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THE SUSTAINABLE SITES INITIATIVE™



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THE SUSTAINABLE SITES INITIATIVE™



An interdisciplinary effort to create voluntary national guidelines and a rating system for sustainable land design, construction and maintenance practices for landscapes of all types, with or without buildings



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The Sustainable Sites Initiative™ (SITES™) is an interdisciplinary effort that was founded in 2005 by the American Society of Landscape Architects (ASLA), the Lady Bird Johnson Wildflower Center at the University of Texas at Austin, and the United States Botanic Garden, to create voluntary national guidelines and performance benchmarks for sustainable land design, construction and maintenance practices.



Success of Green Building

As of 2010, green building accounted for 25% of all new construction activity.

The green building market size is expected to reach \$135 billion by 2015.

The value of green building construction starts was up 50% from 2008 to 2010— from \$42 billion to \$55 billion-\$71 billion.

Source: McGraw-Hill Construction (2010). Green Outlook 2011: Green Trends Driving Growth.

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Green building standards developed by the U.S. Green Building Council (USGBC) and other organizations are a growing success story, providing guidance and motivation to reduce the environmental impact of buildings. As these statistics indicate, the practice of green building is becoming increasingly more mainstream.

Additional statistics:

-By 2015, an estimated 40-48% of new nonresidential construction by value will be green, equating to a \$120-145 billion opportunity (Source: McGraw Hill Construction (2010). Green Outlook 2011: Green Trends Driving Growth.

-Over 160,000 professionals hold LEED credentials. (Source: GBCI, 2011)

Despite the clear success of green building, there have been no national standards, until now, to guide those who want to create sustainable *landscapes*. The goal of SITES is to fill this gap.

Guiding Principles

- Do no harm
- Use the precautionary principle
- Design with nature and culture
- Use a decision-making hierarchy of preservation, restoration and regeneration
- Provide regenerative systems as intergenerational equity
- Support a living process
- Use a systems thinking approach
- Use a collaborative and ethical approach
- Maintain integrity in leadership and research
- Instill a sense of stewardship



In the course of identifying specific and measurable criteria for site sustainability, committee members developed a series of principles to guide the development of the *Guidelines and Performance Benchmarks*. These principles remain central to the core values of SITES™ today.

Sustainable Development

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

Brundtland Report,
Our Common Future (1987)



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SITES also embraced the Brundtland Report’s forward-looking definition of sustainable development.

In the Initiative’s words, “sustainability is defined as design, construction, operations, and maintenance practices that meet the needs of the present without compromising the ability of future generations to meet their own needs.”

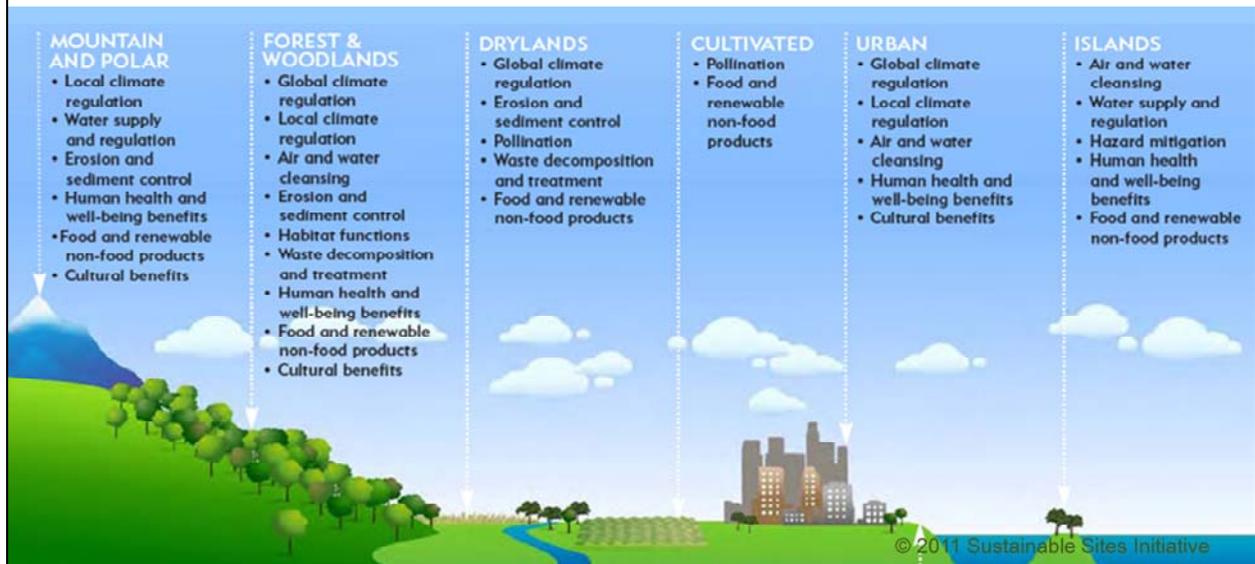
A site can be sustainable over the long term only if it addresses competing demands on three fronts:

- 1) Economically, this includes having profitable, competitive and enduring places to live, work and visit.
- 2) Socially, this means shaping a community that allows us to live healthy, productive lives.
- 3) Environmentally, this ensures that the global ecosystem can continue to provide the basic ecosystem services that all life relies on.

The concept of “ecosystem services” will be covered further on the next slide.

Framework: Ecosystem Services

- | | |
|---|--|
| Regulate global and local climate | Decompose, treat, and re-use waste |
| Detoxify and cleanse air, soil and water | Provide human health and well-being benefits |
| Regulate water supply | Provide food and non-food products |
| Control erosion and retain sediment | Provide cultural, educational and aesthetic values |
| Provide refuge and nursery habitat / pollination services | Mitigate potential hazards |



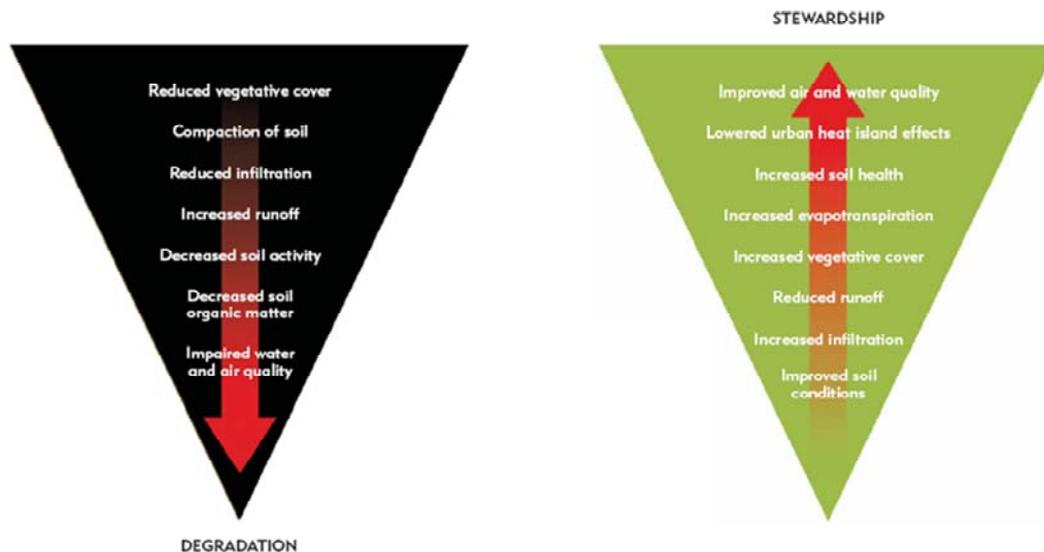
SITES is based on the concept of **ecosystem services**, the idea that healthy ecosystems provide goods and services of benefit to humans and other organisms. These include services of clean air and water, temperature regulation, and improved quality of life.

Like buildings, landscapes can conserve resources or degrade and waste them. However, landscapes are unique in that **they also have the additional capacity to enhance and regenerate natural resources – as shown here**. Because a sustainable site can provide these **ecosystem services**, it can actually **improve** environmental quality rather than simply minimizing the damage to natural systems.

In 1997, the economic value of these services was estimated to be \$33 trillion annually, or roughly equivalent to the entire Global GNP (Costanza et al. 1997).

The *Guidelines and Performance Benchmarks* developed by the Sustainable Sites Initiative™ are based on the best available science and research, a thorough understanding of healthy systems, and the best practices that permit built landscapes to support natural ecological functions.

Paradigm Change



Conservation to Regeneration through High Performance Landscapes

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The opportunity to quantify human benefits from ecosystem services represents a paradigm shift in the way society relates to the environment. It is based on the premise that human beings are a part of (rather than apart from) the rest of nature.

Humans are fully dependent on the services that natural systems provide and have a role in participating in and protecting the ecological systems which provide those services.

SITES suggests that change moves from a **conservation principle to ultimately a production and regenerative outcome, through High Performance Landscapes.**

Project Applications



parks, trails, campgrounds
industrial & office parks
government & medical complexes
conservation easements

botanical gardens
university campuses
residential sites
streetscapes & plazas

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The Guidelines and Performance Benchmarks are intended to apply sustainability principles to any site, **with or without buildings**, including landscapes of all sizes such as parks, recreational facilities, enhanced streetscapes, military bases, and more.



Project Timeline

Guidelines & Performance Benchmarks 2009: Released November 2009

Pilot Project Phase: June 2010 – June 2012

Revised Guidelines & Performance Benchmarks/Reference Guide:
Target 2012/13

Open Enrollment: Target 2013

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Guidelines and Performance Benchmarks 2009 (published November 5, 2009)

A compilation of current research, technology, and practices to provide technical guidance and performance benchmarks for sustainable land development and management practices. This report includes a 250 point rating system with weighted credits and a recognition system. These ratings will recognize performance in achieving a sustainable site, much as LEED standards recognize sustainable buildings. This is a pilot rating system.

Pilot Phase

SITES is currently working with over 150 diverse projects across the country to examine how well the rating system applies to design, construction and maintenance practices. Using data from the projects, SITES will refine the rating system.

Sustainable Sites Initiative Reference Guide/Revised Guidelines and Performance Benchmarks (target publication date late 2012/early 2013)

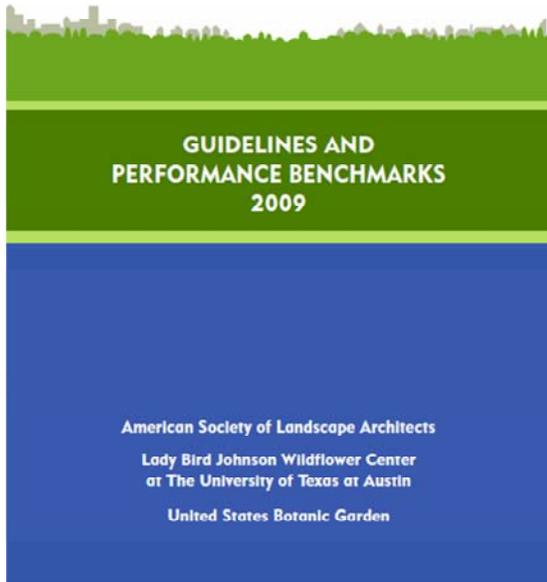
A user guide containing information from pilot projects that will explain credit requirements and provide resources to aid in creative problem solving. Updated Guidelines and Performance Benchmarks based on the findings of the Pilot Phase.

Open Enrollment:

Operate SITES on an on-going basis, openly accepting projects for review and certification.

Overview of SITES™ Guidelines

THE SUSTAINABLE SITES INITIATIVE



Measure a site's sustainability within the context of ecosystem services

250 point scale

Performance based benchmarks

Multiple point levels for many credits

4 levels of Pilot certification

Prerequisites plus:

★ = 100 points (40%)

★★ = 125 points (50%)

★★★ = 150 points (60%)

★★★★ = 200 points (80%)

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The rating system works on a 250-point scale, with levels of achievement for obtaining 40, 50, 60 or 80 percent of available points, recognized with one through four stars, respectively.

If prerequisites are met, points are awarded for the 51 credits covering areas such as the use of brownfields or greyfields; materials; soils and vegetation; and sustainable construction and maintenance practices.

Overview of SITES™ categories



As mentioned in the previous slide, the Sustainable Sites Initiative released the *Guidelines and Performance Guidelines 2009* in November 2009. Building on the 2008 Draft, this report contains 15 prerequisites and 51 credits ranging from site selection to sustainable maintenance and monitoring practices. The guidelines measure the sustainability of a site within the context of ecosystem services. Categories are organized to follow the site design and development process.

Guidelines & Performance Benchmarks 2009



Each Prerequisite and Credit includes:

- Credit Intent
- Requirements
- Submittal Documentation
- Potential Technologies and Strategies
- Links to Other Credits
- Resources

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The *Guidelines and Performance Benchmarks 2009* provides users with a ready-to-use sustainability tool. Each prerequisite and credit is organized into the following sections:

Credit Intent: the desired outcome, or benchmark of the guideline.

Requirements: The performance measures that must be met in order to achieve the guideline

Submittal Documentation: This includes calculations, cost estimates and worksheets, some of which are provided within each credit

Potential Technologies and Strategies: While SITES is not meant to be used as a prescriptive tool, the guidelines contain suggestions for strategies to consider in attaining certain benchmarks, which may facilitate the submittal process

Links to Other Credits: This section identifies connections with other benchmarks, providing users with additional opportunities for recognizing and achieving sustainable outcomes, potentially increasing the number of credits that a project may achieve.

Resources: Each guideline contains additional links to additional reference materials, definitions and other resources.

Economic and Social Benefits: In addition, each guideline contains a boxed section that highlights the economic and social benefits of the specific credit, such as reducing maintenance costs, improving water quality or creating opportunities for community recreational resources etc.

Guidelines & Performance Benchmarks 2009

Site Selection



Site Selection

21 possible points

Select locations to preserve existing resources and repair damaged systems

Prerequisite 1.1: Limit development of soils designated as prime farmland, unique farmland, and farmland of statewide importance

Prerequisite 1.2: Protect floodplain functions

Prerequisite 1.3: Preserve wetlands

Prerequisite 1.4: Preserve threatened or endangered species and their habitats

Credit 1.5: Select brownfields or greyfields for redevelopment (5-10 points)

Credit 1.6: Select sites within existing communities (6 points)

Credit 1.7: Select sites that encourage non-motorized transportation and use of public transit (5 points)

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The following slides take a closer look at a *few* of the prerequisites and credits in the *Guidelines and Performance Benchmarks 2009*.

This slide is an index of Site Selection credits from the *Guidelines and Performance Benchmarks 2009*. Note that the Prerequisites are shown in **bold**. An example of a Site Selection credit follows on the next slide.

Guidelines & Performance Benchmarks 2009: Site Selection

Credit 1.5

Select brownfields or greyfields for redevelopment



- During the site selection process, give preference to previously developed or brownfield sites
- Coordinate site development plans with remediation activity and use of existing infrastructure and materials, as appropriate
- 5 points for selecting greyfield
- 10 points for selecting brownfield

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Credit 1.5 Intent: is to encourage development on urban areas or areas that have been previously-developed, to reduce resource consumption and restore ecosystem services on damaged sites.

Pre-Design Assessment



Pre-Design Assessment and Planning

4 possible points

Plan for sustainability from the onset of the project

Prerequisite 2.1: Conduct a pre-design site assessment and explore opportunities for site sustainability

Prerequisite 2.2: Use an integrated site development process

Credit 2.3: Engage users and other stakeholders in site design (4 points)

The following is an index of Pre-Design Assessment prerequisites and credits from the *Guidelines and Performance Benchmarks 2009*. Note that the Prerequisites are shown in **bold**. An examples of a Pre-Design Assessment prerequisite follows on the next slide.

Guidelines & Performance Benchmarks 2009: Pre-Design Assessment

Prerequisite 2.1

[REQUIRED]

Conduct a pre-design site assessment and explore opportunities for site sustainability



- Use an integrated design team to thoroughly assess the site
- Consider sustainable design options linked to credit options
- Use SITES worksheet to ensure adequate coverage

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The fundamental philosophy of SITES is based on a collaborative design approach. This is demonstrated early on by bringing the team together to look at the site before design begins.

Prerequisite 2.1 Intent: The intent of this credit requires users to conduct a detailed assessment of site conditions and explore options prior to design to inform decisions about site design, construction, operation, and maintenance. This includes using an integrated design team to conduct pre-design assessments about the site, consider how SITES credits are related to the design, and to complete initial calculations to ensure site suitability.

Guidelines & Performance Benchmarks 2009

Site Design - Water



Site Design - Water

44 possible points

Protect and restore processes and systems associated with a site's hydrology

Prerequisite 3.1: Reduce potable water use for landscape irrigation by 50 percent from established baseline

Credit 3.2: Reduce potable water use for landscape irrigation by 75 percent or more from established baseline
(2-5 points)

Credit 3.3: Protect and restore riparian, wetland, and shoreline buffers (3-8 points)

Credit 3.4: Rehabilitate lost streams, wetlands, and shorelines (2-5 points)

Credit 3.5: Manage stormwater on site (5-10 points)

Credit 3.6: Protect and enhance on-site water resources and receiving water quality (3-9 points)

Credit 3.7: Design rainwater/stormwater features to provide a landscape amenity (1-3 points)

Credit 3.8: Maintain water features to conserve water and other resources (1-4 points)

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The following is an index of Water prerequisites and credits from the *Guidelines and Performance Benchmarks 2009*. An examples of a Water credit follows on the next slide.

Guidelines & Performance Benchmarks 2009: Site Design-Water

Credit 3.7
[1-3 points]

Design rainwater/stormwater features to provide a landscape amenity



- Make rainwater/stormwater management features visible, usable, and beautiful
- Document that rainwater falling on site is treated as an amenity through the way it is received, conveyed, and managed on site, and made accessible to site users
- Keep water healthy and clean with natural, chemical-free techniques

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Credit 3.7 Intent: The intent of this credit is to integrate visually and physically accessible rainwater/stormwater features into the site in an aesthetically-pleasing way.

Guidelines & Performance Benchmarks 2009

Site Design – Soils and Vegetation



Site Design – Soil and Vegetation

51 possible points

Protect and restore processes and systems associated with a site's soil and vegetation

Prerequisite 4.1: Control and manage known invasive plants found on site

Prerequisite 4.2: Use appropriate, non-invasive plants

Prerequisite 4.3: Create a soil management plan

Credit 4.4: Minimize soil disturbance in design and construction (6 points)

Credit 4.5: Preserve all vegetation designated as special status (5 points)

Credit 4.6: Preserve or restore appropriate plant biomass on site (3-8 points)

Credit 4.7: Use native plants (1-4 points)

Credit 4.8: Preserve plant communities native to the ecoregion (2-6 points)

Credit 4.9: Restore plant communities native to the ecoregion (1-5 points)

Credit 4.10: Use vegetation to minimize building heating requirements (2-4 points)

Credit 4.11: Use vegetation to minimize building cooling requirements (2-5 points)

Credit 4.12: Reduce urban heat island effects (3-5 points)

Credit 4.13: Reduce the risk of catastrophic wildfire (3 points)

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Index of prerequisites and credits on Soils and Vegetation from the *Guidelines and Performance Benchmarks 2009*. An example follows.

Guidelines & Performance Benchmarks 2009: Soils and Vegetation

Prerequisite 4.3 [REQUIRED]

Create a soil management plan



Prior to construction:

- Indicate designated soil management areas for all site soils
- Indicate locations for all lay down and storage areas
- Describe how restored soils will be protected
- Describe treatment details for each soil zone that will be restored

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Prerequisite 4.3 Intent: The intent of this prerequisite is to develop and communicate to construction contractors a soil management plan (SMP) prior to construction to limit disturbance, assist soil restoration efforts, and define the location and boundaries of all vegetation and soil protection zones.

Guidelines & Performance Benchmarks 2009

Site Design – Materials Selection



Site Design – Materials Selection

36 possible points

Reuse/recycle existing materials and support sustainable production practices

Prerequisite 5.1: Eliminate the use of wood from threatened tree species

Credit 5.2: Maintain on-site structures, hardscape, and landscape amenities (1-4 points)

Credit 5.3: Design for deconstruction and disassembly (1-3 points)

Credit 5.4: Reuse salvaged materials and plants (2-4 points)

Credit 5.5: Use recycled content materials (2-4 points)

Credit 5.6: Use certified wood (1-4 points)

Credit 5.7: Use regional materials (2-6 points)

Credit 5.8: Use adhesives, sealants, paints, and coatings with reduced VOC emissions (2 points)

Credit 5.9: Support sustainable practices in plant production (3 points)

Credit 5.10: Support sustainable practices in materials manufacturing (3-6 points)

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Index of prerequisites and credits on Materials Selection from the *2009 Guidelines and Performance Benchmarks*.

Guidelines & Performance Benchmarks 2009: Materials Selection

Credit 5.7

[2-6 points]

Use regional materials



Use materials, plants, and soils that are sourced near the site

- soils and aggregates within 50 miles
- plants within 250 miles

2 points: 30% sourced regionally

4 points: 60% sourced regionally

6 points: 90% sourced regionally

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Credit 5.9 Intent: The intent of this credit is to purchase plants from providers who reduce resource consumption and waste. An example of a Materials Selection credit follows in the next slide.

Guidelines & Performance Benchmarks 2009

Site Design – Human Health & Well Being



Site Design – Human Health and Well-Being

32 possible points

Build strong communities and a sense of stewardship

Credit 6.1: Promote equitable site development (1-3 points)

Credit 6.2: Promote equitable site use (1-4 points)

Credit 6.3: Promote sustainability awareness and education (2-4 points)

Credit 6.4: Protect and maintain unique cultural and historical places (2-4 points)

Credit 6.5: Provide for optimum site accessibility, safety, and wayfinding (3 points)

Credit 6.6: Provide opportunities for outdoor physical activity (4-5 points)

Credit 6.7: Provide views of vegetation and quiet outdoor spaces for mental restoration (3-4 points)

Credit 6.8: Provide outdoor spaces for social interaction (3 points)

Credit 6.9: Reduce light pollution (2 points)

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Index of prerequisites and credits on Human Health & Well-Being from the 2009 *Guidelines and Performance Benchmarks*. An example follows.

Guidelines & Performance Benchmarks 2009: Human Health + Well Being

Credit 6.3

[2 - 4 points]

Promote sustainability awareness and education



- Provide educational or interpretive elements that explain sustainable site features
and/or
- Provide interactive elements or programming that expands sustainability learning and understanding
and/or
- Create partnerships to extend sustainability education to local community

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Credit 6.3 Intent: The intent of this credit is to interpret on-site features and processes to promote understanding of sustainability in ways that positively influence user behavior on site and beyond.

Guidelines & Performance Benchmarks 2009

Construction



Construction

21 possible points

Minimize effects of construction-related activities

Prerequisite 7.1: Control and retain construction pollutants

Prerequisite 7.2: Restore soils disturbed during construction

Credit 7.3: Restore soils disturbed by previous development (2-8 points)

Credit 7.4: Divert construction and demolition materials from disposal (3-5 points)

Credit 7.5: Reuse or recycle vegetation, rocks, and soil generated during construction (3-5 points)

Credit 7.6: Minimize generation of greenhouse gas emissions and exposure to localized air pollutants during construction (1-3 points)

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Index of prerequisites and credits on Construction from the *2009 Guidelines and Performance Benchmarks*. An example follows.

Guidelines & Performance Benchmarks 2009: Construction

Credit 7.5
[3-5 points]

Reuse or recycle vegetation, rocks, and soil generated during construction



- Soils, mineral/rock waste, and plant material generated during land-clearing
- **3 points:** Reuse 100% within 50 miles
- **5 points:** Reuse 100% on site
- Soils must be reused for comparable to their original function: topsoil for topsoil, etc

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Credit 7.5 Intent: The intent of this credit is to divert from disposal vegetation, soils, and mineral/rock waste generated during construction to achieve a net zero-waste site.

Guidelines & Performance Benchmarks 2009

Operations and Maintenance



Operations and Maintenance

23 possible points

Maintain the site for long-term sustainability

Prerequisite 8.1: Plan for sustainable site maintenance

Prerequisite 8.2: Provide for storage and collection of recyclables

Credit 8.3: Recycle organic matter generated during site operations and maintenance (2-6 points)

Credit 8.4: Reduce outdoor energy consumption for all landscape and exterior operations (1-4 points)

Credit 8.5 Use renewable sources for landscape electricity needs (2-3 points)

Credit 8.6: Minimize exposure to environmental tobacco smoke (1-2 points)

Credit 8.7: Minimize generation of greenhouse gases and exposure to localized air pollutants during landscape maintenance activities (1-4 points)

Credit 8.8: Reduce emissions and promote the use of fuel-efficient vehicles (4 points)

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Index of prerequisites and credits on Operations and Maintenance from the 2009 *Guidelines and Performance Benchmarks*. An example follows.

Guidelines & Performance Benchmarks 2009: Operations + Maintenance

Prerequisite 8.1

[required]

Plan for sustainable site maintenance



- Use an integrated design team to plan for the site's ongoing maintenance
- Include short and long term strategies
- Use SITES worksheet to ensure adequate coverage

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Prerequisite 8.1 Intent: The intent of this prerequisite is to develop a site maintenance plan that outlines the long-term strategies and identifies short-term actions to achieve sustainable maintenance goals.

SITES Pilot Program

- Over 150 Registered Pilot Projects
- Range of project types and sizes, geographic diversity
- Feedback from Pilot Program to inform Reference Guide



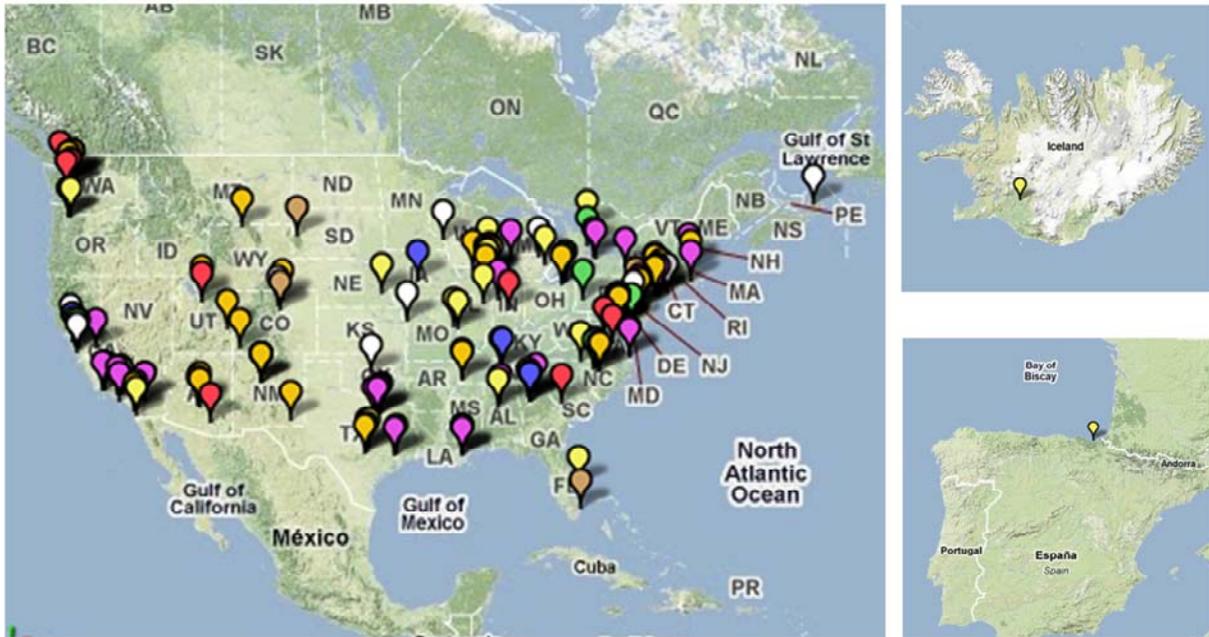
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Pilot Project Update: In conjunction with the release of the *Guidelines and Performance Benchmarks* in late 2009, SITES issued a call for pilot projects to test the rating system. SITES received 345 applications to the Pilot Program, and **over 150 projects have registered** to be a SITES pilot project, from 34 U.S. States and abroad.

Pilot Projects are of all types and sizes, geographic diversity and in all phases of construction. Eligible projects with or without buildings will receive Pilot Certification upon successful completion of the program (meeting all 15 prerequisites and at least 100 credit points). Pilot Projects will serve as a critical resource in informing the development of the revised rating system and SITES user guide, slated for release in late 2012/early 2013.

SITES Pilot Program – Geographic Diversity

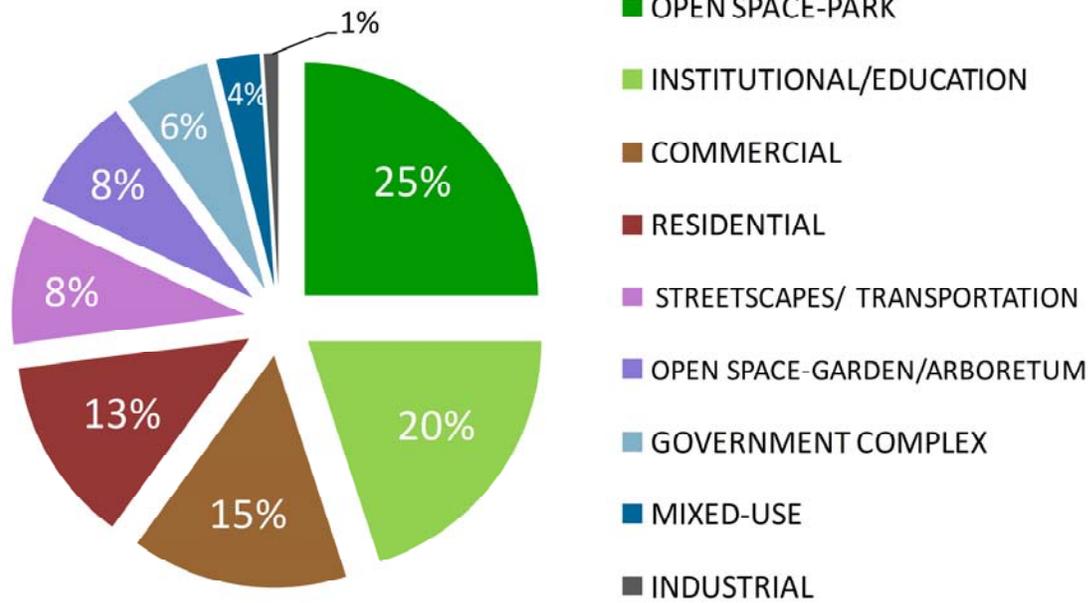
- 34 U.S. states as well as Canada, Iceland and Spain
- Represent disparate US ecoregions



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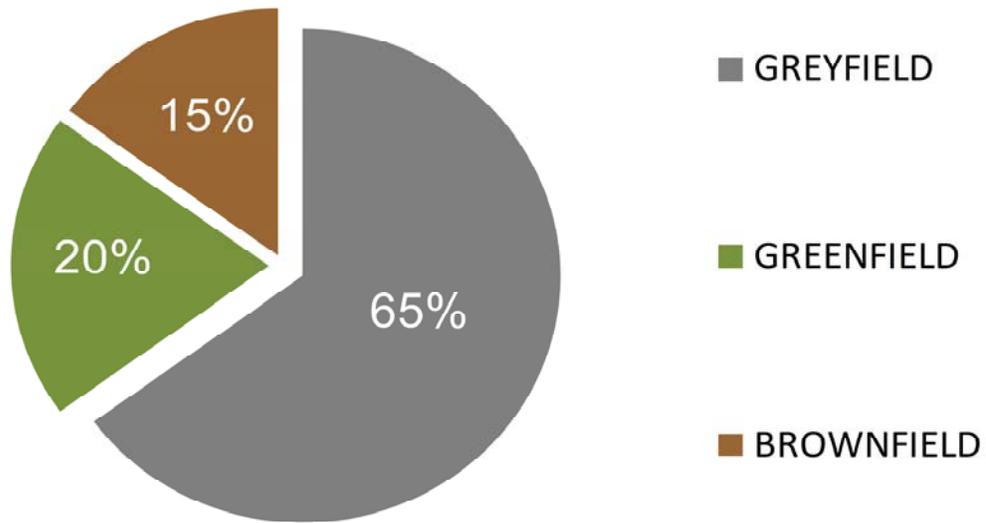
The intent of the pilot program was to assemble representative projects from diverse biogeographic regions, typologies, sizes, and existing land uses and test the *Guidelines and Performance Benchmarks*. The following slides illustrate the range of diversity of the pilot projects.

SITES Pilot Program – Types



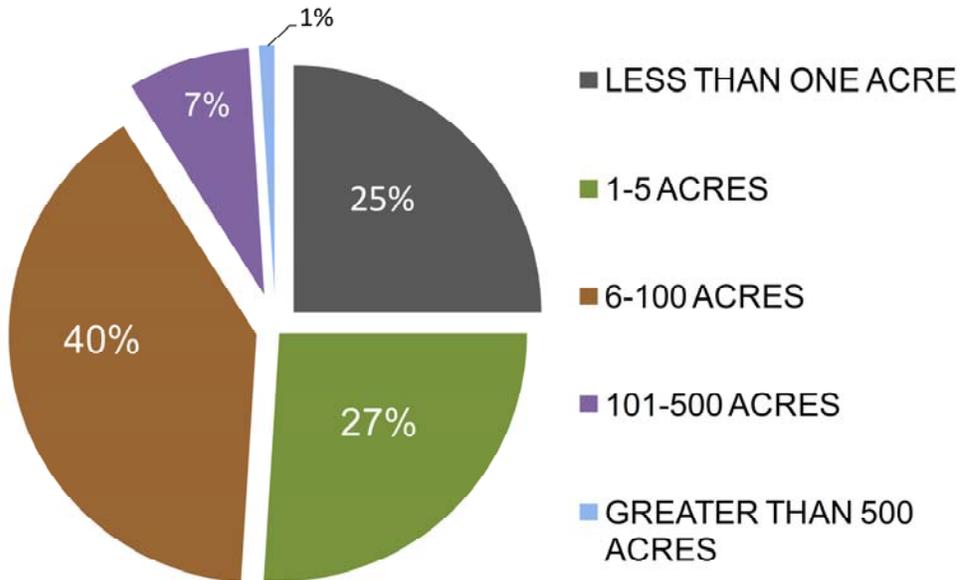
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SITES Pilot Program – Existing Land Use



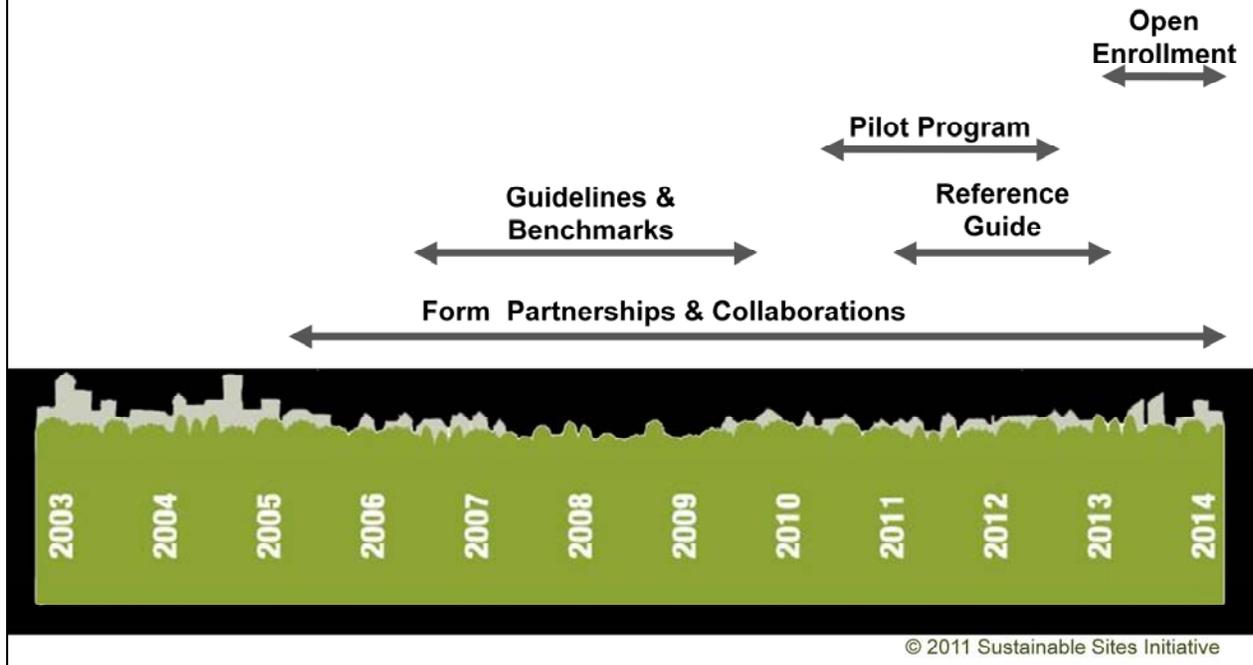
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SITES Pilot Program – Size



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THE SUSTAINABLE SITES INITIATIVE Project Timeline



Schedule Recap:

Guidelines and Performance Benchmarks 2009 released **November 5, 2009**

Pilot Program started **June 2010 (2 year phase)** Staff reviewing project documentation and refining the rating system based on pilot feedback.

Reference Guide: **Target release date: 2012-2013**

Open enrollment: **Target date: 2013**

