

Sustainable Infrastructure and the Role of Envision

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Institute for Sustainable Infrastructure

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ENVISION™

Who we are

Non-profit education and research organization

Hub of a unique community:

- 230 A/E/C Companies
- 120 Government departments, agencies, towns, cities
- + Academic institutions, associations

Developer and manager of the Envision framework & rating system for sustainable infrastructure



ENVISION™

ASCE Report Card (2021)



America's Infrastructure Scores a

C-

There is a water main break every two minutes

and an estimated 6 billion gallons of treated water lost each day in the U.S., enough to fill over 9,000 swimming pools.

Growing wear and tear on our nation's roads

have left 43% of our public roadways in poor or mediocre condition, a number that has remained stagnant over the past several years.

There are 30,000 miles of inventoried levees across the U.S.,

and an additional 10,000 miles of levees whose location and condition are unknown.

Administration Goals

- Climate change
 - Resilience
 - Equity and social justice
 - Environmental protection and biodiversity
 - Public health
 - Economic recovery
-
- Infrastructure is critical in achieving all of these goals. The \$2 trillion American Jobs Plan is a once-in-a-century opportunity to leverage greater outcomes to create the infrastructure that will address the challenges of the 21st century.

What are the Challenges?

- Accountability for federal and state spending
 - Understanding and addressing complex tradeoffs
 - Prioritization of higher performing projects
 - Guidance to embed high-level goals into project delivery
 - A standardized national approach
 - Initiating systemic change within the infrastructure industry
-
- We need a consistent framework that evaluates tradeoffs, supports higher quality infrastructure, and delivers accountability to communities.

Is There a Model for Success?

- Federal adoption of sustainable building requirements in 2000's led to:
 - Third-party accountability and reporting
 - Learning and escalating performance goals
 - Cascading requirements at state and local levels
 - Market transformation from design, construction, and manufacturing
 - Transformation of professional practice and education
 - Rapid scaling of sustainability efforts
- Envision is industry-proven and poised to provide the same benefits for infrastructure—the other half of the built environment.

We are building the infrastructure of 2050 now!



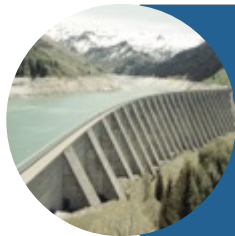
Highways
20-50
years



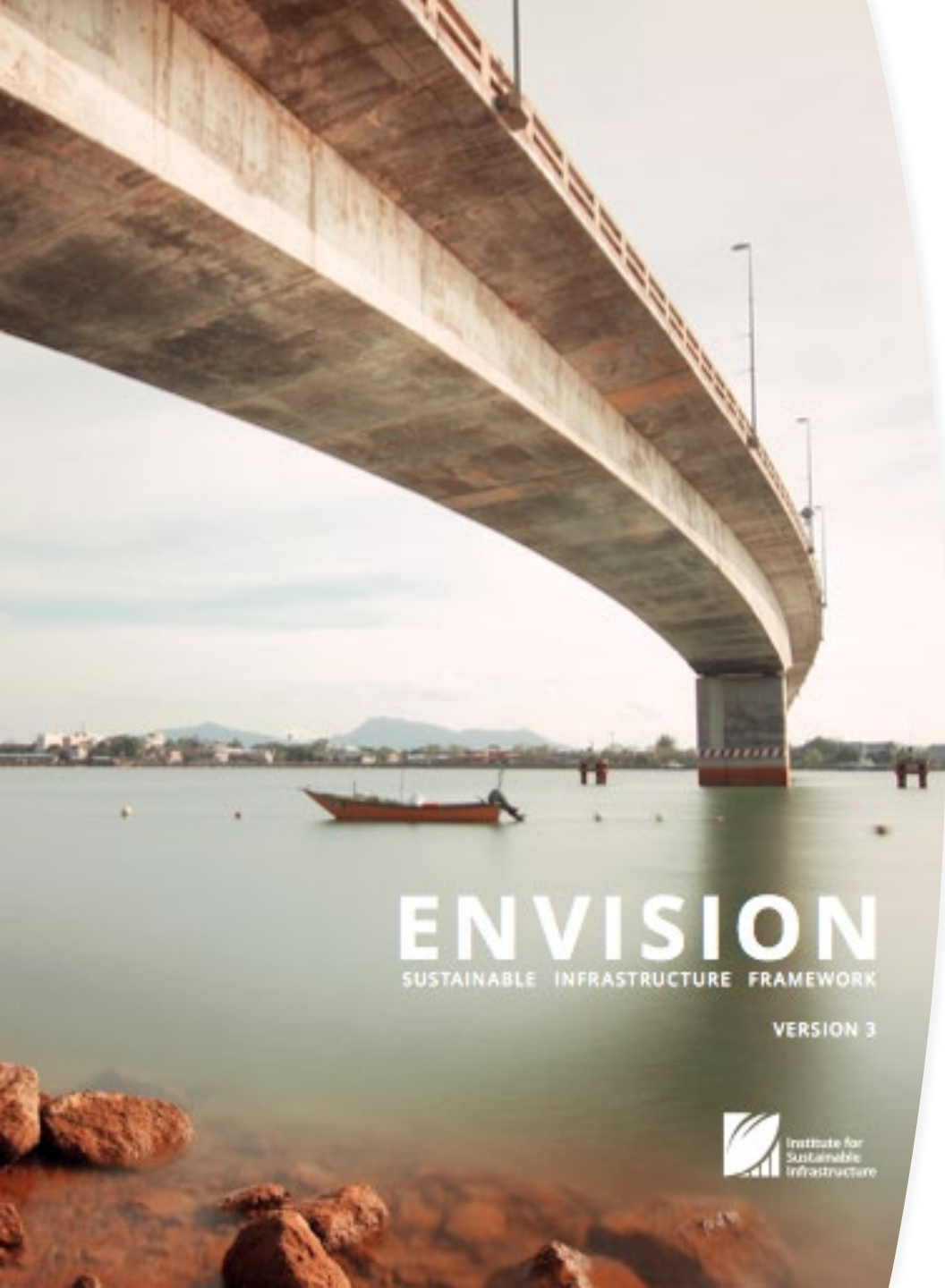
Bridges
30-75 years



Pipelines
50-100 years



Dams
50-100 years



ENVISION™

It's a framework that enables a thorough examination of the sustainability of infrastructure

Provides a common language among stakeholders

Used by governments, public agencies, utilities, planners, designers, engineers, and others

Applicable to all types & sizes of infrastructure



ENERGY

- Geothermal
- Hydroelectric
- Nuclear
- Natural Gas
- Oil/Refinery
- Wind
- Solar
- Biomass



WATER

- Potable water distribution
- Water/wastewater treatment
- Capture/storage
- Stormwater Management
- Flood control



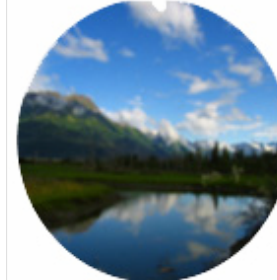
WASTE

- Solid waste
- Recycling
- Hazardous Waste
- Collection & Transfer



TRANSPORT

- Airports
- Roads
- Bridges
- Highways
- Active transportation
- Railways
- Public Transit
- Ports
- Waterways



LANDSCAPE

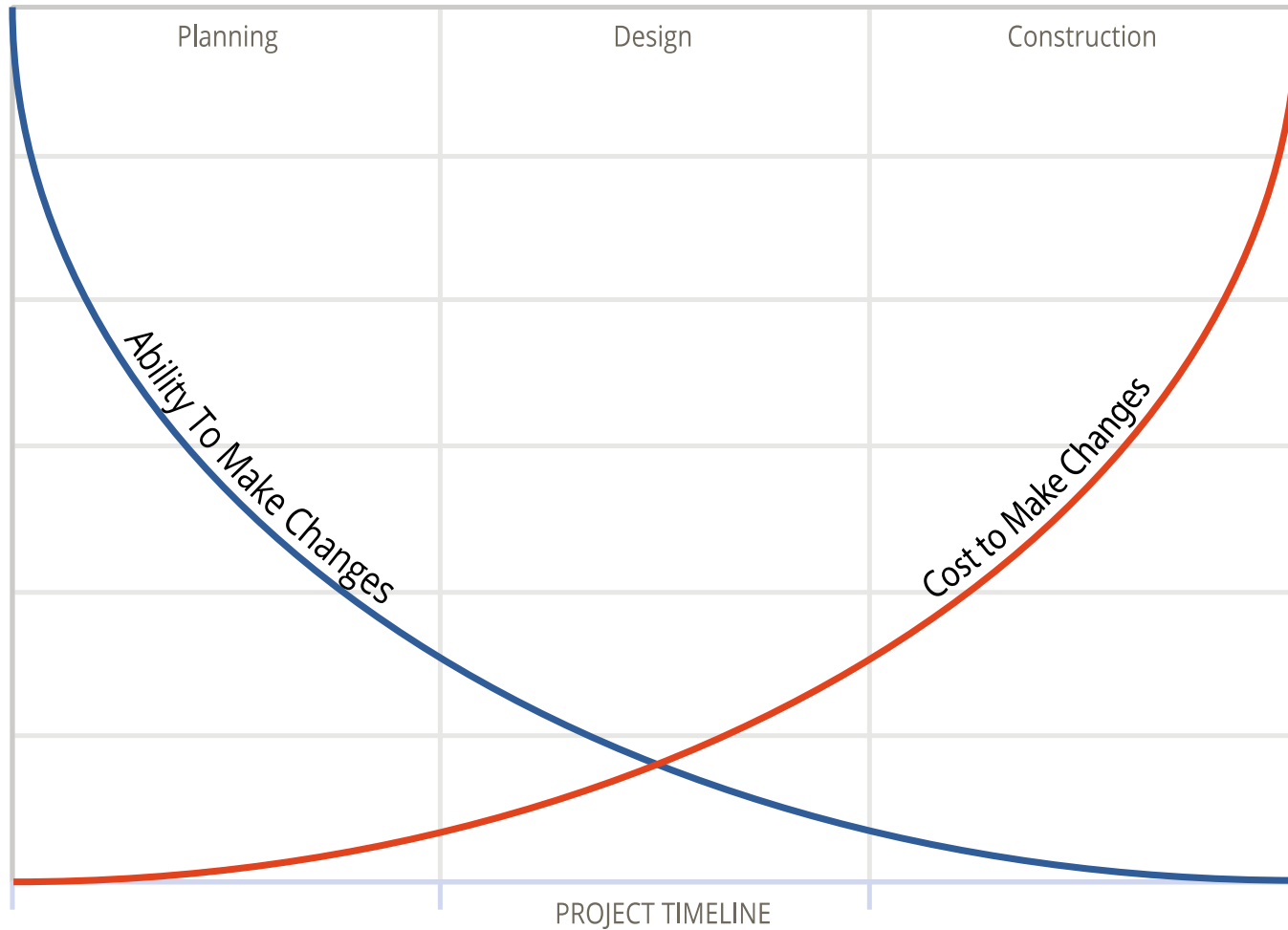
- Public realm
- Parks
- Ecosystem services
- Natural / Green infrastructure



INFORMATION

- Telecomm.
- Internet
- Phones
- Data Centers
- Sensors

Embedding Sustainability from the Start



Components of the Envision framework

- Guidance Manual
- Project self-assessment tool
- Professional training & credentialing
- Project verification and awards/recognition based on % of applicable points achieved
 - Verified (20-29%)
 - Silver (30-39%)
 - Gold (40-49%)
 - Platinum (50% or more)

5 categories of sustainability indicators



Quality of Life

14 Credits

Wellbeing, Mobility, Community



Leadership

12 Credits

Collaboration, Planning, Economy



Resource Allocation

14 Credits

Materials, Energy, Water



Natural World

14 Credits

Siting, Conservation, Ecology



Climate & Resilience

10 Credits

Emissions, Resilience

64 sustainability and resilience indicators (“credits”)



WELLBEING

- QL1.1 Improve Community Quality of Life
- QL1.2 Enhance Public Health & Safety
- QL1.3 Improve Construction Safety
- QL1.4 Minimize Noise & Vibration
- QL1.5 Minimize Light Pollution
- QL1.6 Minimize Construction Impacts

MOBILITY

- QL2.1 Improve Community Mobility & Access
- QL2.2 Encourage Sustainable Transportation
- QL2.3 Improve Access & Wayfinding

COMMUNITY

- QL2.1 Advance Equity & Social Justice
- QL2.2 Preserve Historic & Cultural Resources
- QL2.3 Enhance Views & Local Character
- QL2.4 Enhance Public Space & Amenities
- QL0.0 Innovate or Exceed Credit Requirements



Leadership

12 Credits

COLLABORATION

- LD1.1 Provide Effective Leadership & Commitment
- LD1.2 Foster Collaboration & Teamwork
- LD1.3 Provide for Stakeholder Involvement
- LD1.4 Pursue Byproduct Synergies

PLANNING

- LD2.1 Establish a Sustainability Management Plan
- LD2.2 Plan for Sustainable Communities
- LD2.3 Plan for Long-Term Monitoring & Maintenance
- LD2.4 Plan for End-of-Life

ECONOMY

- LD3.1 Stimulate Economic Prosperity & Development
- LD3.2 Develop Local Skills & Capabilities
- LD3.3 Conduct a Life-Cycle Economic Evaluation
- LD0.0 Innovate or Exceed Credit Requirements



Resource Allocation

14 Credits

MATERIALS

- RA1.1 Support Sustainable Procurement Practices
- RA1.2 Use Recycled Materials
- RA1.3 Reduce Operational Waste
- RA1.4 Reduce Construction Waste
- RA1.5 Balance Earthwork On Site

ENERGY

- RA2.1 Reduce Operational Energy Consumption
- RA2.2 Reduce Construction Energy Consumption
- RA2.3 Use Renewable Energy
- RA2.4 Commission & Monitor Energy Systems

WATER

- RA3.1 Preserve Water Resources
- RA3.2 Reduce Operational Water Consumption
- RA3.3 Reduce Construction Water Consumption
- RA3.4 Monitor Water Systems

RA0.0 Innovate or Exceed Credit Requirements



Natural World

14 Credits

SITING

- NW1.1 Preserve Sites of High Ecological Value
- NW1.2 Provide Wetland & Surface Water Buffers
- NW1.3 Preserve Prime Farmland
- NW1.4 Preserve Undeveloped Land

CONSERVATION

- NW2.1 Reclaim Brownfields
- NW2.2 Manage Stormwater
- NW2.3 Reduce Pesticide & Fertilizer Impacts
- NW2.4 Protect Surface & Groundwater Quality

ECOLOGY

- NW3.1 Enhance Functional Habitats
- NW3.2 Enhance Wetland & Surface Water Functions
- NW3.3 Maintain Floodplain Functions
- NW3.4 Control Invasive Species
- NW3.5 Protect Soil Health

NW0.0 Innovate or Exceed Credit Requirements



Climate and Resilience

10 Credits

EMISSIONS

- CR1.1 Reduce Net Embodied Carbon
- CR1.2 Reduce Greenhouse Gas Emissions
- CR1.3 Reduce Air Pollutant Emissions

RESILIENCE

- CR2.1 Avoid Unsuitable Development
- CR2.2 Assess Climate Change Vulnerability
- CR2.3 Evaluate Risk & Resilience
- CR2.4 Establish Resilience Goals and Strategies
- CR2.5 Maximize Resilience
- CR2.6 Improve Infrastructure Integration

CR0.0 Innovate or Exceed Credit Requirements



QL1.1 Improve Community Quality of Life

26
POINTS

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

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
A + B	A + B + C + D	A + B + C + D + E	A + B + C + D + E + F	A + B + C + D + E + F + G
(2) Community Considerations	(5) Community Linkages	(10) Broad Community Alignment	(20) Holistic Assessment & Collaboration	(26) Protecting The Future
<p>(A) The project team identifies and takes into account community needs, goals, and issues. For example, the project team has located and reviewed the most recent community planning information and assessed relevant community needs, goals, and/or issues.</p> <p>(B) The project meets or supports community needs and/or goals.</p>				
<p>(C) The project assesses the social impacts it will have on the host and affected communities' quality of life.</p> <p>(D) The affected communities are meaningfully engaged in identifying how the project supports community needs and/or goals.</p>				
<p>(E) Based on the social assessment, potential negative impacts on the host or nearby affected communities are mitigated following a hierarchy that prioritizes avoidance, minimization, restoration, and offsetting.</p>				
<p>(F) Community satisfaction is demonstrated by feedback from the stakeholder engagement process verifying actions taken in criteria A, B, C, and D.</p>				
<p>(G) The project proactively addresses trends in changing social, economic, and/or environmental conditions within the community in order to ensure a high quality of life over the long term.</p>				

Common language

- Encourages multidisciplinary teamwork and collaboration
 - Exploration of trade-offs and benefits
 - Finding the “best” pathway to improving project performance
- Common language for collaboration and communication
 - Sustainability planning sessions
 - Design charrettes
 - Public consultations



ISEC Pedestrian Bridge

Boston, MA

Envision Bronze



Historic Fourth Ward Park

Atlanta, GA

Envision Gold



Registered



Verified

A map of the United States with numerous blue location pins scattered across various states, indicating the use of Envision. A legend at the top center shows a black pin for 'Registered' and a blue pin for 'Verified'. The text 'United States' is centered on the map.

Envision use

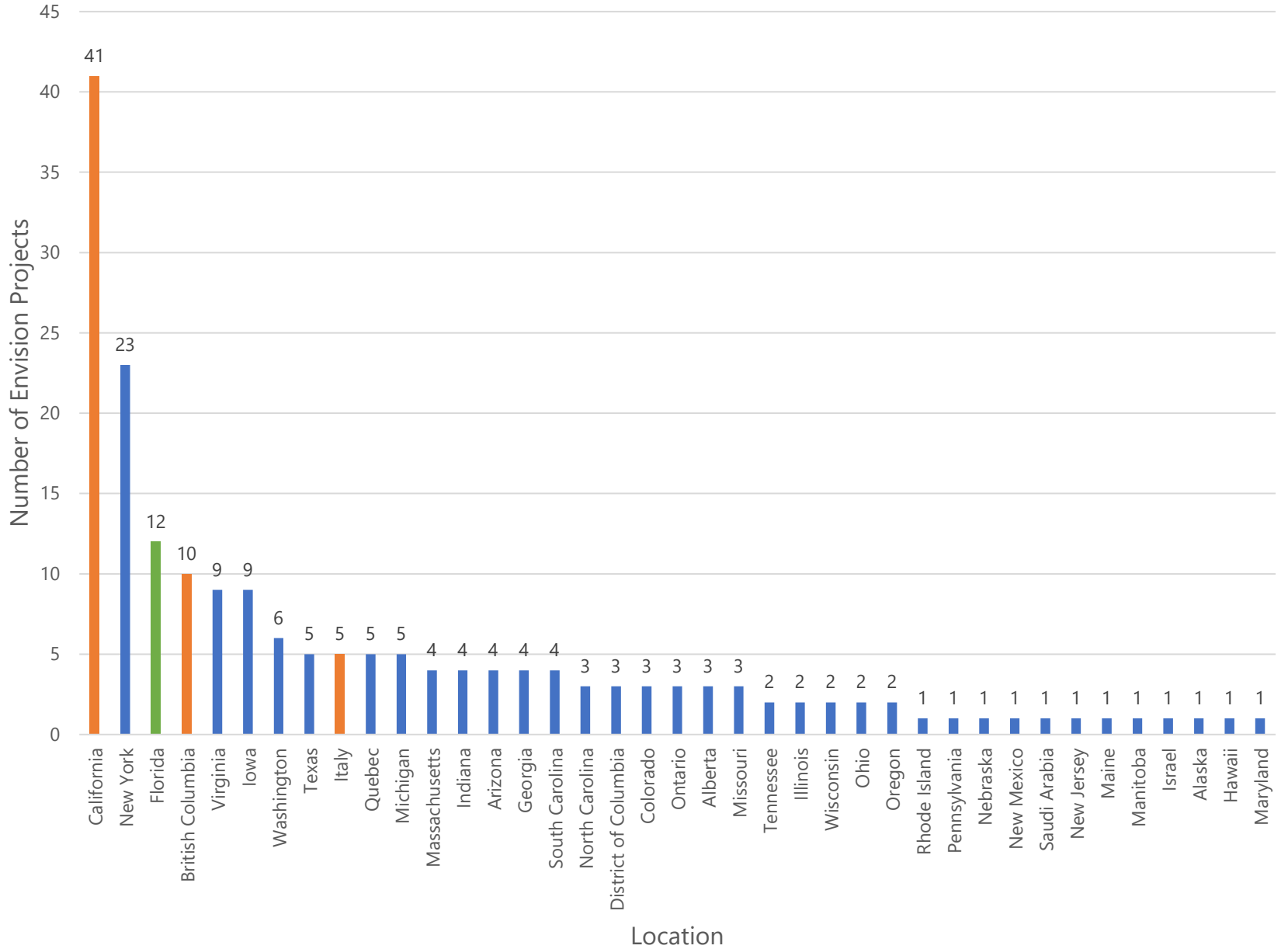
\$106 billion in infrastructure development

100+ rated projects since 2013

~6,000 active credentialed professionals

More than 120 public agencies using Envision

Projects in Verification Program by Location



Large Envision Supported Agencies

- Los Angeles County Public Works (231 ENV SPs)
- City of Los Angeles Bureau of Engineering (83 ENV SPs)
- NYC Department of Design and Construction (70 ENV SPs)
- Harris County Engineering Department (59 ENV SPs)
- Port Authority of New York & New Jersey (57 ENV SPs)
- City of Kansas City, MO (46 ENV SPs)
- Sound Transit (Seattle) (38 ENV SPs)

How Envision is Being Applied

- State Legislation
- City and County Resolutions
- Funding
- RFP Requirements
- Portfolio Assessments
- Design Guidelines

State Legislation

- **Proposed California Bill SB-44 (2021)**

- *Streamlined judicial review for environmental transit projects that meet sustainability goals.*
- *“(F) The public agency demonstrates how it has incorporated sustainable infrastructure practices to achieve sustainability, resiliency, and climate change mitigation and adaptation goals in the project, including principles, frameworks, or guidelines as recommended by one or more of the following:*
 - (i) The sustainability, resiliency, and climate change policies and **standards of the American Society of Civil Engineers.***
 - (ii) The **Envision Rating System of the Institute for Sustainable Infrastructure.**”*

Resolutions

- **Miami-Dade Board of County Commissioners (2017)**

- *“Resolution adopting the Institute for Sustainable Infrastructure “Envision” sustainable infrastructure rating system for Miami-Dade County infrastructure projects; directing the County Mayor to incorporate Envision into the planning, design, construction, and operation of county-funded infrastructure projects where practicable and feasible.”*

- **St. Petersburg Code of Ordinances**

- *“It is the objective of the City that any new qualified City infrastructure project shall be designed and constructed to achieve the current Envision gold standard.”*

Funding

- **Grant Funding or Cost-Share with State Agencies**

- (California Department of Water Resources Division of Flood Management)**

- *“Contribution to the State Sustainability Objective... The applicant should provide evidence that their project has been rated at the Gold or Platinum Award recognition level by the Institute for Sustainable Infrastructure (ISI). The applicants will be entitled to a 5% increase in the State cost share of the Total Project Cost if their project has received a Gold Award from ISI, and a 10% increase in the State cost share of the Total Project Cost if their project has received a Platinum Award from ISI.”*

RFPs

- **Requiring an ENV SP**

- *"As part of the County's goal to incorporate environmentally sustainable design in infrastructure improvements, the Consultant is required to identify and provide a certified Envision Sustainable Professional (ENV-SP) on its staff to assist with design."*

- **Requiring an Envision self-assessment**

- *"For a project which requires Envision the Consultant will be responsible for completing an Envision rating assessment using ISI's online rating tool and following the Envision guidance manual, a copy of which is available..."*

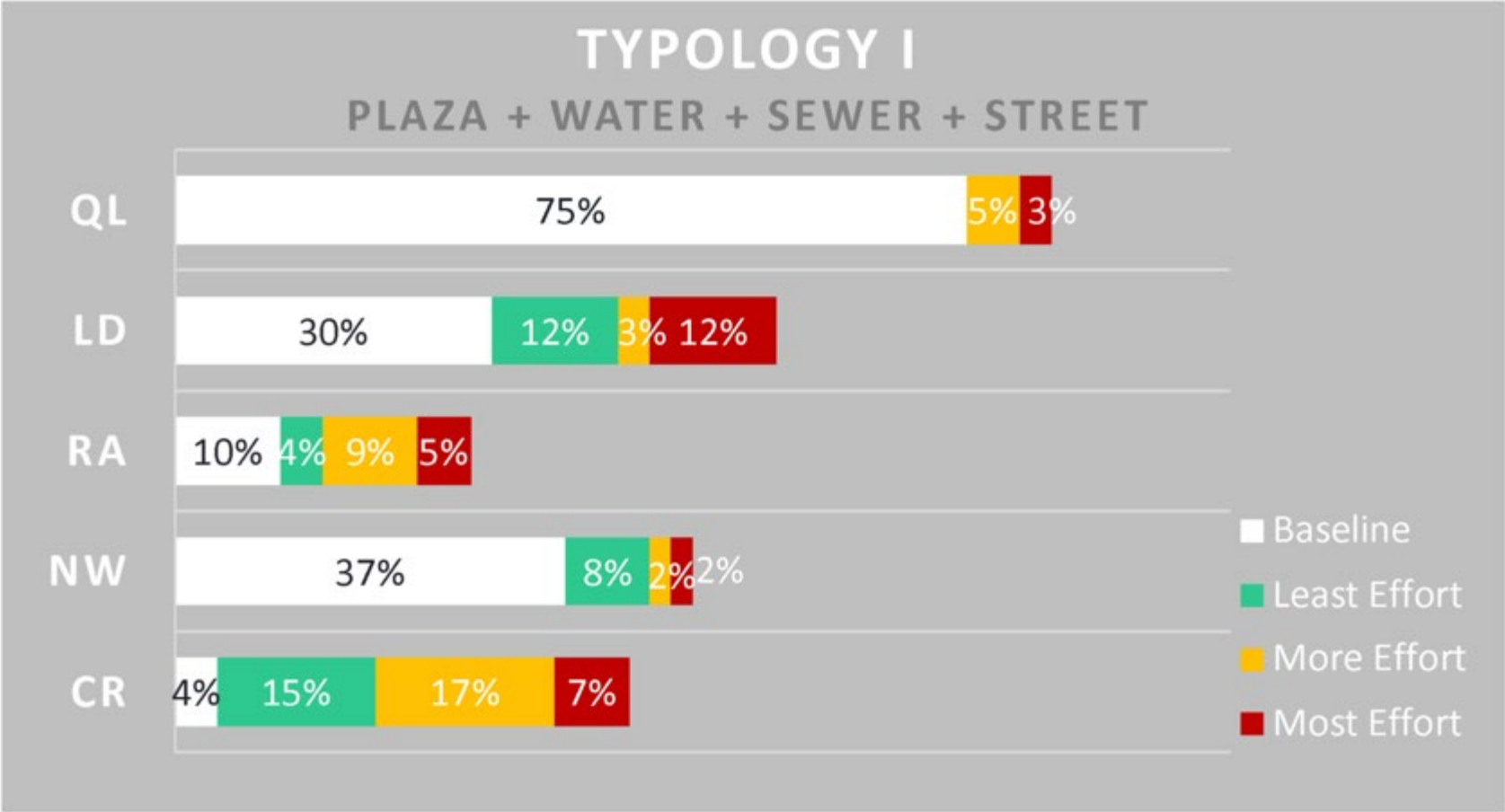
- **Requiring ISI third-party verification**

- *"If third party verification is required the Consultant shall be responsible for registering the project with ISI; gathering, preparing, and submitting all documentation to ISI that is required to complete the verification process; and paying all verification fees."*

EXAMPLE

NYC DDC PORTFOLIO APPROACH

Results



Zofnass Program for Sustainable Infrastructure, Business Case for Sustainable Infrastructure, NYC DDC
 Project & Portfolio Management: an Envision-based Approach

Design Guidelines

- **LA DPW Sustainable Infrastructure Guidelines**

- *“As the application of Envision continues to be expanded within the department, the SIG have been developed to complement Envision. Although all SIG strategies are specific to LA County, they address every Envision credit... An analysis was completed to determine that achievement of all required SIG credits equates to an approximate Envision rating equivalency of Bronze. It is intended that project teams pursue additional strategies, based on specific scope, to reach an Envision equivalency of Silver.”*

- [Port Authority of New York and New Jersey Sustainable Infrastructure Guidelines](#)

- *“With this update, the Port Authority Sustainable Infrastructure Guidelines Version 2.0 now leverages the Envision system, bringing PANYNJ into alignment with industry best practices while maintaining custom application criteria relevant to the Authority’s unique assets and operations.”*

Envision at the Federal Level

- A training and education resource
- A reporting and third-party accountability tool
- A prioritization and funding mechanism
- A nationalized approach to sustainable infrastructure



John Smith

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ENV SP STATUS

NON-ENV SP

Complete the Envision Training course to earn your credential

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MEMBERSHIP

NON-MEMBER

You are not connected to an organization.

[Terms and Conditions](#)

Available Credits

ENV SP TRAINING CREDIT



0

Expand your Account

Select an option below to either connect to an existing member organization or to become a new member organization. To learn more about what type of membership your organization qualifies for, review our [membership page](#).

[Connect Organization](#)

[Become a member](#)

Become an ENV SP

Take the Envision Sustainability Professional (ENV SP) training course and earn your ENV SP credential.

[Become an ENV SP](#)

Resources

> ENVISION

- [Envision Guidance Manual \(v2\)](#) 17.67 MB
- [Envision Guidance Manual \(v3\)](#) 24.54 MB
- [Manuel de référence Envision v3](#) 11.66 MB
- [Envision Checklist \(v2\)](#) 0.66 MB
- [Envision Checklist \(v3\)](#) 3.14 MB

> VERIFICATION RESOURCES

> PRESENTATIONS AND BROCHURES



Thank you!

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