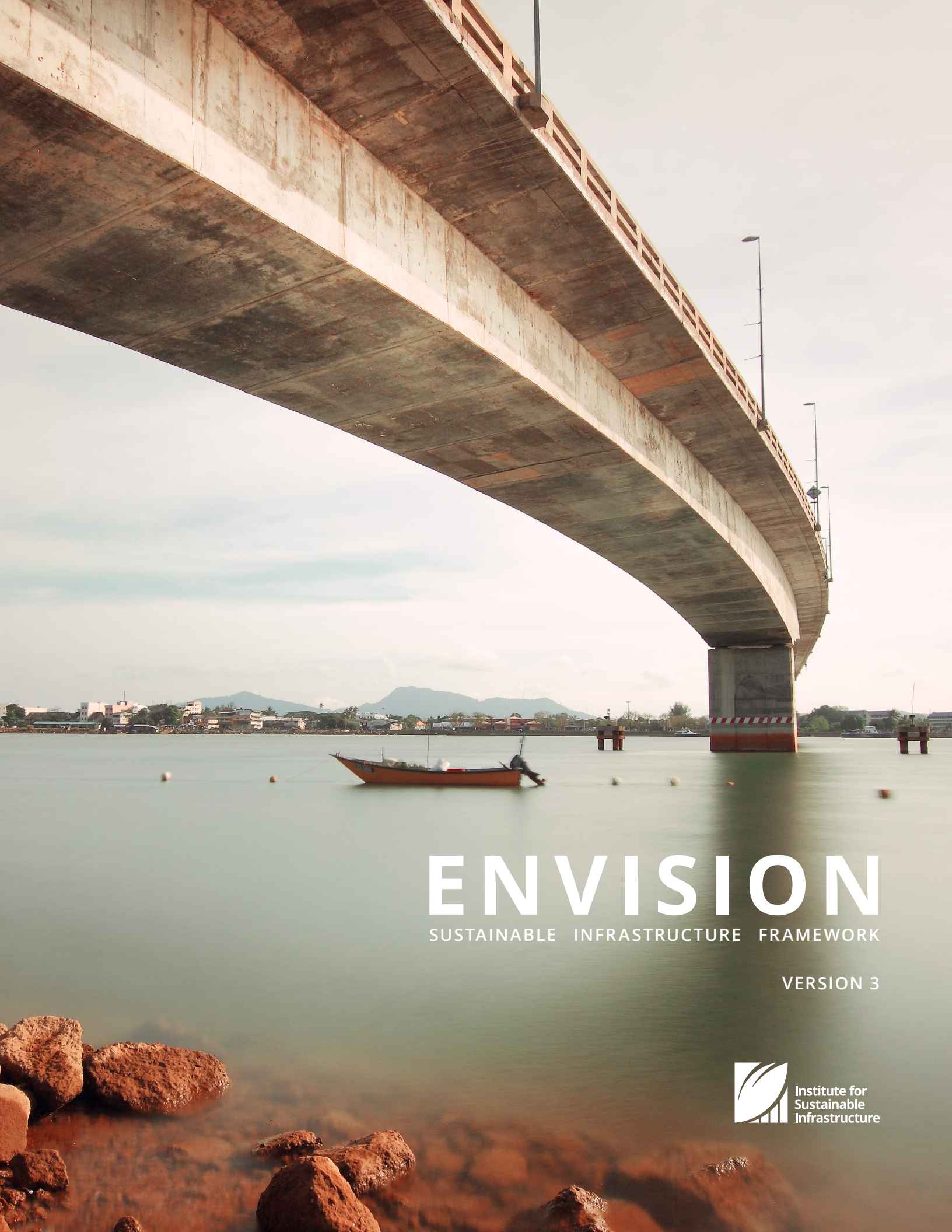

# ENVISION

## SUSTAINABLE INFRASTRUCTURE FRAMEWORK

VERSION 3

Institute for Sustainable Infrastructure






Envision: Sustainable Infrastructure Framework Guidance Manual



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ENVISION

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# Introduction

## PURPOSE OF ENVISION®

The purpose of Envision is to foster the dramatic and necessary improvement in the sustainable performance and resiliency of physical infrastructure by helping owners, planners, engineers, communities, contractors, and other infrastructure stakeholders to implement more cost-effective, resource-efficient and adaptable long-term infrastructure investments.

Envision is a framework that provides the guidance needed to initiate this systemic change in the planning, design and delivery of sustainable and resilient infrastructure. Envision is a decision-making guide, not a set of prescriptive measures. Envision provides industry-wide sustainability metrics for all types and sizes of infrastructure to help users assess and measure the extent to which their project contributes to conditions of sustainability across the full range of social, economic, and environmental indicators. Furthermore, the Envision framework recognizes that these sustainability factors are variable across a project's life cycle. As such, Envision helps users optimize project resilience for both short-term and long-term impacts.

Fundamentally, Envision is about supporting higher performance through more sustainable choices in infrastructure development. The framework provides a flexible system of criteria and performance objectives to aid decision makers and help project teams identify sustainable approaches during planning, design, and construction that will carry forward throughout the project's operations and maintenance and end-of-life phases. Using Envision as a guidance tool, owners, communities, designers, contractors, and other stakeholders are able to collaborate to make more informed decisions about the sustainability of infrastructure.

Community infrastructure development is subject to the resource constraints of multiple departments and agencies, each with different schedules, agendas, mandates, budget cycles, and funding sources. Ratings systems and tools intended for buildings are not designed for this context and cannot adequately assess the extensive external benefits and impacts infrastructure has on a community. Envision assesses not only individual project performance, but how well the infrastructure project contributes to the efficiency and long-term sustainability of the communities it serves. In this way, Envision not only asks, "Are we doing the project right?" but also, "Are we doing the right project?"

## BACKGROUND

Envision was developed in joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure (ISI). ISI is a not-for-profit education and research organization founded by the American Public Works Association, the American Council of Engineering Companies, and the American Society of Civil Engineers.

ISI is the hub of a unique community of organizations and individuals involved in the planning, design, construction, and maintenance of infrastructure. Since the launch of the first version of Envision in 2012, this unique community has continued to push significant progress in the infrastructure industry by applying Envision on billions of dollars' worth of infrastructure projects. ISI has captured lessons learned through the use of Envision and incorporated these key lessons into this third version.

## THE NEED FOR ENVISION

Consider the importance of infrastructure in our daily lives. Infrastructure provides the basis for personal security and public health, impacts the economic viability and competitiveness of our communities, moves people and goods, provides us with drinking water and handles our waste, creates spaces for us to enjoy, and allows us to effectively communicate with one another. However, despite the obvious need for infrastructure and the many benefits it provides, historically it is overlooked and underfunded until it breaks down or service is disrupted.

Decades of neglect mean that massive investments in infrastructure are now needed around the world. In North America and Europe aging and outdated infrastructure needs to be replaced and modernized, while in other regions entirely new infrastructure systems are being developed. At the same time, population growth and climate change are stressing financial, material, and technological resources and underscoring the need to adapt to a more sustainable and resilient society. Infrastructure is at the heart of addressing this key challenge of the 21st century, and the standards and methods of the past will not be adequate to meet the needs of the future. A new paradigm is required. In 2017 United Nations Secretary General Antonio Gutteres stated,

> *"Infrastructure investment will be crucial. The world should adopt a simple rule: if big infrastructure projects are not green [sustainable], they should not be given the green light. Otherwise, we will be locked into bad choices for decades to come."*

But how do infrastructure developers know whether their decisions are contributing to sustainability or not? How do they bring attention to the need for more sustainable infrastructure? How do they communicate around a shared understanding of what sustainability means? Envision provides a consistent, consensus-based framework for assessing sustainability and resilience in infrastructure. Envision:

- Sets the standard for what constitutes sustainable infrastructure;
- Incentivizes higher performance goals beyond minimum requirements;
- Gives recognition to projects that make significant contributions to sustainability; and
- Provides a common language for collaboration and clear communication both internally and externally.

# The Envision Framework

1. **Envision Guidance Manual**
   The written framework.
2. **Envision Pre-Assessment Checklist**
   An early-phase high-level pre-assessment.
3. **Envision Online Scoresheet**
   The detailed online assessment tool and calculator.
4. **Envision Sustainability Professional Credential**
   Professional training in Envision use.
5. **Envision Verification**
   Independent third-party project review process.
6. **Envision Awards**
   Recognition for qualifying verified projects.

## WHAT IS ENVISION?

Envision is a framework that includes 64 sustainability and resilience indicators, called 'credits', organized around five categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Resilience. These collectively address areas of human wellbeing, mobility, community development, collaboration, planning, economy, materials, energy, water, siting, conservation, ecology, emissions, and resilience. These indicators collectively become the foundation of what constitutes sustainability in infrastructure.

Each of the 64 credits has multiple levels of achievement representing the spectrum of possible performance goals from slightly improving beyond conventional practice, to conserving and restoring communities and environments. By assessing achievement in each of the 64 credits, project teams establish how well the project addresses the full range of sustainability indicators, and are challenged to pursue higher performance.

Through its Envision Sustainability Professional (ENV SP) credential, Envision recognizes and brings attention to individuals trained and dedicated to developing more sustainable infrastructure. When used as a self-assessment tool Envision helps practitioners better understand and recognize their project's contribution to sustainability. Through an optional process offered by ISI, Envision can also be used to receive third-party verification of a project assessment which gives public recognition to infrastructure projects that make exemplary progress toward sustainability. Collectively the commitments of public agencies, companies, and universities to use Envision draws needed attention to the value and importance of developing infrastructure more sustainably.

Perhaps most importantly, Envision is a shared platform for effectively collaborating and communicating around the complex concepts and challenges of sustainability. Successful use of the framework in either self-assessments or third-party verifications necessitates collaboration, teamwork, and learning. The ENV SP credential is a tool for training these multi-disciplinary teams to use Envision collaboratively. Envision's easy-to-understand approach to sustainable infrastructure becomes a tool for facilitating project team collaboration, inter-organizational cooperation, and public engagement and communication.

**Energy**

Distribution
Hydroelectric
Coal
Natural Gas
Wind
Solar
Biomass

**Water**

Treatment
Distribution
Capture / Storage
Stormwater
Flood Control
Nutrient Management

**Waste**

Solid waste
Recycling
Hazardous
Waste
Collection & Transfer

**Transportation**

Airports
Roads / Highways
Bikes / Pedestrians
Railways
Transit
Ports
Waterways

**Landscape**

Public Realm
Parks
Ecosystem Services
Natural Infrastructure
Environmental Remediation

**Information**

Telecom
Cables
Internet
Phones
Data Centers
Sensors

## HOW DOES ENVISION WORK?

When addressing sustainability and resiliency in the face of changing variables, it is difficult to assess the full range of benefits and impacts across the broad scope of social, environmental, and economic factors. Envision's framework provides a structure in which users can more easily measure progress and identify potential trade-offs amid this complex mix of objective, subjective, quantifiable, and qualitative criteria. The rating scale presented for each sustainability indicator helps users identify and align priorities against a common scale.

What constitutes the most sustainable solution is often project and context specific and difficult, if not impossible, to prescribe in advance. For each sustainability indicator in the framework Envision provides users with questions to guide decisions and discussions at the project and system-wide levels in order to arrive at the best choice.

Whether using the Envision checklist, online scoresheet, self-assessment, or third-party verification Envision users find it works for them in numerous ways:

- Calibrating internal accountability and assessment against a common set of sustainability criteria;
- Incentivizing higher achievement in project sustainability;
- Identifying and recognizing organizations committed to sustainability through the procurement process;
- Drawing public attention to positive infrastructure projects and sustainable outcomes;
- Strengthening inter-agency and project team collaboration; and
- Demonstrating good governance to voters, taxpayers, or ratepayers.

## WHERE DOES ENVISION APPLY?

Envision is designed as a holistic sustainability rating system for all types and sizes of both public and private infrastructure. A key value of Envision is its universal applicability to all infrastructure. Envision application has ranged across all infrastructure sectors from one million to multi-billion dollar projects.

Envision is not intended to evaluate interior, conditioned, buildings with the primary purpose of human occupation, such as offices, schools, single family homes, or multi-unit residential buildings, but can be used in conjunction with rating systems

*"The purpose of Envision is to foster the dramatic and necessary improvement in the sustainable performance and resiliency of physical infrastructure..."*

that address these types of spaces. For example, Envision is often applied to airports that contain both infrastructure and human-occupied spaces.

Envision has been applied extensively throughout the US and Canada but is applicable, and has been used, all over the world.

## WHO USES ENVISION AND WHY?

Envision was designed to help infrastructure stakeholders implement more sustainable projects. It offers benefits for each category of stakeholder: from owners and design teams, to community and environmental groups, to constructors, regulators, and policymakers.

- Owners, regulators, and policy makers use Envision to set standards for sustainable infrastructure and guide procurement. Envision references appear in RFPs, RFQs, grants, and cost-share programs.
- Engineers, architects, landscape architects, planners, operators, and constructors use Envision to set higher performance goals for projects and to collaborate and communicate on achieving those goals.
- All infrastructure stakeholders use Envision to recognize both trained individuals through the ENV SP credential and high performing projects through the third-party verified awards.
- Community groups, environmental organizations, and the general public use Envision to understand and learn about sustainable infrastructure and to more actively engage in its development.

Anyone can use Envision. Those interested in expert training can become ENV SPs through ISI's online course and exam. These professionals are qualified to lead teams in project assessments or submit for third-party verification.

As of this publication, Envision has been used on hundreds of projects and tens of billions of dollars in infrastructure projects have pursued third-party verification throughout the US, Canada, and internationally. Thousands of individuals have received the Envision Sustainability Professional credential including in every US state, Canadian province, and over 40 countries. Envision is supported and applied by hundreds of companies, and dozens of public agencies, and universities.

## WHEN TO USE ENVISION?

Envision can and should be used throughout the entire life cycle of a project. However, the earlier Envision is applied the greater the value it can deliver. Sustainability begins with the earliest stages of planning and carries through to the end of a project's useful life, but as the project timeline advances the ability to make effective changes decreases while the cost of making changes increases. The false perception that sustainability is more expensive than conventional practice is often a result of adding sustainability 'features' at the end of a conventional process. On the contrary, projects that incorporate sustainable principles of efficiency, resourcefulness, and multi-benefit use from the earliest planning stages often find significant cost savings—even initial capital cost savings—over conventional projects.

**Planning**: In the planning phase of the project, Envision can be used to assess community values, engage stakeholders, and build consensus around the best project solution. It guides decisions when defining a project scope, prioritizing a list of projects, and comparing project alternatives.

# Envision Leaders

*Both the City of Los Angeles City Council and the Los Angeles County Board of Supervisors have passed resolutions adopting the use of Envision.*

*According to City of Los Angeles City Engineer Gary Lee Moore, "The Bureau of Engineering is proud to be an early adopter of Envision, which provides our engineers and architects with nationally recognized standards that work well within our city's vast and varied landscape. Envision is key to advancing our ability to deliver sustainable infrastructure, open space and architecture projects as we work toward our goal of transforming Los Angeles into the world's most livable city."*

*In 2017 the Miami-Dade Board of County Commissioners passed a resolution adopting Envision and, "directing the County Mayor to incorporate Envision into the planning, design, construction, and operation of County-funded Infrastructure Projects... [and] to develop a plan to train the County staff who are responsible for civil infrastructure projects in becoming Envision Sustainability Professional (ENV SP) credentialed."*

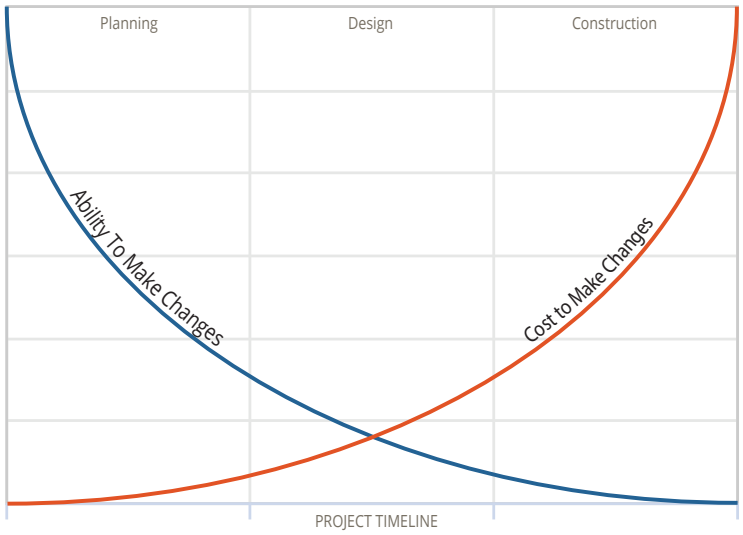
*The resolution was inspired by the pioneering work of the Miami-Dade Department of Water and Sewer.*

*"Envision not only asks, 'Are we doing the project right?' but also, 'Are we doing the right project?'"*

**Design**: In the design phase of a project, Envision guides a thorough evaluation of the design and aids identification of additional improvements toward more sustainable development. The credit levels of achievement benchmark the relative impact and encourage expanding the project goals toward higher levels of sustainability. Integrating the Envision rating system assessment into the design process allows for sustainable-minded decision making throughout the project.

**Construction**: The construction phase of a project allows for creativity and innovation in how the design is achieved. Envision can be used to guide decisions in this phase for continuity between the sustainable intent in design and actual project delivery. During this phase, sustainable achievement is measured and documented. The impact of the credits on the construction process and costs can also be measured.

**Operations and Maintenance**: During operations and maintenance, it is important to measure sustainable performance. The Envision framework provides key sustainable performance indicators that can be monitored over the project life. In this way, Envision supports evaluation of sustainable impacts across project life-cycles.




**Communication and Education**: The Envision framework provides an organized system for educating stakeholders and garnering support. The transparent nature of the system demonstrates the relationship to the triple bottom line. Advertising sustainable project achievements and awards is further supported by this transparency.

**Building Future Sustainability**: The recommendations for sustainable development in the Envision framework are used to shape local design standards, construction codes, and development strategies. Adopting some or all of these best practices recommendations promotes the development of durable, high performance infrastructure for decades to come.

## BENEFITS OF USING ENVISION

The use of Envision can benefit projects in numerous ways including:

- Long-term viability through increased resiliency and preparedness;
- Lower costs through management and stakeholder collaboration;
- Reduced negative impacts on the community and the environment;
- Potential to save owners money over time through efficiency;
- Credibility of a third-party rating system; and
- Increased public confidence and involvement in decision making.

# Envision Design

The development of Envision is first based on identifying and understanding what sustainability and sustainable development are, and their key challenges. This is underscored by a recognition that the social, environmental, and economic systems within which sustainable development must occur are constantly changing due to factors like population growth, climate change, and resource constraints. Therefore, increased resilience and adaptability must be added as a fourth pillar of sustainability. Next, it is critical to recognize the specific role and contribution of infrastructure in becoming a sustainable society and a sustainable world. Achieving a sustainable society will require contributions from every industry but infrastructure must first provide the foundation.

How can infrastructure achieve this goal? Through the systematic prioritization of sustainable choices, challenging conventional practice with higher performance goals, fostering innovation, and investing in education and knowledge sharing to advance the industry and build public awareness. These are the strategies and principles embedded within the Envision framework and applied to the full spectrum of sustainability indicators: social wellbeing, environmental stewardship, economic stability, and resilience.

## WHAT IS SUSTAINABILITY AND SUSTAINABLE DEVELOPMENT?

The traditional definition of sustainable development is taken from the 1987 UN World Commission on Environment and Development report, also known as the Brundtland Commission Report, "development that meets the needs of the present without compromising the ability of future generations to meet their own needs". This raises the critical point that our current quality of life cannot be bought at the expense of future generations. Sustainability is not only about preserving and protecting the environment, but also about preserving the ability of society to sustain itself. These two goals are inextricably linked.

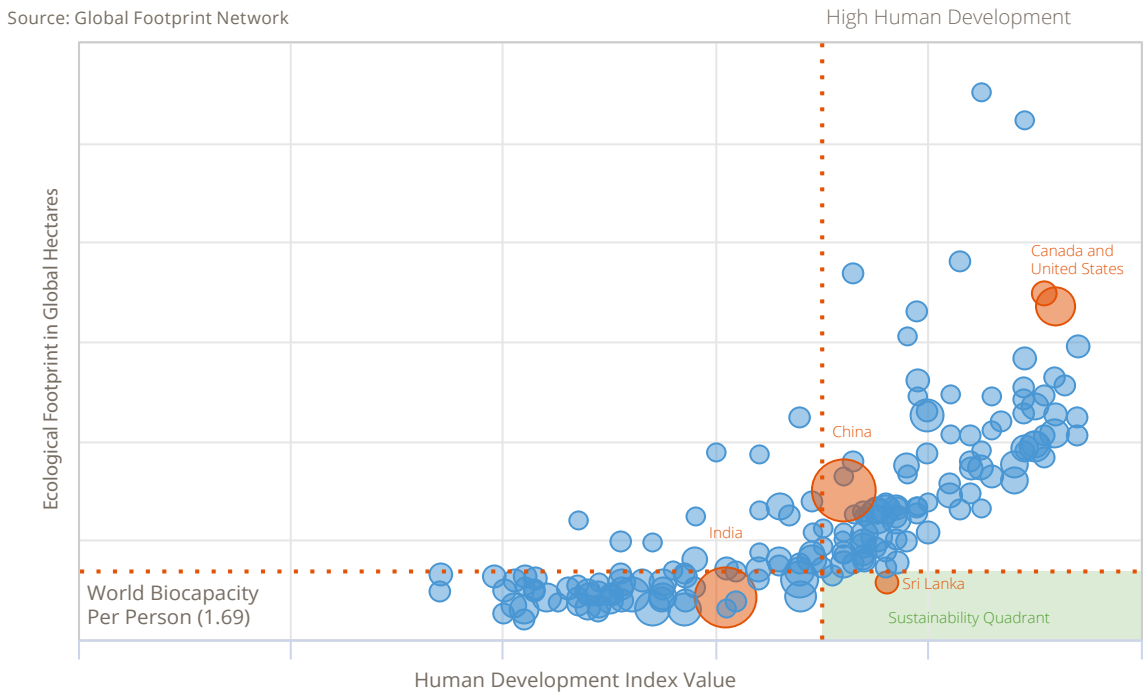
***"Development that meets the needs of the present without compromising the ability of future generations to meet their own needs."***

## WHAT IS INFRASTRUCTURE'S ROLE?

Efficient infrastructure is an essential component for a prosperous and growing economy. Effective transportation systems bring goods to market, workers to jobs, children to schools, and families to stores and recreation areas in a safe and timely manner. Dependable water and wastewater systems bring fresh water to industry, agriculture, and people. Reliable electricity supplies allow businesses and factories to work unimpeded and bring a high level of convenience and productivity to home life across the nation. Extensive telecommunication networks connect people and businesses across the globe and enable the fast flow of information essential to commerce.

Infrastructure should deliver the required services at affordable costs while conserving natural resources and energy. Moreover, these services must be continually maintained and improved in order to remain competitive in the global marketplace. Today, however, the design, construction and operation of our infrastructure systems have a substantial negative impact on our natural resources and ecological systems. If allowed to continue, this overuse of natural resources will have devastating consequences.

## Country Human Development Index and Ecological Footprint




## WHAT ARE THE CHALLENGES?

Most developed countries enjoy a high quality of life but do so by consuming materials and natural resources at a rate our planet cannot support. This undermines the ability of future generations to sustain that quality of life. Furthermore, developing countries are rightfully seeking to improve their own quality of life. In following the model set by developed countries, they are consuming resources necessary to do so.

The human development index is a rough measure of quality of life developed by the United Nations. As inputs, it factors life expectancy, education, and gross domestic product. The problems faced by the U.S., Canada, and other nations in preserving natural resources and ecological systems while maintaining or improving their quality of life is depicted in the graph. Here, the ecological footprint of each country is plotted as a function of their human development index. The area of the circle represents population size. Conditions of sustainability are seen as the area bounded horizontally by the world average available biocapacity and vertically by the threshold of high human development.

The challenge faced by developed countries worldwide is how to reduce our net environmental footprint without sacrificing our quality of life. Making a meaningful shift toward the sustainability quadrant is not a small challenge. Taken to its logical conclusion, reaching the sustainable quadrant involves a complete overhaul of our infrastructure, replacing old components with those that are more effective and efficient. Progress will be made incrementally by project owners, designers, and contractors delivering infrastructure projects that make significant improvements in performance across multiple dimensions of sustainability. These projects must also integrate well with the infrastructure in the community, both existing and planned. Lastly, the designers must take into account changes in the environment in which the delivered works must operate.

### *Changing Operating Environments*

For engineers and designers, the primary consequence of working in a non-sustainable operating environment is that many, if not most, of the normal project design assumptions and variables could change significantly over the design life of the project. Assumptions about expected operating

conditions will change, requiring determinations of new averages, variances and possible extremes. New variables and new relationships among existing variables will appear and need to be taken into account. Resource demands will drive up the cost and scarcity of important materials and fuels. Extreme weather events and atypical weather patterns may change the operating environment.

In addition to the physical structure, the project may need to incorporate "soft" engineering solutions, such as new forms of monitoring and data collection, contingency plans, public education and training. Deteriorating infrastructure paired with a growing population yet struggling economy present serious challenges to conventional thinking. The rating system recognizes these changes and incorporates a number of process-based objectives to ensure that these matters are considered by the project team.

## WHAT STRATEGIES DISTINGUISH ENVISION'S APPROACH?

### *Mitigation Hierarchy*

In taking practical steps toward sustainability, it can be difficult to discern how to prioritize options or even take the first step. Many sustainability best practices have roots in a mitigation hierarchy. For example, the "3 Rs" of material use include: Reduce, Reuse, Recycle; and these practices are prioritized in this specific order to optimize how materials are used. Expanding this example to a more general hierarchy becomes:

- ***Avoidance***: Measures taken to avoid creating impacts from the outset
- ***Minimization***: Measures taken to reduce the duration, intensity or extent of impacts that cannot be avoided
- ***Abatement***: Measures taken to rehabilitate degraded ecosystems
- ***Offsetting***: Measures taken to compensate for any residual adverse impacts

The Envision framework applies this hierarchy across a range of topics. For example, when considering social impacts of a project it is just as important to first avoid adverse impacts as it is when considering environmental implications.

### *Restoration*

Along with encouraging higher performance across three dimensions, the Envision framework is unique in that it creates opportunities for projects to go beyond mitigation measures and restore the social, economic, and environmental assets of the community. "Restorative" becomes an achievable performance goal and is an explicit level of achievement within the Envision framework. This level may be aspirational in many cases, but it highlights what is possible for infrastructure projects, and it lays out the path for success. Likewise, when projects are able to implement practices that restore their community and site, their efforts are recognized. Collectively, these projects then help set a new bar for how sustainable infrastructure projects should perform.

### *Higher Performance*

Envision promotes high performance across three dimensions:

- ***Sustainability Achievement***: Envision recognizes that success in sustainability is incremental, not "all or nothing". As such, the framework illustrates the incremental changes a project team can implement to reach higher levels of sustainability.
- ***Project life cycle***: Credits in the Envision framework address the full project life cycle, beyond planning and design through construction to operations and maintenance. Users are also challenged to consider the project's end-of-useful-life, such as the ability to disassemble and up-cycle materials.
- ***Stakeholder engagement***: When an inclusive, representative group of stakeholders is engaged throughout the project, the results satisfy the widest possible swath of the community. Project team collaboration with stakeholders also identify the widest practical array of sustainability alternatives for consideration, including byproduct synergies and social benefits.

### *Innovation*

The infrastructure industry can be understandably risk averse. Project performance is accountable to the public, and failures are highly visible, sometimes catastrophic events, with lasting repercussions. Yet, in order to be responsive to changing operating environments and fulfill their role in sustainable, resilient development, project teams building tomorrow's infrastructure should be prepared to take measured risks and innovate designs for the future.

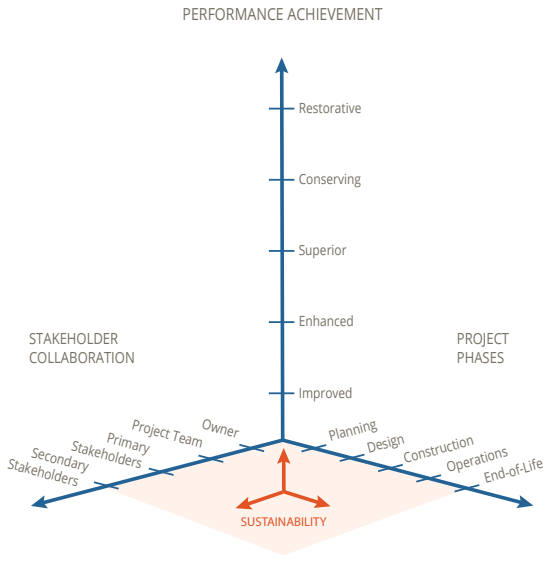
The Envision framework encourages innovation across all aspects of sustainability and resilience. Some topics and approaches provided in the Envision framework are aspirational, laying out the best-case scenario and leaving it to project teams to determine how to achieve it. Other approaches are a blank slate, allowing room for innovation and prompting project teams to pioneer solutions that suit the needs of the present and the future.

### *Education and Knowledge Sharing*

The Envision framework is designed to provide, capture and disseminate knowledge. The process and performance objectives included within the credits are intended to guide sustainable project delivery. They are, however, more than a prescriptive list of specifications. Project teams are able to determine the best path forward in implementing sustainable projects, building on the knowledge of what it takes to deliver a project that truly contributes to sustainability.

In turn, project teams can learn from each other as the knowledge base grows. Many Envision credits have the added goal of collecting industry data. Successive Envision projects build this data set and help set the new sustainable "standard" or baseline for infrastructure design. Furthermore, the Envision framework recognizes projects that excel in sustainability to serve as exemplary models for future projects.

Public attention is often only directed to infrastructure when there is a problem or failure. By recognizing project successes through the Envision framework, teams can begin to educate the public on the value of their often overlooked infrastructure systems. By understanding the inherent value of an infrastructure project, communities are motivated to drive increasingly higher expectations in terms of sustainability.




## HOW DOES ENVISION ADDRESS THE FULL RANGE OF SUSTAINABILITY?

### *Social*

Social wellbeing is comprehensively addressed. As stated previously, Envision poses two questions: "Are we doing the project right?" and, more critically, "Are we doing the right project?" For instance, under Envision, a new highway might be designed with features that contribute to sustainable performance (e.g., preserving wildlife corridors, treating and infiltrating stormwater runoff, and incorporating recycled materials in construction). However, if that highway contributes to significantly greater traffic congestion and urban sprawl, its overall contribution to sustainability may not be as high as an alternate solution such as an extension of public transportation services.

Equity and social Justice refer to the responsibility of a society to ensure that civil and human rights are preserved and protected for each individual, and that all persons are treated equally and without prejudice. These issues are particularly relevant to infrastructure development, which often involves the provision of significant benefits as well as potentially significant impacts. Envision addresses equity and social justice by encouraging active engagement from community stakeholders across the entire project life-cycle. Project teams develop two-way communication with impacted communities allowing them to holistically examine a project's impacts from all perspectives.

### *Environmental*

Restoration of natural resources and ecosystem services is an explicit goal within the Envision framework. While improving sustainable performance is an essential and immediate goal, long-term goals should be directed toward restoration where practical. This is intended to reinforce the point that, to really contribute to sustainability, projects must do more than mitigate negative impacts. Mitigation is important, but does not contribute to the restoration of economic, environmental, and social conditions to sustainable levels.

### *Economic*

Economic development conducted without depleting social and natural resources is sustainable development. While not all infrastructure projects are directly connected to economic growth, they are all connected to the economy by driving community attractiveness and environmental responsibility. The guidance provided in the Envision framework balance these three aspects.

Return on Investment and upfront capital costs are often the key drivers in planning decisions; however they omit the life-cycle costs of the project, risks and uncertainty, or the broader outcomes that impact the environment and society. Envision quantifies these soft benefits and broader outcomes such that owners are less likely to overlook the sustainable returns on investment, such as lower utility costs, operations and maintenance costs, or less replacement costs.

### *Resilience*

Short- and long-term risks are reduced. Project teams are guided to implement measures and infrastructure that prevent committing the community to high fixed costs or create a heavy reliance on resources that could become scarce and/or very expensive. Conversely, projects that create or increase vulnerability to extreme weather events, natural disasters, and/or economic conditions are viewed as being conceptually deficient.

Life-cycle considerations are addressed. Credit is given to project teams that extend design considerations to the full extent of the project life-cycle. Designs that offer increased durability and flexibility to extend the useful life of the constructed works are afforded additional recognition. Extending the useful life of constructed works means that replacement structures are needed less. More recognition is given for designs that incorporate deconstruction principles and enable reuse and up-cycling of materials and equipment.

# Envision

Envision is a framework that includes 64 sustainability and resilience indicators, called ‘credits’, organized into five categories: **Quality of Life, Leadership, Resource Allocation, Natural World,** and **Climate and Resilience**. These collectively address areas of human wellbeing, mobility, community development, collaboration, planning, economy, materials, energy, water, siting, conservation, ecology, emissions, and resilience. These indicators collectively become the foundation of what constitutes sustainability in infrastructure.

# Envision Credit List

## Quality Of Life
14 Credits

### WELLBEING
**QL1.1** Improve Community Quality of Life
**QL1.2** Enhance Public Health & Safety
**QL1.3** Improve Construction Safety (N)
**QL1.4** Minimize Noise & Vibration
**QL1.5** Minimize Light Pollution
**QL1.6** Minimize Construction Impacts (N)

### MOBILITY
**QL2.1** Improve Community Mobility & Access
**QL2.2** Encourage Sustainable Transportation
**QL2.3** Improve Access & Wayfinding

### COMMUNITY
**QL3.1** Advance Equity & Social Justice (N)
**QL3.2** Preserve Historic & Cultural Resources
**QL3.3** Enhance Views & Local Character
**QL3.4** 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 (N)
**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 (N)

**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 (N)
**RA1.5** Balance Earthwork On Site

### ENERGY
**RA2.1** Reduce Operational Energy Consumption
**RA2.2** Reduce Construction Energy Consumption (N)
**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 (N)
**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 (N)
**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

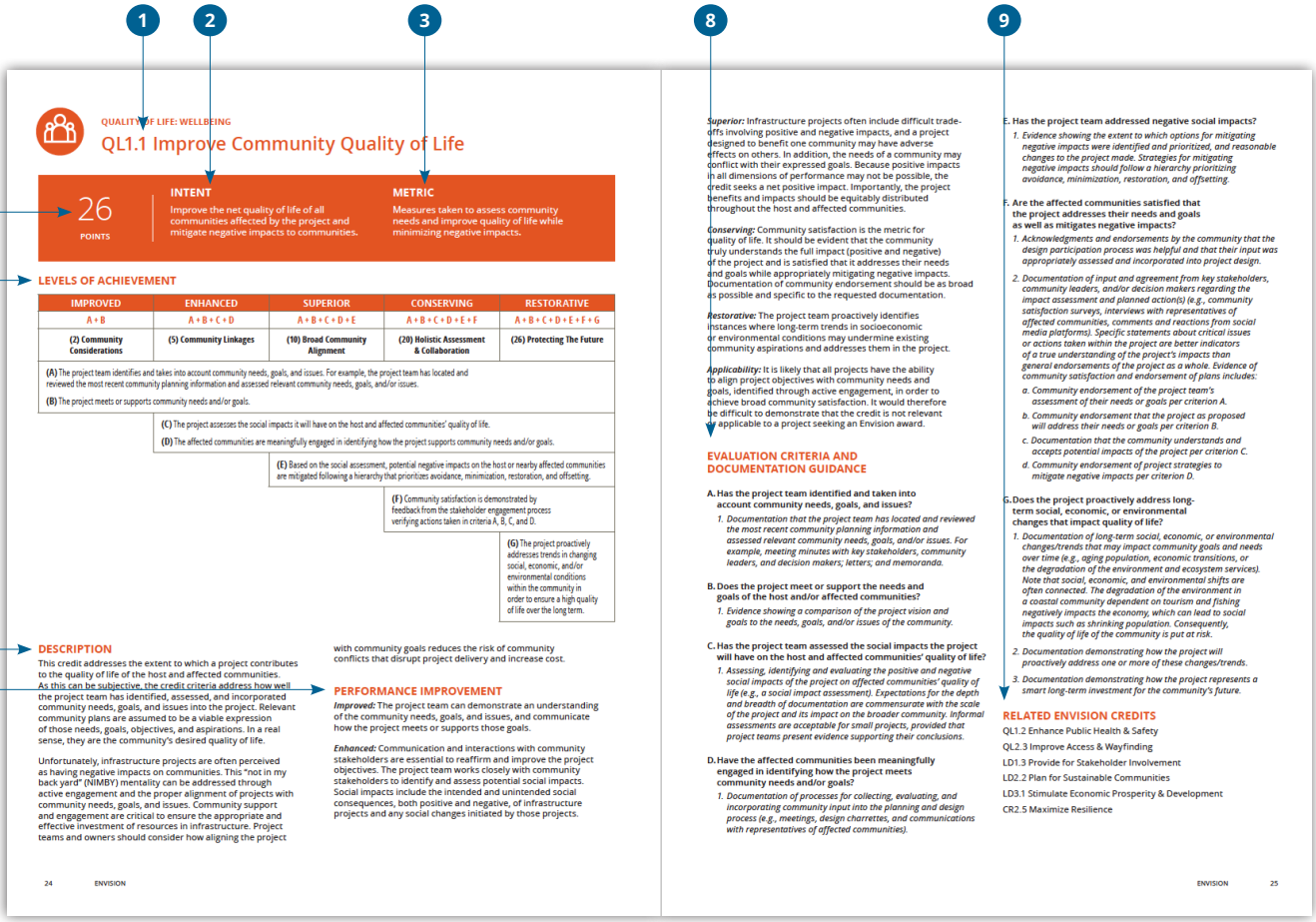
### EMISSIONS
**CR1.1** Reduce Net Embodied Carbon
**CR1.2** Reduce Greenhouse Gas Emissions
**CR1.3** Reduce Air Pollutant Emissions

### RESILIENCE
**CR2.1** Avoid Unsuitable Development
**CR2.2** Assess Climate Change Vulnerability
**CR2.3** Evaluate Risk & Resilience (N)
**CR2.4** Establish Resilience Goals and Strategies (N)
**CR2.5** Maximize Resilience
**CR2.6** Improve Infrastructure Integration

**CR0.0** Innovate or Exceed Credit Requirements

Rewritten
(N) New

# Navigating Credits



QUALITY OF LIFE: WELLBEING

## 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 |

**(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.

**(B)** The project meets or supports community needs and/or goals.

**(C)** The project assesses the social impacts it will have on the host and affected communities' quality of life.

**(D)** The affected communities are meaningfully engaged in identifying how the project supports community needs and/or goals.

**(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.

**(F)** Community satisfaction is demonstrated by feedback from the stakeholder engagement process verifying actions taken in criteria A, B, C, and D.

**(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.

**DESCRIPTION**

This credit addresses the extent to which a project contributes to the quality of life of the host and affected communities. As this can be subjective, the credit criteria address how well the project team has identified, assessed, and incorporated community needs, goals, and issues 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 desired quality of life.

Unfortunately, infrastructure projects are often perceived as having negative impacts on communities. This "not in my back yard" (NIMBY) mentality can be addressed through active engagement and the proper alignment of projects with community needs, goals, and issues. Community support and engagement are critical to ensure the appropriate and effective investment of resources in infrastructure. Project teams and owners should consider how aligning the project with community goals reduces the risk of community conflicts that disrupt project delivery and increase cost.

**PERFORMANCE IMPROVEMENT**

***Improved:*** The project team can demonstrate an understanding of the community needs, goals, and issues, and communicate how the project meets or supports those goals.

***Enhanced:*** Communication and interactions with community stakeholders are essential to reaffirm and improve the project objectives. The project team works closely with community stakeholders to identify and assess potential social impacts. Social impacts include the intended and unintended social consequences, both positive and negative, of infrastructure projects and any social changes initiated by those projects.

24 ENVISION

***Superior:*** Infrastructure projects often include difficult trade-offs involving positive and negative impacts, and a project designed to benefit one community may have adverse effects on others. In addition, the needs of a community may conflict with their expressed goals. Because positive impacts in all dimensions of performance may not be possible, the credit seeks a net positive impact. Importantly, the project benefits and impacts should be equitably distributed throughout the host and affected communities.

***Conserving:*** Community satisfaction is the metric for quality of life. It should be evident that the community truly understands the full impact (positive and negative) of the project and is satisfied that it addresses their needs and goals while appropriately mitigating negative impacts. Documentation of community endorsement should be as broad as possible and specific to the requested documentation.

***Restorative:*** The project team proactively identifies instances where long-term trends in socioeconomic or environmental conditions may undermine existing community aspirations and addresses them in the project.

***Applicability:*** It is likely that all projects have the ability to align project objectives with community needs and goals, identified through active engagement, in order to achieve broad community satisfaction. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.

**EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE**

**A. Has the project team identified and taken into account community needs, goals, and issues?**

1. *Documentation that the project team has located and reviewed the most recent community planning information and assessed relevant community needs, goals, and/or issues. For example, meeting minutes with key stakeholders, community leaders, and decision makers; letters; and memoranda.*

**B. Does the project meet or support the needs and goals of the host and/or affected communities?**

1. *Evidence showing a comparison of the project vision and goals to the needs, goals, and/or issues of the community.*

**C. Has the project team assessed the social impacts the project will have on the host and affected communities' quality of life?**

1. *Assessing, identifying and evaluating the positive and negative social impacts of the project on affected communities' quality of life (e.g., a social impact assessment). Expectations for the depth and breadth of documentation are commensurate with the scale of the project and its impact on the broader community. Informal assessments are acceptable for small projects, provided that project teams present evidence supporting their conclusions.*

**D. Have the affected communities been meaningfully engaged in identifying how the project meets community needs and/or goals?**

1. *Documentation of processes for collecting, evaluating, and incorporating community input into the planning and design process (e.g., meetings, design charrettes, and communications with representatives of affected communities).*

**E. Has the project team addressed negative social impacts?**

1. *Evidence showing the extent to which options for mitigating negative impacts were identified and prioritized, and reasonable changes to the project made. Strategies for mitigating negative impacts should follow a hierarchy prioritizing avoidance, minimization, restoration, and offsetting.*

**F. Are the affected communities satisfied that the project addresses their needs and goals as well as mitigates negative impacts?**

1. *Acknowledgments and endorsements by the community that the design participation process was helpful and that their input was appropriately assessed and incorporated into project design.*
2. *Documentation of input and agreement from key stakeholders, community leaders, and/or decision makers regarding the impact assessment and planned action(s) (e.g., community satisfaction surveys, interviews with representatives of affected communities, comments and reactions from social media platforms). Specific statements about critical issues or actions taken within the project are better indicators of a true understanding of the project's impacts than general endorsements of the project as a whole. Evidence of community satisfaction and endorsement of plans includes:*
   a. *Community endorsement of the project team's assessment of their needs or goals per criterion A.*
   b. *Community endorsement that the project as proposed will address their needs or goals per criterion B.*
   c. *Documentation that the community understands and accepts potential impacts of the project per criterion C.*
   d. *Community endorsement of project strategies to mitigate negative impacts per criterion D.*

**G. Does the project proactively address long-term social, economic, or environmental changes that impact quality of life?**

1. *Documentation of long-term social, economic, or environmental changes/trends that may impact community goals and needs over time (e.g., aging population, economic transitions, or the degradation of the environment and ecosystem services). Note that social, economic, and environmental shifts are often connected. The degradation of the environment in a coastal community dependent on tourism and fishing negatively impacts the economy, which can lead to social impacts such as shrinking population. Consequently, the quality of life of the community is put at risk.*
2. *Documentation demonstrating how the project will proactively address one or more of these changes/trends.*
3. *Documentation demonstrating how the project represents a smart long-term investment for the community's future.*

**RELATED ENVISION CREDITS**

QL1.2 Enhance Public Health & Safety
QL2.3 Improve Access & Wayfinding
LD1.3 Provide for Stakeholder Involvement
LD2.2 Plan for Sustainable Communities
LD3.1 Stimulate Economic Prosperity & Development
CR2.5 Maximize Resilience

ENVISION 25

**1 Credit Title and Identification Number**
Includes the two-letter code identifying the category, and a number identifying the credit.

**2 Intent**
The purpose of the credit.

**3 Metrics**
How the credit will be measured.

**4 Total Possible Points**
Value of the highest level of achievement.

**5 Levels of Achievement**
Brief description of the requirements necessary to meet each level of achievement. Levels increase in their contribution toward sustainability.

**6 Description**
Explanation of the sustainability issue addressed by the credit and its significance in infrastructure projects.

**7 Performance Improvement**
Sets the benchmark for performance. It also provides general strategy for performance improvements.

**8 Evaluation Criteria and Documentation Guidance**
Specifies the questions that the project must address in order to meet the requirements of a level of achievement. It also provides examples of the types of documents that may be submitted for verification in order to demonstrate that requirements were met.

**9 Related Envision Credits**
Envision credits which may share documentation requirements, or may relate in a symbiotic way in order to meet level of achievement requirements.

# Envision Organization and Scoring

## PROJECT SCORING

Project performance is evaluated using a point system. Levels of achievement for each credit are assigned points weighted by three factors:

1. The importance and impact of the sustainability indicator;
2. The difficulty of the specific actions required; and
3. The demonstrable impact meeting the requirements will have.

Guidance is provided in each credit description on how to determine the anticipated level of achievement that may be attained by a given project. Scores for each applicable credit are added together to give the total Envision score. The final Envision score is presented as a percentage of the total achieved points compared to the total applicable points. Scores for each category are always shown in order to emphasize the trade-offs inherent in many project decisions.

## CATEGORIES AND SUBCATEGORIES

The Envision framework is comprised of 64 sustainability indicators, called credits, that cover the full dimensions of infrastructure sustainability. Each credit in the Envision system includes an intent statement and metric, levels of achievement, a description, ways to improve performance, evaluation criteria and documentation guidance, and related Envision credits. The credits are organized into five categories and 14 subcategories by subject matter.

- **Quality of Life**: Wellbeing, Mobility, Community
- **Leadership**: Collaboration, Planning, Economy
- **Resource Allocation**: Materials, Energy, Water
- **Natural World**: Siting, Conservation, Ecology
- **Climate and Resilience**: Emissions, Resilience

Every infrastructure project impacts all five Envision categories, often with complex trade-offs. For example, in an effort to avoid critical habitats, projects may have to consume more resources. Conversely, projects that reduce resource consumption may find they are also achieving the benefit of reducing harmful emissions. By grouping the credits into broader categories of impact, Envision helps users to navigate the complex trade-offs or synergies across the credits.

## LEVELS OF ACHIEVEMENT

The Envision levels of achievement define the level and quality of project performance in each credit as follows:

- **Improved**: Performance that is above conventional. Slightly exceeds regulatory requirements.
- **Enhanced**: Sustainable performance that is on the right track. There are indications that superior performance is within reach.
- **Superior**: Sustainable performance at a very high level.
- **Conserving**: Performance that has achieved essentially zero negative impact.
- **Restorative**: Performance that restores natural or social systems. Such performance receives the highest award possible and is celebrated as such. The Restorative level is not applicable to all performance objectives.

Not all credits have five levels of achievement. The levels are determined by the nature of the credit and the ability to make meaningful distinctions between levels. The level of achievement table clearly indicates the evaluation criteria that must be addressed for each level.

## EVALUATION CRITERIA AND DOCUMENTATION

The evaluation criteria and documentation section within each credit outline what is necessary to demonstrate that a level of achievement has been met. Evaluation criteria, denoted by letters, include both qualitative and quantitative requirements. All evaluation criteria are framed as questions, for which answers and supporting documentation (denoted by numbers beneath each evaluation criterion) needs to be provided if the project submits for ISI's third-party Envision verification program. Examples of evaluation criteria are:

- **Yes/No**: An action taken or an outcome achieved (e.g. the project is not located on sensitive sites).
- **Target**: A specified outcome with discrete quantifiable levels (e.g. the project reduces energy use by 15%).
- **Execution**: A process conducted or a commitment made to accomplish a stated objective (e.g., the project team has a comprehensive sustainability management plan in place).
- **Accomplishment**: A process conducted with a general or unspecified result (e.g. the project team has 'minimized' the use of fertilizers and pesticides on the project).

## BASELINES

A baseline references conventional performance or "business-as-usual". Many credits within the Envision framework require the establishment of a baseline against which to measure project performance. Given Envision's applicability to all types and sizes of infrastructure projects, and applicability across countries and regions, baselines may vary regionally or even project to project. Project teams must determine the most appropriate baseline for their project. In order to reach a level of achievement for any Envision credit, projects must exceed the determined baseline.

There are several options for identifying acceptable baselines. The following may be used as baselines for measuring performance improvement (listed in order of preference):

- **Existing conditions** or the existing system(s) the project will replace.
- **A seriously considered project alternative**.
- **Industry "standard practice"** or existing codes, standards, or regulatory requirements (e.g., for energy and water; greenhouse gas and air pollution emissions).
- **A project of similar scope and size** operating within the same geographical area or within a geographical area with similar operating conditions.

## PERFORMANCE IMPROVEMENT

Each Envision credit includes guidance on concrete ways to incrementally improve performance above the baseline. Recognizing the leap in achievement from "Improved" to "Restorative", each credit outlines the tangible steps, beginning with how to get started. Guidance for performance improvement is cumulative, such that successive incremental steps become less of a leap to high performing projects. Text within the Performance Improvement section is not required for assessment but is intended to informally provide helpful guidance and context for the evaluation.

## APPLICABILITY

As a highly flexible and adaptable resource, Envision recognizes that not all credits will be applicable to all projects or project types. Credits can be omitted from consideration by designating them as "not applicable". This is reserved for cases where the sustainability indicator addressed by the credit does not exist for the project. For example, on a project that is entirely underground external light fixtures would not exist and the project team would not be able to assess credit QL1.5 Minimize Light Pollution. In this example, the credit may be deemed "not applicable". This means that the total point value associated with the credit is removed from the total number of applicable points in the Envision framework for the project. For projects pursuing ISI's third-party verification program, an explanation and supporting documentation as to why the credit is not applicable to the project is required.

## ENVISION POINTS TABLE

| | | | Improved | Enhanced | Superior | Conserving | Restorative | Maximum Points |
|---|---|---|---|---|---|---|---|---|
| Quality of Life | Wellbeing | QL1.1 Improve Community Quality of Life | 2 | 5 | 10 | 20 | 26 | 200 |
| | | QL1.2 Enhance Public Health & Safety | 2 | 7 | 12 | 16 | 20 | |
| | | QL1.3 Improve Construction Safety | 2 | 5 | 10 | 14 | — | |
| | | QL1.4 Minimize Noise & Vibration | 1 | 3 | 6 | 10 | 12 | |
| | | QL1.5 Minimize Light Pollution | 1 | 3 | 6 | 10 | 12 | |
| | | QL1.6 Minimize Construction Impacts | 1 | 2 | 4 | 8 | — | |
| | Mobility | QL2.1 Improve Community Mobility | 1 | 3 | 7 | 11 | 14 | |
| | | QL2.2 Encourage Sustainable Transportation | — | 5 | 8 | 12 | 16 | |
| | | QL2.3 Improve Access & Wayfinding | 1 | 5 | 9 | 14 | — | |
| | Community | QL3.1 Advance Equity & Social Justice | 3 | 6 | 10 | 14 | 18 | |
| | | QL3.2 Preserve Historic & Cultural Resources | — | 2 | 7 | 12 | 18 | |
| | | QL3.3 Enhance Views & Local Character | 1 | 3 | 7 | 11 | 14 | |
| | | QL3.4 Enhance Public Space & Amenities | 1 | 3 | 7 | 11 | 14 | |
| Leadership | Collaboration | LD1.1 Provide Effective Leadership & Commitment | 2 | 5 | 12 | 18 | — | 182 |
| | | LD1.2 Foster Collaboration & Teamwork | 2 | 5 | 12 | 18 | — | |
| | | LD1.3 Provide for Stakeholder Involvement | 3 | 6 | 9 | 14 | 18 | |
| | | LD1.4 Pursue Byproduct Synergies | 3 | 6 | 12 | 14 | 18 | |
| | Planning | LD2.1 Establish a Sustainability Management Plan | 4 | 7 | 12 | 18 | — | |
| | | LD2.2 Plan for Sustainable Communities | 4 | 6 | 9 | 12 | 16 | |
| | | LD2.3 Plan for Long-Term Monitoring & Maintenance | 2 | 5 | 8 | 12 | — | |
| | | LD2.4 Plan for End-of-Life | 2 | 5 | 8 | 14 | — | |
| | Economy | LD3.1 Stimulate Economic Prosperity & Development | 3 | 6 | 12 | 20 | — | |
| | | LD3.2 Develop Local Skills & Capabilities | 2 | 4 | 8 | 12 | 16 | |
| | | LD3.3 Conduct a Life-Cycle Economic Evaluation | 5 | 7 | 10 | 12 | 14 | |
| Resource Allocation | Materials | RA1.1 Support Sustainable Procurement Practices | 3 | 6 | 9 | 12 | — | 196 |
| | | RA1.2 Use Recycled Materials | 4 | 6 | 9 | 16 | — | |
| | | RA1.3 Reduce Operational Waste | 4 | 7 | 10 | 14 | — | |
| | | RA1.4 Reduce Construction Waste | 4 | 7 | 10 | 16 | — | |
| | | RA1.5 Balance Earthwork On Site | 2 | 4 | 6 | 8 | — | |
| | Energy | RA2.1 Reduce Operational Energy Consumption | 6 | 12 | 18 | 26 | — | |
| | | RA2.2 Reduce Construction Energy Consumption | 1 | 4 | 8 | 12 | — | |
| | | RA2.3 Use Renewable Energy | 5 | 10 | 15 | 20 | 24 | |
| | | RA2.4 Commission & Monitor Energy Systems | 3 | 6 | 12 | 14 | — | |
| | Water | RA3.1 Preserve Water Resources | 3 | 5 | 7 | 9 | 12 | |
| | | RA3.2 Reduce Operational Water Consumption | 4 | 9 | 13 | 17 | 22 | |
| | | RA3.3 Reduce Construction Water Consumption | 1 | 3 | 5 | 8 | — | |
| | | RA3.4 Monitor Water Systems | 1 | 3 | 6 | 12 | — | |
| Natural World | Siting | NW1.1 Preserve Sites of High Ecological Value | 2 | 6 | 12 | 16 | 22 | 232 |
| | | NW1.2 Provide Wetland & Surface Water Buffers | 2 | 5 | 10 | 16 | 20 | |
| | | NW1.3 Preserve Prime Farmland | — | 2 | 8 | 12 | 16 | |
| | | NW1.4 Preserve Undeveloped Land | 3 | 8 | 12 | 18 | 24 | |
| | Conservation | NW2.1 Reclaim Brownfields | 11 | 13 | 16 | 19 | 22 | |
| | | NW2.2 Manage Stormwater | 2 | 4 | 9 | 17 | 24 | |
| | | NW2.3 Reduce Pesticide & Fertilizer Impacts | 1 | 2 | 5 | 9 | 12 | |
| | | NW2.4 Protect Surface & Groundwater Quality | 2 | 5 | 9 | 14 | 20 | |
| | Ecology | NW3.1 Enhance Functional Habitats | 2 | 5 | 9 | 15 | 18 | |
| | | NW3.2 Enhance Wetland & Surface Water Functions | 3 | 7 | 12 | 18 | 20 | |
| | | NW3.3 Maintain Floodplain Functions | 1 | 3 | 7 | 11 | 14 | |
| | | NW3.4 Control Invasive Species | 1 | 2 | 6 | 9 | 12 | |
| | | NW3.5 Protect Soil Health | — | 3 | 4 | 6 | 8 | |
| Climate and Resilience | Emissions | CR1.1 Reduce Net Embodied Carbon | 5 | 10 | 15 | 20 | — | 190 |
| | | CR1.2 Reduce Greenhouse Gas Emissions | 8 | 13 | 18 | 22 | 26 | |
| | | CR1.3 Reduce Air Pollutant Emissions | 2 | 4 | 9 | 14 | 18 | |
| | Resilience | CR2.1 Avoid Unsuitable Development | 3 | 6 | 8 | 12 | 16 | |
| | | CR2.2 Assess Climate Change Vulnerability | 8 | 14 | 18 | 20 | — | |
| | | CR2.3 Evaluate Risk and Resilience | 11 | 18 | 24 | 26 | — | |
| | | CR2.4 Establish Resilience Goals and Strategies | — | 8 | 14 | 20 | — | |
| | | CR2.5 Maximize Resilience | 11 | 15 | 20 | 26 | — | |
| | | CR2.6 Improve Infrastructure Integration | 2 | 5 | 9 | 13 | 18 | |
| | | | | | | | **Maximum TOTAL Points** | **1,000** |

The following are not acceptable justifications for deeming a credit 'not applicable':

- The scope of a contract does not address the issue;
- Achieving the credit is deemed to be too expensive, difficult, or time-consuming;
- Local laws or regulations prohibit meeting the requirements;
- Those conducting the Envision assessment do not have decision-making authority; or
- Stakeholders have indicated that the issue is not a priority.

In cases where local laws or regulations prohibit actions that would meet the credit requirements project teams must comply with these laws and regulations and pursue points in other credits. However, conflicting local laws and regulations do not make the sustainability indicator nonexistent. For example, certain projects may be required by regulations, or policies to use bright external lighting. This does not mean light pollution, or QL1.5 Minimize Light Pollution, is not applicable to the project.

## RELATED ENVISION CREDITS

Many of the Envision credits are interrelated. Each credit includes a list of potentially related credits, so the project team can leverage the synergies created by these connections to improve the overall sustainability of their project. However, for every project the interrelationship of credits may vary. Project teams are still encouraged to think carefully about how strategies to achieve points in one credit may positively or negatively impact achievement in another.

## INNOVATION

The Envision framework strongly encourages innovative methods that advance sustainable infrastructure practices or show exceptional performance beyond the expectations of the credit requirements. Each category includes an "Innovate or Exceed Credit Requirements" credit, indicated by a "0.0". Projects may achieve all or part of the points in these credits. The 0.0 credits are not required and these points act as bonus points that are added to the category and total score.

Innovation credits include three options to earn bonus points. The project team may submit for one or bundle multiple in a single category. The three options are:

- **Innovation**: Sustainability solutions that overcome significant problems, barriers, and/or limitations or create scalable and/or transferable solutions for the industry.
- **Exceptional Performance**: Performance in one or more credits that exceeds the highest available level of achievement.
- **Additional Aspects of Sustainability**: A sustainability indicator not already included in the Envision framework.

## ENVISION VERIFICATION PATHWAYS

***Pathway A: Design + Post-Construction***


***Pathway B: Post-Construction***

# Third-Party Verification and Award

## ONLINE SCORESHEET

The Envision Scoresheet is an online tool that allows project teams to collaboratively assess projects using Envision, upload documentation, describe key features of the project, and register the project for third-party verification. Scores are automatically tallied by credit category and for the whole project. An account is required to access the online scoresheet on ISI's website.

## VERIFICATION PROCESS

Recognition is an important component of increasing awareness and initiating systemic change. ISI offers an optional third-party verification and awards program for recognizing sustainable project achievements. ISI's independent project verification program is a transparent process to confirm that a project meets Envision evaluation criteria.

For projects seeking verification, users must provide a credit submittal for each credit being pursued. A credit submittal includes both a narrative (or cover sheet), as well as supporting documentation. The narrative must contain clear and direct responses to the evaluation criteria required for the level of achievement being pursued. Supporting documentation—such as that described in the numbered items listed beneath the evaluation criteria—also forms a crucial component of the credit submittal. Supporting documentation should be referenced in the credit narrative, and relevant pages/sections should be annotated or highlighted for ease of reference.

The ENV SP, verifier, and ISI staff play central roles in the verification process. The verifier is a qualified third-party expert contracted by ISI. ISI hires verifiers from a range of backgrounds to conduct peer reviews of infrastructure projects seeking formal recognition for their sustainable attributes. Envision gives recognition to infrastructure projects that make exemplary progress and contribute to a more sustainable future. To this end, the verifier's primary responsibilities are to thoroughly review project documentation submitted by the ENV SP, determine appropriate levels of achievement, and in cases where the verifier's level of achievement selection differs from that of the ENV SP, provide guidance explaining their selection and what would be required to advance to a higher level of achievement. ISI staff provide oversight and quality control throughout the verification process.

Projects may choose to pursue verification either after the design phase (at or after 95% design completion) or after the construction phase (at or after 95% construction completion). Projects pursuing verification after the design phase will be required to complete an additional post-construction review follow-up. In these cases, this post-construction review is required to maintain the Envision award earned after the design phase. The purpose of the post-construction review is to validate that the commitments made in the planning and design stages of the project were carried through during construction.

Projects may choose to pursue one of two verification pathways:

- **Path A: Design + Post-Construction**
- **Path B: Post-Construction**

## VERIFICATION AWARD LEVELS

To receive recognition, projects must achieve a minimum percentage of the total applicable Envision points. Projects can be recognized at four award levels:

- **Verified**: 20%
- **Silver**: 30%
- **Gold**: 40%
- **Platinum**: 50%

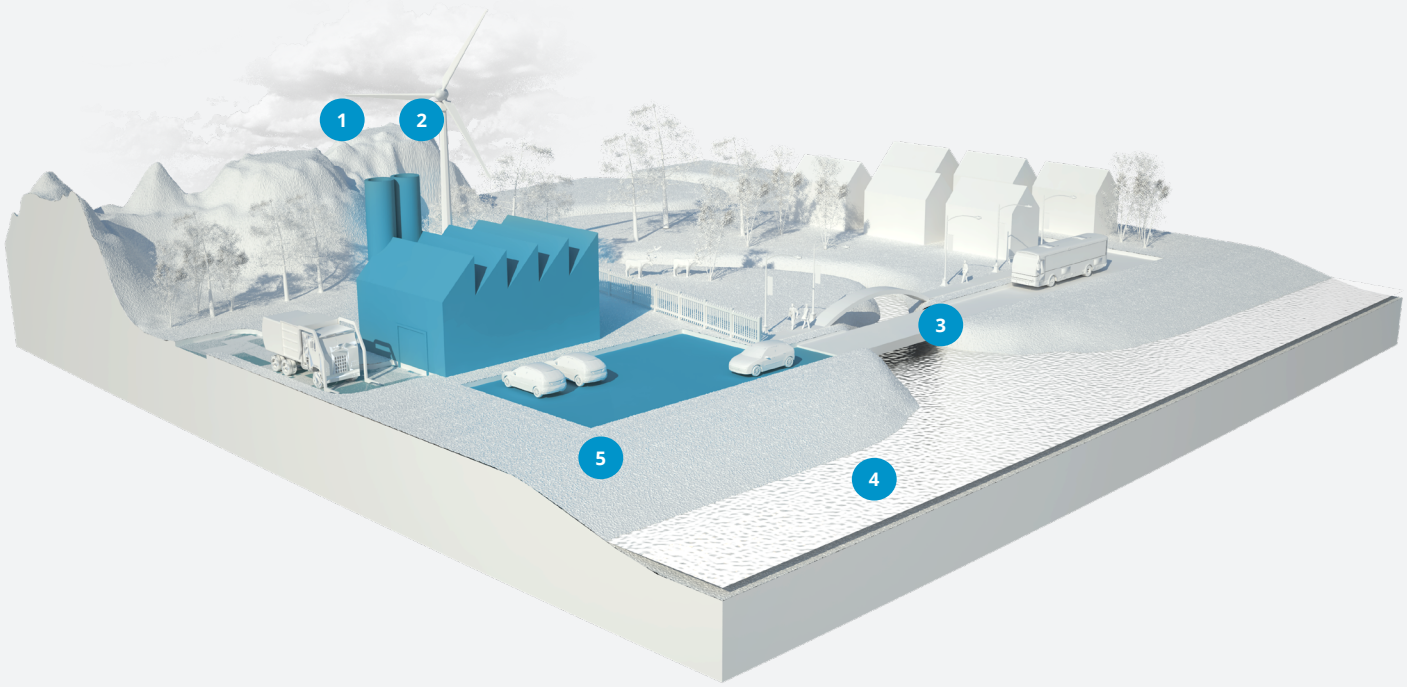
# Climate and Resilience

The scope of the Climate and Resilience category is two-fold: minimizing emissions that may contribute to climate change and other short- and long-term risks, and ensuring that infrastructure projects are resilient. In order to be resilient, infrastructure must be informed, resourceful, robust, redundant, flexible, integrated, and inclusive. The Climate and Resilience category is divided into two subcategories: **Emissions** and **Resilience**.

**10** / **credits**

**Image**
Portland General Electric's Tucannon River Wind Farm near Dayton, Washington (Envision Gold, 2015).

1. Does the project reduce greenhouse gas emissions?
2. Does the project reduce air pollutant emissions?
3. Does the project avoid unsuitable sites?
4. Does the project reduce climate change vulnerability?
5. Is the project resilient and adaptable?




## EMISSIONS

The goal of this subcategory is to promote the understanding and reduction of dangerous emissions and the impact of carbon, during all stages of a project's life cycle. While reducing emissions, pollutants, and embodied carbon may not have a direct impact on the consequences of the particular project, it can help to reduce overall global risk and may contribute far beyond the site borders of the project.

## RESILIENCE

Resilience includes the ability to withstand short-term risks, such as flooding or fires, and the ability to adapt to changing long-term conditions, such as changes in weather patterns, sea-level rise, or changes in climate. Understanding the types of risks and probability of risks allows the project team to deliver an informed project design that anticipates and withstands these risks, minimizing its overall vulnerability. Maximizing resilience ensures a longer useful life and primes the project to more fully meet the future needs of the community.

# Climate and Resilience

## 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 and Resilience
**CR2.4** Establish Resilience Goals and Strategies
**CR2.5** Maximize Resilience
**CR2.6** Improve Infrastructure Integration

**CR0.0** Innovate or Exceed Credit Requirements

CLIMATE AND RESILIENCE: EMISSIONS

# CR1.1 Reduce Net Embodied Carbon

20 POINTS

## INTENT

Reduce the impacts of material extraction, refinement/manufacture, and transport over the project life.

## METRIC

Percentage of reduction in net embodied carbon of materials.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| A + B + C | A + B + C | A + B + C | A + B + C | Not Available |
| **(5) At Least 5% Reduction** | **(10) At Least 15% Reduction** | **(15) At Least 30% Reduction** | **(20) At Least 50% Reduction** | |
| **(A)** The project team identifies primary materials to be used on the project during construction and operation.<br>The team determines which materials are the primary contributors to net embodied carbon (collectively >80%). | | | | |
| **(B)** Embodied carbon is calculated, or acquired by a validated source, for the primary materials identified in criterion A. Calculations include:<br>• Embodied carbon of production, including raw material extraction, refinement, and manufacture.<br>• Embodied carbon of transporting materials to the project site.<br>• The replacement, repair, or refurbishment of materials over the life of the project. | | | | |
| **(C)** The project team demonstrates at least a 5% reduction in total embodied carbon of materials over the life of the project compared to the baseline. Calculations should be in tons $CO_2$. | **(C)** The project team demonstrates at least a 15% reduction in total embodied carbon of materials over the life of the project compared to the baseline. Calculations should be in tons $CO_2$. | **(C)** The project team demonstrates at least a 30% reduction in total embodied carbon of materials over the life of the project compared to the baseline. Calculations should be in tons $CO_2$. | **(C)** The project team demonstrates at least a 50% reduction in total embodied carbon of materials over the life of the project compared to the baseline. Calculations should be in tons $CO_2$. | |

## DESCRIPTION

This credit addresses the embodied carbon of materials used over the life of the project. This combines concepts of sourcing local materials, using materials more efficiently, and using lower-impact materials in order to reduce the combined environmental impacts of material use. In the calculations, carbon is used as a proxy unit of measure to compare various impacts across the entire supply chain of material consumption. One stage of this supply chain involves raw material extraction/harvesting, refinement, and manufacturing into products. The second involves transportation of the materials from the manufacturer to their final destination on site. By designing projects to use less material, use material efficiently, or specifying materials with lower embodied carbon, as well as reducing transportation distances, project teams can reduce the overall impact of the project.

Material use is specifically addressed over the life of the project, including the necessary replacement or renewal of materials. Often, materials with slightly higher initial embodied carbon will have a lower net embodied carbon over the life of the project if they are more durable and less likely to require repair or replacement.

## PERFORMANCE IMPROVEMENT

***Improved – Conserving:*** Levels are distinguished by the percentage reduction in embodied carbon of materials over a baseline. As industry standards on carbon intensity of materials do not exist for most infrastructure projects, project teams are required to provide calculations for an appropriate base case. Accepted methodologies for establishing baseline performance data are explained in detail in the front of this manual and include (1) existing conditions, (2) a seriously considered alternative, (3) standard practice, or (4) a comparable existing project/facility. Envision intends to support data collection in order to eventually provide this baseline data for project teams and the industry as a whole. This is why it is required to submit calculations in acceptable standard units.

Availability of data on the carbon intensity of materials is often limited, and some projects may involve hundreds or thousands of products. Therefore, ISI accepts a streamlined method for conducting calculations on this credit. Project teams may identify a select list of primary materials/products that collectively make up greater than 80% of the total embodied carbon. If data on embodied carbon or material intensity is not available from the manufacturer, project teams may use averages or generalized data from studies or material databases. Project teams should track, document, and clearly explain their methodology for calculating material intensity in this credit.

Transportation of materials to project sites can be a significant contributor to the embodied carbon of materials. Local or regional materials—even materials sourced or processed on site—reduce the impact of long transport and support local economies. It is important to note that while it is generally desirable to use locally sourced materials for the aforementioned reasons, use of local materials could have negative impacts on performance if those materials result in reduced durability, safety, or service life. Carbon emissions associated with the transportation of materials to the project site are specifically broken out as they are often simpler to calculate based on distance; quantity; and standard truck, air, rail, or shipping fuel consumption. They are also calculated separately in order to show the possible conflicts that exist of sourcing a lower-intensity material from farther away. Project teams should consider choices that reduce the overall net embodied carbon of materials.

***Applicability:*** This credit is applicable to all projects that include the use or consumption of physical materials in construction or operation.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. Has the project team determined materials that are the primary contributors to embodied carbon for the project during construction and operation?**

1. *Documentation of the primary materials to be used in the construction and ongoing operation of the project over its life. Documentation should include:*
   a. *The materials used.*
   b. *General estimates of the quantities of materials used. Note that operations materials may need to be multiplied by the frequency of use over the project life. Material estimates should include anticipated repairs/upkeep (e.g., road resurfacing).*
   c. *Estimates of the embodied carbon of materials. Estimates may use readily available public information such as regional, national, or global averages.*
2. *Identification of the select materials that collectively will make up over 80% of the total estimated embodied carbon of the project.*

**B. Has the project team calculated the primary contributors to overall embodied carbon?**

1. *Index of the embodied carbon calculations of the primary contributors to carbon intensity over the life of the project (construction and operations) identified in criterion A. This should include:*
   a. *Carbon emissions to produce the material, including raw material extraction, refinement, and manufacture including secondary or tertiary processing.*
   b. *Carbon emissions from transporting the material from the manufacturer to the project site, including intermediary points.*

*Embodied carbon data may come from the manufacturer, reputable databases, reputable embodied energy software, or from project team calculations. If the source or specific type of materials is not known at the time of assessment, calculations may present a range of values or rely on likely material choices. Calculations should be in tons $CO_2$.*

**C. To what extent does the project reduce the net embodied carbon of materials used in construction and operation?**

1. *Documentation that the project has set targets for reducing net embodied carbon.*
2. *Documentation of strategies/plans to reduce net embodied carbon. These may include but are not limited to:*
   a. *Sizing the project to require less material;*
   b. *Designing the project to use less material;*
   c. *Choosing materials that have lower embodied carbon;*
   d. *Reducing material needed for repair and maintenance;*
   e. *Reducing material waste during construction;*
   f. *Reducing material waste during operation;*
   g. *Sourcing local materials to reduce transportation emissions;*
   h. *Utilizing lower-carbon transportation modes.*
3. *Calculations of reductions in embodied carbon achieved. Calculations should compare total carbon intensity of materials for the project against the total carbon intensity of the baseline. Calculations should be in tons $CO_2$.*

## RELATED ENVISION CREDITS

LD2.3 Plan for Long-Term Monitoring and Maintenance

LD2.4 Plan for End-of-Life

CR1.2 Reduce Greenhouse Gas Emissions

CR1.3 Reduce Air Pollutant Emissions

CLIMATE AND RESILIENCE: EMISSIONS

# CR1.2 Reduce Greenhouse Gas Emissions

26 POINTS

## INTENT

Reduce greenhouse gas emissions during the operation of the project, reducing project contribution to climate change.

## METRIC

Percentage of reduction in operational greenhouse gas emissions.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| A + B | A + B | A + B | A + B | A + B |
| **(8) At Least 10% Reduction** | **(13) At Least 25% Reduction** | **(18) At least 50% Reduction** | **(22) 100% Reduction** | **(26) Carbon Negative** |
| **(A)** The project team demonstrates at least a 10% reduction in total $CO_2e$ over the operational life of the project compared to the baseline. Calculations should be in tons $CO_2e$. | **(A)** The project team demonstrates at least a 25% reduction in total $CO_2e$ over the operational life of the project compared to the baseline. Calculations should be in tons $CO_2e$. | **(A)** The project team demonstrates at least a 50% reduction in total $CO_2e$ over the operational life of the project compared to the baseline. Calculations should be in tons $CO_2e$. | **(A)** The project team demonstrates a 100% reduction in total $CO_2e$ over the operational life of the project compared to the baseline. Calculations should be in tons $CO_2e$. | **(A)** The completed project is carbon negative (i.e., sequesters/removes more $CO_2e$ than it produces over the operational life). |
| **(B)** The project team maps and calculates the total annual greenhouse gas emissions of the final project design for reporting purposes. This includes direct and indirect greenhouse gas emissions and sequestration associated with project operations. Calculations must be in $CO_2e$. | | | | |

## DESCRIPTION

This credit addresses greenhouse gas emissions during operations and the project's contribution in reducing the impacts of climate change. The embodied carbon of materials is specifically addressed in CR1.1 Reduce Net Embodied Carbon. Emission of greenhouse gases during construction is addressed in RA2.2 Reduce Construction Energy Consumption.

The increased release of carbon dioxide ($CO_2$) and other greenhouse gases (GHGs) has caused a significant increase in the concentration of $CO_2$ in the atmosphere, enhancing the greenhouse effect. The subsequent increase in the average temperature of the earth's surface causes various cascading effects, including melting glaciers, arctic sea ice loss, sea level rise, increased ocean temperatures, increased ocean acidity, changing vegetation patterns, increased range of disease vectors, decreased snowmelt, changing precipitation patterns, increased flooding, increased storm intensity, and increased storm frequency, to name a few. This can have many unintended consequences such as flooding when historic periods of snowfall change to rain, drought from increased evaporation and lack of snowmelt, loss of coral reefs and aquatic biodiversity from ocean acidification, and food scarcity as increased temperatures reduce crop production. Reducing the emission of GHGs now will help mitigate the effects of climate change in the future.

## PERFORMANCE IMPROVEMENT

***Improved – Restorative:*** Levels in this credit are distinguished by the percentage of reduction in greenhouse gas emissions over a base case. As industry standards on greenhouse gas emissions do not exist for many infrastructure projects, project teams are required to provide calculations for an appropriate base case. Accepted methodologies for establishing baseline performance data are explained in detail in the front of this manual and include existing conditions (or no-build alternative), a seriously considered alternative, standard practice, or a comparable existing project/facility. Envision intends to support data collection in order to eventually provide this baseline data for project teams and the industry as a whole. This is why it is required to submit calculations in acceptable standard units.

Greenhouse gases are factored according to their global warming potential (GWP), resulting in a $CO_2$ equivalency ($CO_2e$). All greenhouse gas emissions calculations should be quantified in tons of $CO_2e$. Unavoidable $CO_2e$ emissions can be offset by carbon sequestration, in which $CO_2$ is removed from the atmosphere (e.g., planting trees that absorb and use $CO_2$ for their growth).

Project teams should take care not to double count greenhouse gas reductions as offsets. For example, if a project will produce 50 percent less greenhouse gas emissions than the baseline over its 25-year life, then it has achieved a 50 percent reduction. This project would not be able to claim that because produced emissions (50%) equal displaced emissions (50%), so it has achieved 'net-zero' carbon emissions (i.e., 100% reduction).

***Applicability:*** This credit is applicable to all projects that consume energy, fuel, or otherwise produce greenhouse gas emissions during their operation. Projects that do not include greenhouse gas emissions during operations may apply to have this credit deemed not applicable with supporting documentation. However, projects that do not produce greenhouse gas

emissions because of intentional planning decisions may apply for the Conserving level with supporting documentation.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. To what extent does the project reduce greenhouse gas emissions during its operational life?**

1. *Calculations of the baseline greenhouse gas emissions over a period equivalent to the operational life of the project (e.g., 25 years).*
2. *Submit calculations for:*
   a. *the project's estimated annual greenhouse gas emissions over the life of the project;*
   b. *the operational life of the project over which the calculations are made (e.g., 2025-2050); and*
   c. *Calculations of the percentage reduction compared to the baseline used over the same period.*

   *Calculations should include any natural or mechanical methods of carbon sequestration. Purchased carbon offsets may be included in the calculations.*

   *In certain cases where a demand or volume increase is anticipated over the life of the project, project teams may choose to calculate emissions reductions on a per unit basis (passenger miles traveled, millions of gallons of water treated, etc.).*

**B. Has the project team calculated and reported the annual greenhouse gas emissions of the project?**

1. *Calculation of annual greenhouse gas emissions over the life of the project. All greenhouse gas emissions should be in tons of $CO_2e$ ($tCO_2e$). Calculations include all sources of emissions from facilities, processes, or vehicles owned or controlled within the project boundary, as well as indirect emissions from the off-site generation of energy used by the project. Emissions should be classified by the following categories if applicable:*
   a. *Off-Site Energy Generation*
   b. *Stationary Fuel Combustion Emissions (non-vehicular combustion occurring at the facility intended for energy production)*
   c. *Operations Transportation Emissions*
   d. *Waste Emissions*
   e. *Wastewater Emissions*
   f. *Biomass Emissions*
   g. *Industrial Process Emissions*
   h. *Fugitive Emissions*

## RELATED ENVISION CREDITS

QL2.2 Encourage Sustainable Transportation

LD2.1 Establish a Sustainability Management Plan

CR1.1 Reduce Net Embodied Carbon

RA1.5 Balance Earthwork On Site

RA3.2 Reduce Operational Water Consumption

RA3.3 Reduce Construction Water Consumption

## PROJECT EXAMPLE: HOLLAND ENERGY PARK

The Holland Board of Public Works in Michigan considered a number of ways to meet the community's need for more local power and in 2012, they conducted a comprehensive Sustainable Return on Investment (SROI) study to determine whether less expensive and less carbon-intensive alternatives could be pursued rather than the original plan to build a coal-fired power plant. In part through this SROI, the decision was made to build a natural gas combined cycle (NGCC) power plant, known as the Holland Energy Park (Envision Platinum, 2016). The project team undertook a life-cycle assessment (LCA) of greenhouse gas emissions to compare the emissions from the NGCC and the emissions from a coal-fired plant. The LCA revealed the NGCC would result in a more than 50% reduction of greenhouse gas emissions over the life of the project.

CLIMATE AND RESILIENCE: EMISSIONS

# CR1.3 Reduce Air Pollutant Emissions

18 POINTS

## INTENT

Reduce emissions of air pollutants: particulate matter (including dust), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, lead, and volatile organic compounds.

## METRIC

Reduction of air pollutants compared to baseline.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| A + B | A + B + C | A + B + C + D | A + B + C + D | A + B + C + D + E |
| **(2) Exceeding Requirements** | **(4) Ongoing Monitoring** | **(9) VOC Minimization** | **(14) Air Pollutant Elimination** | **(18) Air Quality Improvement** |
| **(A)** The project meets all applicable air quality standards and regulations for air pollutants. | | | | |
| **(B)** The project implements strategies to reduce air pollutant emissions during operations. | **(B)** The project reduces emissions through the use of best available control systems or best management practices. | **(B)** Air pollution controls are within the 95th percentile, or represent the lowest levels possible compared to projects of similar type. | **(B)** The project eliminates air pollutant sources in the design, chooses a non-polluting alternative, or achieves at least a 98% net reduction in air pollution emissions compared to the baseline. | |
| | **(C)** Systems are in place for the ongoing monitoring of any direct sources of air pollution.<br>Processes are in place to identify and address changes in emissions in order to maintain performance targets. | | | |
| | | **(D)** The project team assesses whether volatile organic compounds harmful to human health are material to the project and, if so, implement strategies to reduce their use during construction and/or within occupied spaces of the completed project. | | |
| | | | | **(E)** The project includes the direct removal of previously existing air pollutant sources, or captures and safely stores/disposes of air pollutants for a net positive impact. |

## DESCRIPTION

The criteria pollutants include carbon monoxide, nitrogen oxides, sulfur dioxide, suspended particulate matter smaller than PM-10, ozone, lead, and volatile organic compounds. These pollutants damage human health, property, and the environment. Those most at risk are children, the elderly, and people with lung diseases such as asthma, chronic bronchitis, and emphysema. Dust and odors also can cause a nuisance for nearby residents, reduce property values, and aggravate the aforementioned lung conditions.

## PERFORMANCE IMPROVEMENT

The credit assessment begins with demonstrating attainment of applicable air quality standards and/or regulations. Note that use of the terms, or variations of the terms "best available control technology" and "lowest achievable emissions rates" within this credit have no relationship to US EPA guidelines with similar names. These terms should be interpreted at face value.

Project teams are only required to provide supporting documentation for air pollutants relevant to the project. If a project does not emit certain air pollutants listed in the credit intent they can clarify this in their documentation.

***Improved:*** Projects can demonstrate strategies were implemented to reduce air pollutants emissions during operations.

***Enhanced:*** Modeling life-cycle air pollutant emissions can be challenging for some types of infrastructure. This level recognizes project teams that have utilized the best available control systems, technologies, or methods to reduce emissions with the assumption that, if properly monitored and maintained, these will significantly reduce air pollutants emissions over the project life. Project teams are required to provide documentation as to how controls represent industry best practices.

***Superior:*** Completely eliminating air pollutant emissions may not be possible for certain projects. However, this level

recognizes projects that have achieved 'best-in-class' status by reducing air pollutant emissions to the lowest possible levels or within the 95th percentile compared to similar projects. This may include, for example, replacing old or outdated systems with state-of-the-art systems. Project teams are required to determine and provide supporting documentation for what constitutes best-in-class status for their project type.

***Conserving:*** The project completely eliminates air pollutant emissions. Often this is because a non-polluting alternative was chosen. Projects that can demonstrate at least a 98% reduction compared to the baseline are included in this level.

Volatile organic compounds have negative health impacts on building/facility occupants and, in certain conditions, construction workers.

***Restorative:*** Reserved for rare cases where the project eliminates existing sources of air pollutants or captures and safely stores/repurposes air pollutants. Note that replacing existing sources of air pollutants with less polluting sources would count toward a reduction and not an 'elimination' of air pollutants.

***Applicability:*** This credit is applicable to all projects that directly produce any of the criteria pollutants. Projects that do not include air pollutant emissions may apply to have this credit deemed not applicable with supporting documentation. However, projects that do not produce air pollutant emissions because of intentional planning decisions to choose non-polluting alternatives may apply for the Conserving level with supporting documentation.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

*Note that use of the terms, or variations of the terms, "best available control technology" and "lowest achievable emissions rates" within this credit have no relationship to US EPA guidelines with similar names. For Envision use of these terms should be interpreted at face value.*

**A. Does the project meet all relevant minimum air quality standards and regulations?**

1. *Documentation indicating the local, regional, or national standards and regulations relevant to the project.*
2. *Documentation demonstrating that the project has met or will meet all relevant standards and regulations.*

**B. To what extent does the project reduce air pollutant emissions during operations?**

1. *Estimates of total annual air pollutant emissions over the life of the project.*
2. *Documentation of all strategies deployed to reduce air pollutant emissions.*

   a. *Documentation demonstrating that the project uses best available control systems or best management practices (Enhanced).*

   *OR*

   b. *Documentation demonstrating that air pollution controls are within the 95th percentile, or represent the lowest levels possible compared to projects of similar type (Superior)*

   *OR*

   c. *Documentation that the project eliminates all air pollutant sources, chooses a non-polluting alternative, or achieves at least a 98% net reduction in air pollution emissions compared to the baseline (Conserving and Restorative).*

**C. Does the project include the ongoing monitoring and management of direct air pollutant emissions?**

1. *Documentation that the project includes systems for monitoring any air pollutants directly emitted during operations.*
2. *Documentation of processes, procedures, or systems designed to identify and address changes in emissions in order to maintain performance.*

   *Note that monitoring is not necessary if the project does not produce air pollutants. Documentation that the project does not produce air pollutants emissions is sufficient to satisfy criterion C for certain projects pursuing Conserving or Restorative. If the project produces air pollutants but achieves zero emissions through control systems, the project is still required to meet the monitoring requirements.*

**D. Has the project team assessed the materiality of volatile organic compounds to the health of construction workers and the project operators?**

1. *Documentation that the use of products and materials containing volatile organic compounds (VOCs) and their potential impact on human health over the project life was assessed. If VOCs will be present during construction or operations documentation must include:*

   a. *Specifications limiting the use of, or controlling the exposure to, volatile organic compounds during construction.*

   b. *For projects/facilities with interior occupied spaces, documentation of steps taken to reduce VOCs in material choices.*

**E. Does the project remove existing air pollutant sources?**

1. *Documentation of how the project includes the direct removal of existing air pollutant sources or the capture and sequestration of air pollutants in order to achieve a net positive impact.*

## RELATED ENVISION CREDITS

QL1.2 Enhance Public Health and Safety

QL2.2 Encourage Sustainable Transportation

LD2.1 Establish a Sustainability Management Plan

RA2.1 Reduce Operational Energy Consumption

RA2.3 Use Renewable Energy

CLIMATE AND RESILIENCE: RESILIENCE

# CR2.1 Avoid Unsuitable Development

16 POINTS

## INTENT

Minimize or avoid development on sites prone to hazards.

## METRIC

The degree to which the project is designed and/or sited to avoid or mitigate site-related risks.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| A + B | A + B + C | A + B + C + D | A + B + C + E | A + B + C + F |
| **(3) Alternative Assessment** | **(6) Risk Mitigation** | **(8) Lowest Risk Alternative** | **(12) Unsuitable Development Avoided** | **(16) Strategic Retreat** |

**(A)** During planning and project siting, the project team identifies potential siting hazards and determines both the vulnerability of the project to the hazard and the potential for the project to exacerbate the hazard (e.g., creating impervious surfaces in a floodplain, building on potentially unstable hillsides). Potentially adverse sites include but are not limited to:

- Steep slopes (> 20 degrees)
- Permafrost
- Adverse geology (e.g., risk of liquefaction, subsidence, or sinkholes)
- Flood-prone areas
- At-risk coastline (coastal surges, coastal erosion)

**(B)** The project team assesses siting alternatives that avoid or minimize hazard exposure and/or project alternatives less vulnerable to, or likely to exacerbate, site hazards.

**(C)** The project includes specific strategies to mitigate the impact of site hazards on the project (e.g., elevating structures and equipment above flood levels), as well as the project development impacts on the site hazard (e.g., erosion controls on steep slopes). This may include monitoring and response plans.

**(D)** Based on alternatives identified in criterion C, the project team can demonstrate the selected project and site resulting in the lowest exposure to site risk while still meeting project objectives and requirements.

**(E)** The project is intentionally sited to completely avoid site hazards.

**(F)** The project intentionally modifies or removes existing structures from areas prone to frequent damage and/or at high risk of future damage in order to prevent losses.

## DESCRIPTION

This credit addresses how infrastructure siting can significantly reduce risk and improve project resilience. Certain sites such as steep slopes, permafrost, or flood-prone areas should be avoided if possible. Project teams must consider how certain sites not only expose the infrastructure asset to increased risk, but how the development of the project on these sites can lead to additional environmental, social, or economic risks for the surrounding area. For example, a project located on a steep slope is not only at risk itself, but may contribute to erosion or the potential for landslides. Project teams should also consider how infrastructure development may lead to additional development within the at-risk areas.

Whenever possible, infrastructure should avoid developing, or driving development, in areas prone to hazards. Many communities may even consider strategic or managed retreat. This is the systematic withdrawal and removal of development from areas prone to damage (e.g., frequent flood zones) or at risk of future damage (e.g., low-lying coastal areas impacted by sea-level rise).

## PERFORMANCE IMPROVEMENT

***Improved:*** The first step is to identify potential hazards and consider alternatives. Siting risks are a combination of the vulnerability of both the site and the project. In addition to analyzing the site, project teams should consider whether project alternatives would reduce or eliminate the exposure to site risks.

***Enhanced:*** Infrastructure siting choices are often limited. However, project teams can implement strategies to reduce the impact of site hazards.

***Superior:*** Site selection can be a tradeoff, with each site having potential risks. Project teams can demonstrate that the selected project and site resulted in the least exposure to risk compared to the considered alternatives.

***Conserving:*** The project is intentionally sited to avoid site hazards.

***Restorative:*** The project involves the strategic retreat from hazard-prone areas, removing structures, development, or activities from areas prone to damage or at risk of future damage.

***Applicability:*** Projects that are not located within regions at risk of site hazards, and therefore cannot demonstrate they actively avoided site hazards, may apply to have this credit deemed not applicable with supporting documentation.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. Has the project team identified potential siting hazards, the vulnerability of the project to the hazard, and the potential for the project to exacerbate the hazard?**

1. *Documentation of identified site hazards.*
2. *Documentation of the vulnerability of the project and project alternatives to siting hazards.*
3. *Documentation that the project team considered the potential for the project to exacerbate potential siting hazards. For example, the potential for a project developed on a hillside to increase erosion, contribute to landslide risk, or to increase damage to downhill development in the event of a landslide.*

**B. Can the project team demonstrate that siting and project alternatives were seriously considered in order to minimize exposure to risk?**

1. *Documentation that project and siting alternatives were considered in order to minimize exposure to siting hazards as much as practicable (e.g., review meetings, alternative analyses, siting studies).*

**C. Has the project team implemented strategies to mitigate the impact of site hazards?**

1. *Documentation identifying strategies and controls implemented to reduce risk. For certain hazards, this may include monitoring and response plans.*
2. *Documentation that the project team specifically determined whether the project has the potential to exacerbate site hazards and, if so, mitigation measures were implemented to reduce the project's impact.*

**D. Can the project team demonstrate that the chosen project and site resulted in the lowest exposure to site hazards while still meeting project requirements?**

1. *Based on the alternative sites and projects identified in criterion B, the project team presents evidence that the chosen project and site represent the lowest exposure to site hazards while still meeting project requirements. In certain cases, project teams can present evidence that the nature of the infrastructure requires its location in hazard-prone areas. Similarly, in certain cases, project teams can present evidence that a lower-risk alternative would not meet project requirements. The objective of this criterion is for project teams to demonstrate that the project and site were chosen intentionally with full understanding of the risk exposure and to justify why that was the best decision within the context of the project's reasonable constraints.*

**E. Was the site chosen to intentionally avoid known site hazards?**

1. *Evidence that the project team intentionally avoided siting the project in proximity to site hazards. Evidence should include alternative sites that were seriously considered.*

**F. Does the project remove or modify structures subject to frequent damage?**

1. *Documentation of structures, or other development, removed from the site. This may include structures at high risk of future damage or failure. Evidence should be clear that removal or modification of the structures will prevent or reduce the risk of future damage or loss. Replacing existing structures or other development with similarly at-risk structures does not qualify for this criterion.*

## RELATED ENVISION CREDITS

CR2.2 Assess Climate Change Vulnerability

CR2.3 Evaluate Risk and Resilience

CR2.5 Maximize Resilience

NW1.4 Preserve Undeveloped Land

NW3.3 Maintain Floodplain Functions

### PROJECT EXAMPLE: RIDGEWOOD VIEW PARK RESERVOIR AND PUMP STATION

The siting of the Ridgewood View Park Reservoir and Pump Station (Envision Gold, 2016) in Portland, Oregon was determined after a significant amount of geotechnical work was conducted to find the ideal location for the project, and to ensure the pump station and reservoir facilities would be fully operational in the event of a seismic event. Steep slopes were also avoided; the reservoir could have been constructed on the south end of the park near a steep slope that led to an ephemeral stream, or it could have been constructed within an existing reservoir situated on a steep slope. Neither of these options were selected. Instead, the reservoir was constructed on the north end of the park away from these areas, thus avoiding site-related risks.

# CR2.2 Assess Climate Change Vulnerability

20 POINTS

## INTENT

Develop a comprehensive climate change vulnerability assessment.

## METRIC

Scope and comprehensiveness of climate change vulnerability assessment.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| A + B | A + B + C | A + B + C + D | A + B + C + D + E | Not Available |
| **(8) Project Vulnerability** | **(14) System Vulnerability** | **(18) Community Vulnerability** | **(20) Knowledge Sharing** | |

**(A)** The project team conducts, or relies on, an existing, comprehensive threat/hazard identification study, or assessment, due to climate change. Threats/hazards are classified by:

- Duration: acute shocks over hours and days, or chronic stressors over years and decades.
- Extent of effects: project site (e.g., localized stormwater overflow), infrastructure system wide, or community wide (e.g., changes in climate).

The assessment should account for climate change's impact on the frequency, duration, and severity of threats/hazards.

**(B)** The project team determines vulnerabilities and increased risk to the project, or performance, over its operational life due to climate change-related threats. This should include whether current design variables will continue to meet performance goals over the life of the project under changing operating conditions (i.e., climate, weather patterns, natural hazard frequency and intensity).

**(C)** The project team determines vulnerabilities and increased risk to the connected/related infrastructure system or network due to climate change-related threats. This should include how project vulnerabilities may impact system performance and how system vulnerabilities may impact the project. This should include direct and indirect impacts such as resource and service availability.

**(D)** The project team determines vulnerabilities and increased risk to the broader community due to climate change threats. This should include how project vulnerabilities may impact the broader community and how community vulnerabilities may impact the project.

**(E)** The project team or owner shares climate threat findings in order to support and facilitate community awareness and their inclusion in future projects.

## DESCRIPTION

The credit addresses the project team's understanding of potential climate change impacts. This begins with identifying climate change threats and determining project vulnerabilities. The results of this credit assessment may overlap with CR2.3 Evaluate Risk and Resilience, which addresses all potential project risks. Project teams are encouraged to consider the synergies of addressing both CR2.2 and CR2.3.

Climate change is a serious threat to global development and security for current and future generations. Increased temperatures are increasing glacier loss and raising sea levels. Many low-lying coastal areas are directly at risk, with others facing devastating erosion. Inland areas dependent on snowmelt for freshwater have seen consistent decreases in water availability, and many mountains around the world, once perpetually snowcapped, are now seasonal. Entire permafrost ecosystems collapse as they shift into freeze-and-thaw cycles. Ocean temperatures influence the entire global weather system, and as temperature rises, the frequency, intensity, and pattern of storm systems changes and becomes more unpredictable. The extent of climate change impacts is far-reaching and not entirely understood. Many impacts exacerbate each other; for example, increased storm intensity and rising sea levels compound to make storm surges even more devastating to coastal communities.

Infrastructure development relies heavily on standards that are often based on historic trends that may no longer be an accurate predictor of future conditions. Infrastructure built to the standards of 70 years ago will not provide the level of service needed for the next 70 years. Infrastructure owners and project teams must consider how to make wise economic investments in order to ensure the prosperity, safety, and economic advantages of their community in the face of long-term climate change.

## PERFORMANCE IMPROVEMENT

A comprehensive climate change threat and vulnerability assessment is expected for all levels of achievement. Levels in this credit are distinguished by the scope of the assessment, beginning with the project (Improved) and expanding to include the infrastructure system (Enhanced) and broader community (Superior).

***Improved:*** This credit follows the standard methodology of identifying threats and vulnerabilities that is explained in greater detail in credit CR2.3 Evaluate Risk and Resilience. The assessment should specifically address changing design variables.

***Enhanced:*** While project resilience is important, project teams should consider the interdependencies of a project and its connected system. Islands of functionality/operability in a failed system may be of limited value. Infrastructure systems often rely on an interconnected network, or resources and services in order to function. Climate change may not directly impact the project, but it may impact the chain of resources and services a project needs in order to function efficiently.

***Superior:*** Resilience is best applied at a community level. Infrastructure is inherently connected to vast arrays of physical (other infrastructure) and nonphysical (socioeconomic) systems, and the purpose of resilient infrastructure is to support the health, safety, and functions of the broader community as a whole.

***Conserving:*** The assessment of climate change impacts, infrastructure vulnerability to climate change, and how to incorporate climate change considerations into infrastructure project delivery are still relatively new and unevenly applied concepts. There is significant value in project teams sharing their knowledge and experience in order to facilitate incorporating climate change considerations into future projects.

***Applicability:*** This credit is applicable to all projects potentially impacted by climate change, which is the vast majority of infrastructure.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. Has the project team determined climate change threats to the project and its surroundings?**

1. *Documentation that the project team has conducted a climate threat analysis or that an existing climate change study was available for the community.*
2. *Documentation that the climate threat analysis expands beyond direct impacts to the project and includes threats to the connected infrastructure system or related infrastructure network. For example, a water treatment facility outside the range of heightened storm surges from sea level rise may be disrupted by loss of pump stations located within the heightened range.*
3. *Documentation that the climate threat analysis expands beyond infrastructure systems and includes threats to the broader community. For example, how water-dependent infrastructure in a region at risk of drought would be competing with the community for limited resources.*

**B. Has the project team determined the vulnerability of the project to climate change threats?**

1. *Identification of project vulnerabilities to climate change threats reported in criterion A.*
2. *Documentation that a review was conducted of key design or performance standards to determine whether they would be impacted by changes in operating conditions due to climate change.*

**C. Has the project team determined the vulnerability of the infrastructure system to climate change threats?**

1. *Mapping of the interdependencies between the project and its connected infrastructure system. For example, a light rail station and its connected network of stations and rail lines, or a pump station and its connected water treatment system.*
2. *Identification of system vulnerabilities to climate change threats reported in criterion A.*
3. *Documentation that specific consideration was given to the dependence on resources or services such as materials, energy, water, transportation access, etc., and the future reliability or cost of these resources due to climate change impacts.*

**D. Has the project team determined the vulnerability of the community to climate change threats?**

1. *Mapping of the interdependencies between the project and community systems. This can include physical systems like energy, water, transportation, communication systems, waste removal, and/or food supply. It may also include nonphysical systems like emergency services, funding, regulations, workforce, and/or community/political support.*
2. *Identification of community systems' vulnerabilities to climate change threats reported in criterion A.*

**E. Has the project team or owner shared their climate threat findings?**

1. *Documentation that the project team or owner have shared, or will share, their climate threat findings with a broader audience. Information is shared publicly in order to increase general knowledge of climate threats, advance awareness, and support/facilitate the inclusion of climate threats into future projects.*

## RELATED ENVISION CREDITS

LD1.2 Foster Collaboration and Teamwork

LD2.2 Plan for Sustainable Communities

LD3.3 Conduct a Life-Cycle Economic Evaluation

RA3.1 Preserve Water Resources

NW1.2 Provide Wetland and Surface Water Buffers

NW2.2 Manage Stormwater

CR2.3 Evaluate Risk and Resilience

CLIMATE AND RESILIENCE: RESILIENCE

# CR2.3 Evaluate Risk and Resilience

26 POINTS

**INTENT**

Conduct a comprehensive, multihazard risk and resilience evaluation.

**METRIC**

Scope and comprehensiveness of the multihazard risk and resilience evaluation.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| A + B + C + D + E | A + B + C + D + E | A + B + C + D + E | A + B + C + D + E + F | NOT AVAILABLE |
| **(11) Project Evaluation** | **(18) System Evaluation** | **(24) Community Evaluation** | **(26) Integrated and Inclusive Approach** | |
| **(A)** The project team draws the assessment boundary for subsequent criteria (B, C, D, and E) around the project and its site. | **(A)** The project team draws the assessment boundary for subsequent criteria (B, C, D, and E) around the interdependencies of the project and its associated/connected infrastructure system/network. | **(A)** The project team draws the assessment boundary for subsequent criteria (B, C, D, and E) around the interdependencies of the project, its associated/connected infrastructure system/network, and the broader community. | | |
| **(B)** Understand the Asset: The project team identifies the objectives and performance goals of the project and related systems. It also identifies the critical assets, systems, and networks that are essential to meeting objectives and performance goals. This should include the associated dependencies and interdependencies within the system.<br>**(C)** Identify Threats/Hazards: The project team identifies threats/hazards (natural hazards and human-induced threats). Project teams may reference existing studies or assessments if relevant to the project and its context. Threats should include both acute shocks and chronic stressors.<br>**(D)** Identify Vulnerability: The project team identifies the vulnerabilities of the critical functions and dependencies of the infrastructure asset and its primary components identified in criterion B to the threats/hazards identified in criterion C.<br>**(E)** Evaluate Risk: The project team evaluates the project risk by determining the likelihood/probability of a threat/hazard occurring and the associated consequences/impacts. Consequences and impacts should be classified as social, environmental, and/or economic/financial. | | | | |
| | | | **(F)** The project team conducts the risk evaluation with the owner and a diverse and integrated team of key stakeholders. | |

## DESCRIPTION

This credit requires a comprehensive risk evaluation in order to understand potential hazards/threats and the project's vulnerability. As climate change is an overarching threat to many projects, CR2.2 Assess Climate Change Vulnerability can be considered a subcomponent of this broader credit addressing all potential risks. In turn, CR2.3 Evaluate Risk can form the foundation for credits CR2.4 Establish Resilience Goals and Strategies and CR2.5 Maximize Resilience.

Different disciplines and industries often use different terminology when discussing risk; however, the principles and processes are largely similar.

- Hazards/threats are events that have the potential to cause damage or harm, whether naturally occurring (hazards) or human-induced (threats).
- Vulnerability is a condition whereby a threat has the potential to disrupt or damage a project or system.
- Risk is the probability of a threat exploiting a vulnerability and the associated impacts and consequences.

For example, flooding might be a threat to a project, critical systems located below flood levels would be vulnerable to that threat, and risk would be an evaluation of the probability and severity of a flood event as a factor of the associated losses if the critical systems were flooded. Below is a list of common hazards/threats classified as acute shocks or chronic stressors.

| Acute Shocks (Short-term Duration/ Lower Predictability) | Chronic Stressors (Long-term Duration/ Higher Predictability) |
|---|---|
| Hurricanes | Aging Population |
| Earthquakes | Environmental Degradation |
| Wildfires | Sea Level Rise |
| Heat Waves | Drought/Water Shortage |
| Blizzards | Species Extinction |
| Health Epidemics | Aging Infrastructure |
| Flooding | Shrinking/Growing Population |
| Tornadoes | Global Warming |
| Terrorism | Increased Pollution/Contamination |
| Infrastructure Failure/Collapse | Food Availability |
| Subsidence and Liquefaction | Overtaxed/Inefficient Infrastructure |
| Chemical Spills | Financial Shortages |

**Risk Evaluation Steps**

1. **Draw the Boundary:** establish the boundary and scope of the assessment (criterion A).
   - Project (assessment includes risks to the project). (Improved)
   - System (assessment includes risks associated with the interdependencies of the project to its connected system) (Enhanced).
   - Community (assessment includes risks associated with the interdependencies of the project to its connected infrastructure system, as well as the interdependencies of the project and infrastructure system to their external network of systems) (Superior and Conserving).
2. **Understand the Asset** (criterion B):
   - Identify the objectives and performance goals of the project and related systems.
   - Identify the critical assets, systems, and networks that are essential to meeting objectives and performance goals.
   - Identify associated dependencies and interdependencies within the system.
3. **Identify Threats/Hazards:** Identify potential natural hazards or human-induced threats that have the potential to impact the project, system, and community (criterion C).
   - Identify Short-Term Threats (Acute Shocks)
   - Chronic Stressors
4. **Identify Vulnerability:** Identify the critical assets, systems, and/or networks essential to meeting objectives and performance goals that are susceptible to the identified threats/hazards (criterion D).
5. **Evaluate Risk:** Risk is the potential for loss or damage resulting from a threat/hazard exploiting a vulnerability. It is a product of the likelihood of occurrence and the associated consequences (criterion E).
   - Determine the likelihood/probability of a threat/hazard occurrence.
   - Determine the associated consequences/impact of the occurrence in each category of social (people, community), environmental (contamination, destruction), or economic (cost of repair, financial losses).

## PERFORMANCE IMPROVEMENT

***Improved:*** A comprehensive and thorough risk evaluation is required for all levels of achievement in this credit. Levels are distinguished by the scope of the assessment boundary. This begins with the project and site.

***Enhanced:*** Expands the assessment to the integrated infrastructure system.

***Superior:*** Expands the assessment to the broader network of interdependent systems throughout the community.

***Conserving:*** Additional points are given in Conserving for conducting the risk evaluation through an integrated and diverse process. Often, individuals with diverse backgrounds, perspectives, or skill sets can add value by bringing attention to threats and vulnerabilities that might otherwise be overlooked.

***Applicability:*** It is likely that all projects would benefit from a thorough investigation of potential risks. It would, therefore, be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award. Risks are not always major catastrophic events; small and large projects alike may consider how crime/vandalism or personal injury are also potential risks with associated impacts.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. To what extent does the project team's risk assessment include the project, infrastructure system, and community?**

1. *Evidence that the documentation in criteria B, C, D, and E sufficiently addresses the scope required in the level of achievement: project (Improved), infrastructure system (Enhanced), and community (Superior and Conserving).*

**B. Has the project team identified the critical functions and dependencies of the infrastructure asset and its primary components?**

1. *Documentation that project teams conducted a review to identify critical functions and dependencies of the infrastructure asset and its primary components. Note that documentation for B, C, D, and E can be submitted together as part of the comprehensive risk evaluation.*
2. *Mapping of the interdependencies between the project and its connected infrastructure system (for example, a light rail station and its connected network of stations and rail lines, or a pump station and its connected water treatment system (Enhanced and above).*
3. *Mapping of the interdependencies between the project and community systems. This can include physical systems like energy, water, transportation, communication systems, waste removal, and/or food supply. It may also include nonphysical systems like emergency services, funding, regulations, workforce, and/or community/political support (Superior and Conserving).*

**C. Has the project team identified the threats or hazards to the project and its surroundings?**

1. *Documentation that the project team has identified threats/hazards or that existing threat/hazard studies were available and are sufficient and comprehensive for the project. Projects that pursue CR2.1 may provide that documentation for climate threats. However, documentation in this credit should extend beyond climate threats.*

   *Note that project teams can and should augment existing threat/hazard studies in their documentation if the studies do not fully capture all potential threats to the project.*

**D. Has the project team identified the vulnerabilities of the critical functions and dependencies of the infrastructure asset?**

1. *Identification of the vulnerabilities of the critical functions and dependencies of the infrastructure asset and its primary components identified in criterion B to the threats/hazards identified in criterion C.*

**E. Has the project team evaluated risks by determining the probability of a threat or hazard occurring and the associated impacts?**

1. *Documentation of the potential for loss or damage resulting from the threats and hazards identified in criterion C exploiting vulnerabilities identified in criterion D. This should be presented as a product of the likelihood of occurrence and the associated consequences. Consequences and impacts should be classified as social, environmental, and/or economic/financial.*

**F. Did the risk evaluation conducted by the project include the participation of the owner and a diverse and integrated team of key stakeholders?**

1. *Documentation of the risk evaluation process and evidence of participation by the owner and key stakeholders. Applicants should explain how the stakeholders represented a diverse set of perspectives appropriate to the scope of the project.*

## RELATED ENVISION CREDITS

LD2.2 Plan for Sustainable Communities

LD3.3 Conduct a Life-Cycle Economic Evaluation

CR2.2 Assess Climate Change Vulnerability

CR2.4 Establish Resilience Goals and Strategies

CR2.5 Maximize Resilience

## PROJECT EXAMPLE: OHIO RIVER BRIDGES-EAST END CROSSING

The Ohio River Bridges-East End Crossing (Envision Platinum, 2016) resulted from a long-planned collaboration between the State of Indiana and the Commonwealth of Kentucky. It is designed to address cross-river mobility challenges in the Louisville Metropolitan Area, improve safety and reduce traffic congestion, stimulate the local economy and integrate with existing highways. It has also been designed to be resilient to significant potential climate change risks such as heat wave intensity and flooding, both of which were identified as risks in the region's climate change assessment and adaptation plans.

# Marshalltown Generating Station: Marshalltown, Iowa

Alliant Energy's Marshalltown Generating Station (Envision Platinum, 2017) in Iowa advances clean energy for customers and communities, while significantly reducing its environmental footprint. The project is a natural gas combined cycle facility with a 650-megawatt capacity, providing enough electricity to power 500,000 Iowa homes and businesses. Compared to traditional coal-fired generation, the Marshalltown generating station emits less than half the carbon dioxide, about two-thirds less nitrogen oxide, and roughly 99 percent less sulfur and mercury. The project team credits Envision for helping them design and deliver more sustainability and economic benefits in the project.

Notable achievements for the Marshalltown Generating Station within the Envision categories include:

**Quality of Life:** The project provides a number of additional benefits for the local community, including improved quality of existing electric and gas capacity for businesses, industry and the public. The new gas pipeline connecting the existing Northern Border Power pipeline and the Marshalltown Generating Station was sized to meet expected future population growth and increased demand for natural gas in the Marshalltown area. Improving the natural gas delivery system in the city will also lower the long-term delivery cost of natural gas to the community, thereby saving residents and businesses an estimated $1 million annually.

**Leadership**: The Marshalltown Generating Station created a significant number of jobs during the design, construction and operational phases. During construction, an average of 650 jobs were created with nearly 40% of these workers from Marshalltown, and the remainder commuting from nearby cities and towns. These new jobs brought significant revenue to local businesses, including hotels, restaurants, and other stores. The completed generating station now employs roughly 20 permanent employees. As the largest development project in the City of Marshalltown in more than twenty years, the USD $700 million facility is expected to bring millions of dollars in tax revenue benefits to Marshall County and to the state of Iowa.

**Natural World:** Alliant Energy, working in conjunction with the project team and local stakeholders, restored a significant portion of the project site to create a new nature trail, consisting of natural habitats located near the project. Prairie and pollinator habitats replace previously planted monoculture row crops, and the habitats are accessible to the public. The seven acres of new public space provides visitors with the opportunity to learn more about the benefits of natural prairie and pollinator habitats. A walking trail with educational signage is open to visitors daily.

**Climate and Resilience:** Alliant Energy completed several detailed studies to understand potential climate change and other risks to the project. For example, the firm undertook a detailed analysis to understand the extent to which the Marshalltown Generating System would reduce greenhouse gas (GHG) emissions from the originally-proposed coal-fired facility that was formerly planned to be constructed in the area. The GHG assessment revealed that the station is expected to reduce emissions by more than 40 percent over a 25-year period.

In addition, Alliant Energy conducted an assessment of resource demands and supplies, and resource and infrastructure vulnerabilities. Seven specific risks to the project were proactively identified by the company and intentionally mitigated by the design, including potential shortages in fuel and water resources; flooding and spills; and changes in heat, snow loads, and wind speeds. Ultimately the generating station was designed to be resilient and adaptive to potential changes in the operating environment over the course of its life.

# CR2.4 Establish Resilience Goals and Strategies

20 POINTS

## INTENT

To support increased project and community resilience through the establishment of clear objectives and goals.

## METRIC

The degree to which resilience goals expand from initial commitments to quantifiable project objectives, long-term operating plans, and community-wide development plans.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| Not Available | A + B | A + B + C | A + B + C + D | Not Available |
| | **(8) Strategy Development** | **(14) Stakeholder Input** | **(20) Shared Community Goals** | |
| | **(A)** The project team determines the performance goals of the project and the owner's acceptable level of risk.<br>**(B)** The project team uses the results of a risk evaluation (e.g., CR2.3) to develop risk management strategies that meet project performance goals and budget, and increase project resilience. The project team prioritizes strategies that result in the greatest reduction of risk within project cost constraints. | | | |
| | | **(C)** The project team engages the owner and key stakeholders in developing or reviewing resilience goals and strategies. | | |
| | | | **(D)** The project team aligns project resilience goals with broader community- or region-wide resilience goals and plans.<br>OR<br>If community resilience goals are lacking, the project team publicly shares its resilience goals in support of developing broader community goals. | |

## DESCRIPTION

This credit addresses expanding resilience goals from initial commitments to quantifiable project objectives, long-term operating plans, and community-wide development plans. Projects are more likely to achieve resilience outcomes when owners, designers, contractors, and all involved in the project team establish clear and quantifiable performance targets. Conversely, achieving increased resilience is unlikely when efforts are piecemeal and uncoordinated. While every project contributes to the overall resilience of the infrastructure system, the ultimate objective is always a more resilient community as a whole. This requires coordination and cooperation beyond the boundaries of the project.

The benefits of increased resilience include avoided losses of life, health, assets, and/or operating time and their associated costs. Most studies estimate that every dollar spent on preparedness and prevention saves four dollars in recovery and relief. The increase in global population and spread of human development, combined with the increased frequency and intensity of extreme weather events, means that more people are being exposed to greater risks. Studies from the reinsurance company Swiss Re indicate that global insured losses due to natural catastrophes have increased dramatically over the past four decades. Infrastructure owners should consider the cost savings and benefits of developing more resilient systems.

According to the Rockefeller Foundation's City Resilience Framework, characteristics of a resilient system include being resourceful, inclusive, integrated, robust, flexible, redundant, and reflective. Ultimately, the objective is to be as resilient as possible while being as resource efficient (resourceful) as possible. This necessitates an inclusive (people) and integrated (systems) approach. Risk is a factor of the probability of a threat/hazard occurring, the project's vulnerability, and the associated impacts/consequences (R = T x V x I).

There are many ways to classify or organize resilience strategies. Below is one way of classifying resilience strategies:

- **Vulnerability Reduction**
  - **Eliminate/Avoid:** The project eliminates or avoids the potential threat.
  - **Accommodate**: The project is designed to overcome the threat.
    - Durability/Robustness
    - Adaptability/Flexibility
- **Impact/Consequence Reduction**
  - **Minimize**: The project is designed to minimize the impact of a failure.
    - Redundancy/Diversity
    - Preparedness
  - **Restore**: The project is designed to quickly or more easily recover from losses.
    - Recovery/Response
- **No Action**
  - **Accept**: The likelihood and impacts are deemed an acceptable risk.

## PERFORMANCE IMPROVEMENT

***Enhanced:*** A comprehensive and thorough risk evaluation is required as a prerequisite for all levels of achievement in this credit. It is not possible to establish resilience goals without first understanding the risks. Levels in this credit are distinguished by the inclusivity of the goal setting process.

***Superior:*** The process for establishing goals and strategies extends beyond the project team to include the owner and key stakeholders (operators, contractors, interdependent facilities, or community stakeholders).

***Conserving:*** While projects can take steps to increase their own resilience, resilience is most effective when considered at the community, city, or regional scale. Therefore, project teams should consider the advantage of engaging with stakeholders to align project goals with those of the broader community.

***Applicability:*** All projects that are exposed to risks would benefit from establishing resilience goals and strategies. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. Has the project team identified the project performance goals and risk appetite of the owner?**

1. *Documentation identifying key performance objectives of the project that will form the foundation of the risk assessment.*
2. *Documentation explaining the owner's approach to risk management on the project. This is the guide for separating "acceptable risks" from risks that require mitigation and management.*

**B. Has the project team developed risk management strategies based on a comprehensive risk evaluation?**

1. *Documentation that the project team has conducted a risk evaluation, including at minimum:*
   - *Identification of the objectives and performance goals of the project and related systems.*
   - *Identification of the critical assets, systems, and networks essential to meeting objectives and performance goals.*
   - *Threats/hazards identification*
   - *Vulnerability assessment*
   - *Likelihood/probability of threat/hazard occurrence.*
   - *Consequences/impact of the occurrence*
2. *List or matrix of potential risk management strategies that could be implemented to reduce project risk and increase resilience. Strategies should be prioritized according to their risk reduction potential and any extenuating factors (cost, availability, reliability, effectiveness, etc.)*

**C. Have key stakeholders been engaged in developing resilience goals?**

1. *Evidence of participation by the owner and key stakeholders in developing or reviewing resilience goals. Applicants should explain how the stakeholders represented a diverse set of perspectives appropriate to the scope of the project. Evidence should indicate that stakeholder engagement was meaningful and produced useful feedback on establishing or prioritizing resilience goals.*

**D. Is the project part of, or does it support, larger community resilience or climate change adaptation goals?**

1. *Documentation of broader community or regional resilience goals (for example, as stated in existing resilience or climate change adaptation or preparedness plans). Documentation may include a pre-existing plan developed independently of the project or a plan developed by the project and shared with relevant government agencies.*
2. *Documentation of a direct connection between the project and the broader community resilience goals it supports. Documentation explains how the project contributes to or supports these goals.*

   *OR*

   *If the community- or region-wide resilience goals are lacking, the project team can alternatively submit documentation that the project's resilience goals were shared publicly in order to support development of broader resilience goals within the community.*

## RELATED ENVISION CREDITS

QL1.2 Enhance Public Health and Safety

LD1.1 Provide Effective Leadership and Commitment

LD2.2 Plan for Sustainable Communities

LD3.3 Conduct a Life-Cycle Economic Evaluation

CR2.2 Assess Climate Change Vulnerability

CR2.3 Evaluate Risk and Resilience

CR2.5 Maximize Resilience

CLIMATE AND RESILIENCE: RESILIENCE

# CR2.5 Maximize Resilience

26 POINTS

## INTENT

Increase resilience, life-cycle system performance, and the ability to withstand hazards by maximizing durability.

## METRIC

The degree to which the project incorporates elements that increase durability, the ability to withstand hazards, and extend useful life.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| A + B | A + B + C | A + B + C + D | A + B + C + D + E | Not Available |
| **(11) Improved Resilience Performance** | **(15) Thorough Implementation** | **(20) Ongoing Resilience Monitoring** | **(26) Quantifying Improvement** | |
| **(A)** The project team develops resilience goals and strategies (e.g., CR2.4) based on a detailed risk evaluation of the project (e.g., CR2.3).<br>**(B)** The project team takes a comprehensive approach to implementing resilience strategies. | | | | |
| | **(C)** The project team periodically monitors the implementation of resilience strategies and revisits their effectiveness in addressing project risk throughout project development. | | | |
| | | **(D)** Resilience strategies are incorporated into the operations and maintenance of the project. Organization(s) responsible for the ongoing operation of the project have systems in place to maintain, grow, learn, and continually improve resilience capabilities (i.e., "plan, do, check, act"). | | |
| | | | **(E)** The project team establishes methods for measuring/quantifying the benefits of resilience strategies implemented (e.g., monetary savings from avoided damage or service loss, accelerated recovery time). | |

## DESCRIPTION

This credit addresses the implementation of strategies and systems to increase the resilience of the project. While it can be assessed independently, it should be considered as a continuation of the previous resilience credits. After identifying vulnerabilities and risk (CR2.2 Assess Climate Change Vulnerability and CR2.3 Evaluate Risk and Resilience), and establishing resilience goals and strategies (CR2.4), it is time to implement the strategies on the project. This credit is independent because successful and effective implementation requires a range of actions beyond the resilience strategies themselves.

## PERFORMANCE IMPROVEMENT

***Improved:*** Resilience is critical to a project's long-term success and cannot be parsed in partial achievements. Therefore, the credit begins with a comprehensive implementation of resilience strategies sufficient to address identified risks. The levels in this credit are distinguished by the rigor in implementing the strategies.

***Enhanced:*** Consideration of resilience cannot be limited to early conceptual design. Projects change during development, and as such the implementation of resilience strategies should be regularly monitored and revisited in order to ensure their continued effectiveness and to capture new opportunities as they arise.

***Superior:*** Implementation of resilience strategies should also not end with project delivery. While better-designed projects have an advantage, the ultimate test of project resilience will occur during operations. Therefore, operators should be engaged to develop systems of continual learning and improvement.

***Conserving:*** Quantifying the benefits of resilience performance validates project decisions, provides a basis for future operational improvements, and generates valuable knowledge for future projects and the industry as a whole.

***Applicability:*** All projects that are exposed to risks would benefit from increased resilience. It would therefore be

difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. Has the project team developed resilience goals and strategies based on a comprehensive risk evaluation?**

1. *Documentation of a comprehensive risk evaluation. Projects pursuing CR2.2 may submit their credit documentation. Applicants may refer to CR2.2 for guidance on conducting a risk evaluation and relevant documentation.*
2. *List or matrix of resilience goals and risk management strategies prioritized according to their risk reduction potential and any extenuating factors (cost, availability, reliability, effectiveness, etc.)*

   *Note that for this criterion, documentation must be relevant and specific to resilience goals.*

**B. Has the project team implemented resilience strategies sufficient to address major project risks and improve project resilience?**

1. *Documentation that strategies implemented in the project increase resilience. Project teams should explain how the strategies address one or more of the core principles of resilient systems:*
   - *Reflective (learning and improving)*
   - *Resourceful (resource efficient, creative)*
   - *Inclusive (shared action and responsibilities)*
   - *Integrated (diverse systems, institutions, and people)*
   - *Robust (durable, well constructed)*
   - *Redundant (diverse, fault tolerant)*
   - *Adaptable (flexible, changeable)*

**C. Has the project team periodically monitored the implementation of project resilience strategies and reviewed their continued effectiveness throughout project delivery?**

1. *Project-specific report(s), or meeting minutes, detailing how the project will carry out the implementation of resilience strategies through construction and which key performance indicators will be used to measure and manage initiatives.*
2. *Project-specific sustainability report(s), or meeting minutes, detailing how the project team revisited resilience strategies during project development to ensure their continued effectiveness in the face of potential changes in project design or parameters.*

**D. Will resilience goals and strategies be incorporated into the ongoing operations and maintenance of the project?**

1. *Documentation of operations and management plans, or coordinated efforts with organizations responsible for project operations, that establish plan-do-check-act systems that learn and continually improve resilience capabilities.*
2. *Documentation that any relevant resilience features provide sufficient operations and maintenance guidance to ensure their effectiveness during operations.*

   *Note that for this criterion, documentation must be relevant and specific to resilience goals. Project teams are encouraged to share their resilience strategies, as well as their performance and effectiveness over time during operations. Actions and commitments to do so may qualify for innovation points under CR0.0 Innovate or Exceed Credit Requirements.*

**E. Does the project include methods for measuring or quantifying resilience performance targets?**

1. *Documentation of the calculations and methodology the project team used to quantify resilience goals and outcomes. Many risk management strategies are justifiable through qualitative assessments or do not require justification. However, when possible, quantifying the benefits of increased resilience through objective measure (e.g., cost savings, improved service) can support their implementation on the project and benefit the knowledge and understanding of the broader resilience community.*

## RELATED ENVISION CREDITS

LD2.3 Plan for Long-Term Monitoring and Maintenance

LD2.1 Establish a Sustainability Management Plan

LD3.1 Stimulate Economic Prosperity and Development

LD1.4 Pursue Byproduct Synergies

QL1.1 Improve Community Quality of Life

QL1.2 Enhance Public Health and Safety

CR2.2 Assess Climate Change Vulnerability

CR2.3 Evaluate Risk and Resilience

CR2.4 Establish Resilience Goals and Strategies

CLIMATE AND RESILIENCE: RESILIENCE

# CR2.6 Improve Infrastructure Integration

18 POINTS

## INTENT

Enhance the operational relationships and strengthen the functional integration of the project into connected, efficient, and diverse infrastructure systems.

## METRIC

The degree to which the project is integrated into other connected systems, where beneficial and appropriate, in order to increase resilience and systems performance.

## LEVELS OF ACHIEVEMENT

| IMPROVED | ENHANCED | SUPERIOR | CONSERVING | RESTORATIVE |
|---|---|---|---|---|
| A | A + B | A + B + C | A + B + C + D | A + B + C + D + E |
| **(2) Internal Integration** | **(5) Risk Reduction** | **(9) Systems Integration** | **(13) Community/ Network Integration** | **(18) Information Integration** |

**(A)** The project increases internal systems integration in order to achieve efficiency or system diversity.

**(B)** Integration strategies increase resilience and reduce the risk of systemic or cascading failures.

**(C)** The project leverages its relationship within a larger infrastructure system in order to achieve efficiency or system diversity.

**(D)** The project integrates networks of infrastructure systems (e.g., water and transportation) in order to achieve efficiency or system diversity. In certain cases, projects may substitute the community integration of non-physical social or economic systems.

**(E)** The project integrates data or monitoring systems with reporting or preparedness systems in order to learn and improve performance over time.

## DESCRIPTION

This credit assesses the degree to which the project is integrated into other connected systems, where beneficial and appropriate, in order to increase resilience and system performance. Optimal infrastructure performance integrates all infrastructure elements at the community level. Therefore, each new or renovated element of infrastructure ideally is designed and constructed to take into account how that element will link with, support, and act in harmony with other existing and planned infrastructure elements. While historic infrastructure development focused on a "one problem, one solution" model, increasingly communities are realizing cost savings and improved performance from layering and integrating infrastructure goals.

The ubiquitous availability and access to smart technology and data also presents a new opportunity for infrastructure integration. However, project teams should guard against introducing vulnerabilities, and, rather, integrate systems and technology in order to increase resilience and reduce the risk of systemic or cascading failure. Integrated systems can provide multiple benefits, including but not limited to:

- Efficiency – An integrated systems approach can identify conflicts, achieve higher efficiency, or leverage co-benefits.
- Diversity – Integrated systems can often function in a variety of ways, under various conditions, or in multiple configurations. This increases resilience and can reduce the need for redundant backups.

## PERFORMANCE IMPROVEMENT

***Improved:*** The project team focuses on integration of internal systems within the project.

***Enhanced:*** The project team focuses on ensuring integration increases resilience and does not introduce vulnerabilities such as cascading or systemic failures.

***Superior:*** The project team considers the role of the project within its larger infrastructure system. This may include networks of water treatment, roads, transit, energy, solid waste, parks, and more.

***Conserving:*** The project contributes to the beneficial integration of multiple infrastructure systems. For example, how improved stormwater design can decrease traffic accident morbidity,

how access across a facility can increase community mobility, or how transportation design can benefit and enhance waste diversion and recycling collection. Infrastructure systems support each other in order to achieve higher performance.

***Restorative:*** The project team integrates data or monitoring systems in order to achieve higher performance beyond project delivery. Integrating systems is not only about physical connections, since integrated systems are often effective only when monitored, maintained, and operated as intended.

***Applicability:*** It is likely that all infrastructure would, and should, benefit from the application of an integrated systems approach. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. Does the project increase internal systems integration?**

1. *Documentation of how systems within the project were integrated or coordinated in order to achieve efficiencies, redundancies, or system diversity.*

**B. Will the infrastructure integration reduce the risk of systemic or cascading failures?**

1. *Documentation that the project team understands critical failure points and that efforts to integrate internal or external systems will decrease rather than increase the risk of system or cascading failures.*

**C. Does the project increase external systems integration?**

1. *Documentation that the project improves the efficiency, redundancy, or system diversity of the larger infrastructure system beyond the project boundary.*

**D. Does the project integrate infrastructure networks?**

1. *Documentation that the project team made efforts to identify and leverage opportunities to integrate infrastructure networks in order to achieve efficiency, redundancy, or system diversity. The project may demonstrate that it is part of a larger program, policy, or initiative to improve cross-sector performance and sustainability.*

**E. Does the project integrate data or monitoring systems in order to improve performance?**

1. *Documentation that the project includes integrated monitoring or data gathering systems in order to improve performance during operations.*

## RELATED ENVISION CREDITS

QL2.2 Encourage Sustainable Transportation

LD2.2 Plan for Sustainable Communities

NW1.4 Preserve Undeveloped Land

LD1.4 Pursue Byproduct Synergies

CLIMATE AND RESILIENCE: INNOVATION

# CR0.0 Innovate or Exceed Credit Requirements

+10
POINTS

## INTENT

To reward exceptional performance beyond the expectations of the system and application of innovative methods that advance state-of-the-art sustainable infrastructure.

## METRIC

Whether project sustainability performance qualifies as innovation, exceptional performance, or is not otherwise recognized in existing credits.

## LEVELS OF ACHIEVEMENT

| INNOVATION |
|---|
| A or B or C |
| **(+1-10) Innovate or Exceed Credit Requirements** |
| **(A)** Implement innovative methods, technologies, or processes that are novel either in their use, application, or within the local regulatory or cultural context.<br>OR<br>**(B)** Implement measures that exceed the highest existing requirements within one or more Climate and Resilience credits.<br>OR<br>**(C)** Address additional aspects of sustainability not currently recognized in Envision |

## DESCRIPTION

This credit addresses instances in which projects:

1. Implement innovative methods, resources, technologies, or processes that are novel in their use, application, or within the local regulatory or cultural context of the project;
2. Exceed the performance requirements of one or more credits; and/or
3. Address additional aspects of sustainability not currently recognized in Envision

Points for this credit are not calculated in the overall applicable points and, therefore, act as bonus points. Given the nature of the credit, the broad format of which is intended to encourage creative infrastructure solutions, thorough documentation is expected. Project teams may pursue more than one of the three possible options for this credit, or pursue multiple for the same option, for a total of up to ten (10) bonus points.

## PERFORMANCE IMPROVEMENT

***Innovation***:

To qualify for innovation points, projects must implement innovative methods, resources, technologies, or processes (e.g., the use of a pre-existing technology in a new way or the successful application of a technology or methods in regions or locales where existing policies, regulations, or general opinion have prevented their use). In these circumstances, it is imperative to prove that the application of the technology does, and will continue to, meet performance expectations and that it does not have a corresponding negative impact on the local or global environment, economy, or community.

Projects may demonstrate they implement innovative methods, technologies or processes in several ways:

- The project is an early adopter of new technology or methods that can demonstrably improve project performance without negative trade-offs;
- The project uses technologies or methods that may be general practice in other regions or parts of the world, but within the context of the project (whether climate, regulations, policies, political support, public opinion, etc.) have not yet gained acceptance. Significant efforts are taken to demonstrate the effectiveness of the technology or method within the context and provide a precedent for future adoption.
- The project team takes significant steps to include research goals within the project's development, or work with a university or research organization to advance the general knowledge of the profession. Proprietary research that is not made publicly available cannot count toward achieving this credit.

Project teams must also demonstrate that the innovation serves a purpose. This can be done in one of two ways:

- Overcoming significant problems, barriers, or limitations—Project teams demonstrate that the innovation reduces or eliminates significant problems, barriers, or limitations that previously hampered the use of the new methods, technologies, or processes implemented on the project.

- Creating scalable and/or transferable solutions—Project teams demonstrate that new methods, technologies, or processes implemented on the project are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.

***Exceptional Performance:***

To qualify for exceptional performance points, projects must meet the highest level of achievement for one or more Climate and Resilience credits. For example, projects seeking additional points in credit CR1.1 Reduce Net Embodied Carbon must already be achieving at least a 50% reduction in total embodied carbon of materials over the life of the project. In this case, exceptional performance may be pursued by projects whose design and operations achieves a significantly higher percentage than the minimum called for in the Conserving level of achievement. Exceptional performance may not be pursued by projects that have a basic primary function that meets the requirements (e.g., a decommissioning project).

Possible areas of achievement in exceptional performance for Climate and Resilience may include, but are not limited to, the following:

- Projects that exceed 50% reductions in net embodied carbon;
- Projects that go beyond carbon negative to become large-scale carbon sinks for greenhouse gas emissions;
- Projects for which climate change preparedness and resilience is critical for protecting public safety, availability of services, or long-term community finances at a scale beyond project boundaries (e.g., including long-term weather prediction in levees protecting communities).

***Address Additional Aspects of Sustainability:***

To qualify for bonus points under this approach, project teams must demonstrate that they are addressing one or more aspects of sustainability not currently recognized in Envision. Sustainability performance must be related to Climate and Resilience. Addressing an aspect of sustainability not currently covered by the Envision system might sometimes be considered innovative, in which case the requirements for the Innovation path may be followed. For example, a project may earn bonus points for:

- Managing urban heat island effects through significant shading, or SRI requirements for both vertical and horizontal hardscape areas.
- Anticipating and addressing security risks from quantum computing.

## EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

**A. To what extent does the project implement innovative methods, technologies, or processes that overcome significant problems, barriers or limitations, or create scalable and transferable solutions?**

1. *Documentation of the application of innovative technologies or methods. Detailed description of how this application will improve existing conventional practice either globally or within the unique context of the project. Provide justification as to why this application should be considered innovative either as a technology, a method, or within the project context (climate, political, cultural, etc.).*
2. *Documentation that the project reduces or eliminates significant problems, barriers, or limitations that previously hampered the use or implementation of certain resources, technologies, processes, or methods that improve the sustainability of the project. Alternatively, documentation that the new methods, technologies, or processes implemented on the project are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.*

**B. To what extent does the project exceed the highest levels of achievement for a given credit?**

1. *Detailed documentation of how the project exceeds the existing requirements currently within a given Climate and Resilience credit.*

**C. To what extent does the project address a sustainability aspect that is not currently addressed by the Envision system?**

1. *Detailed documentation of how the project addresses a sustainability aspect that is not currently addressed by the Envision system.*
2. *Documentation showing how this aspect relates to the Climate and Resilience category.*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