

# THE EMERGENCE OF THE SITES RATING SYSTEM FOR ENHANCING PUBLIC PLACES

**Steiner, Frederick**

University of Pennsylvania, fsteiner@design.upenn.edu

**Pieranunzi, Danielle**

Green Business Certification Inc., dpieranunzi@gbci.org

## 1 ABSTRACT

*This paper addresses the results of the Sustainable SITES Initiative, which created the SITES rating system and its emergence as a tool for landscape governance. The method used is reflective analysis from two individuals intimately involved in the design of a distinctive rating system specifically geared toward landscapes and other outdoor spaces. The purpose is to create more understanding of the process of developing the SITES system to demonstrate its interdisciplinary nature and extensive research. A key finding is that the SITES rating system is proving valuable for landscape governance. SITES' contribution to landscape governance is important because it empowers landscape and site design in the development decision-making process, ensuring that essential ecosystem services are protected and restored in our communities. This paper first reviews the history of the design of the SITES rating system. Several examples of how it is being used by federal, state, and local agencies and entities follow, including the U.S General Services Administration, Arizona State University, and the Atlanta BeltLine in Georgia. The paper concludes with prospects about the future applications of SITES in ensuring development projects strive to protect and restore ecosystem services, foster resilience and improve the overall quality of life. SITES elevates the value of sustainable landscapes in development projects (with or without buildings) and in concert, also highlights the importance of landscape architecture in such work.*

### 1.1 Keywords:

Sustainable sites, ecosystem services, site design, landscape governance, resilience

## 2 INTRODUCTION

A landscape is a synthesis of the cultural and natural processes of a place. What we build on the land profoundly affects ecological systems as well as the health, safety, and welfare of human communities (Lady Bird Johnson Wildflower Center et al., 2014a). Any landscape can hold the possibility to both improve and regenerate the natural benefits and services of ecosystems. As such, landscapes provide a suitable framework for governance that promotes sustainability, resilience, health, and equity.

The SITES program at GBCI describes sustainable landscapes as appreciating in value, in contrast to buildings that typically depreciate over time, by continuing to provide many benefits, such as stormwater management, carbon sequestration, less energy use, air and water pollution reduction, habitat protection, and improvements to human health and well-being (GBCI, 2021a). Whether the site is a city park, a university campus, an urban plaza, a cemetery, a schoolyard, or a corporate office, landscapes can be ecologically resilient places that are better equipped to withstand and recover from episodic floods, hurricanes, wildfires, droughts, and other catastrophic events, thus protecting property and people. Landscapes can also be designed to reduce long-term maintenance costs and improve the overall quality of life.

In the early 2000s, several well-established sustainable design interest groups with overlapping agendas were engaged in parallel discussions. The U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating system was measurably changing the building industry in being accountable to specific criteria and metrics that defined sustainable building design and construction. Environmental and landscape-oriented organizations were impressed but felt something was missing and undervalued. This was strongly supported in the 2009 report – *The Case for Sustainable Landscapes*: “The impetus for creating the guidelines came from the recognition that although buildings have national standards for ‘green’ construction, little existed for the space beyond the building skin. Modeled after the LEED® Green Building Rating System™ of the USGBC, the Initiative’s rating system gives credits for the sustainable use of water, the conservation of soils, wise choices of vegetation and materials, and design that supports human health and well-being” (ASLA et al., 2009a, p.5). LEED was wonderfully sophisticated about inside-the-building systems metrics but less so outside the building envelope. For building sites, early LEED suggested the use of native plants and the conservation of water, for example—both worthy objectives but not as thoroughly developed as the building standards.

The American Society of Landscape Architects (ASLA) and the Lady Bird Johnson Wildflower Center (LBJWC) were engaged in these discussions. In 2004, they convened a gathering in Austin, Texas, to explore creating a LEED-like rating system for the landscapes (Steiner, 2011; ASLA et al., 2009b). The event attracted several allied organizations, including the U.S. General Services Administration (GSA), the U.S. Environmental Protection Agency (EPA), and USGBC. The participants committed to developing a new site-scale rating system in cooperation with USGBC, which could be integrated into LEED or used in tandem with it and could also function to assess sustainability for places without buildings.

The Sustainable SITES Initiative was launched soon afterward in 2006, with the U.S. Botanic Garden (USBG) joining the LBJWC and ASLA in leading the effort. Over the subsequent eight years, this core team, with many collaborators, developed the SITES rating system. In 2015, the LBJWC and ASLA transferred the ownership of SITES to GBCI, which oversees LEED and other environmental rating systems. Since then, agencies and entities have adopted SITES in the United States at the federal, state, and local levels. While the use of SITES by private and non-profit groups is certainly important, the adoption of SITES by public entities and agencies at various levels is noteworthy as an indicator of the system’s utility and promise.

SITES was established on the understanding that landscapes are an integral part of the built environment and can be designed and maintained to avoid, mitigate, and even reverse the frequently deleterious impacts of development (Lady Bird Johnson Wildflower Center et al., 2014b; Calkins, 2012; Venhaus, 2012; Pieranunzi et al., 2017). Its adoption by private and public entities in North America and beyond indicates the appeal and need for the rating system and the growing understanding that outdoor spaces can profoundly impact our communities and the environment, in addition to buildings. However, SITES is still relatively new in the market. Additionally, as it is designed for projects undergoing new construction or major renovation, further research is needed to assess how and to what extent more sustainably designed landscapes contribute to providing ecosystem services for the development project and the surrounding community.

This paper first traces the evolution of the Sustainable SITES Initiative that resulted in the SITES rating system. Second, it highlights how SITES is being adopted and employed by agencies and entities at the local, state, and federal levels in the United States.

### **3 A REFLECTIVE HISTORY OF THE SUSTAINABLE SITES INITIATIVE**

The Sustainable SITES Initiative began in 2006 to create a rating system for landscapes like the USGBC's highly successful LEED system for buildings. Although begun in the United States, LEED has also had broad international appeal and use. In its early days, LEED paid relatively little attention to the site beyond the building envelope. While LEED promoted water conservation and use of native plants, for example, it did not place restrictions that would protect healthy, functional systems like floodplains, wetlands and habitat, pay attention to proper soil protection and restoration, or in creating quality outdoor spaces that improve human health and wellbeing. However, its attention to building systems was much more effective than conventional methods. The SITES effort began with the LBJWC of the University of Texas at Austin, the ASLA, and the USBG, which is administered by the Architect of the Capitol. The joint effort fostered close ties with other organizations and government agencies such as USGBC, the EPA, and the GSA. The SITES program was interdisciplinary, involving landscape architects, civil engineers, policymakers, ecologists, botanists, soil scientists, planners, and other environmental and social scientists.

In comparison to other rating systems grounded in industry best practices, SITES from its origins was rooted in science. The ecosystem services concept was used to guide the development of a LEED-like rating system for the outdoors (Windhager et al., 2010; Steiner, 2011). The Wildflower Center staff was the glue that held the initiative together, managing day-to-day operations for the SITES program. The Wildflower Center's leadership was essential as some interested parties pushed back against using ecosystem services as going "too far" and advocating a lower bar of best practices instead. Meanwhile, ASLA reached a wider landscape architecture community and included leading landscape architects from Mithun, Andropogon, OLIN, and other firms to develop the tool. At the same time, USBG provided steady and essential support to keep SITES moving forward.

Beginning in 2006, a SITES steering committee was formed to guide the development of the program and the rating system. In addition to the founding organizations (LBJWC, USBG, ASLA), the committee included a diverse group of interested parties, including the EPA, the National Recreation and Park Association, the American Society of Civil Engineers, leading national landscape architecture firms, USGBC, and others. Drawing from the success of the LEED program and other green development tools, the committee adopted a similarly rigorous approach in creating performance-based benchmarks.

Technical subcommittees were then established that included a committed group of more than 60 recognized experts from across the country (academics, scientists, design practitioners, and policymakers) in five critical areas: soil, vegetation, water, materials, and human health and well-being. The subcommittees were charged with examining and synthesizing the best available science and practices to establish rigorous and comprehensive guidelines and metrics for site planning, design, construction, operations, and maintenance practices.

The SITES Rating System was designed to create clear and practical benchmarks for landscape performance to advance professional practice and transform the market. Rather than simply rewarding projects for compliance with certain prescriptive measures or incorporating a list of desirable features, the system emphasizes measurable performance outcomes and the conservation and enhancement of ecological services and natural functions. Early on, its designers realized that measures and systems for soils, plants, hydrology, and materials vary widely from place to place, so relevant credits focus on regional or local references. In particular, SITES highlights the importance of soil in development projects. It serves as the foundation for robust vegetation, helping to filter pollutants and prevent excess runoff, erosion, sedimentation, and flooding. In SITES, healthy soil and proper topsoil management is a design element and construction priority. The system also pays attention to how outdoor spaces are designed and built for a healthy human habitat — to improve mental and physical wellbeing, strengthen social cohesion, and support social equity. Green infrastructure is promoted throughout the rating system, while resilience and regenerative design are also inherent in SITES credits. Many credits also address how the project can reduce carbon emissions and increase the project's carbon sequestration potential. The rating system is vast, covering various strategies and criteria to ensure a site-specific, high-performance landscape. SITES sought feedback from the general public throughout the development process that was received informally

and systematically and through three formal public comment periods. Transparency was critical to ensuring the system received diverse input from a wider audience.

Drawing from a rich history of design and environmental theory, in 2007, the SITES committee adopted the following principles to guide the development of the program and clarify the elements of creating a sustainable project.

### **3.1 SITES Guiding Principles**

The following SITES Guiding Principles were developed by the original founding partners and associated technical committees. These principles informed the development of specific and measurable criteria for site sustainability, and can also be applied to the land design and development process (GBCI, 2021).

1. **Do no harm.**  
Make no changes to the site that will degrade the surrounding environment. Promote projects on sites where previous disturbance or development presents an opportunity to regenerate ecosystem services through sustainable design.
2. **Adopt the precautionary principle.**  
Be cautious in making decisions that could create risk to human and environmental health. Some actions can cause irreversible damage. Examine a full range of alternatives—including no action—by being open to contributions from all potentially affected parties.
3. **Design with nature and culture.**  
Create and implement designs that are responsive to economic, environmental, and cultural conditions with respect to the local, regional, and global context.
4. **Use a decision-making hierarchy of preservation, conservation, and regeneration.**  
Maximize and mimic the benefits of ecosystem services by preserving existing environmental features, conserving resources in a sustainable manner, and regenerating lost or damage ecosystem services.
5. **Provide regenerative systems as intergenerational equity.**  
Provide future generations with a sustainable environment supported by regenerative systems and endowed with regenerative resources.
6. **Support a living process.**  
Continuously re-evaluate assumptions and values and adapt to demographic and environmental change.
7. **Use a systems thinking approach.**  
Understand and value the relationships in an ecosystem and use an approach that reflects and sustains ecosystem services and re-establishes the integral and essential relationship between natural processes and human activity.
8. **Use a collaborative and ethical approach.**  
Encourage direct and open communication among colleagues, clients, manufacturers, and users to link long-term sustainability with ethical responsibility.
9. **Maintain integrity in leadership and research.**  
Implement transparent and participatory leadership, developing research with technical rigor, and communicate new findings in a clear, consistent, and timely manner.
10. **Foster environmental stewardship.**  
In all aspects of land development and management, foster an ethic of environmental stewardship—an understanding that responsible management of healthy ecosystems improves the quality of life for present and future generations.

### 3.2 Credits to Protect and Restore Ecosystem Services

Typical development processes often attach minimal importance to landscape design issues and consider them only at the end of project planning and even development. In contrast, SITES moves these critical considerations to the forefront of decision-making and project planning to facilitate integrated building and landscape design. The integrative design process (a SITES prerequisite) is the foundation needed for a team to optimize site performance – by identifying and executing synergistic opportunities across different disciplines throughout all phases of design and construction. As stated in the SITES v2 Rating System, innovative solutions are more likely to emerge when experts from several disciplines pool their talents and expertise (Lady Bird Johnson Wildflower Center et al., 2014a). Sustainable goals and practices are easier and often less expensive to achieve when different perspectives are brought to bear on common goals. Thus, in order to change the outcome or performance of a project, the process for getting there must also change. In other words, SITES is not solely a certification system; it is a mechanism for advocacy and education to the public and professional practice. It is a means to elevate the awareness and value of landscapes (and ecosystem services) in our society and design accordingly. The central message of SITES is that any development project – commercial sites, parks, residential landscapes, public gardens, academic campuses, roadsides, cemeteries, and more – has the capacity to protect and regenerate ecosystem services.

Ecologist Gretchen Daily, professor of environmental science at Stanford University and author of *Nature's Services: Societal Dependence on Natural Ecosystems* (Island Press, 1997), provided this definition: “*Ecosystem services* are the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life. They maintain biodiversity and the production of *ecosystem goods*, such as seafood, forage, timber, biomass fuels, natural fiber, and many pharmaceuticals, industrial products, and their precursors” (Daily, 1997, p. 3). The conception of ecosystem services and the implementation of the concept have advanced in the early 21<sup>st</sup> Century and by scholars and practitioners alike around the world (BenDor et al., 2017; Woodruff and BenDor, 2016; Xiang, 2017; La Rosa, 2019; Hagemann et al., 2020). Daily's original definition has been expanded to include the ecosystem services of designed landscapes in addition to built ones. Employing an ecosystem services framework, the SITES rating system offers an alternative and more effective approach to conventional site-design practices (Pieranunzi et al., 2017).

Resource economists have adopted the term ecosystem services to describe those benefits that the natural environment provides to humans for free. Humans would have to find ways to replace them if the natural environment ceased to provide them. These services, essential for our daily life, include but are not limited to filtering air pollutants; controlling erosion; maintaining fishable, swimmable, and drinkable water; regulating climate; cycling nutrients and waste; and supporting tourism and recreation. In 2011, the value of global ecosystem services was estimated to be approximately \$125 trillion/year, about three times the global gross domestic product (Constanza et al., 2014). An in-depth 2017 analysis assessing urban tree cover and its impact on residential building energy use in the coterminous United States estimates a reduction of 38.8 million MWh or \$4.7 billion in electricity use and 246 MMBtus or \$3.9 billion in heating use annually. The estimated collective reduction in national residential energy use attributable to trees is 7.2% (Nowak et al., 2017).

An accurate assessment of the cost and value of a significant project should include a full accounting of the project's diminishment or enhancement of ecosystem services. Planned landscapes and green infrastructure can protect and even regenerate natural systems. Measuring or estimating the value of ecosystem services and natural capital provided on a project site before and after construction can inform a more thorough understanding and estimate of a project's value and its impacts on associated communities, economies, and natural systems in the short and long term. For example, when wetlands are lost to development, new and costly levees, pipes, and pollution-control technology must often be constructed to perform the functions those wetlands previously provided naturally. Such functions may include storm surge protection, flooding control, and water filtration and provide additional benefits such as wildlife habitat, which may also contribute to recreation and tourism. In contrast, front-end planning and design that protects or enhances these natural functions can benefit the environment, property owners, and local and regional communities and economies by reducing the real costs of maintaining and replacing them.

At the launch of the 2009 rating system, the National Recreation Park Association's former chief public policy officer and SITES Steering Committee member Rich Dolesh announced: “The new system

has potential to make a large impact on local and regional parks throughout the country. Many park planners, landscape architects and park administrators have told us that they've always felt there is a lack of an equivalent system for landscapes to the LEED (Leadership in Energy and Environmental Design) rating system, the international standard for green building, and thus there was no way to receive credit for exemplary practices" (NARRP, 2010).

The initial 2009 rating system (i.e., SITES "v1") was used by practitioners in 162 pilot projects (from the over 300 who expressed an interest) to assess the effectiveness of the system and to refine it. Most of these projects were in the United States, but projects in Canada, Spain, and Iceland participated too, an indicator of international interest which continues. Field testing the draft rating system was essential to understanding how it worked on the ground with various project types, sizes and contexts, and where refinement was needed in the rating system. That work resulted in a second iteration of the rating system, called SITES v2 (Lady Bird Johnson Wildflower Center et al., 2014a).

### **3.3 Launching the SITES v2 Rating System**

The SITES v2 Rating System is directed toward new construction or major renovation of existing sites, as with the previous version. The rating system is designed for any site, whether urban, suburban, or rural, which will be protected and developed for public or private purposes. Although SITES is available for use by greenfield, greyfield, and brownfield sites, it strongly encourages the redevelopment of degraded sites through its credit system to restore ecosystem services where they have been lost or degraded.

The organization of the rating system generally corresponds to the typical project design and development phases. The SITES v2 certification levels (Certified, Silver, Gold, and Platinum) mirror LEED certification nomenclature and replace the one to four-star recognition used in the pilot program. The entry point for certification (meeting the prerequisites) and the four certification levels were re-evaluated and refined in SITES v2 to encourage broad participation while at the same time raising the bar for site sustainability. The rating system includes 10 sections that cover various stages of the design and development process. SITES v2 assigns value to each of the 48 credits based on a credit's relative impact on improving sustainability and protecting and restoring ecosystem services. Projects receive SITES certification by fulfilling minimum requirements (i.e., prerequisites) as well as achieving specified numbers of points for different levels of performance. Bonus points are awarded for innovative and exemplary performance outside the 200-point system. The value or number of points assigned to each credit is based on its potential effectiveness in meeting the four goals outlined below.

#### SITES Goals

1. Create regenerative systems and foster resiliency
  - Protect and restore natural resources such as soil, water, and vegetation.
  - Protect and restore biodiversity.
  - Enhance landscapes to provide multiple ecosystem services such as cleaning air and water, providing habitat, and storing carbon.
  - Mitigate for evolving hazards and natural disasters.
  - Plan for monitoring and adaptive management.
2. Ensure future resource supply and mitigate climate change
  - Minimize energy consumption and encourage use of low carbon and renewable energy sources.
  - Minimize or eliminate greenhouse gas emissions, heavy metals, chemicals, and other pollutants.
  - Reduce, reuse, recycle, and upcycle materials and resources.
  - Conserve water.
  - Increase the capacity of carbon sinks through re-vegetation.
3. Transform the market through design, development, and maintenance practices
  - Foster leadership in industry and professional practice.
  - Use a systems-thinking, integrative and collaborative design approach.
  - Use lifecycle analyses to inform the design process.
  - Support local economies and sustainability policies.
4. Enhance human well-being and strengthen community
  - Reconnect humans to nature.
  - Improve human health (physical, mental, and spiritual)

- Foster stewardship by providing education that promotes the understanding of natural systems and recognizes the value of landscapes.
- Encourage cultural integrity and promote regional identity.
- Provide opportunities for community involvement and advocacy (Lady Bird Johnson Wildflower Center et al., 2014a, 2014b).

The ecosystem services addressed in the SITES v2 Rating System are linked to specific actions outlined in the 18 prerequisites and 48 credits. They include reduction of greenhouse gas emissions, filtration of air and water pollutants, water conservation, erosion and sediment control, hazard mitigation, conservation and restoration of pollinator and other habitat functions, waste decomposition and treatment, support for food production, enhancements to human health and well-being, among others. Also fundamental to SITES is the concept of resilience, defined as the capacity for a system to survive, adapt, and flourish in the face of turbulent change (Fiksel, 2006). While healthy natural systems tend to be inherently resilient, many constructed systems are poorly designed and on “life support,” needing supplemental irrigation and fertilizer to thrive and regular mowing during the maintenance phase. They are typically not designing with nature. This lack of attention to nature, in turn, creates an unhealthy landscape that serves as a carbon release rather than a carbon sink. Aside from consuming scarce resources and contributing to pollution, these landscapes are often vulnerable to natural and man-made disruptions.

The goal of promoting resilience is embedded throughout the SITES v2 Rating System; for example, it requires the conservation of critical, functioning natural features (e.g., wetland, floodplains) and rewards ecological restoration of degraded areas. SITES guides projects to create a healthy, functioning, and biodiverse system that can respond, adapt, and recover quickly to a changing climate and other disturbances. This goal was tested recently with a SITES certified project on the coast of Alabama. Gulf State Park Lodge -- a Hilton Hotel in Gulf Shores, Alabama — set out to create an international benchmark of economic and environmental sustainability, demonstrating best practices in the design and operation of facilities in the hospitality sector (The Sustainable SITES Initiative, 2019a; Sasaki, 2018). A traditional hotel landscape mostly serves as “decoration” and requires a significant amount of water, energy, and chemical pesticides and fertilizers to maintain. In contrast, the Gulf State Park Lodge landscape provides habitat for wildlife, buffers the buildings from future storm surges, and naturally filters and absorbs stormwater through wetlands and swales. In short, it was designed to optimize all those services that intact ecosystems inherently provide while also creating a beautiful vacation setting for guests.

The original Lodge at Gulf State Park was located close to the water, directly on top of the primary dunes. Unfortunately, the lodge and the dune system were wiped out by Hurricane Ivan in 2004. In 2010, the British Petroleum (B.P.) Deep Water Horizon disaster flooded the Gulf of Mexico with oil, and tar balls filled the beaches as tourists fled. On September 15, 2020, on the 16th anniversary of Hurricane Ivan’s landfall, Hurricane Sally subjected Gulf State Park to over 12 hours of category 2-3 winds, rain, and storm surge. The new resilient design of the Lodge allowed it to serve as a shelter in the storm for park employees, reporters and recovery teams and resulted in minimal damage. According to Rebecca Dunn Bryant, Principal Architect at Watershed, LLC (sustainability consultant on the project who worked closely with Sasaki Associates), “After the B.P. oil spill disaster, our region had a hard reckoning with the reality that our economy and environment are mutually dependent. People’s lives were deeply affected by the economic devastation of the oil spill, resulting from the environmental devastation. This project was funded by B.P. settlement funds, and SITES helped us to demonstrate that best practices in restoration and conservation support a healthy economy (Figure 1). People protect what they love, and this project will help more people fall in love with Alabama’s Gulf Coast” (The Sustainable SITES Initiative, 2019a).

SITES projects are designed to protect and give back to nature, enhancing and creating ecosystem services that benefit site users and typically those beyond a project’s official “boundary” promoting social equity. In fact, one of SITES Guiding Principles is to “provide regenerative systems as intergenerational equity” (Lady Bird Johnson Wildflower Center et al., 2014a; GBCI, 2021b). In the SITES Rating System, this can translate into protecting any existing site features that are critical, healthy, rare, or sensitive — that provide necessary functions and important resources from floodplains to historical and cultural landscapes. For degraded sites, SITES credits promote ecological restoration and enhance community resilience and vitality. To ensure projects respect and meet community needs, SITES asks projects to engage with the site users, interested parties, and the community in a meaningful and transparent manner before the design is finalized. Subsequent credits in the rating system are in place to support the designs, amenities, and programming that meet the needs of all site users. Additionally, SITES promotes hiring and purchasing

strategies during construction, ones that provide living wages and training and support local businesses. SITES takes a long view of any development project as an investment in our communities, the environment, and our collective future. This may result in more additional project costs in the short run but yield more benefits over time. In many cases, savings are recognized upfront with the input and experience from an interdisciplinary team. “SITES makes you think through the site before you begin to design. It forces you to use a quantifiable framework that creates learning opportunities,” explains Bryan Astheimer from Revision Architecture, who has consulted on three SITES projects so far. “Challenges create growth and ultimately value...I believe that SITES will drive the industry to become more sustainable and transparent” (Green, 2016).

After the release of v2 in 2014, GBCI expressed an interest in acquiring SITES from the LBJWC and ASLA. The SITES original collaborative had worked closely with USGBC and GBCI since the beginning of the process, and elements of SITES had already been incorporated into LEED. GBCI now manages the SITES program, which includes overseeing the certification of projects, the accreditation of professionals (SITES Accredited Professionals or SITES APs) and the evolution and further development of SITES in general. As of July 2021, over 200 projects and more than 744 million gross square feet of outdoor space have registered or certified with SITES, covering 38 U.S. states and Washington, DC and 16 countries. While most of the 76 projects that have been certified as of July 2021 are in the United States, projects in Canada, China, and Japan have also achieved SITES certification, with two projects in Brazil that have achieved SITES precertification. Formally launched in early 2020, precertification recognizes and rewards projects earlier in their planning phase. As of July 2021, eleven projects have also been precertified, mostly in China and Japan. Additionally, one of the largest superfund sites in the U.S. in Butte Montana (approximately 200 acres, 81 hectares) has also achieved precertification. Expanding SITES global presence, the first SITES projects in Uruguay, Spain, Italy, and Saudi Arabia registered in 2020.

The SITES program reviewed in the following section of this paper also illustrates how practice can inform socio-ecological theory advocated by Wei-Ning Xiang (2020). As ecological theory guided the Sustainable SITES Initiative, reflective experiences with the SITES rating system will contribute to our understanding of ecosystem services. For instance, ecosystem services are viewed as those benefits that nature provides to humans at generally no cost. We do not pay for the air we breathe, for example. Instead, we take from nature, often with little thought about what we destroy or diminish in the process. Gretchen Daily and Pamela Matson stress that ecosystem services need to move from theory to implementation. They note that a radical “transformation will be required to move from conceptual frameworks and theory to practical integration of ecosystem services into decision-making, in a way that is credible, replicable, scalable, and sustainable” (Daily and Matson, 2008, p. 9456). SITES offers a tool for such transformation.

#### **4 LANDSCAPE GOVERNANCE AND SITES**

The advantages of SITES include its credibility, replicability, and scalability, and it has inspired SITES use in public projects to guide and verify design decisions toward sustainable outcomes. It also ensures government funds are spent wisely and with the goal of benefitting the community for the long term. These practical applications in landscape governance help inform socio-ecological design practice and theory.

How landscapes are governed contributes to this resiliency potential. De Graaf and colleagues explain: “Landscape governance relates to how various interests in the landscape are balanced in decision-making and how the rules stimulate the sustainable management of the landscape resources” (2017, p.1). Drawing on Kozar et al. (2014), they note that “landscape governance is inherently multi-level, multi-sector, and multi-actor in nature” (De Graaf et al., 2017, p. 5).

During and after the release of the SITES v2 Rating System, governments in the United States began to adapt and to adopt SITES. The first was the New York City Department of Parks & Recreation in 2010. The GSA followed the New York parks department in 2016 and the Atlanta BeltLine in 2018. These examples help illustrate the potential for using SITES in landscape governance and the growing relevance of such systems. Meanwhile, Chicago, Illinois, requires SITES Certification in Section 4.4 of its Sustainable Development Policy Handbook. In Austin, Texas, its Green Building Policy is updated for city council approval to require SITES Certification for projects over \$2 million. In addition, the governor of Arizona issued an executive order in 2005 mandating that all state landscape projects pursue LEED Certification. As a result of the executive order, Arizona State University (ASU) adopted this mandate in its Sustainable

Design Guidelines yet expanded it to include SITES. In December 2020, the Orange Mall Green Infrastructure project became the first SITES v2 certified project at ASU, demonstrating this commitment to the University's overall sustainability goals.

These efforts are noteworthy, in part, because they represent the three principal layers of public agencies and entities in the U.S. system: federal (national), state, and local. This paper focuses on the use of SITES in the United States because that was where the system was developed. The efforts in New York City, the GSA, Arizona, and Atlanta are summarized in more detail below (See also, Steiner, 2020.)

#### **4.1 New York City Parks**

As the SITES developers were in the pilot project stage, the New York City Department of Parks & Recreation adapted the system for its new landscape guidelines (Design Trust for Public Space and the City of New York, 2010). Under the leadership of Mayor Michael Bloomberg and Parks Commissioner Adrian Benepe, the city and the Design Trust for Public Space assembled municipal staff, park advocates, and designers to create a blueprint for designing, building, and maintaining the city's 29,000 acres (11,736 hectares) of parks and open space. It was one measure to help implement the city's 2007 plan, *PlaNYC*, and part of the mayor's strategy to significantly expand parks and open space throughout the city. The resulting *High Performance Landscape Guidelines: 21<sup>st</sup> Century Parks for NYC* (Design Trust for Public Space and City of New York, 2010; Bloomberg, 2020; see also Carlisle and Pevzner, 2012) was closely aligned with SITES as it existed then. This compatibility is stated on the first page of the manual.

The 270-page manual was based on principles about design, ecology, economy, and society. For design, principles were established for engaging all users, integrating nature, and responding to the context of the site. Ecological principles addressed supporting natural functions and increasing diversity and interconnectivity. Resilience and performance were the two economic principles. For society, collaboration and participation, public health, education, and long-term thinking are the key principles. The manual authors presented comprehensive guidelines for sustainable park and open space planning, design, and construction for every new project. The goal was to improve the quality of life for New Yorkers while mitigating the city's global environmental impact. As a result, clearly drawing on SITES, the manual describes strategies for cleaning the air, absorbing stormwater, reducing the urban heat island, addressing climate change, and providing wildlife habitat. These guidelines have subsequently been employed across the five boroughs of the city in park and open place planning. The Hunts Point Landing (Figure 2) is an example of a certified project in New York City that resulted (The Sustainable SITES Initiative (2019b).

#### **4.2 U.S. General Services Administration Capital Construction Program**

The GSA is responsible for supporting the basic functions of federal offices, including buildings and properties across the United States. As a result, the reach of the agency is broad and significant. In 2015-2016, after SITES v2 was published, and as GBCI was assuming leadership for SITES, GSA adopted SITES, with a minimum silver rating, for its capital construction program. This decision was implemented in GSA's *Facilities Standards for the Public Buildings Services* (called the P100 document). GSA believed that the agency needed to address sustainability beyond the building envelope, and with SITES' ecosystem services focus, it was the appropriate tool.

As noted by Christian Gabriel, National Design Director for Landscape Architecture, U.S. General Services Administration, "As a site-focused certification system, SITES is a very useful framework, allowing us to systematically discuss site-related design and construction aspirations and project-level decisions across subject matter experts, project stakeholders, and construction specialists. The SITES system better allows us to bring forward landscape-related project benefits in more measurable terms" (<https://www.asla.org/ContentDetail.aspx?id=46393>).

P100 establishes design standards and criteria for new buildings, site improvements, infrastructural projects, and historical structures for GSA's Public Buildings Service (PBS) (U.S. General Services Administration, 2018). The P100 includes both policy and technical criteria for the programming and design of GSA buildings and facilities. PBS provides workspace for 1.1 million federal employees, primarily within courthouses, ports of entry, and federal offices. PBS acts as a proving ground for green technologies, supports sustainable design, and has over 144,000 acres (58,275 hectares) of land, making it among the largest real estate holders in the United States (U.S. General Services Administration, 2018). GSA participated in the SITES pilot program with projects for a federal office building (Florida) and a courthouse (New Mexico), both of which received certification. GSA currently has 14 SITES v2 projects, including ports

of entry, federal courthouses, and other facilities in various stages of development. One such land port of entry in Columbus, New Mexico (Figure 3), was certified in late 2020 under SITES v2 in addition to achieving LEED Platinum.

#### **4.3 Arizona State University**

In February 2005, Governor Janet Napolitano issued an executive order requiring LEED Silver Certification for all state buildings Executive Order 2005-05). The Executive Order proclaims: “The State of Arizona Governor’s Executive Order 2005-05 mandates that all new state facilities achieve LEED Silver certification. LEED Silver is the minimum standard for Arizona State University (ASU) new construction and major renovation projects with Platinum certification as the goal. Project teams are to design projects to support achievement of ASU’s Sustainability Goals and Vision (<https://cfo.asu.edu/sustainability-goals-and-vision>). ASU has pre-determined LEED credits it usually obtains to assist in building design efficiency, as outlined in Section 3: 01 81 13 ([https://www.asu.edu/fm/documents/project\\_guidelines/Project-Guidelines.pdf](https://www.asu.edu/fm/documents/project_guidelines/Project-Guidelines.pdf)). Compliance with certain LEED credits and sustainability specifications is required for all projects regardless of whether the project is required to achieve LEED Silver certification. All landscape projects are to pursue qualification for Sustainable SITES certification and seek certification when OUA determines it to be appropriate. All parking garages are to pursue qualification for ParkSmart certification and seek certification when OUA and Parking and Transit Services determine it to be appropriate.” Clearly, ecosystem services, such as those provided by shade and water conservation are vital for Arizona’s future.

This is reflected in the Arizona State University (ASU) sustainable guidelines (“Facilities Development and Management Project Guidelines” ([https://www.asu.edu/fm/documents/project\\_guidelines/Project-Guidelines.pdf](https://www.asu.edu/fm/documents/project_guidelines/Project-Guidelines.pdf))). “To address the negative impacts of climate change”, states ASU Project Manager Norman Yatabe, “ASU has committed to leading the world by example and has established a series of sustainability goals which, in essence, permeate all aspects of university life. To meet these goals, ASU’s approach includes advancing sustainable technology and research, converging the university’s mission with its operations, raising awareness of climate change and resource depletion, and learning from the practice of application. Since 2006, ASU has utilized LEED as the measuring stick for sustainable building design,” Yatabe states, “We really see, on the flip side, SITES as that perfect vehicle to help us elevate the significance and role of the landscape in supporting ASU’s sustainability mission” (GBCI, 2021c).

The Orange Mall Expansion (Figures 4 and 5) became the first project certified under the SITES v2 Rating System. Located in the core of ASU’s Tempe Campus, the project replaces a former section of roadway and cul-de-sac with a new pedestrian mall and multi-use plaza for programmed events and informal social gatherings by students, faculty and staff. Developed in concert with the adjacent LEED Platinum and emerging Net Zero Student Pavilion, the project utilizes low impact development (LID) techniques to create an integrated sustainable design solution for both building and site. Connected runnels transfer collected building condensate and stormwater from on-site to a series of planted bio-swales and a rain garden for infiltration and as supplemental irrigation. Excess stormwater flows to a second infiltration gallery for use as groundwater recharge. Students will be actively involved in the on-going monitoring of several site performance factors including stormwater quality and flow rates along with monitoring of space utilization and social interactions. As noted by ASU, this project has strengthened collaboration between academic and operation units of the university to promote sustainable practices in campus landscape design and using campus as a living laboratory integrating research, education, and community outreach, and provides evidence-based design for nature-based solutions applied in hot and arid climate for sustainable and resilient urban environments (<https://herbergerinstitute.asu.edu/research/landscape-architecture-foundation-asu-orange-mall-green-infrastructure>).

#### **4.4 The Atlanta, Georgia, BeltLine**

The Atlanta BeltLine was conceived by Ryan Gravel in his 1999 Georgia Tech thesis. He earned graduate degrees in both architecture and city planning. Gravel’s idea was to create a 22-mile (35 km) loop around the city by converting a ring of abandoned and active freight lines into a system of bike and walking trails, light-rail transit, and parks (Van Mead, 2018). Gravel’s thesis ideas have been pursued by the City of Atlanta since the early 21<sup>st</sup> Century, with additional multi-use paths extending into neighborhoods, resulting in a total of 33 miles (53 km). (Figures 6 and 7). In total, 45 neighborhoods will be linked with the endeavor

that also involves 1,300 acres (526 hectares) of new or renovated open space, 5,600 units of affordable housing, and public art (Day, 2018).

The Atlanta BeltLine Partnership and Atlanta BeltLine, Inc., which are developing the project, have aligned their goals for sustainability with those of the City of Atlanta. As a result, the BeltLine Sustainability Plan embraces SITES. Its guidelines require compliance with the rating system and, since 2018, all parks must achieve silver or gold level certification, becoming the first municipal agency in the world to require SITES (Day, 2018).

Kevin Burke, Director of Design, Atlanta BeltLine Inc., has observed, “In this day and age, we focus too often on the here and now. What Atlanta BeltLine seeks to do is, at its core, create a legacy project that will serve the residents and visitors to Atlanta for the coming decades and beyond. It is critical that we as landscape architects not lose track of that timeframe in all the decisions we make and what urban design in landscape architecture can offer. That is why we adopted SITES for the Atlanta BeltLine. SITES ensure we optimize the parks for the community, providing both short- and long-term benefits.” (Schurch, 2018).

Many other municipalities in the United States are participating in SITES with small neighborhood parks to large regional parks (see Table 1). As Recreation and Park Department General Manager Phil Ginsburg explains, “SITES was invaluable in helping us transform Boeddeker Park (Figure 8) into a safe, inviting and green oasis in San Francisco’s Tenderloin—the city’s densest and poorest neighborhood that is also home to a large population of children and seniors. Nature is woven throughout the project, allowing urban residents to reap the mental and physical health benefits of time in nature.” (Wessel, 2021).

In Nashville, Tennessee, home of the SITES v2 Gold certified Centennial Park, “the principles of sustainability guide decision-making on all of our capital projects,” adds Parks and Recreation’s Tim Netsch. “For landscape projects, SITES has proven to be a useful tool to help organize our sustainability strategy, ensure that we cover the full breadth of considerations, and quantify the outcomes.” (Wessel, 2021). Additionally, more cities, like the City of Austin mentioned above, are also considering adopting SITES for parks and other spaces as they may have done with LEED for building projects. In fact, the first park project in Austin, Mary Elizabeth Branch Park (Figure 9), certified under SITES v2 in early 2021. “Applying SITES strategies to the project had a direct impact on the design and distribution of program elements,” explained Claire Hempel of Design Workshop, the team hired by Catellus to complete the park. “Branch Park has created nature where there once was none. Over 200 trees were planted on a 3.5-acre park site that was former airport runway. The introduction of trees, plants and places for people promotes physical activity, restorative experiences and social interaction.” (Kortick et al, 2021). In addition to advancing the park’s ecological goals, the park was designed with an efficient stormwater management system and as a unique, regionally appropriate civic space.

**Table 1. Local Jurisdictions Using SITES in the United States**

<b>Park</b>	<b>Location</b>	<b>Agency</b>	<b>SITES Status</b>
Blue Hole Regional Park	Wimberley, TX	City of Wimberley, TX	Certified Pilot (v1)
Boeddeker Park	San Francisco, CA	City of San Francisco Recreation and Parks Department	Certified Pilot (v1)
Evans Parkway Neighborhood Park	Silver Spring, MD	The Maryland-National Capital Park & Planning Commission	Certified Pilot (v1)
George "Doc" Cavalliere Park	Scottsdale, AZ	City of Scottsdale Parks & Recreation	Certified Pilot (v1)
Kirke Park	Seattle, WA	Seattle Parks & Recreation	Certified Pilot (v1)
Woodland Discovery Playground	Memphis, TN	Shelby Farms Park Conservancy / Shelby County	Certified Pilot (v1)
Centennial Park	Nashville, TN	Nashville Metro Parks	Certified Gold (v2)
Grant Park Gateway Project	Atlanta, GA	City of Atlanta Parks and Recreation Department	Certified Gold (v2)

Mary Elizabeth Branch Park	Austin, TX	City of Austin / Catellus Development	Certified (v2)
Cully Park	Portland, OR	Portland Parks and Recreation	Registered - In process
Creek Delta at Waterloo Greenway	Austin, TX	City of Austin/ Waterloo Greenway Conservancy	Registered - In process
Earvin Magic Johnson Park	Los Angeles, CA	County of Los Angeles Community Development Commission	Registered - In process
Kingsbury Common at Pease Park	Austin, TX	City of Austin/ Pease Park Conservancy	Registered - In process
Pharr Tennis Center	Austin, TX	City of Austin	Registered - In process
Walnut Park	Walnut Park, CA	County of Los Angeles Parks and Recreation	Registered - In process
Atlanta BeltLine	Atlanta, GA	Atlanta BeltLine, Inc. / the City of Atlanta	Required - SITES Silver or Gold (v2)

(For information on SITES projects, go to [www.sustainablesites.org/directory](http://www.sustainablesites.org/directory).)

## 5 PROSPECTS FOR THE FUTURE USE OF SITES IN LANDSCAPE GOVERNANCE

For landscapes to be effectively used in governance, at least two conditions are necessary. First, the services that landscapes provide must be understood and viewed as relevant and, second, there need to be tools to act. Ecosystem services help with the first condition and SITES with the second. The ecosystem services concept is a useful theory for practice, as illustrated by SITES, as well as related advances in the development of green infrastructure. All landscapes hold the potential to improve and regenerate the natural benefits and services provided by ecosystems. As we advance SITES practice, the experience and reflection about that experience can help advance ecological theory and landscape performance measures. For instance, we may better understand and appreciate our own ecology and how we interact with each other, other species, and our environments. We might advance Patrick Geddes’s idea that we can participate in our own evolution through design and planning (Steiner and McSherry, 2017). The SITES system helps connect people and the decisions they make to nature and society.

As noted earlier, landscapes are an interface between natural and cultural processes. As such, they are a frame to visualize, to experience, and to record ecological and social interactions. These interactions also demonstrate an economic benefit. As stated by Lady Bird Johnson, “The environment is where we all meet, where we all have a mutual interest; it is the one thing all of us share. It is not only a mirror of ourselves but a focusing lens on what we can become.”

In the spirit of Mrs. Johnson, we can watch bees pollinate flowers and note which flowers are preferred. The SITES rating system emphasizes the use of native plants, which are favored by bees and other wildlife. Additionally, SITES encourages green infrastructure to control and clean stormwater, providing several co-benefits such as reducing urban heat islands and air pollution. SITES also pays particular attention to soil conservation and restoration, which tends to be overlooked in conventional developments. Soil formation, defined as a “supporting” ecosystem service, is necessary to ensure all other ecosystem services (regulating, provisioning, and cultural) are provided. Thoughtfully designed outdoor spaces also encourage people to exercise, have mental respite, and recreate, which have many physical and mental health benefits, which is especially important as we spend up to 90% of time indoors.

Additionally, the value of such outdoor spaces and their connection to public health has been elevated during the COVID pandemic. As social scientist Mark Berman describes, “nature is not an amenity—it’s a necessity (for public health). We need to take it seriously” (Wang, 2020). The practices and benchmarks outlined in SITES provides a comprehensive framework vetted by numerous interested parties, project teams, and experts, and offers a multitude of benefits, as shown by the examples noted above and throughout this paper. This makes SITES ideal for planning, designing, and managing spaces in between our buildings or on top of them and for landscapes without buildings. The developers of SITES realized the ecosystem services concept was helpful to raise awareness and elevate the value of

landscapes, design with function in mind in addition to aesthetics, and develop performance measures to understand a site's true impact. SITES, therefore, can be used by government officials to ensure more resilient communities — both socially and ecologically — are created.

In their call to move ecosystem services from theory to implementation, Daily and Matson note: “Around the world, leaders are increasingly recognizing ecosystems as natural capital assets that supply life-support services of tremendous value. The challenge is to turn this recognition into incentives that will guide wise investments in natural capital, on a large scale” (2008, p. 9455). Planners are just beginning to understand how to integrate ecosystem services into urban plans (Woodruff and BenDor, 2016). Scholars have reported the challenges of integrating ecosystem services into planning in Italy (La Rosa, 2019) and Sweden (Hagemann et al., 2020). SITES provides a useful tool for integrating ecosystem services into landscape governance and for demonstrating that ecosystem services are a useful theory for practice. As a result, SITES offers an opportunity and a means for governments from the local to the national to lead and to act.

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