ENVISION V3 DRAFT CREDITS
FOR PUBLIC REVIEW AND COMMENT

SEPTEMBER 6 - NOVEMBER 1
2017
Envision v3
Draft credits for public review and comment

BACKGROUND

Developed and maintained by the Institute for Sustainable Infrastructure (ISI), the purpose of Envision® is to foster a dramatic and necessary improvement in the sustainability and resilience of physical infrastructure. Envision provides the framework and incentives needed to initiate this systemic change. Envision is a decision-making guide, not a set of prescriptive measures; it provides industry-wide, universal sustainability metrics (both qualitative and quantitative) for all types and sizes of infrastructure assets. Envision is used by infrastructure owners, engineers, planners, designers, and other sustainability professionals primarily as a self-assessment tool; it is used to self-assess infrastructure projects in relation to their economic, environmental, and social contributions. ISI also offers an optional verification program to help users calibrate their self-assessments through an independent, third-party review process, as well as a professional training and credentialing program based on Envision professionals in the civil infrastructure industry.

Why is ISI releasing a new version of Envision?

After five years of applying Envision on billions of dollars’ worth of infrastructure assets, the industry has progressed significantly, and ISI has learned a great deal about the Envision assessment process and how Envision is applied to real-world projects. ISI has captured lessons learned through the use of Envision on infrastructure projects and is incorporating these key lessons into the next version of Envision, known as Envision v3. For example, the industry understanding of resilience has grown tremendously, especially in the wake of hurricanes Katrina and Harvey; therefore, ISI identified the need to expand the framework to incorporate a more advanced appreciation and understanding of resilience. Also, ISI identified the need to place greater emphasis on evaluating the economics of infrastructure projects, as well as the need to extend the framework to more specifically to include construction-related sustainability aspects.

Who was involved in the development of the next version of Envision?

The process of developing Envision v3 began two years ago in September 2015. At that time, 65 professionals from across the United States and Canada divided into 13 Technical Committees based on their expertise and spent nearly a year reviewing the Envision credits and laying the foundation for Envision v3. The work of the Technical Committees was then carried forward by ISI staff and the Envision Review Board, a group of industry-leading professionals accountable to the ISI Board of Directors for maintaining the integrity of the Envision framework.
CONTENTS OF THIS DOCUMENT

This document contains the draft Envision v3 credits which are the foundational component of the Envision framework. **ISI is seeking feedback on the draft credits from September 6 – November 1, 2017.** Feedback collected during the public review and comment period will be analysed and used to make Envision v3 as robust, credible, and industry-relevant as possible.

**ISI is accepting feedback on the draft credits contained in this document through an online survey tool.** Feedback will not be accepted via any other means; however, ISI has also made available a Word version of the survey which can be used by respondents to prepare their feedback in advance of inputting it into the online survey tool. Please refer to [https://sustainableinfrastructure.org/envision-v3](https://sustainableinfrastructure.org/envision-v3) to access both the online and Word versions of the Envision v3 feedback survey. Full instructions on how to complete the survey are included in both the online and Word versions.

Thoroughly reviewing this document is essential prior to providing feedback via the online survey tool.

There are 64 credits in this document, divided into five credit categories: Quality of Life (QL), Leadership (LD), Resource Allocation (RA), Natural World (NW), and Risk and Resilience (RR). Each credit in this document is structured as follows:

- **Credit Title and Identification Number:** Includes the two-letter code identifying the category and a number identifying the credit (e.g., QL1.1 is the first credit in the Quality of Life category).

- **Intent:** A short statement outlining the purpose of the credit.

- **Metric:** How the credit will be measured.

- **Levels of Achievement:** A table providing an overview of the requirements necessary to meet each possible level of achievement for a credit. Each credit has up to five levels of achievement: Improved, Enhanced, Superior, Conserving, and Restorative. Levels increase in their contribution towards sustainability and each level of achievement has an associated point value.

- **Evaluation Criteria and Documentation Guidance:** Specifies the questions that the project team must address in order to meet the requirements of a level of achievement, including documentation requirements.

- **Description:** Explanation of the sustainability issue addressed by the credit and its importance in the context of infrastructure projects.

- **Performance Improvement:** Guidance on advancing from conventional design standards to higher levels of sustainability.
**ENVISION V2 AND ENVISION V3**

*What remains the same?*

Envision is a sustainability framework used to assess infrastructure projects of all types and sizes (e.g., airports, bridges, levees, parks, pipelines, ports, power plants, roads, solid waste processing facilities, stormwater projects, streetcars, wastewater treatment facilities, wind farms, etc.) based on their overall contribution to the economic, environmental, and social aspects of sustainability. Envision is not meant to address human occupied, interior conditioned buildings such as offices or multi-unit residential buildings.

Envision is primarily meant to be used as a self-assessment tool, though ISI also provides an optional verification program to help users calibrate their self-assessments through an independent, third-party review process. Projects that earn at least 20% of applicable points in the Envision framework earn an award and public recognition.

Envision can be used in the early planning and design stages of infrastructure development, or used retroactively (post construction) to validate sustainable performance.

*What's different about Envision v3?*

The table below summarizes some of the main differences between Envision v2 and Envision v3.

<table>
<thead>
<tr>
<th></th>
<th>Envision v2</th>
<th>Envision v3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number of credits</strong></td>
<td>60</td>
<td>64</td>
</tr>
<tr>
<td><strong>Maximum total points</strong></td>
<td>809</td>
<td>1000</td>
</tr>
<tr>
<td><strong>Primary focus</strong></td>
<td>Infrastructure Planning and Design, with credits that consider other life-cycle phases such as construction, operations and maintenance, and end-of-life.</td>
<td>Infrastructure Planning, Design, and Construction, with credits that include other life-cycle phases such as operations and maintenance, and end-of-life.</td>
</tr>
<tr>
<td><strong>Topics covered by credits</strong></td>
<td>Broad range of sustainability topics covered by credits.</td>
<td>Broad range of sustainability topics covered by credits with additional credits on these topics: lifecycle economic evaluation, equity and social justice, sustainable community planning, construction phase energy consumption, construction phase water consumption, construction phase waste diversion.</td>
</tr>
<tr>
<td><strong>Levels of Achievement</strong></td>
<td>Five (5): Improved, Enhanced, Superior, Conserving, Restorative.</td>
<td>Five (5): Improved, Enhanced, Superior, Conserving, Restorative with enhanced clarity on how to achieve each level of achievement, the differences between them, and specific documentation requirements for each.</td>
</tr>
<tr>
<td><strong>Verification and award program</strong></td>
<td>Optional program offered by ISI. An Envision award can be achieved at 95% design completion. There is no post-construction follow-up.</td>
<td>Optional program offered by ISI. An Envision award can be achieved at 95% construction completion. An optional provisional award, recognizing achievement in sustainable planning and design, can be achieved at 95% design completion.</td>
</tr>
</tbody>
</table>
Envision v2 | Envision v3
---|---
Professional credential program | ISI provides a training and professional credential program for professionals in the civil infrastructure industry (e.g., engineers, planners, designers). There are no credential maintenance requirements. | ISI will continue to provide a training and professional credential program for professionals in the civil infrastructure industry; however, credential maintenance requirements, including continuing education, will be introduced through an all-inclusive minimal annual subscription.

Cost of Envision | The Envision sustainability framework is available for free. | The Envision sustainability framework will continue to be free for all ISI members.

OFFICIAL LAUNCH OF ENVISION V3
ISI will phase in the release of Envision v3 according to the schedule below.

Envision v3 Guidance Manual: The Envision Guidance Manual is the core component of the Envision framework that includes the Envision v3 credits, scoring methodology, and additional information on how to use the Envision framework. It is scheduled to be released in Q1 2018.

Updated online training and credentialing program: Current Envision Sustainability Professionals (ENV SPs) will be required to take a two-hour online course to learn about the differences between Envision v2 and Envision v3. This course will be required for current ENV SPs to upgrade their credential and remain “active”. Prospective ENV SPs will be required to take a new online training program and pass an open-book, multiple choice exam based on Envision v3. All ENV SPs will be required to maintain their credential on an annual basis through a nominal, all-inclusive subscription that includes access to continuing education courses. The updated online training and credentialing program, including credential maintenance requirements for ENV SPs will be introduced in Q2 2018.

Envision v3 Scoresheet: The Scoresheet is a digital version of the Envision rating system that Envision account holders may access on the ISI website. The Scoresheet is used to conduct more in-depth sustainability project self-assessments and is also used to register projects in ISI’s optional third-party Envision verification program. The Scoresheet based on Envision v3 will be launched on the ISI website in Q2 2018.

Envision v3 project verification: For projects currently registered to pursue Envision verification, the launch of Envision v3 will not affect their ability to continue to verify under Envision v2. Currently registered projects that have not yet submitted for verification will be given an opportunity to verify under v2 or switch over to verify under v3. The cut-off date for switching to v3 will be Q4 2018. New projects will be able to register under either v2 or v3 until Q4 2018, after which all new project registrations will only be accepted under v3. Projects will be able to complete verification in the version under which they are registered; however, the sunset date for Envision v2 will be Q4 2020. In other words, all projects registered under Envision v2 will be required to complete verification under that version by Q4 2020.

CONTACT US

If you require assistance with the Envision v3 feedback survey, or have any questions about the contents of this document, please direct your inquiries to feedback@sustainableinfrastructure.org and a member of the ISI team will respond as soon as possible. Please note that when the final Envision v3 Guidance Manual is released in Q1 2018, a companion document outlining next steps and addressing frequently anticipated questions will also be released.
# ENVISION V3 CREDIT CHANGES OVERVIEW

<table>
<thead>
<tr>
<th>Quality of Life</th>
<th>Wellbeing</th>
<th>QL1.1 Improve Community Quality of Life</th>
<th>Improved</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>QL1.2 Enhance Public Health &amp; Safety</td>
<td>REWRITTEN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QL1.3 Improve Access, Safety, &amp; Wayfinding</td>
<td>Improved</td>
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<tr>
<td></td>
<td></td>
<td>QL1.4 Improve Construction Safety</td>
<td>NEW!</td>
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<tr>
<td></td>
<td></td>
<td>QL1.5 Minimize Noise</td>
<td>Improved</td>
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<tr>
<td></td>
<td></td>
<td>QL1.6 Minimize Light Pollution</td>
<td>Improved</td>
</tr>
<tr>
<td>Community</td>
<td></td>
<td>QL2.1 Advance Equity &amp; Social Justice</td>
<td>NEW!</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QL2.2 Improve Community Mobility</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
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<td>QL2.3 Encourage Active, Shared, &amp; Mass Transportation</td>
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<td></td>
<td></td>
<td>QL2.4 Preserve Historic &amp; Cultural Resources</td>
<td>Improved</td>
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<tr>
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<td></td>
<td>QL2.5 Enhance Views &amp; Local Character</td>
<td>Improved</td>
</tr>
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<td></td>
<td></td>
<td>QL2.6 Enhance Public Space &amp; Amenities</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
<td></td>
<td>QL0.0 Innovate or Exceed Credit Requirements</td>
<td>Same</td>
</tr>
</tbody>
</table>

| Leadership | Collaboration | LD1.1 Provide Effective Leadership & Commitment | Improved |
|           |               | LD1.2 Foster Collaboration & Teamwork           | Improved |
|           |               | LD1.3 Provide for Stakeholder Involvement       | Improved |
| Planning  |               | LD2.1 Establish a Sustainability Management Plan| Improved |
|           |               | LD2.2 Plan for Sustainable Communities          | NEW!     |
|           |               | LD2.3 Plan for Long-Term Monitoring & Maintenance| Improved |
| Economy   |               | LD2.4 Plan for End of Life                     | NEW!     |
|           |               | LD2.5 Stimulate Economic Prosperity & Development| Improved |
|           |               | LD2.6 Develop Local Skills & Capabilities       | Improved |
|           |               | LD2.7 Conduct a Lifecycle Economic Evaluation   | NEW!     |
|           |               | LD0.0 Innovate or Exceed Credit Requirements    | Same     |

| Resource Allocation | Materials | RA1.1 Reduce Energy Intensity of Materials | REWRITTEN (combines former RA1.4) |
|                     |           | RA1.2 Support Sustainable Procurement Practices | Improved |
|                     |           | RA1.3 Use Recycled Materials                  | Improved |
|                     |           | RA1.4 Divert Operational Waste from Landfills | Improved |
|                     |           | RA1.5 Divert Construction Waste from Landfills | NEW!     |
|                     |           | RA1.6 Balance Earthwork On Site               | Improved |

| Energy | RA2.1 Reduce Operational Energy Consumption | Improved |
|        | RA2.2 Reduce Construction Energy Consumption | NEW!     |
|        | RA2.3 Use Renewable Energy                  | Improved |
|        | RA2.4 Commission & Monitor Energy Systems    | Improved |

| Water  | RA3.1 Preserve Water Resources               | Improved |
|        | RA3.2 Reduce Operational Water Consumption   | Improved |
|        | RA3.3 Reduce Construction Water Consumption  | NEW!     |
|        | RA3.4 Monitor Water Systems                  | Improved |
|        | RA0.0 Innovate or Exceed Credit Requirements | Same     |

| Natural World | Siting | NW1.1 Preserve Sites of High Ecological Value | Improved (formerly NW1.1 Preserve Prime Habitat) |
|               |        | NW1.2 Provide Wetland & Surface Water Buffers | Improved |
|               |        | NW1.3 Minimize Disturbing Prime Farmland      | Improved |
|               |        | NW1.4 Preserve Undeveloped Land               | Improved |

| Conservation | NW2.1 Reclaim Brownfields | NEW! (from aspects of former NW1.7 Preserve Greenfields) |
|             | NW2.2 Manage Stormwater   | Improved |
|             | NW2.3 Reduce Pesticide & Fertilizer Impacts | Improved |
|             | NW2.4 Protect Surface & Groundwater Quality | Improved |

| Ecology  | NW3.1 Enhance Functional Terrestrial Habitats | REWRITTEN (formerly NW3.1 Preserve Species Bidiversity) |
|         | NW3.2 Enhance Wetland & Surface Water Functions | Improved |
|         | NW3.3 Maintain Natural Floodplains            | Improved |
|         | NW3.4 Control Invasive Species                | Improved |
|         | NW3.5 Protect Soil Health                     | Improved (formerly NW3.3 Restore Disturbed Soils) |
|         | NW0.0 Innovate or Exceed Credit Requirements | Same     |

| Risk and Resilience | Emissions | RR1.1 Reduce Greenhouse Gas Emissions | Improved |
|                     |           | RR1.2 Reduce Air Pollutant Emissions  | ReWritten |

| Resilience | RR2.1 Assess Climate Threat | REWRITTEN |
|           | RR2.2 Evaluate Risk and Resilience | NEW! (aspects of former CR2.2 Assess Traps and Vulnerabilities) |
|           | RR2.3 Establish Resilience Goals and Strategies | NEW! |
|           | RR2.4 Improve Infrastructure Integration | Improved (formerly LD2.2) |
|           | RR2.5 Maximize Durability | NEW! (aspects of former CR2.4 Prepare for Short-Term Hazards |
|           | RR2.6 Maximize Adaptability | NEW! |
|           | RR2.7 Maximize System Recovery | NEW! |
|           | RR2.8 Maximize Co-Benefits and Synergies | REWRITTEN (formerly LD2.1 Pursue Byproduct Synergy Opportunities) |
|           | RR0.0 Innovate or Exceed Credit Requirements | Same     |
## QUALITY OF LIFE

| Wellbeing | QL1.1 Improve Community Quality of Life | Improved |
|           | QL1.2 Enhance Public Health & Safety    | Improved |
|           | QL1.3 Improve Access, Safety, & Wayfinding | Improved |
|           | QL1.4 Improve Construction Safety       | Improved |
|           | QL1.5 Minimize Noise                    | Improved |
|           | QL1.6 Minimize Light Pollution          | Improved |

| Community | QL2.1 Advance Equity & Social Justice   | NEW! |
|           | QL2.2 Improve Community Mobility        | Improved |
|           | QL2.3 Encourage Active, Shared & Mass Transportation | Improved |
|           | QL2.4 Preserve Historic and Cultural Resources | Improved |
|           | QL2.5 Enhance Views & Local Character   | Improved |
|           | QL2.6 Enhance Public Space & Amenities  | Improved |

QL0.0 Innovate or Exceed Credit Requirements
QL1.1 IMPROVE COMMUNITY QUALITY OF LIFE

INTENT:
Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.

METRIC:
Aligning project objectives with community needs and goals, identified through active engagement, in order to achieve broad community satisfaction.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
<th>ENHANCED</th>
<th>SUPERIOR</th>
<th>CONSERVING</th>
<th>RESTORATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community Considerations</td>
<td>Community Linkages</td>
<td>Broad Community Alignment</td>
<td>Holistic Assessment And Collaboration</td>
<td>Protecting The Future</td>
</tr>
<tr>
<td>(A) The project team has located and reviewed the most recent community planning information and assessed relevant community needs, goals, and/ or issues.</td>
<td>(B) The project meets or supports community needs and/ or goals.</td>
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<tr>
<td>(B) The project meets or supports community needs and/ or goals.</td>
<td>(C) The project conducts a social impact assessment identifying the effects the project will have on the host and affected communities.</td>
<td>(B) The project meets or supports community needs and/ or goals.</td>
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<tr>
<td>(C) The project conducts a social impact assessment identifying the effects the project will have on the host and affected communities.</td>
<td>(D) Based on the social impact assessment potential negative impacts on the host or nearby affected communities are mitigated following a hierarchy prioritizing avoidance, minimization, restoration, and offsetting.</td>
<td>(C) The project conducts a social impact assessment identifying the effects the project will have on the host and affected communities.</td>
<td>(D) Based on the social impact assessment potential negative impacts on the host or nearby affected communities are mitigated following a hierarchy prioritizing avoidance, minimization, restoration, and offsetting.</td>
<td>(E) Community satisfaction is demonstrated by feedback from the stakeholder engagement process verifying actions taken in criteria A, B, C, and D.</td>
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<td>(D) Based on the social impact assessment potential negative impacts on the host or nearby affected communities are mitigated following a hierarchy prioritizing avoidance, minimization, restoration, and offsetting.</td>
<td>(E) Community satisfaction is demonstrated by feedback from the stakeholder engagement process verifying actions taken in criteria A, B, C, and D.</td>
<td>(E) Community satisfaction is demonstrated by feedback from the stakeholder engagement process verifying actions taken in criteria A, B, C, and D.</td>
<td>(F) The project assesses, or references long-term planning documents to identify, impacts to community quality of life due to changing social, economic, or environmental conditions over time. The project proactively addresses these changes.</td>
<td>(G) The project assesses, or references long-term planning documents to identify, impacts to community quality of life due to changing social, economic, or environmental conditions over time. The project proactively addresses these changes.</td>
</tr>
</tbody>
</table>

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 conducted a social impact assessment to identify potential adverse impacts to the host and affected communities?

1. Social impact assessment, identifying and evaluating the positive and negative impacts of the project on affected communities.
   Note that conducting a social impact assessment is required for more than one credit. Consider coordinating documentation for these related credits.

D. Has the project team followed a mitigation hierarchy to address negative impacts identified in the social impact assessment?

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

E. Are the affected communities satisfied that the project is addressing their needs and goals as well as mitigating 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 (e.g. meeting minutes, letters, and/or memoranda). 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.

F. Does the project consider long-term social, economic, or environmental changes that impact quality of life and proactively address them?

1. Documentation of long-term social, economic, or environmental changes/trends that may impact community goals and needs over time.
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.

DESCRIPTION

Infrastructure provides critical services to communities throughout the world, and this credit addresses the extent to which a project contributes to the quality of life of the host and affected communities. Unfortunately, infrastructure projects are often challenged with the perception of 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. Furthermore, community support and engagement are critical to ensure the appropriate and effective investment of resources in community infrastructure. Following the criteria in this credit not only advances project sustainability by contributing to a higher quality of life, but may also reduce the potential for community conflicts that disrupt project delivery and increase cost.

PERFORMANCE IMPROVEMENT

The credit determination begins with 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 expression of their desired quality of life.

As project teams advance through the levels of achievement, 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 address issues and concerns through a social impact assessment. Social impact assessments include the processes of analyzing, monitoring, and managing, the intended and unintended social consequences, both positive and negative, of infrastructure projects and any social changes initiated by those projects. For Envision assessments, expectations regarding the scope, methodology, and complexity of a social impact assessment scale with the relative size of the project.
Addressing issues and concerns identified in a social impact assessment can be challenging. The purpose of this credit is to recognize projects that provide significant benefits to affected communities and reduce or eliminate negative impacts. However, infrastructure projects often include difficult tradeoffs involving positive and negative impacts, and a project designed to benefit one community may have adverse effects on others. In addition, sometimes the needs of a community are in 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.

Higher levels of achievement require evidence 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. Considering the polarizing views infrastructure projects can sometimes elicit, documentation of community endorsement should be as broad as possible and specific to the requested documentation. 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.

In determining whether this credit is applicable to a project assessment, 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.
## QL1.2 ENHANCE PUBLIC HEALTH AND SAFETY

**INTENT:**
Protect and enhance community health and safety.

**METRIC:**
Measures taken to increase safety and provide health benefits on the project site, surrounding sites, and the broader community in a just and equitable manner.

### LEVELS OF ACHIEVEMENT

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</thead>
<tbody>
<tr>
<td>(2) Understanding Impacts</td>
<td>(7) Prioritizing Risk Reduction</td>
<td>(12) Improving Health and Safety</td>
<td>(18) Shared Benefits</td>
<td>(22) Protecting Communities</td>
</tr>
<tr>
<td>(A) The project meets all health and/ or safety requirements and includes features to improve health and/ or safety in internal operations.</td>
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</tr>
<tr>
<td>(B) The project conducts a health and safety risk and impact assessment for the project’s impacts on the host and affected communities over the project life.</td>
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<tr>
<td>(C) The project implements a mitigation hierarchy for health and/ or safety impacts identified in criterion B prioritizing avoidance/ elimination, minimization/ substitution, engineered controls, administrative/ behavioral controls, and personal protection.</td>
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</tr>
<tr>
<td>(D) The project improves health and/ or safety for its immediate surroundings.</td>
<td>(E) The project demonstrates a net positive impact on health and/ or safety for the host or affected communities.</td>
<td>(F) Based on criterion B the project team addresses equity and social justice in regard to health and/ or safety benefits and impacts and can demonstrate the project does not disproportionately burden one community over another.</td>
<td>(G) The project provides critical infrastructure services to communities experiencing, or at risk of experiencing imminent, negative health and/ or personal safety impacts</td>
<td>(H) The project provides critical infrastructure services to communities experiencing, or at risk of experiencing imminent, negative health and/ or personal safety impacts</td>
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</tbody>
</table>
EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Does the project include health and safety improvements beyond minimum requirements for project operations?
   1. Documentation of actions taken, beyond what is minimally required by law, to improve health and/or safety during project operations. Project teams may include cases where the project owner has implemented policies that exceed regulations.
   2. Index of health and safety improvements identifying improvements to project operations.

B. Has the project conducted a health and safety risk and impact assessment for project impacts on the host or affected communities?
   1. Documentation of the health and safety risk and impact assessment. Note that the report must include impacts from the project on the host or affected communities.

C. Will the project mitigate negative health and safety risks and/or impacts prioritizing a mitigation hierarchy?
   1. Documentation of how health and safety risks and impacts identified in criterion A were addressed following a mitigation hierarchy that prioritized: avoidance, minimization, engineered controls, administrative controls, and personal protection.
   2. Project teams may choose to include a detailed narrative of decision-making focused on a selection of critical health and safety risks that represent the largest or most likely potential impacts for the project, supported by more general documentation indicating how the goals of the mitigation hierarchy were communicated and deployed throughout the planning, design, and/or construction process.

D. Does the project include health and safety improvements for the project’s immediate surroundings?
   1. Index of health and safety improvements identifying improvements to the project’s immediate surroundings (e.g., protected areas or elevated walkways for pedestrians, clear lines of sight to traffic, improved lighting, etc.).

E. Does the project include health and safety improvements for the broader host or affected communities?
   1. Index of health and safety improvements identifying improvements to the broader host or affected communities (e.g., reduced pollution in surface waters, higher water quality, better air quality, access to healthy activities, access to health services, etc.).

F. Has the project team considered equity and social justice in regard to health and/or safety benefits and impacts?
   1. Documentation demonstrating that health and safety risks and impacts are not disproportionately borne by a community. Examples may include site maps showing areas of risk or impact overlaid with key demographic data.
   2. Documentation that mitigation measures were proportionately distributed to those communities most impacted by the project.
      Note that conducting a social impact assessment is required for more than one credit. Consider coordinating documentation for these related credits.

G. Will the project provide critical infrastructure services to communities experiencing, or at risk of experiencing, imminent negative health and/or personal safety impacts?
   1. Documentation of how the community is currently experiencing or is at risk of experiencing health and/or safety impacts (e.g. contaminated drinking water).
   2. Documentation of how the project will provide the critical infrastructure services necessary to resolve, or significantly reduce, the impacts. The scale of impact must be at the community level and commensurate with the scope and size of the project. Projects cannot receive the Restorative level for eliminating or reducing health and/or safety impacts solely within the project boundary.

DESCRIPTION

The protection and enhancement of public health and safety is a paramount concern for all infrastructure projects. This credit recognizes the opportunities many projects have to exceed minimum regulatory requirements to improve health and/or safety within a project or community. Note that Envision does not in any way replace, supersede, or create exceptions for existing local, state/provincial, or national health and safety regulations.
The delivery of infrastructure projects often faces negative perceptions of its impact on neighborhoods and communities. Project teams should consider how improving the safety and health benefits of the project, its surroundings, and the broader community, and communicating these benefits to stakeholders, can help combat these negative perceptions that lead to conflicts and project delays. Enhancing and emphasizing the positive health and safety benefits of infrastructure can bolster the public will necessary to making infrastructure investments.

**PERFORMANCE IMPROVEMENT**

This credit assesses the degree to which infrastructure projects contribute to increased safety and health benefits on the project site, surrounding sites, and the broader community in a just and equitable manner. Documentation for this credit may include actions taken in compliance with existing local, state/provincial, or federal regulations or policies. However, to achieve points for this credit projects must first demonstrate they include health and/or safety improvements beyond minimum requirements for project operations.

As project teams advance through the levels of achievement health and safety improvements expand from an internal focus to include the immediate surroundings and the broader community. For example, improvements to the immediate surroundings may include features to improve safety when entering and exiting the site; decrease violence and/or vandalism; prevent spills or local contamination; and many more. Many times projects have features that benefit the broader health and/or safety of a community such as improving air quality, improving water quality, providing access to walking and biking trails, removing or repairing infrastructure at risk of failure, and many more.

This process begins with a health and safety risk and impact assessment. Expectations for the health and safety risk and impact assessment are relative to the scope and scale of the project. Projects pursuing higher levels of achievement may produce a single index of health and safety risks and impacts; how they were addressed; whether they impact internal operations, surroundings, the broader community, or all three; and where they fall in the mitigation hierarchy. Mitigation should follow a hierarchy prioritizing avoidance/elimination, minimization/substitution, engineered controls, administrative/behavioral controls, and personal protection.

Projects seeking higher levels of achievement must demonstrate that both the benefits and exposure to risk associated with the project are distributed in a fair and equitable manner and that one community is not disproportionately burdened over another. When there is resistance to the placement of infrastructure within a region due to potential or perceived negative impacts, it is often those communities least able or least empowered to voice their concerns that eventually receive the burden. Project teams and infrastructure owners should carefully guard against following this path of least resistance.

The highest level of achievement in this credit is reserved for infrastructure projects that provide relief or critical infrastructure services to communities experiencing, or at risk of experiencing imminent, negative health and/or personal safety impacts. This is where existing conditions have dropped below minimum standards for health or safety. For example, communities where drinking water quality has reached unhealthy levels, where bridges are at imminent risk of collapse, or where critical infrastructure services are not available or no longer functioning.

In determining whether this credit is applicable to a project assessment, it is likely that all projects have the ability to positively impact health and/or safety. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.
**QL1.3 IMPROVE ACCESS, SAFETY, AND WAYFINDING**

**INTENT:**
Construct and operate the project safely for a range of users of all ages and abilities, while allowing access to adjacent sites.

**METRIC:**
Incorporating clear access, safety, and wayfinding measures to accommodate emergency services, construction activities, and regular vehicular or pedestrian traffic while providing or maintaining access.

**LEVELS OF ACHIEVEMENT**

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**EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE**

A. Has the project addressed access, safety, and wayfinding for incident management including evacuation and emergency personnel?

1. Design documents showing plans for access and egress routes for emergency personnel, users, and occupants.
2. Documentation of the effectiveness of the design for emergency situations.

B. Does the construction management plan address access, safety, and wayfinding for pedestrians and vehicles during construction?
   1. Specifications of requirements and procedures for the contractor.

C. Does the project utilize access, safety, and signage to protect or minimize impacts on the surroundings?
   1. Documentation of how the project protects nearby sensitive sites (wetland, cultural sites, etc.) or, in populated/developed areas, separates pedestrian and non-pedestrian zones enhancing safety and security.
   2. Documentation that clear signage and wayfinding techniques are used to integrate the project with its surroundings. For example, access roads, bikeways, or pedestrian paths are clearly marked in order to facilitate their proper use.

D. Has the project owner or project team performed a safety audit of the project site?
   1. Reports and plans showing examination of existing or future conditions, documentation of issues, and recommendations for improvements.

E. Does the project provide safe public access points for the benefit of the community?
   1. Documentation indicating areas of the project site that are accessible to the public. Public access may include restrictions.
   2. Documentation that areas open to the public are designed with universal design principles to be inclusive of a broad range of users.

F. Does the project have a positive and transformative impact on community neighborhood access, safety, and/or wayfinding?
   1. Documentation demonstrating that beyond individual site safety features addressed in criteria A, B, C, and D, the project itself will improve broader community or neighborhood safety. For example, formerly abandoned or restricted areas prone to crime and vandalism are replaced by safe and accessible spaces that increase community presence and self-monitoring.

DESCRIPTION

This credit encourages constructing and operating the project safely for a range of users of all ages and abilities, while allowing access to or from adjacent sites. This credit is linked to QL3.4 Enhance Public Space and Amenities; however, whereas QL3.4 addresses the broader social benefits and improved livability of public space, this credit focuses specifically on providing access that is both safe and easy to navigate. This may include navigating around the site, through the site, or both. Providing clear and safe access whenever possible is helpful in gaining acceptance by local communities, reducing accidents and injuries, reducing crime, and encouraging healthy and vibrant neighborhoods. Completely walling off sites from the public, either in construction or operation, contributes to community ‘dead zones’ that become attractors for crime and vandalism. Confusing signage or complicated site access can lead to accidents and injuries, during construction or operation.

The goal of the credit is to ensure users can find their way in and around the project. A safe environment is created with simple messaging. Likewise, potentially unsafe interactions are managed. Projects that promote pedestrian-oriented communities encourage active street life with the associated effect of reducing crime and vandalism. Using environmental and universal design on the project creates open spaces that make users feel more secure and accommodate users with disabilities. Clear access, signage and wayfinding improves overall flow, efficiency, and aids in incident management by reducing accidents, allowing users to evacuate to a safe location, and providing emergency personal access to the site.

By incorporating safe and easy to navigate access to, through, or around projects, infrastructure owners and project teams can help to reintegrate infrastructure into communities and infrastructure awareness into the public mindset. Rather than being barriers to transportation and access infrastructure can often provide elevated pedestrian walkways, bike trails, safer streets, improved intersections, more direct routes, convenient access to public amenities, and many more.

PERFORMANCE IMPROVEMENT

This credit assesses the degree to which infrastructure projects incorporate clear access, safety, and wayfinding measures to accommodate emergency services, construction activities, and regular vehicular or pedestrian traffic while providing or maintaining access. As such the credit assessment incorporates a range of criteria. Project teams should note that the application of these criteria may vary depending on the project type.
For example, publicly accessible projects may be designed to encourage and incentivize individuals to come to the site or navigate through it, while projects that are restricted from public access may focus on reducing negative impacts on community access to adjacent sites by providing safe and easy to identify alternatives for individuals to navigate around the project.

The credit assessment begins with the careful accommodation of emergency services and addressing access, safety, and wayfinding for pedestrian and vehicular traffic during construction. While these activities are often standard on all projects they are important factors in protecting public safety and therefore the overall sustainability of the project. Documentation for this credit should extend beyond evidence of basic signage. Project teams should also consider the role critical infrastructure plays in emergency situations or risks to public safety.

As projects advance through the levels of achievement they should consider how access routes, safety features, and clear signage and wayfinding can be used to facilitate safe and beneficial navigation on, through, or around the site. Wayfinding encompasses all of the ways in which people orient themselves in physical space and navigate from place to place. This includes, but also extends beyond, signage.

Consideration is also given to how the project design can improve safety and security on and around the site. Some considerations in improving physical safety and reducing crime and vandalism include:

- **Physical Safety**
  - Improve the safety and accessibility of street crossings by providing universal access curb cuts, pedestrian crossing signs, and high-visibility crosswalks. Or, for major roads, provide pedestrian over/under passes.
  - Include traffic-calming measures in areas with heavy pedestrian or bicycle traffic.
  - Install physical barriers between sidewalks and street traffic exceeding 40 mph.
  - Design bike lanes to encourage bicycling by being as safe as possible. This may include separating bike lanes from street traffic. When designing street parking, consider the vehicle door swing if adjacent bike lanes are to be included.
  - The design makes a clear distinction between publicly accessible space, where pedestrian traffic is encouraged, and restricted space, where it is not.

- **Crime and Vandalism**
  - Locate publicly accessible space to be as visible as possible from surrounding neighborhoods at night.
  - Design public space to have clear lines of sight internally and from major pedestrian traffic zones.
  - Install surveillance equipment to discourage crime and vandalism.
  - Design public space to integrate to the urban context and encourage pedestrian traffic.
  - Design site for easy public access to, from, and around the project with clear signage and wayfinding signals.

The highest levels of achievement are reserved for projects that expand access considerations beyond personal safety to universally accessible design. Universal design is the design and composition of projects and sites so that they can be accessed, understood and used to the greatest extent possible by all people regardless of their age, size, ability or disability.
QL1.4 IMPROVE CONSTRUCTION SAFETY

INTENT:
Enhance public and worker safety during construction.

METRIC:
Commitments and measures taken during construction to monitor safety, provide feedback mechanisms, train personnel, establish security plans, and make health programs available.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(3) Commitment to Safety</td>
<td>(7) Risk Analysis, Training and Security</td>
<td>(12) Safe Work Practices and a Secure Site</td>
<td>(18) Safety and Security Development for Personnel</td>
<td>(22) Safety Beyond the Site</td>
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<tr>
<td>(A) The owner and contractor have made strong commitments to monitor and improve health and safety for onsite construction operations.</td>
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<td>(D) The owner and contractor have a specific site and project security plan.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Have the project owner and contractor made strong commitments to monitoring and improving health and safety?

1. Documentation that owners and contractors implemented a proactive safety rewards program to support outstanding safety performance.
2. Documentation that the contractors developed a program/requirements to ensure that their subcontractors maintain a high level of safety per the contract.

3. Documentation that the contractor’s senior management are engaged in the project safety program and conduct safety observations and inspections as part of their standard duties.

4. Documentation through commitments that safety is a core concern.

B. Does the project include reliable feedback mechanisms to identify risks, conduct hazard analyses, and communicate hazards to personnel?

1. Documentation that the owner and contractors developed a proactive investigative process that focuses on root cause and corrective actions vs disciplinary actions and financial penalties.

2. Documentation that contractors have a proactive injury management system that supports efficient, effective and timely treatment of their employees injured on the job site.

3. Documentation that owners and contractors have an incident review process that involves all levels of management to validate corrective measures to minimize future injuries and incidents on the job site.

4. Documentation that contractors develop “lessons learned” reports that allow other contractors and projects the opportunity to review the fact finding of an incident and implement processes and procedures to minimize similar incidents on the job site.

C. Does the project include safety or security training requirements for personnel?

1. Documentation of safety and/or security competency training programs, either online or in person, for field personnel, including type of training provided and how they specifically target health and safety. Training may include task specific safety training or general awareness training.

2. Documentation of minimum training requirements for health and safety programs such as occupational safety and health, first-aid, CPR, emergency response, active shooter training, or equivalent.

D. Does the project include a comprehensive security plan to protect workers, the public, and sensitive information?

1. Documentation that the owner and contractor have a specific site and project security plan. This plan may include but is not limited to, contractor background checks on personnel working on the project, 24-hour security monitoring on the project (physical/electronic). The security plan should be appropriate to the size and scope of the project.

2. For small projects (e.g. under $1 million in cost) owners and contractors may substitute general site security policies for the site-specific plan.

E. Does the project include health and/or wellbeing programs?

1. Documentation that the project provides health and/or wellbeing programs beyond the specific activities associated with project delivery. This may include but is not limited to health screenings for workers, nutrition or exercise workshops, and/or free vaccinations.

DESCRIPTION

This credit promotes improving health and safety practices beyond industry standards and to reward best practices. Having a common focus on health and safety throughout the construction industry has benefits that extend beyond the project boundaries. Companies that have a record in jobsite safety attract better employees, have higher retention rates, and are more competitive in the marketplace. The rigor of applying, training, and adhering to health and safety procedures can also increase productivity by standardizing jobsite activities.

Many practitioners may be familiar with “Days Away, Restrictions, or Transfers” (DART) rates, a mathematical calculation that describes the number of recordable incidents per 100 full time employees that resulted in lost or restricted days or job transfer due to work related injuries or illnesses. Many of the world’s leading construction companies find that the return on investment for implementing better health and safety standards is higher than the cost and lost time associated with jobsite incidents.
PERFORMANCE IMPROVEMENT

The levels of achievement for this credit address safety procedures for onsite workers, personnel training and development and site and information security. These themes not only protect the men and women working on the site, they help to maintain safe and secure operations of the asset and provide a foundation for proper operations and maintenance of the facility. Their underpinning is strong institutional commitments to ensuring a safe site. Higher levels of achievement are characterized by clearly documented efforts to assess onsite hazards and implement preventative solutions, leveraging technology to identify and assess hazards and improving the health and wellbeing of the industry’s workforce.

Enhanced health and safety practices are encouraged beyond industry norms; however a novel approach may introduce risks that were not present prior to instituting the new program or technology. Project teams should conduct hazard analyses and develop construction safety plans to address risks associated with using new materials, technologies, and/or methodologies. Having a collective industry approach to implementing new concepts will provide the framework for advancing beneficial concepts that further enhance health and safety for all stakeholders. Though not directly referenced in this credit, in cases where the owner or contractor’s commitment to health and safety results in a new industry standard through procedures, processes, or equipment, project team’s should consider applying for innovation points in QL0.0 Innovate or Exceed Credit Requirements.

In determining whether this credit is applicable to a project assessment, all projects that include construction have the ability to positively impact construction safety. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.
QL1.5 MINIMIZE NOISE

INTENT:
Minimize noise during construction and operation to maintain and improve community livability.

METRIC:
The extent to which construction and operation noise is assessed, mitigated, and target noise levels achieved.

LEVELS OF ACHIEVEMENT

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<td><strong>(1) Noise Assessment</strong></td>
<td><strong>(4) Target Noise Levels</strong></td>
<td><strong>(6) Stakeholder Support</strong></td>
<td><strong>(8) No Noise Increase</strong></td>
<td><strong>(10) Noise Reductions</strong></td>
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</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team conducted an impacted assessment of potential operational noise on the surrounding community and/or environment?

1. Index of all noise generation sources related to the project.
2. Impact assessment of noise generated as a result of the project. This should include, when applicable, increased vehicle or pedestrian noise generated as a result of the project. This should also include potentially noise generating vibrations during operations.
B. To what extent has the project mitigated noise generated as a result of the project?

1. Documentation of all noise mitigation measures used throughout the project. Examples may include drawings and specifications indicating equipment is inherently quieter than typical (e.g. electric motors rather than combustion engines) or equipment has been modified to reduce noise and vibrations at their source.

2. Narrative explaining how mitigation measures follow a hierarchy that prioritizes: avoidance, minimization, source abatement, receptor abatement, and compensation/offsetting.

C. Does the project set or adopt target noise levels?

1. Documentation that the project has adopted or set target noise levels for communities potentially affected by project noise.

2. Evidence of community engagement in the development and/ or acceptance of operational noise targets.

3. Evidence that noise generated as a result of the project will not exceed the target noise levels for impacted communities. Note that these targets are the maximum acceptable noise level for the receiving communities (people or animals) and should include existing ambient noise levels.

D. Has the project team implemented a construction noise management plan to mitigate construction noise?

1. Documentation of a construction noise management plan to mitigate impacts of construction noise to the extent feasible.

2. Documentation that the construction noise management plan includes stakeholder engagement and mechanisms for communities to report complaints. Documentation may include corrective actions taken in response to stakeholder reporting.

E. To what extent will the project maintain or reduce existing noise levels?

1. Analyses and documentation of baseline and anticipated operational noise and vibration levels. In certain cases, project teams may demonstrate why a baseline noise level is not necessary in order to determine credit achievement.

2. Documentation that mitigation measures implemented on the project are sufficient to have no noticeable (to the human ear) noise increase within the surrounding community beyond existing conditions.

   OR

   Documentation that mitigation measures implemented on the project are sufficient to noticeably (to the human ear) reduce noise within the surrounding community beyond existing conditions.

DESCRIPTION

Noise is a common complaint against a wide variety of infrastructure projects. Noise can have significant negative health effects, including hearing impairment, hypertension, and sleep disturbance. It can also reduce performance in cognitive tasks. Residential property values may be improved as a result of reduced ambient noise levels. Noise pollution can also interfere with animal communication, predator–prey relations, and mating habits, particularly among birds.

Addressing both construction and operational noise is a critical step to beneficially incorporating infrastructure into communities and the environment and providing important infrastructure services while minimizing negative impacts. Addressing noise can be an important step in community and stakeholder engagement to demonstrate that community concerns are being heard. Setting noise reduction targets can also provide an impetus to consider creative and innovative alternative solutions compared to the status quo.

PERFORMANCE IMPROVEMENT

The credit assessment begins with impact assessment of construction and operational noise and the implementation of siting strategies and/ or structural controls to minimize noise and/ or vibrations. When applicable, project teams should consider vibrations as a significant source of noise transmission. “Noise” is defined as an unwanted or disturbing sound. It becomes unwanted when it interferes with normal activities or diminishes quality of life.
Proposals to mitigate noise and vibration from stationary and mobile sources are incorporated into the design. Mitigation measures may include the use of soundproofing, noise barriers, designs to locate mechanical equipment and other sources away from exterior spaces designed for use, and the use of innovative pavements designed to reduce traffic noise. For outdoor areas of occupancy, these measures provide for quieter outdoor spaces.

Specifications for minimizing construction noise and vibration should meet or exceed accepted local practices. Programs should include details on the expected sources of significant noise and vibration, how the effects of those sources will be minimized, how noise and vibration will be monitored, and what corrective actions will be taken if specified levels are exceeded. The construction contractor is expected to work with affected neighbors to develop construction plans as well as monitoring and corrective action programs.

In determining whether this credit is applicable to a project assessment, consideration is given to whether the project will have any operational noise and whether construction noises are deemed significant. Noises generated by activities induced by the project such as cars on roads, pedestrians in parks, and trucks accessing facilities are applicable to this credit. Projects that do not include any operational noise and whose construction noise impacts are temporary and minor, may apply to have this credit deemed not applicable with supporting documentation.
QL1.6 MINIMIZE LIGHT POLLUTION

INTENT:
Reduce backlight, uplight, and glare without jeopardizing safety during operations.

METRIC:
Lighting meets backlight, uplight, and glare requirements for lighting zones.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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<th>SUPERIOR</th>
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</tr>
</thead>
<tbody>
<tr>
<td>(1) Light Pollution Reduction</td>
<td>(3) Master Lighting Plan</td>
<td>(6) Eliminating Uplight</td>
<td>(10) Full Backlight, Uplight, and Glare Reductions</td>
<td>(12) Night Sky Restoration</td>
</tr>
<tr>
<td>(A) The project identifies lighting needs and sensitive community and environmental areas potentially impacted by light pollution during operations.</td>
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<td>(B) The project reduces light pollution following a mitigation hierarchy of avoidance, minimization, protection, and offsetting.</td>
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<td>(B) The project reduces light pollution following a mitigation hierarchy of avoidance, minimization, protection, and offsetting.</td>
<td>(E) All project lighting meets backlight, uplight, and glare requirements according to IES BUG rating standards.</td>
<td>(F) The project involves the removal or replacement of existing lighting so as to significantly (&gt;10%) reduce existing lighting.</td>
</tr>
<tr>
<td>(C) The project implements a master lighting plan establishing lighting zones. For each zone the plan outlines lighting goals, safety and security needs, environmental conservation, and reducing lighting when no longer needed.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team conducted an assessment of lighting needs and impacts for the project?
1. A site map indicating lighting needs and potential impacts on the project site and surrounding areas. Site map specifically identifies populated areas and natural habitats.
2. Assessment of how lighting may impact people, flora, and/ or fauna in the area.

B. To what extent has the project implemented strategies to reduce light pollution?
1. Documentation indicating that light pollution reduction strategies were assessed and considered according to the following prioritization:
   a. Avoidance: identifying where lighting may not be needed.
   b. Minimization: determining the minimum lighting necessary to meet safety and performance requirements.
   c. Protection: restricting light spillage to sensitive areas or directing light only to where it is needed.
   d. Offsetting: compensating for lighting in one location by removing lighting in another location.
2. Site map indicating location and type of each lighting strategy deployed.

C. Has the project developed a lighting plan establishing lighting zones?
1. A lighting plan for the project including the establishment of lighting zones with each zone addressing at minimum the following:
a. lighting goals;
b. safety and security needs;
c. environmental conservation;
d. energy efficiency; and
e. reducing lighting when no longer needed.

D. Will luminaires prevent light emission above 90 degrees?
1. Location and type of each luminaire.
2. Documentation that each luminaire type restricts light to below 90 degrees.

E. Do all project lights meet backlight, uplight, and glare (BUG) requirements for their respective lighting zones?
1. Location and BUG rating for each luminaire. If luminaires do not have a BUG rating projects may also provide calculations demonstrating luminaires meet BUG requirements for backlight, uplight, and glare based on IES and IDA standards.
2. Worksheet demonstrating BUG ratings meet lighting zone requirements.

“As provided in the Illuminating Engineering Society Model Lighting Ordinance”

<table>
<thead>
<tr>
<th>Zone</th>
<th>Recommended Uses or Areas</th>
<th>Zoning Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>LZ-0</td>
<td>Lighting Zone 0 should be applied to areas in which permanent lighting is not expected and when used, is limited in the amount of lighting and the period of operation. LZ-0 typically includes undeveloped areas of open space, wilderness parks and preserves, areas near astronomical observatories, or any other area where the protection of a dark environment is critical. Special review should be required for any permanent lighting in this zone. Some rural communities may choose to adopt LZ-0 for residential areas.</td>
<td>Recommended default zone for wilderness areas, parks and preserves, and undeveloped rural areas. Includes protected wildlife areas and corridors.</td>
</tr>
<tr>
<td>LZ-1</td>
<td>Lighting Zone 1 pertains to areas that desire low ambient lighting levels. These typically include single and two family residential communities, rural town centers, business parks, and other commercial or industrial/ storage areas typically with limited nighttime activity. May also include the developed areas in parks and other natural settings.</td>
<td>Recommended default zone for rural and low density residential areas. Includes residential single or two family; agricultural zone districts; rural residential zone districts; business parks; open space include preserves in developed areas.</td>
</tr>
<tr>
<td>LZ-2</td>
<td>Lighting Zone 2 pertains to areas with moderate ambient lighting levels. These typically include multifamily residential uses, institutional residential uses, schools, churches, hospitals, hotels/ motels, commercial and/or businesses areas with evening activities embedded in predominately residential areas, neighborhood serving recreational and playing fields and/or mixed use development with a predominance of residential uses. Can be used to accommodate a district of outdoor sales or industry in an area otherwise zoned LZ-1.</td>
<td>Recommended default zone for light commercial business districts and high density or mixed use residential districts. Includes neighborhood business districts; churches, schools and neighborhood recreation facilities; and light industrial zoning with modest nighttime uses or lighting requirements.</td>
</tr>
<tr>
<td>LZ-3</td>
<td>Lighting Zone 3 pertains to areas with moderately high lighting levels. These typically include commercial corridors, high intensity suburban commercial areas, town centers, mixed use areas, industrial uses and shipping and rail yards with high night time activity, high use recreational and playing fields, regional shopping malls, car dealerships, gas stations, and other nighttime active exterior retail areas.</td>
<td>Recommended default zone for large cities’ business district. Includes business zone districts; commercial mixed use; and heavy industrial and/or manufacturing zone districts.</td>
</tr>
<tr>
<td>LZ-4</td>
<td>Lighting Zone 4 pertains to areas of very high ambient lighting levels. LZ-4 should only be used for special cases and is not appropriate for most cities. LZ-4 may be used for extremely unusual installations such as high-density entertainment districts, and heavy industrial uses.</td>
<td>Not a default zone. Includes high intensity business or industrial zone districts.</td>
</tr>
</tbody>
</table>
The red and purple glow that covers the sky and blocks out the stars in many populated areas is of concern for several reasons. The cumulative exterior light directed upward into the sky because of inappropriate lighting design represents a massive waste of energy. Light spillage also disturbs nocturnal animals and interferes with sensitive environments, including open space, wilderness parks and preserves, areas near astronomical observatories, and other light-sensitive habitats. Finally, the ambient light that blocks the stars from view is undesirable for human beings from both an aesthetic and health perspective. Light pollution has the potential to disrupt circadian rhythms and human sleep patterns, which may have numerous health implications.

Well-designed lighting can maintain adequate light levels on the ground while reducing light pollution by using lighting more efficiently. Many cities and communities may be using more light than is necessary and could benefit from a lighting-needs audit and assessment. By directing light only to where it is needed project lighting can be more efficient and save costs. Unobtrusive lighting may also reduce complaints from individuals who live or work near the project during operation.

The assessment for this credit follows the guidelines of the Model Lighting Ordinance issued by the International Dark-Sky Association and the Illuminating Engineering Society (IES) of North America. The Model Lighting Ordinance outdoor lighting template is designed to help municipalities develop outdoor lighting standards that reduce glare, light trespass and skyglow. The methodology includes five lighting zones to classify land use with appropriate lighting levels, and utilizes the IES TM-15-11 “BUG” (Backlight, Uplight, and Glare) classification of outdoor lighting fixtures. As an industry standard these ratings are often readily available. However, it is also acceptable for project teams to submit their own BUG calculations.
Projects may achieve partial points for helping to preserve the night sky by meeting the uplight requirements that limit lighting to below 90 degrees. Higher levels of achievement additionally require meeting the BUG backlight and glare requirements. The highest level of achievement is reserved for projects that also eliminate or replace preexisting sources of light pollution.

This credit can be designated as not applicable for projects that do not include any exterior lighting. Note that certain types of projects may be required to use lighting that is incompatible with the requirements of higher levels of achievement. This would not be an acceptable reason for designating the credit as not applicable. In these cases the project is not able to demonstrate achievement in this indicator of sustainability and is encouraged to pursue higher performance in other sustainability criteria.
### QL2.1 ADVANCE EQUITY & SOCIAL JUSTICE

**INTENT:**
Ensure that equity and social justice are fundamental considerations within all project processes and decision-making.

**METRIC**
Degree to which equity and social justice are included in stakeholder engagement, project team commitments, and decision-making.

**LEVELS OF ACHIEVEMENT**

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<tr>
<td>(3) Understanding Equity</td>
<td>(6) Mitigation</td>
<td>(13) Empowerment</td>
<td>(20) Equitable Access to Benefits</td>
<td>(24) Equitable Futures</td>
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<td><strong>(A)</strong> Stakeholder engagement is conducted early and informed by the historic context of equity and social justice. Projects respect the autonomy and authority of indigenous communities.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team conducted a social risk and impact assessment?
   1. Documentation of a social risk and impact assessment that specifically includes equity and social justice. The assessment may be part of a larger environmental and social risk and impact assessment. The scope and level of effort of the process is relative to the type, scale, and location of the project (e.g. proximity to population centers).
   2. The assessment should include:
      a. Direct impacts of the project and associated activities.
      b. Impacts from independent secondary development or actions that may occur as a result of the project.
      c. Indirect impacts on resources or services important to the local community.
   3. The social context of the project regarding affected communities should consider, but may expand upon: demographic data, gender equality, health data, income rate, education, and level of historic infrastructure investment.

B. Does the stakeholder engagement process take into account the historic context of equity and social justice within affected communities?
   1. Documentation demonstrating an understanding of the historic context of equity and social justice within the affected communities.
   2. Documentation of how the equity and social justice context informed the stakeholder engagement process.
   3. In cases where the project impacts sovereign peoples, especially indigenous peoples, documentation of how the process specifically addressed and prioritized engagement of these stakeholders.

C. Have key members of the project team made commitments to equity and social justice within their organizations?
   1. Documentation of corporate/organizational policies and commitments concerning equity and social justice. This should include but is not limited to:
      a. Pay equity
      b. Gender equality
      c. Non-discrimination
   2. In cases where the project may have notable social impacts (e.g. a new road going through a community) documentation of project-specific commitments to addressing equity and social justice.

D. Has the project addressed social impacts following a mitigation hierarchy?
   1. Documentation of a management program(s) to address equity and social justice impacts identified in the social impact assessment.
   2. Documentation of specific decisions, programs, strategies, etc. that were implemented to address social impacts.
   3. Documentation of how impacts and mitigation strategies were prioritized: avoidance, minimization, restoration, and compensation.

E. Has the project team empowered communities to engage in the development process?
   1. Documentation that qualified professionals were used to identify, analyze, and address barriers to inclusion in the stakeholder engagement process.
   2. Documentation of how the project specifically targeted underrepresented communities and target higher rates of participation and/or inclusion.

F. Will the impacts and benefits of the project be distributed equitably throughout affected communities?
   1. Documentation of how the project does not overly burden one or more communities with risk or negative impacts while other communities receive the majority of project benefits.
   2. Maps showing the key demographic data identified in the social impact assessment overlaid with areas likely to receive benefits or impacts of the project.
G. Does the project positively address or correct an existing or historic injustice or imbalance?

1. Documentation that the project positively addressed or corrected an existing or historic injustice or imbalance. This may include, but is not limited, to:
   a. The provision or improvement of infrastructure services to historically underserved communities.
   b. The removal of existing infrastructure that historically divided or created barriers within a community.
   c. Addressing historic inequality where one community was disproportionately burdened with negative infrastructure impacts while not receiving the benefits.
   d. Addressing historic socioeconomic trends in infrastructure design, development, and operation related to inclusion.

DESCRIPTION

While they may provide significant benefits, both public and private infrastructure also has the potential to create significant burdens on communities. Infrastructure is considered a global pillar of economic development and as such often operates under governmental regulations but also with governmental authority. There is an obligation to ensure the decisions made in infrastructure project delivery are made with equitable consideration of all community impacts both positive and negative. Measures must be taken to ensure that one community does not disproportionately receive the benefits of infrastructure services while another disproportionately receives the burden. When there is resistance to the placement of infrastructure within a region due to potential or perceived negative impacts, it is often those communities least able or least empowered to voice their concerns that eventually receive the burden. Project teams and infrastructure owners should carefully guard against following this path of least resistance.

By holding projects to a higher standard of stakeholder engagement owners and project teams can earn what is termed the social license to operate. Social license to operate is the acceptance (beyond regulations) of the local community and stakeholders. This unofficial license developed from mutual respect builds good will and trust that will speed projects and smooth the way for future projects. Conflicts that arise in project delivery can often be traced to misinformation and distrust. Project teams that invest in understanding and addressing the history of social injustice in the context of the project can combat this mistrust and gain a significant benefit.

Project teams should consider how overall community resilience is directly impacted by social cohesion within the community. Social conflict is a stressor that leaves communities vulnerable and more at risk during an emergency event. Equitable and just systems of infrastructure development are opportunities to strengthen social cohesion, raise awareness, and further develop the social support systems that increase resilience.

Equity and social justice is rooted in mutual respect. This is of particular concern when projects cross social or political boundaries and are international in nature; impacting autonomous or semi-autonomous nations. This specifically includes but is not limited to First Nations, sovereign tribes, indigenous peoples, aboriginal peoples, or native populations.

PERFORMANCE IMPROVEMENT

Equity and social justice are incredibly complex as well as site and project specific. There is no “one size fits all” solution. The first step is to identify potential factors in the project context from stakeholders and to conduct a social risk and impact assessment.

To ensure both a top-down as well as a bottom-up approach, organizations involved in the project should have strong institutional policies that commit to non-discrimination based on race, color, religion (creed), gender, gender expression, age, national origin (ancestry), disability, marital status, sexual orientation, or military status. This should expand to a policy of active diversity and inclusion. Policies of pay-equity, especially as they relate to gender, are a key indicator of inclusivity. If integrated into the project team these principles should also carry into stakeholder engagement activities on individual projects.

Equity and social justice is not something that can be “achieved” through good design. Rather the goal of this credit is to empower those within the community who may not historically engage in infrastructure development to participate in the process. This should include the entire process and not be limited to early consultations alone. Projects teams should demonstrate that critical decisions regarding the distribution of project benefits and impacts were not intentionally or unintentionally biased.
The highest level of achievement is reserved for projects that can correct an existing or historic injustice. For example, removing a highway that divided a demographic neighborhood, or providing parks for historically underserved communities. Underserved communities are populations that have been disadvantaged or who do not receive adequate levels of infrastructure service due to economic conditions, lack of political will, or barriers to access.
QL2.2 IMPROVE COMMUNITY MOBILITY

INTENT:
Plan the project as part of a connected network that supports all transportation modes for the efficient movement of people, goods, and services.

METRIC:
The project improves mobility by broadening mode choices, reducing commute times, reducing vehicle distance traveled, or improving levels of service.

LEVELS OF ACHIEVEMENT

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<tr>
<td>(1) Satisfactory coordination</td>
<td>(3) Controlled access</td>
<td>(7) Increased access and flow</td>
<td>(11) Connected Networks</td>
<td>(14) Restoring community connections</td>
</tr>
<tr>
<td>(A) The project team demonstrates consistency with local and regional transportation plans.</td>
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<td>(B) The project team obtains input from community officials and the operators of adjacent facilities, amenities, and/ or transportation hubs regarding improved access.</td>
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<td>(D) The project addresses long-term mobility and access needs of the community.</td>
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<td>(E) The team works with local community officials to expand mobility and access options and/or incorporate complete streets policies.</td>
<td>(F) The project creates new or restores previous connections between communities.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Is the project consistent with local transportation plans?

1. Documentation demonstrating consistency with local and regional transportation plans. When applicable, documentation may include an amendment to the transportation plan(s).

B. Has the project team coordinated with community officials, and owners/ operators of adjacent facilities, amenities, and/ or transportation hubs to address issues of mobility and access?

1. Documentation of meetings with community officials, managers and operators covering access to adjacent facilities, amenities, and transportation hubs (e.g. reports, memoranda, and/ or minutes).
2. Records of decisions made and actions taken.

C. Has the project developed an access management plan to increase capacity, manage congestion, reduce vehicle miles traveled, or lower accident rates?

1. Reports documenting access and mobility principles, concepts, requirements, and expected outcomes of the project.
2. Documentation of how the project increases transportation capacity, efficiency (e.g. reduced congestion and/or vehicle miles traveled), or quality (lower accident rates).

3. Documentation of a comprehensive access management plan. This may include, but is not limited to, spacing of traffic signals and interchanges, driveway locations and design, or exclusive turn lanes and median treatments.

D. Has the project team considered the long-term mobility and access needs of the community?

1. Documentation of meetings with community officials or existing, and current, community records covering the long-term mobility and access needs of the community (e.g. reports, memoranda, and/or minutes).

2. Design components showing the extent to which long-term mobility and access needs and issues were incorporated into the constructed work. For example, expanding considerations to anticipated traffic flows and volumes, changes in technology, preferred modes of access, and effects on mobility and connectivity.

3. Documentation showing how the project addressed the community as a connected network, including long-term transportation infrastructure efficiency, walkability, and incentivized transportation efficiency.

E. Has the project team considered opportunities to broaden mobility, access, and/or increase transportation options?

1. Assessments of the availability, feasibility, and use of rail, water, active transportation, and/or transit access.

2. Rationale for making or not making changes to transportation modes.

3. When applicable, reports demonstrating the use of complete streets policies and guidelines.

F. Does the project create new or restore previous connections between communities?

1. Documentation of meetings with community officials discussing the need for connections/reconnections between communities (e.g. reports, memoranda, and/or minutes).

2. Documentation of how the project provides new or improved connections between communities in order to increase overall mobility. For example, connecting housing, jobs, shops and/or community facilities by utilizing or improving existing transportation infrastructure.

DESCRIPTION

This credit addresses community mobility as a connected network for all modes, including private automobile usage, and focuses on the broader community benefits achieved from the efficient movement of people, goods, and services. It assesses quality of life benefits that mobility provides through greater access to jobs, education, and critical services. These include reducing commute times, reducing vehicle distance traveled, or improving levels of service.

Greater mobility provides freedom of choices when it comes to access to education, jobs, affordable housing, and even healthy food and activities. Congestion and impediments to mobility are also a key source of discontent within communities. Local studies can often be found calculating the lost personal time or economic activity due to congestion.

Project teams should consider how even nontransportation projects can become multibenefit projects by contributing to more efficient mobility in the community. This may include how site access is configured, the mode with which it is accessed, or the frequency of trips to and from the site. For example, a park that incorporates a pedestrian overpass improving the mobility for both car and pedestrians.

PERFORMANCE IMPROVEMENT

The project enhances transportation, mobility and access options at all scales—rural, suburban, and urban. Overall mobility is enhanced with a connected network that helps reduce congestion, improves traffic flow and contributes to community livability. The project is consistent with local transportation plans that were developed and adopted through an inclusive public involvement process. Wherever possible, the project should consider its relationship to nearby housing, employment, shops and community facilities. If applicable, consider designing the project to accommodate automobile, transit, and commercial vehicles while promoting complete streets policies leading to more active, healthier lifestyles. With the increasing role of technology, consider ways to utilize open data to enhance project performance.
The assessment of mobility in this credit is scalable, and expectations regarding the geographic scope of the assessment are relative to the scale of the project. For example, large rail projects might assess mobility across an entire region while a small park project may assess mobility to and from local neighborhoods.

In determining whether this credit is applicable to a project assessment, consideration is given to whether the project has any potential to impact mobility. Nontransportation projects that do not include any mobility impacts, and can demonstrate no potential for positively impacting mobility, may apply to have this credit deemed not applicable with supporting documentation. This credit is applicable to all transportation infrastructure projects.
QL2.3 ENCOURAGE ACTIVE, SHARED, AND MASS TRANSPORTATION

INTENT:
Expand accessibility to active, shared, and/or mass transportation choices.

METRIC:
The extent to which active, shared, or mass transportation options are accessible, encouraged, and supported by the project as part of a larger integrated transportation network.

LEVELS OF ACHIEVEMENT

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<thead>
<tr>
<th>IMPROVED</th>
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<tbody>
<tr>
<td>(6) Access to Transit or Active Transportation</td>
<td>(8) Encourages Transit or Active Transportation</td>
<td>(10) Transit or Active Transportation Programs</td>
<td>(16) New Connections</td>
<td></td>
</tr>
<tr>
<td>(A) The project creates or offers convenient access to shared/ mass transportation OR active transportation such as extended contiguous trails and/ or bicycle networks.</td>
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<tr>
<td>(B) Beyond proximity, the project is configured and designed to encourage the use of active, shared, or mass transportation.</td>
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<tr>
<td>(C) The project provides programs and/ or facilities that support the use of active, shared, or mass transportation.</td>
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<td>(C) The project provides programs and/ or facilities that support the use of active, shared, or mass transportation.</td>
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<tr>
<td>(D) The active and/ or shared transportation improvements contribute to a larger integrated transportation strategy for the community or region. The project creates new connections or rehabilitates/ repurposes unused, underused, or previously disconnected pathways, bikeways, rail, and/ or other modes of transportation to enhance the efficiency, quality, or level of service of the overall network.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Does the project provide convenient access to active, shared, or mass transportation options?

1. Map showing pedestrian proximity and accessibility to active, shared, or mass transportation The generally accepted standard for walking distance is 0.5 mi / 0.8 km or a 10-minute walk.

B. Is the project configured and designed in such as way to encourage active, shared, and/ or mass transportation options?

1. Documentation demonstrating that beyond the physical proximity to active, shared, or mass transportation options the project is configured and designed to encourage or facilitate their use. Examples may include, but are not limited to:
   a. Degree of pedestrian convenience and accessibility encourages site users to utilize transit options.
   b. Restricted parking which encourages choosing transit or active transportation.
c. Extended contiguous sidewalks, trails and/or bicycle networks connected to the site and/or the project.

d. Designs that promote security throughout the site via well-lit and clearly visible pathways.

e. Topography that accommodates a network of walkways and bikeways converging on or near the project.

f. Providing accessible options beyond regulatory requirements to accommodate a range of mobility needs.

g. Protection from weather such as covered shelters or walkways.

C. Does the project include programs and facilities that support the use of active transportation and transit?

1. Documentation of programs designed to support the use of active, shared, or mass transportation options.
   a. Programs intended to encourage active or shared transportation can include but are not limited to, bicycle sharing stations, mobile apps, marketing programs, subsidy programs, maintenance programs, or repair programs.
   b. Programs designed to encourage the use of mass transportation can include but are not limited to, subsidized fare programs, emergency ride home services, coordination with ride-sharing companies, off-board ticketing, real time arrival information, or mobile apps. Support may also include coordinating with the local transit agency for new transit services.

D. Does the project contribute to a larger integrated active, shared, or mass transportation strategy for the community or region?

1. Documentation that the project integrates the transportation improvements with existing transportation infrastructure and/or a larger transportation infrastructure strategy (e.g. a transportation master plan).

2. Documentation that the project creates new connections or rehabilitates/repurposes unused, underused, or previously disconnected pathways, bikeways, rail, and/or other modes of transportation to enhance the efficiency, quality, or level of service of the overall network. This should include site plans or illustrative documents showing new connections.

DESCRIPTION

This credit encourages active, shared, and/or mass transportation as a way to increase health, reduce emissions, improve air quality, and increase the number of equitable transportation choices. Project teams should consider how a multi-benefit project that supports active, shared, and/or mass transportation can achieve greater acceptance by the community, have broader access to funding, and deliver a better quality project for owners and operators. Even non-transportation infrastructure often has the opportunity to support and improve these transportation networks.

PERFORMANCE IMPROVEMENT

The credit assessment begins with locating project within walking distance to pedestrian-accessible active transportation and public transit facilities. As project teams advance to higher levels of achievement the assessment extends to encompass whether active, shared, or mass transportation choices are encouraged and supported. Here distinction is made between the physical characteristics that may enhance the quality of the amenity, and the underlying logistical, managerial, or operational programs that can incentivize greater use or ridership.

When addressing this credit and designing for current uses project teams should also consider how to accommodate future transportation trends. In recent years technology and access to data has dramatically changed mass transportation and shared transportation systems. Transportation infrastructure, or infrastructure dependent on transportation systems, should plan for possible technological shifts in order to be sustainable and resilient.

In determining whether this credit is applicable to a project assessment, consider whether the project includes transportation infrastructure, or includes the frequent dependence on transportation for access to the project. This credit is applicable to all transportation infrastructure. Projects that do not include transportation infrastructure and are not accessible, unmanned, or have very small maintenance crews, may apply to have this credit deemed not applicable with supporting documentation.
### QL2.4 PRESERVE HISTORIC AND CULTURAL RESOURCES

**INTENT:**
Preserve or restore significant historical and cultural sites and related resources.

**METRIC:**
Steps taken to identify, preserve, or restore cultural resources.

**LEVELS OF ACHIEVEMENT**

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<thead>
<tr>
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<tbody>
<tr>
<td>(4) Stakeholder Consultation.</td>
<td>(7) Expanded Search</td>
<td>(11) Conservation</td>
<td>(14) Restoration</td>
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<tr>
<td>(A) The project team works with the community and required regulatory and resource agencies to identify historic and cultural resources in and around the project site.</td>
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<tr>
<td>(B) The assessment of cultural resources intentionally extends beyond national or subnational registries to identify important parts of the community culture such as places, events, natural features, oral traditions, or local skills.</td>
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<td>(C) The project implements strategies to preserve or enhance historic and cultural resources.</td>
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<td>(D) Stakeholders of the historic/cultural resources are consulted early in the project’s development and contribute to developing a sensitive design approach.</td>
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**EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE**

**A. Has the project team worked with the community and required regulatory and resource agencies to identify historic and cultural resources?**

1. *Documentation of meetings with the community and required regulatory and resource agencies to identify historic and cultural resources (e.g. reports, memoranda, and/or minutes).*
2. *Index of all historic and/or cultural resources that may be impacted by the project.*

**B. Does the identification of historic/cultural resources extend beyond registries to identify important parts of the community culture?**

1. *Documentation that the identification of historic/cultural resources extended beyond registries of historic sites.*
2. Index of historic or cultural resources not included in historic registries that may still be significant to the culture of the community. These should be identified in criterion A and may include, but are not limited to, places, events, natural features, oral traditions, or local skills.

3. When applicable, documentation of the level of effort that was deployed to identify important cultural resources of the community even if no relevant cultural resources were found.

C. Has the project team developed strategies to preserve or enhance historic and cultural resources to the project?

1. Location and design drawings of efforts to mitigate impacts or demonstrating that the site avoids impacting any historic or cultural

2. Design documents of all strategies to preserve, enhance or mitigate impacts. Efforts. Mitigation efforts must follow a hierarchy prioritizing: avoidance, minimization, restoration, and offsetting/ compensation.

D. Has the project team worked with stakeholders to develop a sensitive design and approach?

1. Documentation that the stakeholder engagement process included the identification and discussion of historic/ cultural resources.

2. Documentation of how the project plans were informed or approved during stakeholder engagement specifically relating to historic/ cultural resources.

E. Does the project avoid all historic/ cultural resources or fully preserve their character-defining features?

1. Documentation of how preservation efforts identified and documented in criterion B were sufficient to avoid all historic/ cultural resources or fully preserve their character-defining features.

F. Does the project enhance or restore historic/ cultural resources in the community?

1. Documentation of efforts to enhance or restore existing historic and cultural resources. Examples may include, but are not limited to, rehabilitation in accordance with the government standards, restoration of lost features such as a historic landscape or green spaces, upgrade and expansion of facilities used for cultural events, or publicly accessible educational/ museum sites in accordance with historic/ cultural stakeholder wishes.

2. Documentation that work was done in collaboration with historic or cultural preservationists to ensure that restoration does not damage the quality of the existing historic and/ or cultural resource.

DESCRIPTION

Infrastructure development that is not culturally sensitive can lead to devastating social, economic, and environmental consequences. While preservation is a necessary first step there are often opportunities to highlight, enhance, or facilitate the continuance or utilization of these historic and cultural resources. This can go beyond the direct protection of physical artifacts. For example, in communities seeking to preserve indigenous languages from extinction, the erection of multilingual infrastructure signage can provide support. Project teams are encouraged to think beyond traditional concepts of historic preservation.

Project owners should consider how preserving or enhancing historic and/ or cultural resources increases the unique character of their community; driving community attractiveness, livability, and tourism that in turn supports economic activity and a strong tax base. This often goes beyond resources specifically protected in state/ provincial, national, or international registries and may include places, events, natural features, oral traditions, or local skills that are important parts of the community culture. The significance of these resources may scale with the size of the community and outsiders can sometimes view cherished cultural resources as unimportant. It is therefore necessary to engage with the community to fully understand their local value. Project teams that engage with a community in order to understand their unique culture and history, indicate a level of respect and consideration that builds trust, reduces conflict, and facilitates effective project delivery. This is particularly important when the project potentially impacts cultural resources of indigenous populations.

Engaging and understanding local culture can lead project teams to a better understanding of underlying behavioral patterns allowing the development of a higher quality project that better meets the community’s needs. There are also occasions where insight into historic methods of meeting infrastructure needs can lead to innovative modern solutions.
PERFORMANCE IMPROVEMENT

The credit assessment begins with the identification of protected historic resources in and around the project site. The identification of known and protected historic and cultural resources is a requisite to achievement in this credit. However, project teams are also required to go beyond historic and cultural registries to engage with the community in order to identify places, events, natural features, oral traditions, or local skills that are important parts of the community culture. Measures are then taken following a mitigation hierarchy to protect resources. The ultimate goal of this hierarchy is to avoid impact to resources whenever possible, to minimize the impacts that cannot be avoided, to commit to restoring resources from remaining impacts, and as a measure of last resort to provide compensation for impacts that cannot be restored.

As projects advance through the levels of achievement the cultural stakeholders are no longer passive recipients of culturally sensitive project designs but are actively engaged in developing project solutions that preserve or enhance cultural resources. While project teams may consider themselves capable of safeguarding cultural resources it is often the cultural stakeholders themselves who are best able to identify the culturally significant aspects of the resource that need protection.

Project teams that incorporate historic and cultural resources into stakeholder engagement activities but are unable to identify any historic or cultural resources relevant to the project may apply to have this credit deemed not applicable with supporting documentation. This credit is applicable to all infrastructure projects that impact a historic or cultural resource identified in state/provincial, national, or international registries, or identified through stakeholder engagement. This credit is also applicable, and no points achieved, for projects that cannot demonstrate a serious effort was made to identify potential historic or cultural resources.
QL2.5 ENHANCE VIEWS AND LOCAL CHARACTER

INTENT:
Preserve or enhance the physical, natural, and historic character of the project site and its surroundings.

METRIC:
Steps taken to assess valued community resources, implement preservation measures, and determine overall satisfaction.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
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<tr>
<td>(1) Value Identification</td>
<td>(3) Alignment With Community Values</td>
<td>(6) Community Preservation And Enhancement</td>
<td>(11) Community Connections And Collaboration</td>
<td>(14) Restoration Of Community And Character</td>
</tr>
<tr>
<td>(A) The project team identifies community values and concerns regarding protection and enhancement of views and local character.</td>
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<td>(B) Specific design features preserve or enhance views and local character, and are informed by the stakeholder consultation process.</td>
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<td>(C) Guidelines are adopted or developed to preserve or enhance views and local character. The aesthetic quality of the project is important</td>
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<td>(D) A construction management plan protects character features, high-value landscapes, or landscape features during construction.</td>
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<td>(E) Community feedback from the stakeholder engagement process verifies actions taken in criteria A, B, and C.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team made a reasonable determination of community values and concerns regarding protection and enhancement of views and local character?

1. Plans, drawings, and reports identifying important elements of the site character including landform or levels, views, natural landscape features, materials, planting, style/ detailing, scale, and landscape/ townscape pattern.

2. Existing policies and regulations regarding public views and design guidelines relevant to the project.
B. Has the project team implemented specific strategies to preserve or enhance views and local character?

1. Documentation that the strategies take into consideration the preservation of natural landscape features and balances the need for safety measures and barriers against the desire for protection or enhancement of views and local character.

C. Has the project team developed or adopted existing guidelines to preserve views and local character?

1. Documentation demonstrating that the aesthetic quality of the project in its context was an important consideration.
2. An inventory of all natural landscape or man-made features to be protected.
3. An inventory of all view resources to be protected.
4. A plan for addressing public views in the project design. Plans include identification and location of the areas to be protected, identifying compatible land use, setting development standards, and establishing policies for inappropriate development and land use.
5. Design guidelines adopted or written for the project to preserve public views and important natural landscape features and to generally fit with the local character and context of its surroundings, whether urban or rural.

D. Does the project include a construction management plan to protect important natural or man-made features?

1. Documentation of the construction management plan that identifies important natural or man-made features deemed important to views or local character and how they will be protected during construction. This may include temporary relocation and restoration.

E. Does the community support actions taken to preserve or enhance views and local character?

1. Documentation that the stakeholder engagement process specifically addressed issues of views and local character. Documentation should include evidence of stakeholder engagement in two key areas:
   a. The identification of important views and elements of local character per criterion A.
   b. Approving or informing design features or guidelines to preserve or enhance views and local character per criteria B and C.

Note that the aesthetic quality of a project is highly subjective. Project teams should seek to provide honest reporting of both supporting and dissenting opinions on the project. Assessment is not based on unanimous support but rather whether stakeholders were meaningfully engaged and given the opportunity to voice their acceptance or concerns.

F. Will the project result in the restoration or enhancement of views and local character?

1. Beyond preservation, the project either restores previously lost or degraded views and elements of local character or it enhances the community by creating new features of local character. For example, the construction of an iconic bridge intended to support the local community’s sense of identity and local pride. Alternatively, the project may involve the removal of degraded infrastructure generally considered to be an eye-sore on the natural landscape.

DESCRIPTION

It is important that a project’s design reflect its context. Context sensitive design, or context sensitive solutions, includes not only preserving views and fitting in with local character, but also enhancing local character when appropriate. The criteria may change depending on the context, but the goals remain the same. For example, in a rural setting, the project may need to be sensitive to views, or vistas, of natural landscapes and prominent features. Design features can fit with local character by reflecting the importance of natural surroundings. In urban settings, projects likewise seek to maintain important view corridors and fit in with the local urban character, reflecting traditional streetscapes, materials choices, height limitations, and other criteria. Tourism is a major industry and communities large and small compete with one another to attract visitors. Infrastructure has the potential to enhance the beauty and attractiveness of a community and its economic potential.

Sometimes enhancing views and local character isn’t about fitting in, but about standing out. Project teams should consider when infrastructure has the potential to, or already has, become a visible symbol of the community. Water towers, bridges, and other infrastructure often become a prominent part of a community’s identity. There is a danger that replacement or refurbishment may unintentionally lose the defining character of the resource. Conversely, the thoughtful consideration of these resources has the potential to provide lasting benefit to a community.
PERFORMANCE IMPROVEMENT

In fulfilling this credit, project teams minimize the impact on natural or community features, including rock formations and cutting of trees and other vegetation. Designs take into account either the natural, or urban, local character in terms of landform or levels, materials, plantings, style/detailing, scale, and landscape/townscape. Special consideration should be given to identify and prevent negative impacts to views. Designs should be in accordance with community goals and plans to protect view corridors, views from public or open spaces, and views of features strongly associated with the identity of the city or community.

Assessment in this credit begins with understanding the project context and engaging with local stakeholders to identify areas of local value and concern. These are translated into design guidelines to ensure they are carried through project delivery. Additional care is taken in higher levels to protect against the accidental damage or removal of character features, high-value landscapes, or landscape features during construction.

Projects often involve difficult tradeoffs of losses and benefits to views and local character, therefore the credit assess net benefit to the community. An action is a net benefit if it results in the overall enhancement of the viewshed or local character. As these determinations are often qualitative and subjective achievement in this credit relies on community engagement and support of the project to demonstrate that views and local character were indeed enhanced.
**QL2.6 ENHANCE PUBLIC SPACE AND AMENITIES**

**INTENT:**
Improve amenities and publicly accessible spaces such as sidewalks, parks, plazas, subway stations, recreational facilities, or nature/wildlife refuges to enhance community livability.

**METRIC:**
Plans and commitments to preserve, conserve, enhance, and/or restore the defining elements of the amenity.

**LEVELS OF ACHIEVEMENT**

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<tbody>
<tr>
<td>(1) No Net Loss</td>
<td>(3) Community Involvement</td>
<td>(6) Improvement And Enhancement</td>
<td>(11) Overall Net Benefit</td>
<td>(14) Substantial Restoration</td>
</tr>
<tr>
<td>(A) The project assesses impacts to existing public amenities and implements a mitigation hierarchy. The project will not result in the net loss of public amenities.</td>
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<td>(B) The stakeholder engagement process specifically includes issues of public space and amenities.</td>
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<td>(C) The project includes a construction management plan to maintain access to any existing public amenities (including public transportation) in a temporary condition during construction.</td>
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<td>(D) The project team can demonstrate stakeholder support for aspects of the project related to public space/amenities.</td>
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**EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE**

A. Has the project team assessed and mitigated impacts to existing public space and/or amenities?

1. Studies and assessments of the impact of the project on existing public space.
2. Reports documenting determination of benefits, improvements, and negative impacts.
3. Documentation of the mitigation hierarchy used to prioritize strategies. Demonstrate that the project will not result in a net loss of public space and amenities in quantity or quality. In cases of offsetting demonstrate that the offsets are of similar or better type and quality and will serve the same community as the lost resources.
B. Does the stakeholder engagement process specifically address issues of public space and amenities?

1. Documentation that public space and amenities were specifically included in the stakeholder engagement process. Examples include, but are not limited to, letters, memoranda, and meeting minutes with stakeholders showing stakeholder involvement.

C. Does the project include a construction management plan to maintain access to public space and amenities during construction?

1. Documentation of a construction management plan including strategies to:
   a. limit disruption and maintain access to public space and amenities during construction within the boundaries of safety
   b. limit interruption of service
   c. limit restrictions to public space and amenities

   Note that moving access points and establishing detours is allowed so long as a similar level of service is provided.

D. Are officials and public stakeholders satisfied with the project plans involving public space and amenities?

1. Evidence of stakeholder approval of how the project will address impacts to public space/amenities including, when applicable, the design and access to new or enhanced public space/amenities.

2. Evidence of stakeholder understanding and acceptance of construction impacts to public space/amenities, specifically access, during construction.

3. Written approval from relevant officials regarding the project plans related to public space/amenities.

E. To what extent does the project involve significantly enhancing, or creating new, public space and/or amenities?

1. Plans and drawings showing the scope and extent of efforts for new or enhanced public space/amenities.

2. Evidence that the new or newly enhanced public space/amenity is a significant asset to the local community. For example, the project contributes to long-term community goals by providing a public park in a neighborhood identified as lacking sufficient park space.

DESCRIPTION

Opening space whenever possible to community activity is helpful in gaining acceptance by local communities, educating the public about sustainable infrastructure, reducing crime, and encouraging healthy and vibrant neighborhoods. For many decades the standard principle for locating infrastructure has been “out of sight, out of mind”. The majority of infrastructure is underground, relocated to the periphery, or even hidden in plain sight. This has contributed to the public’s “not in my back yard” stance to siting and the lack of public will to make necessary infrastructure investments. Compounding this problem, completely walling off sites from the public contributes to community ‘dead zones’ that become attractors for crime and vandalism. By incorporating public space into projects infrastructure owners and project teams can help to reintegrate infrastructure into communities and infrastructure awareness into the public mindset. When sports fields sit atop wastewater treatment facilities (Alexandria, VA, USA), stormwater treatment ponds double as wetland parks (Los Angeles, CA, USA), and ports provide community bike trails (Vancouver, BC, Canada) public perception about the value of infrastructure changes.

PERFORMANCE IMPROVEMENT

Achievement in this credit can include any publicly owned and accessible resources, or such privately owned resources where there is significant and formalized public access that is specifically outlined in the written management plans and/or legal agreements. Public access does not necessarily mean 24-hour access or “free” access. However, facilities or projects pursuing this credit that significantly limit access or charge fees must pass a test of reasonableness as to whether such sites are truly public resources.

Public amenities can be in either urban or natural settings and may include, but are not limited to, parks, plazas, trails, playgrounds, recreational facilities, and wildlife refuges. Enhancing public space can also include the beautification of existing public spaces such as streets, sidewalks, or right of ways. For natural settings such as parks and wildlife refuges, “public” refers to space accessible for human recreation and enjoyment. The preservation of habitats and species biodiversity is addressed by credits in the Natural World category.
Projects often involve difficult tradeoffs of replacing the loss of a public amenity with a new resource, therefore the credit assess net benefit to the community. An action is a net benefit if it results in the overall enhancement of the significant activities, features, and attributes of the resource, or if it replaces an underutilized resource with a more beneficial resource. As these determinations are often qualitative and subjective assessment of this credit relies on community engagement and support of the project to demonstrate that public space and/or amenities were indeed enhanced.

For the highest level of achievement official(s) with jurisdiction over that resource must concur in writing that the proposed project will indeed result in a net benefit to that resource. The official(s) with jurisdiction represent the entity that has control over the operation or governance of that resource. The official is often the owner, but also may include additional entities, as is the case with leases, trusts, and other legal agreements.
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 achievement qualifies as exceptional performance or innovation.

LEVELS OF ACHIEVEMENT

INNOVATION

(+10) Innovate or Exceed Credit Requirements.
(A) Projects clearly document a performance that exceeds the highest existing requirements within one or more credits.
OR
(B) Projects demonstrate the innovative application of methods, technologies, or processes that are novel either in their use, application, or within the local regulatory or cultural climate.
OR
(C) Projects demonstrate actions not currently recognized in the Envision rating system significant contribute to sustainability.

DESCRIPTION
This credit addresses special instances in which projects far exceed the performance requirements of a credit or innovate in a way that advances the industry and the field of knowledge. These points 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, a more thorough documentation is expected. Projects may pursue points for innovation or exceptional performance.

PERFORMANCE IMPROVEMENT

Exceptional Performance
To qualify for exceptional performance points, projects must meet the highest level of achievement within the relevant credit. For instance, projects seeking additional points in credit QL3.1 Preserve Historic and Cultural Resources must already be achieving a restorative impact on existing cultural resources. In this instance, exceptional performance may be pursued by projects whose magnitude of preservation and investment in restoration represent a significant percentage of the project budget and a primary objective of the project.

Exceptional performance constitutes achieving a remarkable increase in performance. This would be a multiple-factor increase in efficiency or effectiveness in one or more credits. Possible areas of achievement in exceptional performance for Quality of Life may include, but are not limited to, the following:

- Projects for which job development and training far exceed the Restorative achievement expectations, demonstrating that the project will fundamentally revitalize the communities’ economy through job creation and skilled training;
- Projects for which net positive impact on public space exceeds small-scale parks and plazas to include large parks or reserves, recreational facilities, or urban spaces that represent a significant contribution to the quality of the community;
- Project whose impact will fundamentally change the ability of community residents to access and use sustainable means of transportation on a large scale.

Innovation
To qualify for innovation points, projects must demonstrate achievement in at least one of the following goals:

- Overcoming significant problems, barriers, or limitations—Project teams demonstrate that they have reduced or eliminated significant
problems, barriers, or limitations that previously hampered the use or implementation of certain resources, technologies, processes, or methodologies that improve the efficiency or sustainability of a project;

- Creating scalable and/ or transferable solutions—Project teams demonstrate that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/ or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.

Project teams may use innovative technology, methods, or application (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 technologies or methods 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 unique 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.

EVALUATION CRITERIA AND DOCUMENTATION

A. 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 Quality of Life credit.

B. To what extent does the project include the innovative application of methods, technologies, or processes?
   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.).

C. To what extent has the project significantly contributed to sustainability through actions not currently recognized in the Envision rating system?
   1. 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 methodologies that improve the efficiency or sustainability of a project.
   2. Documentation that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/ or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.
LEADERSHIP

Collaboration
LD1.1 Provide Effective Leadership & Commitment
LD1.2 Foster Collaboration & Teamwork
LD1.3 Provide For Stakeholder Involvement

Planning
LD2.1 Establish A Sustainability Management Plan
LD2.2 Plan For Sustainable Communities
LD2.3 Plan For Long-Term Monitoring & Maintenance
LD2.4 Plan For End Of Life

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

Improved
Improved
Improved
Improved
NEW!
NEW! (formerly RA1.7 Provide for Deconstruction and Recycling)
Improved
Improved
NEW!
LD1.1 PROVIDE EFFECTIVE LEADERSHIP AND COMMITMENT

INTENT:
Provide effective leadership and commitment to achieve project sustainability goals.

METRIC:
The degree to which the project owner and project team have made general, and project specific, sustainability commitments and instituted sustainability management policies.

LEVELS OF ACHIEVEMENT

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<thead>
<tr>
<th>IMPROVED</th>
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<tbody>
<tr>
<td>(2) Initial Commitment</td>
<td>(5) Strong Commitment</td>
<td>(12) “Walking The Talk”</td>
<td>(18) Sustainability As A Core Value</td>
<td></td>
</tr>
<tr>
<td>(A) The project owner and lead design firm have made clear commitments to sustainability as evidenced by:</td>
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<td>(B) A written commitment by the owner and project team to address the social, environmental, and economic aspects of the project.</td>
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<td>Commitments to sustainability are clearly articulated at the project level in a project chartering session and/or contract documents.</td>
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<tr>
<td>(C) Commitments are supported by a sustainability management policy that is commensurate with the scope, scale, and complexity of the project.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. To what level and extent have the project owner and the project team made public organizational commitments to improve sustainable performance?

1. Identification and description of key members of the project team.
2. Organizational sustainability principles and policies.
3. Documentation of the following commitments to sustainability as required for the relevant level of achievement:
   a. Recognition of past or ongoing projects, or significant initiatives undertaken, to improve sustainable performance (e.g. project write-ups, awards, or third-party recognition received for sustainable performance in one or more areas)
b. Sustainability reports, preferably either verified or partially verified by an independent third-party, with clearly expressed targets and associated performance (e.g. Global Reporting Initiative, corporate GHG emissions reduction targets, corporate energy reduction targets, corporate waste reduction targets). Clear illustration or description of the governance of sustainability within the organizations and clear demonstration of support and commitment from senior management to sustainability.

c. Evidence that the organizations involved in the project have sustainability strategies that are embedded into their business strategy, or evidence of a clear link between the strategies.

d. Third-party organizational recognition or commitments related to sustainability (e.g. signatory to the UN Global Compact, listed on the CDP Climate Performance Leadership Index, listed on the Jantzi Social Index, listed on the Dow Jones Sustainability Index, etc.)

B. Have the project owner and project team made written commitments to address the social, environmental, and economic aspects of the project?

1. Letters, council meeting minutes, notes from design meetings.
2. Contract documents clearly articulating commitments to address the social, environmental, and economic aspects of the project.
3. Evidence of a chartering, value engineering, or other relevant design session that included key members of the project team that clearly express commitments to sustainability.
4. A project-specific sustainability report(s) detailing how the project will achieve its goals and what key performance indicators will be used to measure and manage initiatives.

C. Has the project team developed a sustainability management policy commensurate with the scope, scale, and complexity of the project?

1. A sustainability management policy that includes commitments to achieving improvements in sustainable performance with clear objectives and targets for the project. The policy references project stakeholders, health and safety commitments, environmental commitments, and social/community commitments.

DESCRIPTION

This credit provides incentives for establishing sound and credible management and leadership to adequately and competently address issues surrounding sustainability in all phases of the project. The community will be better served by project teams that are led and managed by people and organizations that have a strong commitment to the principles of sustainability and have demonstrated the ability to effectively incorporate these principles into projects.

Projects are more likely to achieve sustainable outcomes when owners, designers, contractors, and all involved in the project team, make strong commitments to achieve sustainability goals. Conversely, project performance is most at risk when sustainability is considered an ‘add-on’ or lower priority objective. This credit assesses the degree to which various members of the project team have committed to making sustainability a priority within their respective organizations as well as the project itself.

PERFORMANCE IMPROVEMENT

As project’s advance through the levels of achievement the criteria increasingly assess how deeply sustainability is embedded in the organizations, and whether project specific commitments and policies are in place. Documentation should become increasingly comprehensive and detailed. Many Leadership credits reference the importance of decision-making and collaboration within the ‘project team’. The nature of the project team will depend on several factors including the project delivery method. What is intended in Envision when referencing the ‘project team’ is to capture major decision-makers involved in the project as well as those that act as primary advisors, consultants, or specialists on behalf of decision-makers. This will almost always include the project owner, those that act as lead designers (engineers, architects, landscape architects, etc.), and those that manage and execute the project through construction, but ideally would also include those responsible for funding, operating, regulating, sub-consulting, or otherwise utilizing the project (e.g. community groups). Those with the responsibility and authority to implement sustainability efforts should coordinate them to ensure their effectiveness. Envision users should take time to review the organizational hierarchy of the project in order to identify at what levels key decisions regarding project sustainability are being made. This will constitute the starting point of defining the ‘project team’.
The highest level of achievement requires a project sustainability management policy, which defines the scope of the project and the project team’s commitment to sustainable performance improvement. The policy commits the project team to meeting or exceeding all health and safety standards and improving environmental, social and ethical performance. This policy can be a pre-established policy created by the project owner, agreed to by the project team, and customized for the project to the extent required.

In determining whether this credit is applicable to a project assessment, it is likely that all projects can benefit from effective leadership and strong commitments to sustainability. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.
LD1.2 FOSTER COLLABORATION AND TEAMWORK

INTENT:
Enhance project sustainability through interdisciplinary collaboration and teamwork.

METRIC:
The breadth and inclusivity of interdisciplinary and collaborative meetings and the resulting sustainability performance enhancements.

LEVELS OF ACHIEVEMENT

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<tr>
<td>(A) Sustainability goals are defined early during interdisciplinary collaborative project kickoff meetings among project staff at all levels.</td>
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<tr>
<td>(B) The project team can demonstrate at least one (1) sustainability performance enhancement that resulted from the interdisciplinary collaborative process.</td>
<td>(B) The project team can demonstrate at least one (1) sustainability performance enhancement that resulted from the interdisciplinary collaborative process.</td>
<td>Ongoing collaboration meetings, are conducted throughout design with the owner and the interdisciplinary project team to clarify expectations, discuss potential opportunities, and identify potential barriers to integrated design. Meetings involve a broad set of project participants.</td>
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<tr>
<td>(B) The project team can demonstrate two (2) or more sustainability performance enhancements that resulted from the interdisciplinary collaborative process.</td>
<td>(B) The project team can demonstrate two (2) or more sustainability performance enhancements that resulted from the interdisciplinary collaborative process.</td>
<td>The collaboration process is integrated with the proactive stakeholder engagement process.</td>
<td>The collaboration process is integrated with the proactive stakeholder engagement process.</td>
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<tr>
<td>(C) The interdisciplinary collaboration or integrated design process specifically includes stakeholders from later construction, operations, and/or maintenance phases. Important considerations over the project life are understood and incorporated into the project.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. To what extent does the project team establish regular interdisciplinary and collaborative meetings to set and achieve sustainability goals?

1. Identification of the various disciplines or project team roles involved in the interdisciplinary collaborative process.

2. Documentation of design charrettes, value engineering sessions, or other meetings to identify opportunities for improving sustainable performance and reducing design conflicts. Documentation should clearly demonstrate that improving sustainable performance and reducing design conflicts were a focus of the meetings.

3. Documentation of the interdisciplinary project team’s business processes and management controls in the form of procedures, flowcharts, checklists, and other documented control measures to achieve more sustainable outcomes for the project.
4. Documentation that the interdisciplinary and collaborative approach was integrated with the project’s proactive stakeholder engagement process.

B. To what extent has project sustainability performance been enhanced as a result of the interdisciplinary collaboration?
   1. Documentation of project improvements or increased performance that can be attributed to the interdisciplinary collaborative process.

C. Does the process include construction, operations, or maintenance stakeholders, for better incorporation of considerations in later project phases?
   1. Documentation that construction, operations and/or maintenance representatives have participated in the integrated design process.
   2. Documentation that the integrated process has improved sustainability performance in later phases of the project.

DESCRIPTION

This credit encourages owner and project team collaboration in the delivery of more sustainable projects. Integrated project delivery brings project team members together early in the planning and design stages to understand how their design assumptions and decisions positively or negatively affect the work of others. This includes members of the project team who are traditionally involved later in the project (e.g., constructor, commissioning agent). Working separately, performance is suboptimal, confined to individual project components. Working together as an integrated team, performance can be optimized across the entire project.

Owners and project teams should consider how investing in early and regular collaboration between designers, contractors, and operators can prevent design conflicts, reduce change orders, and result in projects that are easier, faster, and less expensive to construct. Meetings where each party is able to bring their expertise and knowledge can prevent errors caused by assumptions or lack of awareness and can often lead to innovative solutions or higher performance targets. Project teams should consider holding meetings where each of the Envision criteria are discussed and each party able to offer feedback on how they can contribute to achieving project goals.

PERFORMANCE IMPROVEMENT

The credit assesses the breadth and inclusivity of interdisciplinary and collaborative meetings and the resulting sustainability performance enhancements. Design charrettes, value engineering sessions, or similar meetings can be used during design development to foster an environment for project innovation. The project team works together to identify opportunities to improve sustainable performance. Note that project design meetings or value engineering sessions are not inherently about improved sustainability and therefore Envision users should clearly identify how these sessions were used to address sustainability (environmental, social, and economic goals) for the project. Written commitments that specify the use of integrated design and how it will be used to improve the sustainable performance of the project can be helpful supporting documentation.

The nature of the documentation provided for this credit will vary depending on project delivery type. However, in determining whether this credit is applicable to a project assessment, it is likely that all projects can benefit from better collaboration and teamwork in pursuit of more sustainable projects. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.
LD1.3 PROVIDE FOR STAKEHOLDER INVOLVEMENT

INTENT:
Early and sustained stakeholder engagement and involvement in project decision-making.

METRIC:
Establishment of sound and meaningful programs for stakeholder identification, early and sustained engagement, and involvement in project decision-making.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(1) Information transfer</td>
<td>(8) Active engagement and dialogue</td>
<td>(16) Community involvement</td>
<td>(24) Community collaboration</td>
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<tr>
<td>(A) Primary stakeholders are identified through a stakeholder mapping process.</td>
<td>(A) Primary AND secondary stakeholders are identified through a stakeholder mapping process.</td>
<td>(A) Primary, secondary, AND key stakeholders are identified through a stakeholder mapping process.</td>
<td>(A) Primary, secondary, AND key stakeholders are identified through a stakeholder mapping process.</td>
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<tr>
<td>(B) A stakeholder engagement process is established for the project.</td>
<td>Stakeholder concerns and specific objectives for stakeholder engagement are defined.</td>
<td>Stakeholder concerns and specific objectives for stakeholder engagement are defined.</td>
<td>Stakeholder concerns and specific objectives for stakeholder engagement are defined.</td>
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<tr>
<td>The primary form of stakeholder engagement is to inform or educate the public about the project.</td>
<td>Engagement moves beyond education into active dialogue. Stakeholder views are monitored and a two-way line of communication is established to reply to inquiries. A lead person from the project team, in addition to any public involvement lead or manager, works with stakeholder groups to understand communication needs and the desire for, and scope of involvement.</td>
<td>Feedback is obtained through solid and credible programs. Sufficient opportunities are provided for stakeholders to be involved in decision-making. The participation process is transparent with opportunities to provide meaningful input.</td>
<td>One or more stakeholders, having mutual interests or interdependencies, are identified and engaged as partners.</td>
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<td>(D) Feedback is sought from stakeholders as to their satisfaction with the engagement process and the resulting decisions made based on their input.</td>
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<tr>
<td>(C) Varied and potentially conflicting stakeholder views and were evaluated and addressed fairly and equitably during decision-making. There are specific and significant case(s) in which public input influenced the outcomes.</td>
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</table>
A. To what extent has the project team undertaken a stakeholder mapping exercise to determine stakeholders?

1. Comprehensive list of potential stakeholders identified, with stakeholder classification (primary, secondary, or key) with a statement or rationale for selection.
   - Primary stakeholders are individuals or groups directly impacted by the project, such as the communities crossed and served by a new road. This should include stakeholders who could be impacted or affected by the project during its lifecycle.
   - Secondary stakeholders are individuals or groups indirectly affected by the project.
   - Key stakeholders could belong to either group, and represent individuals who are important within or to an organization, agency, or institution involved in the project or have a strong interest in the project such as NGOs. This may also include those who are likely to influence the project’s success and/or design characteristics; and stakeholders to whom the project has legal, financial, operational or other responsibilities.

2. Demonstration that stakeholders were identified and prioritized in a fair and equitable fashion.

B. To what extent has the project team analyzed, planned, and executed the engagement for key project stakeholders?

1. Engagement plans for each stakeholder that consider the issues the project team needs to address and the method(s) of engagement (e.g., some stakeholders may require only one-way communication, while others may require dialogue and partnership building engagement such as consultations, hosting stakeholder advisory panels, soliciting online feedback, hosting multi-stakeholder forums and partnerships, and/or convening networks of stakeholders).
   - Stakeholder engagement plans should be proactive. This would be characterized by outreach and a determination to involve those who will be affected by, or are very likely to have an active interest in, the project, as opposed to passive invitations to participation such as public notices with little or no follow up to ensure a robust response.

2. Documentation of engagement which may include letters, meeting minutes, or memoranda with stakeholders. Documentation shows the issues that were addressed with stakeholders and their concerns/feedback specific to the project.

C. To what extent has stakeholder engagement feedback been incorporated into project plans, design, and/or decision-making?

1. Documentation showing that feedback raised by stakeholders was evaluated and prioritized and how feedback deemed material changed/impacted/altered the project plans, design, and/or decision-making.
   - OR
   - Documentation showing how feedback raised by stakeholders was already incorporated into the project plans, design, and/or decision-making.

D. Has the project team sought feedback from stakeholders as to their satisfaction with the engagement process and the resulting decisions made based on their input?

1. Letters or other documentation showing support from stakeholders for the engagement process undertaken for this project.

2. Letters or other documentation showing support from stakeholders for the decisions made based on their input.

3. In certain cases documentation may also demonstrate an absence of significant new stakeholder issues arising as the project advances to final design and construction.

DESCRIPTION

Stakeholder engagement is a critical component of any infrastructure project. While many projects incorporate some level of stakeholder engagement, this credit assesses the degree to which stakeholder engagement was proactive, early, and sustained. It also assesses the degree to which communications were two-directional with project teams soliciting and incorporating community feedback rather than merely informing the community of project decisions.
Project teams that take a business-as-usual approach or assume they know what is best for the community run the risk of failing to notice demographic, socioeconomic, or cultural shifts within the community that may impact the overall success of the project. By holding projects to a higher standard of stakeholder engagement owners and project teams can earn what is termed the social license to operate. Social license to operate is the acceptance (beyond regulations) of the local community and stakeholders. This unofficial license developed from mutual respect builds good will and trust that will speed projects and smooth the way for future projects. Conflicts that arise in project delivery can often be traced to misinformation or distrust. Proactive stakeholder engagement can prevent this by providing communities with accurate information and assuring them that their concerns are being heard and addressed.

PERFORMANCE IMPROVEMENT

This credit rates the sufficiency of the public input process established by the owner and the project team. Relationship building among the public and key stakeholders is an important component of the engagement process. A public participation process is set up to identify and engage key stakeholders in project decision making. Stakeholders are defined as individuals or groups who affect, or are affected by, a project. Project stakeholders may include local communities, customers, employees, government and regulators, NGOs, etc. For this credit, stakeholders are categorized as primary, secondary or key.

- Primary stakeholders are individuals or groups directly impacted by the project, such as the communities crossed and served by a new road. This should include stakeholders who could be impacted or affected by the project during its lifecycle.
- Secondary stakeholders are individuals or groups indirectly affected by the project.
- Key stakeholders could belong to either group and represent individuals who are important within or to an organization, agency, or institution involved in the project or have a strong interest in the project such as NGOs. This may also include those who are likely to influence the project’s success and/or design characteristics; and stakeholders to whom the project has legal, financial, operational or other responsibilities.

Stakeholder engagement involves a process for informing stakeholders of the scope and content of the project, identification of stakeholder issues and concerns, soliciting and collecting feedback, and incorporating that feedback to the design, construction, and operation of the completed project. Project teams should consider how a significant number of Envision credits rely on documentation from a robust stakeholder engagement process and how incorporating these criteria into the stakeholder engagement plan can meet multiple requirements.

Many Leadership credits reference the importance of decision-making and collaboration within the ‘project team’. The nature of the project team will depend on several factors including the project delivery method. What is intended in Envision when referencing the ‘project team’ is to capture major decision-makers involved in the project as well as those that act as primary advisors, consultants, or specialists on behalf of decision-makers. This will almost always include the project owner, those that act as lead designers (engineers, architects, landscape architects, etc.), and those that manage the project through to construction, but ideally would also include those responsible for funding, operating, regulating, sub-consulting, or otherwise utilizing the project (e.g., community groups). Those with the responsibility and authority to implement sustainability efforts should coordinate them to ensure their effectiveness. Envision users should take time to review the organizational hierarchy of the project in order to identify at what levels key decisions regarding project sustainability are being made. This will constitute the starting point of defining the ‘project team’.

In determining whether this credit is applicable to a project assessment, is likely that all projects can benefit from stakeholder engagement. Although the types and scope of stakeholders may vary depending on the project type, it would be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.
LD2.1 ESTABLISH A SUSTAINABILITY MANAGEMENT PLAN

INTENT:
Create a project sustainability management plan that can manage the scope, scale, and complexity of a project seeking to improve sustainable performance.

METRIC:
Organizational policies, authorities, mechanisms, education, and business processes that have been put in place and the determination that they are sufficient for the scope, scale, and complexity of the project.

LEVELS OF ACHIEVEMENT

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<thead>
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<tbody>
<tr>
<td>(3) Plan</td>
<td>(5) “Plan-Do-Check-Act”</td>
<td>(10) Full Implementation</td>
<td>(16) Managing Change</td>
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<tr>
<td>(A) Roles and responsibilities for addressing sustainability are assigned to key members of the project team. Their authority on the project to affect change is sufficient and clear.</td>
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<tr>
<td>(B) The sustainability management plan includes an index of all project features related to sustainability, and an assessment of the environmental, social, and economic aspects of the project. Sustainability goals and performance objectives, are prioritized to reduce the project’s impact. They are aligned with community needs and issues.</td>
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<tr>
<td>(C) Processes are in place to achieve the project's sustainability goals and performance objectives.</td>
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<tr>
<td>(D) The plan is adaptable, flexible, and resilient enough to manage change in environmental, social, or economic conditions of the project over time.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Are roles and responsibilities for addressing sustainability assigned to key members of the project team?

1. Organizational charts and documentation showing the persons responsible for project sustainability issues, their position in the project organization, and their authority to make project decisions and affect change.
B. Has a sustainability management plan been developed to assess and prioritize the environmental, economic, and social aspects of the project and set project sustainability goals, objectives, and targets?

1. An index of all project features related to sustainability.
2. Assessment of the project’s environmental, economic, and social impacts. This may include the potential for existing non-sustainable conditions to further deteriorate environmental, economic, or social conditions if left unaddressed.
3. Prioritized list of project goals, objectives, performance targets that take into account project importance and the consequences of change. Alignment of goals, objectives, and targets to community needs and issues.

C. Does the project include a sustainability management plan that contains sufficient processes and management controls to address the sustainability goals, objectives, and targets?

1. Documentation of the project’s business processes and management controls in the form of procedures, flowcharts, checklists, audits, corrective action reports and other documented control measures.
2. Documentation of a robust plan-do-check-act methodology to identify priorities, evaluate progress, and make adjustments to continually improve project sustainability performance.
3. Documentation showing tracking and implementation of the sustainability management plan during construction.
4. The sustainability goals are communicated throughout the team through methods such as construction plans, daily job briefings, subcontractor orientations, or onsite field training sessions.

D. Is the project sustainability management plan adaptable, flexible, and resilient enough to manage changes in the environmental, social, or economic conditions of the project over its life?

1. Identification of potential areas where changes in key design variables may impact project performance over time related to sustainability. Evidence that the plan accounts for these potential changes and is adaptable.

DESCRIPTION

Given the long timelines, complex inter-organizational cooperation, and varied consultants and contractors it is critical to have a sustainability management plan to establish expectations and ensure that sustainability goals and objectives are communicated and carried through project delivery. When time and budgets are limited sustainability criteria must have this level of institutional support in order to be successful. By clearly establishing roles, responsibilities, and expectations project owners and project teams realize efficiencies in avoided conflicts, duplications, or miscommunication. Having a clear prioritization of goals helps consultants and contractors correctly devote their time and resources in order to deliver the best possible project for their client.

PERFORMANCE IMPROVEMENT

This credit assesses whether the project includes a sustainability management plan that can manage the scope, scale, and complexity of the project’s sustainable performance goals. This assessment is based on the organizational policies, authorities, mechanisms, education and business processes that have been put in place and a determination of their sufficiency.

A sustainability management plan is a plan that enables an organization to set goals, objectives, and policies; instigate plans and programs; review performance against a plan; and take corrective actions across the full dimensions of sustainability. The International Organization for Standardization (ISO) 14004 standard for social and environmental management plans, provides guidance on developing a sustainability management plan.

To create the sustainability management plan, the project team should develop a list of all the environmental, economic, and social aspects of the project that relate to sustainability. Once established, the list of aspects is prioritized by the project team based on the importance of meeting both project and sustainability goals. Once prioritized, the project team creates an action plan consisting of objectives and performance targets for achieving those goals. Project and business processes should be established to periodically review and assess performance against the action plan and to take necessary corrective actions.

Sustainability management plans may be stand-alone or incorporated into larger management plans. Documentation should focus on demonstrating that key environmental, social, and economic performance targets are set, plans implemented, and progress tracked as described above. Sustainability management plans should include, at minimum, the design, construction, and operations and maintenance of the project.
## LD2.2 PLAN FOR SUSTAINABLE COMMUNITIES

**INTENT:**
Incorporate sustainability principles into project identification in order to develop the most sustainable project for the community.

**METRIC:**
The degree to which project identification includes sustainability performance assessments in considering alternatives and is part of larger sustainable development plan.

### LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(1) Sustainability Indicators</td>
<td>(4) Alternative Analysis</td>
<td>(B) Sustainability Assessment</td>
<td>(12) Sustainable Planning</td>
<td>(16) More Sustainable Communities</td>
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<tr>
<td>(A) Sustainability indicators or outcomes are planning consideration in project identification.</td>
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<td>(B) Sustainable performance is included in alternative analyses during project identification. Alternatives include the sustainability of a 'no-build' option.</td>
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<td>(C) During project identification the project's potential impact to broader external systems is assessed, such as growth patterns, congestion, energy and water demand/production, and how these impact the overall long-term sustainability of the community or region.</td>
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<td>(D) The project is part of a comprehensive sustainable development plan at the level of the infrastructure system, municipality/community, or region. The project demonstrates a direct connection and contribution to achieving specific sustainable development goals identified in the plan.</td>
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<td>(E) The project addresses an inherently unsustainable condition within the community.</td>
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**EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE**

A. **Was sustainability considered during project identification?**

1. **Documentation that sustainability indicators or outcomes were factors in considering project alternatives during project identification in the earliest phases of project planning.**
B. Were alternative analyses conducted on sustainability performance during project identification?
1. Documentation that the project identification process included alternative analyses that included sustainability performance assessments.
2. Documentation that alternative analyses included the sustainability performance of a ‘no build’ option, when possible, in order to determine whether new infrastructure construction was necessary.

C. Was an assessment conducted of the project’s impacts to broader long-term community or regional sustainability?
1. Documentation that early planning assessments considered the broader impacts of the project on the long-term sustainability of the community or region.

D. Is the project part of a comprehensive sustainable development plan?
1. Documentation that project is part of a broader community-wide sustainable development plan. If not clearly identified as a sustainable plan, documentation should include how the development plan advances sustainability objectives.

E. Does the project address an inherently unsustainable condition within the community or region?
1. Documentation the project addresses or corrects and existing unsustainable condition within the community (e.g. nonrenewable resource consumption, water overuse, or environmental contamination).

DESCRIPTION
Envision is not only about doing the project right, it is about doing the right project. Choosing the right project is a critical first step toward ensuring a sustainable project. These decisions are often made very early in the planning process during project identification. This credit recognizes projects where social, economic, and environmental considerations were incorporated into the selection criteria.

Most infrastructure projects have very long lifespans and once constructed can commit communities to a certain range of performance outcomes for decades. Furthermore, communities that grow and develop around this infrastructure may face limited choices in the future. This exists today, with communities burdened and limited in their choices for modifying existing infrastructure because of the choices made by planners decades ago. Owners and project teams should consider how infrastructure planning impacts the future of a community or region especially in regards to sustainability and operational or replacement costs.

PERFORMANCE IMPROVEMENT
The credit assessment begins with incorporating sustainability (social, economic, environmental) criteria into the project identification process. In higher levels of achievement sustainability is incorporated into alternative analyses, and the project’s broader impacts to the overall sustainability of the community are assessed.

The highest levels of achievement are for communities that have invested in developing comprehensive sustainability plans. These plans can leverage the co-benefits and efficiencies achieved from integrating infrastructure systems. In most cases infrastructure development occurs within the context of existing infrastructure systems. For maximum points project teams should consider how their project might present an opportunity to correct or mitigate an existing unsustainable condition.

In determining whether this credit is applicable to a project assessment, consideration is given to the scope and scale of the project and whether it has the potential to more broadly impact community sustainability. For example, small projects that involve the retrofitting or refurbishment of components or systems within an existing facility may contribute to improved sustainability performance but may struggle to demonstrate an impact beyond the project site. Small projects that do not impact the broader community sustainability, and do not have the potential to impact community sustainability, may apply to have this credit deemed not applicable with supporting documentation.
LD2.3 PLAN FOR LONG-TERM MONITORING AND MAINTENANCE

INTENT:
Put in place plans, processes, and personnel sufficient to ensure that long-term sustainable protection, mitigation, and enhancement measures are incorporated into the project.

METRIC:
Comprehensiveness and detail of long-term monitoring and maintenance plans, implementation goals, and commitment of resources to fund the activities.

LEVELS OF ACHIEVEMENT

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<tr>
<td>(1) Outline</td>
<td>(3) Working Plan</td>
<td>(5) Plan</td>
<td>(10) Comprehensive Plan</td>
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<tr>
<td>(A) A monitoring and maintenance plan is developed with specific sustainability performance targets and an implementation schedule with clear goals and milestones.</td>
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<td>(A) A monitoring and maintenance plan is developed with specific sustainability performance targets and an implementation schedule with clear goals and milestones. It addresses any unique challenges of monitoring or maintaining the project’s sustainability features.</td>
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<tr>
<td>(B) After construction is completed, the outline of the long-term monitoring &amp; maintenance plan is given to the operation, monitoring, and maintenance staff.</td>
<td>(B) After construction is completed, the designer and contractor meet with the operations, monitoring, and maintenance staff to develop a working plan based on the as-built conditions.</td>
<td>(B) After construction, the project team meets with the operation, monitoring, and maintenance staff to develop a working plan based on as-built conditions.</td>
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<tr>
<td>(C) The project includes strategies to reduce maintenance impacts. This may include better design, durable longer-lasting materials, or ease of access for maintenance and repair.</td>
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<tr>
<td>(D) Owner identifies the key personnel to carry out the plan, funding sources, and other resources to cover associated costs.</td>
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<tr>
<td>(E) A schedule is developed for future reevaluation and modification of the maintenance plan based on monitored data.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Is there a clear and comprehensive plan in place for long-term monitoring and maintenance of the completed project?

1. Plans for long-term monitoring and maintenance of the completed project.
B. To what extent has the monitoring and maintenance plan been communicated to operations and maintenance staff, and appropriate training been conducted?

1. Documentation that the monitoring and maintenance plan has been communicated and delivered to the staff responsible for ongoing operations, monitoring, and maintenance.

2. Documentation of meetings and/or training sessions intended to ensure a successful transition into operations.

C. Has the project team considered how to reduce ongoing operational impacts?

1. Documentation of strategies intended to reduce the negative impacts of ongoing operations and maintenance. This may include but are not limited to, better design, durable longer-lasting materials, ease of access for maintenance and repair, or minimal disruption to users and affected communities.

D. To what extent have sufficient resources been allocated for long-term monitoring and maintenance of the completed project?

1. Designations of the persons or organizations assigned to monitor and maintain the completed project.

2. Explanation of how funding will be allocated, set aside, and maintained at sufficient levels to fund necessary monitoring and maintenance.

3. Documentation or plans showing that these resources will be in place following delivery of the project.

E. Is there a plan in place to reevaluate and modify the maintenance plan based on monitored data?

1. Schedule for reevaluating the monitoring and maintenance plan.

DESCRIPTION

The maintenance of existing infrastructure systems is already a significant burden in many communities. The resulting inability to adequately maintain and monitor infrastructure often leads to degraded performance with significant environmental, social, and/or financial consequences. For example, the cost to repair and maintain roads exponentially increases the further they degrade. In addition, poorly maintained roads lead to increased congestion, increased vehicle maintenance, accidents, and personal injury which all create a financial burden on individuals and the community as a whole. The failure to properly plan or coordinate maintenance activities can also result in inefficiencies and waste.

PERFORMANCE IMPROVEMENT

The credit assessment begins with the establishment of plans and resources for long-term monitoring and maintenance of the completed project. A comprehensive long-term plan is prepared and in place before the end of construction. Clear and concise maintenance requirements and specifications are provided to prevent sustainable performance degradation resulting from the failure to follow specified operations or maintenance procedures required to maintain system performance. Without clear guidance on what is required to maintain sustainable performance, future owners and operators may unknowingly rely on old approaches, processes, and replacement parts.

As projects advance to higher levels of achievement they can demonstrate the project was intentionally designed and constructed to facilitate efficient and low-impact operations and maintenance while achieving high levels of performance.

In the highest levels of achievement skills and resources are available to ensure that sustainability features are properly maintained. This ensures that the design performance will be maintained throughout the life of the project so long as sufficient resources and personnel are provided to implement the plan. The maintenance plan is treated as a living document with plans to reassess and improve performance over the life of the project.

Project teams should consider the new opportunities provided by the proliferation and accessibility of data and technology. Smart systems can reduce operations and maintenance costs, avoid disruptions, improve service, and enhance safety. Providing real-time information to infrastructure operators, key stakeholders, or the general public can provide numerous advantages.

Applicability of this credit is based on the need for ongoing monitoring and maintenance of the project. In rare cases where projects do not include operation or maintenance activities projects may apply to have this credit deemed not applicable with supporting documentation. Otherwise, this credit is considered applicable to all projects that include operations and maintenance.
LD2.4 PLAN FOR END OF LIFE

INTENT:
Ensure that the project is informed by an understanding of the full impacts and costs of the project end-of-life.

METRIC:
The degree to which the project team analyses, and communicates with stakeholders, end-of-life impacts, cost, and value.

LEVELS OF ACHIEVEMENT

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<tr>
<td>(A) The project team develops an end-of-life plan including the necessary replacement/refurbishment of major components over the project life and its ultimate decommissioning, deconstruction, or replacement.</td>
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<td>The plan is included in operations and maintenance documents.</td>
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<td>(B) Relevant future demands, loads, or other requirements on the infrastructure system are estimated over the anticipated project life.</td>
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<td>The project extends useful life through reconfiguration, future expansion, or flexibility, OR options to beneficially repurpose the project after end-of-life.</td>
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<td>(C) End-of-life impacts are assessed including the environmental, social, and economic conditions of the site and surrounding community.</td>
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<tr>
<td>(D) The project includes a feasibility analysis including end-of-life costs and salvage value associated with deconstruction, decommissioning, or replacement.</td>
<td>The findings are presented to stakeholders.</td>
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| EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team developed and end of life plan?

1. Base case for project useful life (in years).
2. Documentation of operations and maintenance documents including the end-of-life plan. The plan includes at minimum the timeline and frequency for replacement or refurbishment of all major components as well as considerations for the ultimate decommissioning, deconstruction, or replacement of the project.

B. Has the project team evaluated opportunities to extend the project’s useful life or beneficially repurpose the project at end-of-life?

1. Estimates of the relevant future demands, loads, or other requirements on the infrastructure system.
2. Documentation of how the overall design will allow for expansion, reconfiguration, and/or multiple uses, OR how the project can feasibly and beneficially be repurposed at the end of its useful life.

C. Has the project team assessed potential social, environmental, and economic end-of-life impacts?

1. Documentation estimating potential impacts associated with the project. Assessment should cover social, environmental, and economic impacts.

D. Has the project team evaluated the costs and salvage value of the project’s deconstruction, decommissioning, or replacement?

1. Results of the feasibility study identifying end-of-life costs and ultimate salvage value.
2. Documentation that the relevant agency, department, or other public entity is aware of the end-of-life feasibility analysis.

E. Has the project team proactively engaged stakeholders in end-of-life planning?

1. Documentation demonstrating that end-of-life costs and impacts were incorporated into the stakeholder engagement process and the community was engaged in considering end-of-life options for the project.

DESCRIPTION

This credit addresses the need to anticipate costs and impacts of project refurbishment or replacement and completes the series of planning credits that includes sustainable project identification and efficient low-impact operations and maintenance. Given the long life of infrastructure careful consideration is not always given to the projects end of useful life. For many projects the default assumption is that the project will continue indefinitely with periodic refurbishment.

PERFORMANCE IMPROVEMENT

This credit encourages project teams to consider the costs and impacts associated with a project’s end-of-life. In doing so, consideration should be given to extending the useful life of the project by enabling reconfiguration, future expansion, or flexibility, or by finding a beneficial use for the project. The longer the useful life of the project, the less it will need to be replaced, substantially reducing the energy, water, and materials required for a rebuild.

The credit assessment begins with developing an end-of-life plan that includes the replacement or refurbishment for major project components and the ultimate decommissioning, deconstruction, or replacement of the project.

There are many instances where infrastructure is currently operating under conditions that exceed its original design parameters. This causes accelerated degradation of the asset and speeds its end-of-life. Project teams should anticipate future loads and incorporate them into the project in order to prolong the project life. This can be achieved through incorporating capacity for reconfiguration, future expansion, or flexibility.

Project teams should also consider the ultimate end-of-life impacts of the project. For example, whether decades of operation will render the site contaminated or otherwise environmentally damaged. These impacts are ultimately borne by the community and therefore they should be actively engaged in understanding the associated trade-offs and end-of-life costs and impacts.
**LD3.1 STIMULATE ECONOMIC PROSPERITY AND DEVELOPMENT**

**INTENT:**
Support and stimulate economic prosperity and sustainable development, including improvements in job growth, capacity building, productivity, business attractiveness, and livability.

**METRIC:**
The degree to which the project creates jobs, adds operating capacity, provides access, increases choices, increases quality, and/or improves socioeconomic conditions, in order to stimulate economic prosperity and future development.

**LEVELS OF ACHIEVEMENT**

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<tr>
<td><strong>(1) Job Creation</strong></td>
<td><strong>(3) New Capacity</strong></td>
<td><strong>(7) Improved Choices</strong></td>
<td><strong>(14) Business Attraction</strong></td>
<td><strong>(20) Developmental Rebirth</strong></td>
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<td><strong>(E)</strong> Stimulate economic prosperity and development beyond the design, construction, and operation of the project, Jobs from the project foster an expansion of the local skill base OR the project is considered critical infrastructure for local, regional, or national economic development. The project is adaptive or takes into account changing social, economic, and/or environmental conditions.</td>
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</table>
EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Does the project create a significant number of new jobs during its design, construction, and operation?

1. Calculations showing the number and type of new jobs created during the design, construction, and operation of the project that benefit the local economy. In this case ‘local’ is relative to the project scale and may even be ‘state/provincial’ or ‘national’ for large projects. Calculations should distinguish between direct jobs and induced jobs.

2. Explanation of the impact of these jobs on the local economy relative to the project size.

B. Does the project provide new operating capacity for business, industry, or the public?

1. Documentation showing how the project expands, or increases the quality of, operating capacity for business, industry, or the public (e.g. cultural and/or recreational facilities).

2. Official documents such as community plans, assessments, meeting minutes, or letters from community leaders, or decision-makers that confirm the project benefits to business, industry, or the public.

C. Does the project provide additional access, increase the number of choices, and/or increase the quality of infrastructure services for business, industry, or the public?

1. Documentation of how the project provides additional access, increases the number of choices, and/or increases the quality of infrastructure services.

2. Analyses showing how additional access, choices, or quality of services will provide benefits to the local economy, e.g., reduced congestion, lower operating costs, increased efficiency, and new operating alternatives.

D. Does the project improve community attractiveness for business, industry, or the public by generally improving the socioeconomic conditions of the community?

1. Documentation of how the project improves community attractiveness for business, industry, or the public by generally improving the socioeconomic conditions of the community.

2. Analyses showing how improved community attractiveness to business, industry, or their workforce as a result of the project will benefit local economic development.

E. Will the project stimulate economic prosperity and further economic development beyond the project boundary?

1. Documentation of how the project will have economic impacts beyond its own scope. For example, a port expansion that will provide benefits to industries throughout a region, or public spaces that will revitalize community property values.

2. Analyses showing how the project is likely to cause systemic change in the local economy. Note that while the scale of economic impact is considered relative to the size of the project, broader economic impacts beyond the project design, construction, and operation, may not be demonstrable for very small projects.

3. Documentation that the project’s projected impact on future economic development has factored changing social, economic, and environmental trends. This may include, but is not limited to, changing demographics of the community, growing or shrinking tax bases, and environmental degradation or climate change.

DESCRIPTION

The intent of this credit is to foster long-term economic prosperity and sustainable development for the community that is in concert with established community goals. Economic prosperity is the state of thriving which transforms a community into a vibrant location that supports and enhances the needs of the community and businesses, and where people want to live, work, and play. Sustainable development is economic development that is conducted without the depletion of social or natural resources. While not all infrastructure projects are directly connected to economic growth, all infrastructure, including recreational or cultural facilities, are connected to the economy by driving livability and community attractiveness to businesses and the workforce. In this way infrastructure can contribute to socioeconomic vitality, with infrastructure costs offset by increased economic activity in the community, region, or country. Demonstrating the broader economic benefits of the project provides significant advantages in acquiring project approval, funding, and community support.
Economic prosperity and sustainable development is not synonymous with expansion. Because of economic downturns, changes in demographics, and other factors, many communities face shrinking populations and an eroding tax base. In these situations, it may be more desirable to reduce the quantity of unused and abandoned housing, commercial buildings, and industrial facilities to reduce the associated burden of infrastructure operations and maintenance.

PERFORMANCE IMPROVEMENT

For this credit, projects are recognized for their contribution to what is termed “community economic prosperity and sustainable development”. This is prosperity and development that takes into account what is realistic and affordable, and expectations for Envision assessments are based on the relative scale and scope of the project. The must fundamental contribution infrastructure can make to economic growth begins with job creation during design, construction, and/or operation of the project.

Beyond job creation, often the impetus behind infrastructure projects is a need to increase capacity. This capacity increase is generally due to projected growth in commercial, industrial, and/or residential demand. By increasing capacity infrastructure meets the fundamental requirements for future growth.

As project teams advance through the levels of achievement, providing increased access, choices, and quality of infrastructure can provide two advantages to communities:

- The first is increased efficiency, competitiveness, or improved productivity. For example, communities that provide access to high-quality multi-modal transportation options can realize economic benefits in reduced productivity loss due to congestions.
- The second is increased attractiveness due to improved socioeconomic conditions. For example, a downtown street revitalization program that makes the community more attractive to businesses and residents.

The best infrastructure projects leverage their limited funding to drive systemic change throughout the local, regional, or national economy. However, project teams need to consider that long-term economic prosperity and sustainable development requires an ability to adapt to changing economic, social, and environmental conditions and the resulting changing operating environment.

The scope of this credit is broad, covering commercial, industrial, cultural, and recreational aspects of community development. In determining whether this credit is applicable to a project assessment, it is likely that all projects have the ability to support and stimulate economic prosperity and sustainable development. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.
LD3.2 DEVELOP LOCAL SKILLS AND CAPABILITIES

INTENT:
Expand the knowledge, skills, and capacity of the community workforce to improve their ability to grow and develop.

METRIC:
The inclusion of current and future training programs, informed by skill or capability gaps, and targeted to economically depressed or underemployed communities.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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<tr>
<td>(1) Gaining Skills</td>
<td>(3) Growing Capacity</td>
<td>(6) Building Communities</td>
<td>(11) Long-term Opportunities</td>
<td>(16) Community Revitalization</td>
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<td>(B) Beyond general skill development the project team identifies specific skill or capability gaps in the local workforce. Training programs target these gaps to improve local capacity. Skills are transferable beyond the end of the project.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Will the project include training programs for local skill development?
1. Evidence of training programs associated with the project. Note that standard internships do not qualify as providing local skill development.

B. Has the project team identified skill or capability gaps in the local workforce and targeted training programs to address them?
1. Documentation of the skill or capability gaps identified. For example, inexperience in deploying sustainable technologies, best practices, or new methods.
2. Evidence of training programs that specifically target identified gaps.

C. Will the project include ongoing training, education, or skill development programs?
   1. Documentation of commitments or programs by the project owner or operator to deliver training, education, or skill development programs after construction is completed. This may include, but is not limited to, community education and/or awareness training programs.

D. Will training and skill development programs specifically target communities that are economically depressed or underemployed?
   1. Documentation of how economically depressed or underemployed communities were determined relative to the local/regional economic conditions.
   2. Evidence that efforts were made to specifically target these communities for participation in training programs.

DESCRIPTION

Infrastructure investment is a major source of job creation in all project phases. Sustainable infrastructure also often utilizes new or uncommon materials, methodologies, or technology, that require new or uncommon skills and capabilities within the workforce. A lack of capacity to deliver these project objectives creates uncertainty that can lead to higher costs, slower delivery, or lower quality results. Building local skills and capabilities helps ensure a successful project. More broadly, skills and capacity building within a workforce can create systemic change that carries over to future projects. Consultants and contractors should consider how capacity building increases marketability and competitiveness that provides an advantage in securing future projects. Infrastructure owners should consider how capacity building within their community can drive competition and decrease future project costs.

PERFORMANCE IMPROVEMENT

This credit addresses the degree to which the project expands the knowledge, skills, and capacity of the community workforce during the project design, construction, and operation and maintenance phases in order to improve their ability to grow and develop. This assessment is based on the inclusion of current and future training programs, informed by skill or capability gaps, and targeted to economically depressed or underemployed communities.

Projects may receive partial points for a wide range of training programs. The scope of training is relative to the scale of the project. Note that standard internships do not qualify as providing local skill development. As project teams advance through the levels of achievement, they should identify opportunities to align projects needs with gaps in the local workforce.

After projects meet the requirements to impart new skills to the workforce, additional points can be achieved by ensuring ongoing or future training that extends beyond the end of construction. The project owner may provide these activities, or other organization committed to the long-term operation of the project. Education and training activities may also expand beyond workforce training to include broader community education and awareness. Expectations of the level of community education and awareness training are relative to the scope and scale of the project.

The Restorative level for this credit is achieved by projects that target skill development and training programs to communities that are economically depressed or underemployed. In this way the project supports the restoration of the economic prosperity of the community with the goal of sustained and inclusive economic growth, as well as full and productive employment and decent work for all.
LD3.3 CONDUCT A LIFECYCLE ECONOMIC EVALUATION

INTENT:
Utilize economic analyses to identify the full economic implications and the broader social and environmental benefits of the project.

METRIC:
The comprehensiveness of the economic analyses used to determine the net impacts of the project, and their use in assessing alternatives to inform decision-making.

LEVELS OF ACHIEVEMENT

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<td>(4) Lifecycle Cost Analysis</td>
<td>(6) LCCA Alternatives Analysis</td>
<td>(A) A lifecycle cost analysis is conducted on the whole project to identify the total economic impacts of the project and provide additional insight into decision-making.</td>
<td>(10) Cost Benefit Analysis</td>
<td>(12) CBA Alternatives Analysis</td>
</tr>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has a lifecycle cost analysis been conducted to identify the financial impacts of the whole project?
1. A narrative description that is clearly and concisely written for reviewers with limited economic expertise to understand. Project teams should describe the proposed project and expected costs. To the greatest extent possible, it should identify evidence-based practices as the basis for the analysis.
2. Documentation of the lifecycle cost analysis: including assumptions, data sources, and methodology. The methodology is to follow best practices, including national or international guidance where appropriate/available. The analysis must be conducted over a consistent time period for all alternatives, while incorporating discounting techniques to factor in the time-value-of-money in order to make comparisons on a common basis. The analysis should at minimum include the following information:
   - Project/Investment costs (capital costs)
   - Replacement costs
   - Annual or reoccurring operations and maintenance costs
   - Residual value
   - Adding financial benefit streams, such as revenues, which offset costs

B. Have lifecycle cost analyses been used to compare alternatives for at least one major project component?
1. Documentation of the planned use of the financial analysis and how it impacted the decision-making process or alternative selected. This should include specific reference to the inherent design features, technologies, or other elements that differ from the base case. The base case is not necessarily always a "do nothing" alternative, but it is generally the "lowest" capital cost alternative that achieves some basic utility to the project. In the case of a new design, the base case could mean a more basic facility design or one with fewer sustainability-related components.
C. Has a cost benefit analysis been conducted to identify the financial, social, and environmental impacts of the whole project?

1. Documentation of the cost-benefit analysis; including assumptions, data sources, and methodology. The methodology is to follow best practices, including national or international guidance where appropriate/available. The analysis must be conducted over a consistent time period for all alternatives, while incorporating discounting techniques to factor in the time-value-of-money in order to make comparisons on a common basis. Note that a cost-benefit analysis includes all data that would have been collected as part of a lifecycle cost analysis in criterion A. In addition project teams may consider but are not limited to the following topics to guide and structure the social and environmental impacts:

- Reductions in mortality, morbidity/injuries – safety improvements
- Benefit to low- and moderate-income persons and/or households – distributional impacts
- Enhanced recreational values – increased biking or walking, exercising, etc.
- Enhanced aesthetics or streetscape – light pollution, general aesthetics, streetscape enhancements
- Productivity improvements – enhanced thermal comfort, reduction in respiratory diseases, allergens, air quality, etc.
- Reduced car or truck mileage – congestion, safety, emissions, road damage, vehicle operating costs
- Noise/Odor levels
- Ecosystem and biodiversity effects (e.g. from wetlands restoration or reforestation)
- Air Quality – Reduced criteria pollutants from reduced energy use, vehicle use, embedded energy in materials, solid waste, amongst others.
- Water quality – reduced stormwater runoff, reduced effluent flows
- Water quantity – reduced demand for freshwater
- Climate change – Reduced Greenhouse Gas emissions (CO2 Equivalents) – from reduced energy use, vehicle use, embedded energy in materials, solid waste, amongst others.
- Resiliency value – value of protection from the effects of future/repeat disasters or enhanced reliability that reduces future cost such as damage, displacement, or loss of service.

D. Have cost benefit analyses, including financial, environmental, and social benefits, been used to compare the alternatives for at least one major project component?

1. Documentation of the planned use of the economic analysis and how it impacted the decision-making process or alternative selected. There is no one prescribed approach that is recommended for conducting a COST BENEFIT ANALYSIS comparison; however, project teams may use the following sample generic approach:

- Define base case
- List feasible alternatives
- Specify categories of costs and benefits
- Quantify costs and benefits (as incremental to the base case)
- Monetize costs and benefits
- Identify and incorporate risks into the analysis (this is a best-practice approach to COST BENEFIT ANALYSIS, and is optional)
- Discount future cash flows to calculate NPV and other metrics
DESCRIPTION

This credit provides incentives for, and recognition of, the use of sound, industry-accepted economic analysis to provide a better measurement of the value of a project and ultimately encourage greater levels of sustainability. Taking a lifecycle economic approach to project evaluation is a means to enhance decision making to encourage the effective management of resources and assets that ultimately lead to more sustainable projects. Lifecycle economic evaluations allow for a comprehensive assessment to better understand the trade-offs of upfront capital costs and the longer-term anticipated operational savings that may accrue from sustainable design. An intended outcome of infrastructure is often to generate benefits and/or reduce negative impacts to the community, the environment, and broader society; economic analysis can be used to measure and value these benefits which are typically assessed only qualitatively.

Given limited funding and increasing demand for infrastructure and public works projects, utilizing rigorous economic analysis to more fully assess investments can help organizations best use its funds amongst competing capital projects. By using a lifecycle approach, design alternatives can be compared on a present value basis, which may ultimately prove the business case for sustainability and yield more sustainable projects.

Often in project planning, upfront capital costs are the key driver to capital planning decisions. In these cases, the financial assessment is relatively simple; however, this omits the lifecycle costs of the project, risks and uncertainty, or the broader outcomes that impact the environment and society. An outcome of this approach is that projects may eschew sustainability-related investments that may have higher upfront capital costs associated with them, but may ultimately produce cost savings over the lifecycle of the project from lower utility costs, operations and maintenance costs, or less replacement costs.

PERFORMANCE IMPROVEMENT

The credit assessment begins with conducting a lifecycle cost analysis (LCCA). LCCA is one of several evaluation techniques commonly used to compare and evaluate the financial feasibility of various design alternatives over an assumed service lifecycle. LCCA provides a more informed perspective of the total financial costs of the project and allows a more direct comparison of competing projects. At a minimum it is necessary to make sure the project is assessing capital, operations and management, replacement cost, and any residual value over a consistent time period for all alternatives, while incorporating discounting techniques to factor in the time-value-of-money to compare multiple different projects on a common basis.

While lifecycle cost analysis provides greater rigor and insight in the planning process, it also omits the explicit assessment of the social and environment benefits generated by the project. As project teams advance through the levels of achievement a cost benefit analysis (CBA) is used to quantify and measure the broader financial, social, and environmental benefits of the project. CBA is a widely used, well-documented methodology for assessing the net economic effects of investments or policies. The approach provides a systematic process for calculating, monetizing, and comparing the economic benefits and costs of a particular project, by putting benefits and costs in a common metric. It allows a direct assessment of the trade-offs for varying levels of financial costs, environmental quality, social impacts, and resiliency, and allows decision makers to identify those projects that are the most beneficial and cost-effective.

A CBA is a systematic evaluation of the economic advantages (benefits) and disadvantages (costs) of a set of investment alternatives. Typically, a “base case” is compared to one or more alternatives (which have some significant improvement compared to the base case). The analysis evaluates incremental differences in order to identify additional benefits that will result if the alternative is undertaken, and what additional costs are needed to bring it about. To compare different projects or alternatives of the same project that may have costs and benefits occurring in different years, discounting is used to convert future benefits and costs to a current year perspective. The standard criterion for deciding whether a project can be justified is whether the net present value is positive. The net present value is the discounted monetized value of expected net benefits (i.e., benefits minus costs). Impacts are quantified and monetized through the use of statistical and/or engineering data, and peer-reviewed valuation research.
LD0.0 INNOVATE OR EXCEED CREDIT REQUIREMENTS

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

METRIC:
Whether project achievement qualifies as exceptional performance or innovation.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>INNOVATION</th>
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<tbody>
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<td>(+10) Innovate or Exceed Credit Requirements.</td>
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<tr>
<td>(A) Projects clearly document a performance that exceeds the highest existing requirements within one or more credits.</td>
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<tr>
<td>OR</td>
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<tr>
<td>(B) Projects demonstrate the innovative application of methods, technologies, or processes that are novel either in their use, application, or within the local regulatory or cultural climate.</td>
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<tr>
<td>OR</td>
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<tr>
<td>(C) Projects demonstrate actions not currently recognized in the Envision rating system significant contribute to sustainability.</td>
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DESCRIPTION

This credit addresses special cases in which projects far exceed the performance requirements of a credit or innovate in a way that advances the industry and the field of knowledge. These points 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, a more thorough documentation is expected. Projects may pursue points for innovation or exceptional performance.

PERFORMANCE IMPROVEMENT

Exceptional Performance

To qualify for exceptional performance points, projects must meet the highest level of achievement within the relevant credit. For instance, credits seeking additional points in credit LD2.1 Pursue Byproduct Synergy Opportunities must already have conducted a thorough investigation into the potential recycling sources for the project’s byproducts. In this case, projects that not only implement a byproduct recycling program with other facilities but with a magnitude of byproduct diversion representing a significant effort and investment by the owner may pursue exceptional performance. Projects also may pursue this credit if new and innovative uses are found for byproducts formerly considered unusable or nonrecyclable waste. Exceptional performance may not be pursued by projects whose basic primary function meets the requirements. For instance, a recycling facility is excluded from innovation in byproduct or waste diversion unless it implements innovative methods that far exceed the industry norm in efficiency.

Exceptional performance constitutes achieving a remarkable increase in performance. This would be a multiple-factor increase in efficiency or effectiveness in one or more credits. Possible areas of achievement in exceptional performance for Leadership may include, but are not limited to, the following:

- Projects in which byproducts are used on a large scale in a novel way either in construction or operation of the project. This application must have the potential to be adopted in other related projects;
- A project whose integration to existing infrastructure systems was key to leveraging multiple-factor increases in efficiency at a scale far beyond the project boundaries.

Innovation

To qualify for innovation points, projects must demonstrate achievement in at least one of the following goals:

- Overcoming significant problems, barriers, or limitations—Project teams demonstrate that they have reduced or eliminated significant
problems, barriers, or limitations that previously hampered the use or implementation of certain resources, technologies, processes, or methodologies that improve the efficiency or sustainability of a project;

- Creating scalable and/or transferable solutions—Project teams demonstrate that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.

Project teams may use innovative technology, methods, or application (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 technologies or methods 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 unique 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.

EVALUATION CRITERIA AND DOCUMENTATION

A. To what extent has the project exceeded the highest levels of achievement for a given credit?

1. Detailed documentation of how the project exceeds the existing requirements currently within a given Leadership credit.

B. To what extent does the project implement innovative technologies or methods?

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.).

C. To what extent does the project overcome significant problems, barriers, or limitations or create scalable and/or transferable solutions?

1. 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 methodologies that improve the efficiency or sustainability of a project.

2. Documentation that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.
# RESOURCE ALLOCATION

## Materials
- RA1.1 Reduce Energy Intensity of Materials
- RA1.2 Support Sustainable Procurement Practices
- RA1.3 Use Recycled Materials
- RA1.4 Divert Operational Waste from Landfills
- RA1.5 Divert Construction Waste from Landfills
- RA1.6 Balance Earthwork On Site

**REWRITTEN** (combines former RA1.4)
- Improved
- Improved
- Improved
- **NEW!**
- Improved

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

**NEW!**
- Improved
- Improved
- Improved

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

**NEW!**
- Improved
- Improved

## RA0.0 Innovate or Exceed Credit Requirements
- Same
RA1.1 REDUCE ENERGY INTENSITY OF MATERIALS

INTENT:
Reduce the impacts of material use over the project life by using less material or specifying materials with lower net embodied energy from extraction, refinement/manufacture, and transport.

METRIC:
Percent reduction in energy intensity of materials.

LEVELS OF ACHIEVEMENT

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<td>(5) At Least 10% Reduction</td>
<td>(10) At Least 20% Reduction</td>
<td>(15) At Least 40% Reduction</td>
<td>(20) At Least 70% Reduction</td>
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<tr>
<td>(A) The project team identifies primary materials to be used on the project during construction and operation. The team determines which materials are the primary contributors to overall material intensity (collectively &gt;80%).</td>
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<tr>
<td>(B) Embodied energy is calculated, or acquired by a validated source, for the primary materials identified in criterion A. Calculations include: • Embodied energy of production, including raw material extraction, refinement, and manufacture. • Embodied energy of transporting materials to the project site.</td>
<td>(B) Embodied energy is calculated, or acquired by a validated source, for the primary materials identified in criterion A. Calculations include: • Embodied energy of production, including raw material extraction, refinement, and manufacture. • Embodied energy of transporting materials to the project site.</td>
<td>(B) Embodied energy is calculated, or acquired by a validated source, for the primary materials identified in criterion A. Calculations include: • Embodied energy of production, including raw material extraction, refinement, and manufacture. • Embodied energy of transporting materials to the project site.</td>
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<tr>
<td>(C) The project reduces total embodied energy for materials used in construction and operation by at least a 10%.</td>
<td>(C) The project reduces total embodied energy for materials used in construction and operation by at least a 25%.</td>
<td>(C) The project reduces total embodied energy for materials used in construction and operation by at least a 40%.</td>
<td>(C) The project reduces total embodied energy for materials used in construction and operation by at least a 70%.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team determined materials that are the primary contributors to energy intensity 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 such as road resurfacing.
   c. Estimates of the embodied energy 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 energy of the project.
B. Has the project team calculated the embodied energy of the primary contributors to energy intensity including extraction/harvesting, manufacturing, and transportation to the site?

1. Index of the embodied energy calculations of the primary contributors to energy intensity identified in criterion A. This should include:
   a. Energy consumed to produce the material including raw material extraction, refinement, and manufacture including secondary or tertiary processing.
   b. Energy consumed transporting the material from the manufacturer to the project site, including intermediary points.

   Embodied energy 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. All calculations should be expressed in standard embodied energy or energy intensity units of megajoules (MJ) or gigajoules (GJ) per unit weight (kg or tonne) or area (m² / ft²).

C. To what extent does the project reduce the total energy intensity of materials used in construction and operation?

1. Documentation that the project has set targets for reducing total embodied energy.
2. Documentation of strategies/plans to reduce embodied energy. For example, 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 a lower embodied energy;
   d. Reducing material needed for repair and maintenance;
   e. Reducing material waste during construction;
   f. Reducing material waste during operation;
   g. Sourcing closer materials to reduce transportation energy;
   h. Utilizing transportation modes that consume less energy.
3. Calculations of reductions in embodied energy achieved. Calculations should compare total energy intensity of materials for the project against the total energy intensity of the base case. The calculations should be expressed in standard energy units of megajoules (MJ) or gigajoules (GJ).

DESCRIPTION

This credit combines two concepts of sourcing local materials and using materials more efficiently in order to assess the combined environmental impacts of material use. In the calculations, energy is used as a proxy unit of measure to compare various impacts across the entire supply change 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 energy intensity (i.e. lower energy associated with manufacture) as well as reducing transportation distances, project teams can reduce the overall impact of the project.

PERFORMANCE IMPROVEMENT

This credit assesses percent reduction in energy intensity of materials over a base case. As industry standards on energy 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 benchmark performance data are explained in detail in the front of this manual and include: existing conditions, a seriously considered alternative, standard practice, or a comparable existing project/facility. It is the intent of Envision to support the collection of data and development of industry performance targets over time in order to eventually provide this benchmark data for project teams and the industry as a whole. This is why it is required to submit calculations in acceptable standard units.

Energy intensity of materials does not refer to electricity use during the construction or operation of the project. Energy intensity can be interpreted as a measure of the energy efficiency in producing and transporting materials. It can sometimes be used interchangeably with the term ‘embodied energy’. However, in certain contexts embodied energy may also include the latent energy of a material that can be released during a phase change (e.g. energy produced from burning wood or fossil fuels). This energy is not included in Envision calculations. Therefore Envision generally uses the term ‘energy intensity of materials’.
Since the availability of data on the energy intensity of materials is still limited, and some infrastructure projects may involve hundreds or thousands of different products, 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 material intensity. If data on embodied energy 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.

Reducing energy intensity of materials does not mean building poorly or for the short term. Maintenance and repairs can consume large amounts of material over the life of the project and these should be factored into the calculations. It is common that a well-built project that invests more material and resources initially will result in less material being consumed over the life of the project. Therefore, projects should be designed to consider total consumption of construction and repair material over the project’s lifespan and include this in the credit calculations.

Transportation of materials to project sites is a significant consumer of fossil fuels and therefore contributes to the total energy intensity 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. Calculations of energy 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 further away. Project teams should consider choices that reduce the net overall energy intensity of materials.

This credit is applicable to all projects that include the use or consumption of physical materials in construction or operation.
RA1.2 SUPPORT SUSTAINABLE PROCUREMENT PRACTICES

INTENT:
Develop sustainable procurement policies and programs to source materials and equipment from manufacturers and suppliers that implement sustainable practices.

METRIC:
The degree to which the project team implements a sustainable procurement program, and the percentage of materials sourced from manufacturers and/or suppliers that implement sustainable practices.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(2) Basic Sustainable Sourcing</td>
<td>(4) 15% Sustainable Procurement</td>
<td>(7) 25% Sustainable Procurement</td>
<td>(12) 50% Sustainable Procurement</td>
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<tr>
<td>(A) A written sustainable procurement policy/program is in place. The program includes a well-defined process for selecting suppliers and/or manufacturers of materials, supplies, and equipment, including selection criteria focused on environmental practices and social responsibility.</td>
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<td>(B) At least 15% of all project materials, supplies, and equipment meet, or come from manufacturers and/or suppliers that meet, disclosure requirements on social and environmental impacts.</td>
<td></td>
<td>(B) At least 25% of all project materials, supplies, and equipment meet, or come from manufacturers and/or suppliers that meet, disclosure requirements on social and environmental impacts.</td>
<td></td>
<td>(B) At least 50% of all project materials, supplies, and equipment meet, or come from manufacturers and/or suppliers that meet, disclosure requirements on social and environmental impacts.</td>
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</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team implemented a sustainable procurement policy and program?

1. Documentation of a sustainable procurement policy that includes commitments to identify and select manufacturers and/or suppliers that implement sustainable practices. Program documentation includes a well-defined process for selecting suppliers and/or manufacturers of materials, supplies, and equipment, including selection criteria focused on environmental practices and social responsibility.

B. To what extent do materials, supplies, equipment, manufacturers and suppliers meet disclosure requirements for social and environmental impacts?

1. Documentation of procurement processes to demonstrate materials, supplies, equipment, manufacturers and suppliers will meet one or more of the following:
   a. Reduced environmental impacts by implementing an environmental management system consistent with ISO (International Organization for Standardization) 14001
   b. Reduced environmental impacts through a product-specific type III Environmental Product Declaration (EPD) conforming to ISO 14025, 14044, or when applicable a Health Product Declaration (HPD)
   c. Have met a recognized third-party verified sustainability program (e.g., Forest Stewardship Council (FSC), Green Seal, EcoLogo, UL, etc.)
   d. Have a third-party verified corporate sustainability report consistent with the Global Reporting Initiative (GRI) Sustainability Report or equivalent.

2. Calculations of the percentage of the total project materials by cost, weight, or volume that meet the disclosure requirements on social and environmental impacts.
a. Documentation of the total weight, volume, or cost of materials.

b. An inventory for all materials being tracked for sustainable procurement practices including a description of the material and the manufacturer or supplier of the material, along with evidence of the disclosure requirements.

c. Documentation of EPDs, HPDs, third-party certifications, or other documentation indicating the environmental and social disclosures were met.

3. Material/supplier tracking forms and/or spreadsheets; receipts/invoices.

DESCRIPTION

This credit encourages choosing suppliers that incorporate sustainability into their policies and daily practices and operations. Project teams should give preference to suppliers that have taken into account the environmental, economic, and social impacts of their products and have active programs in place for performance improvement.

Infrastructure projects are major consumers of materials and owners should consider their ability to influence higher sustainability performance upstream in the material manufacturing chain. As owners and project teams request and require sustainability disclosures this information will become increasingly available and easier to obtain. Such changes have already occurred in the material supply chains for buildings. While this credit is linked to RA1.1 Reduce Energy Intensity of Materials it expands beyond the impacts of per unit material production to include the environmental impacts of the entire manufacturing process.

Supplier integrity and ethical behavior are important considerations. Establishing policies for the procurement of sustainably manufactured products and materials helps safeguard the reputation and achievements of the project, and all organizations involved, from the possibility of future disclosures that project materials were produced in unsafe or environmentally damaging conditions.

PERFORMANCE IMPROVEMENT

In fulfilling this credit, project teams seek to purchase materials and supplies from manufacturers that are protective of human health and the environment. For example, project teams may make efforts to use only wood products certified under a recognized third-party sustainable forestry management certification program, products with environmental product declarations, or choose suppliers based on the incorporation of sustainability policies and practices to their operations. As there is no single standard for determining sustainable and ethical manufacturing practices a variety of indicators are permitted. Manufacturers may meet one or more of the following:

• Reduced environmental impacts by implementing an environmental management system consistent with ISO (International Organization for Standardization) 14001

• Reduced environmental impacts through a product-specific type III Environmental Product Declaration (EPD) conforming to ISO 14025, ISO 14044, or when applicable, a Health Product Declaration (HPD)

• Have met a recognized third-party verified sustainability program (e.g., Forest Stewardship Council (FSC), Green Seal, EcoLogo, UL, etc.)

• Have a third-party verified corporate sustainability report consistent with the Global Reporting Initiative (GRI) Sustainability Report or equivalent.

This credit is applicable to all projects that include the use or consumption of physical materials in construction or operation.
RA1.3 USE RECYCLED MATERIALS

INTENT:
Reduce the use of virgin natural resources and avoid sending useful materials to landfills by specifying reused materials, including structures, and material with recycled content.

METRIC:
Percentage of project materials that are reused or recycled. Plants, soil, rock, and water are not included in this credit.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(3) At Least 5% From Recycled</td>
<td>(6) At Least 20% From Recycled</td>
<td>(11) At Least 50% From Recycled</td>
<td>(14) At Least 80% From Recycled</td>
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<tr>
<td>(A) At least 5% (by weight, volume, or cost) of recycled materials including materials with recycled content and/or reused existing structures or materials.</td>
<td>(A) At least 20% (by weight, volume, or cost) of recycled materials including materials with recycled content and/or reused existing structures or materials.</td>
<td>(A) At least 50% (by weight, volume, or cost) of recycled materials including materials with recycled content and/or reused existing structures or materials.</td>
<td>(A) At least 80% (by weight, volume, or cost) of recycled materials including materials with recycled content and/or reused existing structures or materials.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. To what extent has the project team used recycled materials including materials with recycled content and/or reused existing structures or materials?

1. Total quantity of materials used on the project by weight, volume, or cost.
2. Inventory of specifications for materials containing recycled content. Inventory should include the name of the product, the name of the manufacturer, the weight, volume, or cost of the material, and the percentage of recycled content (either post-industrial or post-consumer recycled content).
3. Calculations of percentage of reused or recycled materials by weight, volume, or cost.
   a. To calculate materials with recycled content, multiply the material weight, volume, or cost by the percentage of recycled content.
   b. Mechanical, electrical, water equipment, and their components may be excluded from the calculations. In these instances, the most efficient equipment should be specified.
   c. Calculations do not include plants, soils, rocks, or water.
4. Inventory of existing materials or structures that have been reused.
   a. The project team must be able to demonstrate an intentional choice to salvage materials or structures that would otherwise have been sent to landfills. Materials or structures that would ordinarily have remained on site cannot be considered “reused” for this credit.
   b. Design documents showing the location and weight, volume, or cost of reused structures or materials. In determining weight, volume, or cost, the project team may refer to standard equivalents.

DESCRIPTION

The purpose of this credit is to reduce the use of virgin natural resources and avoid sending useful materials to landfills. Using recycled, reused, and renewable materials and products, including existing structures and materials on site, reduces demand for virgin materials and the embodied carbon emissions and environmental degradation attributed to their extraction and processing. Using these materials also reduces waste and supports the market for recycled and reused materials. Project teams should consider how the appropriate reuse of structures can significantly reduce demand for new construction materials as well as project costs. The reuse of existing materials or elements may also have a significant cultural or aesthetic value such as street lamps, sidewalk pavers, bridges, and more.
PERFORMANCE IMPROVEMENT

Calculations of recycled materials can be done by weight, volume, or cost, but must remain consistent within the credit. Calculations should compare the total quantity of recycled materials and reused structures with the total quantity of materials on the project. Products that contain a percentage of recycled material should be factored according to the percent of material that is recycled.

Recycled content is defined in accordance with ISO 14021 as the portion of materials used in a product that have been diverted from the solid waste stream and used in part or whole in place of a new primary material. Material eligible for consideration can also be defined as pre-existing material on-site, or from another site, that was previously a product or piece of equipment that is now being repurposed or reused. Natural materials such as soil and rock when used as backfill do not count toward this credit as they cannot be appropriately classified as ‘waste’ nor do they take the place of new primary material (for considering soil and rock reuse please see RA 1.6 Balance Earthwork). If natural resources on the site are harvested and manufactured in order to take the place of new or primary materials, such as pulverizing stone in order to produce aggregate, project teams assume a burden of proof to demonstrate the actions truly replace a new primary material. Likewise when claiming the reuse of existing structures or materials project teams must clearly demonstrate that a conscious decision was made to salvage those materials from demolition and disposal. Materials cannot be counted as recycled if, in standard practice, they would not otherwise have been removed. For example, when repairing a road, project teams cannot claim the entirety of remaining road as ‘recycled’, as that material would not typically have been removed.

Project teams are responsible for ensuring that all materials meet the necessary quality and performance criteria required for the intended application. They also must meet all state or local solid waste agency requirements for using recycled materials in construction. Any recycled materials used must not pose significant risks to human health and safety or the environment.

This credit is applicable to all projects that include the use or consumption of physical materials in construction or operation.
RA1.4 DIVERT OPERATIONAL WASTE FROM LANDFILLS

INTENT:
Reduce operational waste and divert waste streams from disposal to recycling and reuse.

METRIC:
Percentage of total operational waste diverted from disposal.

LEVELS OF ACHIEVEMENT

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<tr>
<td>(4) Recycle/Reuse At Least 25%</td>
<td>(7) Recycle/Reuse At Least 50%</td>
<td>(10) Recycle/Reuse At Least 75%</td>
<td>(16) Recycle/Reuse 95%</td>
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<tr>
<td>(A) The project team determines the potential for collecting recyclables. For any appropriate spaces (e.g. office or public spaces) waste recycling bins are provided.</td>
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<tr>
<td>(B) The project team identifies waste streams that will occur as a result of the operation of the project. The project is planned or designed to divert at least 25% of operational waste. Diversion may be a combination of waste reduction measures and/or sourcing waste to other facilities for recycling or reuse.</td>
<td>(B) The project team identifies waste streams that will occur as a result of the operation of the project. The project is planned or designed to divert at least 50% of operational waste. Diversion may be a combination of waste reduction measures and/or sourcing waste to other facilities for recycling or reuse.</td>
<td>(B) The project team identifies waste streams that will occur as a result of the operation of the project. The project is planned or designed to divert at least 75% of operational waste. Diversion may be a combination of waste reduction measures and/or sourcing waste to other facilities for recycling or reuse.</td>
<td>(B) The project team identifies waste streams that will occur as a result of the operation of the project. The project is planned or designed to divert at least 95% of operational waste. Diversion may be a combination of waste reduction measures and/or sourcing waste to other facilities for recycling or reuse.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Does the project include recycling bins where appropriate?
1. Documentation that project teams determined whether providing recycling bins is appropriate.
2. Documentation of locations of any recycling bins provided in the project.

B. To what extent has the project team reduced waste, or diverted waste from landfills?
1. Identification of waste streams that will occur during the operations of the project (e.g. sludge produced from the treatment of wastewater, byproduct or residual materials produced as a result of waste to energy facilities).
2. Documentation of how the project was planned or designed in order to reduce the generation of waste during operations or to divert operational waste from landfills. Documentation includes waste type and methods to reduce waste generation.
3. Calculations of estimated total waste reduction measures and percentage of materials diverted to recycling or reuse. The percentage of diverted waste should be calculated as the ratio of material diverted from landfills against the total waste generated during construction or operations. Calculations may be done by weight, volume, or cost, but must remain consistent throughout the credit. Waste deemed hazardous should not be included in the total waste calculations and should be disposed of according to local, state/provincial, and federal law. However, measures to reduce the generation of hazardous waste may be included in the calculations when appropriate.
DESCRIPTION

The goal of this credit is to reduce operational waste and divert waste streams from disposal to recycling and reuse. Opportunities exist within the planning, design, and construction of projects to reduce the estimated operational waste produced. Additionally, project teams should consider the ability of the remaining waste generated by the project to be recycled or beneficially reused. Decisions made throughout the project delivery process can either enhance or limit the project’s ability to reduce and divert waste.

PERFORMANCE IMPROVEMENT

As industry standards on waste generation do not exist for most infrastructure projects, project teams are required to provide calculations for an appropriate base case. Accepted methodologies for establishing benchmark performance data are explained in detail in the front of this manual and include: existing conditions, a seriously considered alternative, standard practice, or a comparable existing project/facility.

This credit intentionally separates the collection of recyclables in office or public spaces. While important, for large infrastructure projects this activity can be orders of magnitude smaller than the process waste generated by the operation of the project. On the other hand, for small projects where waste generated in offices or public spaces represents the majority of project waste, criteria A and B may involve the same activities.

This credit minimizes the quantity of waste generated by the completed project and maximizes opportunities for waste to be recycled or reused. This requires identifying potential sources and destinations for recycling and may include a management plan. Project teams should consider whether minimizing waste will make certain waste streams unusable and/or uneconomical for recycling or reuse. Decreasing the quantity of waste may increase its toxicity. Methods that produce less waste may result in less likelihood of recycling. Consideration is given to both the quantity of waste being generated and the recyclability of that waste stream. The objective of is to reach a balance such that the net amount of waste is minimized.

The final application/destination of diverted or reused materials should not pose risks to human health and safety or the environment and should be in compliance with all state/provincial and local solid waste requirements. Waste deemed hazardous should not be included in the total waste calculations and should be disposed of according to local, state/provincial, and federal law. However, measures to reduce the generation of hazardous waste may be included in the calculations when appropriate. Soils and rocks are not included in this credit, but are addressed in RA1.6 Balance Earthwork On Site. Methods of diversion should meet the spirit and intent of the credit to reduce the social and environmental impacts of waste generation. Acceptable means of diversion may include:

- Waste reduction;
- Reuse or recycle materials on site;
- Materials sent to recycling or reclamation facilities;
- Materials sent to manufacturers to be used as post-consumer recycled content;
- Materials composted on site or sent to a composting facility;
- The use of material, if appropriate, as infill;

Unacceptable means of diversion include:

- Burying waste material unsuited for infill.

This credit is applicable to all projects that produce operational waste. Projects that do not include any operational waste, may apply to have this credit deemed not applicable with supporting documentation.
RA1.5 DIVERT CONSTRUCTION WASTE FROM LANDFILLS

INTENT:
Divert construction waste streams from disposal to recycling and reuse.

METRIC:
Percentage of total waste diverted from disposal.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(1) Waste Management Plan</td>
<td>(A) Implement a construction waste management plan that, at a minimum, identifies the materials to be diverted from disposal and whether the materials will be sorted on site or comingled.</td>
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<tr>
<td>(B) The project team sets a target goal for construction waste diversion.</td>
<td>During construction at least 50% of waste materials are recycled, reused, and/or salvaged.</td>
<td>Diversion may be a combination of waste-reduction measures and sourcing waste to other facilities for recycling or reuse.</td>
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<td>(D) During construction at least 95% of waste materials are recycled, reused, and/or salvaged.</td>
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<td>Diversion may be a combination of waste-reduction measures and sourcing waste to other facilities for recycling or reuse.</td>
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<tr>
<td>(E) During construction 100% of waste materials are recycled, reused, and/or salvaged.</td>
<td>Diversion may be a combination of waste-reduction measures and sourcing waste to other facilities for recycling or reuse.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team developed a comprehensive waste management plan to decrease project waste and divert waste from landfills during construction?

1. Documentation of the construction waste management plan,

OR;

Policies, specifications, or contract documents indicating a construction management plan will be developed and implemented.

2. Documentation that the construction management plan was implemented.

B. To what extent has construction waste been diverted from landfills?

1. Policies, specifications, contract documents, or commitments by the project team to achieve a target construction waste diversion rate.

2. Provide a general description of each type/category of construction and demolition materials generated, location of receiving agent, and quantity of waste diverted (by category) in weight (tons) or volume (cubic yards/metres).

3. Calculations of total waste reduction measures and percentage of materials diverted to recycling or reuse. The percentage of diverted waste should be calculated as the ratio of material diverted from landfills against the total waste generated during construction. Calculations may be done by weight (tons) or volume (cubic yards/metres) but must remain consistent throughout the credit.

Note that waste deemed hazardous should not be included in the total waste calculations and should be disposed of according to local, state/provincial, and federal law. Measures to reduce the generation of hazardous waste may be included under the project team’s consideration.
DESCRIPTION

The goal of this credit is to reduce construction waste and divert waste streams from disposal to recycling and reuse. Project teams can improve performance by considering the ability of waste generated during construction to be recycled or beneficially reused, implementing waste management plans to capture waste, and identifying possible recycling centers with appropriate capabilities.

When considering the extra time or effort involved in collecting and diverting construction waste consideration should be given to cost savings in dumping fees. Additionally, some recycled materials such as scrap metal have a positive value. Achieving high rates of construction waste diversion is often about the institutional training and operating procedures of the organizations and companies involved. Infrastructure owners should consider these capabilities when choosing project teams.

PERFORMANCE IMPROVEMENT

Total construction waste diverted from disposal is calculated as the ratio of material diverted from landfills against the total waste generated during construction. Calculations must be done by weight or volume. Though often more difficult to quantify project’s may also include efforts to minimize construction waste generation if sufficient supporting documentation is provided.

Diversion requires a management plan and identifying potential sources and destinations for recycling. Identification and evaluation of options for recycling and reuse are the first steps in development of effective plans for handling, segregation, and storage of materials. It is important to determine which materials must be separated versus which can be commingled. Material sent to landfills for use as daily cover are still being disposed in landfills and therefore do not meet the spirit or intent of this credit.

The final application/destination of diverted or reused materials should not pose risks to human health and safety or the environment and should be in compliance with all state/provincial and local solid waste agency requirements. Waste deemed hazardous should not be included in the total waste calculations and should be disposed of according to local, state/provincial, and federal law. However, measures to reduce the generation of hazardous waste may be included in the calculations when appropriate. Soils and rocks are not included in this credit, but are addressed in RA1.6 Balance Earthwork On Site. Methods of diversion should meet the spirit and intent of the credit to reduce the social and environmental impacts of waste generation. Acceptable means of diversion may include:

- Waste reduction;
- Reuse or recycle materials on site;
- Materials sent to recycling or reclamation facilities;
- Materials sent to manufacturers to be used as post-consumer recycled content;
- Materials composted on site or sent to a composting facility;
- The use of material, if appropriate, as infill;

Unacceptable means of diversion include:

- Burying waste material unsuited for infill.

This credit is applicable to all projects that produce construction waste. Projects that do not include any construction waste, may apply to have this credit deemed not applicable with supporting documentation.
RA1.6 BALANCE EARTHWORK ON SITE

INTENT:
Minimize the movement of soils and other excavated materials off site to reduce transportation and environmental impacts.

METRIC:
Percentage of excavated material retained on site or nearby.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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<th>SUPERIOR</th>
<th>CONSERVING</th>
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</thead>
<tbody>
<tr>
<td>(2) Reuse At Least 30% Onsite</td>
<td>(4) Reuse At Least 50% Onsite</td>
<td>(6) Reuse At Least 80% Onsite</td>
<td>(8) Fully Balanced Site</td>
<td></td>
</tr>
<tr>
<td>(A) 30% of excavated material reused on site</td>
<td>(A) 50% of excavated material reused on site</td>
<td>(A) 80% of excavated material reused on site</td>
<td>(A) The site is fully balanced. No earthwork is removed from the site and no earthwork is imported.</td>
<td></td>
</tr>
<tr>
<td>OR</td>
<td>OR</td>
<td>OR</td>
<td></td>
<td></td>
</tr>
<tr>
<td>100% reused within 25 mi / 40 km of the site.</td>
<td>100% reused within 10 mi / 16 km of the site.</td>
<td>100% reused within 5 mi / 8 km of the site.</td>
<td></td>
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</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. To what extent has the project team designed the project to balance cut and fill to reduce the excavated material taken off site?

1. Documentation showing how the project balanced cut and fill on site and calculations of the percent of excavated materials remaining on site.
2. Documentation showing the destination of any materials transported offsite and their proximity to the project site. For long, linear infrastructure projects the center of the radius moves along the site (i.e. the center of the radius will be at the beginning of the project and move as the project progresses).

Excavated materials deemed hazardous should not be included in the total calculations and should be disposed of according to local, state/provincial, and federal law.

DESCRIPTION

Modern construction equipment and methods have made the leveling of large sites a possibility. However, the large-scale removal and/or replacement of soils and excavated materials has impacts that span the categories of Quality of Life, Resource Allocation, Natural World, and Risk and Resilience. These include but are not limited to: increased noise and congestion, loss of landscape characteristics, increased fuel consumption, increased equipment use, degraded soil health, loss of microbial biodiversity, introduction of invasive species, disrupted hydrology, and increased greenhouse gas and air pollutant emissions. Project teams should consider how finding beneficial uses of excavated soils and rocks on site can reduce social environmental impacts, lead to co-benefits, and save costs.

PERFORMANCE IMPROVEMENT

During planning, design, and construction project teams should identify opportunities to minimize grading, retain soil on site, and/or eliminate the need to transport additional soil to the site. For the purpose of this credit, earthwork includes excavated naturally occurring materials such as soil, rocks, and grubbed plant material. It does not include manufactured materials such as asphalt, concrete pavement, or other manufactured in-ground man-made structures. Excavated materials, such as soils, deemed contaminated or hazardous should not be included in the total calculations and should be disposed of according to local, state/provincial, and federal law. Distances should be calculated as a radius extended from the project boundary. For long, linear infrastructure projects the center of the distance radius moves along the site (e.g. the center of the radius will be at the beginning of the project and move as the project progresses).

This credit is applicable to all projects that involve the excavation of qualifying earthwork. Projects that do not include any earthwork, or only involve the excavation of excluded material considered contaminated or hazardous, may apply to have this credit deemed not applicable with supporting
documentation. In rare cases, where the amount of excavated soil is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of excavated material in the context of the project.
RA2.1 REDUCE OPERATIONAL ENERGY CONSUMPTION

INTENT:
Conserve energy by reducing overall operational energy consumption throughout the project life.

METRIC:
Percentage of operational energy reductions achieved.

LEVELS OF ACHIEVEMENT

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<tr>
<th>IMPROVED</th>
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<th>CONSERVING</th>
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<tbody>
<tr>
<td>(4) At Least 10% Energy Reduction</td>
<td>(8) At Least 30% Energy Reduction</td>
<td>(12) At Least 50% Energy Reduction</td>
<td>(18) At Least 70% Energy Reduction</td>
<td>(26) 100% Energy Reduction</td>
</tr>
</tbody>
</table>

(A) The project team determines the estimated annual energy consumption of the project. If annual energy consumption varies, the project team submits the range of estimated performance over the project life.

(B) Operational energy is reduced at least 10%.

(EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE)

A. Has the project team determined the estimated annual energy consumption of the project during operations?

1. Estimates of the annual energy consumption of the project during operations. All energy sources should be converted into British thermal units (BTU) or Joules (J). If annual energy consumption varies, the project team submits the range of estimated performance over the project life.

   Energy consumption of the project includes:
   
a. Energy purchased from the grid
   b. Energy generated onsite
   c. Fuels used on site by the project

   Note that energy generation projects should use energy conversion efficiency as the measure of energy efficiency, with the goal of increasing the capture of electrical, mechanical, or thermal energy output of the system. Similarly, energy distribution projects should calculate reductions in energy loss, with the goal of achieving better efficiency in energy delivery.

B. To what extent has the project reduced operational energy consumption?

1. Calculation of the benchmark energy consumption. All energy sources should be converted into British thermal units (BTU) or Joules (J).

2. Submit calculations for the project’s estimated annual energy consumption over the life of the project. Document the percentage reduction over the benchmark. All energy sources should be converted into British thermal units (BTU) or Joules (J).

DESCRIPTION

Energy generation is the primary source of greenhouse gas emissions and numerous other pollutants harmful to the environment and human health. While use of renewable energy reduces impacts, the primary goal of all projects should be to minimize the overall energy consumed as much as possible.
There are significant and compounding cost savings to reducing operational energy use. Project teams should take a whole-systems design approach when considering options in order to maximize achievement. While single actions like replacing fluorescent lights with light emitting diodes (LEDs) is a positive first step, large energy savings can be achieved when considering project alternatives and the design of major energy consuming systems.

**PERFORMANCE IMPROVEMENT**

As industry standards on operational energy use do not exist for most infrastructure projects, project teams are required to provide calculations for an appropriate base case. Accepted methodologies for establishing benchmark performance data are explained in detail in the front of this manual and include: existing conditions, a seriously considered alternative, standard practice, or a comparable existing project/facility. It is the intent of Envision to support the collection of data and development of industry performance targets over time in order to eventually provide this benchmark data for project teams and the industry as a whole. This is why it is required to submit calculations in acceptable standard units.

Calculations should include the anticipated operation and maintenance energy consumption on an annual basis for the life of the project. If industry standards such as ASHRAE (formerly American Society of Heating Refrigerating and Air-Conditioning Engineers) are available for the project type they can be used in calculating the project’s anticipated energy consumption as well as the industry base case. Calculations should include energy purchased from the grid, energy generated and used onsite, and fuels used on site by the project.

Energy generation projects should use energy conversion efficiency as the measure of energy efficiency, with the goal of increasing the capture of electrical, mechanical, or thermal energy output of the system. Similarly energy distribution projects should calculate reductions in energy loss, with the goal of achieving better efficiency in energy delivery.

This credit is applicable to all projects that consume energy during their operation. Projects that do not include operational energy, may apply to have this credit deemed not applicable with supporting documentation. In rare cases, where the amount of operational energy use is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of operational energy use in the context of the project.
RA2.2 REDUCE CONSTRUCTION ENERGY CONSUMPTION

INTENT:
Conserve resources and reduce greenhouse gases and air pollutant emissions by reducing energy consumption during construction.

METRIC:
The number of strategies implemented on the project during construction that reduce energy consumption and emissions.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(1) Identify Reduction Opportunities</td>
<td>(4) At Least Two Reduction Strategies</td>
<td>(8) At Least Four Reduction Strategies</td>
<td>(12) At Least Six Reduction Strategies</td>
<td></td>
</tr>
<tr>
<td>(A) The project team conducts one or more planning reviews to identify and analyze options for reducing energy consumption during construction.</td>
<td>(A) The project team conducts one or more planning reviews to identify and analyze options for reducing energy consumption during construction.</td>
<td>(A) The project team conducts one or more planning reviews to identify and analyze options for reducing energy consumption during construction.</td>
<td>(A) The project team conducts one or more planning reviews to identify and analyze options for reducing energy consumption during construction.</td>
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<tr>
<td>(B) The project implements, or has written requirements to implement, at least two (2) energy reduction strategies.</td>
<td>(B) The project implements, or has written requirements to implement, at least four (4) energy reduction strategies.</td>
<td>(B) The project implements, or has written requirements to implement, at least six (6) energy reduction strategies.</td>
<td>(B) The project implements, or has written requirements to implement, at least six (6) energy reduction strategies.</td>
<td></td>
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</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team conducted planning reviews to reduce energy consumption during construction?
1. Documentation that one or more planning reviews were conducted to identify and analyze the potential for reducing energy consumption during construction.

B. To what extent have energy conservation strategies been implemented during construction?
1. Documentation that the project has implemented, or has policies to implement energy conservation strategies during construction. Strategies that meet the credit requirements include:
   c. Tier IV construction equipment or Tier III with Best Available Technology (BAT) for at least 75% of non-road equipment fleet greater than 50 horsepower.
   d. Alternative fuels in heavy equipment such as biodiesel for at least 5% of total fuel consumption.
   e. Hybrid or fully electric project vehicles for at least 50% of fleet
   f. Electrified equipment for at least 20% of equipment with gas or diesel engines
   g. Employee commuting programs with incentives (shuttles to transit, ride share programs, biking facilities, etc.)
   h. Reduce purchased energy for workstations (construction trailer/office energy) by 30% for two of the following (1) lighting; (2) HVAC; (3) Plug loads.
   i. Purchase green power (RECs) for 30% of workstation energy consumption.
   j. Offset electrical consumption by generating 5% renewable energy onsite (e.g. solar panels on trailer complex, solar powered temporary light plant, solar powered cameras and variable message sign boards).
   k. Reduce overall fuel consumption by 10% through improved planning and logistics. Specific strategies may include:
      i. Reduce number of deliveries
      ii. Reduce idle times.
      iii. Onsite reuse of soils or other materials to decrease truck traffic to and from site (ties into Reduced Excavated Material taken Offsite)
      iv. Reduce onsite trucking – proper logistics planning such as staging material in close proximity to installation location
v. Schedule acceleration without additional resource consumption
vi. Waterborne/rail transportation of materials versus trucking (third party distribution or logistics)
vii. On-site plants (concrete plant / asphalt plant) in lieu of trucking material to the site
viii. Prefabrication of design elements

DESCRIPTION
There are significant cost savings that can be achieved by reducing fuel consumed during construction. Project teams should consider the secondary and tertiary benefits of reduced truck trips, improved air quality, and support for renewable energy systems. While single actions like replacing fluorescent lights with light emitting diodes (LEDs) is a positive first step, large energy savings can be achieved when considering broader construction logistics and coordination.

PERFORMANCE IMPROVEMENT
Conducting detailed calculations of construction energy consumption can be burdensome if not impossible. Additionally, like other Resource Allocation credits industry standards on construction energy use do not exist. Therefore, this credit assesses the number of energy conserving and emission reducing strategies deployed on the project as the metric for achievement. Strategies that meet the credit requirements are listed under criterion B. These activities may be more or less difficult to achieve depending on the project type and context, which is why a wide range of options are available.

In fulfilling this credit, project teams should begin with a thorough review of the means and methods of constructing the project including a review of how energy is to be consumed during construction. The list of energy reduction strategies should be used as a guide to identify and analyze options.

This credit is applicable to all projects that consume energy during construction. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award. In rare cases, where the amount of energy used during construction is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of operational energy use in the context of the project.
RA2.4 USE RENEWABLE ENERGY

INTENT:
Meet operational energy needs through renewable energy sources.

METRIC:
Extent to which renewable energy sources are incorporated.

LEVELS OF ACHIEVEMENT

<table>
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<tbody>
<tr>
<td>(4) At Least 10%</td>
<td>(7) At Least 20%</td>
<td>(13) At Least 35%</td>
<td>(16) At Least 50%</td>
<td>(20) Net Positive</td>
</tr>
</tbody>
</table>

(A) The project team assesses the potential for renewable energy use. The project team determines whether the project’s operational energy use is dominated by electricity or fuel consumption. (B) Based upon the determination in criterion A, the project meets either:

10% of electricity needs from renewable sources OR 5% of fuel from renewable / alternative fuel sources.

(A) The project team assesses the potential for renewable energy use. The project team determines whether the project’s operational energy use is dominated by electricity or fuel consumption. (B) Based upon the determination in criterion A, the project meets either:

20% of electricity needs from renewable sources OR 10% of fuel from renewable / alternative fuel sources.

(A) The project team assesses the potential for renewable energy use. The project team determines whether the project’s operational energy use is dominated by electricity or fuel consumption. (B) Based upon the determination in criterion A, the project meets either:

35% of electricity needs from renewable sources OR 20% of fuel from renewable / alternative fuel sources.

(A) The project team assesses the potential for renewable energy use. The project team determines whether the project’s operational energy use is dominated by electricity or fuel consumption. (B) Based upon the determination in criterion A, the project meets either:

50% of electricity needs from renewable sources OR 30% of fuel from renewable / alternative fuel sources.

(A) The project team assesses the potential for renewable energy use. The project team determines whether the project’s operational energy use is dominated by electricity or fuel consumption. (B) Based upon the determination in criterion A, the project meets either:

The project generates a net positive amount of renewable energy OR 100% of fuel from renewable / alternative fuel sources.

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team assessed the potential for renewable energy use?

1. Documentation that the project team has assessed the potential for renewable energy use.
2. Documentation indicating whether the project’s operational energy use will be dominated by electricity or fuel consumption.

B. To what extent does the project meet electricity or fuel needs from renewable sources?

1. Documentation of the anticipated annual output of all renewable sources, direct renewable electricity purchases, or exports to the grid, and the resulting overall percentage of renewable energy to total energy consumption.
   a. Renewable Energy Credits (RECs) cannot be used for achievement in this credit.

2. Breakdown of renewable energy sources by type. Renewable energy may include:
   a. solar energy (thermal heating, both active and passive, and photovoltaic),
   b. wind (electricity generation),
   c. water (hydro or tidal for electricity generation),
   d. biomass (electricity generation or as fuels),
   e. geothermal (electricity generation or heating and cooling), and
   f. hydrogen/fuel cells (used as a fuel).

3. Renewable transportation fuel or electric vehicle use is determined in a similar manner, but as a percentage of total vehicle miles traveled. This is necessary in order to account for different fuel efficiencies and/or conversion efficiency.
DESCRIPTION

While reducing energy use is the primary goal, a net-zero energy society will require significant investment in renewable energy sources. When appropriate, renewable energy can be generated on site to help reduce the need for fossil fuel sources. However, it is important to note that large-scale offsite renewable energy sources such as wind farms, large hydroelectric facilities, or solar arrays are often more efficient. Demonstrating a direct connection to these sources and ensuring their energy generation is not double-counted by other projects is challenging.

Project teams should evaluate the feasibility of renewable energy, including nontraditional energy sources, to effectively increase the portion of operational energy that comes from renewable sources.

PERFORMANCE IMPROVEMENT

Unlike energy consumption in buildings, which are almost always dominated by electricity, infrastructure operational energy use can be dominated by electricity or fuel consumption. For this credit project teams must first determine whether electricity or fuel consumption is the dominant form of energy consumption. Targets for renewable energy use are based on this determination.

Renewable energy can be sourced from onsite generation, purchased in fuels, or purchased from the grid. For purchased renewable energy from the grid the electricity service provider sources power from a renewable energy source and sells that power directly to the project. Renewable energy sources must be in the same power grid as the project in this type of transaction. Renewable Energy Credits (RECs) cannot be used for achievement in this credit.

Onsite generation put back onto the grid is accounted for in determining percentage of electricity used. For example, in a case with 100 kWh of electricity used onsite, 20 kWh of renewables purchased from the grid, 10 kWh of renewables generated and used onsite, and 5 kWh of renewables returned to the grid results in a level of 35% renewables attained.

The percentage of renewable transportation fuels is most often determined by the ethanol blend levels in gasoline. When alternative fuels are used, teams are permitted to calculate percentage of renewable energy based on miles driven in order to capture the potentially higher conversion efficiency or greater fuel economy of alternative fuel vehicles.

This credit is applicable to all projects that consume energy (fuel or electricity) during their operation. Projects that do not include operational energy, may apply to have this credit deemed not applicable with supporting documentation. In rare cases, where the amount of operational energy use is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of operational energy use in the context of the project.
RA2.4 COMMISSION AND MONITOR ENERGY SYSTEMS

INTENT:
Ensure efficient functioning and extend useful life by specifying commissioning and monitoring of energy systems.

METRIC:
The inclusion of monitoring equipment and software, the extent of commissioning, and the commissioning agent’s independence from the project.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(3) Basic Initial Commissioning</td>
<td>(6) Extensive Initial Commissioning</td>
<td>(10) Long-term Commissioning</td>
<td>(14) Advanced Initial And Long Term Commissioning</td>
<td></td>
</tr>
<tr>
<td>(A) The project includes energy monitoring capabilities.</td>
<td>(A) The project includes energy monitoring capability.</td>
<td>(A) The project includes integrated energy management systems.</td>
<td>(A) The project includes integrated energy management systems.</td>
<td></td>
</tr>
<tr>
<td>Equipment and/or software are incorporated to allow detailed monitoring of performance during operation.</td>
<td>Equipment and/or software are incorporated to allow detailed monitoring of performance during operation.</td>
<td>Energy management software is incorporated to allow for detailed and centralized monitoring and reporting of performance.</td>
<td>Energy management software is incorporated to allow for detailed and centralized monitoring and reporting of performance.</td>
<td></td>
</tr>
<tr>
<td>The equipment is capable of monitoring all primary project functions, accounting for at least 50% of the total energy consumption/generation.</td>
<td>The equipment is capable of monitoring all primary project functions, accounting for at least 75% of the total energy consumption/generation.</td>
<td>The equipment is capable of monitoring all primary project functions, accounting for at least 90% of the total energy consumption/generation.</td>
<td>The equipment is capable of monitoring all primary project functions, accounting for at least 90% of the total energy consumption/generation.</td>
<td></td>
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<tr>
<td>Commissioning includes a detailed log of issues.</td>
<td>Commissioning includes a detailed log of issues.</td>
<td>Commissioning includes a detailed log of issues.</td>
<td>Commissioning includes a detailed log of issues.</td>
<td>Commissioning includes a detailed log of issues.</td>
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<tr>
<td>The owner engages a third party or in-house commissioning agent, not involved in the planning/design of the project.</td>
<td>The owner engages an independent third-party commissioning agent.</td>
<td>A comprehensive plan is developed for ongoing commissioning of energy systems throughout the expected life of the project.</td>
<td>A comprehensive plan is developed for ongoing commissioning of energy systems throughout the expected life of the project.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Does the design incorporate advanced integrated monitoring systems in order to enable more efficient operations?
1. Documentation that equipment and/or software are incorporated in the design to allow detailed monitoring of performance. Design documents and specifications showing the location, purpose, and type of monitoring equipment installed. Documentation that the equipment installed is capable of monitoring all primary project functions, accounting for the required percentage of energy consumption (e.g. 50%, 75%, 90%).
2. Rationale as to how the monitoring equipment may enable more efficient operations over the industry norm.
3. Documentation that energy management systems and associated software are incorporated into the project accounting for the required percentage of energy consumption (e.g. 50%, 75%, 90%).

B. To what extent has a commissioning been conducted?
1. Documentation that the project has or will undergo a commissioning (e.g. specification, tender document, contract document).
2. Documentation that the commissioning was executed and covered systems responsible for using or generating the required percentage of energy (e.g. 50%, 75%, 90%).
3. Documentation of the relationship between the owner and the commissioning agent depending on the level of achievement being pursued. Note that for Superior the owner may engage an in-house commissioning agent so long as they are independent of the planning/design of the project. For Conserving an independent third-party agent must be used.

4. Documentation of the commissioning log of issues.

C. Is there a plan for ongoing commissioning of the energy systems throughout the project's life?

1. Documentation of a plan for ongoing commissioning of these systems throughout the expected life of the project

**DESCRIPTION**

Planning, designing, and constructing projects to reduce energy use is the first step toward achieving energy efficiency goals. However, commissioning and ongoing monitoring is necessary to ensure the proper operation of the energy system in order to realize those goals. Systems designed to be energy efficient can fail because of installation errors or degradation over time during operations. Commissioning ensures systems are functioning as intended from the start of operations. Installing advanced monitoring equipment better allows operators to identify efficiency loss. In addition, monitoring equipment allows operators to identify high-energy processes and target them in their own sustainability efforts. Higher resolution monitoring increases the likelihood that projects will achieve and maintain high levels of energy efficiency throughout their useful life.

**PERFORMANCE IMPROVEMENT**

This credit is applicable to all projects that consume energy during their operation. Projects that do not include operational energy, may apply to have this credit deemed not applicable with supporting documentation. In rare cases, where the amount of operational energy use is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of operational energy use in the context of the project.
RA3.1 PRESERVE WATER RESOURCES

INTENT:
Assess and reduce the negative net impact on fresh water availability, quantity, and quality at a watershed scale to positively impact the region’s water resources.

METRIC:
The extent to which the project considers and contributes to positively addressing broader watershed issues.

LEVELS OF ACHIEVEMENT

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<th>LEVEL</th>
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<tbody>
<tr>
<td>(2)</td>
<td>Increased Awareness Of Watershed Issues</td>
<td>(A) Assess the project’s watershed context and the watershed-scale fresh water issues, including location, type, quantity, rate of recharge, and quality of water resources as well as source and impacts of treated water and the destination and impacts of wastewater.</td>
<td>(B) Estimates of water usage and wastewater generation over the life of the project.</td>
<td>(C) The project has features intended to reduce the identified negative impacts of water usage, and/or improve watershed-scale issues.</td>
<td>(D) The project has a net-zero impact on the quantity and availability of fresh surface and groundwater supplies without compromising water quality.</td>
</tr>
<tr>
<td>(4)</td>
<td>Good Water Resource Management</td>
<td>(A) Assess the project’s watershed context and the watershed-scale fresh water issues, including location, type, quantity, rate of recharge, and quality of water resources as well as source and impacts of treated water and the destination and impacts of wastewater.</td>
<td>(B) Estimates of water usage and wastewater generation over the life of the project.</td>
<td>(C) The project has features intended to reduce the identified negative impacts of water usage, and/or improve watershed-scale issues.</td>
<td>(D) The project has a net-zero impact on the quantity and availability of fresh surface and groundwater supplies without compromising water quality.</td>
</tr>
<tr>
<td>(9)</td>
<td>Wise Water Resource Management</td>
<td>(A) Assess the project’s watershed context and the watershed-scale fresh water issues, including location, type, quantity, rate of recharge, and quality of water resources as well as source and impacts of treated water and the destination and impacts of wastewater.</td>
<td>(B) Estimates of water usage and wastewater generation over the life of the project.</td>
<td>(C) The project has features intended to reduce the identified negative impacts of water usage, and/or improve watershed-scale issues.</td>
<td>(D) The project has a net-zero impact on the quantity and availability of fresh surface and groundwater supplies without compromising water quality.</td>
</tr>
<tr>
<td>(17)</td>
<td>Total Water Management</td>
<td>(A) Assess the project’s watershed context and the watershed-scale fresh water issues, including location, type, quantity, rate of recharge, and quality of water resources as well as source and impacts of treated water and the destination and impacts of wastewater.</td>
<td>(B) Estimates of water usage and wastewater generation over the life of the project.</td>
<td>(C) The project has features intended to reduce the identified negative impacts of water usage, and/or improve watershed-scale issues.</td>
<td>(D) The project has a net-zero impact on the quantity and availability of fresh surface and groundwater supplies without compromising water quality.</td>
</tr>
<tr>
<td>(22)</td>
<td>Positive Impact</td>
<td>(A) Assess the project’s watershed context and the watershed-scale fresh water issues, including location, type, quantity, rate of recharge, and quality of water resources as well as source and impacts of treated water and the destination and impacts of wastewater.</td>
<td>(B) Estimates of water usage and wastewater generation over the life of the project.</td>
<td>(C) The project has features intended to reduce the identified negative impacts of water usage, and/or improve watershed-scale issues.</td>
<td>(D) The project has a net-zero impact on the quantity and availability of fresh surface and groundwater supplies without compromising water quality.</td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team conducted a comprehensive watershed assessment?

1. Documentation demonstrating the project team assessed and understands the project’s watershed context. Examples include watershed plans, regional water and wastewater utility plans, climate change reports, etc.
2. Documentation of the location, type, quantity, rate of recharge, and quality of water resources in the watershed.
3. Identification of the source and impacts of treated water and the destination and impacts of wastewater.

B. Has the project team estimated the water usage and wastewater generation over the life of the project?

1. Calculations showing the estimated water usage and wastewater generation over the life of the project (gallons/litres).
C. Does the project include features to minimize the negative impacts of water usage, and/or watershed-scale issues?

1. Documentation of design features that will reduce negative impacts of water usage and/or watershed-scale issues.
2. Documentation of how the design features specifically address issues identified in the comprehensive water assessment in criterion A.

D. Does the project have a net-zero impact on the quantity and availability of fresh surface and groundwater supplies without compromising water quality?

1. Calculations demonstrating that the project’s water usage will have no impact on the quantity and availability of fresh surface and groundwater supplies.
2. Documentation clarifying that the project does not compromise water quality in the watershed.

E. Is the project part of a watershed level or regional plan and does the project make a net-positive improvement to the watershed?

1. Documentation that the project is part of, or contributes to, a larger watershed level or regional plan intended to improve the watershed.
2. Documentation that the project has a net-positive impact to the watershed in terms of water quantity and availability or water quality. Examples of watershed improvements may include improved water quality, better hydrologic connectivity, or water storage and availability.

DESCRIPTION

This credit addresses the increasing demands for fresh water by agricultural, municipal, and industrial users, and encourages the project team to address regional water resources holistically. These demands, combined with the typical variability in the hydrologic cycle, can affect water availability, quantity, and quality. Fresh water, groundwater, and surface waters are being used at a rate that is faster than the rate they are being naturally replenished. In certain areas, groundwater mining is allowing saltwater intrusions to groundwater sources. Land use practices are affecting the quality of surface and groundwater supplies.

Water quality and availability is a major concern affecting communities and regions all over the world. While water conservation is a critical first step all projects that impact water quantity or quality should also consider the opportunity to positively contribute to the greater watershed. Infrastructure owners should consider how project achievement can contribute to broader community cost savings by protecting and conserving water resources.

This credit is inspired by the concept of ‘one water’. This refers to the increasing awareness that water is continuously reused through the natural water cycle. While social taboos are often a barrier to wastewater reuse the reality is that water is continuously reused. Too frequently, water is treated to levels exceeding its ultimate use, representing a huge financial, energy, and resource waste. New efficiencies and cost savings can be achieved if project teams are permitted to view water as a recyclable resource rather than disposable waste.

PERFORMANCE IMPROVEMENT

Positively addressing broader watershed issues begins with understanding the unique watershed conditions in the context of the project. The next step is quantifying water use and determining whether the project has meaningful impact on either water availability or the generation of wastewater. If so, reducing consumption should be a primary concern.

Project teams should be careful and thorough in assessing water usage. Water usage is not merely from toilets and sinks and the focus of this credit is primarily process water consumption associated with the project operation. However, project teams should also account for irrigation, vehicle or equipment washing operations, facility cleaning, and other usage.

As projects advance through the levels of achievement they should positively contribute to the broader watershed. Degraded water quality is often non point source, meaning there is no single primary source of pollution but rather hundreds or thousands of small sources of pollution that accumulate as water travels through the watershed. Addressing this environmental impact requires the concerted action of thousands of communities. The highest levels of achievement in this credit are for projects that make positive contributions as part of a broader coordinated watershed plan.
This credit is applicable to all projects that consume water or impact receiving waters. Projects that do not include any impacts to water quantity or quality, may apply to have this credit deemed not applicable with supporting documentation. In rare cases, where the amount of water consumption is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of operational energy use in the context of the project.
RA3.2 REDUCE OPERATIONAL WATER CONSUMPTION

INTENT:
Reduce overall water consumption while encouraging the use of greywater, recycled water, and stormwater to meet water needs.

METRIC:
Percentage reduction in potable water use and overall water use.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
<th>ENHANCED</th>
<th>SUPERIOR</th>
<th>CONSERVING</th>
<th>RESTORATIVE</th>
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</thead>
<tbody>
<tr>
<td>(4) At Least 25% Reduction</td>
<td>(9) At Least 50% Reduction</td>
<td>(13) At Least 75% Reduction</td>
<td>(17) 95% Reduction</td>
<td>(22) Water Purification</td>
</tr>
</tbody>
</table>

(A) The project team conducts planning or design reviews to identify potable water reduction strategies during operation of the project. The team has considered using alternatives such as nonpotable water, reused water, recycled water, and stormwater.
(B) The project reduces potable water use by at least 25%.
(C) Overall water use (potable and nonpotable) is reduced by at least 20%.

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team conducted planning and design reviews to identify potable water reduction strategies during operation of the project?

1. *Documentation the project team conducted planning and design reviews to identify potable water reduction strategies during operation of the project. Example documents may include reports, memoranda, and minutes of meetings with project teams and owners regarding water reduction strategies.*

B. To what extent has the project reduced potable water use?

1. *Calculation of the industry benchmark for potable water use to be used as a baseline.*
2. *Calculations of estimated annual potable water consumption over the life of the project. Document the percentage reduction over the industry baseline. Calculations should be converted into standard units such as gallons or cubic meters. Note, water treatment projects should address this credit through reducing process water and improved process efficiency.*

C. To what extent has the project reduced overall water use (including potable and nonpotable water)?

1. *Calculation of the industry benchmark for overall water use to be used as a baseline. In some cases this may be the same calculation as the baseline for potable water use in criterion B.*
2. *Calculations of estimated annual total water consumption over the life of the project, and the percentage reduction over the industry baseline. Calculations should be converted into standard units such as gallons or cubic meters.*

   Note that water treatment projects should address this credit through reducing process water and improved process efficiency.
D. Does the project have a net positive impact on water use?

1. Design documents demonstrating that the project achieves a 100% reduction in potable water use, using no water or meeting water needs entirely through nonpotable sources, and provides an available source of usable water (potable or nonpotable) for neighboring projects or communities to offset their own water needs.

DESCRIPTION

In many parts of the world clean water is becoming a scarce resource. Estimates are that countries will become increasingly embroiled in water-related conflicts in the next 20 years. However, water resource disputes are not limited to international conflicts and often pit community against community. This will be exacerbated by climate change as higher average temperatures will not only increase water evaporation rates, but will change the quantity, intensity, and timing of precipitation. Increases in mean temperatures can also affect the amount and duration of snow cover and, in turn, affect the average and peak rates of streamflow. All of these issues have important implications to agricultural irrigation, hydropower, flood management, fisheries, recreation, and navigation.

Overuse of water not only depletes waterbodies and lowers groundwater levels, but the treatment of water consumes large amounts of energy, contributing to global warming and environmental pollution. In many cases, it is not necessary to use potable water for the task at hand. Greywater (e.g., water that has been used for cleaning or other purposes but does not contain toilet waste), recycled water, and stormwater are alternatives to potable water use. Therefore this credit recognizes the added benefit of not only reducing overall water consumption but specifically reducing potable water consumption.

Reducing water consumption can have direct cost savings for many projects. In some circumstances, such as landscaping, reducing the need for irrigation systems and water use entirely includes the compounding benefits of reduced construction costs, maintenance costs, and labor costs associated with maintaining the systems over the project life.

PERFORMANCE IMPROVEMENT

In the context of this credit potable water refers to water that is treated to the level of drinking water. In the majority of projects this will be municipal drinking water. This is not intended to refer to natural sources of water that are of drinking water quality without treatment. However, the direct use of ground or surface water would be included in the calculations for overall water use.

As industry standards on operational water use do not exist for most infrastructure projects, project teams are required to provide calculations for an appropriate base case. Accepted methodologies for establishing benchmark performance data are explained in detail in the front of this manual and include: existing conditions, a seriously considered alternative, standard practice, or a comparable existing project/facility. It is the intent of Envision to support the collection of data and development of industry performance targets over time in order to eventually provide this benchmark data for project teams and the industry as a whole. This is why it is required to submit calculations in acceptable standard units.

Reductions may be accomplished through design, construction, and operational changes for conservation and the ability to use, treat, and/ or reuse nonpotable water. Advanced recycling and reuse are encouraged. If recycled water is provided by a third party project teams must verify water supply and replenishment. If projects choose to ‘upcycle’ water through onsite treatment, they should take into consideration potential risks and energy trade-offs. The use of surface water and marginal groundwater in lieu of potable water should not be considered if use of these waters will have a negative impact on water availability or quality (see credit RA3.1 Preserve Water Resources). Water treatment projects should address this credit through reducing process water and improved process efficiency. Water distribution projects are not considered to consume the water that flows through mains and pipelines. However, in certain circumstances, such as system refurbishment, projects that include water distribution systems may consider water conservation through locating or stopping leaks.

This credit is applicable to all projects that consume water during operations. Projects that do not include any operational water consumption, may apply to have this credit deemed not applicable with supporting documentation. In rare cases, where the amount of water consumption is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of operational energy use in the context of the project.
RA3.3 REDUCE CONSTRUCTION WATER CONSUMPTION

INTENT:
Reduce potable water consumption during construction.

METRIC:
The number of strategies implemented during construction that reduce potable water consumption.

LEVELS OF ACHIEVEMENT

<table>
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<th>IMPROVED</th>
<th>ENHANCED</th>
<th>SUPERIOR</th>
<th>CONSERVING</th>
<th>RESTORATIVE</th>
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</thead>
<tbody>
<tr>
<td>(1) Identify Consumption And Reduction Options</td>
<td>(3) At Least Two Strategies</td>
<td>(5) At Least Four Strategies</td>
<td>(8) No Potable Water Consumption</td>
<td></td>
</tr>
<tr>
<td>(A) The project team conducts one or more planning reviews to identify and analyze options for reducing water consumption during construction.</td>
<td>(A) The project team conducts one or more planning reviews to identify and analyze options for reducing water consumption during construction.</td>
<td>(A) The project team conducts one or more planning reviews to identify and analyze options for reducing water consumption during construction.</td>
<td>(A) The project team conducts one or more planning reviews to identify and analyze options for reducing water consumption during construction.</td>
<td></td>
</tr>
<tr>
<td>(B) At least two (2) potable water conservation strategies are implemented.</td>
<td>(B) At least four (4) potable water conservation strategies are implemented.</td>
<td>(B) At least four (4) potable water conservation strategies are implemented.</td>
<td>(B) No potable water consumption, except for human consumption and hygiene, by means of implementing as many strategies as necessary.</td>
<td></td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team conducted planning reviews to reduce water consumption during construction?

1. Documentation that one or more planning reviews were conducted to identify and analyze the potential for reducing water consumption during construction.

B. To what extent have water conservation strategies been implemented during construction?

1. Documentation that the project has implemented water conservation strategies during construction. Strategies that meet the credit requirements include:
   a. High efficient fixtures in construction trailers or offices (demonstrate a 40% reduction in usage)
   b. Monitoring and management (demonstrate team’s ability to detect leaks and respond to inefficiencies in the system)
   c. Reduce embodied water of materials by reducing waste material (Calculate a 10% reduction in material quantities entering the site as new material)
   d. Use alternatives to dust suppression such as dry agents (show 50% reduction in water usage due to alternative controls)
   e. Alternatives for curing concrete (show 50% reduction in water usage due to alternative controls)
   f. Alternatives for truck tire wash stations (show 50% reduction in water usage due to alternative controls)
   g. Reduced embodied water through material selection (permanent and temporary materials) (Demonstrate how product selection has contributed to reduced potable water consumption by more than 25%)
   h. Stormwater harvesting (Show 40% savings by using harvested stormwater)
   i. Greywater reuse (Show 40% savings by reusing on-site grey water)

2. Calculation of potable water saved (gallons/litres) for each strategy as compared to not implementing the strategy over the construction duration. Note that projects may wish to also calculate their cost savings for reduction measures.
DESCRIPTION

Overuse of water not only depletes waterbodies and lowers groundwater levels, but the treatment of water consumes large amounts of energy. In many cases, it is not necessary to use potable water for the task at hand. Greywater (e.g., water that has been used for cleaning or other purposes but does not contain toilet waste), recycled water, and stormwater are alternatives to potable water use especially in construction. Reducing water consumption during construction can reduce the environmental impact of the project.

PERFORMANCE IMPROVEMENT

Conducting detailed calculations of construction potable water consumption can be burdensome if not impossible. Additionally, like other Resource Allocation credits industry standards on construction water use do not exist. Therefore, this credit assesses the number of water conserving and strategies deployed on the project as the metric for achievement. Strategies that meet the credit requirements are listed under criterion B. These activities may be more or less difficult to achieve depending on the project type and context, which is why a wide range of options are available.

In the context of this credit potable water refers to water that is treated to the level of drinking water. In the majority of projects this will be municipal drinking water. This is not intended to refer to natural sources of water that are of drinking water quality without treatment. However, the direct use of ground or surface water would be included in the calculations for overall water use.

In fulfilling this credit, project teams should begin with a thorough review of the means and methods of constructing the project including a review of how water is to be consumed during construction. The list of water reduction strategies should be used as a guide to identify and analyze options. The use of surface water and marginal groundwater in lieu of potable water should not be considered if use of these waters will have a negative impact on water availability or quality (see credit RA3.1 Preserve Water Resources).

This credit is applicable to all projects that consume water during construction. Projects that do not include any construction water consumption, may apply to have this credit deemed not applicable with supporting documentation. In cases where the amount of water consumption during construction is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of operational energy use in the context of the project.
RA3.4 MONITOR WATER SYSTEMS

INTENT:
Conserve water by including monitoring capabilities and implementing programs to improve performance of water systems.

METRIC:
Extent and sophistication of water monitoring equipment and inclusion of response plans.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
<th>ENHANCED</th>
<th>SUPERIOR</th>
<th>CONSERVING</th>
<th>RESTORATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) One-Time Monitoring</td>
<td>(3) Operations Monitoring</td>
<td>(6) Long-term Monitoring</td>
<td>(12) Responsive Monitoring</td>
<td></td>
</tr>
<tr>
<td>(A) The project includes monitoring capabilities. Equipment and/or software are incorporated in the design to allow detailed monitoring of performance. The equipment is capable of monitoring all primary project functions, accounting for at least 50% of water use.</td>
<td>(A) The project includes monitoring capabilities. Equipment and/or software are incorporated in the design to allow detailed monitoring of performance. The equipment is capable of monitoring all primary project functions, accounting for at least 75% of water use.</td>
<td>(A) The project includes monitoring capabilities. Equipment and/or software are incorporated in the design to allow detailed monitoring of performance. The equipment is capable of monitoring all primary project functions, accounting for at least 95% of water use.</td>
<td>(B) The project has a plan for using monitoring data to address leaks in order to conserve water and avoid waste. This may include a water audit.</td>
<td>(C) The project demonstrates that real-time water monitoring equipment and/or software has been incorporated along with a plan for using this data to improve water efficiency, reduce leakage, and overall conserve water.</td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Does the design incorporate advanced integrated monitoring systems in order to enable more efficient operations?
1. Documentation that equipment and/or software are incorporated in the design to allow detailed monitoring of performance. Design documents and specifications showing the location, purpose, and type of monitoring equipment installed. This may include design documents and specifications identifying the installation of easily accessible and clearly labeled water sub-meters. Documentation that the equipment installed is capable of monitoring all primary project functions, accounting for the required percentage of water consumption (e.g. 50%, 75%, 90%).
   Rationale as to how the monitoring equipment may enable more efficient operations.

B. Does the project have a plan to address leaks?
1. Documentation that monitoring systems will aid in detecting and repairing leaks and that this will lead to an improvement in water efficiency and avoided losses.
2. Documentation that a plan is in place for addressing leaks. The plan must include specific details on how leaks will be identified and repaired in a timely fashion.
3. Rationale as to how the monitoring equipment and plan for addressing leaks will conserve water and avoid waste.

C. Does the project include real-time water monitoring?
1. Documentation that water monitoring equipment is capable of delivering real-time data on water use.
2. Documentation of a plan for using this data to improve water efficiency, reduce leakage, and overall conserve water.

DESCRIPTION
Planning, designing, and constructing projects to reduce water use is the first step toward achieving water conservation goals. However, ongoing monitoring is necessary to ensure the proper operation of the water system in order to realize those goals. Systems designed to be water efficient can fail because of installation errors or degradation over time during operations. Monitoring ensures systems are functioning as intended from the start of operations. Installing advanced monitoring equipment also better allows operators to identify leaks and identify water intensive processes and target them in their own sustainability efforts. Higher resolution monitoring increases the likelihood that projects will achieve and maintain high levels of water efficiency throughout their useful life.

Monitoring water systems and ensuring their proper and efficient operation helps both businesses and the environment. Systems capable of monitoring flows and usage and detecting leaks early save money in operations and prevent the needless waste of potable water and the embodied energy and emissions associated with its treatment and distribution.

PERFORMANCE IMPROVEMENT
Integrated monitoring systems may be used to mitigate negative impacts by shifting water demand to off-peak hours and/or by discharging water to groundwater recharge or constructed wetlands or other best management practices instead of through direct surface water connections or other means.

This credit is applicable to all projects that consume water during their operation. Projects that do not include operational water, may apply to have this credit deemed not applicable with supporting documentation. In rare cases, where the amount of operational water use is insignificant in comparison to the scale of the project, teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining what constitutes an insignificant quantity of water use in the context of the project.
RA0.0 INNOVATE OR EXCEED CREDIT REQUIREMENTS

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

METRIC:
Whether project achievement qualifies as exceptional performance or innovation.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>INNOVATION</th>
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<tbody>
<tr>
<td>(+10) Innovate or Exceed Credit Requirements.</td>
</tr>
<tr>
<td>(A) Projects clearly document a performance that exceeds the highest existing requirements within one or more credits.</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>(B) Projects demonstrate the innovative application of methods, technologies, or processes that are novel either in their use, application, or within the local regulatory or cultural climate.</td>
</tr>
<tr>
<td>OR</td>
</tr>
<tr>
<td>(C) Projects demonstrate actions not currently recognized in the Envision rating system significant contribute to sustainability.</td>
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</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. To what extent has the project exceeded the highest levels of achievement for a given credit?

1. Detailed documentation of how the project exceeds existing requirements within a given Resource Allocation credit.

B. To what extent does the project implement innovative technologies or methods?

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.).

C. To what extent does the project overcome significant problems, barriers, or limitations or create scalable and/or transferable solutions?

1. 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 methodologies that improve the efficiency or sustainability of a project.

2. Documentation that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.

DESCRIPTION

This credit addresses special instances in which projects far exceed the performance requirements of a credit or innovate in a way that advances the industry and field of knowledge. These points are not calculated in 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, a more thorough documentation is expected. Projects may pursue points for innovation or exceptional performance.

Exceptional Performance
To qualify for exceptional performance points, projects must meet the highest level of achievement within the relevant credit. For instance, projects seeking additional points in credit RA3.1 Protect Fresh Water Availability must already be achieving a net positive restorative impact on water availability by obtaining water from renewable sources. In this case, exceptional performance may be pursued by projects whose magnitude of positive impact and investment in water restoration warrants the awarding of additional points. Exceptional performance may not be pursued by projects that have a basic primary function that meets the requirements. For instance, a reservoir may not pursue exceptional performance in credit RA3.1 Protect Fresh Water Availability unless aspects of that project far exceed the industry norm in protecting water sources and it is possible to clearly document that water restoration will occur above and beyond a comparable conventional project.

Exceptional performance constitutes achieving a remarkable increase in performance. This would be a multiple-factor increase in efficiency or effectiveness in one or more credits. Possible areas of achievement in exceptional performance for Resource Allocation may include, but are not limited to, the following:

- Projects for which procuring sustainable materials far exceeds the Conserving requirements in credit RA1.2 Support Sustainable Procurement Practices;
- Projects in which the net positive amount of renewable energy generation has significant impact in terms of scope or scale;
- Projects that achieve significant water efficiency by creatively re-examining water delivery or treatment.

Innovation

To qualify for innovation points, projects must demonstrate achievement in at least one of the following goals:

- Overcoming significant problems, barriers, or limitations—Project teams demonstrate that they have reduced or eliminated significant problems, barriers, or limitations that previously hampered the use or implementation of certain resources, technologies, processes, or methodologies that improve the efficiency or sustainability of a project;
- Creating scalable and/or transferable solutions—Project teams demonstrate that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.

Project teams may use innovative technology, methods, or application (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 technologies or methods 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 unique 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.
## NATURAL WORLD

### Siting
- NW1.1 Preserve Sites of High Ecological Value
- NW1.2 Provide Wetlands and Surface Water Buffers
- NW1.3 Minimize Disturbing Prime Farmland
- NW1.4 Preserve Undeveloped Land

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

### Ecology
- NW3.1 Enhance Functional Terrestrial Habitats
- NW3.3 Enhance Wetland & Surface Water Functions
- NW3.2 Maintain Natural Floodplains
- NW3.4 Control Invasive Species
- NW3.5 Protect Soil Health

### NW0.0 Innovate or Exceed Credit Requirements

<table>
<thead>
<tr>
<th>Category</th>
<th>Objective</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Siting</td>
<td>NW1.1 Preserve Sites of High Ecological Value</td>
<td>Improved (formerly NW1.1 Preserve Prime Habitat)</td>
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<tr>
<td></td>
<td>NW1.2 Provide Wetlands and Surface Water Buffers</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
<td>NW1.3 Minimize Disturbing Prime Farmland</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
<td>NW1.4 Preserve Undeveloped Land</td>
<td>Improved (formerly NW1.7 Preserve Greenfields)</td>
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<tr>
<td>Conservation</td>
<td>NW2.1 Reclaim Brownfields</td>
<td>NEW! (from aspects of former NW1.7 Preserve Greenfields)</td>
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<td></td>
<td>NW2.2 Manage Stormwater</td>
<td>Improved</td>
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<td></td>
<td>NW2.3 Reduce Pesticide &amp; Fertilizer Impacts</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
<td>NW2.4 Protect Surface &amp; Groundwater Quality</td>
<td>Improved</td>
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<tr>
<td>Ecology</td>
<td>NW3.1 Enhance Functional Terrestrial Habitats</td>
<td>REWRITTEN (formerly NW3.1 Preserve Species Bidoversity)</td>
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<td></td>
<td>NW3.3 Enhance Wetland &amp; Surface Water Functions</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
<td>NW3.2 Maintain Natural Floodplains</td>
<td>REWRITTEN</td>
</tr>
<tr>
<td></td>
<td>NW3.4 Control Invasive Species</td>
<td>Improved</td>
</tr>
<tr>
<td></td>
<td>NW3.5 Protect Soil Health</td>
<td>Improved (formerly NW3.3 Restore Disturbed Soils)</td>
</tr>
<tr>
<td>NW0.0</td>
<td>Innovate or Exceed Credit Requirements</td>
<td>Same</td>
</tr>
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</table>
NW1.1 PRESERVE SITES OF HIGH ECOLOGICAL VALUE

INTENT:
Avoid placing the project and temporary works on a site that has been identified as being of high ecological value.

METRIC:
Avoidance of high ecological value sites and establishment of protective buffer zones.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>(3) Improved Siting</td>
<td>(7) Full Mitigation</td>
<td>(12) Total Avoidance</td>
<td>(16) Habitat Protection</td>
<td>(24) Habitat Expansion</td>
</tr>
<tr>
<td>(A) The project team identifies areas of high ecological value.</td>
<td>(A) The project team identifies areas of high ecological value.</td>
<td>(A) The project team identifies areas of high ecological value.</td>
<td>(A) The project team identifies areas of high ecological value.</td>
<td>(A) The project team identifies areas of high ecological value.</td>
</tr>
<tr>
<td>(B) Mitigation measures including avoidance, minimization, restoration, and offsets fully compensate for project impacts to sites of high ecological value.</td>
<td>(B) Mitigation measures including avoidance, minimization, restoration, and offsets fully compensate for project impacts to sites of high ecological value.</td>
<td>(C) The project avoids developing or disturbing 100% of areas of high ecological value located on site.</td>
<td>(C) The project avoids developing or disturbing 100% of areas of high ecological value located on site.</td>
<td>(D) The project establishes effective protective buffer zones around areas of high ecological value.</td>
</tr>
<tr>
<td>Temporary impacts from construction activities do not decrease the capacity of preserved land.</td>
<td>Mitigation is on site or an adjacent contiguous parcel of equal or higher ecological value.</td>
<td>(D) The project establishes effective protective buffer zones around areas of high ecological value. OR</td>
<td>(E) The project team can demonstrate the site was intentionally chosen to avoid development on or near sites of high ecological value.</td>
<td>(F) The project significantly increases the area of high ecological value. This involves the restoration or conservation of additional areas of high ecological value as determined by a licensed or similarly qualified professional.</td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team identified whether the site contains areas of high ecological value?
1. Documentation of research undertaken to identify areas of high ecological value on the site. Research may include, but should extend beyond, references to local, state/provincial, or federal agencies or organizations indicating areas of high ecological value on site. Examples may include, but are not limited to: old growth forest; habitats important for threatened or endangered species; areas within ecosystems that support significant diversity of species (native, migratory), habitats, and/or important/rare/unusual geomorphological features/processes; and areas that are ‘pristine’ or not adversely affected by human activity.
2. Index of areas of high ecological value on or near the site.

B. Has the project mitigated any areas of high ecological value that are disturbed?
1. A mitigation plan including:
   a. an assessment of impacts to areas of high ecological value including a calculation of area impacted;
   b. measures the project will undertake to monitor, minimize, and mitigate impacts;
   c. the resources that will be made available to implement such measures;
   d. alternative actions to the taking that the project analyzed, and the reasons why the project did not adopt such alternatives;
   e. additional measures that may be required by regulatory agencies, as necessary or appropriate.
2. The plan is appropriately designed to meet mitigation goals. The plan should be prepared by a licensed or similarly qualified professional with expertise in ecological, natural resources and environmental habitat and, if applicable, approved by a regulatory agency.
3. Site plan showing temporary works and their proximity to sites of ecological value.
4. Documentation that the capacity of ecological sites was not diminished as a result of construction activities.

C. Does the project preserve an effective protective buffer zone around areas of high ecological value?
   1. A site map illustrating a protective zone for areas of high ecological value.
   2. Documentation demonstrating the zone provides effective protection. This should include the nature and makeup of the buffer zone.

D. Does the project avoid developing or disturbing areas of high ecological value on site?
   1. Documentation showing that no existing areas of high ecological value will be developed as a result of the project.
   2. Documentation demonstrating that areas of high ecological value will be protected during construction (e.g., contract documentation, specifications, contractor standard operating procedures).

E. Was the project intentionally sited to avoid areas of high ecological value?
   1. Documentation demonstrating to what extent areas of high ecological value were intentionally avoided.
   2. Documentation must show that the owner and the project team made meaningful efforts to avoid disturbing areas of high ecological value during the site selection process.

   Note that meeting criterion E is an alternative achievement path for the Conserving level. Achieving Conserving by meeting criterion E does not require meeting criteria A, C, and D, and vice versa.

F. Does the project significantly increase the area of high ecological value?
   1. Documentation of how areas of high ecological value were increased or restored. The habitat produced can be part of a protective buffer zone. Documentation should include a site map outlining locations and a technical summary describing the methods and materials of restoration.
   2. The documentation must be signed by a qualified natural resource professional who attests to the functionality of the restoration.

DESCRIPTION

Some areas are especially important in protecting wildlife biodiversity because of their size, location, diversity of habitat types, or presence of a particular type of habitat for plant or animal species. Some of these areas are large and already protected; for example, national parks, national forests, or national wildlife refuges. However, other habitat areas, such as areas of old-growth forest amidst a patch of younger trees, may be smaller and undocumented. All play important roles in maintaining biodiversity by providing crucial habitats for wildlife.

Through construction, noise, light pollution, removal of vegetation, and other practices, infrastructure projects can have negative effects on these areas as well as the local biodiversity. Therefore, siting infrastructure projects to prevent and minimize direct and indirect impacts is crucial. Problems associated with a poorly sited project are difficult to correct after construction. Preventing impacts by selecting appropriate sites during planning is significantly more effective.

PERFORMANCE IMPROVEMENT

Not every undeveloped or vegetated site is considered an area of high ecological value, and the qualifications of what constitutes a site of high ecological value can be subjective. Therefore this credit assessment begins with the act of identifying areas of high-ecological value. As mentioned above, these areas can be designated by municipal, state/provincial, or federal agencies or may be undocumented areas containing rare or significant habitat, species, or geologic formations. Project teams unsure of whether their site is of high ecological value should consider the following factors:

1. Biodiversity
   a. Rarity
      i. Sites with a concentration of endemic flora or fauna species
      ii. Sites containing rare or threatened flora or fauna species
iii. Sites containing rare or threatened habitat types
iv. Sites containing habitat or species of limited distributional range

b. Richness
i. Sites concentrating high numbers of flora or fauna species
ii. Sites concentrating high numbers of habitat types
iii. Sites seasonally concentrating significant population of migratory species

2. Ecosystem Functions
a. Size
i. Sites embedded into large areas preserving good environmental conditions
ii. Sites embedded into a large and connected landscape matrix

b. Ecological Processes
i. Sites maintaining good soil conditions for high-quality habitat development
ii. Sites maintaining good regeneration conditions for dominant species
iii. Sites significant to the hydrologic system, including groundwater recharge

c. Age/Maturity
i. Sites maintaining old-growth forests or similar undisturbed habitats
ii. Sites containing a variety of age classes of fauna
iii. Multi-layer forest sites with indicator species for each layer

After identifying sites of high ecological value projects should follow a mitigation hierarchy prioritizing avoiding sensitive sites to the extent possible. Mitigation measures are actions that reduce or address potential adverse impacts of a project on an area of high ecological value. They should address specific needs of the site and species involved and be manageable and measurable. Mitigation measures may take many forms, such as:

- Avoidance (e.g. preservation of existing habitat)
- Minimization (e.g. establishment of buffer areas around existing habitats)
- Restoration (e.g. enhancement or restoration of degraded or a former habitat)
- Offseting (e.g. creation of new habitats)

Mitigation must be accomplished on or adjacent to the impacted site. Mitigation measures can be achieved onsite through the dedication of a conservation easement that provides restrictions on access and limits, or through the acquisition of an adjoining contiguous parcel of equal or higher quality. Offsets must equal or exceed the area disturbed by the project and cannot be part of an existing conservation easement. Remote offsetting does not contribute to achievement in this credit.

For the Conserving level projects have two options. The first is to meet criteria A, C, and D. The second option is to submit documentation for criterion E demonstrating that the site was intentionally chosen to avoid development on or near sites of high ecological value. This must include evidence that impacting a site of high ecological value was a seriously considered option and that decisions made during planning or design led to avoiding a sensitive site.

Applicability of this credit is determined by whether the project contains sites of high ecological value, or whether impacting a site of high ecological value was a seriously considered option that was avoided due to conscious decisions made during planning or design. Projects that do not contain areas of high ecological value, and for which no siting options containing areas of high ecological were possible or seriously considered, may apply to have this credit deemed not applicable with supporting documentation.
NW1.2 PROVIDE WETLAND AND SURFACE WATER BUFFERS

INTENT:
Protect, buffer, enhance, and restore wetlands, shorelines, and waterbodies by providing natural buffer zones, vegetation, and soil-protection zones.

METRIC:
Type and quality of natural buffer zone established around all wetlands, shorelines, and waterbodies.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
<th>ENHANCED</th>
<th>SUPERIOR</th>
<th>CONSERVING</th>
<th>RESTORATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Buffers</td>
<td>(5) Managed Buffers</td>
<td>(10) Mixed Buffers</td>
<td>(16) Natural Buffers</td>
<td>(20) Buffer Restoration</td>
</tr>
<tr>
<td>(A) The project team identifies wetlands and surface water on or near the site, or with the potential to be impacted by the project.</td>
<td>(A) The project team identifies wetlands and surface water on or near the site, or with the potential to be impacted by the project.</td>
<td>(A) The project team identifies wetlands and surface water on or near the site, or with the potential to be impacted by the project.</td>
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</tr>
<tr>
<td>(B) The project team identifies the appropriate type and width of buffer zones for wetlands and surface waters.</td>
<td>(B) The project team identifies the appropriate type and width of buffer zones for wetlands and surface waters.</td>
<td>(B) The project team identifies the appropriate type and width of buffer zones for wetlands and surface waters.</td>
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</tr>
<tr>
<td>(C) The project provides vegetated buffer zones around 90% of wetlands and surface waters on site. The buffer is augmented with engineered controls sufficient to slow surface runoff, and trap sediments and pesticides.</td>
<td>(C) The project provides a buffer of managed vegetated zones around all wetlands and surface waters. Managed zones may include grass. The buffer is of sufficient width to slow surface runoff, and trap sediments and pesticides. Suggested widths are 20-30 ft / 6-9 m.</td>
<td>(C) The project provides a buffer of managed and natural vegetated zones around all wetlands and surface waters. Natural vegetated areas are not managed and consist of natural habitat. The buffer is of sufficient width to slow surface runoff, and trap sediments and pesticides. Suggested widths are 20-30 ft / 6-9 m.</td>
<td>(C) The project provides a buffer of natural vegetated zone around all wetlands and surface waters. The buffer is of sufficient width to slow surface runoff, and trap sediments and pesticides. Suggested widths are greater than 100 ft / 30 m. OR</td>
<td>(D) The project team can demonstrate the site was intentionally chosen to avoid development on or near wetlands or surface waters.</td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team identified wetlands and surface waters on or near the site?
1. Map of wetlands and surface waters in and around the site.

B. Has the project team determined the type and width of buffer zones necessary to protect wetlands and surface waters?
1. Calculation of the proposed buffer type and minimum width.
2. Documentation that the project team has considered site conditions including soil type, slope, land use, and vegetation mix in determining the appropriate buffer width and type.
3. Documentation that the proposed buffer width and type are sufficient to address:
   a. pesticide retention;
   b. bank stabilization;
   c. sediment control;
   d. nutrient retention;
   e. litter and debris;
f. water temperature;
g. terrestrial wildlife; and
h. aquatic wildlife.

4. Documentation that the project team has considered the cumulative impacts of acidification and/or eutrophication of the water bodies in the project design.

C. To what extent has the project implemented protective buffer zones around wetlands and surface waters?

1. A site plan showing the final site design, the boundaries of the buffer zone, and the minimal buffer zone width calculated as the shortest point between the buffer zone boundary and the identified wetland, waterbody, or shoreline.

2. Minimum widths follow the suggested widths or are justified by documentation in criterion B.

D. Was the project intentionally sited to avoid wetlands and surface waters?

1. Evidence that the project team intentionally avoided siting the project on or near wetlands and surface waters. Evidence should include alternative sites that were seriously considered.

   Note that meeting criterion D is an alternative achievement path for the Conserving level. Achieving Conserving by meeting criterion D does not require meeting criteria A, B, and C, and vice versa.

E. Will the project involve returning previously developed sites within the buffer zone to a natural state?

1. Maps and plans of developed areas of the project site that will be returned to a natural state within the protective buffer zones. Developed areas include man-made surfaces (e.g. pavement) and/or structures (e.g. facilities). Project teams may not count returning existing vegetated landscape (whether constructed or natural) to a natural state as evidence of restorative actions.

DESCRIPTION

Wetlands, shorelines, and waterbodies provide a number of important ecological services, including mitigating flooding, improving water quality, and providing wildlife habitat. Maintaining the integrity of these important elements requires more than simply protecting the elements themselves from adverse impacts of infrastructure and related development. Buffer zones around wetlands, shorelines, and waterbodies play particularly important roles in the following:

- Protecting wildlife habitats, providing connected habitat corridors, and maintaining biodiversity—Many wetland and aquatic-dependent species also require access to riparian or upland habitats for feeding, nesting, breeding, and hibernation;
- Regulating water temperature—Receiving water infiltrated from surface sources to the ground in buffer areas and shade from vegetation in buffer areas maintains water temperatures. Increased water temperatures can harm aquatic life;
- Maintaining water quality—Buffer areas provide erosion control and filter excess nutrients, such as nitrogen and phosphorus, and pollutants from runoff through groundwater infiltration;
- Protecting hydrology—Buffer areas regulate the flow of stormwater runoff and help preserve surface water and groundwater levels and flows;
- Protecting against human disturbance—Providing a buffer helps protect wetlands and surface waters from impacts in nearby areas, including destroying vegetation, compacting soils, debris, noise, and light.

PERFORMANCE IMPROVEMENT

For the Conserving level projects have two options. The first is to meet criteria A, B, and C. The second option is to submit documentation for criterion D demonstrating that the site was intentionally chosen to avoid development on or near wetlands or surface waters. This must include evidence that developing on or near wetlands or surface waters was a seriously considered option and that decisions made during planning or design led to avoiding a sensitive site.

Applicability of this credit is determined by whether the project is located on or near wetlands or surface waters, or whether developing on or near wetlands or surface waters was a seriously considered option that was avoided due to conscious decisions made during planning or design. Projects
that do not contain wetlands or surface waters, and for which no siting options containing wetlands or surface waters were possible or seriously considered, may apply to have this credit deemed not applicable with supporting documentation.
NW1.3 MINIMIZE DISTURRING PRIME FARMLAND

INTENT:
Identify and protect soils designated as prime farmland, unique farmland, or farmland of importance.

METRIC:
Percentage of farmland avoided or preserved during development.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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<th>CONSERVING</th>
<th>RESTORATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) 75% Avoidance</td>
<td>(3) 85% Avoidance</td>
<td>(8) 95% Avoidance</td>
<td>(12) 100% Avoidance</td>
<td>(16) Restore Productive Farmland</td>
</tr>
<tr>
<td>(A) The project team identifies soils designated as prime farmland, unique farmland, or farmland of importance.</td>
<td>(A) The project team identifies soils designated as prime farmland, unique farmland, or farmland of importance.</td>
<td>(A) The project team identifies soils designated as prime farmland, unique farmland, or farmland of importance.</td>
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<td>(A) The project team identifies soils designated as prime farmland, unique farmland, or farmland of importance.</td>
</tr>
<tr>
<td>(B) The project maximizes avoidance of prime farmland.</td>
<td>(B) Less than 10% of the project site is developed or disturbed prime farmland.</td>
<td>(B) Less than 5% of the project site is developed or disturbed prime farmland.</td>
<td>(B) The project avoids developing or disturbing any prime farmland located on site.</td>
<td>(E) In addition to 100% avoidance the project includes protecting farmlands for posterity against future disturbance, or restoring previously developed areas to a contiguous, functional, and productive farmland state.</td>
</tr>
<tr>
<td>(C) Farmland permanently damaged or disturbed as a result of the project is mitigated through offsets.</td>
<td>(C) Farmland permanently damaged or disturbed as a result of the project is mitigated through offsets.</td>
<td>(C) Farmland permanently damaged or disturbed as a result of the project is mitigated through offsets.</td>
<td>OR</td>
<td></td>
</tr>
<tr>
<td>Any farmland temporarily disturbed as a result of construction impacts shall be restored to a level that does not decrease the capacity of the preserved land.</td>
<td>Any farmland temporarily disturbed as a result of construction impacts shall be restored to a level that does not decrease the capacity of the preserved land.</td>
<td>Any farmland temporarily disturbed as a result of construction impacts shall be restored to a level that does not decrease the capacity of the preserved land.</td>
<td></td>
<td></td>
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</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team assessed the project site for soils identified as prime farmland, unique farmland, or farmland of importance?

1. Results of government studies and/or soil surveys designating areas of prime farmland, unique farmland, or farmland of special importance (e.g. United States Department of Agriculture, or Canadian Land Inventory).

B. To what extent will the project protect or preserve prime farmland, unique farmland, or farmland of importance?

1. Provide calculations and plans showing less than the required percentage of the project site includes development on farmland. The remaining avoided farmland must be contiguous and functionally viable to support farming.
2. Documentation showing that during construction no soils will be stripped from areas to be preserved as farmland.

C. Has the project team mitigated any damage or disturbance to prime farmland, unique farmland, or farmland of importance?

1. Documentation showing how the disturbed farmland has been mitigated on site per local jurisdiction standards.
2. For areas permanently disturbed by the constructed project offsetting criteria for farmland include:
   a. Preservation of adjacent or contiguous farmland of similar quality or better.
   b. Preserved area must equal or exceed area disturbed by the project.
   c. Preserved land cannot be part of an existing conservation easement.
3. Documentation that a construction management plan includes provisions for protecting farmland during construction. Documentation includes the full restoration of sites disturbed as a result of temporary works.
4. For projects that involve temporary disturbance to farmland, documentation that protection and restoration activities were carried out.
D. Was the project intentionally sited to avoid prime farmland?

1. Evidence that the project team intentionally avoided siting the project on prime farmland. Evidence should include alternative sites that were seriously considered.

   Note that meeting criterion D is an alternative achievement path for the Conserving level. Achieving Conserving by meeting criterion D does not require meeting criteria A and B and vice versa.

E. Does the project preserve existing farmland for posterity or restore previously disturbed farmland?

1. Documentation that farmland has been preserved for posterity against future disturbance or development. Proposed preserved land cannot be part of an existing conservation easement. In certain cases projects may submit the inclusion of urban agriculture for the Restorative level if it is of a scale commensurate with the project size.

   Note that Restorative cannot be achieved if any farmland of importance, as defined in criterion A is permanently impacted by the project. In addition, Restorative cannot be achieved by converting previously undeveloped natural areas into farmland.

DESCRIPTION

Farmland supports the economic base of many rural and suburban communities. Agricultural land is vital to achieving local and national food, health, and economic security. While some communities may not consider farming a significant contributor to the local economy now, they should look to trends in organic farming, local food sourcing, urban agriculture, and 'slow food'/regional cuisine movements, that are changing the economic viability of small and local farming. Agricultural land can also supply products with little market value, but enormous cultural and ecological importance. Some are more immediate, such as social heritage, scenic views, open space, and community character.

PERFORMANCE IMPROVEMENT

Designations of prime farmland, unique farmland, or farmland of local significance, by municipal, state/provincial, or federal agencies can be used in documentation for this credit. In the United States, prime farmland is designated by the U.S. Department of Agriculture (USDA); in Canada, it is classified by the Canadian Land Inventory (CLI). Farmland designations for most of the United States can now be accessed from the USDA Soil Survey Geographic (SSURGO) soil surveys database. Similar information for Canada can be accessed through the Canadian Soil Information Service (CanSIS) and the Agricultural Census. Many states and provinces also have classifications for farmland of significance. In countries or regions that lack official designations, project teams can use the description of prime farmland below to make their own determinations.

Prime farmland possesses a combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops economically if it is treated and managed according to acceptable farming methods. Soil properties are only one of several criteria that are necessary for land to be designated as prime farmland. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity and an acceptable content of salt or sodium. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding.

After identifying prime farmland project teams must follow a mitigation hierarchy including avoidance, minimization, restoration, and offsetting . Project teams must demonstrate that they prioritized avoiding developing farmland to the extent possible, that remaining temporary impacts were minimized and restored, and that any permanent development on farmland was offset.

Mitigation must be accomplished on or adjacent to the impacted site. Mitigation measures can be achieved onsite through the dedication of a conservation easement that provides restrictions on access and limits, or through the acquisition of an adjoining contiguous parcel of equal or higher quality. Offsets must equal or exceed the area permanently disturbed by the project and cannot be part of an existing conservation easement. Remote offsetting does not contribute to achievement in this credit.

For the Conserving level projects have two options. The first is to meet criteria A and B. The second option is to submit documentation for criterion D demonstrating that the site was intentionally chosen to avoid development on prime farmland. This must include evidence that developing on or near prime farmland was a seriously considered option and that decisions made during planning or design led to avoiding a sensitive site.

Applicability of this credit is determined by whether the project is located on prime farmland, or whether developing on or near prime farmland was a seriously considered option that was avoided due to conscious decisions made during planning or design. Projects that do not contain prime
farmland, and for which no siting options containing prime farmland were possible or seriously considered, may apply to have this credit deemed not applicable with supporting documentation.
NW1.4 PRESERVE UNDEVELOPED LAND

INTENT:
Conserve undeveloped land by locating projects on previously developed sites.

METRIC:
Percentage of project development that is located on a previously developed site.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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</tr>
</thead>
<tbody>
<tr>
<td>(4) At Least 25% Previously Developed.</td>
<td>(8) At Least 50% Previously Developed.</td>
<td>(12) At Least 75% Previously Developed.</td>
<td>(16) 100% Previously Developed.</td>
<td>(22) Restore Natural Areas</td>
</tr>
<tr>
<td>(A) At least 25% of the developed area of the project is located on a previously developed site.</td>
<td>(A) At least 50% of the developed area of the project is located on a previously developed site.</td>
<td>(A) At least 75% of the developed area of the project is located on a previously developed site.</td>
<td>(A) 100% percent of the developed area of the project is located on a previously developed site.</td>
<td>(A) 100% percent of the developed area of the project is located on a previously developed site.</td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. To what extent is the project located on a previously developed site?
1. Documentation showing the percentage of the developed area of the site that was developed prior to project construction and may be classified as a greyfield.

Note that this credit considers all previously developed sites as greyfields. This includes contaminated sites referred to as ‘brownfields’. Developed sites consist of pre-existing paving or construction. Land dedicated to current agricultural use, forestry use, or use as a preserved natural area does not qualify as a greyfield even if it contains pre-existing paving, or construction. Sites with historic development that have since returned to a natural state do not qualify as previously developed or greyfield sites.

B. Has the project returned developed areas to a condition that supports natural open space, habitat, or natural hydrology?
1. Documentation showing previously developed areas that have been returned to a natural state.

DESCRIPTION

This credit addresses conserving undeveloped land (greenfields) by locating project on previously developed sites (greyfields). Projects located on previously developed site often have fewer impacts on wildlife by minimizing the likelihood of new habitat fragmentation.

Developing on previously developed sites is often an investment in community prosperity. Infrastructure owners that can locate projects on abandoned, underutilized, or degraded properties can remove eyesores that degrade property values and replace them with beneficial projects. Project teams should consider the advantages of locating projects in areas designated or recognized as urban core/desired development zones. Such projects often:

• Promote urban development and channel development to urban areas, resulting in reduced pressure on undeveloped land and conservation of resources;
• Promote socioeconomic urban and neighborhood revitalization. This includes safety improvement, creation of short- and long-term local jobs, and the creation or preservation of parks and other recreational property.

In choosing greyfield sites, projects may realize the following additional benefits:

• Under the Natural World category, projects may provide for the restoration of impaired drainage-ways and other damaged or stressed...
natural resources;

- Under the Quality of Life category, these projects may positively impact historically and economically disadvantaged urban populations;
- Under the Resource Allocation category, projects located on greyfield sites may provide for the reuse of existing underground and above-ground structures, including buildings, utilities, and roadways.

**PERFORMANCE IMPROVEMENT**

While the term “greyfield” in some contexts may refer to underutilized or abandoned sites, this credit defines all previously developed sites as greyfields. This also includes contaminated sites referred to as ‘brownfields’. Developed area consists of paving or construction while undeveloped area consists of natural or managed vegetation. Vegetated areas of public parks are considered undeveloped land, whereas paved areas are considered developed. Assessment of this credit is determined by whether the project is located on a previously developed site or a previously undeveloped site. As all sites fall within these two classifications it would be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award. Inability to locate the project on a developed site is not sufficient justification to remove this credit from consideration.
NW2.1 RECLAIM BROWNFIELDS

INTENT:
Locate projects on sites classified as brownfields.

METRIC:
The degree of remediation of the brownfield site.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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<th>RESTORATIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>(11) Reuse Former Brownfield</td>
<td>(13) Mitigate Exposure</td>
<td>(16) Passive Remediation</td>
<td>(19) Active Remediation</td>
<td>(22) Complete Remediation</td>
</tr>
<tr>
<td>(A) The project is located on a site classified as a brownfield that has been remediated by others.</td>
<td>(B) The project is located on a site classified as a brownfield.</td>
<td>(B) The project is located on a site classified as a brownfield.</td>
<td>(B) The project is located on a site classified as a brownfield.</td>
<td>(B) The project is located on a site classified as a brownfield.</td>
</tr>
<tr>
<td>(C) Minimum required capping and remediation is performed to reduce human exposure to safe levels. Contaminants remain generally on site untreated.</td>
<td>(C) Passive remediation is performed to reduce human exposure and to gradually remove or breakdown contamination on the site.</td>
<td>(C) Active, or a combination of active and passive remediation, is performed to reduce human exposure and to remove or breakdown contamination on the site.</td>
<td>(C) Active, or a combination of active and passive remediation, is performed to restore site soils and/or groundwater back to regional background levels for the entire site.</td>
<td>The site is closed by regulators.</td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Is the project located on a site currently identified as a closed brownfield?

1. Provide documentation showing that the site is closed or already remediated site according to federal or state/provincial programs. For example, in Canada according to the Federal Contaminated Sites Inventory or provincial brownfields program, or in the United States as a federal or state brownfield or Voluntary Cleanup Program (VCP) site.

B. Is the project located on a site currently identified as an active brownfield?

1. Provide documentation showing that the site is already designated as an active (non-remediated) brownfield according to federal or state/provincial programs.

2. For sites not already designated as a 'Brownfield' under state/provincial or federal definitions project teams may provide evidence of contamination.
   a. Qualifying sites may include, for example, sites classified as “Suspected” in the Canadian Federal Contaminated Sites Inventory or provincial brownfields program, or property under a state managed Voluntary Cleanup Program (VCP).
   b. Documentation of contamination should include information delineating the lateral and vertical extents of impact and concentrations of the identified contaminants of concern. Examples include completed American Society for Testing and Materials (ASTM) or Canadian Standard Association (CSA) Phase I and Phase II Environmental Site Assessment (ESA), appropriate Voluntary Cleanup Program documentation, or site assessments completed under applicable provincial regulations.

3. Submit any deed restrictions, record of decision (ROD), or other legally binding agreements between the site owners or potentially responsible parties and regulatory authorities for the mitigation or remediation of contaminants associated with the property.

C. To what extent has the project mitigated or remediated the site?

1. Submit a mitigation and remediation plan that has been approved by the appropriate regulatory agencies.

2. Documentation showing that the plan meets the target level of achievement. Examples of documentation could include, but are not limited to:
   a. Identify sampling completed for contaminants of concern identified during the ASTM/CSA Phase I and II ESAs.
b. Identify containment, mitigation and/or remediation methods for all remaining contaminants of concern in excess of regulatory or site specific concentration thresholds either onsite or with the potential to migrate into the proposed development area.

ix. Passive remediation is defined as methods and improvements that stimulate or focus on natural attenuation in the ground. Examples include promoting microbial growth or installing a permeable reactive barrier that relies on natural ground water flow.

x. Active remediation is defined as methods that trap and remove contamination from the site. Examples include soil vapor extraction or “pump and treat” methods.

c. If the contaminants of concern include potentially volatile compounds, include an evaluation of the vapor intrusion pathway, if applicable, and a mitigation approach, as needed.

3. If applicable, include construction and post-construction phase monitoring and remediation plans to ensure contaminant mobilization is minimized and in compliance with applicable federal, state/provincial, and local exposure requirements and the planned development.

4. Documentation that the site has been closed by the appropriate regulatory agencies (e.g. a closure report).

DESCRIPTION

This credit recognizes the incredible benefit and service that projects provide when they are located on brownfields (i.e. contaminated sites). A brownfield is a property for which the expansion, redevelopment, or reuse may be complicated by the presence or potential presence of a hazardous substance, pollutant, or contaminant. Developing on brownfields comes with certain risks and responsibilities that may increase the cost of a project. However, there are often funding sources available to support or offset these costs.

Environmental benefits of brownfield development include cleanup or containment to prevent exposure, reducing threat to human and ecological health. It can also reduce the runoff of toxics into nearby water bodies, and therefore lead to improvements in overall water quality and habitat. As with greyfield development, brownfield development reduces sprawl by promoting development into urban areas, resulting in reduced pressure on undeveloped land. In some cases brownfield development may also involve the remediation and restoration of damaged or stressed natural resources.

Socio-economic benefits to brownfield development include increased local tax revenue both directly from the site as well as neighboring properties. Development promotes socioeconomic community and neighborhood revitalization including safety improvement, and creation of short- and long-term local jobs. This type of development can create a catalyst effect that spurs other investment and transformation in communities. Because they are undesirable and often expensive to address brownfields are frequently found in economically depressed neighborhoods. Project teams should consider how the benefits of redeveloping brownfields might specifically support historically disadvantaged populations.

Brownfields are not without challenges. Developers and property owners will need to manage past and future environmental liabilities associated with the property’s environmental history. Private lenders are often reluctant to give loans for potentially impaired lands. In some cases, cleanup costs for a property may ultimately be more than the property’s value. Brownfield projects may take longer than typical development due to environmental assessment and cleanup activities and a more complex permitting and regulatory environment.

PERFORMANCE IMPROVEMENT

Assessment of this credit is based on the degree of remediation of the brownfield. This begins with sites that are classified as brownfields but have been previously remediated or contained. This may include a former landfill that has been capped and closed. Projects advance to higher levels for sites that require increasing levels of remediation. While this credit seeks to recognize and reward the varying degrees of cost and effort involved in brownfield remediation, points in this credit are assigned such that even the Improved level contributes to the highest possible award level. This is in recognition of the fact that any brownfield redevelopment is a significant achievement for projects.

For the Superior level less intensive passive measures are sufficient. Passive remediation is defined as methods and improvements that stimulate or focus on natural attenuation in the ground. Examples include promoting microbial growth or installing a permeable reactive barrier that relies on natural ground water flow.

The Conserving level is where active, or a combination of active and passive measures. Active remediation is defined as methods that trap and remove contamination from the site. Examples include soil vapor extraction or “pump and treat” methods.

Restorative is reserved for projects that successfully close a contaminated site. This ensures the site is no longer a potential risk for future generations. Often the type or degree of contamination requires years of remediation so achievement of this level may not always be possible.

Project teams that considered siting the project on a brownfield but were unable to identify a suitable site may apply to have this credit deemed not applicable with supporting documentation of the efforts made. If no evidence is provided that any consideration was given to locating the project on a
brownfield the credit is considered applicable and no points achieved. Project teams that submit this credit as not applicable on the grounds the project is excluded from being located on a brownfield should consider that there are many types of contaminated sites and that demonstrating universal inapplicability would be difficult.
NW2.2 MANAGE STORMWATER

INTENT:
Minimize the impact of development on stormwater runoff quantity, rate, and quality.

METRIC:
Degree to which the project infiltrates, evapotranspirates, reuses, filters, and/or treats stormwater while not exceeding rate or quantity runoff targets.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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<th>SUPERIOR</th>
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</tr>
</thead>
<tbody>
<tr>
<td>(2) Expanded Options</td>
<td>(4) 85th percentile / 2-year event</td>
<td>(9) 90th percentile / 10-year event</td>
<td>(17) 95th percentile / 50-year event</td>
<td>(24) 95th percentile / 100-year event</td>
</tr>
<tr>
<td>(A) Infiltrate, evapotranspirate, reuse, filter, and/or treat 100% of the 85th percentile 24-hour event. Ensure compliance with local requirements if these are stricter.</td>
<td>(A) Infiltrate, evapotranspirate, and/or reuse 100% of 90th percentile 24-hour event. Ensure compliance with local requirements if these are stricter. OR</td>
<td>Detain and filter 150% of 90th percentile 24-hour event.</td>
<td>(A) Infiltrate, evapotranspirate, or reuse 100% of 95th percentile 24-hour event. OR</td>
<td>Detain and filter more than 150% of 95th percentile 24-hour event. OR</td>
</tr>
<tr>
<td>(B) Do not exceed rate or quantity of runoff for the 2-year 24-hour rainfall event relative to the pre-existing condition (greenfield, greyfield, or brownfield).</td>
<td>(B) Do not exceed rate or quantity of runoff for the 2, 5, and 10-year 24-hour rainfall event relative to the pre-existing condition (greenfield, greyfield, or brownfield).</td>
<td>Detain and filter 150% of 95th percentile 24-hour event. OR</td>
<td>(B) Do not exceed rate or quantity of runoff for the 2, 5, 10, 25 and 50-year 24-hour rainfall event relative to the pre-existing condition (greenfield, greyfield, or brownfield).</td>
<td>Detain and filter more than 150% of 95th percentile 24-hour event. OR</td>
</tr>
<tr>
<td>(C) The project includes an erosion, sedimentation, and pollutant control plan for construction activities.</td>
<td>(C) The project includes an erosion, sedimentation, and pollutant control plan for construction activities.</td>
<td>(C) The project includes an erosion, sedimentation, and pollutant control plan for construction activities.</td>
<td>(D) The project manages or treats stormwater on or from other sites according to criterion A. OR</td>
<td>The project demonstrates that it contributes to, or is part of, a larger watershed plan for managing stormwater runoff quantity, rate, and/or quality.</td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. To what extent does the project infiltrate, evapotranspirate, reuse, filter, and/or treat stormwater on site?

1. Site plan and documentation of all stormwater management strategies in the project and their function in infiltrating, evapotranspirating, reusing, filtering, or treating.

   Note that beginning with the Enhanced level criterion A has two compliance paths, it is only necessary to meet one set of requirements.

2. Calculations showing that stormwater management systems meet the relevant requirements for storm events as laid out in the level of achievement table:

B. To what extent does the project limit rate or quantity of runoff compared to pre-existing conditions?

1. Site plan, documentation, and calculations of the existing site and stormwater runoff patterns.

2. Site plan, documentation, and calculations of the designed project site and stormwater runoff patterns.
3. Calculations showing that the project does not exceed rate or quantity of runoff for the relevant 2, 3, 10, 25, 50, or 100–year 24-hour rainfall event.

C. Does the project include an erosion, sedimentation, and pollution control plan for all construction activities?
   1. Documentation of an erosion, sedimentation, and pollutant control plan—commonly referred to as Stormwater Pollution Prevention Plan (SWPPP) or Erosion and Sedimentation Control Plan (ESCP)—for all construction activities associated with the project. The plan (SWPPP or ESCP) conforms to all applicable erosion and sedimentation requirements. If the project is located in a region where construction erosion and sedimentation are not regulated the plan is demonstrated to comply with industry accepted best practices.

D. Does the project treat stormwater from other sites or does it function as part of a larger stormwater management plan?
   1. Documentation of stormwater strategies in the project that infiltrate, evaporate, reuse, filter, or treat water from other sites.
   2. Documentation of how the project is directly incorporated into a broader watershed plan for managing stormwater runoff quantity, rate, and/or quality.

   Note that criterion D has two compliance paths. It is only necessary to meet one set of requirements.

DESCRIPTION

Stormwater is an increasing concern and source of risk for communities around the world. Climate change is making precipitation rates increasingly unpredictable, with more intense storms becoming common. Historic design standards and regulations may not be sufficient to prepare communities for the future. Lawsuits are increasingly challenging and defining the liability of governments for failing to consider climate change in their policies when such failures increase damage to property.

Infrastructure owners should consider their exposure to risk for not taking opportunities to improve stormwater management systems. There are significant cost savings in addressing stormwater without sending it through wastewater treatment facilities. Reducing the demand on wastewater treatment will limit the need for expansion by prolonging the ability of existing facilities to provide sufficient capacity.

Improperly managing stormwater can have serious environmental impacts. Increased surface runoff typically leads to increased stream and channel erosion, downstream flooding, water temperatures (and thereby lowered dissolved oxygen in receiving waters), and concentration of pollutants reaching surface waters. It can deposit sediment and pollutants into waterways and warm historically cold-water streams. This can negatively impact aquatic life as native species are replaced with more pollutant-tolerant warm-water species.

Natural systems for stormwater management, often referred to as ‘green infrastructure’, provide multiple benefits. Bioswales and rain gardens can provide community beautification and present an opportunity to educate the public on the importance of stormwater management.

PERFORMANCE IMPROVEMENT

Low-impact development measures should be incorporated into the design to reduce and mitigate potential negative impacts associated with increased runoff. Designs should maintain, restore, or improve upon the pre-existing project site runoff characteristics (quantity, rate, and quality) through introduction of integrated BMPs that infiltrate and recharge, evaporate, and reuse runoff. BMPs may be a combination of integrated measures including bioretention, rain and/or rooftop gardens, sidewalk/parkway storage, vegetated swales, buffers and strips, tree and vegetation preservation, roof leader disconnection, rain barrels and cisterns, permeable pavers, soil amendments, impervious surface reduction and disconnection, and pollution prevention.

Project teams should factor the following criteria into their designs in order to ensure stormwater management strategies do not have negative unintended consequences:

- Increased infiltration, evapotranspiration and/or reuse of runoff onsite should not create or exacerbate regional (onsite, upstream, or downstream) ecological, vector, or safety problems. For example, increased onsite infiltration, beyond baseline conditions, in arid climates may alter historic stream types, converting ephemeral streams to perennial streams.

- The design should not negatively affect receiving waters by changing the site water balance so that detrimental impacts to base flow, nutrient cycling, sediment transport, and groundwater recharge occur. For example, water harvesting techniques that starve receiving systems of adequate flows necessary to maintain the ecological function of downstream waters are not used.
• The design should not be in conflict with adjacent structures, geologic, geotechnical, and/or groundwater pollution conditions. For example, infiltration within certain unsuitable geologic areas (liquefaction, karst topography, etc.) may not be permitted.

Applicability of this credit is determined by whether the scope of the project includes exterior surface areas that receive rainfall. Projects that do not include exterior areas (such as internal system refurbishments) or surface areas (such as underground projects), nor include the transportation or management of stormwater, may apply to have this credit deemed not applicable with supporting documentation.
NW2.3 REDUCE PESTICIDE AND FERTILIZER IMPACTS

INTENT:
Reduce non-point-source pollution by reducing the quantity, toxicity, bioavailability, and persistence of pesticides and fertilizers.

METRIC:
Efforts made to reduce the quantity, toxicity, bioavailability, and persistence of pesticides and fertilizers used on site, including the selection of plant species and the use of integrated pest management techniques.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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<tbody>
<tr>
<td>(1) Application Management</td>
<td>(2) Less Pesticide Or Fertilizer</td>
<td>(3) Better Selection, Lower Use</td>
<td>(4) No Pesticide Or Fertilizer Use</td>
<td>(5) Pesticide Or Fertilizer Removal</td>
</tr>
<tr>
<td>(A) Operational policies and programs are designed to control the application of pesticides and fertilizers so they are not over applied.</td>
<td>(A) Operational policies and programs are designed to control the application of pesticides and fertilizers so they are not over applied.</td>
<td>(A) Operational policies and programs are designed to control the application of pesticides and fertilizers so they are not over applied.</td>
<td>(C) For previously undeveloped sites with no prior use of pesticides or fertilizers, the project team designs landscaping to incorporate plant species that do not require pesticides or fertilizers.</td>
<td>(C) For project sites with prior use of pesticides or fertilizers, the project team redesigns existing site landscaping to incorporate plant species that do not require these pesticides or fertilizers.</td>
</tr>
<tr>
<td>(B) Runoff controls are put in place to minimize contamination of groundwater and surface water.</td>
<td>(B) Runoff controls are put in place to minimize contamination of groundwater and surface water.</td>
<td>(B) Runoff controls are put in place to minimize contamination of groundwater and surface water.</td>
<td>(C) Landscaping is designed to incorporate plant species that require less fertilizers and pesticides.</td>
<td>(D) When needed, pesticides and fertilizers with low toxicity, persistence, and/or bioavailability are specified.</td>
</tr>
</tbody>
</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Have operational policies and programs been put in place to control the application of fertilizers and pesticides?
   1. Operational policies and programs for applying fertilizers and pesticides.

B. Have runoff controls been put in place to minimize contamination of groundwater and surface water?
   1. Plans and drawings showing how runoff controls will be designed, installed, and maintained.

C. To what extent has the project team designed landscaping to require less pesticides and fertilizers?
   1. Documentation of plans for landscaping showing the mix of plant species emphasizing non-invasive plant species.
   2. Design specifications showing that less, little, or no fertilizers or pesticides will be used on the project site during construction and operation.
      a. Exceptions are allowed for the controlled use of fertilizer for initial landscaping establishment. Provide documentation indicating the necessity, benefits, and term of use.
      b. Exceptions are allowed for the controlled use of pesticides for removal of existing invasive species during project delivery. Provide documentation indicating the necessity, benefits, and term of use.
   3. Documentation and details about any integrated and pest management approaches demonstrating pesticides will not be required.
   4. Documentation and details of any natural fertilizer management approaches (e.g. composting) demonstrating no chemical fertilizers will be required.
D. To what extent has the project team selected pesticides and fertilizers that have lower toxicity, persistence, and bioavailability?

1. Documentation showing the pesticides and fertilizers to be used on the finished project.
2. Measurements of pesticide and fertilizer toxicity, persistence, and bioavailability along with recommended application rates and procedures.
3. Documentation showing how lower toxicity, persistence, and bioavailability were incorporated into the choice of pesticides and fertilizers.

DESCRIPTION

Pesticides and fertilizers are a significant non-point-source pollutant and, whenever possible, their use should be reduced or eliminated. Overapplication of pesticides and fertilizers can contaminate runoff and pollute streams, rivers, lakes, and groundwater. If chemicals are necessary, licensed applicators and appropriate protocols should be used to source less-toxic pesticides and fertilizers. Improper application of pesticides can also pose risks to human health.

Project teams should consider how better-suited plants can be chosen to grow without fertilizers and to resist pests. Integrated pest management is a low-impact approach to addressing pests that includes the selection of hardier pest resistant plants and natural prevention and control measures.

Project teams should consider the socio-economic benefits of reduced fertilizer and pesticide use. Direct costs are saved in both materials and labor. Plants chosen to be soil tolerant and pest resistant are inherently harder and less prone to replacement. Plants that do not require fertilizer or pesticides are often native or naturalized plants that enhance the regional character of a community.

PERFORMANCE IMPROVEMENT

This credit assesses efforts made to reduce the quantity, toxicity, bioavailability, and persistence of pesticides and fertilizers used on site, including the selection of plant species and the use of integrated pest management techniques. Pesticides are toxic substances released intentionally into the environment to kill living things. The family of pesticides include fungicides, herbicides, insecticides, rodenticides, and others.

The intent of this credit is to address long-term operational application of pesticides and fertilizers. Projects are permitted an initial use of pesticides for the purpose of eradicating or controlling invasive species found on site per credit NW3.4 Control Invasive Species. Similarly the controlled initial use of fertilizers is permitted when necessary to establish plants.

Applicability of this credit is determined by whether the scope of the project includes exterior vegetated areas. Projects that do not include exterior vegetated areas, may apply to have this credit deemed not applicable with supporting documentation.
NW2.4 PROTECT SURFACE AND GROUNDWATER QUALITY

INTENT:
Preserve water resources by incorporating measures to prevent pollutants from contaminating surface and groundwater and monitor impacts during construction and operations.

METRIC:
Designs, plans, and programs instituted to prevent and monitor surface and groundwater contamination during construction and operations.

LEVELS OF ACHIEVEMENT

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>(2) New Pathway Avoidance</td>
<td>(4) Community Support</td>
<td>(9) Risk Reduction</td>
<td>(14) Public Reporting</td>
<td>(18) Water Quality Improvement</td>
</tr>
<tr>
<td>(A) An environmental risk assessment has determined potential impacts to surface or groundwater quality, including temperature during construction and operations.</td>
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</tr>
<tr>
<td>(B) The project does not create new direct pathways for surface and/or groundwater contamination such as:</td>
<td>(B) The project avoids creating new direct pathways for groundwater contamination by means listed in the Improved level.</td>
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<tr>
<td>• Direct runoff into karst terrain;</td>
<td>• The project includes spill and leak diversion systems, spill prevention plans, and cleanup.</td>
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</tr>
<tr>
<td>• Untreated industrial or chemical discharge to unlined industrial ponds or lakes;</td>
<td>(C) The project team informs community stakeholders of any potential risk and/or impacts to water quality and demonstrates stakeholder support for the project plans involving surface and/or groundwater.</td>
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</tr>
<tr>
<td>• Re-injection water wells unless water is treated to secondary levels, or local regulations, whichever is more stringent; or</td>
<td>(D) Based on impacts identified in criterion A, the project reduces the risk of surface and/or groundwater quality degradation. This should include water temperature.</td>
<td>(D) Based on the types of impacts identified in criterion A, the project is designed or includes components that reduce the risk of surface and/or groundwater quality degradation. This should include water temperature.</td>
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</tr>
<tr>
<td>• Chemical, byproduct, or fracking water, injection.</td>
<td></td>
<td>(E) Adequate measures enable responsive surface and/or groundwater quality monitoring and reporting mechanisms to provide the public with water quality data.</td>
<td></td>
<td>(F) The project improves surface and/or groundwater quality. Beyond existing conditions.</td>
</tr>
</tbody>
</table>
EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has project team determined the potential for surface and/or groundwater contamination during construction and operations?
   1. Documentation of hydrologic and/or hydrogeologic delineation studies, taking into consideration the complexity of the aquifers. Note that local authorities may already have done delineation.
   2. Documentation explaining potential impacts to surface and/or groundwater quality, their risk, and consequences. Water temperature should be included as a potential impact.

B. Does the project include spill and leak prevention and response plans and avoid creating new pathways for contamination during construction and operations?
   1. Documentation that the project does not involve any of the following:
      a. No direct runoff into karst terrain
      b. No untreated industrial or chemical discharge to unlined industrial ponds or lakes
      c. No reinjection water wells unless water is treated to secondary levels
      d. No chemical or fracking water injection
   2. Documentation demonstrating spill and leak prevention and response plans are in place.
   3. Documentation showing the placement of materials storage piles and handling of potentially polluting runoff (e.g. plans and drawings).

C. Has the project team informed community stakeholders of potential water quality impacts and received stakeholder support for plans to address surface and/or groundwater issues during construction and operations?
   1. Documentation of stakeholder engagement demonstrating that potential water quality impacts were clearly communicated including their severity and probability of occurring.
   2. Documentation demonstrating stakeholder support of the project team’s plans to address surface and/or groundwater impacts.

D. To what extent does the project reduce the risk of surface and/or groundwater quality degradation during construction and operations?
   1. Documentation of project planning, design, or construction decisions intended to reduce the risk of surface and/or groundwater quality degradation. These actions may include but are not limited to:
      a. Siting the project to avoid important groundwater recharge areas (e.g. Karst topography).
      b. Locating equipment and facilities containing potentially polluting substances away from sensitive environments.
      c. Installing runoff interceptors and drainage channels designed to accommodate pollutants in stormwater runoff or ice melt, potential spills, and leakage.
      d. Installing natural systems to capture or prevent potentially polluting substances from reaching surface and/or groundwater sources.
      e. Significantly reducing or eliminating potentially polluting substances from operations.
      f. Recycling potentially polluting substances, including keeping them within the operation or sending them off site for use in other applications.
   2. For projects situated in areas where groundwater is used as a source or drinking water, documentation of wellhead and groundwater recharge area protection plans and other requirements including protection areas.

E. Have adequate and responsive surface and/or groundwater quality monitoring and reporting systems been incorporated into the project?
   1. Documentation of surface and/or groundwater quality monitoring programs. Documentation that discharges to receiving waters and/or the receiving waters themselves are monitored to verify pollutant loading, biological impact, water temperature, and the impact on receiving water flow.
   2. Documentation demonstrating that the frequency and level of monitoring is sufficient to address the potential water quality impacts provided in criterion A.
F. Does the project improve surface and/or groundwater quality?

1. *Documentation of water quality baseline prior to the project’s development.*

2. *Documentation demonstrating that the project improves overall water quality onsite, or in the watershed, compared to the pre-existing baseline.*
   
   Examples of improving water quality may include but are not limited to:
   
   a. **Implementing land use controls.**
   
   b. **Restoring degraded natural systems.**
   
   c. **Installing systems to clean or remove contaminants from surface and/or groundwater.**
   
   d. **Cleaning up contaminated areas.**
   
   e. **Installing systems to prevent existing (non project related) contamination from entering receiving waters or altering receiving water flow.**

**DESCRIPTION**

The goal of this credit is to preserve water resources by incorporating measures to prevent pollutants from contaminating surface and groundwater and monitor impacts during construction and operations. Groundwater is a widely used source of drinking water. Protecting wellheads and groundwater recharge areas reduces the chances of groundwater contamination and protects natural water purification processes. In addition, aquatic ecosystems depend on a particular set of water conditions. Changes to any of these factors can adversely affect aquatic life and groundwater quality. Aquatic ecosystems are threatened by changes in pH, decreases in water clarity, and increases in temperature, dissolved solids, coliform bacteria, toxic substances, and nutrients (especially phosphorus and nitrogen).

Leaks, spills, and other sources of contamination have serious environmental, social, and economic costs with prevention almost always being more economical than clean up. Contamination takes many forms but can kill flora and fauna, destroy habitats, and cause illness or premature death in humans.

Concerns regarding equipment and facilities containing potentially polluting substances include fuel and chemical storage, pipelines, piles of raw materials, and process areas. At the construction stage, potential sources of groundwater and surface water contamination include spills and leaks from tanks, pipes, and construction vehicles; leaching of pollutants from raw or waste materials; and releases of pollutants from the demolition of previously completed projects.

**PERFORMANCE IMPROVEMENT**

Project teams should focus on significantly reducing or eliminating potentially polluting substances from operations. If unable to do so, they seek to recycle the substances, keeping them within the operation or sending them off site for use in other applications. Project teams continue to address prevention measures by identifying equipment and facilities containing potentially polluting substances and locating them away from sensitive environments. Runoff interceptors and drainage channels should be designed to accommodate pollutants in stormwater runoff or ice melt, potential spills, and leakage. Water temperature is considered as a potential contaminate.

The highest level of achievement is reserved for projects that improve surface or groundwater quality, for example by cleaning up previously contaminated land, restoring wellhead and groundwater recharge area protection, and installing land-use controls to prevent future contamination. Restoration also may include removal of materials storage piles, rerouting of surface runoff, or restoring groundwater infiltration patterns.
NW3.1 ENHANCE FUNCTIONAL TERRESTRIAL HABITATS

INTENT:
Preserve and improve the functionality of the site and the surrounding natural habitat, and ensure at minimum a no net loss of habitat area and function.

METRIC:
The number of habitat functions addressed in order to preserve or enhance the net amount and quality of functional habitat.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(2) Mitigate Impacts</td>
<td>(5) One Ecosystem Function</td>
<td>(9) Two Ecosystem Functions</td>
<td>(15) Three Ecosystem Functions</td>
<td>(18) Restore And Create Habitats</td>
</tr>
<tr>
<td>(A) The project team identifies existing habitat types on or near the project site.</td>
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<tr>
<td>(B) Efforts are made to avoid and minimize impacts to existing terrestrial habitats and to compensate for remaining unavoidable habitat loss.</td>
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<td>(B) Efforts are made to avoid and minimize impacts to existing terrestrial habitats and to compensate for remaining unavoidable habitat loss.</td>
<td>(B) The project ensures that no existing habitats are disturbed or damaged.</td>
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</tr>
<tr>
<td>Mitigation measures ensure that existing habitat functions as defined in criteria C, D, and E are not degraded or lost. Mitigation measures must maintain net habitat quality and quantity and follow a hierarchy that prioritizes avoidance, minimization, restoration, and compensation.</td>
<td>Mitigation measures ensure that existing habitat functions as defined in criteria C, D, and E are not degraded or lost. Mitigation measures must maintain net habitat quality and quantity and follow a hierarchy that prioritizes avoidance, minimization, restoration, and compensation.</td>
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<td>(C, D, or E) Protect or enhance one or more ecosystem functions.</td>
<td>(C, D, and E) Enhance one or more ecosystem functions.</td>
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<tr>
<td>(C, D, or E) Protect or enhance one or more ecosystem functions.</td>
<td>(C, D, or E) Protect or enhance one or more ecosystem functions.</td>
<td>(C, D, or E) Protect or enhance two or more ecosystem functions.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team identified existing terrestrial habitats?

1. Documentation showing areas of important habitat on site and in the surrounding region, identifying potential and/or likely movement corridors between habitat areas, and potential existing barriers to these corridors on site.

2. The assessment of habitat must be prepared by a trained, certified or licensed habitat professional.

3. Documentation of collaboration with local and state/provincial agencies.

B. Does the project minimize and mitigate disturbance to functional terrestrial habitats?

1. Documentation identifying new impacts or barriers that will result from development and the specific actions that will be taken to minimize or to mitigate them.

2. The mitigation plan prepared by a trained, certified or licensed habitat professional. Acceptable mitigation must be on site, on a contiguous adjacent parcel, or within the affected landscape. Mitigation measures must maintain net habitat quality, quantity, and connectivity to provide a means for animals to access pre-development habitat after development is complete.

3. A monitoring plan to ensure mitigation measures are effective for preserving habitat quality and connectivity.
C. Does the project increase the quantity of terrestrial habitat?
1. A site plan and documentation illustrating the measures taken to provide new habitat.
2. Identification of the species that will benefit from the new habitat.

D. Does the project improve the quality of any existing or proposed new terrestrial habitat?
1. A site plan and documentation illustrating the measures taken to improve the quality of the existing habitat on the project. If new habitat is proposed for the project, document measures taken to improve the quality of proposed habitat.
2. Documentation of habitat improvement efforts and the intended impact they will have on site species.
3. A monitoring or maintenance plan, if applicable, to ensure the measures put in place to improve habitat quality are meeting their performance targets.

E. Does the project facilitate movement between terrestrial habitats, provide new connections, or remove barriers, in order to improve habitat connectivity?
1. Documentation of new connections provided between habitats and their appropriateness for the local wildlife, and/or documentation of the removal of existing barriers to movement and habitat connectivity.
2. A monitoring plan to confirm improved habitat connectivity.

DESCRIPTION
Consideration for the impacts of infrastructure development on habitat is too often limited to direct land development. However, development fragments and shrinks areas of suitable habitat. When patches are not individually large enough to support the population of a species, connectivity between patches becomes critical for survival. Infrastructure projects should prioritize protecting and enlarging habitats, connecting patches, and promoting safe movement between patches to create a functional habitat. Functional habitat supports the fundamental requirements of native organisms during all stages of their lifecycle and provides the habitat connectivity necessary to support plants and animals. Preserving and linking habitats is critical to biodiversity because it:

- Preserves basic and natural ecosystem processes and components that provide the lifecycle requirements to satisfy the needs of a range of living organisms;
- Provides sufficient habitat for large-range species (some animals require a large home range);
- Promotes genetic diversity and connectivity between patches allowing separate populations of the same species to interact and breed.

Project teams should consider how maintaining biodiversity and functional habitats adds value to regions. They enrich the quality of a community making them more desirable places to live and visit. Project sites can become destinations for educational school trips, bird watchers, or other wildlife enthusiasts.

PERFORMANCE IMPROVEMENT
Assessment in this credit begins with ensuring the project does not result in the net loss in quantity or quality of existing habitat. Project teams must follow a mitigation hierarchy including avoidance, minimization, restoration, and offsetting. Project teams demonstrate that they prioritized avoiding disturbing existing habitat to the extent possible, that remaining temporary impacts were minimized and restored, and that any permanent disturbance to habitat was offset.

Mitigation offsets can be achieved onsite through the dedication of a conservation easement that provides restrictions on access and limits, or through the acquisition of an adjoining contiguous parcel of equal or higher quality. Offsets must equal or exceed the area disturbed by the project and cannot be part of an existing conservation easement. Remote offsetting does not contribute to achievement in this credit.

Mitigation plans must be approved by a habitat professional. Habitat professionals may include, but are not limited to, conservation scientists, professional foresters, environmental scientists/ecologists, wildlife biologists, certified wetland scientists, professional hydrologists, or professional geologists.

Applicability of this credit is determined by whether the project contains or impacts natural habitat. Projects that do not contain or impact natural habitat, may apply to have this credit deemed not applicable with supporting documentation.
NW3.2 ENHANCE WETLAND AND SURFACE WATER FUNCTIONS

INTENT:
Maintain and restore the ecosystem functions of streams, wetlands, waterbodies, and their riparian areas.

METRIC:
Number of functions maintained and restored.

LEVELS OF ACHIEVEMENT

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<thead>
<tr>
<th>IMPROVED</th>
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<tbody>
<tr>
<td>(3) Enhance One Ecosystem Function</td>
<td>(7) Enhance Two Ecosystem Functions</td>
<td>(12) Enhance Three Ecosystem Functions</td>
<td>(18) Enhance Four Ecosystem Functions</td>
<td>(20) Restore Ecosystem Function</td>
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<tr>
<td>(A) Project team identifies project impacts to hydrologic connection, water quality, aquatic habitat, and sediment transport.</td>
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<td>(B) Efforts are made to avoid and minimize negative impacts to wetland and surface water functions and to compensate for remaining unavoidable losses. Mitigation measures must maintain net aquatic habitat quality and quantity and follow a hierarchy that prioritizes avoidance, minimization, restoration, and compensation.</td>
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<td>(B) The project ensures that no existing wetlands or surface waters are disturbed or damaged.</td>
<td>(B) Efforts are made to avoid and minimize negative impacts to wetland and surface water functions and to compensate for remaining unavoidable losses. Mitigation measures must maintain net aquatic habitat quality and quantity and follow a hierarchy that prioritizes avoidance, minimization, restoration, and compensation.</td>
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<td>(C, D, E or F) Protect or enhance two ecosystem functions.</td>
<td>(C, D, E or F) Protect or enhance three ecosystem functions.</td>
<td>(C, D, E or F) Protect or enhance four ecosystem functions.</td>
<td>(C, D, E and F) At minimum protect all four ecosystem functions. Additionally the project can demonstrate enhancements in at least one ecosystem function.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team identified impacts to wetland and surface water functions?
   1. Documentation identifying all potential impacts to wetland and surface water functions including: hydrologic connection, water quality, aquatic habitat, and sediment transport.

B. Does the project minimize and mitigate disturbance to wetland and surface water functions?
   1. Documentation of strategies implemented to minimize disturbance to wetland and surface water functions: hydrologic connection, water quality, aquatic habitat, and sediment transport.
   2. Documentation of mitigation measures to compensate for unavoidable losses in wetland and surface water functions.

C. Does the project maintain or enhance hydrologic connection?
   1. Documentation showing how the project will protect or enhance hydrologic connection. This may include:
      d. For streams, rivers, and lakes, documentation showing how the waterway is connected, or proposed to be connected, to its riparian floodplain. Project teams may use a 6-month to 2-year frequency flow event.
      e. For wetlands, documentation showing that structures that drain wetlands will be removed and/or appropriate sources of groundwater or surface waters are reconnected, diverted, or maintained.
D. Does the project protect or enhance water quality?

1. Documentation showing the current source of the waterways’ normal flow, the water quality of its source water, and how the water quality will be maintained or enhanced.

E. Does the project protect or enhance aquatic habitat?

1. A habitat survey of the waterbody and reference areas conducted by a recognized professional, and a plan to protect or enhance the habitat for aquatic and riparian species by plantings and appropriate physical modifications. This survey may include the location and proposed mitigation of existing obstructions to habitat connectivity such as dams, roadway structures, and other infrastructure that may block aquatic or shoreline species migration.

F. Does the project protect or restore sediment transport?

1. Documentation demonstrating that sediment transport will not be disrupted by the proposed project.
2. Documentation that existing sources of sediment obstruction will be removed or mitigated, and, if appropriate, sediment will be removed.
3. Reports from qualified resource professionals are required as part of the documentation.

DESCRIPTION

This credit addresses the maintenance and restoration of the ecosystem functions of streams, wetlands, waterbodies, and their riparian areas. Project teams should prioritize implementing controls and safeguards in order to maintain any existing natural hydrologic functions and consider opportunities to enhance previously degraded functions.

The socio-economic benefits of protecting or restoring natural wetland and surface water functions. This can include improved water quality, higher diversity of aquatic species, more visible and natural water flow, and reduced need for engineered sediment controls. These all increase the recreational value, sport fishing value, aesthetic value, and property value, of the site and surrounding areas while reducing maintenance and remediation costs.

PERFORMANCE IMPROVEMENT

Assessment in this credit begins with ensuring the project does not result in the net loss in quantity or quality of wetlands or surface waters. Project teams must follow a mitigation hierarchy including avoidance, minimization, restoration, and offsetting.

Mitigation offsets can be achieved onsite through the dedication of a conservation easement that provides restrictions on access and limits, or through the acquisition of an adjoining contiguous parcel of equal or higher quality. Offsets must equal or exceed the area disturbed by the project and cannot be part of an existing conservation easement. Remote offsetting does not contribute to achievement in this credit. Wetland mitigation plans must be approved by a licensed professional.

Additional levels includes four actions: maintain or enhance hydrologic connection, maintain or enhance water quality, maintain or enhance habitats, and maintain or enhance sediment transport. In the context of this credit, protecting wetland and surface water functions is not synonymous with avoidance. While avoidance can be considered in criterion B, criteria C, D, E, and F require action on the part of the project. Projects must include strategies, controls, safeguards, or other measures to demonstrate active protection of one or more functions.

When addressing hydrologic connectivity project teams should consider that many healthy waterways and wetlands receive much of their normal flow from underground sources. Protecting or restoring water quality may be documented by showing the current source of the waterways’ normal flow, the water quality of its source water, and how the water quality will be protected or enhanced. In some areas, this may mean disconnecting direct surface water discharges and constructing infiltration best management practices that will help remove pollutants and cool stormwater, by means of discharging to the waterbody through groundwater. To protect or enhance aquatic and riparian habitats consider past infrastructure projects may have removed the natural riffle, pool, and meander sequence of rivers and streams that is important in providing a healthy ecosystem. Waterways not only move water but also sediment, and in-waterway sediment transport is important for a healthily functioning ecosystem.

Applicability of this credit is determined by whether the project contains or impacts wetlands or surface waters. Projects that do not contain or impact natural wetlands or surface waters, may apply to have this credit deemed not applicable with supporting documentation.
NW3.3 MAINTAIN NATURAL FLOODPLAINS

INTENT:
Preserve floodplain functions by limiting development and impacts of development in the floodplain.

METRIC:
Efforts to avoid floodplains or maintain predevelopment floodplain functions.

LEVELS OF ACHIEVEMENT

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<tr>
<td>(1) 75% Avoidance (A) The project team identifies the design frequency floodplain. Consideration is given to future floodplain scenarios. If the project is located outside the floodplain the project team identifies whether it is part of the watershed contributing to flood intensity. (B) The project maintains a net quantity of at least 75% of preexisting natural area within the floodplain.</td>
<td>(3) 85% Avoidance (A) The project team identifies the design frequency floodplain. If the project is located outside the floodplain the project team identifies whether it is part of the watershed contributing to flood intensity. (B) The project maintains a net quantity of at least 85% of natural area within the floodplain. (C) Project impacts to floodplain functions such as infiltration, rate of runoff, and water storage are mitigated. Overall floodplain functions are not diminished as a result of the project.</td>
<td>(7) 95% Avoidance (A) The project team identifies the design frequency floodplain. If the project is located outside the floodplain the project team identifies whether it is part of the watershed contributing to flood intensity. (B) The project maintains a net quantity of at least 95% of natural area within the floodplain. (C) Project impacts to floodplain functions such as infiltration, rate of runoff, and water storage are mitigated. Overall floodplain functions are not diminished as a result of the project.</td>
<td>(11) Floodplain Preservation (A) The project team identifies the design frequency floodplain. If the project is located outside the floodplain the project team identifies whether it is part of the watershed contributing to flood intensity. (B) The project maintains 100% of the area of vegetated zones within the floodplain. The project includes natural areas within the floodplain that are specifically preserved and protected. (C) Project impacts to floodplain functions such as infiltration, rate of runoff, and water storage are mitigated. Overall floodplain functions are not diminished as a result of the project. OR (D) The project team can demonstrate the site was intentionally chosen to avoid development on or near floodplains.</td>
<td>(14) Floodplain Restoration (A) The project team identifies the design frequency floodplain. If the project is located outside the floodplain the project team identifies whether it is part of the watershed contributing to flood intensity. (B) The project avoids developing any existing vegetated zones within the floodplain. The project includes natural areas within the floodplain that are specifically preserved and protected. (C) Project impacts to floodplain functions such as infiltration, rate of runoff, and water storage are mitigated. Overall floodplain functions are not diminished as a result of the project. (E) Previously developed areas are restored to vegetated zones in order to improve the floodplain functions.</td>
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</table>

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team identified the 100-year or design frequency floodplain in relation to the project location?

1. Documentation showing the location of the project relative to the 100-year or design floodplain (whichever is more stringent).
2. Documentation showing how any areas of the project located outside the floodplain may impact or contribute to flooding.

B. To what extent does the project preserve vegetated zones within the floodplain?

1. Site maps indicating the area of impervious/vegetated zones within the floodplain prior to the project development.
2. Site maps indicating the area of impervious/vegetated zones within the floodplain after the project development.
3. Calculations of the percentage of existing vegetated areas after development.
4. Documentation of any vegetated areas on site that will be specifically preserved and protected as vegetated areas.
   Note that for Restorative the project avoids developing any existing vegetated areas within the floodplain.
C. Does the project mitigate impacts to floodplain functions?

1. Documentation of efforts to mitigate impacts to floodplain functions. Mitigation efforts may include but are not limited to:
   a. Maintain pervious surfaces, slow stormwater, retain stormwater, and/or increase or maintain floodplain storage capacity.
   b. Maintain pre-development floodplain infiltration, such as amount of impervious surfaces, vegetation and soil protection zones, and other approaches that allow for natural floodwater infiltration and filtration of pollutants.
   c. Maintain or enhance aquatic habitat connectivity, such as fish and sediment transport, including removal of barriers and traps.
   d. Maintain or enhance habitat such as riparian buffers within and along waterways in the floodplain.

D. Was the project intentionally sited to avoid floodplains?

1. Documentation demonstrating that the project was intentionally sited to avoid a floodplain. Documentation must show that the owner and the project team made meaningful efforts to avoid developing or impacting a floodplain during the site selection process.
   Note that meeting criterion D is an alternative achievement path for the Conserving level. Achieving Conserving by meeting criterion D does not require meeting criteria A, B, and C, and vice versa.

E. Does the project return previously developed areas within the floodplain to a vegetated state?

1. Site maps indicating the area of impervious/vegetated zones within the floodplain prior to the project development.
2. Site maps indicating the area of impervious vegetated zones within the floodplain after the project development.

DESCRIPTION

Floodplains are hydrologically important, environmentally sensitive, and ecologically productive areas and flooding is a naturally occurring process in every river and coastal area. Development within floodplains that does not account for these ecosystem functions often limits or restricts the natural benefits of flooding while simultaneously putting people and property at greater risk. Project teams should consider how maintaining natural floodplains can provide environmental benefits, protect human health and safety, and reduce risks and costs from flood damage.

Climate change is making precipitation rates increasingly unpredictable, with more intense storms becoming common. This in turn impacts the frequency and severity of flooding. Historic design standards and regulations may not be sufficient to prepare communities for the future.

When possible projects should avoid developing in floodplains. In addition, infrastructure planning should direct community growth and development away from floodplains. Some infrastructure projects may not be able to avoid the floodplain (e.g., roadway and utility crossings, wastewater treatment facilities, ports, and other water-dependent structures). However, these structures should be designed to minimize waterway crossings and floodplain impacts. The goal of all projects should be to maintain or enhance floodplain storage and to not increase flood elevations. Infrastructure owners and project teams should consider how these measures can protect assets and the broader community.

PERFORMANCE IMPROVEMENT

Infiltrating floodwater is one of the most critical floodplain functions and is addressed in criterion B by quantifying the amount of vegetated area that remains on the site. This is based on existing conditions prior to the project development. The Restorative level is possible for projects that meet all relevant criteria and additionally return developed impervious surfaces to a natural vegetated state.

Some projects that are not directly within the floodplain may still have an impact on flooding and floodplain functions through their handling of stormwater runoff. These projects may also pursue achievement in this credit if they can demonstrate a direct connection to the floodplain. There are strong links between this credit and NW2.2 Manage Stormwater and some project components and strategies may apply to both credits.

Applicability of this credit is determined by whether the project is located within or impacts a floodplain. Projects that do not contain or impact natural wetlands or surface waters, may apply to have this credit deemed not applicable with supporting documentation.
NW3.4 CONTROLS INVASIVE SPECIES

INTENT:

Use appropriate non-invasive species, control or eliminate existing invasive species.

METRIC:

Degree to which invasive species have been reduced or eliminated.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(1) Prevention</td>
<td>(2) Assessment And Prevention</td>
<td>(5) Program Controls</td>
<td>(8) Minor Infestation Control</td>
<td>(10) Major Infestation Control</td>
</tr>
<tr>
<td>(A) Best practices should be used to prevent unintentional introduction of known invasive species to the site. A construction management plan includes provisions for preventing the introduction of invasive species.</td>
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<td>(B) Identify, map and/or document invasive species infestations on site.</td>
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<td>(C) Establish and implement a program that controls minor infestations of invasive species on site before and throughout construction.</td>
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<td>(C) Establish and implement a program that eradicates or controls minor infestations of invasive species on site before and throughout construction.</td>
<td>(D) The project guards against future infestations by supporting the establishment of native and/or non-invasive species.</td>
<td>(E) Long-term controls are in place through a 10-year management plan to prevent the introduction or reintroduction of invasive species and perform follow-up control actions if populations persist.</td>
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<td>(F) Additionally, the project implements similar programs for controlling major infestations on site.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Does the project avoid introducing invasive species to the site?

1. **Documentation showing the type and quantity of all species introduced to the site.** For example, a landscaping plan that includes all species of vegetation showing that no invasive species will be planted.

2. **Documentation that species used on the site are noninvasive.**

3. **A construction management plan to prevent the introduction of invasive species.** The plan includes best practices to ensure that construction materials and equipment used on site are free of invasive species and seeds.
B. Has the project team conducted a site assessment to determine if invasive species are present?

1. Mapping of all invasive species populations found on the site.
   a. The documentation should identify populations of minor or major infestations. Infestations over one hectare (2.5 acres) can generally be considered major. However, exceptions can be made with justification of the type and level of establishment of the infestation.
   b. The documentation should include the assessment of a trained biologist, ecologist, or environmental professional whether the populations can be eradicated or only controlled.

2. Documentation of collaboration with state or local agencies OR the qualifications of the biologist, ecologist, or environmental professional who conducted the site assessment.

C. Does the project implement controls for existing infestations of invasive species before, during and post-construction?

1. Documentation of plans for the removal of minor infestations of invasive species before and throughout construction to prevent their growth into major infestations. Plans may include specifications, contract language, or operational management plans.

2. Documentation of plans for a post-construction follow-up to remove any invasive species that re-emerges after initial control. Plans may include specifications, contract language, or operational management plans.

3. Documentation of control, containment or suppression activities during construction for any major infestations of invasive species found on site.

D. Does the project guard against future infestations by supporting the establishment of native and/or non-invasive species?

1. Documentation of the inclusion of native species in the project landscaping. Project teams should recognize that the intent of this criterion is to prevent the future introduction of invasive species by establishing or protecting healthy systems of native or naturalized species. Documentation should focus on how landscaping or maintenance plans are intentionally designed to increase the site resilience to infestation.

2. Plan showing areas of existing non-invasive species that will remain undisturbed.

E. Does the project provide long-term controls to prevent the re-introduction of invasive species?

1. A minimum 3- or 10-year plan that addresses:
   a. Prevention strategies for reducing the potential for invasive species to become reestablished and spread at the site after initial removal
   b. Early detection and management strategies that monitor for and remove invasive species emerging on site in the future.
   c. Rehabilitation and restoration methods to support long-term reestablishment of native species at the site.

F. Does the project control, suppress or contain major infestations of invasive species during and after construction?

1. Documentation of control, containment or suppression of major infestations of invasive species.

DESCRIPTION

Non-native invasive species can lead to the decline or extinction of native species or change the function of an ecosystem, altering fire regimens, nutrient cycling, and hydrology. Invasive plant species may also affect fauna by altering available food systems and degrading habitats. Invasive species can have direct operations and maintenance costs for projects or, if left unchecked, communities as a whole. In some cases entire industries dependent on ecosystem services (fishing, forestry, agriculture, etc.) may be impacted by invasive species.

Invasive species include nonindigenous or non-native flora, fauna, insects, and aquatic life that adversely affect the habitats or bioregions they invade. Invasive species may dominate the new region, forcing out existing species by outcompeting native species for nutrients, light, physical space, water, or food. Invasive species may invade and overcome native species through several mechanisms, including rapid reproduction and dispersal, direct competition and/or suppression, and the ability to quickly adapt to a wide range of environmental conditions and food types.
PERFORMANCE IMPROVEMENT

Two of the primary methods of limiting the spread of invasive species include protecting existing healthy habitats from disturbance and avoiding the introduction of invasive species. For this credit the first step in controlling invasive species is to not introduce new invasive species to the site. Humans can be a significant factor in the distribution and establishment of invasive species. Often invasive species are introduced through transportation pathways (e.g. trans-oceanic ballast water, cargo freight, etc.) and disturbed sites. Major construction projects involve both.

In criterion D projects take steps to protect existing healthy habitats from disturbance. It is more difficult for invasive species to gain a foothold in dense, natural, and healthy ecosystems. While this does not always require native indigenous plants, project teams should consider the value of reintroducing or expanding the use of native plants on their project.

It may not always be possible to eradicate invasive species. Successful eradication of an invasive species population depends to a great extent on the size of the population and the degree of establishment. Research indicates that invasive plant infestations under one hectare (2.5 acres) in size have the highest likelihood of being eradicated. Therefore, plant infestations greater than one hectare could be considered major infestations where suppression and containment are the only management options. The assessment methodology for this credit distinguishes between major and minor infestations and the different approaches to addressing infestations. At the Conserving level projects implement programs to eradicate or control minor infestations (under one hectare) up through project delivery and develop a three-year management plan to complete control actions. In cases where project sites include major infestations it is often not possible to eradicate the invasive species and their management will be an ongoing activity for the project. Therefore projects are required to take initial control steps and to develop a long-term ten year management plan.
NW3.5 PROTECT SOIL HEALTH

INTENT:
Preserve the composition, structure and function of site soils.

METRIC:
Soils can support healthy native plants and trees.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(1) Minimize Disturbance</td>
<td>(3) Restore Soils</td>
<td>(4) Special Feature Plan</td>
<td>(6) Best Management Practices</td>
<td>(8) Soil Restoration</td>
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<tr>
<td>(A) The project limits the area that is disturbed by development activities.</td>
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<td>(B) At least 95% of post-construction vegetated areas disturbed during construction are restored for appropriate soil type, structure, and function to support healthy plant and tree growth.</td>
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<td>(C) A soil-protection plan is prepared and implemented around special landscape features.</td>
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<td>The plan is expanded to comply with best management practices from a local soil conservation agency.</td>
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<td>(B) At least 100% of post-construction vegetated areas on site are restored for appropriate soil type, structure, and function to support healthy plant and tree growth.</td>
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<tr>
<td>(C) A soil-protection plan is prepared and implemented around special landscape features.</td>
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<tr>
<td>The plan is expanded to comply with best management practices from a local soil conservation agency.</td>
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<tr>
<td>The soil-protection plan is reviewed or prepared under the guidance of a certified soil scientist.</td>
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<tr>
<td>(D) All areas disturbed by previous development and planned as vegetated areas have been restored for appropriate soil type, structure, and function to support plant and tree growth.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team limited the area that is disturbed by development activities?
1. Site plans and documentation showing total vegetated areas and percentage that will be disturbed.
2. Documentation of how development plans will limit soil disturbance either through the project design or construction management.

B. Have vegetated areas disturbed by development activities been restored for appropriate soil type, structure, and function to support healthy plant and tree growth?
1. Plans and specifications indicating that at least 95% of post-construction vegetated areas on site, including areas disturbed by development, will be restored to a condition that can support healthy plant and tree growth. Soils must be reused for functions comparable to their original function (i.e. topsoil is used as topsoil, subsoil as subsoil, or subsoil is amended to become functional topsoil).
2. Documentation that disturbed natural soils in vegetated areas will be conserved and reused on site to the extent possible.
3. Documentation, including site plans, showing how soil type, structure and function has been restored. Calculations that soil restoration activities constitute at least 95% of the post-construction vegetated areas on site. Soils must be reused for functions comparable to their original function (i.e. topsoil is used as topsoil, subsoil as subsoil, or subsoil is amended to become functional topsoil).
4. Documentation that disturbed natural soils in vegetated areas were conserved and reused on site to the extent possible.

C. Has the project team implemented a soil-protection plan?
1. Documentation that the soil-protection plan at minimum identifies special landscape features and includes best management practices to prevent soil disruption within their protective zones.
2. Documentation that the soil-protection plan is comprehensive and is compliant with best management practices according to a local soil conservation agency.
3. Documentation that the soil-protection plan has been reviewed or was prepared under the guidance of a certified soil scientist.

D. Has the project restored appropriate soil type, structure, and function to vegetated areas disturbed by previous development?
1. Plans and documentation showing the existing condition of the site and clearly identifying areas previously disturbed by development.
2. Documentation that the project involves restoring previously disturbed areas to a condition that can support healthy plant and tree growth.
3. A soil restoration plan has been reviewed or prepared for designated non-hardscape areas under the guidance of a certified soil scientist. Soils must demonstrate functionality (e.g., restored soils have appropriate water holding capacity, nutrient retention capability, and erosion prevention capability as reference soils).

DESCRIPTION
Construction activities can disturb soil health in many ways, the most common being compaction. Disturbed soils cannot hold water, nutrients, or carbon as well as natural, undisturbed soils. Disturbed soil is less capable of absorbing floodwaters or sustaining vegetation. Compaction caused by construction equipment can kill surrounding plants and trees and prevent future plant growth.

Climate, organisms, relief, parent material, and time (CORPT) are the factors of soil formation. Given enough time, if all other factors are held constant, soils that have been mechanically disturbed can naturally restore themselves. However, because soil formation is slow, the natural process of soil recovery can take millennia. Various human activities can be used to enhance the ability of mechanically disturbed soils to function as they did prior to being disturbed. This process is referred to as “soil restoration”. The details of which activities should be used are highly dependent on the original soil type, the factors that formed it, and the functions that land managers wish to recover.

PERFORMANCE IMPROVEMENT
This credit assesses the ability of the soil in vegetated areas to support healthy plants and trees. This refers to areas that remain as vegetated areas after construction. It does not include soil located under paving or construction. For the Enhanced through Conserving levels action is focused on soils impacted by construction activities. This may include areas used for temporary staging, access for construction equipment, material storage, or others. In the context of this credit soil restoration refers to the quality and condition of the soil and does not refer to keeping soil on site (this is addressed in RA1.6 Balance Earthwork on Site). As there are many types of soil, soil health in the context of this credit is determined by whether it is capable of supporting native plant and tree growth.
NW0.0 INNOVATE OR EXCEED CREDIT REQUIREMENTS

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

METRIC:
Whether project achievement qualifies as exceptional performance or innovation.

LEVELS OF ACHIEVEMENT

INNOVATION

(+10) Innovate or Exceed Credit Requirements.
(A) Projects clearly document a performance that exceeds the highest existing requirements within one or more credits.
OR
(B) Projects demonstrate the innovative application of methods, technologies, or processes that are novel either in their use, application, or within the local regulatory or cultural climate.
OR
(C) Projects demonstrate actions not currently recognized in the Envision rating system significant contribute to sustainability.

DESCRIPTION
This credit addresses special cases in which projects far exceed the performance requirements of a credit or innovate in a way that advances the industry and the associated field of knowledge. These points 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, a more thorough documentation is expected. Projects may pursue points for innovation or exceptional performance.

PERFORMANCE IMPROVEMENT

Exceptional Performance
To qualify for exceptional performance points, projects must meet the highest level of achievement within the relevant credit. For instance, credits seeking additional points in credit NW1.1 Preserve Prime Habitat must already be restoring prime habitat. In this case, exceptional performance may be pursued by projects where the large magnitude of restoration or the exceptional effort and investment necessary to achieve restoration warrants the awarding of additional points. Exceptional performance may not be pursued by projects that have a basic primary function that meets the requirements. For example, unless extensive restoration was necessary, a nature reserve providing prime habitat may not qualify. It is important to note that exceptional performance is not possible for avoidance. For instance, projects that preserve prime habitat by selecting a project location in areas without prime habitats may achieve the full credit value for NW1.1, but do not qualify for exceptional performance.

Exceptional performance constitutes achieving a remarkable increase in performance. This would be a multiple-factor increase in efficiency or effectiveness in one or more credits. Possible areas of achievement in exceptional performance for the Natural World credit may include, but are not limited to, the following:

- Projects for which significant efforts were made to preserve important natural resources in perpetuity;
- Projects in which efforts to control invasive species represent a significant aspect of the project;
- Projects for which the avoidance of habitat, surface waters, and/or sensitive geologic features required exceptional effort and/or the implementation of innovative methods.

Innovation
To qualify for innovation points, projects must demonstrate achievement in at least one of the following goals:
Overcoming significant problems, barriers, or limitations—Project teams demonstrate that they have reduced or eliminated significant problems, barriers, or limitations that previously hampered the use or implementation of certain resources, technologies, processes, or methodologies that improve the efficiency or sustainability of a project;

Creating scalable and/or transferable solutions—Project teams demonstrate that the improved performance achieved, or the problems, barriers, or limitations overcome, are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.

Project teams may use innovative technology, methods, or application (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 such 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 technologies or methods 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 unique context of the project (whether climate, regulations, policies, political support, public opinion, etc.) have yet to gain acceptance. Significant efforts are taken to demonstrate the effectiveness of the technology or method within the context and to 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.

EVALUATION CRITERIA AND DOCUMENTATION

A. To what extent has the project exceeded highest levels of achievement for a given credit?
   1. Detailed documentation of how the project exceeds the existing requirements currently within a given Natural World credit.

B. To what extent does the project implement innovative technologies or methods?
   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.).

C. To what extent does the project overcome significant problems, barriers, or limitations or create scalable and/or transferable solutions?
   1. 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 methodologies that improve the efficiency or sustainability of a project.
   2. Documentation that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.
RISK AND RESILIENCE

Emissions
- RR1.1 Reduce Greenhouse Gas Emissions
- RR1.2 Reduce Air Pollutant Emissions

Resilience
- RR2.1 Assess Climate Threat
- RR2.2 Evaluate Risk and Resilience
- RR2.3 Establish Resilience Goals and Strategies
- RR2.4 Improve Infrastructure Integration
- RR2.5 Maximize Durability
- RR2.6 Maximize Adaptability
- RR2.7 Maximize System Recovery
- RR2.8 Maximize Co-Benefits and Synergies

- RR0.0 Innovate or Exceed Credit Requirements
RR1.1 REDUCE GREENHOUSE GAS EMISSIONS

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

METRIC:
Life-cycle net carbon dioxide equivalent emissions.

LEVELS OF ACHIEVEMENT

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<th>IMPROVED</th>
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<tbody>
<tr>
<td>(5) At Least 10% Reduction</td>
<td>(8) At Least 25% Reduction</td>
<td>(14) At Least 50% Reduction</td>
<td>(18) Carbon neutral</td>
<td>(25) Carbon Negative</td>
</tr>
</tbody>
</table>

(A) The project team determines the estimated annual greenhouse gas emissions of the project. This includes:
- Identifying any greenhouse gases that will be emitted or absorbed/sequestered by the project during operations, including direct emissions, and indirect emissions associated with off-site energy generation.
- Determining the carbon dioxide equivalent (CO2e) for each gas.

(B) The project team establishes a target of at least a 10% reduction in total CO2e over the operational life of the project. Calculations should be in tons/tonnes (tCO2e).

(A) The project team determines the estimated annual greenhouse gas emissions of the project. This includes:
- Identifying any greenhouse gases that will be emitted or absorbed/sequestered by the project during operations, including direct emissions, and indirect emissions associated with off-site energy generation.
- Determining the carbon dioxide equivalent (CO2e) for each gas.

(B) The completed project is carbon neutral (i.e., does not produce any net carbon emissions, or achieves a 100% reduction over the operational life).

(A) The project team determines the estimated annual greenhouse gas emissions of the project. This includes:
- Identifying any greenhouse gases that will be emitted or absorbed/sequestered by the project during operations, including direct emissions, and indirect emissions associated with off-site energy generation.
- Determining the carbon dioxide equivalent (CO2e) for each gas.

(B) The completed project is carbon negative (i.e., sequesters more carbon than it produces over the operational life).

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team estimated annual greenhouse gas emissions of the project?

1. Identification of sources of greenhouse gas emissions. Sources include direct emissions from facilities owned or controlled within the project boundary (often referred to as “Scope 1”), as well as indirect emissions from the off-site generation of energy used by the project (often referred to as “Scope 2”). Other indirect emissions (often referred to as “Scope 3”) are not included in the calculations. Emissions should be classified by the following categories:
   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
B. To what extent does the project reduce greenhouse gas emissions during its operational life?

1. **Calculations of the benchmark greenhouse gas emissions.**

2. **Submit calculations for (1) the project’s estimated annual greenhouse gas emissions over the life of the project; (2) the time period over which the calculations are made (e.g. 2025-2050); and (3) calculations of the benchmark used over the same time period. Calculations should include any natural or mechanical methods of carbon sequestration. Purchased carbon offsets may be included in the calculations. All greenhouse gas emissions should be converted into tons/tonnes of CO2e (tCO2e).**

**DESCRIPTION**

In the past century, an increased release of carbon dioxide (CO2) and other greenhouse gases (GHGs), primarily attributed to the burning of carbon-based fossil fuels, have caused a significant increase in the concentration of CO2 in the atmosphere. The increase of these gases in the atmosphere enhances the greenhouse effect, which scientists agree causes the earth’s surface and the average temperature of the lower layer of the atmosphere to rise. The 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.

It is often difficult for infrastructure owners and project teams to prioritize large-scale global concerns like reducing greenhouse gas emissions when faced with limited budgets and concrete local issues to address. The relatively small contributions of an individual project seem inconsequential. First priority should be given to discovering and considering low-carbon alternatives that can be implemented at no additional cost. Beyond that, infrastructure owners should consider that all trend lines indicate the world is headed toward a more regulated, taxed, and/or controlled carbon economy. Investments in transitioning to low-carbon infrastructure can help communities be more locally and globally competitive and desirable. Such communities attract young professionals, scientists, researchers, tech industries, start-ups, sustainable product manufacturers, and other demographics where reduced impacts to climate change align with personal or corporate regard for social responsibility.

**PERFORMANCE IMPROVEMENT**

This credit assesses percent 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 benchmark 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. It is the intent of Envision to support the collection of data and development of industry performance targets over time in order to eventually provide this benchmark 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 CO2 equivalency (CO2e). All greenhouse gas emissions calculations should be quantified in tons/tonnes of CO2e. Unavoidable CO2e emissions can be countered by carbon sequestration, in which CO2 is removed from the atmosphere and deposited in a reservoir, typically deep within the earth where it cannot reach the atmosphere. Sequestration can also come in the form of planting new forests, which absorb and use CO2 for their growth.

Note that greenhouse gas reductions must always be calculated in comparison to a base case over the design life of the project. For example, over its 25-year life, a project is estimated to produce 50% less greenhouse gas emissions than an alternative scenario. This project would not be able to claim it is “carbon neutral” because produced emissions equal displaced emissions. Rather, this project has achieved a 50% reduction over the base case and may be eligible for the Superior level of achievement. If the project were to additionally purchase carbon offsets for the remaining 50%, or plant sufficient trees to sequester the same amount of carbon over the calculated time span, then the Conserving level may be possible. Projects that reduce greenhouse gas emissions compared to existing conditions are not automatically considered Restorative. If the current rate and quantity of greenhouse gas emissions is considered the starting benchmark, then the project can calculate its reductions by comparison. Often greenhouse gas emissions calculations will incorporate projected growth models.
RR1.2 REDUCE AIR POLLUTANT EMISSIONS

INTENT:
Reduce the emission of criteria pollutants: particulate matter (including dust), ground-level ozone, carbon monoxide, sulfur oxides, nitrogen oxides, lead, noxious odors, and volatile organic compounds.

METRIC:
Measurements of air pollutants compared to standards used.

LEVELS OF ACHIEVEMENT

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<tr>
<td>(2) Exceeding Requirements</td>
<td>(4) Ongoing Monitoring</td>
<td>(7) VOC Minimization</td>
<td>(12) Negligible Air Quality Impact</td>
<td>(18) Air Quality Improvement</td>
</tr>
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</table>

(A) The project meets all relevant minimum air quality standards and regulations for all criteria pollutants.

(B) The project has implemented strategies to reduce air pollutant emissions during operations beyond minimum air quality requirements.

Specific performance targets are established beyond minimum air quality requirements.

(C) Systems are in place for the ongoing monitoring of air pollution sources.

Processes are developed to identify and address changes in emissions in order to maintain the performance targets established in criterion B.

(D) The project has implemented strategies to reduce or eliminate volatile organic compounds harmful to human health during construction and/or within occupied spaces of the completed project.

EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

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 or will meet all relevant standards and regulations.

B. To what extent does the project reduce air pollutant emissions during operations beyond minimum air quality requirements?
1. Specific performance targets established beyond minimum air quality requirements.
2. Documentation of all strategies deployed to reduce air pollutant emissions.
C. Does the project include the ongoing monitoring and management of air pollutant emissions?

1. Documentation that the project includes systems for monitoring air pollutant emissions during operations.
2. Documentation of processes, procedures, or systems designed to identify and address changes in emissions in order to maintain the performance targets established in criterion B.

D. Does the project reduce or eliminate volatile organic compounds during construction and/or within occupied spaces of the completed project?

1. Documentation (e.g. specifications) limiting the use of, or controlling the exposure to, volatile organic compounds (VOCs) during construction.
2. If the project contains interior spaces intended for human occupation, documentation that steps were taken to reduce or eliminate VOCs in material choices affecting those spaces.

DESCRIPTION

The criteria pollutants include carbon monoxide, nitrogen oxides, sulfur dioxide, suspended particulate matter smaller than PM-10, ozone, lead, noxious odors, 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 number of pollutants relevant to a project and the ability of the project to manage pollutants may vary. Acceptable levels of air pollutant emissions may also vary from region to region and project to project. Therefore the credit assessment begins with demonstrating the project meets all relevant local, state/provincial, or federal regulations on emissions. Projects may then achieve higher levels by increasing emissions reductions, implementing monitoring systems, and minimizing volatile organic compounds.

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.
RR2.1 ASSESS CLIMATE THREAT

INTENT:
Develop a comprehensive climate impact assessment.

METRIC:
The degree to which the project is informed by a comprehensive understanding of climate change impacts.

LEVELS OF ACHIEVEMENT

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<tr>
<td>(3) Climate and Risk Assessment</td>
<td>(6) Expanded Assessment</td>
<td>(9) System Assessment</td>
<td>(12) Community Assessment</td>
<td>(16) Community Action</td>
</tr>
<tr>
<td>(A) The project team determines threats and increased risk to the project, or performance, over its operational life due to projected climate change impacts.</td>
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<tr>
<td>(B) The project includes strategies to address impacts from projected climate change. This is not limited to risk of failure but includes degraded performance or lost efficiency due to climate change.</td>
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<tr>
<td>(C, D, or E) The project team conducts an in-depth assessment of how climate change may increase vulnerability in at least one (1) area: resource availability, siting/configuration vulnerability, changing design variables.</td>
<td>(C, D, or E) The project team conducts an in-depth assessment of how climate change may increase vulnerability in at least two (2) areas: resource availability, siting/configuration vulnerability, changing design variables.</td>
<td>(C, D, or E) The project team conducts an in-depth assessment of how climate change may increase vulnerability in three (3) areas: resource availability, siting/configuration vulnerability, changing design variables.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team determined threats and increased risk to the project and its performance due to climate change?

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 of 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, water dependent infrastructure in a region at risk of drought increasing water efficiency in order to conserve limited resources for the community.

B. Does the project mitigate or address impacts from climate change for itself, the infrastructure system, and/or the community?

1. Documentation that the project incorporates specific measures to address potential threats identified in criterion A. These may follow a mitigation hierarchy prioritized based on impact and probability. Documentation should include not only direct threats to the project but factors that may impact its performance of efficient operations over its life. Documentation expectations expand as criterion A expands in higher level to encompass broader network/system and community impacts.

C. Has the project team considered vulnerabilities from lack of resource or service availability due to climate change?

1. Documentation that specific consideration was given to the project’s 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 considered increased risk and vulnerability due to the project’s siting or configuration due to climate change?

1. Documentation that specific consideration was given to additional risk from climate change due to the siting or configuration of the project.

E. Has the project team determined whether standards and design variables used are sufficient to account for climate change impacts?

1. Documentation that a thorough review was conducted of key design or performance standards to determine whether they would be impacted by potential changes in operating conditions due to climate change.

F. Is the project part of a larger climate change adaptation plan intended to increase community preparedness?

1. Documentation of a broader community or regional climate change adaptation or preparedness plan. Documentation may reference a preexisting 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 climate change adaptation or preparedness plan. Documentation explains how the project contributes to or supports the plan objectives.

DESCRIPTION

There is broad global consensus that for current and future generations climate change is one of the most serious threats to global development and security. Increased temperatures are increasing glacier loss and raising sea levels. Many low-lying coastal areas are directly at risk and 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 ecosystems developed around permafrost 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 are 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 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 ensure the prosperity, safety, and economic advantages of their community in the face of long-term climate change.

PERFORMANCE IMPROVEMENT

The credit assesses the degree to which the project is informed by a comprehensive understanding of climate change impacts. As stated above these impacts are varied, nuanced, and context specific. Therefore credit is given for the depth and breadth of efforts made to understand this complex challenge. As projects advance to higher levels of achievement the scope of assessment increases beyond the project, to include its network/system and the community as a whole.

The Enhanced, Superior, and Conserving levels give projects the opportunity to choose which criteria to address. Additional guidance on the three areas of climate vulnerability are included below:
• Resource and service availability: Infrastructure systems rely on an interconnected network or resource 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. Projects dependent on electricity have increased vulnerability if power generation or distributions are located in areas at risk to climate change impacts. Additionally, consider how projects dependent on fossil fuels may increase the economic risk of a community if prices increase. Consider that in an increasingly globalized world the availability or cost of resources may be influenced by climate change impacts in regions very far from the project site.

• Siting/Configuration Vulnerability: Certain sites are more at risk to climate change impacts than others. Additionally project configurations can also increase vulnerability to climate change, such as locating electro-mechanical equipment low to the ground in flood risk areas.

• Changing Design Variables: Infrastructure development relies heavily on standards that are often based on historic trends. A consequence of climate change is that historic data may no longer be an accurate predictor of future conditions. Projects may need to endure higher temperatures, more intense storms, higher volumes of precipitation, and even more or heavier snowfalls due to climate change. For example, stormwater management systems not designed to changing weather patterns can increase the risk of damage to the project and flooding in the community.

This credit is applicable to all projects potentially impacted by climate change, and therefore is applicable to the vast majority of infrastructure projects. In rare cases, if a thorough investigation found no potential impacts from climate change project teams may apply to have this credit deemed not applicable with supporting documentation. However, the reviewer may exercise their discretion in determining whether the investigation was comprehensive enough or whether the project does indeed have the potential to be impacted by climate change.
RR2.2 EVALUATE RISK AND RESILIENCE

INTENT:
Conduct a comprehensive, multi-hazard risk and resilience evaluation.

METRIC:
Steps taken to ensure the project is informed by a comprehensive, multi-hazard risk and resilience evaluation.

LEVELS OF ACHIEVEMENT

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<tbody>
<tr>
<td>(2) Risk Analysis</td>
<td>(5) Risk Assessment</td>
<td>(10) Broader Community Risks</td>
<td>(15) Risk Reduction</td>
<td>(20) Community Resilience Plan</td>
</tr>
<tr>
<td>(A) The project team conducts a risk analysis to identify natural and human-induced hazards.</td>
<td>(A) The project team conducts a risk analysis to identify natural and human-induced hazards.</td>
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<td>(B) A risk management study is developed based on the risk analysis. The project team clearly identifies key methods, decisions, and/or strategies to reduce risks.</td>
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<td>• Social (e.g. demographic shifts) • Economic (e.g. financial downturns) • Environmental (e.g. degradation of ecosystem services)</td>
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<td>(F) The project is part of a broader community risk or resilience plan.</td>
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<td>(G) The project is part of a broader community risk or resilience plan.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Does the project include a risk analysis of natural and human-induced hazards?
1. Documentation of the risk analysis conducted. Extent of documentation is appropriate to the scale and scope of the project.

B. Does the project include a risk management study to identify and prioritize risk reduction and mitigation strategies?
1. Documentation of a mitigation hierarchy prioritizing risk avoidance, minimization/substitution, engineered controls, administrative/behavioral controls, and personal protection
C. Does the project include a risk assessment identifying magnitude of loss and probability of occurrence?
   1. Documentation that risks have been factored by magnitude of loss and probability of occurrence.

D. Does the project consider broader project, system, and community vulnerabilities?
   1. Documentation that the scope of risks considered extend beyond direct threats to the project or its performance and include the broader infrastructure system/network and community. Consideration also extends beyond direct physical threats and includes how broader social, economic, or environmental shifts may impact the project, system, or community.
   2. Documentation that these broader considerations include infrastructure aging or deterioration.

E. Have the findings of the risk and resilience evaluation been used to establish resilience goals and strategies?
   1. Documentation that risk and resilience evaluation findings were used to inform project resilience goals and strategies. Project teams may refer to documentation submitted for RR2.2 Establish Risk and Resilience Goals and Strategies.

DESCRIPTION

Given the wide variety of risks and vulnerabilities associated with project resilience it is critical to engage in a concerted effort to fully understand the impacts and consequences. For projects pursuing RR2.1 Assess Climate Threat, the threat analysis may form the starting point for addressing this credit but expand to include non-climate related natural and human-induced hazards. Risk assessments are not novel to infrastructure development but play a significant role in enhancing community resilience. Recent disasters around the world show how communities are increasingly dependent on infrastructure services like power, water, transportation, and security.

The next steps are to incorporate social, economic, and environmental planning into risk and resilience assessments. While floods and power outages might be threats to a project’s operations, aging populations, economic downturns, skilled-labor shortages, and environmental contamination are also threats to the viability of communities and entire infrastructure systems.

PERFORMANCE IMPROVEMENT

Credits within the Resilience subcategory are closely linked. Comprehensive risk and resilience planning is new and complex for many projects. Therefore Envision credits attempt to separate and reward specific actions that projects can take to improve overall project resilience. However these actions in practice may often be integrated, simultaneous, or overlapping with other criteria. For example, threats identified in RR2.1 Assess Climate Threat may also be appropriately included in RR2.2 Evaluate Risk and Resilience. It is acceptable to submit the same actions as achieving multiple criteria in different credits. This is often an indicator of an efficient and integrated approach.

This credit specifically overlaps with RA2.3 Establish Resilience Goals and Strategies at the Conserving level. While evaluating and understanding risks brings its own benefit, projects pursuing Conserving or Restorative are required to translate this evaluation into concrete goals and objectives. Projects pursuing RA2.3 may refer to this documentation as evidence for criterion E, though achievement in RA2.3 is not a prerequisite for this credit.

In determining whether this credit is applicable to a project assessment, it is likely that all projects have the ability to positively address risk and resilience. It would therefore be difficult to demonstrate that the credit is not relevant or applicable to a project seeking an Envision award.
RR2.3 ESTABLISH RESILIENCE GOALS AND STRATEGIES

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

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<th>IMPROVED</th>
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<tr>
<td>(1) Resilience Commitments</td>
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<td>(4) Stakeholder Input</td>
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<td>(8) Measuring Resilience</td>
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<td>(14) Ongoing Resilience</td>
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<td>(20) Coordinated Alignment</td>
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<td>(E) The project aligns with or supports broader community- or region-wide resilience goals and plans.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Is resilience a stated objective of the project with clearly defined goals?
1. **Documentation of commitments made by the owner to incorporate resilience goals into the project.**

B. Has the community and key stakeholders been engaged in developing resilience goals?
1. **Documentation that project or community resilience was a specific topic of stakeholder engagement. Evidence that stakeholder engagement was meaningful and produced useful feedback on establishing or prioritizing resilience goals.**
C. Does the project include established methods for measuring or quantifying resilience performance targets?
   1. Documentation of the methodology the project team used to quantify resilience goals and outcomes. In essence, how did the project team determine what constituted increased resilience in the context of the project.

D. Have resilience goals been incorporated in the 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-out systems that learn and continually improve resilience capabilities.
      Note that for this criterion documentation must be relevant and specific to resilience goals.

E. Does the project align with or support broader community or regional resilience goals?
   1. Documentation that the project is part of or aligns with a broader community or regional resilience plan.

DESCRIPTION
Projects are more likely to achieve resilience outcomes when owners, designers, contractors, and all involved in the project team, establish clear quantifiable performance targets. Conversely, achieving increased resilience is unlikely when efforts are piecemeal and uncoordinated. The intent of this credit is to support increased project and community resilience through the establishment of clear objectives and goals.

The ultimate goal of more resilient projects and communities is to save costs in future damages or lost operating time. 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 and more people are exposed to greater and greater risk. 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.

PERFORMANCE IMPROVEMENT
This credit assesses the degree to resilience goals expand from initial commitments to quantifiable project objectives, long-term operating plans, and community wide development plans. While projects can take steps to increase their own resilience to extreme events or changing operating conditions, 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. While better designed projects can provide 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.
RR2.4 IMPROVE INFRASTRUCTURE INTEGRATION

INTENT:
Enhance the operational relationships and strengthen the functional integration of the project into connected, efficient, redundant, 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

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<tr>
<td>(2) Internal Integration</td>
<td>(4) External Integration</td>
<td>(6) Network Integration</td>
<td>(13) Risk Reduction</td>
<td>(16) Information Integration</td>
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<td>(B) Integration strategies increase resilience and reduce the risk of systemic or cascading failures.</td>
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<td>(C) The project leverages its relationship within a larger infrastructure system in order to achieve efficiency, redundancy, or system diversity.</td>
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<td>(D) The project integrates networks of infrastructure systems (e.g. water and transportation) in order to achieve efficiency, redundancy, or system diversity. In certain cases, projects may substitute the integration of non-physical social or economic systems.</td>
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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 and resilience?

1. Documentation that the project includes integrate monitoring or data gathering systems in order to improve performance and resilience during operations.

DESCRIPTION

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 reduces the risk of systemic or cascading failure. In the context of Envision this is referred to as system diversity, the ability of a system to function in various ways, under various conditions, or in multiple configurations.

Redundancy is one way to improve resilience. While duplicate systems or components may be appropriate in certain contexts, in a resource constrained world this type of investment can run counter to the sustainability objectives of reducing economic and environmental impacts. Systems integration may present an alternative approach whereby multifunction components can be both redundant and efficient. This is also related to the objectives of RR2.6 Maximize Adaptability.

PERFORMANCE IMPROVEMENT

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 systems performance. The first level is the integration of internal systems within the project. From there project teams consider 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. The next level is to contribute to the beneficial integration of 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.

Project teams should consider that integrating systems is not only about physical connections. Integrated systems are often only effective when monitored, maintained, and operated as intended. The highest level of achievement is for projects that integrate data or monitoring systems in order to achieve higher performance beyond project delivery.
RR2.5 MAXIMIZE DURABILITY

INTENT:
Increase resilience, lifecycle system performance, and the ability to withstand hazards by maximizing durability.

METRIC:
The degree to which the project incorporate elements that increase durability, the ability to withstand hazards, and extend useful life

LEVELS OF ACHIEVEMENT

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<tr>
<td>(2) Exceed Minimum Requirements</td>
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<td>(A) The project exceeds minimum requirement, regulations, or standard practice for project durability in order to improve resilience.</td>
<td>(B) The project team assesses the project robustness in order to determine where failures or degradation are most likely to occur.</td>
<td>(C) The project secures critical nodes, components, or systems to prevent damage, maintain operability, or facilitate rapid and cost/time effective repair.</td>
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<td>(12) Anticipate Future Loads</td>
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<td>(18) Operational Guidelines</td>
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<td>(D) The project anticipates how durability may be impacted by future demands, loads, or other requirements on the infrastructure system up until the anticipated end-of-life.</td>
<td>(E) The project includes robust operational and management guidelines and project processes in order to maintain and extend project durability.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team identified and exceeded minimum expectations for project durability?

1. Documentation of the minimum requirements, regulations, or standard practice used for comparison.

2. Documentation that the project exceeds minimum expectations for durability.
B. Has the project team identified where durability will be negatively impacted by point-failures or degradation?

1. Analysis of the project indicating where degradation of components or failure will cause negative impacts to project durability.

C. Has the project addressed weak points in order to prevent damage, maintain operability, or facilitate rapid and cost/time effective repair?

1. Documentation that issues identified in criterion B are addressed in order to prevent damage, maintain operability, or facilitate rapid and cost/time effective repair. Documentation should focus on how the project exceeds standard practice in order to improve durability and overall resilience. Actions may include mitigating hazards, fortifying against hazards, or absorbing impacts, but may also include maintaining a good level of repair.

D. Has sufficient guidance been provided to maintain durability and extend useful life during operation and maintenance?

1. Documentation that adequate operational guidelines have been provided in order to maintain the enhanced durability features of the project. Documentation should focus on how the project specifically exceeds standard practice and what guidelines are in place for those specific features. Generic operations manuals submitted without annotation or explanation are not acceptable forms of documentation.

DESCRIPTION

The definition of resilience includes the ability of a system to withstand, adapt, and recover from disturbances or changes. These three components are directly addressed in credits RR2.5 Maximize Durability, RR2.6 Maximize Adaptability, and RR2.7 Maximize System Recovery. Many words can be used as synonyms for the ability to withstand in the context of this credit: durable, fortified, hardened, resistant, absorbent, reliable, robust, or stable. This credit defines durability as both the ability of a project to withstand an extreme event, and the ability to endure the long-term wear and tear associated with project operations. Depending on the project type one or the other may take priority in contributing to overall resilience.

Durability is an important component of resilience when balanced with adaptability, and recovery. However, when considered on its own durability may conflict with other resilience and sustainability objectives. Project teams should be aware that a myopic focus on durability may lead to excessive consumption of financial and physical resources with diminishing reductions in risk.

PERFORMANCE IMPROVEMENT

Project teams should consider that enhanced overall durability may not mean the ability of the entire project to withstand an extreme event. In fact, often it is more efficient to design systems so that minor components can fail while preserving more critical or costly components. In addition, durability is not always about withstanding hurricanes and earthquakes. For some projects durability may be about the efficient and timely repair of project components. There are many instances where infrastructure is currently operating under conditions that exceed its original design parameters. This causes accelerated degradation of the asset and increases the risk of failure. Infrastructure is always initially designed to be durable within very safe margins. Therefore, documentation submitted for this credit should not include standard design or construction practices. Focus should be on what the project is doing to anticipate future loads, increase durability, and/or prevent accelerated degradation.
## RR2.6 MAXIMIZE ADAPTABILITY

### INTENT:
Maximize adaptive capacity in the face of hazards and long-term changes.

### METRIC:
The inclusion of physical and nonphysical strategies to increase adaptive capacity, and the ability of the system to learn and adapt over time.

### LEVELS OF ACHIEVEMENT

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<td>Assessment and Planning</td>
<td>(5) Physical Adaptability</td>
<td>(B) Learning and Growing</td>
<td>(14) Strategic Deployment</td>
</tr>
<tr>
<td>(A) The project maps long-term changes in key social, economic, and environmental variables.</td>
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<td>(C) The project increases physical adaptability such as expansion, reconfiguration, repurposing, disassembly, self-regulating systems, or self-repairing systems.</td>
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<td>(E) Operational guidance, including thresholds and indicators, are developed to trigger deployment of adaptation strategies at appropriate times.</td>
<td>(F) The project utilizes or strengthens natural or social systems that are self-regulating, self-repairing, and/or reduce the risk of hazards.</td>
</tr>
</tbody>
</table>

### EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team identified potential long-term changes in key variables?

1. Documentation of studies including long-term predictions in changing social, economic, and environmental conditions in the context of the project. Existing studies or projections may be referenced. The time ranges considered should be relative to the design life of the project.

B. Are project tolerances sufficient to adapt to long-term changes?

1. Documentation that the project is designed and constructed to adapt to long-term changes in key variables. For certain projects with advanced adaptation plans this may include the future deployment of adaptation strategies to increase tolerance or capacity.

C. Does the project increase the physical adaptability of the project?

1. Documentation that the project includes capacity for expansion, reconfiguration, repurposing, disassembly, self-regulating systems, or self-repairing systems.
E. Does the project have the capacity to learn and adapt over time?

1. Documentation that the project includes systems to learn and adapt over time. For example, plans or guidance for reassessing adaptation plans periodically, policies for reviewing and learning from hazard events “lessons learned”, or programs to communicate and learn from other facilities or departments.

D. Does the project include threshold and operational guidance for deploying adaptation strategies?

1. Documentation that project team has provided sufficient resources, training, or guidance for the operations of the project. This should include the conditions at which adaptation strategies should be deployed. For example, a multi-cell wetland adaptable to changing precipitation should provide operational guidance on closing or opening cells and under what conditions these actions should be taken.

F. Does the project utilize or strengthen more adaptable and resilience natural or social systems?

1. Documentation that the project utilizes or strengthen more adaptable and resilient natural or social systems. For example, using living breakwaters to protect against storm surges, or contributing to social cohesion in order to strengthens the adaptive capacity of the community.

DESCRIPTION

The definition of resilience includes the ability of a system to withstand, adapt, and recover from disturbances or changes. These three components are directly addressed in credits RR2.5 Maximize Durability, RR2.6 Maximize Adaptability, and RR2.7 Maximize System Recovery.

Many words can be used as synonyms for adaptive in the context of this credit; flexible, elastic, modular, agile, reconfigurable, and absorbing. It is important to prepare infrastructure systems to be adaptive to the consequences of long-term changes in social, environmental, or economic conditions. Infrastructure projects that are designed for today’s conditions may not be able to function adequately under altered conditions in the future. Many communities face socio-economic shifts such as aging populations, growing/shrinking populations, and financial constraints. Environmentally, climate change will likely lead to changes in weather patterns and sea levels affecting communities all over the world.

PERFORMANCE IMPROVEMENT

Adaptive capacity refers to the systems ability to respond to changing conditions over time in order to better withstand them. Flexibility and redundancy are key components of adaptive capacity. Strategies for improving adaptability may include, but are not limited to, the following:

- Structural changes—expand the range of conditions in which the system can function, grow, or be configured;
- Decentralized systems—relying on many small facilities instead of a single large facility; distributed networks spread risk;
- Natural systems—biologic or natural systems that regenerate and repair themselves (e.g., using wetlands to treat stormwater);
- Alternative supply options—identify alternative methods or locations for resources that are important for the infrastructure project (water sources, energy sources, materials, etc.); and
- Intelligent systems—systems that can learn or change over time.

The first step to adaptability is ensuring the project incorporates sufficient tolerances to meet changing conditions. This may include the ability to physically expand or reconfigure over time. Beyond physical adaptability is the ability of the system to learn and adapt over time. The availability of big data and smart systems has increased the potential for decentralized, aware, and self-regulating systems. However, the ability to learn and adapt can also be analogue through operational policies and procedures.

Many projects have the ‘ability’ to adapt over time. However, the likelihood that these strategies will be deployed is dependent on the informed operation of the project. Therefore in higher levels project teams are required to provide detailed guidance on when and how adaptive strategies should be deployed in order to be most effective.

Natural living systems are inherently adaptable as they retain the ability to grow, heal, and expand. Similarly, most studies indicate that social cohesion is the greatest indicator of community resilience. Therefore the highest levels of achievement are reserved for projects that utilize natural living systems or support social cohesion.
RR2.7 MAXIMIZE SYSTEM RECOVERY

INTENT:
Improve project and system resilience by maximizing system recovery during failure scenarios.

METRIC:
The degree to which the project expands recovery planning from the project level, to the infrastructure system and broader community.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
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</thead>
<tbody>
<tr>
<td>(2) Target Recovery Times</td>
<td>(A) The project has, or is included in existing, emergency management, or disaster relief recovery, plans to minimize losses during a failure scenario.</td>
<td>(B) The project has established target recovery times and service levels in the event of likely hazards.</td>
<td>(C) The project includes specific strategies to speed system recovery or minimum level of service in the event of hazards.</td>
<td>(D) The project team determines those most vulnerable to service failure (e.g. the young, elderly, or disabled) and prioritize them in recovery and assistance plans.</td>
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<td></td>
<td>(E) Enhanced Recovery</td>
<td>(F) Prioritized Assistance</td>
<td>(G) Scenario Planning</td>
<td>(H) Critical Lifelines</td>
</tr>
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<td>(D) The project team conducts scenario planning exercises to identify failure points and barriers to system recovery.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project developed, or is it included in, an emergency management plan?

1. Documentation that the project is included in an emergency management plan or disaster relief recovery plan. The plan may be project specific or included in a larger plan but must specifically relate to the project. The plan may address operational policies in the event of a hazard, or may outline the temporary use of the project/facility for disaster relief.

2. Documentation that the plan is comprehensive in addressing the entire related infrastructure system (e.g. if the project is a subway station then the plan should address the full operation of the subway system).
B. Does the project or system have established target recovery times and service levels for likely hazards?

1. Documentation that the project (Improved/Enhanced) or entire infrastructure system (Superior/Conserving/Restorative) has established target recovery times and services levels in the event of likely hazards.

C. Does the project include specific strategies to maximize system recovery?

1. Documentation of specific actions the project team has taken to speed system recovery or provide minimum service levels in the event of likely hazard scenarios.

D. Has the project team identified those most vulnerable to service failure and prioritized them in recovery strategies?

1. Documentation indicating the project team has identified those who are most vulnerable to service failure of the project (e.g. the young, elderly, or disabled). Documentation may be provided as part of a more comprehensive risk or social impact assessment.
2. Documentation that recovery plans, target recovery times, or assistance programs specifically address the needs of vulnerable groups.

E. Has the project team conducted scenario planning exercises to identify failure points and barriers to recovery?

1. Documentation that scenario planning exercises were used to step through likely hazard events, potential system impacts, and steps to recovery. The goal of the exercises should be to better identify failure points and potential barriers to recovery. Project teams should also consider opportunities to support broader community disaster preparedness.

F. Is the project part of critical lifeline system necessary for the protection of human life in the event of a disaster?

1. Documentation that the project is part of a critical lifeline system necessary for the protection of human life in the event of a disaster (e.g. levee systems, facilities used as disaster recovery centers, critical evacuation routes, etc.)

DESCRIPTION

The definition of resilience includes the ability of a system to withstand, adapt, and recover from disturbances or changes. These three components are directly addressed in credits RR2.5 Maximize Durability, RR2.6 Maximize Adaptability, and RR2.7 Maximize System Recovery.

Minimizing time that systems are not operational is an important component of infrastructure resilience. Infrastructure provides the critical services most communities need to survive. Depending on the project type emergency management and disaster recovery planning may already be a critical consideration for the project. However, all projects can benefit from increased consideration for resilience and system recovery. Infrastructure owners and project teams should consider how better hazard scenario planning and reducing recovery time can provide economic benefits to the organization and the entire community.

PERFORMANCE IMPROVEMENT

This credit assesses the degree to which the project expands recovery planning from the project level, to the infrastructure system and broader community. In the lower levels of achievement the project focuses on improving its own performance and recovery in hazard scenarios. The assumption is that even when isolated, more resilient projects still contribute to a more robust system. In higher levels the overall recovery of the infrastructure system is taken into direct consideration. For example, resources are not invested in project recovery strategies that would have no impact on the overall system recovery.

Often discussions on project or system recovery can focus exclusively on the technical challenge of making projects operational. However, this discussion should be augmented by consideration of the social, environmental, and economic impacts of service loss. Most importantly addressing the impacts on vulnerable groups such as the elderly, young, or disabled should be prioritized.
RR2.8 MAXIMIZE CO-BENEFITS AND SYNERGIES

INTENT:
Collaborate on multi-benefit projects that address multiple objectives efficiently through co-benefits and synergies.

METRIC:
The extent to which the project team works with external groups to find beneficial use of excess resources or capacity.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>IMPROVED</th>
<th>ENHANCED</th>
<th>SUPERIOR</th>
<th>CONSERVING</th>
<th>RESTORATIVE</th>
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</thead>
<tbody>
<tr>
<td>(1) Initial Investigation</td>
<td>(4) Co-Benefits Achieved</td>
<td>(11) Byproduct Reuse</td>
<td>(18) Circular Economy</td>
<td></td>
</tr>
<tr>
<td>(A) The project team conducts an assessment of the availability and viability of excess resources (waste), or capacity including but not limited to: material or waste, heat or cooling, financial capacity, or management/personnel capacity</td>
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<td>(B) Candidates for co-benefits, synergies, and byproduct reuse are identified. Studies and assessments are made and managers of relevant facilities or departments are contacted.</td>
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<td>(C) The project includes at least one (1) co-benefit, which is a service not directly related to the project’s primary function. Co-benefits may be for construction or operation but must advance sustainability within the project or community.</td>
<td>(D) The project includes at least one (1) byproduct synergy; the beneficial use of otherwise unwanted excess resources including heat, cooling, materials, waste, emissions, or electricity. Byproduct synergies may be for construction or operation but must advance sustainability within the project or community.</td>
<td>(E) The project is fully engaged in a “circular economy” system whereby the majority of its operational waste is beneficially repurposed OR the majority of its operational resource consumption is beneficially repurposed.</td>
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EVALUATION CRITERIA AND DOCUMENTATION GUIDANCE

A. Has the project team assessed the availability of either internal or external excess resources or capacity?
1. Documentation of efforts to identify available resources or capacity within the project, or project needs that could be met by external resources or capacity.

B. Has the project team identified and contacted candidates for co-benefits, synergies, or byproduct reuse?
1. Documentation that serious overtures were made to potential candidates. The intent of this criterion is to recognize projects that attempted to implement a co-benefit or byproduct reuse into the project but were unable due to unavoidable external factors.

C. Does the project advance sustainability by achieving multiple benefits and co-benefits?
1. Documentation that the project includes a co-benefit, which is a service not directly related to the primary function of the project. This refers to the additional nonphysical benefits or services that a project may provide.
2. Documentation that the recipient (organization/company/agency receiving) acknowledges the co-benefit and confirms its utility in their operations.

D. Does the project include byproduct synergy by utilizing unwanted excess resources or finding destinations for the beneficial reuse of unwanted excess resources?

1. Documentation that the project includes a byproduct synergy, which is a direct exchange of otherwise unwanted resources. Byproducts may be physical waste streams, emissions, or even energy (heat/electricity).

E. Is the project part of a ‘circular economy’ whereby the majority of operational byproducts are beneficially repurposed or the majority of operational resources consumed are beneficially repurposed?

1. Documentation that the project includes multiple byproduct synergies that constitute a majority of its wastestreams or feedstock. Documentation should demonstrate that these are part of a broader network of byproduct reuse and not isolated independent activities.

**DESCRIPTION**

The benefits of developing sustainable and resilient infrastructure extend well beyond the project itself into the environmental, social, and economic systems of the community. Furthermore limited resources mean that the numerous challenges facing communities cannot be addressed one at a time or in silos. Infrastructure must support numerous community objectives simultaneously. In doing so, development is not only more efficient and cost-effective but more resilient. Infrastructure that performs multiple functions can provide redundancy, flexibility, and adaptive capacity to other important systems like stormwater management, community development, health, safety, disaster relief, and many more.

The classification of excess services and resources as ‘waste’ is inherently inefficient. Everything has value. In a circular economy all excess services and resources are directed to local beneficial use. These industrial ecology systems are more resilient by eliminating waste and reducing dependence on external sources. True circular economies are rare but every project can contribute by investigating opportunities for beneficial reuse.

**PERFORMANCE IMPROVEMENT**

In the context of this credit co-benefits are distinguished from byproduct reuse. Co-benefits are defined as a service not directly related to the project’s primary function that is provided to an external party. This may include a road project that invests in bioswales in order to capture and treat stormwater. The co-benefit is provided to the wastewater utility. Byproducts are the more direct exchange of excess resources from one project to another.

It is not always possible to institute a co-benefit or byproduct reuse during project delivery. Therefore points are available to projects that seriously pursue opportunities. For the Superior level projects are required to demonstrate at least one co-benefit. As co-benefits can often be instituted on a project without coordinated efforts from external groups these are generally more common and easier to achieve. However, co-benefits in the context of this credit must have a direct recipient that acknowledges the benefit. For example, the wastewater utility confirms that the bioswales will provide direct benefit to their operations. General benefits provided by a project to the community are covered in other Envision credits.

Byproduct reuse is itself a more direct co-benefit and therefore the Conserving level does not require projects to demonstrate both a co-benefit and a byproduct reuse. Though byproducts are most commonly thought of as solid waste they may include any excess resource such as gas emissions, effluent, or energy. Achieving byproduct reuse can be more challenging as it requires making agreements with external groups to either supply or receive excess resources streams.

The highest level of achievement is reserved for projects that fully integrate into a circular economy. This is determined by the amount of project waste utilized as byproduct reuse and the number of reuse connections in the network.
RR0.0 INNOVATE OR EXCEED CREDIT REQUIREMENTS

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

METRIC:
Whether project achievement qualifies as exceptional performance or innovation.

LEVELS OF ACHIEVEMENT

<table>
<thead>
<tr>
<th>INNOVATION</th>
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<tbody>
<tr>
<td>(+10) Innovate or Exceed Credit Requirements.</td>
</tr>
<tr>
<td>(A) Projects clearly document a performance that exceeds the highest existing requirements within one or more credits.</td>
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<tr>
<td>OR</td>
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<tr>
<td>(B) Projects demonstrate the innovative application of methods, technologies, or processes that are novel either in their use, application, or within the local regulatory or cultural climate.</td>
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<tr>
<td>OR</td>
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<tr>
<td>(C) Projects demonstrate actions not currently recognized in the Envision rating system significant contribute to sustainability.</td>
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</table>

DESCRIPTION

This credit addresses special instances in which projects far exceed the performance requirements of a credit or innovate in a way that advances the industry and the field of knowledge. These points 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, a more thorough documentation is expected. Projects may pursue points for innovation or exceptional performance.

Exceptional Performance

To qualify for exceptional performance points, projects must meet the highest level of achievement within the relevant credit. For instance, projects seeking additional points in credit CR1.1 Reduce Greenhouse Gas Emissions must already be achieving net-zero carbon. In this case, exceptional performance may be pursued by projects whose design and operations not only offset 100% of their own carbon, but will also achieve a significant net-positive reduction in carbon over the life of the project.

Exceptional performance constitutes achieving a remarkable increase in performance. This would be a multiple-factor increase in efficiency or effectiveness in one or more credits. Possible areas of achievement in exceptional performance for the Climate and Risk credit may include, but are not limited to, the following:

- Projects that go beyond carbon negative to become large-scale carbon sinks;
- Projects for which significant effort, beyond standard practices, is given to considering and preparing for changing operating environments;
- 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).

Innovation

To qualify for innovation points, projects must demonstrate achievement in at least one of the following goals:

- Overcoming significant problems, barriers, or limitations—Project teams demonstrate that they have reduced or eliminated significant problems, barriers, or limitations that previously hampered the use or implementation of certain resources, technologies, processes, or methodologies that improve the efficiency or sustainability of a project;
- Creating scalable and/or transferable solutions—Project teams demonstrate that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/or are applicable and transferable across multiple...
kinds of infrastructure projects in multiple sectors.

Project teams may use innovative technology, methods, or application (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 such 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 technologies or methods in several ways:

- The project is an early adopter of new technology or methods that can demonstrably improve project performance without negative trade-offs and
- The project uses technologies or methods that may be general practice in other regions or parts of the world, but within the unique 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.

EVALUATION CRITERIA AND DOCUMENTATION

A. To what extent has the project exceeded highest levels of achievement for a given credit?

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

B. To what extent does the project implement innovative technologies or methods?

1. Documentation of the application of innovative technologies or methods. Detailed description of how this application will improve upon 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, method, or within the project context (climate, political, cultural, etc.).

C. To what extent does the project overcome significant problems, barriers, or limitations or create scalable and/or transferable solutions?

1. 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 methodologies that improve the efficiency or sustainability of a project.

2. Documentation that the improved performance achieved or the problems, barriers, or limitations overcome are scalable across a wide range of project sizes and/or are applicable and transferable across multiple kinds of infrastructure projects in multiple sectors.