The Sustainable Sites Initiative: Translating Science to Performance
LOOKS GREEN BUT IS IT SUSTAINABLE?
STEERING COMMITTEE

American Society of Landscape Architects
Lady Bird Johnson Wildflower Center
United States Botanic Garden

U.S. Green Building Council

U.S. Environmental Protection Agency, GreenScapes Program
National Recreation and Park Association
National Association of County and City Health Officials
The Nature Conservancy, Global Invasive Species Team
University of Texas at Austin, Center for Sustainable Development
American Society of Civil Engineers, Environment & Water Resources Institute
Goods and services, with an estimated combined value of $33 trillion, that are produced by ecosystem processes.

ECOSYSTEM SERVICES

All sites CAN provide ecosystem services
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)
POTENTIAL PROJECT TYPES

Sites with or without buildings:

- parks, trails, campgrounds
- industrial and office parks
- govt. & medical complexes
- conservation easements
- botanical gardens
- university campuses
- residential sites
- streetscapes & plazas

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Research & Evidence Based

- Soils
- Materials
- Vegetation
- Hydrology

Human Health & Well-being
THE SUSTAINABLE SITES INITIATIVE™
An Integrated Approach
LEED
Green Building Rating Systems

- *Leadership in Energy and Environmental Design*
- using tools and performance criteria
- building and development checklist
- started in U.S. in 1998, now 30 countries, 14,000 projects
LEED Performance Checklist

- sustainable site development
- water savings
- energy efficiency and atmosphere
- materials selection
- indoor environmental quality
LEED Ratings

- Certified
- Silver
- Gold
- Platinum
LEED Rating Systems
Bronx Library
(New York City)

New Construction Certification

score: 34/69
rating: Silver
Morrisania Homes
(Bronx NY)

Homes Certification

score: 62/108
rating: Silver
Tepeyac Haven
(WA state)

Homes Certification

score: 68/130
-rating: Gold
Clearview Elementary School
(Hanover PA)

New Construction Certification

score: 42/69
rating: Gold
LEED Certification - Summary

- Performance Criteria = design score
- Rating Levels: Silver, Gold, Platinum
- Adopted widely! Incentive not regulation
- Project certification & professionals are certified
An Integrated Approach
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
- Foster environmental stewardship
Guidelines & Performance Benchmarks

- Site Selection
- Pre-Design Assessment
- Site Design – Water
- Site Design – Soil and Vegetation
- Site Design – Materials
- Site Design – Human Health & Well Being
- Construction
- Operations and Maintenance
- Monitoring and Innovation

released November 2009
RATING SYSTEM

Guidelines & Performance Benchmarks 2009

- 250 point scale
- Recognize % of attainment
- Multiple point levels for many credits
- 4 levels of certification

American Society of Landscape Architects
Lady Bird Johnson Wildflower Center
at The University of Texas at Austin
United States Botanic Garden
Site Selection
*Preserve existing resources and repair damaged systems*

Pre-Design Assessment and Planning
*Plan for sustainability from the onset of the project*

Site Design - Ecological Component
*Protect and restore site processes and systems*

Site Design Human Health Component
*Build communities and a sense of stewardship*

Site Design - Materials Selection
*Reuse/recycle and support sustainable production practices*

Construction
*Minimize effects of construction related activities*

Operations and Maintenance
*Maintain the site for long-term sustainability*
DRAFT PREREQUISITES AND CREDITS

1 SITE SELECTION
Select locations to preserve existing resources and repair damaged systems
1.1 Prerequisite Preserve threatened or endangered species habitat
1.2 Prerequisite Protect and restore floodplain functions of riparian and coastal zones
1.3 Prerequisite Limit disturbance of prime farmland soils, unique soils, and soils of statewide importance
1.4 Credit Select brownfields or greyfields for redevelopment

2 PRE-DESIGN ASSESSMENT AND PLANNING
Plan for sustainability from the onset of the project
2.1 Prerequisite Conduct a pre-design site assessment
2.2 Prerequisite Use an integrated design process
2.3 Prerequisite Develop a program plan with site performance goals
2.4 Credit Engage users and other stakeholders in meaningful participation in site design

3 SITE DESIGN—ECOLOGICAL COMPONENTS
Protect and restore site processes and systems
3.1 Prerequisite Control and manage invasive species
3.2 Prerequisite Use appropriate, non-invasive plants
3.3 Prerequisite Preserve special status trees
3.4 Prerequisite Reduce potable water consumption for irrigation
3.5 Credit Minimize or eliminate potable water consumption for irrigation
3.6 Credit Preserve and restore plant biodiversity onsite
3.7 Credit Minimize building heating and cooling requirements with vegetation
3.8 Credit Reduce urban heat island effects
3.9 Credit Promote a sense of place with native vegetation
3.10 Credit Preserve and restore native wildlife habitat
3.11 Credit Protect and restore riparian and wetland buffers
3.12 Credit Repair or restore damaged or lost streams, wetlands, and coastal habitats
3.13 Credit Preserve existing healthy soils
3.14 Credit Preserve existing topography
3.15 Credit Restore soils disturbed by previous development
3.16 Credit Manage water on-site
3.17 Credit Cleanse water on-site
3.18 Credit Eliminate potable water use in ornamental or stormwater features
3.19 Credit Minimize use of potable water in water features designed for full human contact
3.20 Credit Mitigate potential wildfire risks

4 SITE DESIGN—HUMAN HEALTH COMPONENTS
Build strong communities and a sense of stewardship
4.1 Credit Promote equitable site design, construction, and use
4.2 Credit Promote sustainability awareness and education
4.3 Credit Provide for optimum site accessibility, safety, and visibility
4.4 Credit Provide views of the natural environment to building occupants
4.5 Credit Provide opportunities for outdoor physical activity
4.6 Credit Connect site to surrounding resources, amenities, and services
4.7 Credit Provide outdoor spaces for mental recreation
4.8 Credit Provide outdoor spaces for social interaction
4.9 Credit Design stormwater management features to be a landscape amenity
4.10 Credit Prevent and control sensory stress
4.11 Credit Protect and promote unique cultural and historical site attributes

5 SITE DESIGN—MATERIALS SELECTION
Reuse/recycle existing materials and support sustainable production practices
5.1 Prerequisite Eliminate use of lumber from threatened tree species
5.2 Credit Support sustainable practices in plant production
5.3 Credit Support sustainable practices in materials manufacturing
5.4 Credit Reuse on-site structures, hardcore, and landscape amenities
5.5 Credit Use salvaged and recycled content materials
5.6 Credit Use certified wood
5.7 Credit Use products designed for reuse and recycling
5.8 Credit Use adhesives, sealants, paints, and coatings with reduced VOC emissions
5.9 Credit Conduct a life cycle assessment

6 CONSTRUCTION
Minimize effects of construction-related activities
6.1 Prerequisite Create a soils management plan
6.2 Prerequisite Restore soils disturbed during construction
6.3 Credit Achieve a carbon-neutral site
6.4 Credit Divert construction and demolition materials from disposal
6.5 Credit Control and retain construction pollutants
6.6 Credit Use excess vegetation, rocks, and soil generated during construction

7 OPERATIONS AND MAINTENANCE
Maintain the site for long-term sustainability
7.1 Prerequisite Plan for sustainable landscape maintenance
7.2 Credit Minimize exposure to localized air pollutants
7.3 Credit Recycle organic matter generated during site operations and maintenance
7.4 Credit Provide for storage and collection of recyclables
7.5 Credit Use renewable sources for site outdoor electricity
EXAMPLE CREDIT

1.4 Credit Select brownfields or greyfields for redevelopment

Intent
Channel development to urban areas with existing infrastructure and rehabilitate damaged sites to reduce pressure on undeveloped land and restore ecosystem services.

Requirements
• Option 1 Brownfield redevelopment: Select a site documented as contaminated (by means of an ASTM E1903-97 Phase II Environmental Site Assessment or a local Voluntary Cleanup Program) OR a site defined as a brownfield by a local, state, or federal government agency.
• OR
• Option 2 Greyfield redevelopment: Select a site that has been previously developed or graded.

Suggested submittal documentation
• Option 1: Provide confirmation that the existing site was documented as contaminated or defined as a brownfield, and provide a detailed narrative describing the site contamination.
• OR
• Option 2: Provide a site vicinity plan (e.g., sketches, block diagrams, maps, and aerial photographs) showing the project site and the surrounding sites and buildings.

Technologies and strategies
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.

Ecosystem services addressed:
• Global climate regulation
• Air and water cleansing
• Waste decomposition and treatment
• Human health and well-being benefits
• Cultural benefits

Economic and social benefits:
Brownfield and greyfield redevelopment reduces pressure on undeveloped land, thereby protecting habitat and preserving natural resources. Using existing infrastructure and on-site materials as resources can reduce project costs for new materials. The rehabilitation of a site with environmental contamination is an opportunity to improve the environmental quality and resources available to local communities. Such properties may also cost less and be offered for sale with tax incentives.
Research & Evidence Based

- Soils
- Vegetation
- Hydrology
- Materials
- Human Health & Well-being
HUMAN WELL-BEING goals:
• Design and maintain conditions to promote physiological health
• Enhance human cognitive function
• Promote positive social dynamics

HUMAN WELL-BEING potential strategies:
• Provide a sense of security
• Coherent design – repeated themes and textures
• Provide both visual and physical access
• Provide opportunities to interact with nature
• Offer places for rest and reflection
C 1.6 Select sites within existing communities
C 1.7 Select sites that encourage non-motorized transportation and use of public transit
C 2.3 Engage users and other stakeholders in site design
C 6.1 Promote equitable site development
C 6.2 Promote equitable use of the site
C 6.3 Promote sustainable awareness and education
C 6.4 Protect and maintain unique cultural and historical places
C 6.5 Provide for optimum site accessibility, safety & wayfinding
C 6.6 Provide opportunities for outdoor physical activity
C 6.7 Provide views of vegetation and quiet outdoor spaces for mental restoration
C 6.8 Provide outdoor spaces for social interaction
C 6.9 Reduce light pollution
C 8.6 Minimize exposure to Environmental Tobacco Smoke
Research Reviews

Metro nature - including trees, parks, gardens, and natural areas - enhance quality of life in cities and towns. The experience of nature improves human health and well-being in many ways. Nearly 40 years of scientific studies tell us how. Here's the research...

RESEARCH THEMES

- Livable Cities
- Place Attachment & Meaning
- Community Building
- Community Economics
- Social Ties
- Crime & Fear
- Reduced Risk
- Wellness & Physiology
- Active Living
- Healing & Therapy
- Mental Health & Functioning

http://www.greenhealth.washington.edu

first phase:
June 2010

summaries complete:
Dec 2011

additional products
Local Economics

Trees in cities are not grown and managed for products that can be bought and sold on markets, but they do provide many intangible services and functions! This article serves two purposes. First, it introduces valuation methods that are used to convert intangible benefits to dollar sums. Then, it shows how nonmarket valuations can support local decision-making.

Fast Facts

- The presence of larger trees in yards and as street trees can add from 3% to 15% to home values throughout neighborhoods.
- Averaging the market effect of street trees on all house values across Portland, Oregon yields a total value of $1.35 billion, potentially increasing annual property tax revenues $15.3 million.
- A study found 7% higher rental rates for commercial offices having high quality landscapes.
- Shoppers claim that they will spend 9% to 12% more for goods and services in central business districts having high quality tree canopy.
- Shoppers indicate that they will travel greater distance and a longer time to visit a district having high quality trees, and spend more time there once they arrive.
Promote equitable site development

During construction of the site, ensure that the project provides economic or social benefits to the local community.

**Technologies and Strategies:**

- Low Range - Opportunities for job employment during construction to local, low-income individuals.
- Mid Range - Commit to a living wage requirement for 75 percent of workers employed during construction of the site.
- High Range - Develop a Community Benefits Agreement or similar.

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<th>Promote equitable site development</th>
<th>Economic and Social Benefits</th>
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- **Long-term economic stability** of local families and businesses.
- By capturing economic opportunities that result from site development and **providing these opportunities to local residents**, a site helps support resilient neighborhoods.

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CREDIT 6.3

Promote sustainability awareness and education

Interpret on-site features and processes to promote understanding of sustainability in ways that positively influence user behavior and beyond.

Technologies and Strategies:

- Low range - Provide minimum of 3 educational or interpretive elements.

- High range - Provide interactive elements OR programming that expands sustainability learning and understanding OR create partnerships to extend sustainability education to local community.

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Provide views of vegetation and quiet outdoor spaces for mental restoration

| Provide visual and physical connections to the outdoors to optimize the mental health benefits of site users. |

Technologies and Strategies:
- For sites *without* regularly occupied building(s), provide quiet outdoor spaces accessible to potential users. Provide seating for 5% of total site users.
- For sites *with* regularly occupied buildings, provide quiet outdoor spaces that must be accessible to potential users *within 200’ of the building entrances* and provide seating for 5% of total site users.
- Additional point – provide unobstructed views for 90% of common areas or 75% all windows.

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PROJECT SCHEDULE

Guidelines and Performance Benchmarks Draft 2008
*Released November 2008*

Guidelines And Performance Benchmarks 2009
with Rating System
*Released November 2009*

Pilot Projects Phase
*From 2010 – 2012*

Reference Guide
*Target publication – 2013*
PILOT PROJECTS

For more information, visit www.sustainablesites.org/pilot

sites chosen in 2010 - evaluations underway

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PILOT PROJECTS for credit review and revisions

Below is a summary of the projects participating in the pilot program.

**PROJECT TYPES**
- 25% Open space - Park
- 20% Institutional/Educational
- 15% Commercial
- 13% Residential
- 8% Transportation corridor/ Streetscape
- 8% Open space - Garden/Arboretum
- 6% Government Complex
- 4% Mixed-use
- 1% Industrial

**EXISTING LAND USE**
- 65% Greyfield
- 20% Greenfield
- 15% Brownfield

**PROJECT SIZE**
- 25% Less than one acre
- 27% 1-5 acres
- 40% 6-100 acres
- 7% 101-500 acres
- 1% Greater than 500 acres

**PROJECT LOCATIONS**
- Projects in 34 U.S. States
- 3% of projects outside U.S. in Canada, Iceland and Spain
Ecosystem Services – landscape gradient

Source: Millennium Ecosystem Assessment
Certifiable?

Crissy Field (former Navy airfield, San Fran)
Certifiable?

Pierce Co Environmental Services, WA
Certifiable?

Namba Parks retail center
Osaka, Japan
Certifiable?

Fukuoka City Hall
Tokyo, Japan
Human Dimensions of Urban Forestry and Urban Greening

What's New?

Nature and Consumer Environments
Research about how the urban forest influences business district visitors.

Trees and Transportation
Studies on the value of having quality landscapes in urban roadsides.

Civic Ecology
Studies of human behaviors and benefits when people are active in the environment.

Policy and Planning
Integrating urban greening science with community change.

Urban Forestry and Human Benefits
More resources, studies and links . . .

Research Director
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