

Wellesley College Strategic Sustainability Plan, 2016-2026 (Proposed - 2/5/16)

Environmental stewardship and consciousness are at the core of Wellesley's mission to educate women to make a difference in the world. Creating opportunities for future generations can only be possible if the principles of sustainability infuse all that we do as a college community.

--President of Wellesley College, H. Kim Bottomly

Wellesley College considers environmental sustainability to be an important component of its core mission. As part of this commitment, the college will consider sustainability as a factor in all institutional decisions. Members of the Wellesley community have individual and collective responsibility for environmental stewardship.

--Adopted April 2007 by President Diana Walsh '66

It is said that the meek shall inherit the Earth. But it will take boldness and action to save it. [L]et us each pledge to treat our shared environment with respect, and to act with determination to safeguard it for generation upon generation to come.

--Madeleine Albright '59, Wellesley Alumna and Former Secretary of State

These declarations by Wellesley leaders inspired and guided the development of Wellesley College's Strategic Sustainability Plan, 2016-2026. Their voices remind us that although our efforts to address sustainability must begin on campus, this work must also extend to the world beyond. Given that environmental inequities disproportionately affect women, Wellesley women have an important role to play in advancing sustainability through research, education, and leadership. Wellesley is an ideal, even crucial, place to develop in young women an understanding of sustainability strategies and their importance.

Our commitment to sustainability rests on several principles:

1. There is an intrinsic relationship between on-campus practices and broader sustainability challenges. Taking action here is consistent with our commitment to *minister unto*; a commitment to sustainability can be an important element of the Wellesley Effect.

2. It benefits our students to live in an ecologically diverse, energy efficient, and healthy campus that models traditional and new approaches to environmental sustainability.
3. Sustainable practices are consistent with the long-term stewardship of the college's assets and financial well being.
4. Improving our environmental sustainability will burnish Wellesley's reputation. An institution that fosters leadership and civic should lead in this work.

Wellesley's longstanding commitment to environmental sustainability has gained momentum in recent decades. A co-generation plant has lowered greenhouse gas emissions approximately 25 percent since 1994. Potable water consumption has been reduced 39 percent since 1999. And the college has undertaken a wide range of other sustainability initiatives: including significant campus landscape restoration projects, developing a move-out move-in sale to help students' recycle and reuse furnishings, adopting Green Building Standards, and piloting innovative programs with the support of the Class of 1957 Green Fund.

Wellesley is now ready to build on these past successes and to expand on its commitment to integrate sustainability into all institutional decisions. This strategic plan sets forth Wellesley's overarching priorities and goals for addressing sustainability over the next decade. A companion [website](#) and report include detailed descriptions of the approaches, projects, responsible departments, and incremental steps for each overall goal and its objective.

This work has been spearheaded by the Advisory Committee on Environmental Sustainability, which, in addition to researching similar practices at other colleges and institutions, solicited suggestions, comments, and advice from the campus community and met with stakeholders from across Wellesley in an effort to make this document the product of many desires, beliefs, and voices.

Sustainability Priorities and Goals

Academic and Co-curricular Integration. The most important contributions Wellesley will make to advancing sustainability will be through its activities as an educational institution. Advancing sustainability requires deep, creative, and critical thinking across a range of disciplines, the kind of thinking that is central to Wellesley's mission as a liberal arts college. This means providing students with the conceptual tools to consider how social and cultural contexts, economic and policy trade-offs, and scientific concepts and evidence are relevant to studying sustainability.

Primary Goals:

- Support study of sustainability by providing interested faculty with resources to help them incorporate sustainability-related material into their classes.
- Implement a Sustainability Year to raise awareness across the college
- Increase hands-on learning and research opportunities for students related to sustainability

Data Collection and Community Engagement. The most important step the college can take to advance sustainability on campus, both in support of institutional decision making and community engagement, is to expand monitoring of resource consumption. Data on energy, water, and waste should be collected on at least a building-by-building basis to better support institutional decision making, promote community engagement, and provide data sets for analysis and research (in a range of disciplines, from psychology to environmental studies to computer science).

Primary Goal:

- To implement metering for primary utilities at the building-level for 80 percent of campus within five years and ensure the resulting data is available for facilities management, academic research, and educational purposes.

Energy, Buildings, and Transportation and Climate Change. Wellesley College is committed to aggressively and creatively pursuing opportunities to promote energy conservation, increase energy efficiency, and implement infrastructure changes that can reduce its greenhouse gas emissions and contributions to climate change. We can achieve these goals through community engagement and investments in campus infrastructure (such as the college's co-generation facility) and existing buildings. At the same time, the College values our culturally and geographically diverse student body, study abroad opportunities, and academic travel; as a result, we do not anticipate substantial reductions in travel-related greenhouse gas emissions.

Primary Goals:

- To reduce the college's greenhouse gas emissions from on-campus activities by 37 percent by 2026 and 44 percent by 2036 from a 2010 baseline.
- To improve the energy efficiency of buildings through the implementation of the Green Building Standards (adopted in 2014) for major construction and renovation and the expansion of the current Green Revolving Fund to further support improvements in other buildings (which could help address deferred maintenance issues).
- To expand awareness of the impacts of college-funded travel and encourage alternatives, without limiting such travel.

Landscape, Watershed, and Water. Wellesley College's beautiful landscape at the edge of Lake Waban is a resource as precious as any financial asset we own. To advance landscape and watershed health, we must make the campus a more sustainable landscape, promote human engagement with the landscape, and improve our management of water resources.

Primary Goals:

- To establish a more ecologically sustainable campus landscape through both design and maintenance, building on the 1998 Campus Landscape plans and updates.
- To encourage community engagement with the landscape through research (the campus is a living laboratory), additional signage (to educate people about the campus), and support for pedestrians and bicyclists.
- To improve the sustainability of campus water consumption by carefully managing our aquifer, reducing potable water consumption to 50 percent below the 1999 baseline by 2026, and eliminating the purchase of bottled water.

Food, Dining, Purchasing and Waste Management. Wellesley can increase sustainability by refining purchasing practices, dining operations, and waste disposal.

Primary Goals:

- Encourage reductions in purchasing and waste generation by encouraging reuse and setting specific goals for the purchase of environmentally preferable products in high-volume categories (paper, toner, computers).
- Develop and implement goals for sustainable purchasing in dining operations that factor in considerations such as local, fair, humane, organic, and other relevant criteria.
- Develop a waste management plan in the next two years, including quantitative goals for long-term waste reduction.

Academic and Co-curricular Integration

“Environmental stewardship and consciousness are at the core of Wellesley's mission to educate women to make a difference in the world. Creating opportunities for future generations can only be possible if the principles of sustainability infuse all that we do as a college community.” - H. Kim Bottomly, President of Wellesley College

As an academic institution, Wellesley College recognizes the importance of incorporating sustainability into the curriculum and the greater Wellesley College community. Wellesley College has a proud tradition of environmental consciousness that extends from the incorporation of the academic study of natural and built environments into its curriculum to the implementation of sustainability programs and practices that foster a culture of environmental stewardship across the campus. There are many groups at Wellesley that aim to foster a culture that values sustainability as an important facet of daily life. The Botanic Gardens (WCBG) is incorporated into the curriculum through biology classes, but goes even further to engage with students and community members. The WCBG hires interns and supports the Botanistas student organization, both of which do outreach events to promote botanical and environmental literacy. The Office of Sustainability similarly works on projects and events that promote sustainability across campus. The Office of Sustainability hires several student Sustainability Interns who focus on campus sustainability projects, and eco-reps who promote sustainability in student residential halls.

Initiatives to address environmental issues and promote sustainability on campus have also been led by several student organizations. These organizations include Wellesley Energy and Environmental Defense (WEED), Regeneration, El Table Food Cooperative, Slow Food and Going Beyond Green. WEED hosts several lecturers and events during the year, runs campaigns and holds events to enact college-wide policy changes on issues related to climate change and sustainability. Regeneration runs a small-scale farm near campus. Slow Food promotes the growth of natural, nutritious produce. There is also the Sustainable Living Cooperative (SCoop) where students choose to opt-out of the campus dining plan and live in a sustainable manner. Going Beyond Green is an environmental and green justice group at Wellesley.

Sustainability is a multi-faceted issue that can be approached from a variety of disciplines, and Wellesley offers various courses from the entire curriculum that integrate sustainability in various ways. Some courses discuss social, cultural, and historical contexts that shape how we think about environmental problems and solutions. Others have actual field studies, conducted both locally and globally. Others make extensive use of the landscape and infrastructure of the college to provide hands-on learning.

These courses and co-curricular initiatives help shape the future generations of leaders and decision makers who must deal with the full range of sustainability challenges, from global climate change to resource depletion and agricultural production. Furthermore, these learning opportunities can lead to changes in behaviors and attitudes of each individual which can have long-lasting impacts in many

areas including the environment and climate change. The long-term challenges to sustainable practices require deep, creative, and critical thinking across a range of disciplines, the kind of thinking that Wellesley is committed to teach as central to its mission as a liberal arts college. The goal of this plan is to make Wellesley community aware of the various learning opportunities and to tap into the existing physical and intellectual resources that will enable faculty to incorporate an academic consideration of sustainability into their research and teaching and to modify their research and teaching practices where possible to put less strain on resources (e.g., use less paper, consider remote meetings, and other interventions).

Main Issues/Primary Goals

1. Support sustainability across the curriculum
2. Increase hands-on learning and research opportunities in sustainability
3. Introduce incoming students to sustainability at Wellesley
4. Assess sustainability awareness among the entire Wellesley community

How We are Doing

For the purposes of this initiative, we are defining sustainability-related courses broadly, as those that focus on the relationship between humans and the environment, providing students with skills, knowledge, and experiences that will allow them to critically engage in and contribute to discussions regarding sustainability. Studying sustainability is not about advancing a particular worldview, but about providing students with the conceptual tools to consider how social and cultural context, economic and policy trade-offs, and scientific limitations and challenges and other approaches are relevant to studying sustainability.

By this definition, Wellesley College currently offers 20+ sustainability-related courses that are offered by 18 out of 52 departments, including courses in the humanities (philosophy, art), social sciences (politics, history), and the sciences (geosciences, biological sciences, chemistry). These courses take place on campus, in the Northeast, and more globally, such as at Lake Baikal in Russia, and in Belize. Currently, sustainability-focused majors and programs include Environmental Studies and the Sustainability Certificate Program run by Wellesley, Babson, and Olin. One goal of this section of the sustainability plan is to increase support for faculty interested in engaging in discussions of sustainability in their courses.

Another goal of this section of the sustainability plan is to support efforts to promote sustainability across the campus through student engagement. Much of this work occurs in conjunction with the Office of Sustainability, which oversees programs, such as Wells on Wheels, Sustainable Move-Out and Move-In Sale, the Bike Share Program, and Sustainable Office Certification and Sustainable Living Certification Programs, and recycling competitions. Wells on Wheels are water stations that connect directly to our own municipal water supply and serve to reduce the amount of bottled water purchased for events. Sustainable Move-Out and Move-In Sale allows students to drop off unwanted items, which are subsequently resold at the Sustainable Move-In rummage sale or given to charity. The Bike Share Program allows students to borrow bikes free of charge. The Sustainable Office

Certification and Sustainable Living Certification Programs offer offices and students, respectively, to be certified for complying with a list of sustainable standards in their offices or dorms. Most importantly, in the context of this sector, the Office of Sustainability provides many opportunities for students to engage in sustainability issues on campus. The office usually has 6-10 interns each year and works with 10-14 Eco-Reps (who live in the residence halls). These students play a crucial role in drawing attention to sustainability related issues on campus. In addition, the office works with the Advisory Committee on Environmental Sustainability on campus, oversees the Class of 1957 Green Fund (which funds community related sustainability initiatives), and helps implement the Green Revolving Fund (which funds infrastructure and energy efficiency improvements). Students have been important drivers for expanding Wellesley's engagement in sustainability. Many student projects, such as the use of low flow shower heads, composting and recycling styrofoam, have been implemented and continue to contribute to the sustainability of WC. In addition to undertaking research projects related to sustainability through coursework and independent studies, summer research programs with faculty, and college-sponsored internship programs, students have also engaged in sustainability through campus activism. Initiatives include a Sustainability Month Energy Competition, Recyclemania, Coal Action Week, and Earth Week. Fossil Free Wellesley led a divestment campaign in 2013-14, which raised awareness about climate change and investment policy across campus and led to substantive discussions with the Board of Trustees. Although the Board chose not to divest, it did commit to addressing climate change in other ways (Wellesley College, 2014). During the 2014-15 year, WEED led a campaign to prohibit the purchasing of bottled water for campus events using College Government funds. WEED has also held inter-dorm energy competitions. After the 2014-15 academic year, Slow Food will disband; however, new food and consumption focused groups are in the works.

There are also new campus programs that have emerged in recent years. One of the most exciting is the Center for Work and Service's Alternative Break Program, which sends small groups of students to sites around the country to participate in a week-long service project during the College's winter or spring breaks. Some of the service trips have a focus on sustainability. During the 2013-2014 academic year, a spring break trip went to Everglades and Biscayne National Parks to focus on environmental pollution and protection. During the 2014-2015 academic year, one group went to Lake Mead, Nevada to learn about water conservation and environmental stewardship, and another group with a focus on food justice went to Baltimore, Maryland to work with an urban farming organization.

These activities are communicated in many ways to the campus community. There is a centralized sustainability website that outlines the College's sustainability initiatives and provides information on past and present projects to improve sustainability at Wellesley (Office of Sustainability, Wellesley College, 2015). The Friends of the Wellesley College Botanic Gardens has a bi-annual newsletter with articles written by students, faculty, staff, and alumnae (Friends of the Wellesley College Botanic Gardens, 2015). There is the Wellesley Center for the Environment Newsletter (Wellesley Center for the Environment, 2015) that is sent on a weekly basis to interested students and community members. This newsletter promotes upcoming campus events, jobs, and internships that relate to the environment and sustainability. However, the College currently lacks any regular communications regarding sustainability activities on campus that is sent to the entire Wellesley College community with a broader array of content.

Finally, the Class of 1957 has established the Class of 1957 fund for initiatives that enhance sustainability at the College. The goal is to provide funding for projects that increase awareness of sustainability across the campus, reduce environmental impacts of the College and promote sustainable practices on campus. This fund has provided funding for multiple projects, including a Book Arts Program that focused on responsible use of paper on campus and providing water bottles during orientation to reduce the use of bottled water. This funding is available for some of the activities proposed in this plan.

In summary, there are many curricular and co-curricular activities at Wellesley that incorporate sustainability. However, there is a lack of communication and campus-wide awareness about these learning opportunities. Thus, a key goal of this section is to provide support to faculty interested in engaging sustainability in the curriculum and to expand awareness of sustainability-related initiatives across the campus.

Recommended Strategies

Phase 1 = Within 2 years of plan being adopted

Phase 2 = Within 5 years of plan being adopted

Phase 3 = Within 10 years of plan being adopted

*PLTC = Pforzheimer Learning and Teaching Center

**SUST = Sustainability Committee

***LTS = Library and Technology Services

1. Provide support for faculty in integrating sustainability across the curriculum

Issue	Strategy	Responsible Party	Status	Phase
AC1.1	Continued support for existing sustainability-related courses and research	Academic Departments, Provost's Office	In Progress	1

Many courses, programs, and departments engage sustainability. The only program focused on sustainability, however, is the Three College Sustainability Certificate Program, which is supported jointly by Babson, Olin, and Wellesley. Due to lack of resources, the future of this program is in jeopardy; its continuation requires ongoing support from Wellesley.

AC1.2	Provide resources for faculty across the college who wish to incorporate sustainability into courses.	PLTC, Sustainability Office, faculty with experience in incorporating	Planned	2
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		sustainability into their classroom		
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The College will develop resources for faculty and host lectures on effectively incorporating sustainability into their teaching. During the sustainability-themed year (see below, section AC1.3), the PLTC will host lectures by faculty at Wellesley and other institutions who have successfully incorporated sustainability into their teaching. The college has many faculty who already have incorporated sustainability in their courses, and their experiences and strategies should be shared amongst the community. This will aid other Wellesley faculty who wish to incorporate sustainability into their courses.

AC1.3	Organization of a sustainability-themed year	SUST, Knapp Social Sciences Center, PLTC & Departments, Sustainability Office	Planned for 2017-2018	3
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As part of the discussions with the Provost's office and the Dean's office, it has been proposed that a sustainability themed year should be organized to increase awareness of sustainability among the Wellesley community. During this year, the Wellesley community will be encouraged to incorporate sustainability in the classroom, co-curricular events, and campus life. Courses with sustainability-themes should be highlighted in the sustainability website (see AC1.4). The Sustainability Committee will meet with departments during the year prior to the event to encourage participation by as many members of the college community as possible. Ruhlman and Tanner conferences could have sustainability themed sessions.

In addition, the Knapp Social Sciences Center and PLTC, partnering with other programs across disciplines, will host a number of lectures and events surrounding sustainability to encourage thought-provoking discussions on sustainability. Lectures will provide balanced views on sustainability so that the Wellesley community can engage in thoughtful discussions and formulate their own informed opinions about sustainability.

AC1.4	Increase awareness of current courses, research opportunities and internships related to sustainability through the enhancement of sustainability website.	Sustainability Office, SUST	In Progress	1
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Currently, a web page with a list of sustainability-related courses exists, but it has not been updated for several years. The site should be updated and include courses from across the college. The website should also link out to lists of faculty conducting sustainability-related research and sustainability

internships. Creating this website will succeed if faculty volunteer information about classes and research projects that have sustainability-related content.

AC1.5	Promote the use of the campus as a laboratory for sustainability-related issues.	Sustainability Office, Facilities, SUST	Planned	2
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The Wellesley campus provides numerous opportunities for incorporating sustainability into courses. From waste management to energy use, as well as buildings and the fauna and flora on campus, the Wellesley campus provides ample opportunities for students to engage in creative projects related to sustainability. The Office of Sustainability and Facilities Department can assist interested faculty by providing ideas for using the campus as a laboratory in two ways: 1) A list of potential sustainability related projects on campus that might be of interest to courses and helpful to facilities staff should be created; 2) A webpage with datasets regarding campus operations (energy, water, waste, purchasing, food and dining, etc.) would greatly facilitate faculty in disciplines such as computer science, environmental studies, and economics, among others, to integrate campus sustainability issues into the curriculum.

AC1.6	Explore the establishment of the Center for the Environment.	ES, Departments, Provost's Office, Sustainability Office, SUST	Planned	3
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A draft plan for the Center for the Environment was developed in 2013. According to this plan, the Center would serve to integrate sustainability-related fields at the college (1). The Center would promote collaborative research and teaching across Wellesley as well as Babson and Olin College. In addition, the Center would promote alumni involvement and outreach to increase student engagement in sustainability. The transdisciplinary center would be housed within the Science Center, in part to further the integration of the sciences with the rest of the liberal arts. The specific goals for the Center included (Wellesley Center for the Environment Working Group, 2013):

- Bringing in environmental practitioners from around the world who can contribute to the curriculum. The Center would also connect with local environmental practitioners who can engage students in real-world issues, comment on student work, and host student internships.
- Providing consistent programming to enhance student leadership and communication skills. Programs and events might involve invited speakers as well as workshops and student-led symposia
- Involving the alumni through Project Handprint
- Hosting weekly informal seminars and research updates
- Housing student-led sustainability projects and events
- Serving as a hub for sustainability-related data and information for the campus community

The College should continue to explore the possibility of establishing this Center.

2. Increase hands-on learning and research opportunities in sustainability

Issue	Strategy	Responsible Party	Status	Phase
AC2.1	Continue to support sustainability-focused summer research projects led by faculty and students.	Provost's Office, Sustainability Office	Planned	1

Many faculty use Wellesley's existing resources, such as the botanical gardens and Lake Waban, to run sustainability-related projects. These projects should continue to be supported by the summer research program.

AC2.2	Encourage sustainable classroom practices.	Sustainability Office, LTS	Planned	1
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As mentioned in the Purchasing section [see section 7], the college spends \$50,000 annually on purchasing paper. As an attempt to save costs and to be more sustainable, faculty should consider going paperless in their courses. In addition, some classes in the arts and the sciences use toxic chemicals, which are harmful to both the environment and the body. Efforts should be made to find alternatives for these materials. Faculty should consider sustainability when their comments are solicited for classroom and lab renovations (the new studio arts building will offer many good examples of such initiatives taken by faculty).

The LTS and sustainability office websites also should host a site with resources to aid the incorporation of sustainability in their teaching. In addition, small problem-solving sessions or online forums should be offered for interested faculty to discuss strategies for effectively incorporating sustainable practices in the classroom while also improving pedagogy. For example, how should faculty get students to learn effectively without having to print out volumes of text? How might new electronic devices be incorporated into the classroom that minimize paper while enhancing student learning? The Sustainability Office and SUST should provide resources to ensure that interested faculty are provided with adequate tools to work with.

AC2.3	Encourage sustainable lab practices. This may include equipment sharing and swaps, educating research faculty about energy efficient appliances.	Sustainability Office	Planned	1
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Per square foot, research labs, teaching labs, and some studio arts spaces are often much more energy intensive to run than classrooms. Thus, sustainable practices in such areas can contribute

substantially to reductions in energy use. Sustainable practices in labs and studio arts spaces should be supported. These include:

- use of environmentally friendly solvents and cleaning reagents
- swapping unwanted equipment and supplies
- purchasing energy efficient equipment
- turning off equipment and lights when not in use
- closing fume hoods when not in use
- regular defrosting of -20C freezers

The Office of Sustainability will work with relevant departments and buildings to develop a webpage to assist faculty in sustainable lab and studio practices.

AC2.4	Initiate a Green lab certificate program	Sustainability Office	In Progress	2
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In consultation with representatives of the Sustainability Office, interested faculty members will obtain a list of recommendations to improve sustainability in their research labs. A Green lab certificate will be given to labs that act on the recommendations. Examples of recommendations might include improving recycling procedures, defrosting freezers and turning equipment off at night. These recommendations will not take substantial amount of time to implement but will bring significant energy and waste reduction. Such green lab certification has been implemented at many major universities, such as Harvard University (Harvard University Sustainability, 2015), University of Washington (University of Washington Sustainability, 2015) and Cornell University (Cornell Sustainable Campus, n.d.).

AC2.5	Integration of the Global Flora Project into courses and summer research.	Departments, Botanic Gardens, Sustainability Office, SUST	Planned	2
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As part of Wellesley Renewal project, the permanent collections greenhouses are proposed for major renovation (French, Jones, Summa, & Mathes, 2014). Goals of the Global Flora project include net-zero water and energy building to meet aspects of the Living Building Challenge. Once completed, the renovated greenhouses will provide students and faculty with opportunities to study the building from multiple disciplines, including architecture, engineering, chemistry, physics and biology. In addition, the indoor landscape will be closely monitored using sensors that can detect abiotic factors, such as soil moisture, temperature, humidity and light. These metrics will provide ample opportunities for class research projects. In the long run, these studies will allow for the development and further understanding of indoor ecosystems and ecosystem services which in turn will provide opportunities for interdisciplinary teaching and research.

AC2.6	Expand the use of Edible Ecosystem Teaching Garden to additional courses.	Departments, Botanic Gardens	Planned	2
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The Edible Ecosystem Teaching Garden is a garden that mimics natural, biologically diverse ecosystems while providing products humans can use/consume (Wellesley College Botanic Gardens, n.d.). It is designed to be a self-sustaining community of plants that remains healthy with minimal human maintenance. The establishment of the Edible Ecosystem Teaching Garden is currently in progress but as it grows and becomes established, it should be a valuable resource for teaching in a variety of courses.

AC2.7	Ensure that Wellesley students continue to have opportunities to farm.	Sustainability Office	In Progress	1
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Currently, Wellesley students have access to a plot of land on North 40 where they can grow their own plants and produce. The College should continue to allow the the students to continue growing their own plants and produce on North 40. If the Town of Wellesley decides to use that portion of land for other purposes, the College should find an alternative plot of land.

AC2.8	Circulate regular sustainability bulletins and advertise sustainability-related events on campus.	Sustainability Office	In Progress	1
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The bulletin will highlight sustainability-related issues and opportunities on campus as well as provide lists of internships. In addition, sustainability-related events with a focus on sustainability need to be better advertised. These may include events such as talks given by artists who focus on engaging with environmental issues or talks by economists and biologists. The bulletin should be a resource that the campus community can consult to learn about all the sustainability-related events happening on campus.

3. Expose incoming students to Sustainability at Wellesley

New Student Orientation is an ideal time to teach incoming students about sustainable practices on campus and Wellesley’s commitment to sustainability. Impressing upon them the importance of sustainability can have long lasting impacts throughout the four years at the college. The following are concrete actions to be implemented by the Sustainability Office and the First-year orientation team:

Issue	Strategy	Responsible Party	Status	Phase
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AC3.1	Train student leaders about sustainability so they can educate first-years about sustainability on campus	First-year orientation team, Sustainability Office	Complete/In Progress	1
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Student leaders collaborate with the first-year orientation team and the sustainability office to develop strategies to increase sustainability awareness among the incoming students. The student leaders will then educate the first-years about the importance of sustainability:

- Incoming students will be provided with tips on how to be sustainable. For example, an APT can teach students how the use of tablets can significantly reduce the amount of paper used in courses.
- Student orientation coordinators will organize sustainability-related events and model sustainable behaviors

AC3.2	In the “What to bring” section of the welcome package, a section on sustainable items will be included (e.g. LED bulbs, hand towels etc)	First-year Orientation Team, Sustainability Office	Planned	1
AC3.3	Include a section on Wellesley’s efforts on sustainability to the parents’ guide.	First-year Orientation Team, Sustainability Office	Planned	1
AC3.4	Implementation of sustainability themed pre-orientation trips	First-year Orientation Team, Sustainability Office	Planned	2

Although Wellesley does not currently run first-year pre-orientation trips, such a program has been discussed preliminarily. If this were to move forward, sustainability themed experiences, such as sustainable farming, should be incorporated as one of the trip options.

4. Assess sustainability awareness among the Wellesley community

Issue	Strategy	Responsible Party	Status	Phase
AC4.1	Work with OIR to survey sustainability awareness for incoming students and graduating seniors.	Office of Institutional Research, Planning and Assessment, Sustainability Office	Planned	1

In conjunction with the Office of Institutional assessment, the sustainability office will develop questions for incoming students and graduating seniors to track how their knowledge and awareness on sustainability changes over their college years. This will also allow the College to assess whether the proposed goals stated in this plan are being met.

AC4.2	Develop a survey for alumni involvement in sustainability.	Office of Institutional Research, Planning and Assessment, Resources, Sustainability Office	Planned	2
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With the assistance of the Center for Work and Services, we will gather information on:

- alums who have gone on to pursue sustainability-related careers
- alums who have gone on to graduate programs in sustainability-related fields
- how their study at Wellesley has changed their lifestyle and interactions with their community

Such information will provide us with a sense of how Wellesley has engaged them in sustainability related issues throughout their time at Wellesley. In addition, such information will allow us to connect current students with alums who have gone on to pursue sustainability related fields.

AC4.3	Assess the Sustainability Office.	Sustainability Committee	Planned	1
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An external review of the Sustainability Office is needed to assess how the Sustainability Office is staffed and organized relative to the college's commitment to addressing sustainability in all institutional decisions.

Financial Implications

Promoting awareness of sustainability amongst the community can lead to behavioral changes that will ultimately lead to reduced use of resources from water to paper and energy. While the financial impacts are difficult to estimate, such behavioral changes can reduce the college's overall energy use and waste generation [[see Sections 6 and 7]]. In addition, promoting green labs will lead to cost savings from reduction in energy use in the laboratories. Some of the initiatives listed here, such as enhancing student research and developing sustainability-related courses, will require funds. In order to secure funding, the College should explore funding opportunities from foundations. Sustainability is currently a high priority among many institutions and organizations. The intersection of sustainability and education should be of interest to foundations. The Class of 1957 funds should also be utilized to support some of the activities proposed in this plan. In addition, funds from CLCE should be sought for the Sustainability year.

Climate Implications

Education is arguably one of the most effective ways of promoting changes at the individual, societal and political levels. Educating the current generation of students about sustainability will make the appropriate inroads into environmental stewardship. As educators of the next generation of leaders, the College has the responsibility to ensure that students graduate with accurate knowledge and critical thinking skills to tackle issues related to climate change.

In the short-term, implementing these goals will lead to a general reduction in use of resources from water to paper and energy. Furthermore, improving sustainability in research labs can have significant reduction to the College's overall energy use and waste generation. Overall, these efforts will contribute to the overall reduction in carbon emissions and reduce the College's impact on the environment.

Potential Student Involvement

- Student leadership on sustainability as Eco-reps, APTs, RAs and FYMs.
- Sustainable farming on campus
- Student research in sustainability-related fields
- Internships in the Office of Sustainability

Sources

- Cornell Sustainable Campus. (n.d.). Green Your Lab. Retrieved from <http://www.sustainablecampus.cornell.edu/initiatives/green-your-lab>
- French, R., Jones, K., Summa, C., & Mathes, V. (2014). The Global Flora Collection of the Margaret C. Ferguson Greenhouses. Retrieved from <https://sites.google.com/a/wellesley.edu/global-flora/>
- Friends of the Wellesley College Botanic Gardens. (2015). Newsletter. Retrieved from <http://www.wellesley.edu/wcbg/resources/newsletter/node/27057>
- Harvard University Sustainability. (2015). Green Labs. Retrieved from <http://green.harvard.edu/programs/green-labs>
- Office of Sustainability, Wellesley College. (2015). Sustainability. Retrieved from <http://www.wellesley.edu/sustainability>
- University of Washington Sustainability. (2015). Green Laboratory Program. Retrieved from <http://green.uw.edu/green-laboratory>
- Wellesley Center for the Environment. (2015). Wellesley Center for the Environment Newsletter Archives. Retrieved from <https://drive.google.com/a/wellesley.edu/folderview?id=0BzqP82l8FumGb1dWcXIteGVvSEU>
- Wellesley Center for the Environment Working Group. (2013). Draft Case Statement.
- Wellesley College. (2014, March 7). Divestment. Retrieved from <http://www.wellesley.edu/about/president/mytake/divestment/node/42604>
- Wellesley College Botanic Gardens. (n.d.). Edible Ecosystem Teaching Garden. Retrieved from http://www.wellesley.edu/wcbg/our_gardens/edible_ecosystem_teaching_garden/node/30407

Buildings

The Wellesley College campus is famed for its many buildings of historical, architectural, and iconic importance to all who live and work on campus as well as former students and campus visitors. The college's *2025 Plan for Campus Renewal* declares that a “deep and nuanced understanding of the College’s buildings – individually and as an ensemble – and preservation of their most significant qualities are necessary precursors to additions and renovations that engage in meaningful ways with the existing campus” (Venturi, Scott Brown and Associates, Inc., 2013).

To keep the campus’ diverse portfolio of academic, residential, and administrative structures built over a period of 150 years functioning as relevant spaces and to enable them to operate as sustainable spaces will require creative, often challenging, decisions.

From the 1980s to the early 2000s, the college has increasingly included sustainability of its buildings and of the infrastructure serving them in its renovation planning. *The 1998 Landscape Master Plan* noted that “the nearly built-out condition of the campus makes expansion and growth difficult” (Michael Van Valkenburgh Associates, Inc., 1998). This limitation necessitated a general sustainability element in the college’s building program. The college emphasized the replacement of aging buildings (the demolition of the Mary Hemenway Gymnasium and the building of the Keohane Sports Center 1985), the new construction that combines several functions of older buildings (the Lulu Chow Wang Student Center 2005 with new spaces for the campus bookstore, an open dining area, student mailboxes, as well as several student gathering areas), and the extensive renovations of existing buildings (Pendleton East 2000, Lake House 2005, the Houghton Memorial Chapel 2008).

The 2007 *Comprehensive Facilities Plan*, a survey of estimated capital needs in all the college’s buildings and infrastructure, declared that “[c]apital planning for future alterations or expansion at Wellesley will address sustainability, with an emphasis on ecological, cost-effective, and low-maintenance capabilities” (Eva Klein & Associates, Harvey H. Kaiser Associates, & Symmes Maini McKee Associates, 2007). Within the last five years there have been major building renovations of the Field House, the Whitin Observatory, and, most recently, Schneider. With the exception of the Field House, these renovations have earned LEED Silver; the renovation of Alumnae Hall LEED Gold. The current renovation of Pendleton West is also projected to earn LEED Gold. The 2014 *Green Building Standards*, authored by the Advisory Committee on Sustainability and formally adopted by the Trustees, recommends as sustainability goals for future large renovation projects (all major building and minor building projects in some cases) LEED Gold at a minimum (Advisory Committee on Environmental Sustainability, 2014).

The 2007 *Comprehensive Facilities Plan* served as the basis for the current *2025 Plan for Campus Renewal*. However, a real challenge to the college’s vision of sustainability lies in the large number of buildings (of various functions: faculty and student housing, academic and administrative) listed on the *Facilities Plan* but not included in the *2025 Plan* for renovation (and it should be noted that a number of renovations in the *2025 Plan* will be quite limited to “freshenings” of interiors [paint and carpeting] and replacing the HVAC [heating, ventilating, and air-conditioning] systems). This portfolio of

excluded buildings--of various ages and conditions of repair--does not allow of one boilerplate fix. However, most of these buildings do share two critical issues: the lack of individual utility metering and the large backlog of deferred maintenance (which remains static or slowly growing) to both buildings and their less visible supporting infrastructure (the utility systems providing for the delivery of water, electricity, heat, and tech hookups, which because of “dispersed nature of the campus requires a high proportion of length-of-linkages relative to the number of buildings served”) (Michael Van Valkenburgh Associates, Inc., 1998). Without metering it is difficult to track energy and water waste. Without strongly addressing the deferred maintenance backlog, the college struggles to catch up on maintenance at the same time as keeping buildings and their infrastructure functioning. The result is a significant waste of energy, time, and personnel power--and, therefore, a significant cost to the college. The college cannot fully address its sustainability issues until it has good data on each building’s systems and addresses the deferred maintenance backlog. The crucial challenge will be for the college to balance catching up on the maintenance of its buildings and their infrastructure with keeping up on timely, predictable repairs to building systems.

Main Issues/Primary Goals

1. Move from constant need to catch up on repairs, to planned maintenance of buildings systems and infrastructure; that is, the ability to keep up with repairs and think proactively about future repairs.
2. Establish for each building consistent expectations of how it should be managed through proper maintenance and scheduling of its use for maximum energy efficiency. Metering of utilities will be crucial to meeting this goal.
3. Educate each building’s occupants about how they can contribute to its conservation of energy and water with the goal of good building behavior becoming a habit in the college culture.

How We Are Doing

The *2025 Plan for Campus Renewal* building upon the assessments of the college’s 105 buildings in the *2007 Comprehensive Facilities Plan* stated directly that the college “currently has enough space and will focus on renovation and re-purposing existing spaces; there is no plan to add any new permanent space, nor is there an intention to demolish any existing space” (Venturi, Scott Brown and Associates, Inc., 2013). (To be noted, the current renovation of Pendleton West will add approximately 5,000 square feet with an addition, as will the renovation of Munger if the projected plans are implemented.) Whereas the earlier projects were largely driven by program and design, the later ones (the renovations of Field House, Schneider, Alumnae Hall, the Whitin Observatory) and ongoing projects (the Boathouse and Pendleton West)--are included in the base plan of the *2025 Plan* and, as noted above, all except the Field House (which did not pursue LEED certification) and the Boathouse are LEED certified--have included explicitly the added goal of sustainability. Global Flora, the reimaging and rehousing of the Margaret C. Ferguson Greenhouses, has set as an important goal net-zero energy and net-zero water in accordance with the Living Building Challenge, a sustainable building guide even more stringent than LEED, with additional considerations of aesthetics and social justice. Smaller projects have aimed at improving the energy efficiency of some existing buildings by repairing the building envelope, upgrading the energy efficiency of windows, replacing older heating systems, and lighting efficiency.

Despite new construction, major renovations, and smaller improvements to select campus buildings, as was noted above many of the college's ageing buildings and their infrastructure are considered low priority for renovations--for example, even though they are included in the college's accounting of greenhouse emissions, Faculty Housing buildings were excluded from evaluation in the *Comprehensive Facilities Plan*--and, thus, improvements to their energy efficiency. Only 11 of 113 campus buildings, the latest count by Facilities (McLean, 2015), are individually metered. Data on energy use in most buildings must be manually read; a few meters need to be replaced and/or calibrated--this makes it difficult to plan for increased energy efficiency. Most buildings are not air-sealed: doors don't shut properly, windows are drafty, and roofs leak heat. Their outmoded heating systems are inefficient.

Of concern, too, is (as noted above) the deferred maintenance backlog of the college's buildings and infrastructure. As the *2014 Sightlines (State of Facilities in Higher Education)* report underscores, at the college as with almost all American public and private colleges and universities, these problems are exacerbated by the trend of increased pressure on the facilities to make do with less funding: "as the 'fixed' costs of physical plant operations continue to rise, balancing the budget has meant reducing service levels and cutting back on efforts to reduce the [deferred maintenance] backlog" (Sightlines, 2014). Fewer people have to keep up with urgent and immediate issues as they arise as well at the same time trying to catch up with maintenance backlogs. The costs of being constantly in a reactive mode to maintenance are much higher than being in a planned, proactive mode.

The college is pursuing strategies that will affect sustainability in campus buildings: as noted above, the pursuit of long-term maintenance projects, like the use of LED lighting and air-sealing building envelopes; the possibility of revisiting the *2025 Plan* decision to maintain current gross square footage and perhaps instead eliminate some aging, energy-wasting buildings the college doesn't absolutely need; the sectioning off of groups of campus buildings, as for example Faculty Housing, into discrete business units which can better fund their own maintenance (the Nehoiden Golf Course is already successfully functioning as this kind of enterprise); finally, as systems become modernized the labor intensiveness of catching up on maintenance will decrease.

Recommended Strategies

Phase 1 = Within 2 years of plan being adopted

Phase 2 = Within 5 years of plan being adopted

Phase 3 = Within 10 years of plan being adopted

*VP = Vice President for Finance and Administration

**CFP = Comprehensive Facilities Plan

1. Move from daily service of facility maintenance, the constant need to catch up on repairs, to planned maintenance of buildings systems and infrastructure, the ability to keep up with repairs and think proactively about future repairs.

This goal includes three initiatives: measurement, addressing the deferred maintenance backlog, and improvements to the infrastructure.

Issue	Strategy	Responsible Party	Status	Phase
B1.1	Bring building systems up to date for maximum efficiency with preventative maintenance and equipment upgrades as needed, in particular to HVAC	Trustees, VP, Facilities	In Progress	1
B1.2	Metering (for all utilities including water) all buildings, consistently monitored by a web-based dashboard	Facilities	Needs Prioritized Plan	1
B1.3	Move from reactive to proactive by implementing and funding an aggressive maintenance plan	Facilities, Budget Office	In Progress	2

Campus-wide metering will give a global understanding of what is going on in all buildings and allow campus planners to plan for energy reductions. Consistent monitoring of the central system will facilitate timely and effective troubleshooting. With proper funding and staffing, Facilities can achieve these goals.

Issue	Strategy	Responsible Party	Status	Phase
B1.4	Plan to address backlog	Facilities, Budget Office, Human Resources	In Progress	1
B1.5	Depreciation list for cycle maintenance (stewardship)	Facilities - with support from both the VP and Trustees	Not Started	2
B1.6	Comprehensive plan for each building	Facilities, Budget Office	Not Started	3

With its documentation of the estimated costs of renovations to all college buildings, even though only a general estimate, the *CFP* revealed the magnitude of costs in 2007. The *CFP* should be brought up

to date and include documentation of the deferred maintenance backlog for each building, projections of future needs, and plans how to fund and work with Facilities to catch up and keep up on maintenance.

Issue	Strategy	Responsible Party	Status	Phase
B1.7	Air sealing (caulking, weatherstripping)	Facilities	In Progress	1
B1.8	Envelope enclosure	Facilities	During Renovation	2
B1.9	Update HVAC, LED lighting, plumbing, steam heat	Facilities	During Renovation	3
B1.10	Update existing building commissioning process	Facilities	Needs to be Formalized	3
B1.11	Conversion of steam heat to forced hot water heating	Facilities	During Renovation	3

The renovation of Schneider is the best example on campus of a building where long-term maintenance projects have been successfully implemented: building envelope is enclosed (new roof, new windows, HVAC using minimum air, LED lighting). Forced hot water systems are more efficient: “steam boilers operate at a higher temperature than hot water boilers [forced hot water boilers], [they] are inherently less efficient”; they are also more controllable” (10).

The college should establish an “existing-building commissioning process,” perhaps similar to that at Michigan State University (Michigan State University, n.d.). Commissioning not only occurs during new construction, but can be implemented in existing buildings and with renovations to those buildings.

In Faculty Housing, the crucial first steps are to address the energy waste in the apartment buildings by replacing old heating systems and by air-sealing windows.

2. Establish for each building consistent expectations of how it should be managed through proper maintenance and scheduling of its use for maximum efficiency.

Issue	Strategy	Responsible Party	Status	Phase
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B2.1	Set point temperatures	Policy set by Senior Staff	In Discussion	1
B2.2	Restricted use of buildings	Policy set by Senior Staff	In Discussion	2
B2.3	Light sensors, timers	Facilities	In Progress	2

Setting building temperatures at optimum levels during hours of extended use, between 68 and 72 degrees Fahrenheit, will reduce heat consumption. Restricting use of the buildings not only during holiday and academic break periods, but also at night and on weekends can significantly reduce energy consumption. Setting these policies will require a collaboration between various building users, but Senior Staff needs to outline and advocate for set point temperatures in order to strongly reinforce their use. Currently in buildings with Energy Management Systems (EMS) there are set points; a policy would be helpful to back up Facilities when set points are enforced.

3. Educate each building’s occupants about how they can contribute to its conservation of energy and water with the goal of good building behavior becoming a habit in the college culture.

Issue	Strategy	Responsible Party	Status	Phase
B3.1	Sustainable Office and Living Certifications	Office of Sustainability	In Progress	2
B3.2	Residential Life: --Trained Eco-Reps for every residential hall --One SCoop-like residential hall --Use of metered data to promote reduction of energy consumption in the residential halls	Residential Life	In Discussion and Progress	1 2 3
B3.3	Faculty Housing Info Packets	Faculty Housing Office	Not Started	1
B3.4	Reinforce energy conservation measures	Office of Sustainability	In Progress	1
B3.5	Faculty Building Representatives	Faculty Building Representatives	In Progress	1

Across campus, groups of staff, faculty, and students are becoming more engaged in the sustainable use of the buildings they occupy:

The Office of Sustainability is offering a Sustainable Office Certification for any group that considers itself to be a geographically-unified “office” (including faculty departments, staff offices, and other groups of individuals whose desks neighbor each other) to encourage the college community to be more energy efficient and reduce overall environmental impact. Every office on campus should have gone through the certification by Phase II.

In the residential halls, there are two programs that promote sustainability on campus. Eco-Reps are active members of House Councils and serve as liaisons between the Sustainability Office and student body through Res Life; a current project of the Eco-Reps is to promote the Sustainable Living Certification, which certifies individuals based on their sustainable practices in their residence halls. Residents of the Sustainability Co-op (SCoop) seek to reduce their environmental footprint in their daily activities; however, SCoop only has fourteen residents. By Phase II, there should be an entire residence hall dedicated to living sustainably and emulates SCoop.

Although currently tenants of Faculty Housing have no organized sustainability protocols; information packets should be handed out to each tenant with several suggestions to promote sustainable practices: how to recycle waste through use of the Town of Wellesley’s Recycling Center or by engaging an outside contractor for a low monthly fee; how to obtain LED lights from the Office of Sustainability; best practices for conserving energy in daily life.

Faculty Building Representatives can work more closely with the Office of Sustainability and each other to encourage the occupants of their respective buildings to work collaboratively in reducing energy consumption.

Financial Implications

The cost to the college of addressing crucial sustainability issues--and most particularly the deferred maintenance backlog--in all campus buildings (and infrastructure) will be enormous; however not facing these issues will be even more costly in the future.

Climate Implications

Reducing energy waste will have major positive implications for the college’s greenhouse emissions, but at the moment these are difficult to quantify without metering.

Potential Student Involvement

Our student population is integral to achieving our sustainability goals. With the increasing community recognition of the Eco-Reps in the residential halls, the example of SCoop (the Sustainability Co-op) and of WEED (Wellesley Energy and Environmental Defense), a student run organization addressing campus-wide sustainability issues, and of other student organizations (El Table, Regeneration,

Slow Food Wellesley), all Wellesley students are becoming increasingly exposed to sustainable practices on campus.

Sources

- Advisory Committee on Environmental Sustainability. (2014). Wellesley College Green Building Standards.
- Eva Klein & Associates, Harvey H. Kaiser Associates, & Symmes Maini McKee Associates. (2007, February). Wellesley College Comprehensive Facilities Plan Final Report. Retrieved from <http://www.wellesley.edu/sites/default/files/assets/departments/facilities/files/ComprehensiveFacilitiesPlan.pdf>
- McLean, K. (2015, April 6). Wellesley College Building List. Wellesley College. Retrieved from https://docs.google.com/spreadsheets/d/1-MyPqFzpsxY6EiBAVvha-BVjKCnE74A5QTW0npZS5_g/
- Michael Van Valkenburgh Associates, Inc. (1998, August 15). Wellesley College 1998 Landscape Master Plan. Retrieved from https://www.wellesley.edu/sites/default/files/assets/departments/facilities/files/1998_landscape_master_planpt1.pdf
- Michigan State University. (n.d.). Commissioning Process. Retrieved from <http://ipf.msu.edu/green/energy/building-efficiency/commissioning-process.html>
- Sightlines. (2014, August). State of Facilities in Higher Education: 2014 Benchmarks, Best Practices & Trends. Retrieved from <http://www.sightlines.com/wp-content/uploads/2014/08/The-State-of-Facilities-in-Higher-Education-2014-Benchmarks-Best-Practices-Trends-FINAL.pdf>
- Venturi, Scott Brown and Associates, Inc. (2013, October 22). Wellesley 2025 A Plan for Campus Renewal. Retrieved from <http://web.wellesley.edu/PublicAffairs/finalreport102213.pdf>

Climate & Energy

One of the most pressing global challenges that Wellesley students will face in the twenty-first century is global climate change. The college believes that addressing climate change is a social and moral imperative that intersects with issues that are of pressing concern to the Wellesley College community, including issues of international equity, international governance, human rights, environmental protection, and economic development.¹ Wellesley has long educated its students to be leaders on such issues. The college acknowledges that to fully address climate change requires changing campus operations by reducing consumption of fossil fuels, curbing greenhouse gas emissions, and improving energy efficiency. Making those changes requires that the college establish goals for reducing greenhouse gas emissions, improving energy efficiency, and promoting energy conservation that will guide institutional decision-making at all levels.²

Main Issues/Primary Goals

1. Reduce greenhouse gas emissions from on-campus activities, including operations of the central energy plant, transportation, and other operations, from 2010 levels by 37% by 2026 and 44% by 2036.
2. Develop an energy masterplan for the campus that reflects the college's commitment to environmental sustainability, including long-term plans for achieving carbon neutrality.
3. Engage the community in a sustained effort to conserve energy on campus.

How We're Doing

Wellesley College has a history of taking substantive steps to promote energy efficiency and reduce environmental impacts.

The college's most significant effort to advance energy efficiency and environmental stewardship occurred in 1994, when the college built a \$7.5 million on-campus co-generation facility. Compared to a traditional power plant, which operated at 30% efficiency, the co-generation facility was designed to operate at 85+% efficiency by generating electricity and capturing waste heat for heating, cooling, and other uses. For more than 20 years, the co-generation facility has performed at or near expectations. Between 1994 and 2014, it is estimated that the co-generation facility resulted in a total savings of \$37.2 million in utility costs and reduced annual GHG emissions by approximately 25% (compared to purchasing electricity from the grid), while providing the college with reliable electricity, heating, and cooling generation.³

The college has also made strides in reducing energy consumption. Between 2003 and 2014, the college reduced electricity consumption by 19%, with corresponding reductions in greenhouse gas

¹ Wellesley College, "Wellesley College Statement on Divestment."

² Advisory Committee on Environmental Sustainability to Academic Council, "Proposed Resolution on Greenhouse Gas Emissions & Climate Change."

³ Energy General, "Wellesley College Central Utility Plant: Cogeneration Analysis, Efficiency & Recommissioning Options, Energy, CO2 & CUP Planning, 2025, 2035 & 2050."

emissions.⁴ Since 2012, the college has purchased 5% green electricity from the municipal light district.⁵ In 2014, it adopted green building standards, which prioritize energy conservation and efficiency in new buildings and major renovations.⁶ The college has also piloted a \$500,000 Green Revolving Fund since 2014.⁷ To date, that fund has supported improved insulation at the central energy plant and energy efficient lighting projects in the Distribution Center, Dower, Motor Pool, Central Energy Plant, and Jewett auditorium. These projects cost \$179,000, have an average payback of 4.7 years, and will result in an annual reduction of 265 metric tons of CO₂.⁸

Despite these commitments, there are significant opportunities for the college to advance its commitment to energy efficiency and sustainability. The college has limited and/or outdated metering of utilities (whether at the scale of buildings or at the central energy plant) and none of that information is easily available to the facilities staff or the college community to support operations, behavioral change, or academic research on a regular basis. The college's central energy plant is facing increasing reliability issues and maintenance costs as it approaches the end of its useful life. As of January 2016, one of the five generators in the plant is off-line and beyond cost-effective repair; two additional generators require major maintenance.⁹ Investments in the co-generation plant could yield cost savings, increases in energy efficiency, and reductions in greenhouse gas emissions. And the college faces significant challenges in addressing deferred maintenance in buildings and infrastructure that are not scheduled for major renovations under the campus renewal plan. Addressing those deferred maintenance issues could also yield costs savings, increases in energy efficiency, and reductions in greenhouse gas emissions.¹⁰

Related Policy Issues

Since the college owns and operates a power plant, it is likely that the college will have to reduce greenhouse gas emissions to meet state and/or federal regulations in the future. The state and federal government have recently begun requiring the college to report greenhouse gas emissions annually. The state of Massachusetts adopted long-term greenhouse gas reductions goals in 2008 to achieve a 20% reduction below 1990 levels by 2020 and an 80% reduction by 2050.¹¹ The federal government finalized the Clean Power Plan in 2015. It mandates that the state of Massachusetts reduce greenhouse gas emissions from the electric power sector by 18% below a 2012 baseline by 2030.¹² In addition to reporting requirements and pending regulations on greenhouse gas emissions, the state and federal government also provide numerous incentives that could support projects outlined in this sector. Such incentives include tax-credits for renewable energy projections, co-generation facilities, microgrid

⁴ Willoughby and Bort, "Wellesley College Sustainability Progress Report 2014," 13.

⁵ US EPA, "Town of Wellesley Designated First Green Power Partner Community in Massachusetts."

⁶ Advisory Committee on Environmental Sustainability, "Wellesley College Green Building Standards."

⁷ Office of Sustainability, Wellesley College, "Green Revolving Fund."

⁸ Sustainable Endowments Institute, "Green Revolving Investment Tracking System (GRITS)."

⁹ Energy General, "Wellesley College Central Utility Plant: Cogeneration Analysis, Efficiency & Recommissioning Options, Energy, CO₂ & CUP Planning, 2025, 2035 & 2050."

¹⁰ Ibid.; Competitive Energy Services, "Wellesley College: Climate Action Plan Investigative Report (Draft)."

¹¹ Competitive Energy Services, "Wellesley College: Climate Action Plan Investigative Report (Draft)."

¹² US EPA, "Clean Power Plan: State at a Glance - Massachusetts."

projects, etc. Taking advantage of some of these incentives may require partnership with private developers and/or the Town of Wellesley.¹³

Recommended Strategies

Phase 1 = Within 2 years of plan being adopted

Phase 2 = Within 5 years of plan being adopted

Phase 3 = Within 10 years of plan being adopted

*FPM = Office of Facilities and Planning

** SUST = Office of Sustainability

*** ES = Environmental Studies Program

Issue	Strategy	Responsible Party	Status	Phase
CE1.1	Reduce Wellesley's scope 1 and scope 2 greenhouse gas emissions by 37% by 2026 and 44% by 2036.	FPM, Office of Sustainability, SUST, College		1, 2, 3

There are a variety of options that the college can pursue to reduce greenhouse gas emissions from on-campus activities (scope 1) and purchases of electricity (scope 2) including improvements to the central energy plant, behavioral change, improvements to new, existing, and to-be renovated buildings, and expansion of renewable energy generation. By pursuing such projects systematically, the college can affect substantial reductions in greenhouse gas emissions, lower energy consumption on campus, and reduce operating costs.

CE1.2	Update the college's greenhouse gas inventory.	ES, Office of Sustainability, FPM	Planned	1
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The capstone Environmental Studies course, ES300, undertook comprehensive greenhouse gas inventory (including scope 1, 2, and 3 emissions) in 2002 and 2008. Producing an updated inventory during the 2015-16 academic year would inform a long-term commitment to reducing institutional greenhouse gas emissions. Such an inventory is planned for spring 2015.

CE1.3	Review of the Central Energy Plant and development of a comprehensive energy plan for campus, including an	ES, Office of Sustainability, FPM		1
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¹³ DSIRE, "Database of State Incentives for Renewables & Efficiency, Massachusetts."

	assessment of long-term strategies for achieving carbon neutrality.			
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A comprehensive energy master plan for campus would allow the college to assess opportunities for improving the performance at the central energy plant, to ensure that infrastructure is best able to meet the demands of existing and upcoming campus renovations, and to assess opportunities for improving efficiency and reducing operating costs campuswide. Such an energy plan is necessary to reach the proposed greenhouse gas reduction goals. In advancing those goals, such an energy plan should also give attention to potential strategies for achieving carbon neutrality in the long term.

CE1.4	Review how energy management and efficiency is managed and staffed in the Office of Facilities Planning and Management.	ES, Office of Sustainability, FPM		1
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Realizing the improvements in energy efficiency, reductions in greenhouse gas emissions, and related savings in operational expenses requires reviewing how energy management and efficiency projects are staffed. Many institutions have hired energy efficiency specialists to implement such projects. Wellesley should consider creating such a position, or fulfilling such a position through existing staff positions, in the Office of Facilities and Planning.

CE1.5	Install solar arrays, and other renewable energy technologies. Sell RECs to finance such projects.	Office of Sustainability, FPM, SUST	In Planning	1, 2, 3
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The college worked with three outside firms to assess the potential for roof-top solar arrays on campus buildings during 2014 and 2015, considering both purchased and power purchase agreements. It is estimated that roof-top solar arrays could generate up to 1.25 million kWh a year, or approximately 5% of the college's energy needs.

It is important to note that the fiscal return and investment in solar on campus are somewhat unique. As a non-profit institution, the college is unable to take advantage of the 30% federal tax credit in place through 2020. The college also enjoys a relatively low-cost to generate electricity through the on-campus co-generation plant.

To ensure such projects are cost-efficient (whether the college purchases the systems or enters into a power-purchase agreement), the college should sell Solar Renewable Electricity Credits or avail itself of other similar market-based incentives. During the time the college sells SRECs, it cannot claim the greenhouse gas emissions reductions associated with these projects. The length of time that the college sells SRECs or allows a third party to sell SRECs on its behalf (in the case of a leased system) should be

determined on a case-by-case basis, but should generally not be more than one-third the anticipated life of the installation.

CE1.6	Expand energy metering on campus, such that energy consumption is monitored on at least a building by building basis.	FPM, Office of Sustainability		1, 2, 3
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Expanding metering of electricity, heat, steam, and other utilities in existing buildings on campus will allow for better facilities management, support behavioral change, and support long-term decision making. 33% of campus square footage should be metered within 2 years (including the central energy plant), 80% within 5 years, and 95% within ten years.

CE1.7	Deploy a publicly accessible campus dashboard.	FPM, Office of Sustainability		1, 2, 3
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Data on energy and utility consumption on campus can support behavioral change, sustainability planning, student projects, and scholarly research. Other schools have deployed such dashboards, including [Smith](#), [Colgate](#), and [U-Mass Amherst](#). Such a dashboard would draw on the metering infrastructure outlined in the previous strategy and be accessible both at kiosks on campus and via the web. Deployment of the dashboard should match the expansion of metering on campus in CE1.6.

CE1.8	Expand the Green Revolving Fund.	FPM, Office of Sustainability, Office of Finance and Budget		1, 2, 3
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Since 2014, the college has piloted a \$500,000 Green Revolving Fund. To accomplish its long-term goals for greenhouse gas reductions, several steps are necessary: the size of the Green Revolving Fund needs to be increased to \$2,000,000; the scope of GRF projects should be revisited (and the payback period extended from 7 to 10 years); accounting procedures related to the GRF projects need to be formalized; and management of these projects needs to be consolidated within the Office of Facilities and Management.

CE1.9	Undertake a behavioral campaign to promote energy conservation on campus.	Office of Sustainability, SUST, FPM, College		1, 2, 3
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The college projects that it can reduce greenhouse gas emissions on campus by .5% each year through behavioral changes, including outreach to the campus community, encouraging conservation, mandating

high-efficiency lighting, incentivizing the removal of personal refrigerators and heaters, and working better with building occupants to improve building management (including set points for temperature and more energy efficient settings for heating and cooling in off hours or days).

Financial Implications

While an investment in energy efficiency and infrastructure improvements on this scale is not currently included in the college's capital budget, such investments could be financed through reductions in operating costs, cost avoidance, and additional revenue streams (in the case of the central energy plant) and generate long-term financial savings for the college. For instance, improvements to the central energy plant are estimated to cost between \$10 and \$20 million (based on preliminary analyses) and a fully-funded Green Revolving Fund would be a commitment of \$2 million. If the college pursued all available strategies for improving energy use and reducing greenhouse gas emissions, preliminary estimates indicate the college could realize cumulative operating cost savings of \$16 - \$34 million between 2016 and 2026 and a cumulative \$37 - \$73 million between 2016 and 2036. Some additional expenses necessary to undertake such a large-scale energy program, such as metering, a campus dashboard, and changes in staffing necessary are not included in these estimates. If carefully planned, Wellesley has the opportunity to both reduce both its impact on the environment in a manner that will also benefit the college fiscally.

Climate Implications

The greenhouse gas reductions recommended in this sustainability plan would represent a substantial reduction in the college's greenhouse gas emissions through 2036, on top of the approximately 25% reduction already achieved by running the co-generation plant since 1994. But to address climate change as fully as possible, further reductions are likely to be necessary in the future. The greenhouse gas reduction commitments outlined here will be revisited at least every five years and revised as necessary. As part of this sustainability plan, the college will also begin planning for a long-term commitment to achieving carbon neutrality.

Potential Student Involvement

Student involvement will be central to advancing these energy conservation and greenhouse gas reduction goals. Students have the opportunity to help inventory the college's greenhouse gas emissions through the Environmental Studies Capstone course. Students will be involved in affecting behavioral change through internships with the Office of Sustainability and program such as the Eco-Reps in the dormitories. Students will be able to undertake research projects to assess the effectiveness of different campaigns or other mitigation strategies using data available from the campus dashboard.

Bibliography

- Advisory Committee on Environmental Sustainability. Letter to Academic Council. "Proposed Resolution on Greenhouse Gas Emissions & Climate Change," December 5, 2015.
- . "Wellesley College Green Building Standards," 2014.
<https://drive.google.com/a/wellesley.edu/file/d/0B3qQ5qdnqCI8UIRXdDIzZHcwbk9pY1VOM3NUM2h6aXRLcGRF/view>.
- Competitive Energy Services. "Wellesley College: Climate Action Plan Investigative Report (Draft)," December 5, 2015.
- DSIRE. "Database of State Incentives for Renewables & Efficiency, Massachusetts," 2015.
<http://programs.dsireusa.org/system/program?state=MA>.
- Energy General. "Wellesley College Central Utility Plant: Cogeneration Analysis, Efficiency & Recommissioning Options, Energy, CO2 & CUP Planning, 2025, 2035 & 2050," November 2015.
- Office of Sustainability, Wellesley College. "Green Revolving Fund." *Wellesley College*, March 12, 2014.
<http://www.wellesley.edu/sustainability/what-we-re-doing/green-revolving-fund/node/78781>.
- Sustainable Endowments Institute. "Green Revolving Investment Tracking System (GRITS)," n.d.
<http://grits.greenbillion.org/>.
- US EPA. "Clean Power Plan: State at a Glance - Massachusetts," August 2015.
<http://www3.epa.gov/airquality/cpptoolbox/massachusetts.pdf>.
- . "Town of Wellesley Designated First Green Power Partner Community in Massachusetts," September 4, 2012.
<http://yosemite.epa.gov/opa/admpress.nsf/0/720ebd9b9aa266f485257a70004a4744?OpenDocument>.
- Wellesley College. "Wellesley College Statement on Divestment." *Wellesley College*, March 7, 2014.
<http://www.wellesley.edu/about/president/mytake/divestment/node/42604>.
- Willoughby, Patrick, and Sharon Bort. "Wellesley College Sustainability Progress Report 2014." Wellesley College, 2014.
<https://drive.google.com/a/wellesley.edu/file/d/0BzqP82l8FumGcEZCa1R2UG5PZTBzV3NnU2tKWndIcHcxSDh3/view>.

Food & Dining Services

The purchasing, preparation, consumption, and disposal of food have an effect on the environment, the health of students, and the economic strength of the College. Therefore, food is inherently tied to the College's commitment to sustainability. The College's sourcing of foods affects environmental issues such as climate change, biodiversity, toxicity, and animal welfare; the transportation and preparation of foods affects energy and water consumption; and the disposal of food contributes to economic and physical waste. The Sustainability Committee therefore aims to identify and execute ways to minimize the College's negative impact on these issues and implement methods that will be both environmentally, socially, and economically sustainable.

Dining at Wellesley

Wellesley College contracts with AVI, locally known as Wellesley Fresh, to operate most of its dining services. With the exception of the College Club restaurant and two student-run co-operatives (El Table and Café Hoop), Wellesley Fresh handles all aspects of dining at Wellesley. Wellesley Fresh has already begun addressing the sustainability of its practices and is open to implementing more sustainable practices in the future.

All 2,500 Wellesley College students, with the exception of a small number of those who live off campus or live in co-operatives, are on the College's dining plan. The dining plan requires students to pay an equal, uniform cost and gives students access to a buffet-style selection of foods. Students are not limited in the number of times they may enter the dining hall or how much food they can take.

There are five dining halls located in Pomeroy, Bates, Tower, Stone Davis, and the Bae Pao Lu Campus Center. Pomeroy strictly serves vegetarian and kosher items, and the Campus Center is the only facility where students have to swipe their One-cards. These facilities are open and accessible from 7:30am to 7:00pm on weekdays, with extended hours at the Stone Davis and Bae Pau Lu Chow Campus Center. Breakfast, lunch, and dinner hot-entrees are served during specific time intervals. A salad bar and cold items are accessible all day long. Four out of the five dining halls are open on weekends. It is against school policy for food to be taken out of the dining halls, but this is currently a common practice, and to-go containers are not available. Students receive eight guest passes per semester for these dining halls.

Prepared foods and packaged items are offered at three other facilities operated by Wellesley Fresh: the Collins Café, the Leaky Beaker, and the Emporium. These facilities are not included in the dining plan, require payment for their products, and have more limited hours than the dining halls.

The Committee's ultimate vision for sustainable dining is to work with Dining Services to maximize the amount of food purchased that are in-season from local or regional farms that minimize pesticide use or are from sustainable fisheries, to serve healthy and nutritious meals that have low energy and water footprints, and to produce little to no food and non-food waste.

Main Issues/Primary Goals

Reduce the College's footprint by:

1. creating a multi-stakeholder Food Committee to implement the goals of this Sustainability Plan,
2. creating a better system for collecting more food related data and information,
3. increasing sustainable food and utensil purchases, and
4. decreasing overall food and utensil purchases and waste generation.

How We're Doing

Much of the work done by the Food and Dining Services sector of the Sustainability Committee has been focused on identifying what information is necessary to understand current policies and practice on campus. This is the first and vital step in evaluating our strengths and weaknesses with regard to sustainability, and beginning to target areas for improvement. Current policies are discussed in four sections below, which include summaries of how food is categorized currently, where we are with respect to sustainable purchasing, where we are with respect to decreasing overall purchasing, and current and potential waste disposal procedures. Raw data about purchases and waste disposal costs are being processed to provide a more comprehensive picture of current sustainability practices. A new and ongoing Food Committee will need to carry on the charge of developing short and long term goals, specific strategies for reaching those goals, and methods for monitoring progress and adapting targets as needed.

How are we categorizing food right now?

Through a collaboration between Dining Services, the Office of Sustainability, and the Sustainability Committee, Wellesley College has begun to collect data on the 'sustainability' of its food purchases. The Sustainability Committee contributed by creating a definition for what types of food can be considered 'sustainable.' It pulled largely from the nationwide movement on college campuses called Real Food Challenge, and then appropriately modified the definitions to fit Wellesley College.

As defined by this committee, the College defines sustainable food as food items that meet one or more of the following characteristics:

- Local
 - Produce: grown within 250 miles from Wellesley College.
 - All other foods: processed/prepared within 250 miles from Wellesley College AND/OR (b) contains only ingredients grown/produced within 250 miles from Wellesley College
- Fair
 - Fair Trade Certified
 - Domestic Fair Trade Certified
 - Rainforest Alliance Certified
- Humane
 - AGA grass-fed
 - Pasture raised

- 100% grass-fed
- Certified Humane Raised and Handled
- Cage-free
- Sustainable Seafood
 - Marine Stewardship Council Certified
 - Aquaculture Certification Council Certified
 - Seafood Watch Guide "Best Choices" or "Good Alternatives"
- Protected Harvest Certified
- Food Alliance Certified
- USDA Certified Organic

Additionally, food items will not be considered sustainable if: (1) information is available that indicates that confinement/battery cages, child labor, slave labor, or indentured servitude are used in the production/processing of the items, (2) information is available that indicates that food items qualified as sustainable under a certain characteristic are not actually in keeping with the intention of that characteristic (e.g. a locally grown produce item transported to campus via a distribution center that is not local), or (3) they contain harmful additives.

Dining Services has contributed to the College's effort to quantify the sustainability of our food purchases by providing line item food purchasing data that are currently being analyzed by student interns working for the Office of Sustainability. This joint effort will help the College identify the baseline level of sustainable food purchasing so that it can set reasonable goals for future purchasing.

How are we doing with respect to increasing sustainable food and utensil purchases?

For the past few weeks, we have been compiling data from line item listings provided by Wellesley Fresh to establish the percentages of sustainable food and utensil purchases across categories. Once this process has been completed (by mid-October), we will be in a position to evaluate how well we are doing currently. That will give us a baseline to establish specific goals, by category, for increasing sustainable purchases.

We currently have working definitions for sustainability, as well as general policy statements from food providers on campus. Those definitions and policies for purchasing are included below (AVI Fresh, 2015):

Purchasing

- *Meat:*
 - A majority of beef and pork used in Wellesley Fresh operations come from Niman Ranch and is therefore free of hormones, antibiotics, and nitrates.
 - Niman Ranch also ensures that the cattle and pigs are raised humanely and emphasizes sustainable practices.
- *Seafood:*

- A majority of seafood purchased for the campus is either harvested locally or certified by the Marine Stewardship Council, and is evaluated by the Gulf of Maine Research Institute for sustainable harvesting practices.
- Wellesley Fresh also participates in the Red's Best Seafood Program to bring sustainably harvested local fish to the College.
- *Coffee:*
 - All coffee in the dining halls on campus provided through Wellesley Fresh is certified fairtrade and organic (with the exception of Starbuck's and Peet's coffee).
- *Sugar:*
 - Wellesley Fresh now uses cane sugar almost exclusively in dining halls and in baking recipes. The sugar supplier is able to use the cane fiber to generate electricity to power their operations.

In addition, Wellesley Fresh has committed to purchase a number of items from local suppliers as available, including seafood, milk, ice cream, bread, and seasonal produce.

How are we doing with decreasing overall food and utensil purchases?

We have not had information about previous baseline levels, nor over time data to use to measure whether overall food and utensil purchases have decreased in recent years. With the baseline data mentioned above, however, it will be possible to set specific targets and develop strategies for specific decreases. Doing so will involve ongoing work by a standing Food Committee that will evaluate the feasibility and implications of possible changes designed to decrease purchases within different categories.

How are we doing with respect to waste management?

An overarching infrastructural feature of dining services on campus is that there are five separate dining halls. Each dining hall must prepare a range of meal options at each location without knowing exactly how many students will choose to go where. This situation influences the sustainability of our food system on campus in a number of ways, but particularly affects the amount of waste produced by the system. A committee charged with evaluating several aspects of Dining Services, including a possible consolidation of some dining halls, has formed recently.

Another important feature of our food system on campus is that in most dining locations, students are not required to swipe their OneCards to enter and eat a meal. This means that Dining Services does not have data on how many students (or others) eat where, which is valuable information when planning meals with waste reduction in mind.

A 2013 student report estimates that Wellesley College wastes 220 metric tons of food annually (Environmental Studies 300 Capstone Course, 2013). Due to a recent Massachusetts ban on organic waste disposal for institutions producing over one ton of food waste weekly, the College is mandated to compost its food waste (Massachusetts Executive Office of Energy and Environmental Affairs, 2014). To

comply with this ban, Wellesley College composts pre- and post-consumer food waste as well as biodegradable, greenware products like paper plates and compostable utensils from dining operations on campus (Willoughby & Bort, 2014). Organic and biodegradable waste is collected weekly and sent to an industrial composting facility in Marlborough, MA, WeCareEnvironmental, about forty miles away (Environmental Studies 300 Capstone Course, 2013). In the Fall 2014 semester alone, roughly 27,000 pounds of pre- and post-consumer waste was sent for composting (C. Tyger, Resident Director of Food Service, personal communication 2015). Separate from, but related to composting, Dining Services recycles cooking oil used by dining services by selling it for conversion to biodiesel.

To minimize waste entering the composting stream, Dining Services intentionally prepares and cooks food in small batch sizes across the dining hall system. To help consumers reduce waste, trays must be requested in dining halls rather than being readily available, which encourages people to take only what they think they will eat and reduces water since there is less to go through the dishwasher.

Dining Services also recycles office supplies, such as paper and ink cartridges as well as other typically recycled items on campus like bottles, cans, and cardboard. Silverware, plates, cups and napkins used in the dining halls are mostly greenware, which can be composted. Finally, though patrons rarely take advantage of it, discounts are offered at the Collins Cafe, the Leaky Beaker and the Emporium if patrons bring their reusable mugs.

As mentioned earlier, the College Club does not contract with Wellesley Fresh, but they too have implemented a few waste reduction measures. They donate their organic waste, between 200 and 250 pounds per week, to Weatherbury Farm in Natick, MA, and their leftover food, around 25 pounds per week, to the Metrowest Harvest Shelter (Office of Sustainability, 2015).

As we process the currently available data, it is clear that developing a comprehensive Sustainability Plan for Dining Services is both a high priority and a long-term endeavor. Below we describe recommended strategies across three phases of plan development and implementation.

Recommended Strategies

Phase 1 = Within 2 years of plan being adopted

Phase 2 = Within 5 years of plan being adopted

Phase 3 = Within 10 years of plan being adopted

*SUST = Sustainability Committee

1. Create a multi-stakeholder Food Committee to implement the goals of this Sustainability Plan

Issue	Strategy	Responsible Party	Status	Phase
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FD1.1	Create a multi-stakeholder Food Committee to implement the goals of the Sustainability Plan and engage with a variety of sustainability-related issues.	Dining Services, Office of Sustainability, SUST	Planned	1
FD1.2	Create a comprehensive Sustainable Food Policy.	Dining Services, Office of Sustainability, Sustainability Committee	Planned	1

2. Create a better system for increased food related data and information.

Issue	Strategy	Responsible Party	Status	Phase
FD2.1	Collect data annually on food purchases.	Dining Services, Office of Sustainability	In Progress	1
FD2.2	Create baseline of current food purchases based on categories such as local, organic, and Fair Trade.	Dining Services, Office of Sustainability	Planned	1
FD2.3	Evaluate the sustainability of food purchases, waste, and practices through regular audits of Dining Services data.	Office of Sustainability	In Progress	1
FD2.4	Revise ongoing strategies based on regular audits.	Food Committee	Planned	2

3. Increasing sustainable food and utensil purchases.

Issue	Strategy	Responsible Party	Status	Phase
FD3.1	Include sustainability goals, benchmarks, and timetables in the Dining Contract for campus food services.	Office of Finance and Administration, Dining Services, Office of Sustainability	Planned	1

Information in the contract, particularly sustainability goals, benchmarks, and timetables should be made available to the campus community while sensitive financial information is still kept confidential.

FD3.2	Set clear and achievable percentage increases in sustainable purchases to be met by 2020, 2025 and beyond	Office of Finance and Administration, Dining Services, Office of Sustainability, Food Committee	Planned	3
FD3.3	Promote vegetarian diet/reduced meat products consumption through educational outreach programs.	Office of Sustainability, Interested Student Groups	In Progress	1
FD3.4	Advertise local and sustainable main dishes in dining halls and online menu.	Dining Services	In Progress	2

4. Reduce the College’s footprint by decreasing overall food and utensil purchases and waste generation.

Issue	Strategy	Responsible Party	Status	Phase
FD4.1	Consider reducing the number of dining halls in order to decrease energy use, increase food preparation efficiency, and reduce food waste.	Office of Student Life, Office of Finance and Administration	In Progress	1

As noted above, a committee has been created to further explore this issue and the feasibility of changing the number of dining halls. If this strategy was to be pursued, community engagement must be sought out and included in the decision.

FD4.2	Educate students during orientation week about proper food disposal in dining halls.	Office of Sustainability, Dining Services	In Progress	1
FD4.3	Encourage less food waste through student-oriented competitions.	Dining Services	Planned	1
FD4.4	Purchase and utilize environmentally friendly cleaners and detergents throughout all food service operations.	Dining Services	Planned	2
FD4.5	Increase advertising and/or discount for reusable mug program.	Dining Services	Planned	1

FD4.6	Enforce current rules and regulations surrounding dishes and utensils leaving the dining halls.	Dining Services, student body	In Progress	1
FD4.7	Explore to-go containers to reduce the loss of dishes and utensils as well as the use of paper cups.	Office of Sustainability, Dining Services, Food Committee	Planned	2

Financial Implications

It is difficult to be specific about the financial implications of meeting the goals outlined above, largely because many of the details have yet to be decided. In general, environmentally sound and sustainable food purchases often carry a 15-20% price premium, although this is not always the case (Committee on Sustainability, 2010). Reducing consumption of meat and some dairy products would also lower purchasing costs, but whether those cost reductions would offset the increased price of sustainable food across the board is currently unclear.

Food waste reduction efforts, in contrast, are likely to save money both in terms of lower overall food expenditures, and reductions in the cost of waste disposal (because there would less disposal required). Consolidation of the dining halls would lower energy, water usage and labor costs, and would be likely to further lower waste disposal cost because it would be easier to estimate the number of diners per meal and gauge amounts accordingly. Any efforts to reduce dish loss would lower costs since Wellesley Fresh currently spends roughly \$50,000 a year to replace lost dishware and silverware. Research is ongoing into the relative costs of reusable containers and the feasibility of changing student behavior in this domain. Further cost efficiencies might be expected to the extent that food waste from dining services can contribute to compost programs on campus.

Waste reduction efforts primarily require time, commitment and persistence on the part of those working to motivate and educate students about sustainability, as opposed to substantial financial costs. Those efforts, however, will require ongoing support for the Office of Sustainability overall.

Climate Implications

The food system impacts climate change in a number of ways: through food production, packaging and processing, transportation, and consumption as well as the waste products from each stage. Each of these stages results in greenhouse gas emissions either directly through fossil fuel use and livestock or indirectly through land use changes and degradation of organic waste. Wellesley College can reduce our climate impact by sourcing food from local and sustainable vendors, minimizing waste in the preparation and consumption of food, offering vegetarian and vegan options at meals, and educating students and others about the climate impacts of their food system.

Potential Student Involvement

Food on campus intimately affects students' quality of life. There are many avenues for students to help create a more sustainable food system at Wellesley:

- Food Reps in each residence hall connect House Council to Dining Services. Reps can better inform residence halls about new sustainable achievements as well as lead tutorials on how to compost correctly and reduce food waste.
- Relevant student groups can also help educate the student body by screening food-related documentaries, having poster campaigns to educate students about food-related sustainability issues, and collaborating with Dining Services to create sustainable change.
- Student interns at the Office of Sustainability provide a crucial bridge between the administrative side of on-campus sustainability and the student body.
- When the future Food Committee is up and running, there should be room for a couple of student representatives to ensure student input is incorporated into the decision making process for campus dining services.
- Independent research opportunities are available for students who wish to analyze the College's food system and new sustainable dining practices.

Sources

- AVI Fresh. (2015). Sustainability Love of the Earth Mission. Retrieved September 15, 2015, from <http://www.wellesleyfresh.com/sustainability.html>
- Committee on Sustainability. (2010). Sustainability and Climate Action Management Plan (SCAMP). Smith College. Retrieved from <http://www.smith.edu/green/docs/SmithCollegeSCAMP.pdf>
- Environmental Studies 300 Capstone Course. (2013). Food is Not Trash: Redefining Wellesley's Waste Culture by Composting. Wellesley College. Retrieved from <http://www.wellesley.edu/sites/default/files/assets/departments/environmentalscience/files/es300-2013-foodisnottrash.pdf>
- Massachusetts Executive Office of Energy and Environmental Affairs. (2014). Commercial Food Waste Disposal Ban. Retrieved September 15, 2015, from <http://www.mass.gov/eea/agencies/massdep/recycle/reduce/food-waste-ban.html>
- Office of Sustainability, Wellesley College. (2015). Food and Dining. Retrieved September 15, 2015, from <http://www.wellesley.edu/sustainability/food-and-dining/node/49931>
- Willoughby, P., & Bort, S. (2014). Wellesley College Sustainability Progress Report 2014. Wellesley College. Retrieved from <https://drive.google.com/a/wellesley.edu/file/d/0BzqP82l8FumGcEZCa1R2UG5PZTBzV3NnU2tKWndIcHcxSDh3/view>

Landscape and Watershed

“Am I not right in feeling that it is especially the duty of an institution of learning which is possessed of such an example [of landscape beauty] to treasure it for future generations with the most sympathetic care for its scientific as well as for its aesthetic value?” (Michael Van Valkenburgh Associates, 2010, p. 44)

What Frederick Law Olmsted, Jr., wrote in 1902 is true today. In addition to its beauty, the College’s wooded, glacial-till landscape at the edge of Lake Waban is a resource as precious as any financial asset we own—whether historic building or irreplaceable piece of art—and merits the most sustainable stewardship possible.

Unlike many other colleges and universities formed in the late nineteenth and early twentieth century, when campus design sought to showcase control over the environment, Wellesley made its landscape a primary, structuring feature of the campus. The College’s mission of educating and empowering women by connecting them to their world was embodied in the landscape, which acts as a feminist critique of traditional campus-making. The Wellesley College campus was not designed to create efficiency and convenience, but to be a place where people move through the landscape, experience natural surroundings, and meander in a way that promotes physical and emotional health. The way from point A to point B is rarely a straight line here, which may have something to do with why Wellesley women are renowned for long vision, creative solutions, and navigating complex systems and organizations.

This historic campus landscape, with its remarkable biodiversity, is a living laboratory with tremendous potential: We must care for it to ensure that our environment continues to match our mission by creating a sustainable land use design that reflects and promotes our educational ideals. This would yield a wide range of potential benefits in aesthetics, community health, curriculum, and scholarship.

The College landscape today spreads across approximately 500 acres, 22 of which are managed by the Wellesley College Botanic Gardens, with the remainder—including the 90 acres of Nehoiden Golf Course—in the hands of the Grounds Department. The watershed we occupy is an integral part of this landscape. Wellesley is the only college or university in Massachusetts, and one of very few in the country, that manages and supplies all of its water needs from on-campus sources. Because we are part of the larger Charles River Watershed, our sustainable practices also have a broader influence on our neighbors and the region. We owe it to future generations to maintain the health, utility, and beauty of these systems.

Main Issues/Primary Goals

1. Make the campus a fully regenerative landscape
2. Promote sustainable and educational human interaction with the landscape
3. Improve sustainability of water management

How We're Doing

Wellesley College has a deep history in sustainable thinking about its landscape, starting with founders Henry and Pauline Durant, who gathered depleted agricultural parcels and re-naturalized the landscape by working with the land rather than shaping it. Appreciation of nature at the scale of natural systems was built into the landscape design from the very start. The Durants' vision gave women a place in the landscape from which they were well positioned to learn about the world and encouraged to experience it physically, through, for example, required morning walks designed to awaken bodies and minds—unusual at a time when prevailing notions held that women were fragile, indoor creatures. Olmsted was inspired by the College's glaciated landscape to lay it out in a way that facilitated biodiversity and green infrastructure: buildings arranged in three-sided, south-facing, micro-climatically sheltered quadrangles on wooded hilltops overlooking open valleys filled with meadows that infiltrated and directed the water to the lake. In the post-World War II period, however, with scarce resources, loss of institutional memory, and the rise of automobiles and power lawn mowers, Olmsted's approach was less faithfully followed, and the landscape suffered. The rerouting of College Road in the 1960s made campus more car-friendly, but fragmented the landscape and transferred the overland drainage into pipes, a major departure from the original reliance on natural infrastructure. The ecologically rich meadows were turned into a monoculture of lawn grass that required weekly motorized mowing and its attendant demand for fossil fuels; some meadows were turned into parking lots.

The 1998 Campus Master Plan (98CMP) by Michael Van Valkenburgh Associates sought to reconnect the valley system and revitalize ecological diversity on campus, strengthening infrastructure by embracing natural systems rather than attempting to control them. Alumnae Valley, for example, which drains 80 acres of campus watershed, was thoroughly rehabilitated in the first decade of the 2000s. It is now a working landscape: Toxic waste from a former coal-to-gas processing site is systematically removed; classified soils were utilized but insulated by 30 inches of clean soil above for planting and walkways; a wetland was restored and contaminants safely contained; the cattail marsh and a series of infiltration swales cleanse the water and provide habitat where there had been acres of impermeable surface parking. Since the gigantic Paintshop Pond remediation project was completed in 2004, all campus land west of a line between Hazard Quad and the Boat House—including the Campus Center, Alumnae Valley, and Davis Parking Garage—has been irrigated with water from Lake Waban, primarily to reduce potable water use but also to improve the health of the lake and its aquatic life. Other recent achievements in sustainability include:

- 5.7 acres of pavement and parking restored to landscape
- 60 acres of campus intensively renovated or restored
- Over 7,000 trees, 25,000 shrubs and tens of thousands of herbaceous perennials including wetlands plants planted in renovated areas
- 8 acres of wetlands restored at Paint Shop Pond and Alumnae Valley
- Reduction of potable water consumption by 38.6% since 1999
- Alumnae Valley received the highest honor of Design Excellence from the American Society of Landscape Architects.

This progress in restoring and renewing landscape sustainability resulted from substantial investment after 1998 and included numerous infrastructure upgrades throughout campus.

The Grounds Department has cultivated a skilled staff of 16 highly trained landscape professionals. Construction projects in recent years have presented challenges to landscaping efforts, but the Wellesley 2025 (W2025; also known as Campus Renewal) project team is more successfully collaborating with the landscape team. Each area on campus has a landscape management program, and integrated pest management (IPM) principles are rigorously followed campus-wide. Soil testing and pest management are linked to the specific place and time of their application. All organic debris (including stumps but excluding invasives) goes into compost and is eventually deployed on campus as mulch or loam, returning nutrients to the landscape. In keeping with the integrated design of the campus, barriers among divisions responsible for the landscape (e.g., Nehoiden groundskeeping team and playing fields groundskeeping team) have been broken down and these caretakers now work together more effectively.

The Botanic Gardens, too, are managed in an ecologically sound manner: Most plantings are well established and require very little water or fertilizer, and a comprehensive maintenance plan has been created. This is critical to Wellesley's potable water situation, because our wells are in the midst of the WCBG. The Edible Ecosystem grows on a slope above the campus wells, and this garden has been designed to improve the quality of the runoff into the wells. The new path there (basalt and schist stone-dust) was completed in spring 2014 with permission from Massachusetts Department of Environmental Protection (Mass. DEP); Botanic Gardens staff worked to make the path as accessible as possible while still being permeable for better water infiltration.

Stakeholders agree that maintenance and sustainability practices are much improved and heading in the right direction, though continued support from the community is needed.

Some trends, however, are less encouraging, and point to opportunities for education and fine-tuning our approaches. The economic downturn of 2008 slowed the professionalization of landscaping staff. Legal, logistical, and aesthetic resistance to allowing students and faculty to investigate the landscape for academic and research work (e.g., sampling in Lake Waban, measuring water quality, studying green roof construction) at times seems excessive. Community expectations in some areas are extremely (and resource-intensively) high, such as bare pavement on all walkways after snowstorms, grass mown to certain heights, or leaves removed from planting beds. The long-term work of following through on landscape maintenance, especially in the wake of construction and renovation projects, is at times postponed for budgetary reasons, giving the appearance of neglect.

Measuring the state of the landscape and watershed takes place on several fronts. Grounds crews test the soil on at least an annual basis. The water treatment vault just northwest of the Science Center is also used for regular measurement of water quality. The Mass. DEP requires compliance with the College's Water Management Act Permit for all water uses on campus; this includes both potable and nonpotable water from ground and surface waters on campus. The College's Annual Statistical Report (ASR), is one of many reports submitted to Mass. DEP on an annual basis that describes water use on

campus. Our Environmental Health and Safety (EHS) office maintains a database on use of pesticides, herbicides, fertilizers, etc., with data from Grounds personnel tracking amounts, dates, totals, and so on. A great deal of hazardous material testing is done on campus; the EHS Construction/Renovation checklist, for example, is followed before all construction projects are undertaken to record the condition of the site before work begins. The College is required by the Massachusetts Water Resources Authority (MWRA) to test wastewater that goes from campus into the sewer system. EHS continuously compares our practices to those of other colleges, and Wellesley is a member of several leading-edge environmental health and safety organizations (e.g., Campus Consortium for Environmental Excellence, or [C2E2](#)).

Recommended Strategies

Phase 1 = Within 2 years of plan being adopted

Phase 2 = Within 5 years of plan being adopted

Phase 3 = Within 10 years of plan being adopted

*EHS=Office of Environmental Health and Safety

1. Make the campus a fully regenerative landscape

Issue	Strategy	Responsible Party	Status	Phase
LW1.1	Promote a systems approach to landscape management that boosts natural self-regeneration	Wellesley College Botanic Gardens, Grounds Service, Office of Sustainability, Academic Community , Public Affairs	In Progress	1

The College should aim to establish a “regenerative” landscape (to borrow a term from agriculture), managing soil, plant health, plant diversity, and dependent fauna with this goal in mind. The regenerative approach seeks to make biological communities self-renewing, self-sustaining, even self-repairing. First, often overlapping, steps toward this include:

1. Remediation. Restore environmentally fragmented sites with a sustainable approach using green infrastructure, as in Alumnae Valley. Target areas for restoration that will beautify the campus and aid education, e.g., Severance-facing slope of Jewett Hill could become a site where flowering herbaceous plants and shrubs replace lawn. Reduce erosion on hillsides throughout campus (see 2, below).
2. Plants. Boost plantings on campus opportunistically. Plant trees close together (following the British model) in a naturalistic way to encourage a shaded understory and straight, vertical growth in selected areas. Plant long-lived, native species of herbaceous plants, shrubs, and trees. Tailor management of plant nutrients for each plant community.
3. Soil. Soil is a living system in its own right and is the foundation of the landscape. We should continue to emphasize soil management to achieve healthy structure, biological diversity, and

mineral balance. Expand innovative soil management practices that approach landscape as a system. Restore organic matter and calcium in soil (e.g., by adding crushed limestone and composted plant litter). Monitor soil biology levels and use compost or compost teas to balance the bacterial and fungal communities as needed for plant health. Calcium and other beneficial minerals have been leached out by acid rain and organic matter is lost by removing all plant litter (leaves, twigs, grass cuttings, etc.) from the soil. Careful irrigation practices are crucial to healthy soil. Continue and expand such laudable current projects as the soil manufacturing effort on Service Drive. At Nehoiden Golf Course, add more natural areas and continue to use Audubon International’s golf course certification program (Audubon International, n.d.). Increase and sustainably manage natural areas (e.g., Paint Shop Pond, Waban Brook, Fuller Brook).

4. Invasives. Address invasive species through gradual removal of invasive plants and trees, and employ integrated pest management to discourage, reduce, and remove invasive fauna. Encourage and support desirable types of plants and grasses that will compete for space, water, and sunlight against invasives.
5. Trees. Actively care for campus trees according to established sustainable guidelines. Give clear rationale to the Office of Sustainability for any mature tree to be felled.

LW1.2	Metering, measurement, and environmental testing.	Facilities, Office of Sustainability, Office of EHS, Grounds Service, Wellesley College Botanic Gardens	In Progress (Some in place; more would be better)	2
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“You can’t manage what you don’t measure” is a mantra of C2E2 (Campus Consortium for Environmental Excellence, n.d.). Metrics will ensure that we know what is needed and that we are on track. First steps include:

1. Inspect. Institute regular, systematic inspections of the landscape and watershed by qualified outside observers, perhaps every two years. Seek out ecological-systems-based consultants (e.g. Applied Ecological Services, Interfluen, Haley & Aldrich).
2. Monitor. Expand and regularize the existing Grounds Service soil testing regime campus-wide. Establish baseline soil measurements with top criteria as pH, calcium, phosphorus, organic matter, and soil biology. Monitor trends at a dozen specific sites representative of specific, varied habitats across campus landscape.
3. Expand. Investigate ways faculty and students may participate and broaden or deepen testing and sampling efforts. Use cutting-edge technology (including GIS and smartphone apps) when possible.
4. Communicate. Boost communication between FMPD and academic departments (e.g., staffers currently sampling the water supply and Geosciences, Chemistry, and Biology). Log data on water quality in a way that makes it usable for scientific study or publishable by scientists in academic departments. Make the data transparent and easily accessible to the campus community, such as on large video screens in public spaces on campus.

LW1.3	Revitalize and use the landscape master plan (98CMP)	Facilities, Grounds Services, Wellesley College Botanic Gardens, Academic Community	In Progress, Need to address Cohesive College Landscape around Sage, Observatory and Gray Lot	1
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Although nearly 20 years old, the 1998 Campus Master Plan (98CMP) compiled by Michael Van Valkenburgh Associates is a rich resource. We should continue to review and update this plan to ensure its ongoing status as a guiding document. We recommend:

1. Assessment. Starting with an assessment of what’s been done and how it has affected campus culture, landscape, and infrastructure, we urge a periodic revisiting of the plan.
2. Completion. Complete the remaining implementation projects of the plan that will make the campus even more sustainable. (Looming among these is to renovate or consolidate the remaining parking lots that are paved with impervious materials—likely a phase 3 project; see LW1.6 below.) Build on the important landscape goals set in the 98CMP by supplementing it with such items as maintenance of the landscaping it had recommended. Include ongoing and evolving work as driven by goals old and new.
3. Revision. Systematically revisit the 98CMP to incorporate more recent discoveries and developments in eco-friendly practices and update goals accordingly. Create a short digest of 98CMP recommendations for dissemination to all responsible parties.

LW1.4	Continue to hire and develop expert staffs to steward the landscape	Facilities, Grounds Service, Wellesley College Botanic Gardens, Office of Sustainability	In Progress (budgets and hiring freezes have somewhat impeded progress)	1
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The enormous, biologically and aesthetically complex landscape of the College demands that we continue to build a scientifically sophisticated, qualified landscaping staff in Grounds and WCBG whose members take a holistic, systems-based approach that emphasizes sustainable practices. Grounds and WCBG already have a good working relationship, and they should continue to build on that foundation by meeting more regularly to exchange ideas and coordinate landscape management techniques. All of these landscape stewards should have the cleanest equipment to do the job. Replace as many internal-combustion-engine landscaping vehicles and tools as possible with manual or electric alternatives.

LW1.5	Continue to collaborate prudently with the best possible landscape experts/consultants	Grounds Service, Facilities, Wellesley College Botanic Gardens, Academic Community	In Progress	
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Involve landscape architects at the earliest stages of all building projects, including W2025, and constantly revisit our partnerships to ensure that we hire the firms best suited to our vision of a regenerative landscape. Michael Van Valkenburgh Associates and Andropogon Associates have been past and/or current partners. When hiring or working with any consultants, make sure to consider future use and maintenance in design plans, and seek the highest sustainability standards affordable.

1. Dissemination: Inform each project team (internal and external) of the College’s overarching sustainability goals for the campus and the 98CMP principles and goals for the landscape.
2. Integration: Encourage integration of sustainable design principles at the beginning of the planning and design phase of projects to insure that the project’s relationship with the landscape is a foundation of the design.

LW1.6	Embrace Lake Waban as part of the campus landscape	Facilities, Grounds, Public Affairs, Office of EHS, Office of Sustainability	In Progress	1
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Integrate Lake Waban, recognized by the Commonwealth as a “great pond,” more fully into the campus landscape. Steps include:

1. Preservation. Preserve in perpetuity the berm along Lake Waban’s northwestern shore that separates the lake from the Paintshop Brook marsh to prevent the marsh under the boardwalk from draining itself and disappearing.
2. Investigation. Incorporate study of the lake’s water, soil, flora, and fauna in academic courses. Investigate the possibly detrimental effects of mute swans on vegetation in the lake’s littoral zone.
3. Improvement. Take any necessary steps to discourage or remove invasive species. Restore the areas of the lake edge that are being deforested by woolly adelgid infestations of the Eastern Hemlock stands (most notably at Tupelo Lane, Tupelo Point, and at the base of Tower Hill).

LW1.7	Continue to limit parking in central campus areas and improve parking facilities elsewhere.	Facilities, Office of Sustainability, Grounds Service, Academic	In Progress	2
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		Community, Public Affairs, Campus Police		
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Continue efforts to reduce the presence of automobiles in the center of campus and promote this as a walking campus. Gray Lot is an unsightly and environmentally injurious hardscape that sends pedestrian visitors from Wellesley Square the wrong message about the College’s commitment to sustainability. Some of these action items are capital-intensive but should not be postponed indefinitely.

1. Limits. Eliminate non-handicap parking between the Science Center and WCBG; make the road to the Observatory into a pedestrian path open only to delivery vehicles.
2. Replacements. Replace Gray Lot with a multi-story structure that has a smaller footprint, open sides, green roof, and is designed (like the Davis Garage) to ensure the personal safety of its users. Alternatively, reconfigure the surface lot with a more sustainable design that collects parking lot run-off into bioswales planted with plants and trees that will clean the water and provide shade to mediate heat island effects.
3. Improvements. Consider eliminating Founders Parking Lot, or changing its surface to be permeable. Use bio-swales or investigate a parking structure.

2. Promote sustainable and educational human interaction with the landscape

Issue	Strategy	Responsible Party	Status	Phase
LW2.1	See the Global Flora project through to a successful conclusion	Facilities, Wellesley College Botanic Gardens, Office Of Sustainability, Office of EHS, Academic Community	In Progress	2

The new Global Flora greenhouse complex will beneficially blur the distinction between landscape and the indoor environment. With construction set for spring 2016, it will have the same sized footprint as the current greenhouses. Ensure that the finished project achieves its planned net-zero energy and water impact. If water table allows, dig another well to serve Global Flora.

LW2.2	Use the campus as a living laboratory	Wellesley College Botanic Garden, Grounds Service, Academic	In Progress	1
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		Community, Public Affairs		
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As part of coursework in science departments or interdisciplinary studies, students could themselves undertake sampling projects (flora and fauna inventories; water or soil composition, etc.); findings of such projects could inform future sustainability plans.

1. Enlist faculty collaboration in the study of landscape.
2. Integrate investigations of new technology (e.g., micro-hydro generators) into the curriculum, possibly via the WeLab or Olin collaboration.
3. Develop courses that team humanities and science students to investigate the campus environment together; this could especially benefit underrepresented racial and socio-economic groups, who often have had fewer opportunities for outdoor experiences in childhood.
4. Involve faculty from Olin, Babson and MIT for wider perspectives on our vision for landscape sustainability; share resources if economies of scale are possible.

LW2.3	Make the landscape inviting and interesting to the campus community		In Progress	1
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These action items could be subtle, low-impact, and inexpensive. Examples include:

1. Place logs or boulders—materials already located on campus land—strategically so they can be used as outdoor seats (in keeping with Olmstedian design).
2. Place comfortable Adirondack chairs on common green spaces made from sustainable recyclable materials.
3. Place bird boxes, sundials, mounted weatherproof binoculars, or other unintrusive, naturally interesting items in the landscape to attract attention to the environment.
4. Preserve continuity of student interest in the landscape beyond graduation (e.g., revive/promote celebrations to encourage the Class Tree tradition; enlist students and alumnae to help with landscape activities on annual Community Service Day or at Reunion; continue Project Handprint).

LW2.4	Boost signage in WCBG, and for other campus specimens	Wellesley College Botanic Gardens, Grounds Service, Public Affairs, Academic Community		2
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Increase signage interpreting landscape features (e.g., bog garden, green roof, Edible Ecosystem) and identifying species.

Wellesley College Sustainability Plan, Landscape & Watershed, Draft, 1/19/16

LW2.5	Create work-study jobs in the landscape that take advantage of students academic interests	Wellesley College Botanic Gardens, Academic Community, Grounds Service, Office of Sustainability, Public Affairs	Needs Planning	2
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LW2.6	Continue to enlist the Hunnewell family as partners in stewarding the lake and surrounding properties	Wellesley College Botanic Gardens, Facilities, Grounds Service, Public Affairs, Academic Community, Office of Sustainability	In Progress	1
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LW2.7	Relocate student garden plots to promote their visibility	Wellesley College Botanic Gardens, Grounds Service, Facilities, Office of Sustainability	In Discussion	2
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Garden plots, which will no longer be housed at the North 40 after 2015, should be moved to a carefully considered site close to the center of campus.

LW2.8	Increase our dissemination of environmental regulatory requirements (from EPA and Mass. DEP) to the campus community	Office of EHS, Grounds, Wellesley College Botanic Gardens, Office of Sustainability, Public Affairs	In Progress	1
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Increase awareness on campus of environmental regulatory requirements in order to promote best practices for environmental sustainability. Boost communication between groups affected by the regulations and those who serve as a conduit for those regulations; look ahead and anticipate future regulations.

LW2.9	Use creative means to communicate about the campus landscape	Grounds, Wellesley College Botanic Gardens, Academic Community, Office		2
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		of Sustainability, Public Affairs		
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Publicize the College’s numerous achievements in environmental sustainability to date, and educate the community better about environmental impacts of their actions, such as what goes down campus drains and storm drains. Tactics to pursue:

1. Enlist students to help create a clever, funny campaign for the landscape.
2. Use the “Daily Shot” on the College homepage to educate the community (and wider world) about the campus landscape and watershed.
3. Use social media and viral videos to showcase the precious resource WC’s landscape represents.
4. Use temporary signage cleverly and humorously to educate people about sustainability (e.g., “You need a rest. I do too” instead of “Keep off the grass” on lawns being reseeded).
5. Put eco-education messages on the flat-screen monitors in campus buildings.
6. Use outreach tools available at the website of Campus Consortium for Environmental Excellence (C2E2.org), of which Wellesley College is an active member.
7. Consider hiring innovative communications firms (e.g., [Ideo](http://Ideo.com), [ESI Design](http://ESI-Design.com)) to help get the word out about sustainability at Wellesley.

LW2.10	Use tours to educate the community about the landscape	Wellesley College Botanic Garden, Grounds Service, Academic Community, Office of Sustainability, Public Affairs	In Progress	1
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Increase tours of the landscape, including virtual tours using GIS technology. Actions include:

1. Encourage student who is currently creating an iPod tour of the WC landscape.
2. Revive and extend the “Wellesley College Web of Species” website:
<http://academics.wellesley.edu/Biology/Web/index.html>.
3. Incorporate the large Global Information System (GIS) database and map of plants and trees in WCBG being compiled by Mary Coyne (Prof. Emeritus of BISC).
4. Incorporate green infrastructure and campus sustainability features into tours by the Office of Admission for prospective students.

LW2.11	Exploit the Wang Campus Center as an outreach tool	Office of Sustainability, Academic Community, Grounds Service,	Not Started	1
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		Wellesley College Botanic Gardens, Public Affairs		
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Make part of the Wang Campus Center a focus for environmental outreach. Make the Wang Center’s roof garden into an edible garden.

3. Improve sustainability of water management

Issue	Strategy	Responsible Party	Status	Phase
LW3.1	Improve management of campus potable water supply	Facilities, Grounds Service, Office of EHS, Wellesley College Botanic Gardens, Office of Sustainability	In Progress	1

Vigilantly continue to review all factors that might impact the campus water supply. Meanwhile:

1. Continue to reduce amount of water used on campus (required by Mass. DEP as part of Charles River watershed).
2. Undertake a comprehensive cost analysis (including labor, training, compliance reporting, chemicals, etc.) of our current practice of maintaining our own water supply and compare that with cost of switching entirely to Town of Wellesley water supply. Talk with the Town to ensure they would be able to handle the increased capacity.

LW3.2	Re-engineer the Silver Thread and Paramecium Pond water system	Facilities, Grounds Service, Wellesley College Botanic Gardens, Office of EHS, Office of Sustainability	In Progress	1
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The use of treated well water to supply the Silver Thread and Paramecium Pond system is unsustainable. Increase use of non-potable water for irrigation throughout campus, and for Paramecium Pond develop a plan investigating these options:

1. Work to source water from Lake Waban in a way that eliminates the possibility of introducing lake-borne cyanobacteria into the Silver Thread system.

2. Conclusively investigate the feasibility of drilling a well on Water Tower Hill (if the water table allows) that would feed the Silver Thread; this would allow the stream and pond be largely gravity-fed rather receive pumped water.

LW3.3	Update snow and ice management approach	Grounds Service, Facilities, Wellesley College Botanic Gardens, Academic Community, Public Affairs	In Progress	2
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Management of water in its frozen state is currently a significant problem for the health of the campus landscape. We urge these immediate measures:

1. Petition the Mass. state authorities responsible for clearing the section of Route 135 adjacent to campus to designate the area a low-salt zone.
2. Reduce salt use in the territory of the WCBG; temporary signage on the path as it goes by the bog garden can warn pedestrians of reduced salt in winter. Consider closing this path in the winter.
3. Devise and implement a campus-wide snow and ice management plan that minimizes both chloride use and impacts from Route 135 treatment. Continue to explore alternative melting agents (calcium, beet juice, brewery mash).

LW3.4	Update stormwater management	Grounds, Office of EHS, Facilities, Public Affairs	In Progress	1
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The Commonwealth of Massachusetts, Town of Wellesley, and Wellesley College need to work in concert on stormwater management and should pull together a joint stormwater management plan. For our part, we should:

1. Create a precise, comprehensive inventory of exactly which stormwater drains empty into Lake Waban and how much volume they handle.
2. Ensure that stormwater “best management practices” are incorporated into new construction projects.
3. Consider employing soil moisture sensors to monitor water in the soil.
4. To fight erosion, develop a plan to manage stormwater that uses topography and plantings as much as possible. The 98CMP is a good starting place, as is Sustainablesites.org: “Design sites to capture, slow, and treat stormwater runoff by reducing impervious surfaces, harvesting rainwater, and directing the remaining runoff to soil- and vegetation-based treatment areas. Use vegetated bioretention facilities, such as rain gardens, constructed wetlands, green roofs, and bioswales, to

capture and slowly infiltrate water into the soil or groundwater” (“Sustainable SITES Initiative,” 2015).

5. Work with the MBTA (or other authority) to reduce use of pesticides and other potentially toxic substances in the railroad zone across Route 135 from campus.

LW3.4	Update irrigation systems	Grounds, Facilities, Public Affairs	In Progress	1
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Expand the satellite irrigation systems—currently in use on the Athletic Fields—campus wide. Use software that encourages smart watering. Use flow sensors, water efficiency, metering, weather data, and evaporation transpiration.

Financial Implications

Though regenerative landscape management reduces maintenance costs and leads to a more sustainable landscape in the long term, the College should commit itself to real innovations in sustainability by being willing to sacrifice short-term financial payback, especially when a particular step fits our mission, institutional values, and core activities. It is not sustainable, for example, to continue to cut the Grounds budget; we must maintain healthy, realistic budgets for landscape caretakers.

As the Wellesley 2025 project proceeds, the administration must work with landscaping caretakers to ensure that funds for landscaping are not harmfully diverted by W2025. Moreover, the campus renewal plan for each building currently has no budget for landscape outside of a 5-foot perimeter. This must be revisited with a broader view of how landscape can function to support buildings, utilities, and circulation; money can be saved through increased efficiencies and avoidance of future repairs. Revisit the 98CMP, evaluate it, and use it as a tool for setting future landscape-related budgets.

Careful, functional landscaping and water management can have significant budgetary benefits. For example, the campus landscape currently produces the equivalent of \$75,000 of mulch per year for its own use, and groundskeepers always save all soils for future use. Allowing the landscape to accommodate science students’ field experiments will save money in the long run by obviating the need for off-campus field trips.

Climate Implications

The verdant, forested landscape of Wellesley College sequesters a great deal of carbon. WCBG grows and maintains significant carbon sinks, and both WCBG and Grounds compost and reuse landscape materials on campus, which prevents the emission of greenhouse gases created by trucking from and to campus. Future landscaping decisions should always be made with an eye toward boosting the campus’s function as a carbon sink. An excellent guide to this approach is *Everything but the Carbon Sink: Managing Land Responsibly in a Time of Global Climate Change*, co-written by Professor of Biological Sciences Nicholas Rodenhouse with his Environmental Studies 300 students in spring 2004; see

Appendix, below, for specific landscaping recommendations, tailored to campus biomes, excerpted from Chapter 6. Grounds Service's existing campus tree inventory, which tracks more than 3,000 individual trees, can also help us estimate current and future carbon sequestration. The various landscape goals outlined above will allow Wellesley to reduce its carbon footprint and increase its capacity for carbon sequestration.

To confirm its commitment to addressing climate change, the College should immediately sign on to the American College and University Presidents' Climate Commitment (Second Nature, <http://www.presidentsclimatecommitment.org/>). Membership would afford us access to a network of like-minded institutions as well as numerous tools for educating students, faculty, staff, and alumnae.

A changing climate (e.g., wetter winters and drier summers) will require WCBG and Grounds to plan ahead as much as possible for water-management implications. With climate change, we can expect to lose many mature, tall trees due to hurricanes, downbursts, ice storms, and invasive pests and pathogens (e.g., hemlock woolly adelgid, emerald ash borer, Asian longhorned beetle, etc.). Considerable effort has already been made, and we need to continue creating the next generation of trees to prevent the campus from being denuded by such events.

Potential Student Involvement

As is clear from our LW2 recommendations above, students have a crucial role to play in stewarding the campus landscape by studying it and promoting its well-being. Specific actions include:

- Incorporating landscape into coursework
- Using campus as a field laboratory
- Leading tours of the landscape
- Creating electronic landscape guides
- Taking part in outdoor activities
- Working in landscaping work-study jobs

Sources

Audubon International. (n.d.). About the Audubon Cooperative Sanctuary Program for Golf. Retrieved from <http://www.auduboninternational.org/acspgolf>

Campus Consortium for Environmental Excellence. (n.d.). Measuring Environmental Performance. Retrieved from

http://www.c2e2.org/Documents/OriginalC2E2Documents/c2e2_CampusPoster_Full_PresCE84-1ink.pdf

Environmental Studies 300 Capstone Course, & Rodenhouse, N. (2004). Everything but the Carbon Sink. Wellesley College. Retrieved from

http://academics.wellesley.edu/EnvironmentalStudies/Research/pdf/managing_land_2004.pdf

Michael Van Valkenburgh Associates. (2010). The Observatory Hill Landscape Master Plan.

Second Nature. (<http://www.presidentsclimatecommitment.org/>). Presidents Climate Commitment.

Sustainable SITES Initiative. (2015). Retrieved from <http://sustainableites.org/>

APPENDIX: *Everything but the Carbon Sink: Managing Land Responsibly in a Time of Global Climate Change*

by Lara Browning, Lindsey Habermann, Esther Kim, Claire Leamy, Roshni Sampath, Jenny Wang, Madeleine deBlois, Lesley Yen, and Nicholas Rodenhouse (ES 300, Spring 2004)

Specific recommendations in Chapter 6 (“Control Your Carbon: Recommendations for Landscape Management,” pp. 61-73):

Woodland Recommendations (p. 62):

- Control invasive species
- Plant and/or select for long-lived tree species with a large leaf area
- Maintain multiple forest strata
- Allow forest debris to remain on forest floor
- Increase soil organic matter by leaving leaves and other decaying material on the forest floor
- Expand the area of forests where possible (Figure 1)

Grove Recommendations (p. 64):

- Plant large, long-lived tree species
- Create multiple strata
- Build soil organic matter, allowing small, woody debris to remain on the grove floor
- Remove trees only when necessary
- Increase the area of groves, such as planting trees around buildings and parking lots
- Allow some groves to become forests (Figure 2)

Meadow Recommendations (p. 66):

- Plant or encourage a wide array of species
- Manage for warm season grasses
- Mow only as frequently as needed to control invasive species
- Mow in mid-July for warm season grasses
- Leave mowing residues
- Never mow below 8 inches in height
- Spot mow if possible
- Do not drain wet meadows

Turfgrass Recommendations (p. 67):

- Minimize irrigation
- Time irrigation to minimize water loss due to evaporation
- Optimize fertilization
- Build soil organic matter
- Plant grasses that grow slowly and low to the ground
- Minimize soil disturbance
- Use energy-efficient mowers
- Reduce the frequency of mowing
- Avoid soil compaction by creating walkways in accordance with paths of desire or establishing green barriers

Wetland Recommendations (p. 71):

- Minimize both chemical and physical disturbance
- Do not drain them
- Prevent excess nutrients from entering wetlands
- Establish riparian buffers of forests, shrubs, or wet meadows

Lake Recommendations (p. 72):

- Establish riparian zones to mitigate shoreline erosion
- Control invasive species
- Promote integrated watershed management

Purchasing & Waste Management

One of the primary ways in which Wellesley College affects the environment is through the purchase of goods necessary to operate the college (office supplies, computers, furniture, etc.) and the recycling and disposal of those materials after their use. The flow of such goods at Wellesley is significant: each year the college spends approximately \$250,000 on office supplies, including \$50,000 on paper alone. It purchases approximately 400 computers. The college spends approximately \$150,000 on custodial supplies. And the college pays approximately \$300,000 for waste disposal services: 29 dumpsters on campus are emptied an average of four times each week.

Wellesley College is committed to factoring environmental sustainability into both purchasing decisions and its waste management practices. Historically, however, purchasing decisions at the college have largely been focused on price and quality and have been handled in a decentralized manner. Considering environmental sustainability requires that those considerations be expanded to include the social, environmental, and economic factors across the life cycle of products. In this section, we focus on general purchasing decisions (policies with respect to food, bottled water, fertilizers, and vehicles are addressed in other sections of this plan).

Recycling and waste management at the college are also handled in a decentralized manner. Although these activities are coordinated through the facilities department, waste streams are handled in different ways. While there is data regarding the amount of recycling and composting on campus, there is limited data regarding what percentage of college waste is diverted for recycling, composting, or other uses relative to the overall waste stream. Although there are significant sustainability accomplishments, such as the reuse and composting of landscaping materials, a Sustainable Move-Out collection and Move-In Sale, and the donation of end-of-life computers to non-profit organizations, systematic monitoring of the college's waste stream is critical to advance sustainability at the college.

Main Issues/Primary Goals

1. Develop and follow sustainable purchasing policies focused on high-volume categories, such as paper, toner, computers, and peripherals that encourage reductions in consumption.
2. Develop management strategies for college activities and operations that encourage materials re-use and waste reduction.
3. Systematize waste management to ensure that sustainability is tracked and factored into all waste management decisions.

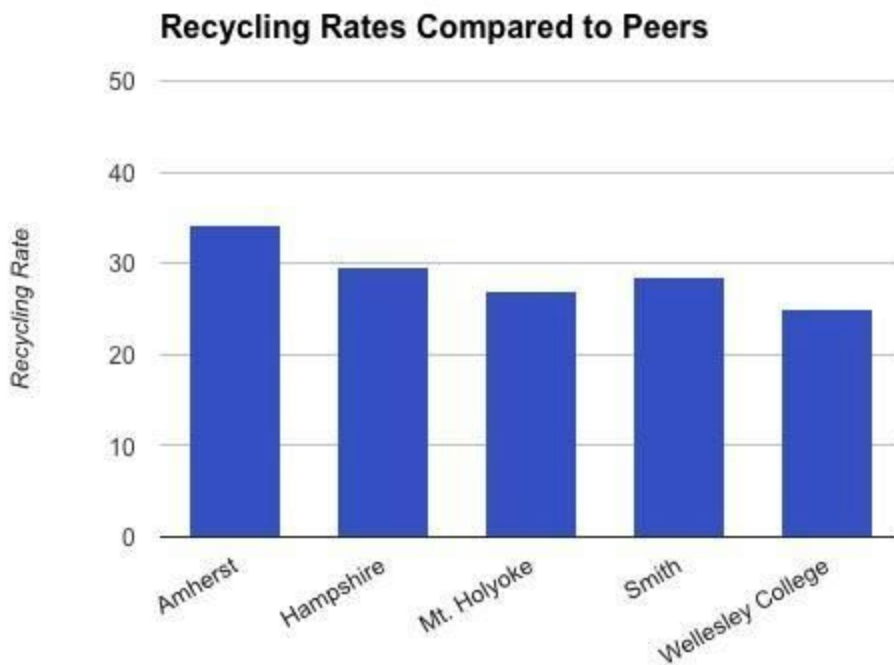
How We're Doing

Some of Wellesley's most important accomplishments with respect to purchasing have been in improvements in efficiency and reductions in the purchase of goods and supplies. Since 2007, office supply deliveries to campus have been limited to four times a week and a 2015 recommended minimum order policy of \$25 will help make delivery runs more efficient. In 2010, LTS phased out printers from

the 21 residential halls. Much of the reduction in purchases has been associated with a transition toward electronic forms of communication. The college has switched to electronic distribution of numerous materials, including applications for admission, reading materials for trustees, and library materials (journals and books). This transition will continue in the near future, as other campus offices transition to electronic handling of personnel records (Human Resources), major declaration forms, and transcripts (Registrar's Office).

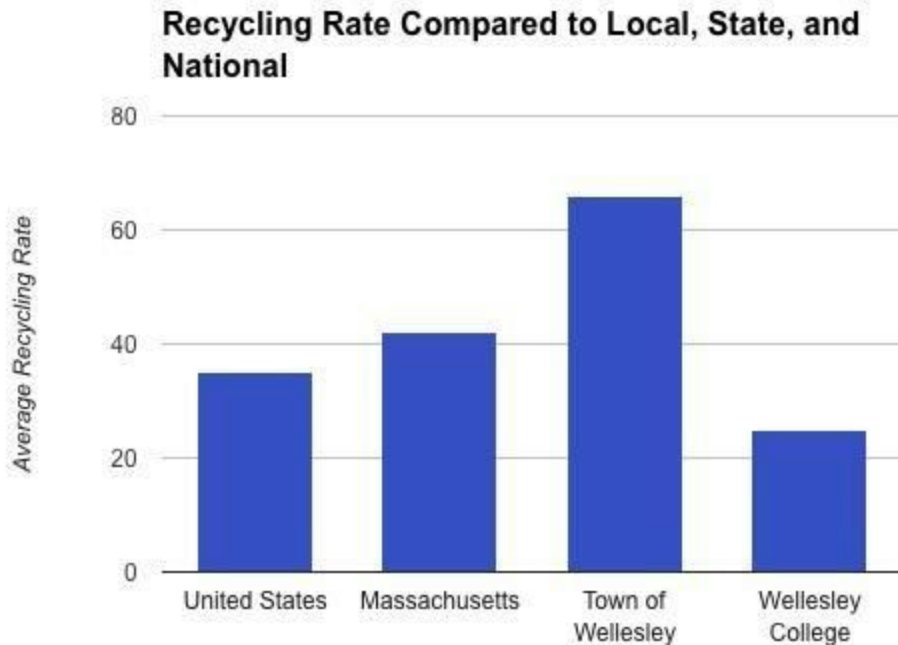
The college has no formal sustainability guidelines with respect to the purchase of office supplies, computers, or other goods, such as furniture. Despite the lack of such standards, the college is already engaging in some sustainable purchasing practices. For instance, 46% of college paper purchases contain at least 30% post-consumer recycled content and paper towels contain 78% post-consumer recycled content. Yet, to encourage such sustainable choices it is necessary to formalize purchasing guidelines that will promote environmental sustainability while managing costs.

The college has improved the sustainability of waste management practices. Between 2008 and 2013, the college estimates it increased recycling to 25% of the waste stream, recycling 220 tons of paper, bottles, and glass in 2013. This puts Wellesley somewhat behind peer institutions, for whom data is available from 2009-2010 (Mt. Holyoke College, n.d.; Willoughby & Bort, 2014).



However, this is significantly lower than the U.S. as a whole (35%), the state of Massachusetts (42%), or the Town of Wellesley (66%) (Girantikanon & Fujiwara, 2010; Massachusetts Department of

Environmental Protection & Massachusetts Executive Office of Energy and Environmental Affairs, 2013; US EPA, 2015). Almost all college waste, however, is sent to a waste-to-energy facility, rather than landfilled (Environmental Studies 300 Capstone Course, 2012).



Although there is much room for improvement, Wellesley had made substantial progress toward reducing waste reduction and re-use. Since 1979 the College has recycled all organic landscaping materials (clippings, leaves, and woody debris) to produce approximately \$75,000 worth of mulch annually. In 2010, the Office of Sustainability launched a Sustainable Move-Out Collection and Move-In Sale that has significantly reduced the waste associated with the end-of-year move out on campus. In 2013, this program resulted in the donation of 6 tons of clothing to Big Brothers Big Sisters of Massachusetts, the sale of 1.75 tons of dorm furnishings to returning students, and the donation of all remaining goods to local charities (Long, 2013). And since 2013, Library and Technology Services has been diverting recently retired computers from recycling to be refurbished and donated to schools and nonprofit organizations in the Boston area and abroad. In 2014, 90 computers were repurposed and donated of approximately 300 computers retired (“Re:Route,” n.d.).

Recommended Strategies

Phase 1 = Within 2 years of plan being adopted

Phase 2 = Within 5 years of plan being adopted

Phase 3 = Within 10 years of plan being adopted

Abbreviations of Responsible Parties:

*SUST=The Sustainability Committee

**LTS= Library & Technology Services

***EHS=Environmental Health & Safety

1. Develop and follow sustainable purchasing policies focused on high-volume categories, such as paper, toner, computers, and peripherals that encourage reductions in consumption.

Issue	Strategy	Responsible Party	Status	Phase
PWM1.1	Make suppliers aware of Wellesley's commitment to green purchasing.	All campus - overseen by Purchasing	In Progress	1

This can be accomplished by putting a statement on the purchasing office website and including language in bids where applicable.

PWM1.2	Educate the campus on the college's green purchasing strategies.	Purchasing, Office of Sustainability	In Progress	1
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A guide to purchasing will help spread the word about the green purchasing guidelines and educate the campus community about environmentally relevant characteristics to consider when making purchases.

PWM1.3	Reduce paper consumption on campus by 10% (Phase 1), 20% (Phase 2), 40% (Phase 3)	All campus - overseen by Purchasing and LTS	In Progress	1, 2, 3
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Strategies for accomplishing this goal include a continued transition to electronic record keeping on campus, encouraging efficiency in classroom-based use of paper, mandating double-sided printing, re-using single-sided paper, and discouraging the purchase of individual printers. There are additional opportunities for reducing paper use on campus, such as how time sheets are kept, academic materials are distributed and collected, etc. This will require the effort of everyone on campus, since no single office oversees the purchase, set-up, and implementation of printing.

PWM1.4	Develop a campaign to encourage reduced paper use in classes (for assignments, readings, and handouts).	SUST, Office of Sustainability	Needs to be Formalized	1
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Without compromising the college's educational mission or the ability of professors to teach how they best see fit, there are opportunities to use paper more efficiently in the classroom context: re-using readings, minimizing unnecessary printing, and electronic assignments are all possibilities. The goal is to develop a campaign to encourage such efficiencies. Currently, printer use peaks at the start of each semester, as students print out course e-readings in bulk. There are opportunities for groups like the PLTC to hold workshops for professors on transitioning to electronic grading

PWM1.5a	Increase post-consumer recycled content of purchased paper: 75% of paper purchases should have at least 30% recycled content..	All campus - supported by Purchasing and LTS	In Progress	1
PWM1.5b	Increase post-consumer recycled content of purchased paper: 90% of paper purchases should have at least 30% recycled content; 25% of paper should have 100% recycled content.	All campus - supported by Purchasing and LTS		2
PWM1.5c	Increase post-consumer recycled content of purchased paper: 95% of paper purchases should have at least 30% recycled content; 50% of paper should have 100% recycled content.	All campus - supported by Purchasing and LTS		3

Concerns have been raised regarding the quality of recycled paper on campus, particularly that it sometimes does not feed through printers as smoothly through printers as does non-recycled paper. This is a concern particularly during humid summer months. Despite this challenge, the primary users of paper on campus (the print shop and copy shop) use almost exclusively recycled paper without problem. With the improving quality of both paper and printers, it is feasible to use more recycled paper on campus.

PWM1.6	Purchase recycled toner and ink cartridges: 30% (Phase 1), 50% (Phase 2), 75% (Phase 3)	All campus - supported by Purchasing and LTS	Needs Planning	1, 2, 3
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Increase the use of recycled toner cartridges will require the support of administrative offices on campus, who order many of these products directly. Increasing the use of recycled toner should also be

addressed in future contracts with companies that lease and service the larger-scale multifunction devices on campus.

PWM1.7	Maintain the minimum order size required for the college’s preferred office suppliers (such as W.B.Mason) at \$25.	All campus - overseen by Purchasing	In Progress	1
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A minimum order size can improve efficiencies in delivery. A \$25 minimum order size was put into place in 2015. Further changes to the minimum order size beyond \$25 would require community input before implementation. There is a risk that if minimum order sizes are imposed from the college’s preferred vendors, purchasers will redirect the purchases to other retailers (such as Amazon) that would not have similar requirements.

PWM1.8	Partner with Boston Consortium Schools to require that office suppliers deliver goods in reusable totes (that they will collect and reuse).	All campus - overseen by Purchasing	Not Started	1
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Schools in other parts of the country have worked with their suppliers to shift away from delivery of goods in cardboard boxes to reusable totes. This goal could best be accomplished in cooperation with other Boston-area schools. This goal should be considered in future negotiations for office supply contracts.

PWM1.9	Purchase EPEAT Certified computers and peripherals. All computers and laptop purchases should meet EPEAT Silver certification. 75% should meet EPEAT Gold (Phase 1); 95% should meet EPEAT Gold (Phase 2); 100% should meet EPEAT Gold (Phase 3)	All campus - overseen by LTS	In Progress	1, 2, 3
PWM1.10	Expand the number of offices participating in the Sustainability Office Program: 25% (Phase 1), 50% (Phase 2), 75% (Phase 3).	All campus - overseen by Office of Sustainability	In Progress	1, 2, 3

In 2015, the Office of Sustainability launched a certification program (“Sustainable Office Certification,” n.d.) to encourage offices to improve sustainable practices.

PWM1.11	To make use of recycled content paper, turned used paper into scratch pads for distribution on campus.	Printing Services	Complete	
PWM1.12	Develop sustainability guidelines for the purchase of furnishings.	SUST, Office of Sustainability, Residential Life, Facilities	Not Started	2

The college currently has no standards in place for the sustainability of furnishings.

PWM1.13	Undertake a review of the sustainability of current cleaning supplies purchased on campus.	Custodial Services; Office of Sustainability	In Progress	2
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The college last reviewed its standard cleaning supplies approximately 2 years ago. At the time, concerns were raised about the effectiveness of green cleaning supplies. In the next five years, custodial services will undertake another review of green cleaning supplies, giving full consideration to products that meet the Green Seal standard in consultation with the Office of Sustainability.

PWM1.14	Increase the amount of post-consumer recycled material in disposable paper products, such as paper towels and toilet paper.	Custodial Services	In progress	
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Custodial services has already shifted to purchasing disposable paper products with a lower environmental impact, including products that are wound tighter (minimizing shipping costs) and lack a cardboard tube (reduce materials use). Bath tissue currently used on campus has 20% post-consumer recycled fiber content. Paper towels currently have 78% post-consumer recycled fiber content and are certified by the Forest Stewardship Council.

2. Develop management strategies for college activities and operations that encourage materials reuse and waste reduction.

Issue	Strategy	Responsible Party	Status	Phase
PWM2.1	Recycle all landscape waste to provide mulch and loam	Facilities	Complete	
PWM2.2	Donate books retired from the library	LTS	Complete	
PWM2.3	Refurbish and donate computers at end-of-life	LTS	Complete	

The Re:Route program diverts computers retired from the campus's laboratories, staff, and faculty for refurbishment and donation to nonprofits in the Boston area and abroad. This program is staffed by students and overseen by LTS.

PWM2.4	Increase awareness of the speciality recycling services for e-waste and batteries provided through the library.	LTS, Office of Sustainability, Office of EHS	In Progress	1
PWM2.5	Review campus policy with respect to storing and re-using furnishings	Facilities, Office of Sustainability	In Progress	1

Historically, unused furnishings have been stored on campus at the Distribution Center for re-use. This is an important practice that has facilitated re-use of furnishings, which is environmentally and financially preferable. In light of the increased pace of renovations on campus, it is necessary to think systematically about how the college can ensure reuse is possible and, if not, how best to donate unneeded furnishings and equipment to other organizations.

PWM2.6	Create a campus re-use store.	Office of Sustainability	In Progress	3
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There is strong interest in campus on establishing a campus re-use store, where students could trade unwanted items, including furnishings, clothing, and other goods. The primary hurdle to establishing such a store is space. The Student Aid Society fills this need somewhat with their closet dedicating most of its space to clothing, but for other goods and supplies there is still a lack of space

PWM2.7	Establish a protocol for what constitutes a zero-waste event on campus.	SUST, Office of Sustainability	In Progress	2
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A first-step toward zero-waste events on campus would be to establish criteria for such events: no disposable water bottles, using compostable or recyclable materials, and eliminating trash cans.

PWM2.8	Phase out plastic bags at all retail operations on campus.	Food Services, Bookstore	In Discussion	2
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Plastic bags are being phased out by municipalities across the country. Wellesley can contribute to this effort by banning plastic bags on campus. Advancing this goal will require discussions with the bookstore and food services operations about alternatives such as the sale of reusable or paper bags.

PWM2.9	Expand composting to all dining halls, dormitory kitchens, and other food vendors on campus,	Food Services, Facilities Management	In progress	2
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Currently, all dining halls on campus compost pre- and post-consumer food waste. In the next five years, this will be expanded to include other major sites of food preparation and consumption on campus including dormitory kitchens and other food vendors (college club, campus coffee shops, etc.)

3. Systematize waste management to ensure that sustainability is tracked and factored into all waste management decisions.

Issue	Strategy	Responsible Party	Status	Phase
PWM3.1	Establish goals for waste reduction	Facilities, SUST	In Progress	2

Starting this year, Wellesley’s contract with its waste hauler requires that the weight of waste being hauled from campus be reported. Once a baseline has been established, the Advisory Committee on Sustainability and Office of Sustainability will work with stakeholders to establish a goal for waste reduction.

PWM3.2	Comprehensive review of waste management and recycling practices	Facilities, SUST	In Discussion	1
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Wellesley rebid its contract for waste management services in summer 2015 for an initial one-year contract with the potential for long-term renewal. Prior to committing to a long-term contract, the college should undertake a review of how all waste management services could be coordinated, including waste haulage, recycling, and composting, to allow for economies of scale, increased levels of service, potential cost savings, and systematic data reporting. Currently the college pays a flat-rate for waste haulage, regardless of the amount of waste hauled; a contract that included a weight-based rate would provide incentive for the college to reduce waste.

PWM3.3	Regular and publicly reported statistics on waste and recycling collection on campus	Facilities, SUST	Provided in Annual Report but Should more Frequent	1
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An important prerequisite for any contract for waste management on campus should include requirements for reports on the weight of materials collection. Weekly data should be collected and reported to the college at least monthly.

PWM3.4	Review the college's single-stream recycling policy	Facilities, SUST	In Discussion	1
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Wellesley operates a dual-stream recycling process that requires that recyclables be sorted prior to collection. Most other institutions practice single-stream commingled recycling, that allows for common recyclables (glass, paper, cardboard, etc.) to be mixed. Although there are advantages to single-stream recycling, the college should review its practices for potential cost savings and increased collection rates.

PWM3.5	Develop a uniform system for waste management labeling and communication. Standards should be established during Phase I; implementation will take place in Phase II and III (as waste receptacles are replaced).	Facilities, SUST	In Progress	1, 2, 3
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This review should include consideration of labeling and the size of waste containers. Recycling and composting bins in offices and dormitory rooms should be larger in size than trash bins.

Financial Implications

In many instances, the financial implications of more sustainable purchasing are modest. For example, 30% recycled office paper retails for 6% more than non-recycled paper and some refurbished toner cartridges retail for 33% less than non-refurbished options. The price premium of some green products can be offset by reductions in consumption. Alternatively, bundling purchasing shifts together can offset costs too: for instance, the increase in cost for recycled paper could be offset by purchasing lower-cost refurbished toner cartridges (T. Dolan, Purchasing Office of Wellesley College, personal communication, September 24, 2015).

The potential benefits of reducing waste management costs through increased waste diversion are substantial. In recent years, the college has spent more money on managing waste than purchasing office supplies on an annual basis, for instance. Reducing waste haulage through decreases in waste generation and increases in recycling and composting could reduce the college's operating costs. Currently the college contracts out waste management and composting, but handles recycling on campus. A more systematic approach to waste management, including regularly reported figures for waste haulage, will be important steps toward better managing waste and associated costs.

Climate Implications

How the college purchases and handles waste have climate impacts. However, purchasing decisions (including sourcing and delivering goods) are estimated to be a relatively small portion of the college's indirect (scope 3) emissions. A 2008 inventory of Wellesley's greenhouse gas emissions

estimated that less than 4% of the college's annual emissions were a result of the purchase of goods and services (air travel accounted for 87% of the college's scope 3 emissions) (Environmental Studies 300 Capstone Course, 2008).

Currently, the college does not have data regarding the climate implications of waste management at the college. As of 2011, most solid waste from the college was incinerated at the Southeastern Massachusetts (SEMASS) Resource Recovery facility, which generates electricity through waste incineration. Although this process is more expensive than landfilling, it likely offsets fossil-based electricity generation (Environmental Studies 300 Capstone Course, 2008).

The college's current practices of reusing all landscaping materials on campus and composting in dining halls both avoid methane emissions from landfills or carbon dioxide emissions from incineration facilities.

Potential Student Involvement

Students have the opportunity to take a leadership role in affecting the sustainability of purchasing and waste management:

- Students can educate other students during orientation week regarding printing and waste management on campus, involving Dorm Eco-Reps.
- Students can contribute to reductions in paper use on campus.
- Students can contribute to increasing re-use, recycling, and waste reduction.
- Students can take part in the Sustainable Living Certification program ("Sustainable Living Certification (SLC)," n.d.).

Sources

- Environmental Studies 300 Capstone Course. (2008). Climate for Change. Wellesley College. Retrieved from <http://www.wellesley.edu/sites/default/files/assets/departments/environmentalscience/files/es300-2008-wellesley-ghg-audit.pdf>
- Environmental Studies 300 Capstone Course. (2012). Waste Reduction: Ensuring Wellesley's Pursuit of Sustainability Doesn't End Up in the Trash. Wellesley College. Retrieved from <http://www.wellesley.edu/sites/default/files/assets/departments/environmentalscience/files/es300-2012-wastenotwantnot.pdf>
- Girantikanon, T., & Fujiwara, D. (2010, March 14). Recycling in Massachusetts. Retrieved from http://www.boston.com/news/local/massachusetts/graphics/031410_recycling/
- Long, K. (2013, June 18). Summer Is Off to a Green Start with New and Repeat Sustainability Projects at Wellesley. Retrieved from <http://www.wellesley.edu/news/2013/06/node/36192>
- Massachusetts Department of Environmental Protection, & Massachusetts Executive Office of Energy and Environmental Affairs. (2013, April). Massachusetts 2010-2020 Solid Waste Master Plan. Retrieved from <http://www.mass.gov/eea/docs/dep/recycle/priorities/swmp13f.pdf>
- Mt. Holyoke College. (n.d.). Five College Comparison of Recycling Tonnage and Metrics FY2009-10. Mt. Holyoke College. Retrieved from <https://www.mtholyoke.edu/sites/default/files/envstewardship/docs/5crecycletonnage0910.pdf>

Re:Route. (n.d.). Retrieved from
<https://www.wellesley.edu/lts/-new-lts-left-hand-quick-links-/node/68626>

Sustainable Living Certification (SLC). (n.d.). Retrieved from
<http://www.wellesley.edu/sustainability/-new-page-/sustainable-living-certification-slc-/node/57261>

Sustainable Office Certification. (n.d.). Retrieved from
<http://www.wellesley.edu/sustainability/sustainable-office-certification/node/59236>

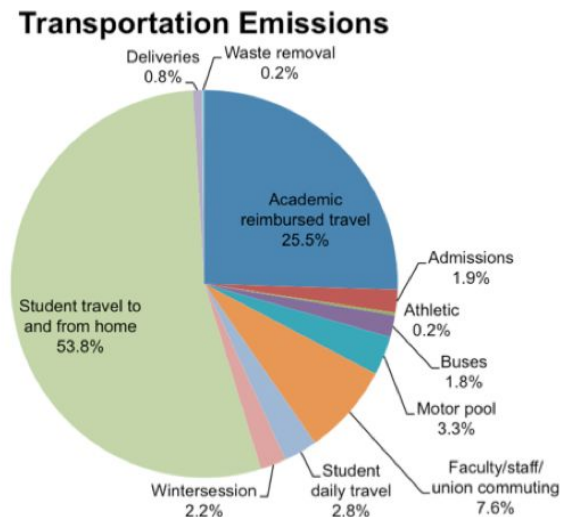
US EPA. (2015). Learn about Waste [Collections and Lists]. Retrieved October 13, 2015, from
<http://www2.epa.gov/learn-issues/learn-about-waste>

Willoughby, P., & Bort, S. (2014). Wellesley College Sustainability Progress Report 2014. Wellesley College. Retrieved from
<https://drive.google.com/a/wellesley.edu/file/d/0BzqP82l8FumGcEZCa1R2UG5PZTBzV3NnU2tKWndIcHcxSDh3/view>

Transportation

Transportation accounts for 39% of Massachusetts's greenhouse gas emissions (Executive Office of Energy and Environmental Affairs, 2014). This includes gasoline and diesel fuel burned for road, rail, air and marine transportation. Transportation is also responsible for a significant portion of Wellesley

College's carbon emissions. An earlier student analysis found that transportation produced over one third of all the College's emissions in the year studied: 17,000 metric tons of carbon dioxide equivalents (MT eCO₂) (Environmental Studies 300 Capstone Course, 2008).



As can be seen in the figure at left, student travel to and from school contributes over half of the transportation emissions (54%), and college-funded travel contributes another quarter of the transportation emissions (Environmental Studies 300 Capstone Course, 2008). The next largest contributors are faculty/staff commuting (7.6%) and motor pool (3.3%).

The factors that contribute most heavily to emissions are the focus of the transportation sector. Accordingly, transportation at Wellesley is divided into three sub-sections: 1) Air travel, 2) Faculty/staff commuting and 3) Fleet vehicle use (Chase, Gaglini, & Willoughby, 2013). The first two subsections, air travel and commuting, fall under Scope 3 of the EPA's classification of GHG emissions, whereas fleet vehicles fall under Scope 1 (US EPA, n.d.). Student travel to and from home is, by far, the single largest contributor to transportation emissions. Wellesley is proud of its geographic diversity; Wellesley students hail from all 50 states and 55 countries. As it is a goal of the College to encourage a culturally and geographically diverse student body, student travel will remain a dominant emissions factor.

Our recommended strategies focus on the remaining significant emissions factors: college-funded academic travel, the college-owned fleet of vehicles, and faculty/staff commuting.

Main Issues/Primary Goals

1. Introduce systematic tracking of college-funded travel type (air, rail, auto) and associated miles and investigate carbon offsets.
2. Increase the efficiency of the Wellesley Motor Pool fleet with new purchases and replacements.
3. Reduce single-occupant personal vehicle use for commuting from 80% to 60% of trips by 2020 (207,600 miles or 114 MT eCO₂).

How We're Doing

1. Air Travel

Student Travel

Wellesley does not calculate or report emissions from student travel to and from the College throughout the year. We have a diverse student body from 50 states and 55 countries. The most popular home state for our student body is California (>14%, n=326); Massachusetts is second (Office of Institutional Planning and Assessment, Wellesley College, 2015). About 10% of our students (about 230 students) also participate in study abroad programs each academic year. Student air travel to and from the College is an inevitable by-product of the college's mission to maintain cultural and geographical diversity. Our challenge is how to mitigate air travel emissions while supporting student diversity and study abroad.

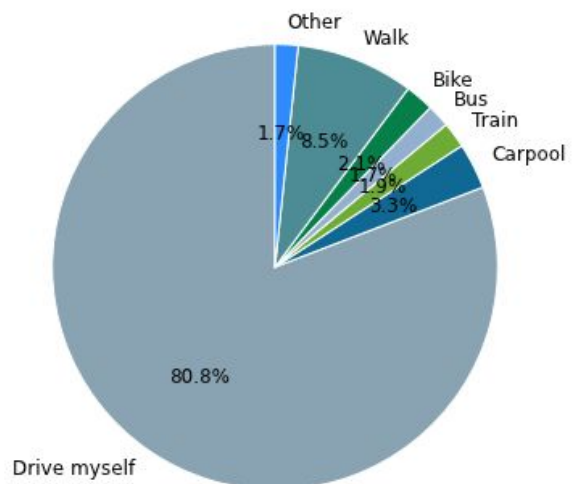
Faculty/Staff Travel

Wellesley does not currently collect direct data about air travel that is college-funded. Documentation of college-reimbursed travel exists on paper, but air travel is embedded within each individual travel expense report. It is prohibitively time-consuming to collect that data. The Purchasing Department is exploring working with a select group on campus to pilot software that would potentially allow for us to better store and retrieve information about air travel more efficiently (M. Fletcher, Controller's Office Wellesley College, personal communication 2015).

2. Faculty/Staff Commuting

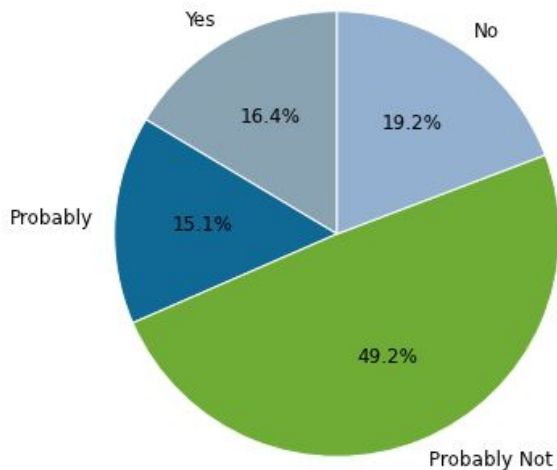
Wellesley employs approximately 1,260 faculty and staff. In 2015, commuters travel an average of approximately 12 miles (with the range of commutes spanning 0-216 miles each way). During 2008 (the last year for which we have commuting emissions data (Environmental Studies 300 Capstone Course, 2008)), faculty/staff commuting accounted for about 8% of college transportation-related emissions. For this report, we collected commuting data from over 500 participants that allows us to assess the average number of days that people commute to campus, the average distance traveled, and mode(s) of transportation used and the likelihood of carpooling. Of those 500 responses, roughly 60% were staff and 38% were faculty (the remaining 2% classified

Figure 2.
How do you get to work?



themselves as “other”). The responses mirror the actual composition of the College’s faculty/staff ratio, which is about 38% faculty and 62% staff.

Figure 3.
Would you consider carpooling?



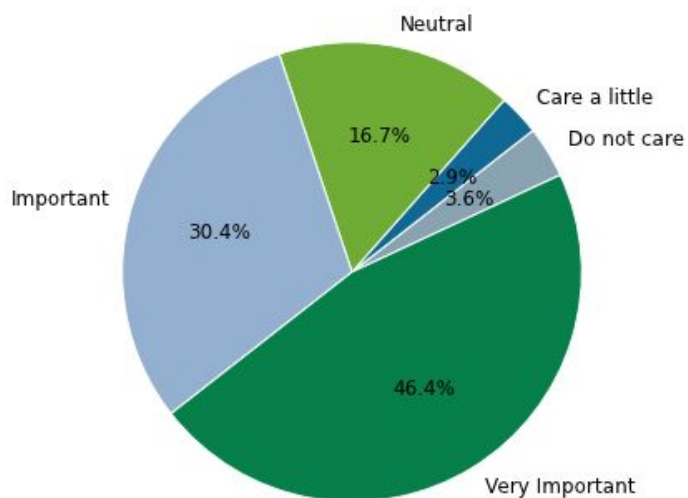
Our survey indicates that over 80% of faculty/staff drive to work by themselves (Figure 2).

Commuters travel an average of 12 miles (one way) to get to work at Wellesley. Most employees (63.3%) commute to work 5+ days/week, with 21.4% commuting 4 days/week, 11% commuting 3 days per week and less than 4% commuting less than 2 days per week.

Of the employees who drive themselves to work, approximately 16% said they would consider carpooling and about 15% said they would probably consider carpooling (Figure 3). About half (49%) said probably not and about 19% indicated they would not carpool (mostly due to erratic schedules and shuttling their children back and forth). These statistics are not surprising, considering Wellesley’s suburban location and the

limited public transportation infrastructure linking it to neighboring towns.

Figure 4.
Rank Importance of On-Campus Electric Chargers



The College currently has two electric car charging stations that are capable of servicing a total of four vehicles. The charging stations are free for Wellesley students, faculty, staff, and visitors. The charging stations are located in the Davis parking lot (Chase et al., 2013). This has enabled the College to purchase electric vehicles and has influenced several college community members to purchase electric vehicles (J. Olmsted, Manager of Landscape & Motor Pool Operations Wellesley College, personal communication 2015).

In our survey, among the 138 drivers who are considering purchasing an electric car, about three-quarters (76.8%) indicated that it was very important or important to have charging stations on campus (Figure 4).

Wellesley College offers an incentive for faculty and staff to use public transportation via a payroll deduction to pay for transit and parking expense (Human Resources, Wellesley College, n.d.). Many of our survey participants suggested discounted commuter rail passes.

For getting around on campus, the college created a Bike Share Program in 2012 with generous funding from the Class of 1957 Green Fund. Currently, 25 bicycles are available for pick up at two locations on campus for free 24-hour rentals. The Office of Sustainability sells bike helmets below cost (Office of Sustainability, Wellesley College, n.d.). At the February 2015 Sustainability-sponsored IdeaFest on campus, 32% of the submitted Transportation ideas revolved around promoting biking on campus (e.g. sponsor more bike repair workshops, offer more covered bike storage, publicize bike trails in town).

3. Fleet Vehicles

In 2015, Wellesley's fleet contains 116 pieces of equipment, including 97 vehicles. This includes maintenance vehicles, police cars, escort vans, waste recycling haulers, athletic vehicles, departmental vehicles, boats, etc. The service fleet vehicles are overseen by Motor Pool. In recent years, the fleet has been reduced by 20% (J. Olmsted, personal communication 2015). Sixteen percent of the vehicles use biodiesel fuel (J. Olmsted, personal communication 2015).

Wellesley also has a passenger fleet that is operated by three different campus organizations: Department of Faculty Housing & Transportation, Disability Services and Campus Police. The Department of Faculty Housing & Transportation oversees 7 different passenger shuttles for off-campus transportation. These modes of transportation will be described from highest volume to lowest volume (P. Eastment, Director of Housing & Transportation Wellesley College, personal communication 2015).

- Two MIT exchange buses that both run 17 hours a day, 5 days a week. Free for students; faculty/staff are charged \$3 each way (started in 2008).
- Senate bus runs Friday night from 6pm to 3:45am and runs all day Saturday until 3:45am and Sunday until 12am. There are typically 2 buses during the day and 3-4 at night. \$3 each way. On Sundays, there is one bus every other hour.
- Natick shuttle runs from campus to the Natick Collection Mall, the AMC Framingham theater and Target. Runs Saturday 11am-9pm. \$3 round trip.
- Babson-Olin-Wellesley (BOW) shuttle runs Monday-Friday, 7am-9:30pm and Saturday from 3pm until 12midnight.
- Thursday night orchestra shuttle to Brandeis
- Fall and Spring semesters: buses for crew team athletes to Charles River (at 4:00am)
- Student teachers (Education majors), for transportation to their teaching assignments, use zipcars (total of 7; 4 are hybrids) or taxis.

Wellesley employees also have access to MetroWest Regional Transit Authority shuttle from Alumnae Hall to MBTA commuter rail.

There are two more modes of transport available for students on campus: 1) Disability Services oversees the Access van (for long-term disabilities, serves between 100-200 students per semester) and 2) Campus police provides rides via the Rides List (short-term disabilities).

Recommended Strategies

Phase 1 = Within 2 years of plan being adopted
 Phase 2 = Within 5 years of plan being adopted
 Phase 3 = Within 10 years of plan being adopted

1. Introduce systematic tracking of college-funded travel type (air, rail, auto) and associated miles and investigate carbon offsets.

Issue	Strategy	Responsible Party	Status	Phase
TR1.1	Conduct survey of faculty/staff air travel as first step in creating an improved system	Office of Sustainability	Not Started	1
TR1.2	Run a college-wide awareness campaign environmental damage caused by air travel. Promote rail or bus trips for trips < 500 miles	College, Office of Sustainability	Not Started	1
TR1.3	Collect accurate data about college-funded air travel	Department of Faculty Housing & Transportation; Human Resources; Dean's office	Not Started for Current Data	2
TR1.4	Research carbon offset companies and establish a partnership with one	Department of Faculty Housing & Transportation; Human Resources	In Progress	3
TR1.5	Educate all students about the carbon-emissions impact of flying to and from campus; emphasize alternative modes of transportation (here is a great resource for carbon ONsetting).	The Office of International Study, The Office of Sustainability	In Progress	1

2. Increase the efficiency of the Wellesley Motor Pool fleet with new purchases and replacements.

Issue	Strategy	Responsible Party	Status	Phase
TR2.1	Administer annual commuting survey	Office of Sustainability	In Progress	I
TR2.2	Consider adapting policies that charge parking rates for students/faculty/staff	Department of Faculty Housing & Transportation; Campus Police	Not Started	2
TR2.3	Consider introducing a parking opt-out incentive (pay employees who do not park on campus, e.g. \$100 for < 1 mile from campus and \$400 for < 5 miles)	Department of Faculty Housing & Transportation; Campus Police; Human Resources	Not Started	2
TR2.4	Encourage the 30+% of commuters who say they would carpool or probably carpool by facilitating communication and organization among those interested.	Department of Faculty Housing & Transportation; Campus Police	In Planning	1
TR2.5	Provide more subsidies for taking public transportation and promote those benefits more aggressively.	Human Resources; Department of Faculty Housing & Transportation	Not Started	2
TR2.6	Analyze Zipcar usage data and, if needed, adjust the number of vehicles on campus (students are then less likely to have their own cars on campus)	Department of Faculty Housing & Transportation; Campus Police	In Progress	2
TR2.7	Improve biking and walking on campus (suggestions from our IdeaFest indicate a strong support for more biking on campus, specifically, bike storage/coverage in the winter, more workshops, repair accessibility and resources on where to buy a bike)	Department of Faculty Housing & Transportation; Campus Police; Landscape and Facilities Maintenance	In Progress	3

3. Reduce single-occupant personal vehicle use for commuting from 80% to 60% of trips by 2020 (207,600 miles or 114 MT eCO₂).

Issue	Strategy	Responsible Party	Status	Phase
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TR3.1	Implement and enforce no idling rule for all vehicles on campus	Motor pool, campus police, Department of Faculty Housing & Transportation	ongoing	1
TR3.2	Consider merger of Campus Police and Disability services with respect to the RidesList and the Access vehicle	Disability services, Campus police, Health Services	Not Started	1
TR3.3	Replace outdated vehicles with fuel-efficient/hybrid alternative fuel vehicles	Motor Pool	In Progress	3
TR3.4	Periodically re-evaluate contracts with Peter Pan bus companies	Department of Faculty Housing & Transportation	In Progress	2
TR3.5	Improve the GPS tracking of the Peter Pan buses. Reliable GPS allows riders to better plan their time-sensitive trips and prevents students from using Uber or cabs when bus arrival is imminent	Department of Faculty Housing & Transportation	In Progress	3
TR3.6	Add more electric charging stations (limiting access to Wellesley College users would require retrofitting existing stations to track via OneCard)	Motor Pool, Department of Faculty Housing & Transportation	Planned	3

Financial Implications

Although air travel is the largest contributor to transportation-related emissions and a large expense, it is also one which is impossible to eradicate. Simply put, many of our students must fly to and from college and faculty/staff must attend key conferences in their field. Best practices would include encouraging alternative transportation whenever possible, and introducing carbon offsets when travel is necessary.

Climate Implications

Reducing the amount of air travel, solo commuters, and the average mpg of the Wellesley fleet will yield substantial carbon reductions. Implementation of carbon offsets for air travel will contribute to renewable energy, forest protection and reforestation.

Potential Student Involvement

- Include a student representative on the Department of Faculty Housing & Transportation Committee to inject student perspective into transportation policies (in conjunction with the Office of Sustainability).

Sources

- Chase, S., Gaglini, D., & Willoughby, P. (2013). Wellesley College Sustainability Progress Report 2013. Wellesley College. Retrieved from <https://docs.google.com/a/wellesley.edu/file/d/0B3qQ5qdnqCI8NUw4NnBBS3VvX2FQalY0aEN4MEktUjhyS1dF/edit>
- Environmental Studies 300 Capstone Course. (2008). Climate for Change. Wellesley College. Retrieved from <http://www.wellesley.edu/sites/default/files/assets/departments/environmentalscience/files/es300-2008-wellesley-ghg-audit.pdf>
- Executive Office of Energy and Environmental Affairs. (2014, July). Massachusetts Annual Greenhouse Gas Emissions Inventory: 1990-2011, with Partial 2012 Data. Mass.gov. Retrieved from <http://www.mass.gov/eea/docs/dep/air/climate/magghinv.xls>
- Human Resources, Wellesley College. (n.d.). Other Benefits. Retrieved October 13, 2015, from <http://www.wellesley.edu/hr/benefits/otherbenefits/>
- Office of Institutional Planning and Assessment, Wellesley College. (2015). Factbook 2014-2015. Wellesley College.
- Office of Sustainability, Wellesley College. (n.d.). Bike Share: What Is It? Retrieved October 13, 2015, from <https://www.wellesley.edu/sustainability/transportation/bike-share/>
- US EPA. (n.d.). Greenhouse Gases at EPA [Overviews and Factsheets]. Retrieved October 13, 2015, from <http://www2.epa.gov/greeningepa/greenhouse-gases-epa>

Water

The Wellesley College campus abounds in both natural and landscaped water features: Lake Waban and the adjoining wetlands of Alumnae Valley; Paramecium Pond fed by the small waterfall and brook meandering through the Alexandra Botanic Garden; the Longfellow Pond fountain next to the Clapp Library. Less visible to those who live on, work at, or visit the campus are the college's two wells that provide water for drinking, domestic use, the power plant, and scientific research. The wells draw from an aquifer (the underground layer of permeable material of water-bearing rock--such as sandstone, sand, and gravel--that lets water pass through to a well) in the Charles River Basin. The college controls Zone I, the immediate area around the wellheads Botany Wells #1 and #2 (the sources of potable water) limited to water supply activities, and Zone II, the primary recharge area (the ground surface area that contributes water to a well) for the aquifer upon which most of the campus is located, including the new well (2012) for non-potable irrigation located on the Nehoiden Golf Course. The other important source of water for irrigation is Lake Waban.

Why should a college blessed with its own wells and the proximity of Lake Waban worry about water consumption? Three strong incentives encourage the college to become a better steward of its water.

First, the Charles River Basin is a stressed water environment: "With high growth rates in suburbs west of Boston, there is increased demand for public drinking water and expanded sewer systems - both of which jeopardize water levels in the Charles River. New public wells tap into aquifers that are already showing signs of stress - as evidenced by restrictions on water use in many suburban communities during the summer."¹

Second, even though the college owns its wells, the Massachusetts Department of Environmental Protection issues renewable permits for the college's total withdrawals from those wells and from Lake Waban; the MassDEP is concerned about the stress on the Charles River Basin and beyond: "water withdrawals and an increase in development and impervious areas [such as asphalt and roofs], combined with the out-of-the-basin export of wastewater [water down the drain and flushed], substantially contribute to low flow in the Commonwealth." In the latest water withdrawal permit amendment (July 3, 2013), the department reduced the college's annual average withdrawal volume (from the wells and the lake) from 0.41 mgd (million gallons per day) to 0.35 mgd. In the event the MassDEP determines the Charles Basin will be adversely affected by current withdrawal levels, the college's withdrawal volume could be lowered further.²

Third, the college's commitment to reducing water waste on campus can serve as a powerful example to students and to the larger community on and off campus of its determination to protect this precious resource.

¹ Charles River Watershed Association, "Charles River History."

² Massachusetts Department of Environmental Protection to Zuraw, "Permittee: Wellesley College."

A concomitant campus water issue is the volume of bulk bottled water purchases on campus. The college drinking water meets all applicable health standards regulated by the state and federal government; in fact, the college received the 2013 Public Water Systems Small Community Award, announced by the MassDEP during National Drinking Water Week.³ (It is important to note that municipal water supplies are under much more stringent testing regulations than those for bottled water.) Yet most academic departments, administrative offices, and event organizers buy bottled water; the reason often cited is a “chemical” taste to campus water, a result of the aging campus water infrastructure. As the college works to improve that infrastructure, we can still recognize the purchase of bottled water is costly to the college in dollars--close to \$20,000 for Poland Spring purchases alone in FY14 (T. Dolan, personal communication, May 19, 2015). Bottled water is also costly in its environmental impact. One study has found that “producing bottled water requires ... as much as 2000 times the energy cost of producing tap water.”⁴ A Government Accounting Office’s analysis shows that almost 77% of PET plastic water bottles are discarded, with most of them ending up in U.S. landfills.⁵ We believe a commitment to phasing out bottled water purchases constitutes an additional example of the college’s willingness to become good environmental citizens.

Main Issues/Primary Goals

1. Reduce potable water consumption an additional 11% to achieve a 50% reduction below 1999 baseline by 2026.
2. Improve metering of potable water to inform water consumption strategies.
3. Pursue strategies to improve the campus’ already high quality water supply, including upgrade of the college’s existing water supply infrastructure, the source for taste complaints about campus water. As feasible, continue to install hydration stations that filter water and facilitate filling of reusable water bottles.
4. Educate the community about the high quality of campus drinking water and campaign for a phase-out of bottled water purchases.

How We’re Doing

Wellesley College consumes **potable water** for drinking, irrigation, bathrooms, cooking and cleaning in the campus food service venues, domestic use in student housing, sports facilities, and off-campus facilities (faculty housing, the Center for Research on Women, Grounds, and Motor Pool). In the period 1999-2014, the college achieved a 39% reduction of potable water consumption (from 124,769,000 gallons to 76,603,590). These reductions were accomplished by the following actions:

1. The increased use of non-potable water from Lake Waban for irrigation.
2. The replacement of 90-95% of all fixtures and of all showerheads (except for the handicapped accessible showers) in the residential halls with low flow fixtures and showerheads.

³ Wellesley College, “2014 Annual Drinking Water Quality Report for Wellesley College.”

⁴ Gleick and Cooley, “Energy Implications of Bottled Water.”

⁵ United States Government Accountability Office, “Bottled Water.”

3. The complete swap-out of washing machines for high efficiency units in the residential halls.

Future projects will employ standards that further reduce consumption of potable water:

1. Dual flush toilets have been standard in all college renovations since 2008. Of course, it must be noted, most buildings on campus are not up for renovations that involve updating their plumbing systems.
2. The planned renovation of the greenhouses will use rainwater for most of its irrigation needs.
3. The new system to supply Paramecium Pond with recirculating feedwater from an abandoned well near #1 and #2 wells instead of potable water as is the current practice will constitute a large reduction in use of potable water.
4. The use of showerhead timer/reminders has been launched in several of the residence halls.
5. The future planned use of low-phosphate additives in our water distribution system would create a protective coating on the inside of pipes that inhibits corrosion and subsequent water leaks from pipes; this will have a positive effect on the taste of the college drinking supply. These additives have been implemented widely and safely in cities across the United States; the college is continuing to investigate this move and to consult with the campus community.
6. The Facilities metering project will continue to meter for water use each building as it is renovated. Currently out of 64 structures, only 12 faculty houses and 9 buildings are individually metered. The KSC pool house (not the KSC as a whole) is submetered for pool filling. The water use in all other buildings is recorded by two main meters, one for each well. Backing up the metering project is the Green Building Standards mandate that in all major building renovations meters will be installed for all utilities including water.⁶

The use of **non-potable** water drawn from Lake Waban and the wells on the Nehoiden Golf Course is for irrigation of the campus landscape. Overall, irrigation has become a good example of college's efforts to conserve water. Irrigation lines have been repaired. On the west side of campus, irrigation systems are weather station controlled; the rest of the campus is governed by rain sensors. All irrigation systems are already submetered. In addition the installation of a sophisticated controls system allows for highly efficient water use on the Nehoiden Golf Course. Irrigation does use water, but most irrigation water returns through the ground to the aquifer.

Several departments and offices on campus have taken steps to reduce the purchase of **bottled water**:

1. In 2007, the PERA (Physical Education, Recreation, Athletics) department located in the KSC prioritized programming for students over water and stopped purchasing bottled water. Although bottled water continues to be sold in KSC vending machines, the 2013 installation of 3 hydration

⁶ Advisory Committee on Environmental Sustainability, "Wellesley College Green Building Standards."

stations with a refillable water bottle feature has nearly eliminated use of bottled water in that building.

2. In early 2015, a survey of 112 faculty and staff in the Science Center found that 93% would use on a regular basis a high-quality refillable water bottle if offered one; with funding from the Class of 57 Green Fund, 100 bottles have been made available and 3 hydration stations were installed in the summer 2015. In November 2015, the Science Center declared it will no longer provide disposable bottles of water for Science Center events.

3. To support these efforts, the Sustainability Office provides mobile water stations: “Wells on Wheels,” for outdoor campus events and three gallon table-top dispensers for indoor events.

Projects are underway to improve the already high quality of the college’s drinking water. The installation of 4-log removal systems, a testing protocol to assure that water treatment has been effective, will require changes to our piping and distribution system. The low-phosphate additives discussed above will improve drinking water and the taste of our drinking water by preventing the absorption of unwanted metals like lead, copper, and iron. These measures will be important in the campaign to phase out bottled water.

Recommended Strategies

- Phase 1 = Within 2 years of plan being adopted
- Phase 2 = Within 5 years of plan being adopted
- Phase 3 = Within 10 years of plan being adopted

* Office of Environmental, Health, and Safety

1. Improve conservation of potable water.

Issue	Strategy	Responsible Party	Status	Phase
W1.1	Installation of a water recirculation system for Paramecium Pond	Facilities	In progress	1

Currently Paramecium Pond is fed by 12 million gallons of potable water. Steps to install a recirculating feedwater system of non-potable water should be resolved as soon as possible and will constitute a 16% reduction in current potable water use on campus (or a 10% reduction relative to the 1999 baseline for potable water consumption). Installing the feed system will be necessary if phosphate is added to the water supply; the additives could result in significant algae blooms in Paramecium Pond.

W1.2	Synergistic engagement with the power plant evolution to reduce water consumption.	Facilities	In Progress	2
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W1.3	Steam traps to capture condensate leaks	Facilities	In Progress	2
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The power plant uses a large amount of potable water due to the currently poor state of the cooling towers and steam condensate leaks. After steam gives up its heat, it condenses in the system and unless removed as quickly as possible affects heating efficiency. In the future as the power plant evolves into a more efficient system, the conservation of water in its operations should be a major consideration. Proper maintenance of steam traps can increase the operating efficiency of the college’s steam-based heating system. Steam traps should be routinely inspected and repaired as quickly as possible if found defective. For more information on steam traps see Gorelick & Bandes.⁷

W1.4	Low-phosphate additives	Facilities, Office of Sustainability, Office of EHS*	Planned	2
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Low-phosphate additives prevent corrosion in the college’s aging water distribution infrastructure. Additives help maintain water mains, service lines, valves, meters and building plumbing by reacting with metals on the interior pipe surface to form a microscopic protective film. Facilities with help from Office of Sustainability and the Office of Environmental Health and Safety will educate the public on the safety of these additives.

W1.5	Use of rainwater for greenhouse irrigation	Facilities	Planned	3
W1.6	Replacement of outdated toilets, faucets, etc. with low-flow fixtures.	Facilities	During Renovation	3

The renovation of the greenhouses will include the use of rainwater for irrigation; the use of greywater is being considered. Although the technology for using grey water in campus buildings is available, the cost of replacing current plumbing systems to do that is significant. As noted earlier, most buildings on campus still operate with outdated plumbing fixtures.

2. Completion of campus-wide metering of potable water use to provide data for strategies (both for Facilities and educational purposes) to reduce consumption.

Issue	Strategy	Responsible Party	Status	Phase
W2.1	Campus-wide metering	Facilities	In progress	2

Facilities has an on-going metering project: every building will be metered for water, steam heat, and electricity. The 2014 **Green Buildings Standards**, which mandates metering in all new and renovated buildings, should provide support to Facilities in this regard. However,

⁷ “Why Do Steam Traps Fail?”

with 44 out of 65 buildings not metered, even though the cost will be substantial, the critical concern has to be complete metering--the crucial factor in implementing water conservation actions both for Facilities and in the education of the campus on limiting water use.

W2.2	Use of metered consumption to educate about and provide incentives for reduced water consumption	Facilities, Office of Sustainability, Residential Life	Planned	2
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Facilities should provide user-friendly public online access to water use data. With that data the Office of Sustainability can highlight areas on campus where water waste can be further curbed.

3. Pursue strategies to improve the campus' already high quality water supply.

Issue	Strategy	Responsible Party	Status	Phase
W3.1	4 log removal systems	Facilities	Planned	1

4 log removal systems are one of the essential components of the EPA's 2006 Ground Water Rule (GWR) aimed at testing drinking water quality in order to ascertain that we are indeed already meeting this threshold. Completing the 4-log removal system will ensure that treated drinking water reliably achieves 99.99 percent (4-log) inactivation or removal of viruses.

W3.2	Low-phosphate additives	Facilities	Planned	2
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Low-phosphate additives not only protect the water infrastructure, but improve the quality of drinking water by "sequestering" unwanted metals from the water, such as lead and copper, addressing complaints about the "chemical" taste of Wellesley water.

4. Educate the community about the excellence of campus drinking water and campaign for a phase-out of bottled water purchases.

Issue	Strategy	Responsible Party	Status	Phase
W4.1	Educate campus community about the quality of campus drinking water and environmental waste associated with bottled water	Office of Sustainability, Residential Life, Faculty Building Representatives	In progress	1

Bringing the campus community's attention to the continuing efforts to make our drinking water supply as safe as and "clean" tasting as possible will be an crucial argument in the

campaign to phase out the use of bottled water on campus. The college annually issues a Drinking Water Quality Report; that report and the above measures should figure in the Office of Sustainability’s outreach. The Office of Residential Life can provide data and recommendations on water consumption and conservation to incoming students during orientations in “The Bubble,” the new all-inclusive communications channel for students to receive news and information from faculty, staff, and administrators in one convenient location. Faculty Building Representatives can help educate faculty and departmental staff and agitate for improved drinking water systems.

W4.2	Phase-out campuswide the purchase of bottled water	Trustees, Purchasing, Senior Staff	In Progress	1
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The phase-out will best be accomplished by the following actions:

1. The education of the college community about the high quality of the college’s drinking supply, as noted in P4.1, and thus the unnecessary environmental waste of using bottled water.
2. College government should consider legislation banning the use of SOFC money to purchase bottled water. Club leaders and event planners should be trained by the Sustainability Office in finding alternatives.
3. By direction of the Trustees, the Purchasing Office should direct that individual bottles are not to be purchased and/or their purchase by other entities will not be reimbursed.
4. The Office of Sustainability will continue to provide table-top dispensers for indoor events and “Wells on Wheels” for outside events.
5. A detailed list of locations without water fountains and filling stations should be drawn up and funding requested to supply these locations with hydration stations.
6. A list of drinking water options on campus should be made public.
7. Replacement of Poland Spring jugs in offices and departments with alternative drinking water options, like the hydration stations in the KSC featuring chilled, filtered water with a refillable water bottle fixture.

Financial Implications

Campus-wide metering, again the most crucial step for water conservation on campus, is an enormous investment, but without it large scale efforts to conserve water are difficult to pursue effectively. Costs with modernizing the power plant, including the use and repair of steam traps, ⁸ are considerable, too, not only for purchase of equipment upfront but for properly maintaining it. However, the long-term savings in energy efficiency and the long-term effects of conserving water should mitigate costs. Saving \$20,000 plus each year (as noted above) by ending the purchase of bottled water could offset the expense of supplying more modern hydration stations all over campus.

Climate Implications

⁸ Risko, “Understanding Steam Traps.”

The availability of fresh water is the most critical resource on earth. Global warming and increased consumption all over the planet is depleting the planet's reserves. Even though Massachusetts is not currently in an extreme water emergency, as noted earlier, the Charles River Basin aquifer from which it draws its water supply is a highly stressed environment. Given the high probability of even more development in Boston's western suburbs and the rising average temperatures in Massachusetts, we should be very concerned about the future of our water supply. It is crucial for the college to uphold strong environmentally sound practices related to water consumption. In this respect, the college can serve not only as a model for women's education, as it has for one hundred and forty years, but in the future as a model for education about water management for our students and the greater community.

Potential Student Involvement

Although Wellesley College is fortunate in having an ample supply of potable water, many of our students will return to or move to areas all over the globe where water is a much more precious resource. Student awareness of water conservation efforts should be a part of a Wellesley education. Student organizations like WEED (Wellesley Energy and Environmental Defense) and SCoop (the Sustainability Co-op) are already working to raise awareness of our water consumption on campus and how to reduce it. The Eco-Reps in the residence halls will increasingly play a role in day-to-day water awareness. A highly advertised campaign to phase out bottled water along the lines of the "Take Back the Tap On Your Campus" model sponsored by Food and Water Watch can recruit an even larger number of students to get involved.⁹

Sources:

- Advisory Committee on Environmental Sustainability. "Wellesley College Green Building Standards," 2014.
- Charles River Watershed Association. "Charles River History." *Charles River Watershed Association*, 2014. <http://www.crwa.org/charles-river-history>.
- Gleick, P. H., and H. S. Cooley. "Energy Implications of Bottled Water." *Environmental Research Letters* 4, no. 1 (2009): 014009. doi:10.1088/1748-9326/4/1/014009.
- Gorelick, Bruce, and Alan Bandes. "Why Do Steam Traps Fail?" *UE Systems*, 2015. <http://www.uesystems.com/resources/articles-and-announcements/why-do-steam-traps-fail>.
- Massachusetts Department of Environmental Protection. Letter to Peter Zuraw. "Permittee: Wellesley College," July 3, 2012.
- Risko, J. R. "Understanding Steam Traps." *Chemical Engineering Progress* 107, no. 2 (February 2011): 21–26.
- "Take Back the Tap." *Food & Water Watch*, 2015. <http://www.foodandwaterwatch.org/campaign/take-back-tap>.
- United States Government Accountability Office. "Bottled Water: FDA Safety and Consumer Protections Are Often Less Stringent Than Comparable EPA Protections for Tap Water."

⁹ "Take Back the Tap."

Report to Congressional Requesters. Washington, D.C.: U.S. Government Accountability Office, June 2009. <http://www.gao.gov/new.items/d09610.pdf>.
Wellesley College. "2014 Annual Drinking Water Quality Report for Wellesley College," 2014. http://www.wellesley.edu/sites/default/files/assets/2014_ccr_wellesley_7.pdf.