



Greenroads[®]

RATING SYSTEM V2

Free Sample Download

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www.greenroads.org

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The Rating System includes many performance measures of sustainable practices for transportation design and construction projects. Employing any or all of these sustainable practices may or may not help make your Project more sustainable, though Greenroads International believes they are accurate and reliable measures for sustainability performance. The user is advised that new information, practices, and technologies may be discovered after the date of this publication that may cause the information in the Greenroads Rating System to change. Greenroads International may publish errata and addenda from time to time to supplement or change the information contained herein.

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VERSION 2

RATING SYSTEM

TABLE OF CONTENTS

Introduction	17
What is Greenroads?	17
Project Rating Program	18
About the Rating System	21
Baseline Performance: Project Requirements	22
Scoring Points: Core Credits.....	22
Getting Extra Points: Creativity & Effort	23
How Credits are Weighted	23
Getting Started: Apply	27
Minimum Eligibility Criteria To Apply	27
What Types of Work Should Apply?	27
What Types of Work Should NOT Apply?	27
What Happens With Your Application?	28
Getting Registered	29
Minimum Eligibility Criteria to Register	29
Getting Rated: Pilot Projects.....	31
Minimum Eligibility Criteria For Pilot Projects	31
What Success Looks Like	31
Getting Rated: Certification	35
Minimum Eligibility Criteria To Certify	35
Defining Rating Boundaries.....	35
Required Performance Reporting	36
What Success Looks Like	36
About Greenroads International.....	43
More Guidance & Training.....	44
Project Scorecard	45
Project Requirements	49
Ecological Impact Analysis	50
Energy & Carbon Footprint	51
Low Impact Development.....	52
Social Impact Analysis	53
Community Engagement.....	54
Lifecycle Cost Analysis.....	55
Quality Control	56
Pollution Prevention	57

Waste Management.....	58
Noise & Glare Control	59
Utility Conflict Analysis	60
Asset Management	61
Environment & Water	63
Preferred Alignment	64
Ecological Connectivity	65
Habitat conservation.....	67
Land Use Enhancements.....	68
Vegetation Quality	69
Soil Management	70
Water Conservation	72
Runoff Flow Control	73
Enhanced Treatment: Metals	75
Oil & Contaminant Treatment	77
Construction Activities	79
Environmental Excellence	80
Workzone Health & Safety.....	81
Quality Process.....	83
Equipment Fuel Efficiency.....	85
Workzone Air Emissions.....	86
Workzone Water Use	87
Accelerated Construction.....	88
Procurement Integrity.....	89
Communications & Outreach.....	90
Fair & Skilled Labor	91
Local Economic Development.....	93
Materials & Design.....	95
Preservation & Reuse.....	96
Recycled & Recovered Content.....	98
Environmental Product Declarations	100
Health Product Declarations	101
Local Materials	102
Long-Life Design	104
Utilities & Controls.....	107
Utility Upgrades	108
Maintenance & Emergency Access.....	109
Electric Vehicle Infrastructure.....	110
Energy Efficiency	112
Alternative Energy.....	113
Lighting & Controls.....	114

Traffic Emissions Reduction	115
Travel Time Reduction	116
Access & Livability	119
Safety Audit	120
Safety Enhancements	122
Multimodal Connectivity	123
Equity & Accessibility	124
Active Transportation	126
Health Impact Analysis	127
Noise & Glare Reduction	128
Culture & Recreation	130
Archaeology & History	131
Scenery & Aesthetics	132
Creativity & Effort	133
Educated Team	134
Innovative Ideas	135
Enhanced Performance	137
Local Values	138

INTRODUCTION

The Greenroads® Rating System is an easy way to measure and manage the sustainability of transportation projects. Greenroads Projects are the missing links of the world's most sustainable cities—or those wishing to become greener cities—that have green building rating systems down pat and an eye toward holistic sustainable development. The Rating System challenges project teams to go beyond minimum environmental, social, and economic practices with an independent, third-party review of a project's sustainability performance.

The Greenroads Rating System recognizes transportation projects that have been designed and constructed to a level of sustainability that is substantially higher than current common practice.

The Greenroads Rating System recognizes projects that create cleaner, greener, longer-lasting, quieter, safer, and better places for people, the planet, and pocketbooks. We have helped cities, counties, states, and countries move toward a larger goal of fundamentally changing the way the world builds its transportation systems for a more sustainable future. We invite you to be a part of it, to educate yourself and your peers, and to help us recognize the world's next generation of transportation projects.

WHAT IS GREENROADS?

The Greenroads Rating System is a collection of sustainability best practices and activities, called credits, that apply to transportation capital assets, much like third-party rating systems for green buildings. Completing credits contributes points toward a total score that can be used as an indicator of the overall sustainability of a project and as a tool to communicate green performance.

Greenroads credits are grouped into seven categories based on sustainability theme areas and project lifecycle phases. Credits are either mandatory or voluntary. All projects pursuing Certification must complete all 12 mandatory credits, called Project Requirements, in order to qualify. There are 49 other voluntary credits, called Core Credits and Extra Credits, that earn points toward one of four levels of Certification (Bronze, Silver, Gold, and Evergreen) when completed with all the Project Requirements.

Rating System at a Glance

Category Name	Credits	Points
Project Requirements (PR)	12	0
Environment & Water (EW)	10	30
Construction Activities (CA)	11	20
Materials & Design (MD)	6	24
Utilities & Controls (UC)	8	20
Access & Livability (AL)	10	21
Creativity & Effort (CE)	4	15
Total Main Categories	57	115
Total w/ CE	61	130
Certification Thresholds	PRs	Points
Bronze	All 12	40
Silver	All 12	50
Gold	All 12	60
Evergreen	All 12	80

PROJECT RATING PROGRAM

Working on your first green mile or kilometer? This section explains how the Project Rating Program works and the tools available to participating project teams.

Participating in the Project Rating Program provides an independent, third-party, expert evaluation of a transportation project. There are two types of official scores that Greenroads offers.

GREENROADS PILOT PROJECT

A Greenroads Pilot Project is an official, but informal, assessment from Greenroads International, completed with a few important project documents and supported by an interview. Pilot Projects carry educational and promotional value, and future value for Greenroads Certification. They are generally used as a soft entry into the Project Rating Program prior to committing to Certification. Pilot Projects can be customized to suit the needs and goals of the project team and may be performed confidentially. Pilot Projects can be performed at any time during project development and have a shorter turnaround than Certification. Multiple Pilot Projects may also be completed as part of a Pilot Program.

Greenroads Certification is the most common goal for the majority of project teams that are interested in the Project Rating Program. Greenroads does not guarantee all projects will be recommended to pursue Certification.

GREENROADS CERTIFICATION

Greenroads Certification is a formal score assigned by Greenroads staff and approved by the Board of Directors, based on rigorous review of all project documents in the as-built condition. A project team must satisfactorily complete and document all 12 Project Requirements and earn at least 40 points to meet the minimum threshold for Certification. Certification requires the project team to provide full disclosure of project data and documentation, participation from several members of the design and construction team for the entire duration of the Project, and use of the Greenroads website for document submittals and records. Certification is the ultimate goal for most projects but may not be appropriate for all projects based on their individual eligibility criteria.

NO RATINGS BY OTHERS

Claims made by any party other than Greenroads International or its licensed partners that projects are rated or Certified are **not** recognized and should not be assumed to be compliant with the measures set forth in the Rating System. All Greenroads Projects are publicly listed in the Project Directory: greenroads.org/projectdirectory.

NO ENDORSEMENTS

Greenroads does not have preferred providers, processes, or products, and Greenroads validates no claims thereto. Greenroads does not endorse any products, brands, processes, people, or organizations.

THE RATING HANDBOOK

The *Greenroads Rating Handbook* is the set of rules and policies for how a given project will be rated. It is reviewed and updated periodically by Greenroads International. It includes detailed information about how projects are rated, agreements, roles and responsibilities, timing for submittals, versioning, petitioning rules, how to submit credit ideas, and other general expectations and terms for submittals and participation in the Project Rating Program. Please read the handbook before getting started on your first project.

Please read the *Greenroads Rating Handbook* before getting started on your first project, available for download at: greenroads.org/rating-handbook.

AGREEMENTS & POLICIES

A variety of legal agreements govern participation in the Project Rating Program. It is important that all project teams take time to read and understand the policies and agreements, all of which are available for review on the Greenroads website: greenroads.org/policies. Agreements and policies are updated from time to time, usually about once a year.

USING THE GREENROADS WEBSITE

The Greenroads website is the proprietary project management, credit tracking, and document storage hub for the project team. It is the key means of communication between Greenroads and a project team. All project team members are advised to view our video tutorials to learn how to navigate and use the website while progressing through the Project Rating Program: greenroads.org/tutorials.

YOUR INTELLECTUAL PROPERTY

All required project documents must be disclosed to Greenroads, including cost data and change orders. If you have concerns about confidentiality, your Project does **not** need to be publicly registered, and we may offer elective confidentiality arrangements on request.

HOW WE MAY USE YOUR PROJECT INFORMATION

Greenroads reserves the right to publish, distribute, or otherwise use project data in accordance with the educational mission of the organization. Project information that is not confidential may be shared on the Greenroads website, in future publications, in technical and academic presentations, and in other forms of public media. Confidential project data is treated in aggregate with other project data, without disclosing any information about the Project's identity. Greenroads may also use project information created as a result of working with Greenroads for internal business development and/or quality control purposes to improve user experience.

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FEES & TERM

Fees are set annually by the Board of Directors and are posted on the Greenroads website. Fee estimates are based on term of service information provided by the project team at the time of application and the selected evaluation that the project team opts to pursue. Failure to represent project duration accurately or modifying the project duration dates may result in additional fees for delays, expedited submittals, extensions of agreements, or changes in applicable Rating System version. The project team is responsible for informing Greenroads, in writing, of any material changes to the duration of the Project's expected completion. All agreements are subject to expiration.

RATING SYSTEM ERRATA

It is important for project teams to understand the current status of the Greenroads Rating System when determining the strategy for Certification, because the Rating System changes over time. Errata of collected corrections and clarifications are published periodically to keep the operable version of the Rating System up to date. Errata should be used in conjunction with this document and are intended to keep the Rating System consistent with technical decisions, clarifications (including responses to public comments on the online Rating System), and other content-related questions that have been resolved by working with Registered Projects. Formatting issues with website display of credit language and typographical errors are considered minor housekeeping issues and will not usually be formally tracked and recorded in Errata.

FUTURE VERSIONS OF THE RATING SYSTEM

A new version of the Rating System represents substantial changes to the content of Greenroads credits and organization of the Rating System. Greenroads International prepares and produces new versions of the Rating System on a planned update cycle of approximately three to five years. When a new version is released, a sunset schedule of no less than one year will be published on the Greenroads website. If you are pursuing Certification, the version of the Rating System that applies to your Project is the version that is current as of the date of a valid registration for your Project. If a new Rating System version is released and your Project will not start construction or complete a submittal prior to the old version registration close date, you may opt in to a new Rating System version. You may not regress to an older version. Greenroads may recommend version upgrades for certain projects.








ABOUT THE RATING SYSTEM

All Greenroads credits have been included in the Rating System for a reason. The requirements of each credit are supported by a substantial body of academic and industry research and have been calibrated with real projects to validate their inclusion in the Rating System, as well as their technological possibility in practical applications. You can read about the background of each metric in the original publication of the *Greenroads Manual v1.5*, published by the University of Washington and archived on the Greenroads website. New practices included in Version 2 have been similarly developed and vetted as a result of active participation and feedback from project teams.

Each Greenroads credit sends a message to the transportation industry about how sustainability performance can be improved and verified through the design and construction of our publicly funded capital transportation projects. All of these practices have been put into use before; however, it is rare to find projects doing many of these things at once and rarer still to find those reporting their performance holistically and quantitatively.

Ultimately, the purpose of the Project Rating Program and using the Rating System to shape design and construction is to substantiate the idea of "green" for transportation projects as a measure of environmental, social, and economic success.

GREENROADS CREDIT CATEGORIES & INTENT

	Project Requirements	Mandatory baseline activities to be considered "sustainable"
	Environment & Water	Promote environmental best practices related to land use, habitat, water, and other ecological resources.
	Construction Activities	Promote environmental, social, and economic best practices for construction beyond minimum compliance.
	Materials & Design	Promote responsible practices for materials management to lower costs, extend service life, and reduce maintenance.
	Utilities & Controls	Promote best practices for improved operations, improved mobility, efficient systems, and enhanced user experience.
	Access & Livability	Promote best practices for improved quality of life—including safety, human health, accessibility, social justice, and placemaking.
	Creativity & Effort	Promote practices that are unique and exceed performance expectations.

BASELINE PERFORMANCE: PROJECT REQUIREMENTS

Project Requirements are the minimum steps that must be completed in order to be considered a Greenroads Certified Project, defined as a transportation project designed and constructed to a level of sustainability that is substantially higher than current common practice. These mandatory credits can be thought of as characteristics common to all Certified Projects and a baseline for any road to become more sustainable than current common practice.

A Greenroads Certified Project is a transportation project designed and built to a level of sustainability that is substantially higher than current common practice.

The credits in the Project Requirements Category are fundamental to the idea of transportation sustainability. The aim of the Project Requirements is to position a project team to think more strategically and holistically about sustainability practices throughout the entire lifecycle of a project.

In order to achieve Certification, the Project Requirements must all be met and documented, and an additional number of Core Credit points must be earned. In other words, regardless of how many points are achieved, if a project does not meet all of the Project Requirements, it will not be eligible for Greenroads Certification.

SCORING POINTS: CORE CREDITS

Each credit in the Greenroads Rating System contributes to specific environmental, social, and economic benefits. Completing and documenting the Core Credits will likely result in a high-performance green transportation project. Greenroads Projects can provide cleaner water, reduced emissions, and better connectivity for all users and modes, and they often cost less, last longer, and are safer, more comfortable places for people and communities.

Core Credits are voluntary, and there are more credits available than any project can reasonably achieve. There are 45 Core Credits organized between five categories, arranged roughly according to the professionals that would most likely document these activities during project development and construction.

The Core Categories are Environment & Water, Construction Activities, Materials & Design, Utilities & Controls, and Access & Livability. These categories are arranged in the Rating System in order of frequency of achievement. For example, Environment & Water credits are less frequently achieved than those in Access & Livability.

Each Core Credit is worth a variable number of points, often with a range of point values possible based on project performance. The total number of points earned by a project will determine the level of Certification achieved. In order to earn a Bronze Certification Award, at least 40 points must be earned.

CORE CREDITS WITH MULTIPLE PATHS

In *Greenroads Manual v2*, we have combined several performance measures from earlier versions of Greenroads under the same Core Credit, because the measures contribute to the same goal. Some credits have multiple paths.

Projects must pick one path to submit for such credits. Achievement of multiple paths, or achievement of multiple items under a single path heading, may qualify a project for extra points in the Creativity & Effort Category.

A FEW RULES ABOUT CORE CREDITS

- Only one path may be earned per Core Credit.
- There is no partial credit or partial points for Core Credits.
- If multiple paths or higher increments of performance are achieved for any Core Credit, points are added to the CE-3 Enhanced Performance Credit, not to the Core Credit itself. The Core Credit will earn the maximum points for the path with the highest value.

GETTING EXTRA POINTS: CREATIVITY & EFFORT

Up to 15 Extra Credit points can be earned for establishing new and unique ideas, having an educated and integrated project team, achieving a higher incremental performance than credits allow, meeting more than one path option for a credit, or aligning with locally important strategic values. More details are available in Creativity & Effort (CE) credits CE-1 through CE-4. Extra points are not required for any project to earn Certification.

A FEW RULES ABOUT EXTRA CREDITS

- No more than 15 extra points in the CE Category may be earned by a project, even if new ideas are developed and added to the CE Category.
- Projects may not earn points above the maximum points allowed for any CE credit.
- As new ideas are developed and adopted into the Rating System, they may be incorporated as alternative paths for existing credits or as new CE category credits and made available to all active and future projects.
- There is no partial credit or partial points for CE credits.
- Innovative idea submittals that propose lower standards on an existing Core Credit will not be accepted.

TIPS FOR DOCUMENTING YOUR INNOVATIONS

The purpose of all the credits in the Rating System is to provide evidence of your sustainability decisions as you progress through project development. Project teams are responsible for proposing innovative ideas or alternatives to Greenroads. When you have an innovation to share with Greenroads or the industry in general, be sure to keep good records of how your idea developed. Then, make sure the concept can be applied outside of your specific case. Sometimes it is difficult to map project-specific practices to globally applicable performance measures. Project teams proposing innovations should follow the same general weighting structure that is used for all credits in the Rating System.

HOW CREDITS ARE WEIGHTED

Each credit in the Greenroads Rating System contributes to specific sustainability benefits and goals, where **sustainability is defined as a system's capacity to support natural laws and human values**¹ (e.g. environmental,

¹ Muench et. al (2011). *Greenroads Manual v1.5*.

social, and economic values). Points for each credit are assigned based on the measurable performance outcomes achieved and are weighted by relative lifecycle impacts and motivations for the activity. Below are some general rules that we have used to assign weights to the credits in the Rating System so that weighting is consistent throughout and reflects the highest sustainability objective for any one credit. Most credits have multiple benefits that achieve multiple sustainability objectives under the weighting approach. Most are expressed as a range of achievement starting with a minimum of one point to a maximum of five points.

- **Not Weighted:** Also known as Project Requirements, these are the minimum requirements to be considered a Certified Project. Unweighted activities occur upstream in the early stages of transportation planning and project development but impact the whole lifecycle.
- **1 point:** Credits motivated by financial considerations or economic impacts in the short term; credits related to construction activities or time and productivity.^{2,3}
- **2 points:** Credits motivated by social considerations and related to people and their interactions with the human environment, including core transportation issues such as mobility, safety, access, human health, jobs, cultural resources, and movement of goods and services.⁴
- **3 points:** Credits that reflect environmental performance beyond minimum compliance through environmental quality improvements or minimized environmental impacts to natural resources.⁵
- **5 points:** Credits related to the highest overall lifecycle impacts for energy, carbon dioxide emissions, and people, as well as lifetime cost-effectiveness within direct control or influence of the design and construction team.⁶

² Version 2 clarifies and simplifies the weighting approach used in Muench et al. (2011) *Greenroads Manual v1.5*.

³ Bureau of Transportation Statistics, Transportation Statistics Annual Report 2013. Tables 1-1 Estimated Value of Transportation Capital Stock by Mode, 2005-2012 and Table 1-2 Value of Construction Put-in-Place, 2005-2012.

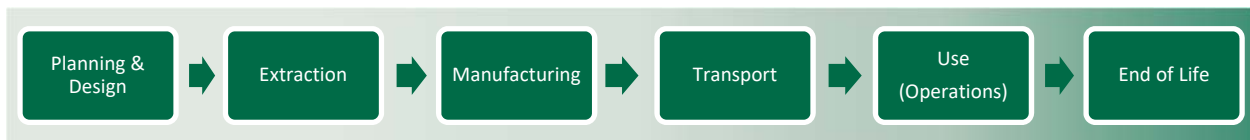
⁴ Equity, safety and health impacts of transportation is studied in Litman and Doherty (2011), Transportation Cost and Benefit Analysis Techniques, Estimates and Implications[2nd ed.] Accessible at vtpi.org/tca/

⁵ The weights are based on an approximation of ecosystem resources economic value from Costanza et al. (1997). *The value of the world's ecosystem services and natural capital. Nature. 387, 253-260.*

⁶ Derived from Muench, S.T. (2010). Roadway Construction Sustainability Impacts: A Life Cycle Assessment Review. *Transportation Research Record* 2151, TRB, National Research Council, Washington, D.C., pp. 36-45.

WHAT WE MEAN BY “LIFECYCLE IMPACTS”

Building one mile of a one-lane transportation project uses about as much energy as 100 average American households use in a year, about 4 terajoules. That is equivalent to a carbon footprint of 243 metric tons.



Construction projects represent a substantial portion of capital investment for public spending. Upwards of 75% of public expenditures on transportation for streets and highways is used for just construction materials, such as pavements and other structural materials.⁷

Fortunately, we have the technology and skills available to go beyond business as usual. We only have one chance to meaningfully reduce a transportation project’s footprint, lifecycle impacts, and costs: when it undergoes construction.

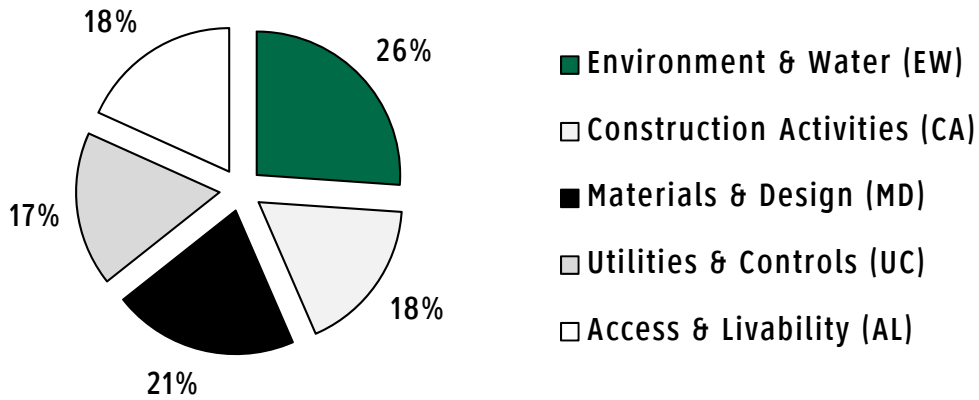
At Greenroads, we’ve done our homework^{1,8} and mapped out where better design and construction choices can have the most sustainable results. We reviewed more than 44 studies⁶ of lifecycle assessments for transportation projects. Initial construction operations (equipment energy and emissions) contribute the least to the overall project footprint, while production and transport of materials represent the most important contributions. We found the following rules of thumb helpful to organize and assign weights to Greenroads credits:

- Materials production (including extraction and manufacturing processes) has 20 times the impact of initial construction operations.
- Materials transport for construction and construction maintenance has about five times the impact of initial construction operations.
- Initial construction has approximately three times the impact of future construction, maintenance, and preservation activities (where substantial materials are required).
- Over 40 years, project system operations have about the same energy demand as all lifetime construction and construction maintenance activities.
- The footprint of motor vehicles matches the initial construction footprint within about one to two years of operational use.

⁷ Bureau of Transportation Statistics, Transportation Statistics Annual Report 2013, p. 110.

⁸ Anderson, J. and Muench, S.T (2013). Sustainability Trends Measured by Greenroads Rating System. *Transportation Research Record* 2357. TRB, National Research Council, Washington, D.C., pp. 24-32.

Relative Weighting of Core Categories



While the relative category weights in the above chart do not mirror our research on lifecycle impacts exactly, they do reflect the values of Greenroads International. Specifically, the values of each credit and category represent the areas that we have discovered are important, meaningful, and challenging to improve sustainability for transportation projects in the long run.

GETTING STARTED: APPLY

All projects must submit a free screening application. The screening application process allows Greenroads to sort projects and recommend the best path to participate in the Greenroads Project Rating Program. The application creates an entry in the website database with some basic information about the scope and purpose of your Project for our staff and a point of contact so we can reach you.

MINIMUM ELIGIBILITY CRITERIA TO APPLY

The screening application is open to all and always free. There is one key criterion to consider before you apply:

- The Project or Program (one or more projects) must be real property that serves a transportation purpose and provides a public benefit.

WHAT TYPES OF WORK SHOULD APPLY?

Greenroads can be used to rate most transportation capital and construction maintenance projects. Most projects rated to date have some sort of motorized component, though Greenroads is not mode-specific or restrictive. Motorized facilities may or may not have major structural components, such as bridges, tunnels, or retaining walls.

The most common types of projects we see are:

- Street improvements (new construction, reconstruction, rehabilitation, and streetscapes)
- Highway improvements (new construction, reconstruction, and rehabilitation)
- Stormwater utility improvements in a street or right-of-way (e.g. raingarden installation)
- Bridge replacements with affiliated structural and approach work
- Transit-related improvements and stop facilities

Unusual applicants that would likely be best to first rate as Pilot Projects include:

- Rail projects⁹ (any kind)
- Bridge retrofits
- Air and water port capital projects (non-roadway facilities)
- Unpaved trails or equestrian facilities
- Low-volume roads
- Parking lots or other parking facilities

WHAT TYPES OF WORK SHOULD NOT APPLY?

- Specific products
- Specific processes

⁹ We do have a Greenrails™ program concept currently seeking Pilot Projects.

- People (see our Sustainable Transportation Professional accreditation program)
- Companies and agencies (see our Membership Program for ways to get involved: www.greenroads.org/join)
- Policies and plans
- Maintenance practices and operational systems (and any other daily business of an agency or organization)

WHAT HAPPENS WITH YOUR APPLICATION?

1. After we receive the application, we will contact you to discuss the Project.
2. Then, we will provide a formal estimate of the fee, including any membership discounts that apply on behalf of the Applicant (including owner agency member discounts).
3. If approved, Greenroads staff will set up your Project to proceed to Registration.

GETTING REGISTERED

After your application eligibility is determined and the Project has been approved to participate in the Project Rating Program, the Project must register. Projects must maintain Registration throughout the entire duration of participation in our rating program.

As soon as Registration is complete, the project team has access to the online Project Workspace and may begin using it to track and manage the Project's submittals and team member access.

Registration fees and terms of service are updated annually by the Board of Directors and are posted on the Greenroads website or available by request.

The minimum length of Registration is one year, and the maximum duration of Registration is the date you registered through 90 days past final completion. For projects that do not have full funding for construction, the maximum term of Registration is three years. Registration may be extended as needed to stay Registered through the end of construction for additional fees. Registration expires according to the terms of the Registration Agreement or 90 days after the date of final completion reported on the application, whichever is sooner. Registration may be extended for additional fees if the project experiences delays.

Registration fees do not include fees for any type of training, guidance, membership, professional credentials, Certification, or Assessment.

MINIMUM ELIGIBILITY CRITERIA TO REGISTER

Most projects are approved for Registration, and they must also meet the following minimum eligibility criteria.

- The Project or Program must be owner-approved to proceed to project development. Owner-approved means the Project is a programmed, budgeted, and approved part of a transportation plan.

If a program containing multiple projects is registered, the Registration applies to the entire program.



VERSION 2

RATING SYSTEM

GETTING RATED: PILOT PROJECTS

Greenroads Pilot Projects receive a state-of-the-Project score and gap analysis completed by Greenroads staff using a few critical project documents and an interview with key members of the Project Team. Pilot Project scores are thoughtful, expert assessments of a project’s performance that carry educational value, limited promotional and business development value, and often future strategic value when planning for Certification (especially for owner agencies). Pilot Projects are a great soft entry into Certification for project teams that are new to Greenroads or to sustainable transportation in general.

The Pilot Project process is more fluid, informal, and flexible than Certification and may be completed **at any time** in the Project lifecycle—even after the project is completed—with a relatively **short turnaround**. In some cases, including projects which register after NTP, a Pilot Project is a required first step toward Certification. Details about when and why Pilot Projects might be required are included in the *Greenroads Rating Handbook*.

Projects teams that successfully complete a Pilot Project (without confidentiality restrictions) may use the Greenroads Pilot Project Logo on their Project’s site, website, and informational materials for limited outreach purposes. Pilot Project recognition and other confidential results are valid for three years after completion of the Pilot Project.

MINIMUM ELIGIBILITY CRITERIA FOR PILOT PROJECTS

It’s easy to commit to a Pilot Project and meet the minimum eligibility criteria. A Pilot Project must:

- Meet screening application eligibility criteria
- Meet Registration eligibility criteria
- Agree to share project data with Greenroads (see “How We May Use Your Project Information”)

WHAT SUCCESS LOOKS LIKE

When your Pilot Project is completed, you may be authorized to put up a sign or plaque with an appropriate Greenroads Logo on your Project. We publicly recognize projects that successfully participate in the Project Rating Program on an annual basis at our membership events. Greenroads also shares your Project performance for others to use as examples in the Greenroads Featured Projects Portfolio, located on the Greenroads website: www.greenroads.org/portfolio.

Northshore Drive Road & Drainage Improvements

Bellingham, WA, USA



In 2009, Northshore Drive (above) in the city of Bellingham, Washington, became the city's first Pilot Project (below: Project Manager Freeman Anthony). It was one of the first test projects used when developing the Rating System and included pervious concrete sidewalks, bike lanes, and asphalt overlay on a collector street in a suburban area. The city took what they learned and applied it to their next project, Meador Kansas Ellis Trail, when the Certification program began in 2011. Bellingham has since registered six more projects for Certification!



West Dowling Road Phase II

Alaska DOT & PF, Anchorage, AK



Greenroads® Summary	
West Dowling Road Phase II Pilot Project Anchorage, AK	
Total Score*	32
Project Requirements	8/11
Environment & Water	7/21
Access & Equity	12/30
Construction Activities	5/14
Materials & Resources	5/23
Pavement Technologies	0/20
Custom Credits	3/10

*Does not include Project Requirements



The Alaska Department of Transportation & Public Facilities completed its first Pilot Project for West Dowling Road Phase II in late 2014 (above). The Project is a new US\$46.8 million highway corridor in the City of Anchorage, improving mobility for all modes and upgrading stormwater and sewer utilities. The Project built dedicated snow storage and created systems to clean snow near Tina Lake (below left). The Project Team was recognized at the April 2015 Annual Reception (below right: Jenn Harper of HDR and Adam Hand of Granite Construction) and will be looking for future opportunities to apply Greenroads in Alaska, including starting a local Greenroads Chapter and continuing to pursue Certification on the West Dowling Road Phase II Project.





VERSION 2

RATING SYSTEM

GETTING RATED: CERTIFICATION

A Greenroads Certification is a rigorous, independent third-party evaluation by Greenroads International of a transportation project to determine which Greenroads credits a project has completed and earned. The Greenroads Rating System requires all project documentation to be organized and submitted via an online process for verification of earned credits according to the details outlined in each Greenroads credit. Certification is a process that follows a project from development through the end of construction. Projects may become Certified only after final completion.

A project is eligible for Greenroads Certification if it completes the Certification process successfully, by meeting all of the Project Requirements and achieving a number of voluntary credit points.

MINIMUM ELIGIBILITY CRITERIA TO CERTIFY

Automatic approval terms to participate in Certification are listed below. If one or more of the 10 items below is missing, Greenroads staff must approve, review, and waive the term(s) before proceeding to certification. Most projects that do not meet all 10 will be directed to complete a Pilot Project Assessment first.

- The Project is in full legal and regulatory compliance from the start of project development or upon Registration, whichever is soonest, and remains so for the duration of Certification.
- The Project has at least one centerline and/or flow pattern and is located on contiguous real property.
- The Project is part of a transportation master plan(s) and/or comprehensive system plan(s) that has been approved by all local public agencies impacted by the project, and the approval process includes a public engagement component.
- The Project has more than 50% funding approved for construction.
- The Project has an approved budget upon commitment to Certification and must reasonably be expected to receive full funding within 2 years.
- The Project is more than 6 months prior to construction NTP for projects that are less than US\$15 million in project value or 1 year for projects that are greater than US\$15 million in project value.
- At least one representative that is a full-time employee of the public owner agency is part of the process for the full duration of Certification.
- The Project includes substantial transportation-related improvements and is more than 5,000 square feet (464 square meters) in total disturbed area.
- The Project Team includes all Agencies that own real property within the Certification boundary.
- The Project is located in a country that has successfully completed a Greenroads Pilot Program.

DEFINING RATING BOUNDARIES

Boundary definition is addressed on a case-by-case basis. In most cases, the screening application, done early in project development, can help identify reasonable project boundaries as the Project(s) moves forward. The project boundary is often determined considering at least two factors: the limits of construction (in space and timing) and the Owner(s) of the real property being developed and rated.

In some cases, the project boundary may **not** equal the construction limits. In these cases, your Project may be a Greenroads Program—consisting of multiple certifiable segments, which are each Greenroads Projects.

Here are some known examples of Greenroads Programs:

- Corridor improvements constructed in multiple phases
- Streetscape improvements in multiple locations
- Alternative delivery projects with an operations and maintenance component completed by private companies operating on behalf of the Owner Agency
- Projects involving real property with multiple Owners

In all cases, what is Certified must have a continuous perimeter, no gaps or discontinuities in area, and at least one centerline or flow pattern. All areas within the boundary must be in a state of good repair upon acceptance and be expected to continue performing in this condition for a minimum of five years before reconstruction.

- It is **required** that all segments in a Greenroads Program meet and document all of the Project Requirements.
- It is **not required** that all of the segments identified in a Greenroads Program pursue Certification.
- It is **not required** that all of the segments in a Greenroads Program pursue Certification under the same version of the Rating System (often the case with phased or extended duration programs).
- It is **not required** that a Greenroads Program has a continuous centerline or flow pattern.
- Programs **cannot be Certified** unless all project segments pursuing Certification in the program are successfully Certified (A composite rating may be assigned for programs, which is a weighted average score of all projects.).

Additional boundary criteria and guidance may be developed and published in the *Greenroads Rating Handbook* or separately.

REQUIRED PERFORMANCE REPORTING

Certified projects must continue to collect and disclose select performance data after Certification is awarded. Failure to report will result in Greenroads International expiry or voiding Certification of your Project. More information about performance reporting requirements is included in the *Greenroads Rating Handbook*.

WHAT SUCCESS LOOKS LIKE

When your Certification is completed, you may be authorized to put up a sign or plaque with an appropriate Greenroads Logo on your Project. We publicly recognize projects that successfully participate in the Project Rating Program at our annual membership events.

Meador-Kansas-Ellis Trail

Bellingham, WA, USA



Meador-Kansas Ellis Trail (above) was the first project to pursue Certification in the City of Bellingham, Washington, and the first Greenroads Certified Project in the world, designed internally and built by local contractor Larry Brown Construction. It included completion of a new pedestrian trail with water quality improvements at parking areas, a pavement overlay, and minor intersection improvements. It also found an innovative solution to divert 400 toilets from landfill from a local housing project by crushing them as aggregate for sidewalks (called “Poticrete”) with 33% recycled content (bottom left: Poticrete placement on Meador Kansas Ellis Trail). The Bellingham City Council was pleased with the Project’s Certification results (bottom right: City Councilmember Terry Bourneman with Greenroads Executive Director Jeralee Anderson at the presentation of the Certification results to the Council).



Monterey Road Rehabilitation & Reconstruction

San José, CA, USA



The Monterey Road Rehabilitation and Reconstruction Project (2010 STP Resurfacing and Rehabilitation Project) was the first Greenroads Certified Project in California and revitalized a roadway with terrible pavement conditions on a key urban expressway. Using cold-in-place recycling (above), the Project Team, led by the City of San José’s Infrastructure Maintenance Division (below with Mayor Chuck Reed and other city staff) and built by Pavex, realized 23% cost savings over traditional paving and reused over 97% of the existing pavement section. The asphalt binder was made of 19% scrap rubber tires and the resulting roadway, formerly part of the world-famous El Camino Real and notorious for being the noisiest road in the state, extended its service life by many years and became substantially quieter. The project also installed energy efficient LEDs with dimmer control retrofitting onto existing lighting, reducing light pollution and saving energy as part of an overall city policy and energy retrofit plan.



Bagby Street Reconstruction

Midtown Redevelopment Authority, Houston, TX, USA



The Silver Certified Bagby Street Reconstruction Project (above) in Houston, Texas, is a great example of Complete Streets policy aligning with several Greenroads performance measures. Bagby Street was designed by Walter P. Moore and Design Workshop and built by SER Construction with ESPA Corp as construction management. The Project was part of Mayor Annise Parker and the Houston Midtown Redevelopment Authority Board's (below) plan to revitalize the historic Midtown District and promote economic development as a beta test of Complete Streets principles. Mayor Parker announced the adoption of Houston's Complete Streets policy the same day the Project became Greenroads Certified. It includes wide pedestrian areas, native landscaping, access to a local park and many streetscape amenities, as well as green features like bioswales for improved stormwater management in heavy Houston rains. Bagby is part of a two-way couple with Brazos Street, and the Development Authority plans to pursue Certification for both (with an eye on a Gold Rating this time).



Smokey Point Transit Center

Community Transit, Arlington, WA, USA



Silver Certified Smokey Point Transit Center (above) was Community Transit’s flagship Project for Greenroads and the first transit-only facility to earn Certification. The Team originally considered pursuing LEED® Certification, but found that the facility did not meet the eligibility requirements for conditioned spaces and determined that Greenroads’ transportation focus was a better fit. The Project, with a team led by Perteet, Inc. (below with Community Transit Board and staff) and built by local contractor CA Carey Construction, was designed with transit users and vehicles in mind, with a focus on responsible, safe, and pleasant site design for durability and accessibility. Additionally, a huge on-site raingarden infiltrates 99.5% of the stormwater, treating 80.4% of it to enhanced levels to remove dissolved metals. Washington Governor Jay Inslee praised the Project’s green efforts, and Community Transit has already registered its next planned transit center facility.



Presidio Parkway Phase I

Caltrans/SFCTA, San Francisco, CA, USA



California Department of Transportation was the first US highway agency to register a Pilot Project with Greenroads and later opt for Certification, earning Bronze for the Presidio Parkway Phase I Project (above). The US\$495 million corridor redevelopment project turned a heavily travelled urban arterial from a major seismic hazard into an iconic green gateway to the City of San Francisco. The Project’s Certification included three major structure replacements (Ruckman Bridge, Southbound High Viaduct, and Southbound Battery Tunnel) in addition to historic building preservation, great outreach activities, and the creation of new recreation areas with layered public space and infrastructure. It was designed by Parsons Brinckerhoff/ARUP Joint Venture and was constructed by two prime contractors, R&L Brosamer and CC Myers Inc. (pictured below: John Eddy of ARUP and Paula Hammond of Parsons Brinckerhoff with Young Sang Song and Patrick Barnum, both of Walsh Group). Phase II of the Project, a public-private partnership, is also registered to pursue Certification.





VERSION 2

RATING SYSTEM

ABOUT GREENROADS INTERNATIONAL

Established in 2010, Greenroads International (domestically known as Greenroads Foundation) is an independent 501(c)(3) non-profit corporation located in the Seattle metro area of Washington State. Greenroads International advances sustainability education and initiatives for transportation infrastructure.

As the developer of the Greenroads Rating System, the Foundation manages the education and rating programs for sustainable transportation design and construction projects in the US and internationally. For more information, visit greenroads.org and join us on social media on Facebook (facebook.com/greenroads), Twitter (@Greenroads), and LinkedIn (linkedin.com/company/greenroads-foundation).

VISION STATEMENT

We strive to fundamentally change the way the world builds transportation projects.

MISSION STATEMENT

To benefit communities and the environment by recognizing sustainable transportation projects and by promoting sustainability education for transportation infrastructure.



2015 Greenroads Board of Directors

MORE GUIDANCE & TRAINING

GREENROADS RATING HANDBOOK

This document is updated periodically and fully explains the rules and policies to get a project engaged with the Project Rating Program.

EXAMPLE PROJECTS

The Greenroads website includes a portfolio of completed projects with a short description of the sustainable features of each project, summary scorecards, and photos as available: greenroads.org/portfolio.

GREENROADS ONLINE

Access the online version of Greenroads to keep up-to-date on changes to the Greenroads Rating System on the web and your mobile device: greenroads.org/publications.

ARCHIVED VERSIONS OF GREENROADS

Previous versions of Greenroads (all copyright University of Washington), now archived and no longer in use as part of the Project Rating Program, contain the original background research to support each credit, as well as approaches and strategies, potential issues, and other strategic considerations: greenroads.org/files/236.pdf.

GUIDANCE & COACHING

Greenroads offers coaching and shares helpful tools and templates for building green transportation projects, including an online credit query tool called Ask Dr. Greenroads. Learn more at: greenroads.org/guidance.

EDUCATIONAL EVENTS

Greenroads offers a variety of webinars, seminars, and student events. Get engaged by checking out the events page: greenroads.org/events.

MEMBER DIRECTORY

The Greenroads website includes a Member Directory, so you can find an experienced team near you. Member profiles lists headquarters location, names of credentialed staff, active and completed projects, and how long they have been a part of Greenroads. Visit greenroads.org/leaderboard.

SUSTAINABLE TRANSPORTATION PROFESSIONAL (STP) DIRECTORY

The Greenroads website lists all individuals who have passed any of the Greenroads Sustainable Transportation Professional (STP) Exams in the STP Directory. Find a STP near you at greenroads.org/stpdirectory.

PROJECT SCORECARD

Project Name _____

Location _____

Project Manager _____

Project Budget _____

Current Status _____

Points	Certification Requirements	Level
40	12 Project Requirements + 30% of available points	Bronze
50	12 Project Requirements + 38% of available points	Silver
60	12 Project Requirements + 46% of available points	Gold
80	12 Project Requirements + 61% of available points	Evergreen

Project Requirements (PR)		PR Max:			
No.	Title		Y	?	N
PR-1	Ecological Impact Analysis	Required			
PR-2	Energy & Carbon Footprint	Required			
PR-3	Low Impact Development	Required			
PR-4	Social Impact Analysis	Required			
PR-5	Community Engagement	Required			
PR-6	Lifecycle Cost Analysis	Required			
PR-7	Quality Control	Required			
PR-8	Pollution Prevention	Required			
PR-9	Waste Management	Required			
PR-10	Noise & Glare Control	Required			
PR-11	Utility Conflict Analysis	Required			
PR-12	Asset Management Systems	Required			
All 12 PR Met?					

Environment & Water (EW)			<i>EW Max: 30</i>			
No.	Title			Y	?	N
EW-1	Preferred Alignment	1 - 3				
EW-2	Ecological Connectivity	1 - 3				
EW-3	Habitat Conservation	1 - 3				
EW-4	Land Use Enhancements	1 - 3				
EW-5	Vegetation Quality	1 - 3				
EW-6	Soil Management	1 - 3				
EW-7	Water Conservation	1 - 3				
EW-8	Runoff Flow Control	1 - 3				
EW-9	Enhanced Treatment: Metals	1 - 3				
EW-10	Oil & Contaminant Treatment	1 - 3				

Construction Activities			<i>CA Max: 20</i>			
No.	Title			Y	?	N
CA-1	Environmental Excellence	1 - 3				
CA-2	Workzone Health & Safety	1 - 2				
CA-3	Quality Process	1 - 3				
CA-4	Equipment Fuel Efficiency	1				
CA-5	Workzone Air Emissions	1				
CA-6	Workzone Water Use	1 - 3				
CA-7	Accelerated Construction	1 - 2				
CA-8	Procurement Integrity	1				
CA-9	Communications & Outreach	1				
CA-10	Fair & Skilled Labor	1 - 2				
CA-11	Local Economic Development	1				

Materials & Design			<i>MD Max: 24</i>			
No.	Title			Y	?	N
MD-1	Preservation & Reuse	1 - 5				
MD-2	Recycled & Recovered Content	1 - 5				
MD-3	Environmental Product Declarations	2				
MD-4	Health Product Declarations	2				
MD-5	Local Materials	1 - 5				
MD-6	Long-Life Design	1 - 5				

Utilities & Controls			UC Max: 20					
No.	Title		Y	?	N			
UC-1	Utility Upgrades	1 - 2						
UC-2	Maintenance & Emergency Access	1						
UC-3	Electric Vehicle Infrastructure	1 - 3						
UC-4	Energy Efficiency	1 - 3						
UC-5	Alternative Energy	1 - 3						
UC-6	Lighting & Controls	1 - 3						
UC-7	Traffic Emissions Reduction	1 - 3						
UC-8	Travel Time Reduction	1 - 2						
Access & Livability			AL Max: 21					
No.	Title		Y	?	N			
AL-1	Safety Audit	1 - 2						
AL-2	Safety Enhancements	1 - 2						
AL-3	Multimodal Connectivity	1 - 2						
AL-4	Equity & Accessibility	1 - 2						
AL-5	Active Transportation	1 - 2						
AL-6	Health Impact Analysis	2						
AL-7	Noise & Glare Reduction	1 - 3						
AL-8	Culture & Recreation	1 - 2						
AL-9	Archaeology & History	1 - 2						
AL-10	Scenery & Aesthetics	1 - 2						
Creativity & Effort			CE Max: 15					
No.	Title		Y	?	N			
CE-1	Educated Team	1 - 2						
CE-2	Innovative Ideas	1 - 5						
CE-3	Enhanced Performance	1 - 5						
CE-4	Local Values	1 - 3						
Greenroads Total of 130 Possible Points								
Certification Level								



VERSION 2

RATING SYSTEM

PROJECT REQUIREMENTS

The general intent of this category is to encourage environmentally responsible decision-making processes, to have management plans in place for construction, and to establish a minimum baseline for every project that applies for Certification.

Project Requirements are the minimum steps that must be completed in order to be considered Greenroads Certified. They can be thought of as characteristics common to all Greenroads and the baseline performance measures for sustainable transportation projects.

The Project Requirements also consist of items or procedures that are often related to practices that can achieve points in one or more Core Credits, which may strategically assist project teams planning to pursue Certification.



ECOLOGICAL IMPACT ANALYSIS

GOAL

Encourage comprehensive evaluation of the Project's ecological impacts for its whole lifecycle.

INSTRUCTIONS

1. Collect, document, and disclose all available information about:
 - a. The existing ecological state, geographical and topographical conditions, and designated land use of the proposed Project site prior to any construction works.
 - b. The proposed direct, indirect, and cumulative ecological impacts and improvements to the Project site expected as a result of the construction works for all alternative builds considered.
 - c. The committed approach for mitigation and compensatory works for all adverse direct, indirect, and cumulative ecological impacts.
2. Evaluate the information and prepare a narrative describing how the ecological impacts of the Project will be managed by the Project Team. Include, at minimum, a review of the following:
 - a. Air, surface water, groundwater, stormwater, earthen materials, and energy impacts
 - b. Noise, odor, light, and glare impacts
 - c. Wildlife and vegetation impacts
 - d. Environmental hazards, including spills and contamination
 - e. Environmentally sensitive or critical areas
 - f. Land use, farmland, floodplain designation, and shoreline impacts
3. Demonstrate that the ecological evaluation process has been completed prior to the start of construction works on the site, including related site preparation or other preliminary works.
4. List any necessary approvals and/or permits required to perform the work and identify any governing authorities that will issue needed approvals and/or permits.
5. List any codes or ordinances that are relevant to the ecological impacts on the Project. State whether the Project has conflicts with any known local, regional, national, or international laws or requirements for the protection of the environment.
6. List the parties that performed or contributed to the ecological evaluation and a short description of their scope of work.

ENERGY & CARBON FOOTPRINT

GOAL

Improve accountability for energy and emissions for the Project materials and construction activities.

INSTRUCTIONS

Prepare an inventory of energy use and greenhouse gas emissions due to materials, construction, and construction maintenance for, at minimum, the final Project alternative and report:

- Total weight and types of virgin materials
- Total weight and types of recycled materials
- Expected transportation distances for all materials to site and from site (including disposal)
- Expected construction vehicle types
- Estimated service life
- Scheduled years and expected type of maintenance
- Total lifetime energy use, including feedstock energy (expressed as a percentage of total energy)
- Total global warming potential (GWP), measured in carbon dioxide equivalent emissions (CO₂e)

Exclude emissions and energy from operations of the facility (such as traffic, lighting, or operational systems) and end-of-life activities. If desired, report these items separately from the above.

LOW IMPACT DEVELOPMENT

GOAL

Encourage consideration of low-impact stormwater management practices for the Project.

INSTRUCTIONS

Complete a low-impact development (LID) feasibility study to determine if Project soils are able to infiltrate stormwater and snowmelt and to what extent, if any. A LID feasibility study shall:

1. Be completed in the early stages of project development.
2. Report the permeability or hydraulic conductivity of the soils in the Project boundary, at minimum.
3. Include the overall approach for LID implementation on the Project based on the opinion of a hydrologist, geotechnical engineer, hydrogeologist, geologist, or other licensed and registered professional.
4. Include information related to other drainage and hydraulic design restrictions, soil conditions, or other hydrological elements impacting the Project.
5. Include a statement based on the study findings, clearly stating whether or not LID practices are recommended for implementation.

SOCIAL IMPACT ANALYSIS

GOAL

Encourage comprehensive evaluation of the Project's social and community impacts for its whole lifecycle.

INSTRUCTIONS

1. Collect, document, and disclose all available information about:
 - a. The existing social conditions of the project prior to any construction works, including land use and development, zoning, and housing and parking conditions.
 - b. The proposed direct, indirect, and cumulative social impacts and improvements to the Project site expected as a result of the construction works.
 - c. The committed approach for mitigation and compensatory works for all adverse direct, indirect, and cumulative social impacts.
2. Evaluate the information and prepare a narrative describing how the social impacts of the Project will be managed by the Project. Include, at minimum, a review of the following:
 - a. Community demographics, including potential communities subject to disparate impacts
 - b. Transportation modes available on the project
 - c. Public transportation service impacts
 - d. Commercial transportation impacts
 - e. Housing and business impacts
 - f. Service interruptions for utilities
 - g. Recreational resources
 - h. Historical and archaeological resources
 - i. Aesthetic treatments and viewsheds
 - j. Other cultural and community resources
3. Demonstrate that the social evaluation process has been completed prior to the start of detailed design during project development and before any construction has begun.
4. List any necessary approvals and/or permits required to perform the work and identify the governing authorities for the approvals and/or permits.
5. List the parties that performed or contributed to the social impact evaluation and a short description of their scope of work.

COMMUNITY ENGAGEMENT

GOAL

Promote active participation from community, agency, and business stakeholders in Project decision-making.

INSTRUCTIONS

Create a Community Engagement Plan (CEP) and implement it at the beginning of the Project's initial scoping, land acquisition, and design development activities. The CEP should extend for the duration of project planning through completion of design.

The primary components of the CEP are:

- **Information gathering:** A process for collecting direct input and feedback about community stakeholder needs, values, and opinions relevant to the Project.
- **Information targeting:** A process for shaping the information to cater to the specific needs of the community affected by the project.
- **Information dissemination:** A process for responding to input and feedback and for notifying the community about upcoming outreach activities, results of past activities, and the resulting scope decisions made for the selected alternative.
- **Community outreach:** Engagement events with meaningful participation by the community.

A CEP shall include, at minimum:

1. A set of Project-specific goals and objectives to be achieved by the CEP.
2. A list of all parties impacted by the Project, including local residents and other members of the general public employed or living nearby, local businesses owners, community leaders, public agencies, regulatory bodies, and utility managers.
3. A list of planned community engagement activities for the duration of project development, including dates of engagement events, venues, agendas, and necessary materials.
4. A dedicated responsible party for communicating with stakeholders, soliciting and receiving feedback, and responding to stakeholder comments.
5. Multiple means of delivering the information about engagement activities to the impacted parties, including a digital or electronic component, a media relations component, and an educational component.
6. An allocation for funding the proposed engagement activities, especially for participants that are disproportionately impacted by the proposed Project.
7. An approach for measuring and monitoring the effectiveness of engagement activities, including routine updates to the CEP, correction or revision procedures, and a list of items to be measured.

LIFECYCLE COST ANALYSIS

GOAL

Encourage comprehensive evaluation of the Project's financial impacts for its whole lifecycle.

INSTRUCTIONS

Perform a lifecycle cost analysis (LCCA) of the Project for, at minimum, the final alternative. The LCCA must contain at least initial costs, agency costs (operation and maintenance), and workzone user costs for both initial construction and future construction maintenance and preservation events.

Justify and record the use of any default inputs if using software tools. The LCCA must use values to make projections that are representative of the Project, such as historical data or engineering estimates. The analysis must represent the Project as a whole, including all capital assets, such as:

- Pavements
- Bridges
- Walls and major structures
- Utility and controls infrastructure
- Vegetation and irrigation infrastructure

A cost-benefit analysis (CBA), occasionally used for project finance decisions, is a form of LCCA, but must also include at least initial costs, agency costs (operation and maintenance), and workzone user costs for both initial construction and future construction maintenance events, and must represent all capital assets.

Either approach is accepted; however, for either approach, it is the responsibility of the Project Team to specifically allocate costs according to the Project, to ensure that all lifecycle costs are accounted for, and to report the representative Net Present Value (NPV) of the facility pursuing Certification.

If using software tools to complete the analysis, initial values for calculations should be consistent with existing owner agency policies and software should report probabilistic results rather than deterministic results for the NPV.

QUALITY CONTROL

GOAL

Encourage systematic quality management practices during Project construction.

INSTRUCTIONS

The prime contractor shall establish, implement, and maintain a formal construction Quality Control Plan (QCP) that applies throughout construction and to all subcontractors. The QCP must be in place and approved by the Owner prior to the start of construction.

The QCP must address the following quality control elements:

1. Key quality control personnel, their responsibilities, and their qualifications
2. Procedures used to control quality during construction, including (as a minimum):
 - a. Items to be monitored
 - b. Testing to be done (including testing standards and frequency)
3. When corrective action is required (action limits):
 - a. Procedures to implement corrective action
 - b. Procedures to modify the QCP if ineffective or when modifications are necessary

Report any modifications to the QCP and provide supporting evidence of the process control activities and records of monitoring quality control throughout construction.

POLLUTION PREVENTION

GOAL

Reduce and prevent pollution due to the Project's construction activities.

INSTRUCTIONS

The prime contractor shall establish, implement, and maintain a formal construction Pollution Prevention Plan (PPP) that applies throughout construction and to all subcontractors, signed by an authorized party responsible for pollution prevention activities. The PPP must be in place and approved by the Owner prior to the start of construction and be available on site.

The PPP must address the following pollution prevention elements:

1. Key pollution prevention personnel, their responsibilities, and their qualifications
2. Schedule of activities for construction operations
3. A list of expected pollutants generated by construction operations
4. Relevant regulatory compliance information, including minimum effluent and air quality standards
5. Identification of buffers and potentially impacted bodies of water
6. Procedures used to control pollutants and prevent pollution, including but not limited to effluent from stormwater and snowmelt, non-stormwater discharges (e.g. groundwater, washing water, other fluids from chemicals, etc.), erosion and dust control, spills, and other human health and environmental hazards, such as contaminated soils or water.
7. Emergency procedures, including:
 - a. A list of preventive measures and site controls
 - b. A map of locations for installed site controls
8. Procedures for inspection and maintenance of preventive measures and site controls
9. Procedures for corrective action for non-compliance with the plan
10. Expected staff training needs

Prepare and record any corrective actions made during construction of the project, including corrective actions due to non-compliance events.

WASTE MANAGEMENT

GOAL

Encourage responsible waste management practices during Project construction.

INSTRUCTIONS

Establish, implement, and maintain a formal Construction and Demolition Waste Management Plan (CWMP) during Project construction. The CWMP must clearly describe the plan for implementing, communicating, monitoring, and maintaining appropriate recycling and diversion practices on site. The CWMP must be in place at the start of construction and cover all project activities, including subcontractor work.

The CWMP should be included in the project contract documents and identify, at minimum, these items:

1. Type of construction waste
2. Expected or actual tonnage
3. Costs and fees for landfills, recovery facilities, and hauling
4. Contact information of the party responsible for hauling
5. Destination of waste (e.g. recycling facility, landfill, contractor's backyard)
6. Contact information of responsible party for disposal or materials recovery site
7. Locations of site receptacles
8. Diversion and recovery goals and targets
9. Proper handling for recyclable or reusable materials
10. Training requirements for all site employees related to waste management and recycling
11. Means of corrective action

Collect waste summary reports or diversion reports for any facility receiving waste or recyclables from the Project. Report any modifications to the CWMP and provide supporting evidence of the monitoring activities that occur throughout construction.

NOISE & GLARE CONTROL

GOAL

Reduce and prevent disturbances to surrounding environments and communities due to the Project's construction activities.

INSTRUCTIONS

Establish, implement, and maintain a formal Construction Impact Mitigation Plan (CIMP) during construction for the prime contractor. The CIMP must be in place at the beginning of construction activities and cover all project activities, including subcontractor work.

The CIMP must address, at minimum, the following construction impacts together as one plan or as separate plans: noise, vibration, light, glare, and other activities anticipated to create nuisance or disturbance to surrounding communities.

For each type of impact:

1. Identify the responsible party for mitigation activities, their contact information, their responsibilities, and their qualifications. Include information if any portions of the CIMP were prepared by an outside party.
2. Identify the location and distance to the closest receptors for noise, vibration, light, and glare.
3. Describe the surrounding zoning and parcel information (i.e., commercial, residential, hospitals, schools, parks, sensitive habitat).
4. List proposed construction activities (e.g. demolition, excavation, paving, bridge foundations, finishing).
5. Identify dates and working hours of proposed construction activities.
6. List noise-, vibration-, light-, glare- or other nuisance-generating devices that are used during each construction activity listed in step 4.
7. List mitigating devices and reduction strategies used during each construction activity listed in #4, including:
 - a. Personal safety equipment requirements for all site employees.
 - b. A map showing the locations of any installed controls (include mitigating devices or strategies for construction phase activities only; for permanent controls, see AL-7 Noise and Glare Reduction).
8. Identify procedures for inspection and maintenance of preventive measures and site controls.
9. Include permit numbers and agency or local authority policies associated with construction work, as applicable.
10. Describe monitoring standards, methods, and acceptable levels.
11. Describe correction procedures for non-compliance.
12. Outline expected staff training needs.
13. Include the signature of the responsible party.

Report any modifications to the CIMP and provide supporting evidence of the monitoring activities that occur throughout construction.

UTILITY CONFLICT ANALYSIS

GOAL

Evaluate impacts of the Project's construction on public and private utilities.

INSTRUCTIONS

Complete a Utility Conflict Analysis using the process described in *Identification of Utility Conflicts & Solutions* (Quiroga et al., 2012). At minimum, a Utility Conflict Analysis includes:

1. The location of all public and private utilities within the Certification boundary
2. All potential utility conflicts and where they are located (station-to-station or coordinates)
3. A description of the conflict
4. An investigation of the proposed conflict, such as test holes or borings
5. Proposed actions to resolve any conflicts
6. A resolution schedule
7. A cost estimate of resolution alternatives

ASSET MANAGEMENT

GOAL

Maintain and preserve all capital assets and environmental quality for the Project's service life.

INSTRUCTIONS

Have and implement a comprehensive ongoing site Asset Management Program for routine maintenance that addresses, at minimum, responsible parties and organizations, standards, schedule, methods to be used, decision criteria for timing maintenance events, and funding source(s). At minimum, the Asset Management Program should cover the following capital assets and items (listed by major topics):

1. Asset management systems (including pavements, bridges, and major structures):
 - a. Pavement, bridge, and major structures inspection
 - b. Condition measurement procedures
 - c. Routine preservation activities
 - d. Scheduled construction maintenance
 - e. Pavement patching, repair, and crack sealing
 - f. Shoulder and sidewalk maintenance and repair
 - g. Stormwater system cleaning and repair
2. Vegetation assets:
 - a. Landscaping
 - b. Control of noxious weeds and nuisance plants
3. Weather maintenance (snow, ice, sand/dust)
4. Controls, signals, and other operational systems:
 - a. Pavement marking maintenance and repair
 - b. Sign maintenance and repair
 - c. Safety device maintenance and repair
 - d. Signal maintenance and repair
 - e. Lighting maintenance and repair
 - f. Intelligent transportation system maintenance and repair
5. Cleaning
 - a. Pavement sweeping and cleaning
 - b. Litter control
 - c. Trash collection

Note any items that are not applicable, accompanied with a short reason for the “not applicable” listing.



EW

30 POINTS MAX

ENVIRONMENT & WATER

The intent of this category is to promote environmental stewardship efforts related to land use, habitat, water, and other ecological resources that go above and beyond minimum regulatory requirements. The Environment & Water Category is one of the most challenging and important categories in the Rating System for sustainable transportation projects.



Transportation infrastructure projects have major environmental impacts within and outside of urban areas. In undeveloped areas, transportation facilities can degrade, fragment, and destroy sensitive and critical habitats over great distances. In urban areas, transportation infrastructure contributes to poor air and water quality, waste generation, and other environmental health issues. Many of the credits in the Environment & Water Category encourage selection and implementation of environmental best practices that consider and minimize impacts.

The following credits in this category have multiple paths or percentage-based performance measures, which, if achieved, may be eligible for Extra Credit in the Creativity & Effort Category.

- EW-2 Ecological Connectivity
- EW-3 Habitat Conservation
- EW-4 Land Use Enhancements
- EW-5 Vegetation Quality
- EW-6 Soil Management
- EW-8 Runoff Flow Control
- EW-9 Enhanced Treatment: Metals
- EW-10 Oil & Contaminant Treatment

CONSTRUCTION ACTIVITIES

The intent of this category is to promote environmental, social, and economic best practices for construction beyond minimum compliance.

Sustainable construction is about more than minimum environmental compliance. When implemented from the start of construction, construction best management practices—such as waste management and water conservation—can help mitigate acute construction impacts to nearby habitats, reduce release of pollutants to water bodies, and save valuable natural resources and money.

Beyond resource management, construction projects carry substantial economic development opportunities and social impacts by providing work for local trades and small businesses and by vigilantly monitoring health and safety. Credits in the Construction Activities Category can also help support local policy goals, including economic development, economic vitality, and green job creation.

Contractors with good business practices—such as environmental, health, safety, and quality programs—will help ensure project delivery is more sustainable in the long term. As a result, credits in the Construction Activities Category focus on a contractor’s contributions to sustainability, as well as the local economic and social impacts of construction works.

The following credits in this category have multiple paths or percentage-based performance measures, which, if achieved, may be eligible for Extra Credit in the Creativity & Effort Category.

- CA-1 Environmental Excellence
- CA-2 Workzone Health & Safety
- CA-3 Quality Process
- CA-4 Equipment Fuel Efficiency
- CA-5 Workzone Air Emissions
- CA-7 Accelerated Construction
- CA-10 Fair & Skilled Labor
- CA-11 Local Economic Development



MATERIALS & DESIGN

The intent of this category is to promote responsible practices for materials management to lower costs, extend service life, and reduce maintenance.

The median energy used to build one mile of one lane of road is about as much as 100 average U.S. households use in one whole year (2-4 terajoules). That's quite an impactful carbon and energy footprint! The Materials & Design Category seeks to measurably reduce this footprint.

Transportation projects tend to offer plenty of opportunities for the creative reuse, recycling, and reduction of overall resource intensity. Credits in the Materials & Design Category are often associated with high return on investment, which reduces the bottom line with lower costs for initial construction, lifetime cost savings, and maintenance, as well as big environmental savings upfront and for a lifetime.

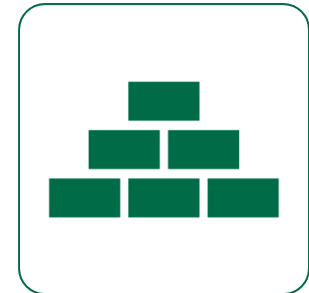
The following credits in this category have percentage-based performance measures, which, if achieved, may be eligible for Extra Credit in the Creativity & Effort Category:

- MD-2 Recycled & Recovered Content

No credits in the MD category may achieve Extra Credit for pursuit of multiple calculation options.

Three credits in the MD Category are eligible for Extra Credit in the Creativity & Effort Category for disclosing and computing specific cost information when compared to a reasonable conventional alternative. Additional information regarding Extra Credit computations is provided in the following credits:

- MD-1 Preservation & Reuse
- MD-2 Recycled & Recovered Content
- MD-6 Long-Life Design



UTILITIES & CONTROLS

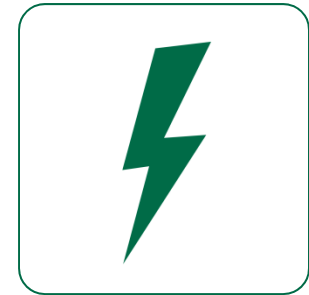
The intent of this category is to promote best practices for improved operations, efficient systems, improved mobility, and enhanced user experience.

Without systems, controls, and maintenance, transportation projects do not function efficiently, safely, or effectively. However, unlike buildings, the majority of energy use from the operation of transportation projects does not usually come from electricity usage. Instead, the burning of fossil fuels for motor vehicle travel makes the transportation sector third in energy consumption and second in generation of greenhouse gas emissions. Also, transportation projects are often located in utility infrastructure corridors where multiple opportunities for infrastructure improvements may exist to avoid future maintenance issues due to aging or underperforming systems.

Credits in the Utilities & Controls Category apply to Projects that employ alternative systems and technologies choices which may be more energy efficient, improve congestion and commutes for better user experience and behavior, reduce lifetime maintenance and operational expenses, and help reduce environmental impacts.

The following credits in this category have multiple paths or percentage-based performance measures, which, if achieved, may be eligible for Extra Credit in the Creativity & Effort Category.

- UC-4 Energy Efficiency
- UC-5 Alternative Energy
- UC-6 Lighting & Controls
- UC-7 Traffic Emissions Reduction
- UC-8 Travel Time Reduction



ACCESS & LIVABILITY

The purpose of this category is to promote best practices for improved quality of life, including safety, human health, accessibility, social justice, and placemaking.

Transportation project goals often include encouraging new economic development and community interaction, while improving quality of life for all users and increasing transportation choices. Credits in the Access & Livability Category highlight Projects that incorporate multiple modes, providing safer access and better mobility to the area and its local amenities. A context-sensitive approach to design and construction of the Project also allows a community's culture and history to be preserved and celebrated in many creative and beautiful ways.

Credits in the Access & Livability Category often align with transportation agency strategic objectives or other local policy goals, including Complete Streets and other active transportation initiatives, economic vitality objectives, vehicle-miles traveled (VMT) reduction goals, and more.

The following credits in this category have multiple paths or percentage-based performance measures, which, if achieved, may be eligible for Extra Credit in the Creativity & Effort Category.

- AL-1 Safety Audit
- AL-3 Multimodal Connectivity
- AL-4 Equity & Accessibility
- AL-5 Active Transportation
- AL-7 Noise & Glare Reduction
- AL-8 Culture & Recreation
- AL-9 Archaeology & History
- AL-10 Scenery & Aesthetics



CREATIVITY & EFFORT

The intent of this category is to promote best practices that are unique and exceed performance expectations.

The Creativity & Effort Category rewards teams that employ a creative, context-sensitive approach to understanding how the Project can ultimately serve community needs and fit local values. It provides room for and recognition of innovative ideas that can help future project teams be successful with new best practice ideas and activities that are environmentally, socially, and economically more sustainable.

No credits in the Creativity & Effort Category are eligible for Extra Credit beyond the stated maximum points for each credit.



MY NOTES

AND ERRATA

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