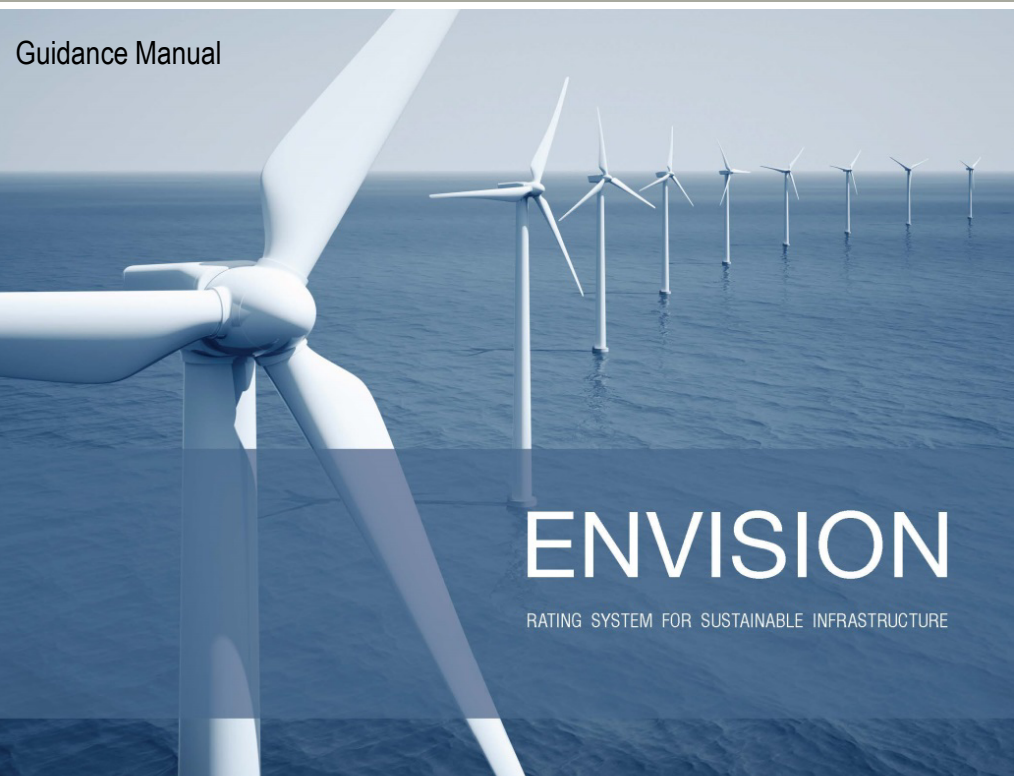
LEVEL OF ACHIEVEMENT	IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
QL.1 Overall Goals: The project team has established a vision for the project that includes the needs and interests of the community. The project team has established a vision for the project that includes the needs and interests of the community.	QL.1 Overall Goals: The project team has established a vision for the project that includes the needs and interests of the community. The project team has established a vision for the project that includes the needs and interests of the community.	QL.1 Overall Goals: The project team has established a vision for the project that includes the needs and interests of the community. The project team has established a vision for the project that includes the needs and interests of the community.	QL.1 Overall Goals: The project team has established a vision for the project that includes the needs and interests of the community. The project team has established a vision for the project that includes the needs and interests of the community.	QL.1 Overall Goals: The project team has established a vision for the project that includes the needs and interests of the community. The project team has established a vision for the project that includes the needs and interests of the community.	QL.1 Overall Goals: The project team has established a vision for the project that includes the needs and interests of the community. The project team has established a vision for the project that includes the needs and interests of the community.

DESCRIPTION:
This credit addresses the extent to which the project contributes to the quality of life of the host and affected communities. This determination is based on how well the project team has identified, assessed, and incorporated community needs, goals and objectives into the project. Highest community goals are assumed to be those representing critical needs, goals, objectives, and aspirations. In a real sense, they are the community's expression of their desired quality of life.

ADVANCING TO HIGHER ACHIEVEMENT LEVELS:
Benchmark: The project team leads and reviews community goals, leading to possible project-level goals. The team consults with local regulators and policies for stakeholder involvement.
Reference: The project team leads or allows others to lead community goals, and takes on the role to the project. Through the transparency and participatory engagement by which community goals and goals are incorporated into the project. One additional contribution to existing conditions and look for opportunities to rehabilitate community assets. Active strong engagement to stakeholders and community leaders.

EVALUATION CRITERIA AND DOCUMENTATION:
A. Use the project team identified and been into account community needs, goals, and desired.
1. Copy and examples of documents submitted and reviewed, including all meeting notes and agendas, community surveys, and stakeholder surveys, letters, and memoranda.

Guidance Manual



ENVISION

RATING SYSTEM FOR SUSTAINABLE INFRASTRUCTURE

Five Categories, 14 Topic Areas, 60 Credits



QUALITY OF LIFE

13 Credits

1 PURPOSE

- QL1.1 Improve Community Quality of Life
- QL1.2 Stimulate Sustainable Growth & Development
- QL1.3 Develop Local Skills and Capabilities

2 WELLBEING

- QL2.1 Enhance Public Health and Safety
- QL2.2 Minimize Noise and Vibration
- QL2.3 Minimize Light Pollution
- QL2.4 Improve Community Mobility and Access
- QL2.5 Encourage Alternative Modes of Transportation
- QL2.6 Improve Site Accessibility, Safety & Wayfinding

3 COMMUNITY

- QL3.1 Preserve Historic and Cultural Resources
- QL3.2 Preserve Views and Local Character
- QL3.3 Enhance Public Space
- QL0.0 Innovate or Exceed Credit Requirements



LEADERSHIP

10 Credits

1 COLLABORATION

- LD1.1 Provide Effective Leadership & Commitment
- LD1.2 Establish a Sustainability Management System
- LD1.3 Foster Collaboration and Teamwork
- LD1.4 Provide for Stakeholder Involvement

2 MANAGEMENT

- LD2.1 Pursue By-Product Synergy Opportunities
- LD2.2 Improve Infrastructure Integration

3 PLANNING

- LD3.1 Plan for Long-Term Monitoring & Maintenance
- LD3.2 Address Conflicting Regulations and Policies
- LD3.3 Extend Useful Life
- LD0.0 Innovate or Exceed Credit Requirements



RESOURCE ALLOCATION

14 Credits

1 MATERIALS

- RA1.1 Reduce Net Embodied Energy
- RA1.2 Support Sustainable Procurement Practices
- RA1.3 Use Recycled Materials
- RA1.4 Use Regional Materials
- RA1.5 Divert Waste from Landfills
- RA1.6 Reduce Excavated Materials Taken Off Site
- RA1.7 Provide for Deconstruction and Recycling

2 ENERGY

- RA2.1 Reduce Energy Consumption
- RA2.2 Use Renewable Energy
- RA2.3 Commission and Monitor Energy Systems

3 WATER

- RA3.1 Protect Fresh Water Availability
- RA3.2 Reduce Potable Water Consumption
- RA3.3 Monitor Water Systems
- RA0.0 Innovate or Exceed Credit Requirements



NATURAL WORLD

15 Credits

1 SITING

- NW1.1 Preserve Prime Habitat
- NW1.2 Protect Wetlands and Surface Water
- NW1.3 Preserve Prime Farmland
- NW1.4 Avoid Adverse Geology
- NW1.5 Preserve Floodplain Functions
- NW1.6 Avoid Unsuitable Development on Steep Slopes
- NW1.7 Preserve Greenfields

2 LAND + WATER

- NW2.1 Manage Stormwater
- NW2.2 Reduce Pesticides and Fertilizer Impacts
- NW2.3 Prevent Surface and Groundwater Contamination

3 BIODIVERSITY

- NW3.1 Preserve Species Biodiversity
- NW3.2 Control Invasive Species
- NW3.3 Restore Disturbed Soils
- NW3.4 Maintain Wetland and Surface Water Functions
- NW0.0 Innovate or Exceed Credit Requirements



CLIMATE AND RISK

8 Credits

1 EMISSIONS

- CR1.1 Reduce Greenhouse Gas Emissions
- CR1.2 Reduce Air Pollutant Emissions

2 RESILIENCE

- CR2.1 Assess Climate Threat
- CR2.2 Avoid Traps and Vulnerabilities
- CR2.3 Prepare for Long-Term Adaptability
- CR2.4 Prepare for Short-Term Hazards
- CR2.5 Manage Heat Island Effects
- CR0.0 Innovate or Exceed Credit Requirements

Envision as a Design Tool

Inherent to Project:

- Noise and Odor Control
- Stakeholder Involvement
- Infrastructure Renewal
- Capacity Enhancement
- Flexible Operations
- Resiliency

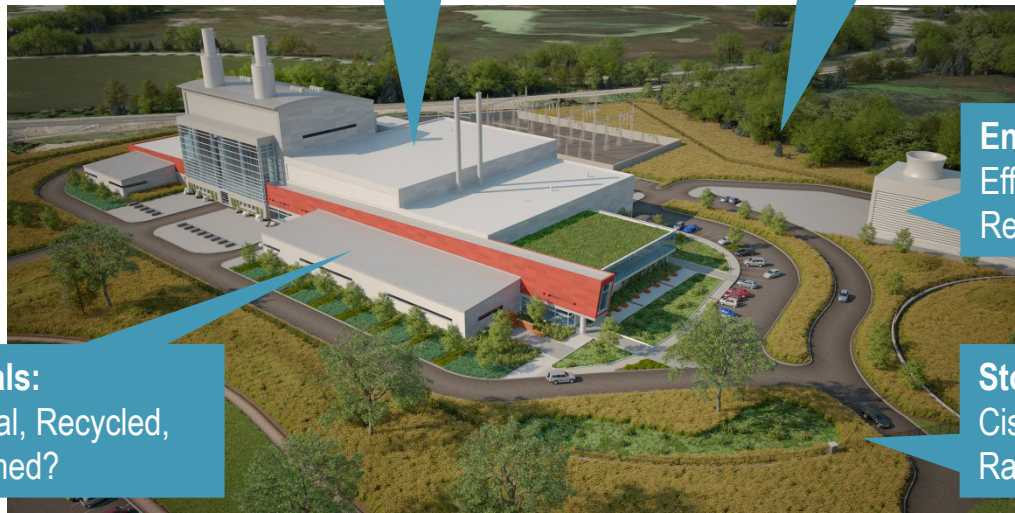
Materials:
Regional, Recycled,
Reclaimed?

Roof:
Vegetated, Solar,
High Reflectance?

Vegetation:
Local, Non-invasive,
Natural Pesticides?

Energy:
Efficiency,
Renewable?

Stormwater:
Cistern,
Rain Garden?



Identify opportunities for incremental improvements
in sustainable performance

Envision – Online Scoring Sheet

My Projects

My Credentialing

My Membership

My Invoices

Terry's Test Project

Utah, DC

No Award Level

Project Stage


Unregistered

Status: Awaiting registration by project leader.

Select All/None

Generate printable view of selected credits

Download selected credit attachments



13 credits in progress, 0 credits completed
Last updated 03/07/2016 by Terry Warner

Project progress

25 of 181 Possible points – 14%

			I	E	S	C	R		
Purpose	<input type="checkbox"/> QL1.1 Improve Community Quality of Life		N/A	0	2	5	10	20	25
	<input type="checkbox"/> QL1.2 Stimulate Sustainable Growth and Development		N/A	0	1	2	5	13	16
	<input type="checkbox"/> QL1.3 Develop Local Skills and Capabilities		N/A	0	1	2	5	12	15
Wellbeing	<input type="checkbox"/> QL2.1 Enhance Public Health and Safety		N/A	0	2	–	–	16	–
	<input type="checkbox"/> QL2.2 Minimize Noise and Vibration		N/A	0	1	–	–	8	11
	<input type="checkbox"/> QL2.3 Minimize Light Pollution		N/A	0	1	2	4	8	11
	<input type="checkbox"/> QL2.4 Improve Community Mobility and Access		N/A	0	1	4	7	14	–
	<input type="checkbox"/> QL2.5 Encourage Alternative Modes of Transportation		N/A	0	1	3	6	12	15
	<input type="checkbox"/> QL2.6 Improve Site Accessibility, Safety and Wayfinding		N/A	0	–	3	6	12	15
Community	<input type="checkbox"/> QL3.1 Preserve Historic and Cultural Resources		N/A	0	1	–	7	13	16
	<input type="checkbox"/> QL3.2 Preserve Views and Local Character		N/A	0	1	3	6	11	14
	<input type="checkbox"/> QL3.3 Enhance Public Space		N/A	0	1	3	6	11	13
Innovate or Exceed	<input type="checkbox"/> QL0.0 Innovate or Exceed Credit Requirements		N/A	Maximum Level of 8			8		
			Submitted		25		Verified		

Third-Party Rating Systems Comparison

		Envision® V2	LEED ND V4	Greenroads V2	INVEST V1.2
Applicability	Planning	✓	✓	✓	✓ [^]
	Design	✓	✓	✓	✓
	Construction	● [^]	✓	✓	✓
	Operations	● [^]	●	●	✓ [^]
	Neighborhoods	✓	✓	✗	✗
	Infrastructure support facilities	✓	✗	✗	✗
	Roadways	✓	✓	✓	✓
	Transit	✓	✓	✓	✓
	Highways	✓	✗	✓	✓
	Bridges, tunnels, walls	✓	✗	✓	✓
	System and program level	✓	✓	✓	✓
	Other civil infrastructure	✓	✗	✗	✗

LEGEND
 ✓ Applicable
 ● Somewhat applicable
 ✗ Not applicable
[^] separate module of rating system, existing or planned



04 Project Examples



INVEST

A web-based **self-evaluation** tool that covers the full lifecycle of **transportation services**. [Infrastructure Voluntary Evaluation Sustainability Tool]

I-20/26/126 Corridor Improvements – Carolina Crossroads; South Carolina DOT

- Profound capacity and operational deficiencies for a transportation corridor:
 - 14 miles of Interstate freeway (166 lane miles on three interstates—I-20, I-26, and I-126)
 - 12 interchanges
 - 19 bridges
- Identify and assess the impacts of solutions to:
 - Reduce congestion
 - Improve traffic operations
 - Increase safety
 - Increase capacity
- Integrating the INVEST and Envision sustainability rating systems into EIS process



TriMet

- INVEST Modules: Project Development and O&M
- Evaluated Portland Milwaukie Light Rail
- 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





Greenroads

Sustainability rating system used to measure and manage sustainability on transportation projects.

West Dowling Road Phase II

- The Alaska Department of Transportation & Public Facilities first **Pilot Project**
- New, \$46.8 million highway corridor in the City of Anchorage
- Improving mobility for all modes and upgrading stormwater and sewer utilities
- Built dedicated snow storage and created systems to clean snow near Tina Lake
- The project is registered to pursue certification



Greenroads® Summary
West Dowling Road Phase II **Pilot Project**
Anchorage, AK

Total Score*	32
Project Requirements	8/11
Environment & Water	7/21
Access & Equity	12/30
Construction Activities	5/14
Materials & Resources	5/23
Pavement Technologies	0/20
Custom Credits	3/10

*Does not include Project Requirements



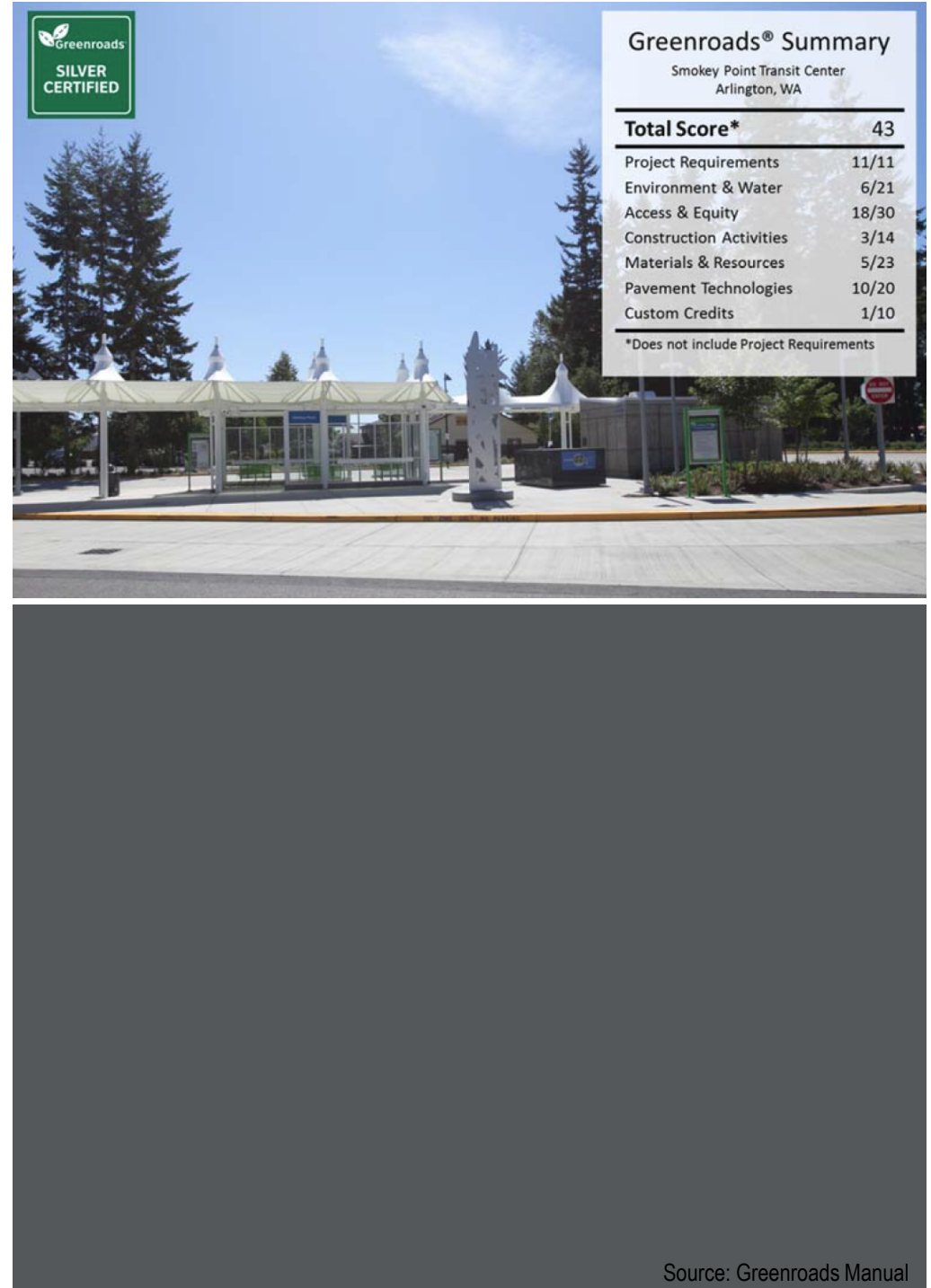
The image shows a construction site for the West Dowling Road Phase II Pilot Project in Anchorage, AK. In the background, there are snow-capped mountains under a cloudy sky. In the foreground, there is a dirt road with orange traffic cones and construction equipment. A summary table is overlaid on the top left of the image, and a Greenroads PILOT PROJECT logo is in the bottom left corner.



Source: Greenroads Manual

Smokey Point Transit Center Arlington, WA

- Community Transit's flagship Project for Greenroads and the first transit-only facility to earn Certification.
- Team originally considered pursuing LEED, but found that the facility did not meet the eligibility requirements for conditioned spaces and determined Greenroads' transportation focus was a better fit.
- Designed with transit users and vehicles in mind, with a focus on responsible, safe, and pleasant site design for durability and accessibility.
- Huge on-site raingarden infiltrates 99.5% of the stormwater, treating 80.4% of it to enhanced levels to remove dissolved metals.
- Community Transit has already registered its next planned transit center facility.





Envision

Sustainable best practices and **rating system** for planning, designing, building and maintaining **civil infrastructure**.










Kansas City Streetcar Kansas City, MO

- Alternatives Analysis built around four goals directly tied to the needs and objectives of the local community: Connect, Develop, Thrive, Sustain
- Improves mobility and accessibility for a heavily developed urban area, within walking distance to a mix of commercial, office and residential uses
- Provides “last mile” connectivity to other regional transit services
- \$1.8 billion in economic development initiated in the vicinity of the streetcar corridor
- Nearly 90 percent of the Singleton Yard (vehicle maintenance facility) construction waste diverted from landfill.



KC Streetcar: Envision Platinum

CREDIT CATEGORY	AVAILABLE POINTS	AWARDED POINTS	INNOVATION PTS	% OF AVAILABLE POINTS
QUALITY OF LIFE	181	157	8	91%
LEADERSHIP	121	75	0	62%
RESOURCE ALLOCATION	182	49	0	27%
NATURAL WORLD	127	32	0	25%
CLIMATE & RISK	122	53	0	43%
TOTAL PROJECT POINTS	733#	366	8	51%

<p>17th Envision rated project</p>	<p>One of only two streetcar systems in the country with</p>  <p>100% low-floor vehicles provide 100% access</p>	<p>More than 40 development projects in the area, totaling about</p> <p>\$1.8 Billion</p>  <p>in economic activity since the streetcar project was announced</p>	 <p>13 community kiosks located on the streetcar line— as part of the Smart City initiative</p>	<p>Diverted nearly</p> <p>88%</p>  <p>of Vehicle Maintenance Facility construction waste from the landfill</p>
<p>1st Transit project</p>	 <p>2.2-mile streetcar route carries over</p>  <p>6,000 passengers per day</p>	<p>Replaced or upgraded</p> <p>100-year-old</p>  <p>water & sewer lines along much of the streetcar route during construction</p>	<p>Using a block rail reduced excavated material by nearly</p> <p>14,000 cubic yards (approximately 50% reduction)</p> 	<p>As part of Kansas City's One Percent for Art Program, the city provided</p> <p>\$100,000</p>  <p>to support artists in developing innovative, original art for select stops</p>

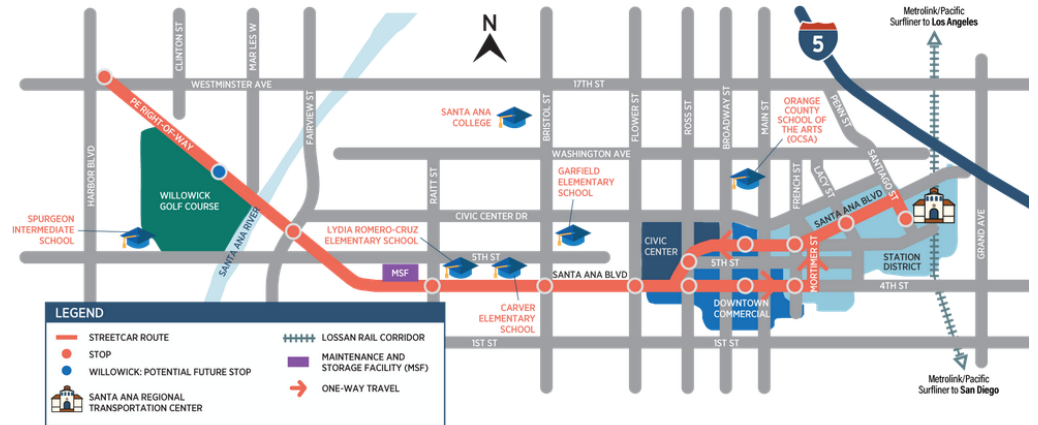
Kansas City Streetcar

- QL1.1 – Improve community quality of life
 - Built on a series of previous local and regional planning efforts
 - Significant community engagement and incorporated feedback
 - Upgrades to adjacent infrastructure
- RA1.3 – Use recycled materials
 - 47% of VMF materials contain recycled content
 - 845 tons of rail – all steel used included recycling of metal scrap
- NW3.2 – Control invasive species
 - VMF Built on a grayfield site
 - Approx. 27,700 SF restored to natural areas
 - Planted with native/adapted plants
 - Measures deter and control the establishment of invasive species on the project site



OC Streetcar Orange County, CA

- Located in Santa Ana & Garden Grove, California
- 4.15 mile route
- 10 stops in each direction
- Opening planned for 2020
- Offers a connection to and from the Santa Ana Regional Transportation Center Station – OC's 2nd busiest rail station with 65+ daily train connections
- Connections to 18 OCTA bus routes
- Eliminates transit gaps
- Creates a vital link in Orange County's extensive transportation network – an integral part of the region's mobility future



OC Streetcar

- QL 3.1 - Preserve historic & cultural resources
 - Extensive research compiled regarding historic and cultural resources in the project area
 - Letter from OHP concurs with finding that the project will result in no adverse effect to historical properties
 - Special consideration given to historic significance of Pacific Electric Santa Ana River Bridge and possible effects on the bridge due to the project
 - Working with local preservation groups resulted in alternative that preserves bridge at its current location

OVERVIEW

OC STREETCAR BY THE NUMBERS

PROJECT FEATURES



- OCTA BUS CONNECTIONS: 18
- FLEET SIZE: 8
- FREQUENCY: 10-15 MINUTES
- STOPS: 10 (IN EACH DIRECTION)
- STREETCAR CAPACITY: UP TO 150 PEOPLE
- DAILY TRAIN CONNECTIONS AT SARTC: 65+

ROUTE: 4.15 MILES (in each direction)

OC Streetcar is the first modern streetcar project to be built in Orange County and will serve Santa Ana's historic and thriving downtown, which includes federal, state and local courthouses, government offices, colleges, an artists' village and a thriving restaurant scene. Expected to begin carrying passengers in late 2020, it will operate along a 4.15-mile route that connects the Santa Ana Regional Transportation Center (SARTC) and a new transit hub at Harbor Boulevard and Westminster Avenue in Garden Grove.

Through Transit Extensions to Metrolink, a Measure M program, Santa Ana and Garden Grove pioneered the streetcar project. In cooperation with those cities, OCTA became the lead agency in 2014 for project development, engineering, construction, operations, and maintenance.

SCHEDULE



- Project Development: 2015
- Design and Engineering: 2016
- Construction: 2018
- Testing and Operations: 2020

I-4 Ultimate Improvement, Florida

- Signature corridor:
Connecting Communities, Improving Economies and Enhancing Livability
- 21 miles of interstate reconstruction, including:
 - 15 major interchanges
 - Widening 13 bridges, replacing 74 bridge, adding 53 new bridges
 - General use lanes
 - 4 new variable-priced lanes



I-4 Ultimate Improvement: Envision Platinum

Credit Category	Applicable Points	Awarded Points	Innovation Points	Percentage of Applicable Points
QUALITY OF LIFE	181	144	3	81%
LEADERSHIP	113	87	2	79%
RESOURCE ALLOCATION	182	43	5	26%
NATURAL WORLD	182	80	0	44%
CLIMATE AND RISK	122	28	0	23%
Total Points	780*	382	10	50%

I-4 Ultimate Improvement, Florida

- QL0.0 – Quality of Life Innovation
 - \$1.5 million endowment fund for the arts to define the Signature Corridor and \$750k fund for public awareness of alternative modes.
- LD0.0 – Leadership Innovation
 - Exceptional coordination with local agencies and commitment to aesthetic enhancement program.
- RA0.0 – Resource Allocation Innovation
 - Extensive use of recycled demo'd concrete as new aggregate, heavy equipment fuel monitoring systems, and reduced machine hours.
- QL1.3 – Develop Local Skills and Capabilities
 - On the job training program (250 people).



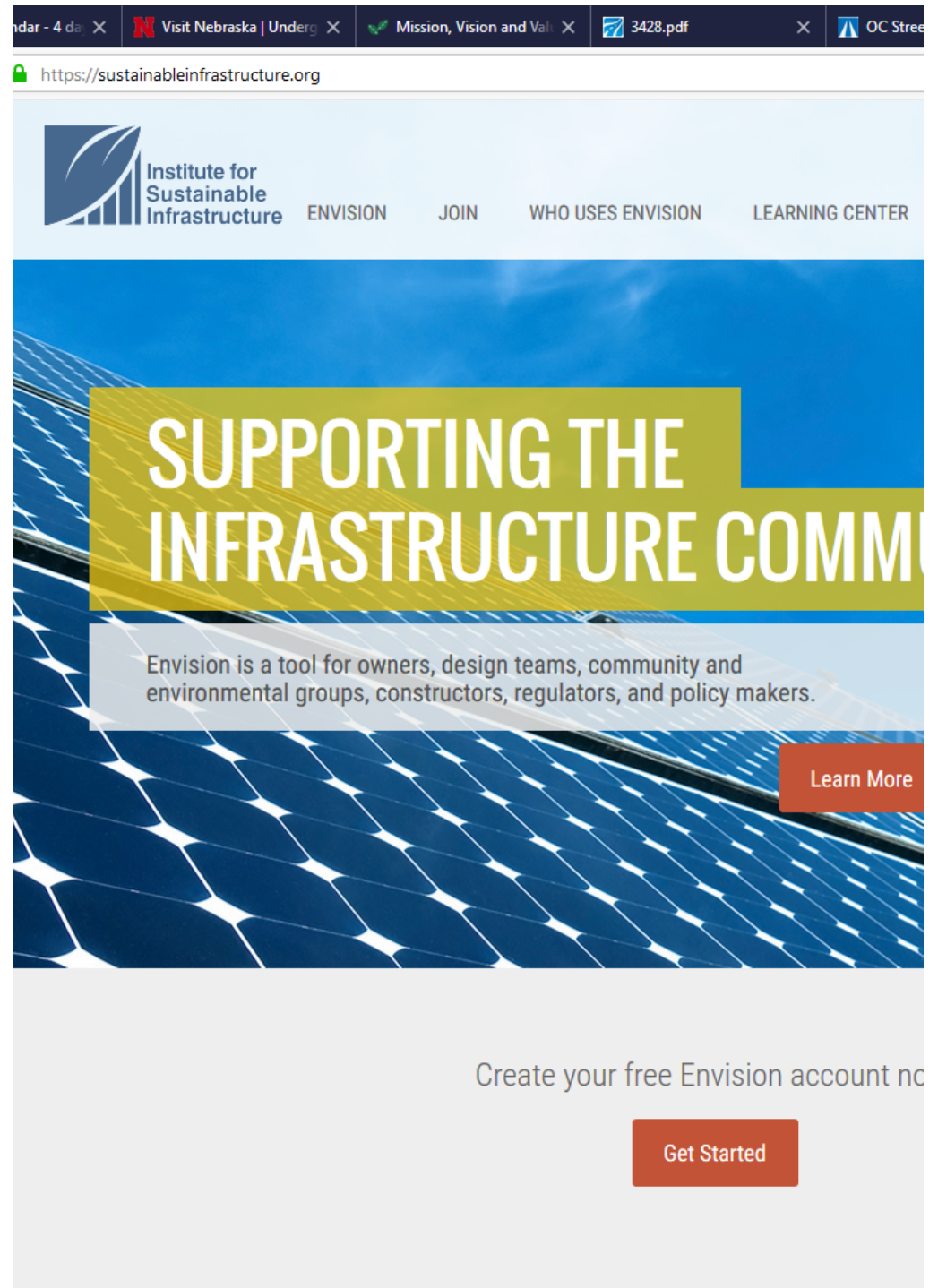


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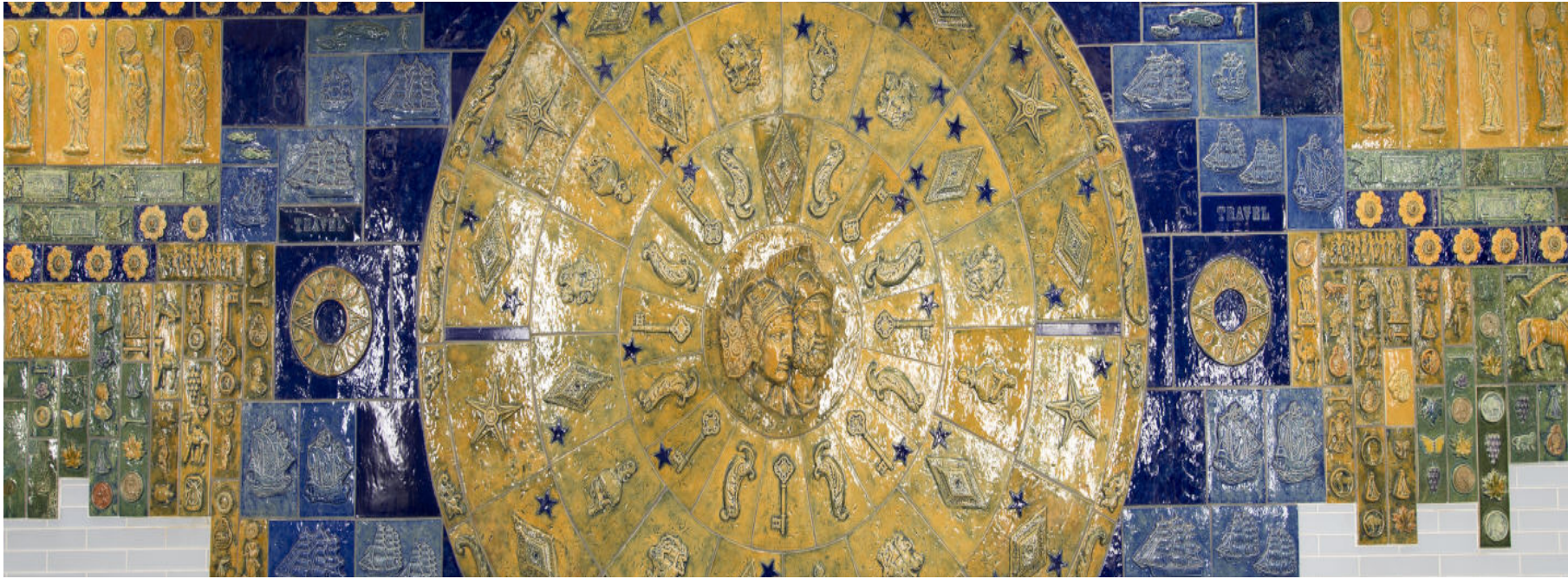
Future of Envision

Envision Tools

- v3 will be released Spring 2018
- ISI tools and resources will be updated
- ISI will also be working on an on-line training that current ENV SPs will need to take in order to keep their credential current
- Project timing

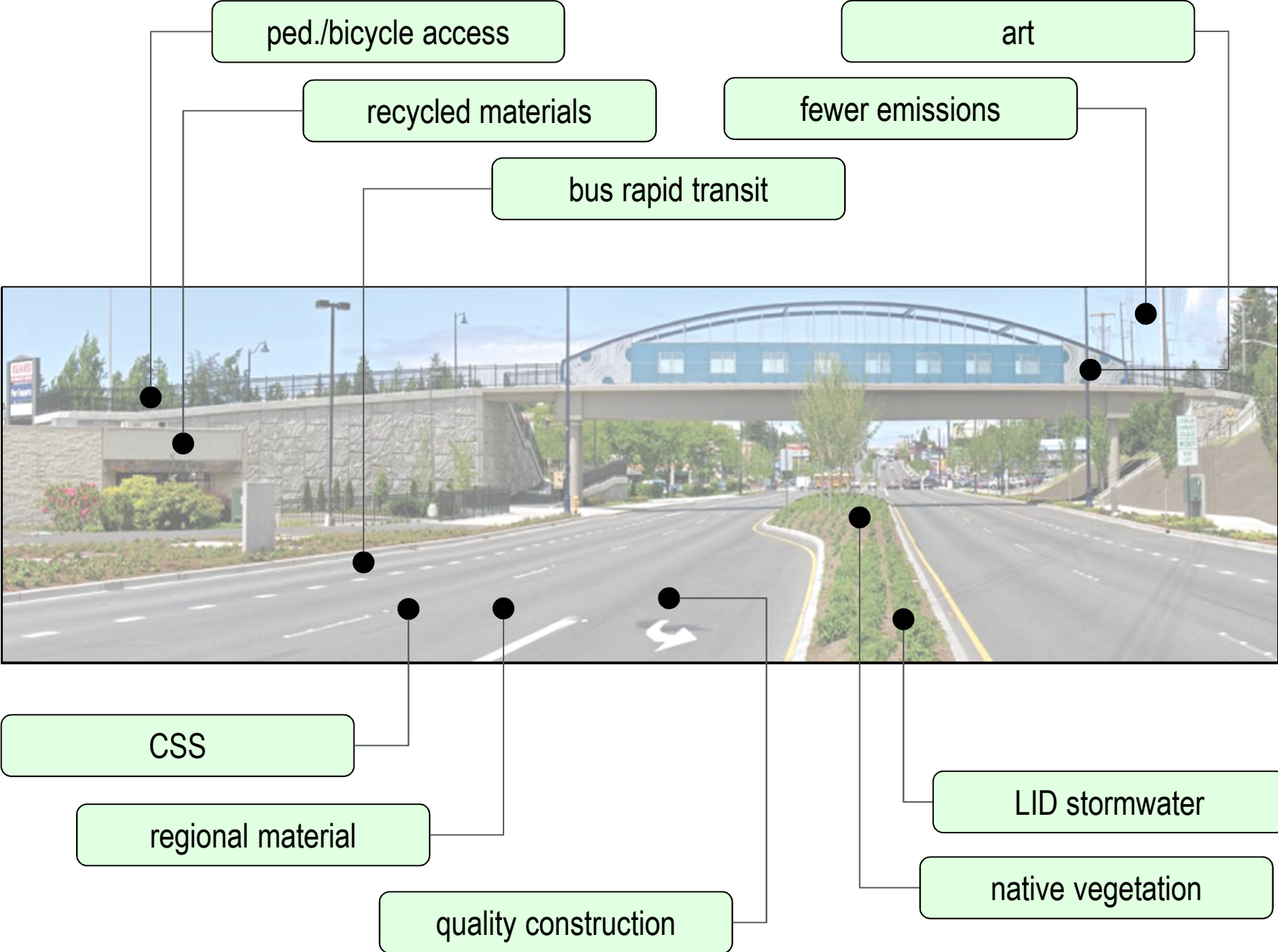


The screenshot shows a web browser window with the URL <https://sustainableinfrastructure.org>. The page features the logo for the Institute for Sustainable Infrastructure and a navigation menu with links for ENVISION, JOIN, WHO USES ENVISION, and LEARNING CENTER. The main content area has a background image of solar panels and a blue sky. A large yellow banner contains the text "SUPPORTING THE INFRASTRUCTURE COMMUNITY". Below this, a grey box contains the text: "Envision is a tool for owners, design teams, community and environmental groups, constructors, regulators, and policy makers." There are two orange buttons: "Learn More" and "Get Started". At the bottom, there is a prompt to "Create your free Envision account now" with a "Get Started" button.



06

Envision and me?



What Makes a Good Envision Candidate?

Stated Environmental and/or Sustainability Goals



- Established design guidelines for sustainability
- Principles reference environmental stewardship
- Desire to implement strategies that reduce risk
- Desire to design for durability and long-term operational savings

Interested in Metrics and Environmental Reporting

- Has a 'green projects' portfolio
- Wants to do the "right project"
- Interested in third-party verification
- Stated importance of triple-bottom-line metrics



Progressive Leader in their Industry

- Strives to demonstrate sustainability leadership
- Interest in broadly contributing to sustainability



Highly Engaged with the Community and Local Government

- Public approval is important
- Responsive to local government sustainability issues
- Invites significant stakeholder engagement
- Seeks substantial stakeholder engagement





07

QUESTIONS?