

# Sustainable Infrastructure and Envision

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*Hydrogen and Fuel Cell Seminar*

*Long Beach California*

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*Institute for Sustainable Infrastructure*

# Institute for Sustainable Infrastructure (ISI)

**Non-profit education and research organization that developed and managed Envision**

**Founded in 2010 by:**

- American Public Works Association (APWA)
- American Council of Engineering Companies (ACEC)
- American Society of Civil Engineers (ASCE)

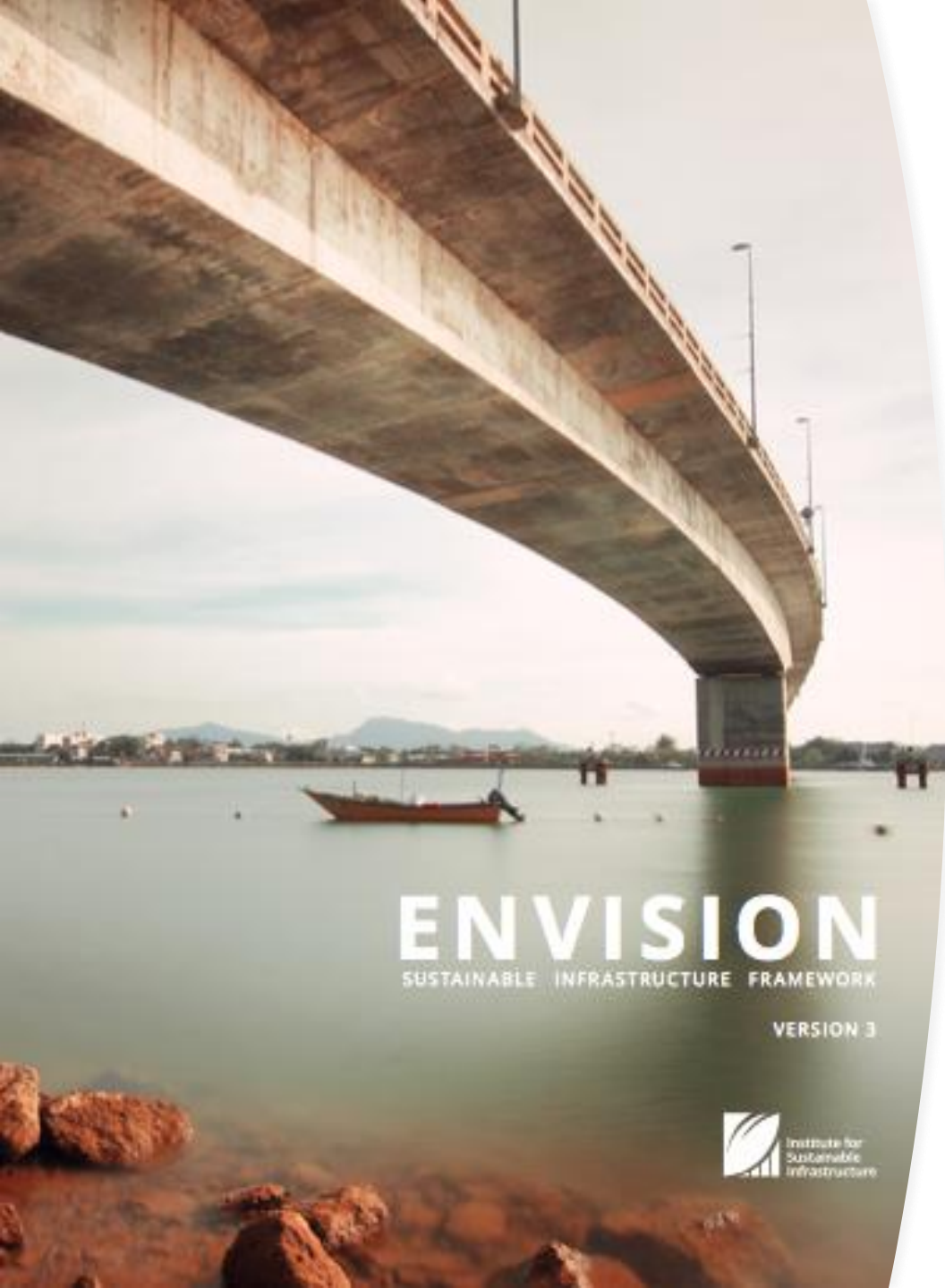
**Hub of a unique community:**

- 300 A/E/C Companies
- 200+ Government departments, agencies, towns, cities
- 85 Academic institutions, associations



# Global Challenges

- Climate change
  - Resilience
  - Equity and social justice
  - Environmental protection and biodiversity
  - Public health
  - Economic recovery
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- Infrastructure plays a critical role in addressing all of these challenges



ENVISION™

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- A blueprint for better infrastructure
- Enables a thorough examination of the sustainability and resiliency of infrastructure projects
- Provides practical guidance on how to improve performance
- Drives better project management

# 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

# 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

# Envision 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



## 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



## 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



## 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



## 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



# Common language

- Encourages multidisciplinary teamwork and collaboration
- Promotes meaningful stakeholder engagement
- Common understanding of sustainability indicators and performance

## ISEC Pedestrian Bridge

Boston, MA

Envision Bronze



## Historic Fourth Ward Park

Atlanta, GA

Envision Gold

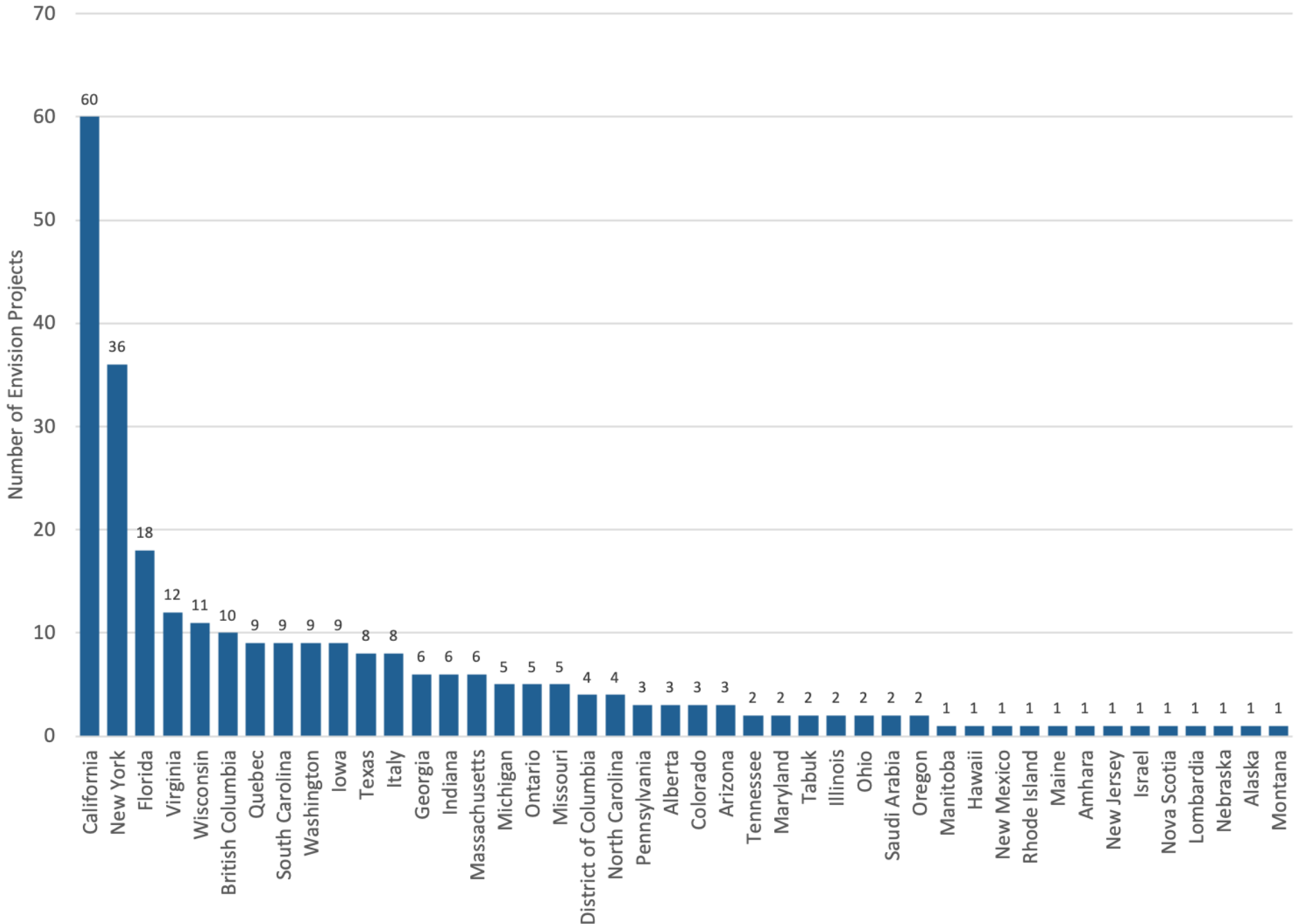


# Envision Use



- 140 verified projects
- \$135 billion in infrastructure development
- 6,500 active credentialed professionals
- 200+ public agencies

# Projects in Verification by Location



# How Envision is Being Applied

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

# Infrastructure Canada Climate Lens

- **All federally funded infrastructure must conduct a climate change resilience assessment.**
- Approved methodologies to assess climate change risk and resilience consistent with ISO 31000 include Envision.

# 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.”*

# Design Guidelines

- 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.”*

# Thank you!

ISI: [www.sustainableinfrastructure.org](http://www.sustainableinfrastructure.org)

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