Draft 7

Atlanta Botanical Gardens

Sustainability Case Study

Christy Jellets
Facility Operations Manager, Atlanta Botanical Gardens
President – Atlanta Chapter of IFMA

1.0 Introduction

The Atlanta Botanical Garden ("Garden") is a 30 acre botanical garden in Midtown Atlanta. The Garden is a "Botanical Museum" and a sustainability learning laboratory. Since 1976, the garden's mission is to: "Develop and maintain plant collections for the purposes of display, education, conservation, research and enjoyment[1]".

To advance its mission, the Garden's Board initiated a multi-phase "Green Expansion Plan." During the construction phase the plan emphasized five key areas of human and environmental health:

- Sustainable site development
- Water savings
- Energy efficiency
- Materials selection and
- Indoor environmental quality.

Completed in early-2010, the Green Expansion Plan resulted in a new visitor's center, the building of green roofs, the installation of an underground 100,000 gallon water cistern, the construction of a new pedestrian path, and the planting of a southern seasons garden.

The expansion enhanced the Garden's plant offerings while reducing the overall heat island[3] effect and increased its sustainability features. For example, the new multi-level parking facility, which the Garden shares with neighboring Piedmont Park, occupies only one acre and allows both the Garden and the park to convert existing parking lots to green space. The plan included constructing new facilities including the new Hardin Visitor Center and a 600-foot-long (180 m) Canopy Walk.

The results of this effort are impressive. For example:

- The installation of three green roofs: one intensive green roof which contains deep soil (as much as 18") that allow for shrubs and perennials to grow and create a garden-like landscape; and two extensive green roofs which are shallow and provide just enough soil mix for low growing plants like sedum and native grasses. It is worth noting that the extensive roofs are less expensive to build yet provide most of the benefits of the more intensive design
- A focus on water conservation: a 100,000-gallon capacity cistern was installed underground. The cistern harvests storm water from a seven-acre watershed and provides irrigation for 40% of the new gardens. A rainfall of 1.2 inches is needed to fill it to capacity.
- The installation of nineteen foot doors which are open for nine months during the year and allow for natural ventilation throughout the building and help to claim an energy reduction of 122040 kwh per year – resulting in a savings of $14,644 in 2010
- Recycling granite curbs and reusing materials from the site to preserve the history of the Garden.
- A minimum damage to trees, critical root zones and tree canopies because non-traditional construction practices were used and resulted in the recycling of removed trees into mulch for use on the job-site. However, one tree was commissioned to be transformed into a bench that is now on exhibit at the High Museum of Art.
- A new pedestrian path, linking Piedmont Avenue to the Garden and to Piedmont Park, encourages visitors and staff to walk or cycle.

2.0 Green Expansion Plan – LEED Gold

The U.S. Green Building Council (USGBC) [2] awarded its LEED Gold certification to two elements of the project—the SAGE parking facility, built into a steeply sloped hillside, and the Hardin Visitor Center.

The Hardin Visitor Center is a visually impressive, transparent structure filled with natural light. It contains three green roofs that absorb rainfall and provides both sound and thermal insulation. Runoff is eliminated, as rainwater falling on the green roof is absorbed by the plants. The LEED-certified design includes:

- Natural day lighting
- Green roof overhead
- Insulated glass
- Local and sustainable wood,

The plantings that cover nearly 50% of the Hardin Visitor Center roof area provide:

- Natural cooling,
- Sound insulation,
- Additional garden area for visitors,
- New wildlife habitat.

3.0 Success Factors

Flat Organization Structure

A significant percentage of the staff report directly to the Executive Director including the directors and managers responsible for marketing, development/institutional advancement, education, human resources, finance, facility operations, conservation and the conservatory. All staff members are encouraged to provide input and opinions on all major actions being considered.

Connecting to Stakeholders

Advancing Members' Sustainability Efforts

The Garden has an extensive and ongoing program to help its members identify and implement residential sustainability improvements. Employing a plant hotline, answered daily by volunteers, the Garden answers such sustainable questions as "how to build a rain barrel" and "what is the recipe for compost tea?" With over 300,000 visitors a year, the Garden uses stealth[5] learning opportunities to not only share its collections of beautiful botanical plants but to educate visitors on how to maintain their own landscapes in an environmentally responsible[4] way.

Volunteers

Volunteer participation is critical to the success of the Garden. At present, there are currently over 300 volunteers that work alongside the 97 staff. As volunteers continuously meet with visitors (e.g., talking with visitors during "Breakfast in the Garden", providing "Discovery Cart" education, etc.), they significantly impact the "visitor's experience." Consequently, the Garden supports a comprehensive set of programs to orient, train and guide volunteers including initial and ongoing training, support documentation updates, volunteer staff meetings and newsletters.

Partners

The Garden connects with a number of other organizations to ensure the continuance of its mission, including:

- "Garden To Garden" – a benchmarking initiative with other gardens across the country.
- Membership of the American Public Gardens Association (APGA[6]). Recent initiatives include a network of Public Garden Facility Managers working on best practices together.
- Participation on the "Atlanta Cultural Operations Team." This team is comprised of the operational leaders for a number of local organizations including the Atlanta History Center, The Fernbank Museum of Natural History, the Atlanta Zoo and the Georgia Aquarium. As a team they share best practices and mutually support individual team member initiatives.

Fiscal Responsibility

A comprehensive assessment and due diligence is completed before projects are started that considers life cycle costs and benefits and expected return on investments. The Garden has a philosophy of "pay-as-you-go" so the Green Expansion Plan was completed in phases at a total cost of $55M. All phases were initiated after funds were raised and after a review of costs and projected benefits.

Capital Planning
Board, executives and staff work closely together to plan and execute sustainability projects. The Garden has an established consensus-driven culture so staff and volunteers have the ongoing opportunity to impact future plans via participation during staff focus groups. “Give us feedback” is an important goal of the Garden .

Programs and Practices
The Garden is developing a Green Sustainability Plan with an emphasis on Sustainability practices, including:

- Capital Projects
  When capital projects are undertaken, particular consideration is given to incorporating the ability to implement future sustainability projects. For example, the SAGE parking facility was constructed using framing that would accommodate the future deployment of solar panels.
- Energy Efficiency Focus
  The Garden has been active in approving and implementing a variety of Energy Efficiency programs, including: an extensive lighting study, deploying lighting sensors as well as a program to deploy solar panels. While the Garden is not energy self-sufficient yet because of the energy requirements of the Conservatory and Orchid Center, it has already implemented energy efficiency initiatives that have had a major positive impact on the reduction of energy costs.
  It is noteworthy that Georgia Power has been particularly helpful and generous by providing technical advice and energy credits for approved projects.
  Energy efficiency continues to be a major focus with solar projects being the first priority followed by the implementation of lighting upgrades
- Visitors
  The Garden requests that visitors take their waste home with them and support the Garden’s efforts to achieve a zero-trash environment. This initiative saved over $7,000 in its first year.
- Employees.
  Staff are managed by a Human Resources Director who emphasizes how each individual’s actions can positively impact the overall environmental stewardship.
  Relevant Garden initiatives include:
    - Water conservation through the use of the Garden’s onsite hydro-station. Additionally, employees are encouraged to “bring your own glass” to meetings and other activities. In keeping with its focus to supportdo the right things for the environment, this program helps the Garden to avoid using styrofoam and paper cups
    - Disposal of all waste via an on-site compactor
    - Employee access to free monthly electronic waste (e-waste) and battery disposal at the Garden which helps reduce landfill waste
    - Employee incentives for the use of alternative transportation including monthly employee recognition and participation in raffles for gift cards. Since May 2009, participation in the program has tripled.
- Events and Green Concerts where only recyclable materials are used.
- Outsourced Services
    - Sustainability is built into Service Level Agreements and is part of the evaluation for employee performance reviews.
    - When contracts are renewed, vendors are required to document their sustainable practices and their plans to achieve additional improvements. These factors are given considerable weight in awarding contracts. Therefore contracts are not driven solely by cost considerations.
    - Sustainable practices are incorporated into food preparation, the serving of organic food, the provision of environmentally friendly beverages, composting and the use of recyclable materials (e.g. bamboo plates)

Conclusion

Every aspect of The Atlanta Botanical Gardens is driven by what the Garden calls “Sustainability in Action” which has, as its goal, the achievement of responsible environmental stewardship as well as the realization of energy and water conservation. The sustainability achieved encompasses not only the Garden and its interaction with visitors, employees and vendors, but also in its interaction with the City of Atlanta and with other local and national cultural institutions.

Appendix: Sustainability Attributes Exhibited by the Botanical Gardens

- Energy credits
  Measuring and analyzing energy consumption to improve energy efficiency
- Energy efficiency
  Using less energy to provide the same level of energy service
- Environmental stewardship
  Promoting environmental stewardship through the safeguarding and effective use of energy, water soil and other natural resources
- Green education
  Educating how natural ecosystems function including how human beings can best interact with them in order to live in a sustainable manner.
- Green Expansion Plan
  The development and execution of a Strategic Sustainable Performance Plan
- Green procurement – products & services
  Procurement of environmentally friendly products and services, the selection of contractors and the embedding of environmental requirements in contracts.
- Green roof - extensive & intensive
  A green roof is one that includes vegetation and a growing medium, planted over a waterproofing membrane. "Extensive" green roofs, are virtually self-sustaining and require minimum maintenance "Intensive" green roofs are labor-intensive, requiring irrigation, feeding and other maintenance.
- Green space
  Green space generally refers to any land area covered with vegetation
- Heat island effect
  This occurs in developed areas where the elimination of natural land cover results in an increase in outdoor temperatures. The effect can be offset by vegetation, green roofs, and light colored materials that reflect heat.
- Indoor environmental quality.
  A term used to describe the relative health of the air in an indoor environment
- LEED Certification
  The Leadership in Energy and Environmental Design (LEED) Green Building Rating System was developed by the U.S. Green Building Council (USGBC. LEED certification is based on a variety of categories, including site sustainability, energy, materials, and indoor quality and divides buildings into four categories - basic certification, silver, gold, and platinum.
- Lighting study
  Studies that lead to more energy efficient lighting that results in lower electricity usage.
- Natural ventilation
  Natural ventilation uses outside air without the use of a fan or other mechanical system.
- Natural daylight
  The use of natural daylight to reduce energy usage in buildings.
- Recycled/Reuse materials
  The cycle where discarded materials are collected, sorted, processed and converted into materials which can be reused. Also referred to as “cradle to cradle”
- Solar panels
  Solar panels are also referred to as photovoltaic panels and are a packaged interconnected assembly of solar cells. In combination with other panels they generate and supply electricity.

- Sustainability learning laboratory
  The use of an environment as a dynamic learning laboratory for sustainability initiatives.
- Sustainable site development
  This is the process of ecologically planning and implementing with regards to all aspects of a site's development.
- Thermal/shade curtains
  An energy curtain or screen is an insulating blanket that adds an additional thermal boundary in greenhouses.
- Water conservation
  Water conservation refers to actions that reduce water usage and recycles waste water
- Zero-trash environment
  A philosophy that encourages the redesign of resource life cycles so that all products are reused.

Appendix: References and Additional Reading

- American Public Gardens Association (APGA)

  http://www.publicgardens.org/
- Conserve Georgia

  http://www.conservegeorgia.org/
- Georgia Department of Natural Resources – Sustainability Division

  http://www.gasustainability.org/
- Environmental Protection Agency – Georgia

  http://www.gaepd.org/
- EPA – State and Local Climate and Energy Program

  http://www.epa.gov/statelocalclimate/state/partner/index.html
- EPA – Southeastern States Air Quality Toolkit

  http://www.epa.gov/region4/airqualitytoolkit/index.html
- EPA – State Climate Change Mitigation Strategy

  http://www.epa.gov/statelocalclimate/state/activities/index.html
- Green Roofs

  http://en.wikipedia.org/wiki/Green_roof

References

1. Botanical Garden website (http://www.atlantabotanicalgarden.org/about-us/mission-history)
2. U.S. Green Building Council (USGBC) - http://www.usgbc.org/
3. "An urban heat island (UHI) is a metropolitan area which is significantly warmer than its surrounding rural areas." – Wikipedia (http://en.wikipedia.org/wiki/Heat_island)
4. Also refer to the IFMA Foundation How-To Landscaping Guide (http://www.ifmafoundation.org/programs/sustain_wp.cfm)
5. Rochelle Schwartz-Bloom, a Duke University (http://www.news-medical.net/news/2007/09/27/30520.aspx)
6. APGA - http://www.publicgardens.org/