

# 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 building 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.
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" (5). (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 Whittin 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. 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**

Abbreviations of Responsible Parties:

FMPD = Facilities Management and Planning Department

CFP = Comprehensive Facilities Plan

OS = Office of Sustainability

FHO = Faculty Housing Office

FBR = Faculty Building Representatives

RL = Residential Life

VP = Vice President for Finance and Administration

B = Budget Office

T = Trustees

HR = Human Resources

SS = Senior Staff

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. 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	Measurement	Responsible Party	Status	Phase
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P1.1	Bring building systems up to date for maximum efficiency with preventative maintenance and equipment upgrades as needed, in particular to HVAC	T, VP and FMPD		1 ongoing
P1.2	Metering (for all utilities including water) all buildings, integrated central system consistently monitored	FMPD		1
P1.3	Move from reactive to proactive by implementing and funding an aggressive maintenance plan	FMPD, B		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.

<b>Issue</b>	<b>Deferred Maintenance</b>	<b>Responsible Party</b>	<b>Status</b>	<b>Phase</b>
P1.4	Plan to address backlog	FMPD, B, HR		1
P1.5	Depreciation list for cycle maintenance (stewardship)	FMPD with support from VP and T		2
P1.6	Comprehensive plan for each building	FMPD, B		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	Infrastructure Improvements	Responsible Party	Status	Phase
P1.7	Air sealing (caulking, weatherstripping)	FMPD		1
P1.8	Envelope enclosure	FMPD		2
P1.9	Update HVAC, LED lighting, plumbing, steam heat	FMPD		3
P1.10	Update existing building commissioning process	FMPD		3
P1.11	Conversion of steam heat to forced hot water heating	FMPD		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	Building Energy Savings	Responsible Party	Status	Phase
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P2.1	Set point temperatures	Policy set by SS		1
P2.2	Restricted use of buildings	Policy set by SS		2
P2.3	Light sensors, timers	FMPD		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	Engage Occupants	Responsible Party	Status	Phase
P3.1	Sustainable Office Certification	OS		2
P3.2	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	RL		1 2 3
P3.3	Faculty Housing Info Packets	FH		1
P3.4	Reinforce energy conservation measures	OS		1

P3.5	Faculty Building Representatives	FBR		1
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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 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 sub-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**

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