

Environmental Sustainability

Introduction

This chapter presents an overview of the sustainable principles and goals guiding Boston College's long-term planning and the University's current activities and future plans for on-campus sustainable practices. It is divided into three sections: goals adopted by the University in various areas of sustainability, existing and planned sustainability practices and programs, and coordination with City agencies.

Implementation of the Boston College Master Plan provides an unparalleled opportunity to transform the campus into a model of sustainability. More than 500,000 square feet of outmoded, energy-inefficient buildings will be replaced by 1.5 million square feet of modern, energy-efficient facilities. Boston College has committed to developing a Sustainability Policy and Plan within one year, and to achieving Leadership in Energy and Environmental Design® (LEED) certification for all new buildings. It will also seek LEED Silver certification, or higher, where practicable. In addition, the University has committed to calculating its current and projected greenhouse gas emissions,

Boston College recognizes that there are limits to the world's resources. To ensure the quality of life for future generations, Boston College seeks to demonstrate leadership in environmental stewardship and sustainability, living the motto "ever to excel." The University is committed to conserving resources and reducing the impact that its services and activities place on the environment.

A number of important goals have been established by Boston College, and further expanded goals will emerge through the development and adoption of a comprehensive sustainability policy and plan. This section provides details on the following areas related to sustainability goals embraced by the University:

- y Leadership
- y Social Justice
- y Green Buildings
- y Energy and Climate Change
- y Water Conservation
- y Waste Reduction and Recycling
- y Air Quality
- y Stormwater Management
- y Landscape and Natural Features
- y Transportation
- y Education and Outreach
- y Procurement
- y Performance Standards and Indicators

Leadership

From formal commitments to the energetic activities of student-led groups, Boston College has engaged in a variety of initiatives to advance environmental sustainability. Development of the Boston College Sustainability Policy and Plan is integral to the University's Institutional Master Plan. To that end the University recently appointed a Director of Sustainability and Energy Management. Reporting to the Executive Vice President on sustainability programs and to the Vice President of Facilities Management on energy management programs, this position also works closely with the Office of the Provost on educational programs. The Director of Sustainability and Energy Management will lead campus activities regarding sustainability and work with an advisory panel of operations administrators and student representatives that recommends additional environmentally appropriate initiatives. This group will develop a comprehensive sustainability plan that includes goals, timetables and metrics for measuring and reporting progress. The University's commitment to its sustainability program will include appropriate budgetary allocations.

- y *Goal* Establishment of a broad-based advisory panel of stakeholders representing campus operations.
- y *Goal* Within one year, develop and adopt a Sustainability Policy and Plan.





wishes to harness this benefit and the environmental, financial and operational benefits of

each contribute and relate to local environments in different ways. Sustainability, education and student formation are all interrelated critical aspects of the mission of Boston College.

- y *Goal* Publicize efforts through a new website devoted to sustainability.
- y *Goal* Publish an annual assessment of campus environmental sustainability progress.

Procurement

The provision of goods and services has a significant impact on the environment. Choices made by consumers can have positive or adverse results. Demand for sustainably harvested building materials, for example, has helped to create a market for new agricultural products. Buying products made with recycled content stimulates demand for recycling. Using less toxic cleaning products improves water quality and human health and safety.

- y *Goal* Develop a fiscally responsible procurement policy for the purchase of environmentally-preferable products and services within one year.

Performance Standards and Indicators

It is impossible to judge success in environmental sustainability without evaluation or measurement. Metrics play two important roles: provide an understanding of targets that helps clarify expectations and communicate those expectations to others; and provide a way to measure and evaluate the value and impact of a particular effort or set of measures. Appropriate metrics provide a means for establishing intentionality, accountability and monitoring. Boston College is committed to measurement of its environmental impacts for improved education and student formation.

- y *Goal* Commit to broad sustainability principles with specific performance standards and a system of indicators and metrics to track performance.
- y *Goal* Publish an annual assessment of campus environmental sustainability progress.

Sustainable Practices

This section provides a summary of Boston College's existing and planned sustainability practices and programs. The sustainable practice areas within the University include the following main sustainability topics:

- y Leadership
- y Social Justice
- y Green Buildings
- y Energy and Climate Change
- y Water Conservation



y Vermont Agency of Natural Resources (VANR)

Through this collaboration, which began in 1999, the university partners have implemented laboratory-specific environmental management plans. The goal of the project is to create a



Campus Sustainability Advisory Panel

The Director of Sustainability and Energy Management chairs the Campus Sustainability Advisory Panel, which was formed to assure broad institutional coverage of interested parties during implementation of the Institutional Master Plan. The panel includes representatives from operating units such as Facilities Management, Environmental Health and Safety, Dining Services, Auxiliary Services, Capital Projects Management, Procurement Services and

original design, prerequisite LEED credits and at least a minimum of the other credits are likely to be met. Early review of requirements helps to ensure that the project will remain on schedule. The LEED “checklist” consists of six credit categories, with many credit synergies (e.g., green roofs affect water, materials and energy). If the team is confident about the checklist, the next step is to register the project with the USGBC for the appropriate certification category. While LEED rating system versions include those for new construction (and major renovations) and also exist for homes, neighborhoods, interiors, buildings core and shell, schools and existing buildings, the overarching set of credit categories common to all include:

- y *Site Selection* (e.g., land reuse/remediation, density, alternative transportation, habitat protection, stormwater management, light pollution and heat island reduction)
- y *Water Efficiency* (e.g., minimum plumbing and landscaping irrigation efficiencies, wastewater reuse, conservation of potable water)
- y *Energy & Atmosphere* (e.g., renewable power generation on-site or off-site purchases, Energy Star appliances and building ratings, automated building energy and airflow systems, system commissioning, CFLs/other high efficiency lamps, daylighting, insulation)
- y *Materials & Resources* (e.g., life cycle analysis, recycling, composting, recycled/reused/rapidly renewable resource-content in material usage such as floors and walls, use of locally/regionally sourced resources)
- y *Indoor Environmental Quality* (e.g., thermal comfort, outdoor air supply, particulates management, lighting controls, window views, green cleaning)
- y *Innovation in Design* (e.g., car share services, education/outreach/awareness programs, sustainable food provisions, exceptional performance in other five credit categories)

The team can actively manage project information about the status of meeting credit goals via LEED-Online, which is enabled once the project is registered. Post-construction, and once the online templates and supporting documents are completed, the team submits the full set of application materials to the USGBC for review. The USGBC will contact the team to identify achieved points and provide comments about unachieved points which the team may amend (often through simply sending more detailed supporting documentation) for re-submission to the USGBC for final review. A LEED certified project approved by the USGBC may attain a Certified, Silver, Gold or Platinum level rating based upon how many total points were achieved; successful projects receive national recognition from the USGBC and the team may benchmark the project to similar projects on the campus or at peer institutions. The process of building LEED projects has been demonstrated to gain greater efficiency over time, with practice, in that project teams like those which will be assembled by Boston College gain experience and learn quickly about how to manage the LEED documentation; they also establish information tracking approaches and vendor relationships that can be common to

Energy and

Elevators

Boston College is evaluating the use of more energy-efficient and environmentally friendly elevators, such as the Otis Gen2 and Kone systems. New elevator systems set the standard for elevator performance, efficiency and comfort.

Combined Heat and Power

The University is currently evaluating the feasibility, as well as the environmental and economic benefit, of combined heat and power (CHP) technology. Several locations, configurations and load profiles are being assessed on the BC campus.

Geothermal Heat Exchange Wells

Geothermal systems are scalable and can be constructed in a distributed fashion. As such,



- y The University is researching the planting of increased ratios of native plants, which typically reduce the amount of water necessary for landscaping. The University is also implementing a small demonstration xeriscape garden in the same location as the organic garden.
- y The Grounds & Athletic Maintenance Department has plans to maintain five acres of the Brighton Campus with organic fertilizer as a pilot program to evaluate the effectiveness of this approach.

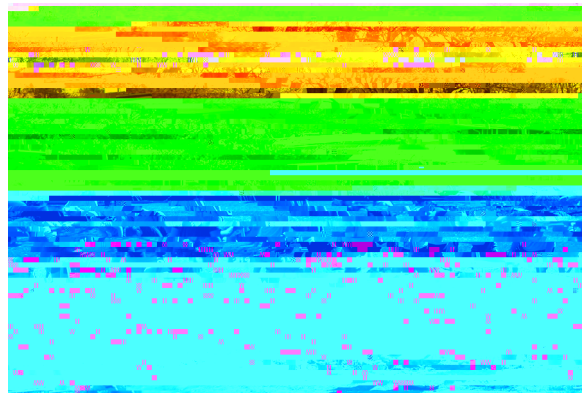


Any concerns about water inefficiencies on the campus can be reported to Facilities Management personnel online via the University's new sustainability page and a link to an electric work-order filing system. The portal also features a breadth of resources and tips for learning more about water conservation practices.

Waste Reduction and Recycling

Boston College has undertaken a number of measures to reduce waste through recycling and reuse:

- y Through the Institution Recycling Network (IRN), the University recycled the following amounts in Fiscal Years 2005 through 2007:
 - 62.1 tons mixed electronics
 - 27.9 tons wood
 - 26.4 tons mixed metal
 - 15.2 tons mixed metal appliances
 - 85.6 tons surplus property
 - 5.8 tons universal waste (batteries and fluorescent lamps)
- y The University increased number and distribution of outdoor recycling containers across campus.
- y Housekeeping Services provides recycling bins for campus events.
- y In-room residence hall recycling debuted in fall 2007 in all freshmen areas, and the University will expand the program to all residence halls this fall.
- y Battery and ink cartridge recycling bins are located in 25 locations in residence halls and at five central locations throughout the campus.





rate of 38 percent and a weekly recycling rate of 45 percent. Students are recycling approximately 2.6 pounds per week. RecycleMania is supported by the U.S. EPA and the National Recycling Coalition as a project of the College and University Recycling Council.

Another student effort to increase enthusiasm about sustainability, led with support from the University, is the Undergraduate Government of Boston College's (UGBC) new partnership for recycling with Boston College's Athletics Department and the Boston Red Sox. UGBC has proposed increased distribution and visibility of recycling receptacles at Conte Forum and Alumni stadium. Given the large amount of refreshment containers disposed of at sporting venues, the UGBC also recently announced that it is recruiting Boston College students to be on a Green Team organized by the Red Sox. Under the agreement, approximately 150 volunteers, in addition to many from other local schools, make a commitment to attend scheduled meetings to learn about recycling. Education also entails posters and 'A to Z' handouts (provided by the NRDC) about sustainability practices.

Students from Ecopledge also partnered with Facilities Services to institute recycling outside football games this past fall. The program was well received by tailgaters and students alike.

Bookstore and Reprographics

The Bookstore and Reprographic facilities reuse and conserve a large amount of material:

- y An average of approximately 40,000 used text books are brought back each year to the Bookstore for resale by Boston College or through distributors.
- y Cardboard boxes are retained and reused for returning unsold books.
- y Waste reduction measures through quantifying book recycling and increasing trash management are under development.
- y A new student printing policy began in 2007 which limits the number of pages students can print for free. Any student who exceeds the limit is charged 3 cents per page.

Stormwater Management

In an effort to improve its existing stormwater infrastructure, Boston College is working with a team that is developing a campus-wide analytical stormwater model of both existing conditions and full build-out of projects presented in the Institutional Master Plan. The goal of the modeling effort is to identify specific improvements that will both alleviate current problems and create opportunities for innovative stormwater management.

Inherent in the modeling effort, best management practices (BMPs) and Low Impact Development (LID) techniques have enabled the University to prioritize sustainability in the development of its stormwater management plan through the full build-out of the IMP. Boston College's Director of Sustainability and Energy Management will work with the



for capital projects and helps control stockpiling, washing and risk management for other drained materials.

The University's stormwater infrastructure is also discussed in Chapter 8, *Utilities and Infrastructure*.

Ongoing improvements to Boston College's stormwater collection system are primarily related to improving the existing on-campus conditions, and to mitigating impacts of future development. The design of new facilities necessitating connection to the municipal stormwater systems will require review by BWSC, under its Site Plan Review Process, on a project-by-project basis. Stormwater management controls, including a Stormwater Pollution Prevention Plan (SWPPP), will be established in compliance with BWSC standards and the Massachusetts DEP Stormwater Management Policy.



Landscape and Natural Features

Grounds and athletic facility maintenance responsibilities at campuses largely consist of ensuring the usability, health and aesthetic quality of common areas outdoors. Landscape practices directly affect student recruitment and athletic field playability, but also have environmental impacts. Open space areas are often heavily worn by the campus community and general public and require application of energy, care and resources. At Boston College, the Grounds and Athletic Maintenance group provides services to the campus community in three functional areas: Grounds Maintenance, Athletic Maintenance and Fleet Maintenance. The group's goal is to provide a welcoming environment by maintaining a safe, secure and attractive campus and workplace that reflects the University's pride in its operation and sensitivity to the community's needs. For general upkeep of athletic facilities and other campus grounds, including lawns and gardens, Boston College regularly tests and applies new landscaping practices to introduce and protect native species, protect waterways and minimize chemical applications, particularly through the use of alternatives like biological controls or organic products where feasible. It has a growing cadre of irrigation reduction strategies like xeriscaping.

Xeriscaping began principally as a concept aimed to design gardens and landscapes in such a way that the use of water is minimized. Boston College is reviewing the practices of xeriscaping in its ground efforts in the form of natural landscaping and will implement a pilot garden this summer. Natural landscaping is based on six principles for gardening:

- y *Planning and Design* Adjust the placement of plants to consider yearlong color, evaporation from the sun and wind, runoff and water tolerance of the plant.

prepared by Helen Liu, a leading researcher at the University of Massachusetts¹, leachate resulting from SBR derived from scrap tires and chemicals from the other components of the synthetic surface system (sand, polyolefin fibers and acrylic backings) meet current environmental standards and should not be considered hazardous.

Studies indicate that leachate from the SBR is only problematic at extreme pH levels. Organic compounds can be leached at highly acidic pH levels and metals at highly basic pH levels. Soil and rainwater pH in the greater Boston area is generally close to neutral (7.0 being neutral). The studies indicate that significant leaching of metals does not occur until the level drops into the 2.0 to 3.5 range. There is no reason to believe that soil or rainwater levels on the Brighton Campus would reach these extreme levels. Therefore significant leaching of pollutants is not expected as a result of the proposed construction of the new synthetic turf baseball and softball fields. Based on available research the University believes that the installation of synthetic playing surfaces is a wise investment, provides significant benefit to users, conserves water and results in no significant environmental or health impacts.

Air Quality

Boston College seeks to maintain good air quality on campus through the following:

- y Calculation of greenhouse gases, including CO₂ emissions, by tracking fuel usage or by employing other methods used to measure success in meeting benchmarks, targets and goals.
- y Boston College is exploring the following best practice measures to reduce emissions from diesel construction equipment and vehicles, requiring contractors to:
 - Install emissions control devices to reduce particulates and other tailpipe pollutants.
 - Burn only ultra-low sulfur diesel fuel.
 - Follow applicable anti-idling laws.

Boston College recognizes that indoor environmental quality has a great effect on the health and well being of its students, faculty and staff, and the community-at-large. The University will consider aspects of air quality, acoustics, thermal comfort, composition of building materials and daylighting, among others, when designing and constructing new or renovated facilities.

Dining Services

Boston College Dining Services administration places a high priority on sustainability and has made great strides to integrate sustainable efforts of local vendors and manufacturers and sustainable products into the department and University systems. Dining Services

¹ H.Liu, et.al., Environmental Impacts of Recycled Rubber in Light Fill Applications; Summary & Evaluation of Existing Literature, 1998.



Composting and Organics

A successful pilot food composting program in Corcoran Commons Dining Hall was implemented in the summer of 2007. Following on that success, in January 2008, a new sorting system that includes organic waste was installed at the McElroy Dining Hall as a collaborative effort between Dining Services and campus members of Ecopledge to make students aware of the amount of waste they produce in a day and how to reduce that through the use of a new designated recycling area. The program also included an educational component to reduce the use of “to go” containers.

The system was first successfully tested in Stuart Dining Hall on the Newton Campus. Students now separate their dishes and food waste from recyclable cans, plastic containers and bottles, in addition to stacking plastic containers instead of throwing them out, which reduces trash volume. This program will be expanded to additional dining facilities.

Student groups are also involved in campus food choices, including Real Food BC, which strives for the establishment of a more sustainable food system. It was started as a part of the nation-wide Real Food Challenge. The group promotes the purchase of food from local, green, humane sources in order to support localized food production and reduce carbon emissions that result from long distance food shipments. Dining Services has already taken the initial steps towards more sustainable food procurement; for example, Dining Services initiated a fall farmers market in 2007. The program was a success and projects are being designed to further incorporate the use of local produce to support small farmers within the

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A formal Waste Management Program at Boston College coordinated by Facilities Management and the Office of EH&S oversees the collection and disposal of a number of waste streams from facilities, studios, residences and laboratories. The program manages regulated hazardous wastes – chemicals, oils, paints and paint thinners, pesticides and cleaners - and assists in the disposal of biohazard wastes, photographic wastes, gas cylinders and recyclable wastes such as batteries and electronic equipment. Many of the EH&S practices are outlined in Boston College’s Environmental Management Plan, which specifies best management practices and regulation compliance guidelines for handling such materials.

Hazardous Materials

An overview of measures employed by the University to safely manage and reduce hazardous materials includes:

- y Used ink and toner cartridges are sent back to the manufacturer for recycling. Most manufacturers are including return boxes for shipment with orders and campus members may direct questions on disposal to the distributor, manufacturer or EH&S.
- y From research activities that generate medical waste, the University ships approximately 2,200 pounds per year from laboratories and Health Services for safe disposal off-

y Disposal of photographic chemicals is managed by EH&S.

Electronic Equipment

Boston College collects irreparable and obsolete electronic equipment, including CRTs and other computer-related equipment, from the campus community for recycling.

Procurement

A fiscally responsible procurement policy fo



Boston College actively promotes the use of alternative transportation and minimization of environmental impacts through the following measures:

- y Operation of a free shuttle bus between the Chestnut Hill Campus, Newton Campus, and into Brighton, where it serves two Green Line stops at Cleveland Circle on the C Branch and at the Reservoir stop on the D Branch. The Green Line B Branch ends at the northeast corner of the Chet MOrh. The Grtl Campurof the C8(n.(8(0p)eghto)-3.4(n)2.8(er)pu)-3. .6(a



(UGBC). Sustain BC is a faculty- and student-led group that advocates for initiatives and policies that benefit the environment.

Academic

Environmental Scholars

The Environmental Scholars Program provides a combined internship and advanced research program for Boston College students during a year-long, six-credit course. Environmental Scholars work with the Environmental Studies Program, the Lynch School of

