

Standard Eight: Physical and Technological Resources

Overview of Campus

Bowdoin's beautiful and historic campus includes buildings of widely varied ages and many architectural styles on approximately 215 acres closely surrounded by residential neighborhoods. The College also owns numerous smaller frame and brick dwellings that ring the campus on three sides. Together they constitute the character and charm of the campus. Much of the main campus has been designated a historic district in the National Register of Historic Places. Known as the Federal Street Historic District, the district extends beyond the main campus to include several of the College-owned buildings along Federal, Maine, and College Streets.

Adjacent to the main campus are the Farley Field House athletic complex and other property holdings. All told, the College owns 121 buildings in Brunswick that total approximately 2.0 million gross square feet. In addition to its Brunswick campus, the College owns and operates a 118-acre Coastal Studies Center and marine laboratory in Harpswell, Maine, and a scientific field station on Kent Island, Canada, and has other minor property holdings both in Maine and Canada.

The campus is used intensively year round. The Events and Summer Programs Office schedules many events (such as lectures and symposia) during the evenings and the summer that enhance the academic program, attract visitors, enable use of facilities by local schools and other groups, and bring revenue to the College. Major summer activities include the Maine State Music Theatre and the Bowdoin International Music Festival, each of which has been affiliated with the College for more than 40 years. Upward Bound, which began at Bowdoin in 1965, is funded by the U.S Department of Education and provides low-income high school students with preparation for college; the Bowdoin program has both summer and school-year programs and currently works with students from 18 Maine high schools.

Campus Planning

Bowdoin has undertaken a series of planning initiatives to ensure that the development and maintenance of College facilities support the mission of the College. The Campus Plan (Standard 2) stands as the core planning document. The Board of Trustees endorsed the Skidmore Owings & Merrill strategic plan in October 2004 and adopted its guiding principles, which recognize the campus's historic character and connection to the Town of Brunswick and endorse the notions of a mixed-use campus, walkability, environmental stewardship, building sustainability, and design planning and review (TR 8.1).

As part of the plan, SOM helped site future building locations and recommended growth and property acquisition strategies for the near term (2010), mid-term (2025), and long term (2050). Among its chief recommendations, SOM suggested that the campus grow southward, better connecting the main campus to the new residence halls and the athletic

facilities beyond them. The plan also suggested a new quadrangle in the area of Coffin Street. Many of the building projects recently completed or currently underway embrace the findings of the SOM report. The SOM report has been shared with the Town Council and Planning Board of the Town of Brunswick, as well as with neighborhood groups. The campus plan is intended to be dynamic in nature and will evolve over time.

In light of the plan, the College has created a Campus Planning and Design Committee composed of faculty, staff, and students. This group meets regularly to select architects, review building siting, and review design and aesthetic issues (TR8.2). The College also follows a master landscape architectural plan that guides the maintenance and renewal of campus grounds and informs the landscape plans for major projects. In addition, the Trustees have adopted a formal Real Estate Acquisition and Disposition Policy, most recently revised in February 2004. The policy identifies real estate priority zones and outlines a plan to purchase desired real estate as it becomes available.

The College communicates about its plans with Town officials and residential and downtown neighbors. Crucial to these relationships is a study, recently completed, of the College's parking needs and a comprehensive parking plan. Bowdoin is represented on the Local Reuse Authority for the Brunswick Naval Air Station and will try to acquire portions of the base property for future College use.

Capital Projects

Over the past decade, the College's building acquisition, construction, and renovation efforts have been extensive, focusing on central strategic goals related to the mission of the institution. These projects have been aimed primarily at improving the student residential experience and supporting the expanding academic program, in particular renewing and expanding outdated and cramped facilities in the arts and sciences. These projects have included both major renovations and new construction. Additional projects have expanded administrative space off the central campus and responded to problems inherent in old buildings. The College aims strategically to consolidate administrative space on campus and preserve the main quadrangle for the academic program.

Funding for capital projects at Bowdoin derives from a variety of sources, including grants, gifts, endowment, and debt. The College developed a capital expenditure plan in FY 2004–05 that presents a five-year perspective on proposed capital expenditures, including expenses related to the construction, renovation, maintenance, or acquisition of College property, the physical plant, and all major equipment (TR8.3).

Academic projects: Major capital projects during the past ten years have focused on College priorities in enhancing the arts and the sciences. In 2000, the College completed renovation of Memorial Hall, which now contains a modernized 610-seat air-conditioned Pickard Theater and a new 150-seat experimental theater. Currently underway is a \$20 million renovation of and addition to the Walker Art Building, which houses the College's Museum of Art. The museum is expected to reopen in Spring 2007. Construction of a new state-of-the-art 286-seat recital hall is underway in the former

Curtis Pool building at the center of the campus. The hall, which will include rehearsal space, nine music practice rooms, and other ancillary spaces, will open in Spring 2007.

The construction of Druckenmiller Hall and renovation of Cleaveland Hall were completed in 1997 to create a multidisciplinary science center for the departments of biology, chemistry, and geology. The College is currently designing and implementing a combined dehumidification and expanded air-conditioning solution that will be completed by June 2007 to deal with unresolved building issues. Searles Science Building was renovated in 1999 to house computer science, mathematics, and physics and provides the campus with a set of attractive classrooms. Kanbar Hall opened in September 2004. It houses parts of the neuroscience program, the departments of psychology and education and the College's Center for Learning and Teaching.

In 1997, the College completed construction and renovation of facilities at the Coastal Studies Center on Orr's Island, including a meeting center, terrestrial laboratory, and salt-water marine laboratory. Completion of a dock in 2006 will make the Center more accessible to the water and support a variety of research activities by faculty and students.

In general support of the academic program, the College undertook two major renovations and improvements in Hawthorne-Longfellow Library in 2000 and 2005. In addition, another frame house was renovated to house an academic department and relieve office space pressures on campus in 2000.

Classroom renovation is now a regular part of the planning cycle for major maintenance and capital projects. Planning has been led by the Associate Dean for Academic Affairs and involves close collaboration with IT and Facilities. Through FY 2005-06, renovations and/or upgrades of academic space (including classrooms and labs) had been completed in 17 locations.

Supporting a new residential life system: To build the new College House system, the College acquired and renovated six former fraternities and transformed them into College Houses. The new plan for residential life moved existing dining facilities from fraternities to a central location and thus required a new dining commons (Thorne Hall), which was completed in 2000 to complement renovated and expanded dining space in Moulton Union (1995).

Three new student residence buildings, Howard and Stowe Halls (1996) and Chamberlain Hall (1999), have helped to draw students back to the central campus. East and West Halls (2005) help to shape the new quadrangle on the south end of the campus as envisioned by SOM. Currently these two residence halls house 204 first-year students. In Fall 2005, the College embarked on a 28-month major renovation project to renovate the six historic brick residence halls located on the main quad.

The College is committed to providing housing to nearly all students and has achieved a historic high of 95% of students residing in College housing. We continue to assess our housing needs. Short-term leases of properties off campus have been executed. Under

the campus master plan, the Harpswell and Pine Street apartments will be removed and a substantial renovation (or replacement) of the Brunswick Apartments will accommodate the growing needs of upperclass students.

Other campus additions and renovations: The McLellan building opened in 1999 to provide administrative space and visual arts space away from the center of campus, thus opening up central campus space for reuse by the academic program and student life. A former fraternity became the Burton-Little House in 2000 and now houses the Admissions Office in a prominent and welcoming setting. In addition, Ham House was renovated in 2000 to house the Treasurer's Office, and Copeland House was remodeled in 2000 to house Development offices. In 2004 the College renovated a house to create space off the central campus for transitional offices for retired faculty.

As a result of special gifts, the Lubin Family Squash Courts were completed in 1999 and the Ryan Artificial Turf Field in 2003. To further strengthen the most popular student club, the Schwartz Outdoor Leadership Center was constructed in 2002. Finally, to support Bowdoin's active and important Children's Center, a new building adjacent to the campus on South Street was completed in 2003.

The historic Bowdoin Chapel interior was renovated in 1997–98, and a rehabilitation of the 120-foot twin towers was completed in 2004 as a response to building decay due to moisture infiltration. Major restoration is expected for the tower of Hubbard Hall and for Searles Science Building within the next two years.

Future projects: The current capital campaign includes a new hockey arena to replace the aging Dayton Arena, built in 1956. The location of a new arena on the athletic campus will free central campus space for parking and, in the longer term, will permit the construction of new academic space as part of the Campus Plan. In addition, the capital campaign will support the development of a new fitness center in the Morrell Gym. Other projects under study include finding a new home for the unique collections of the Peary-MacMillan Arctic Museum, the development of a preservation plan for the historic Stowe House on Federal Street, an Alumni Center, and a renovated Health Center.

Organizational Support for Facilities

Facilities Management: The Office of Facilities Management employs 135 full-time employees and includes the housekeeping, preventive maintenance, groundskeeping, and maintenance shops, and major maintenance and motor pool divisions. The College employs numerous professionals, including licensed engineers, electricians, certified boiler mechanics, and plumbers (TR8.4). The department serves the campus community in providing support and maintenance of all campus buildings and nearby facilities such as the Coastal Studies Center and the sailing and rowing club facilities. The department operates the central heating plant and several warehouse and storage locations on and off-campus. The department also maintains a user-friendly work-order system and has recently completed a comprehensive review of deferred maintenance needs. In addition

to employing numerous tradespeople, the department employs the campus Sustainability Coordinator and a Manager of Environmental Health and Safety.

Capital Projects: The capital projects division employs three project managers in addition to the director. This group represents the College as owner on all major construction and renovation projects. The staff also coordinates sustainability features of construction projects and staffs the Campus Planning and Design Committee.

Facilities Maintenance and Renewal

The College is committed to regular renewal of its buildings and infrastructure. In addition to regular plant maintenance, the College has recently devoted significant resources to complete renovations of many campus buildings. For example, aging electrical transformers on campus have been upgraded as part of the renovation of the Museum of Art and the first-year residence halls. Over the past ten years, the amount of resources devoted to deferred and major maintenance has grown significantly. In 2004, Bowdoin engaged Sightlines Facilities Asset Advisers to review preventive maintenance, deferred maintenance, and staffing. The study concluded that Bowdoin has more buildings to maintain than its peers and a unique age distribution of its buildings (more new and more old). Financial and personnel resources dedicated to maintenance exceed or are comparable to those of peer schools.

Sightlines advised that the College could improve the way planned maintenance was budgeted and performed. To address these findings, the College has appointed a full-time maintenance coordinator who will enter data for a computerized maintenance management system. The Facilities Management Department is working with Sightlines on a cyclical repair and/or replacement plan of primary building components for each of the College's 121 buildings.

Funding for the capital renewal program comes from the College's operating budget and was \$3,785,000 for FY 2004-05; \$3,900,000 million in FY 2005-06; and \$3,029,000, a planned reduction, in FY 2006-07. This reduction was made for the short-term in response to significant capital investments made in building renovation that addressed several pending major maintenance items. For example, a number of longstanding ADA accessibility issues will be addressed by renovating the Museum of Art and the historic first-year residence halls. The College plans to rebuild the capital renewal/major maintenance budget gradually over the next several years.

Utilities and Energy Conservation

Energy efficiency and conservation are key components of maintaining Bowdoin's physical plant. In Fall 2004, the College changed its primary heating source from #6 to #2 heating oil. Consultants on the project feasibility study report that the conversion provides significant cost savings, extends the life of storage tanks, and provides significant environmental benefits, including emissions reductions of 57%.

A commissioned energy audit in 2004 projected steady increases in net electrical energy as a result of increased technology needs but also suggested a series of energy conservation measures. Several of these have been identified and funded in the Major Maintenance and Capital Renewal budget. For example, a burner in the main heating plant has been converted to allow it to burn both natural gas and #2 heating oil. Other dual-fuel boilers will follow. The College has converted the furnace of one of the College Houses from #2 heating oil to biodiesel fuel in 2005-06 and expects to expand the use of biodiesel fuel at other locations. Energy-efficient lighting and appliances are purchased as part of Bowdoin's procurement policy, and a hybrid fuel car was recently added to the College vehicle fleet. Several new construction or renovation projects (Museum of Art, recital hall, and East and West Halls) include geothermal wells to reduce heating and cooling demand and costs. The College has arranged to purchase all of its electricity through green power and is testing the feasibility of installing solar electric panels at the Farley athletic complex.

Other Environmental Initiatives

As part of its stewardship duties, the College is committed to environmental awareness and its responsibility to a cleaner environment. In 2006, the College voluntarily signed on to the Maine Governor's Carbon Challenge and has been designated a "Maine environmental leader." The College has committed to a reduction of 11% of carbon dioxide emissions from 2002 levels by the year 2010. Efforts are also underway to become an EPA green power partner and to adopt an environmental management system (EMS).

For new construction, the College has adopted certification standards for Leadership in Energy and Environmental Design (LEED™) Green Building Rating. Since 2000 Bowdoin has incorporated many LEED™-type features into new building projects; the two new first-year residence halls received LEED™ silver certification in April 2006. Bowdoin has continued to improve its environmental initiatives with the development of its own building design standards for renovation projects (TR8.5). In addition, the College maintains a standard product purchasing list that includes low-VOC materials, products with recycled content, and energy-efficient lighting fixtures.

Environmental awareness also extends to cleaning and housekeeping. Where possible, the housekeeping division uses green cleaning supplies. In addition, the groundskeeping department avoids the use of pesticides and other harmful applications, especially on terrain included within the Town of Brunswick's aquifer protection zone.

Safety and Security

The Bowdoin College Department of Safety and Security provides 24-hour patrol coverage 365 days a year. The department embraces "community-oriented policing," a philosophy and organizational strategy that allows the department and members of the Bowdoin and Brunswick communities to work together to promote mutual understanding; identify problems; prevent, solve, and reduce the fear of crime; and

increase the level of safety and security. The department conducts regular programs with students, faculty, staff, and Brunswick residents on issues such as RAD (Rape Aggression Defense), personal safety, a Whistle Program (to call for help in an emergency), crime prevention, and alcohol/drug abuse. Safety initiatives in conjunction with Bowdoin Student Government encourage the use of blue light emergency phones located throughout the campus, promote pedestrian safety, improve campus lighting, and encourage walking in groups and watching out for the safety of other students.

Bowdoin also has formed a Campus Emergency Management Team to handle campus emergencies and disasters. The group meets annually and is currently addressing issues the College will face in the event of an outbreak of avian flu.

Technology Infrastructure and Support

As noted under Standard 7, Information Technology at Bowdoin has changed dramatically in the last decade. Of particular significance to this Standard are the developments in campus infrastructure that provide the hardware and software backbones for many campus functions.

Hardware Infrastructure

Bowdoin's network infrastructure was replaced in 2004 with Cisco networking and security equipment. This high-speed gigabit network connects the campus through a wired and wireless network reaching 84 buildings through 92 network closets. All residence halls, office spaces, and meeting and gathering spaces are wired, with over 13,000 active gigabit ports. Additionally, virtually the entire campus is covered by 802.11G (54 Mb/sec) connectivity. The network hosts more than 4,000 devices in a fault-tolerant environment including redundant connectivity to the Internet and between buildings. The College currently connects to the Internet over redundant gigabit links at 115 Mb/sec including I2 connectivity.

Bowdoin has built a redundant, reliable, and secure gigabit network that will support video, security cameras, facilities systems management, VoIP, storage, and other media services, and we will be migrating these new and existing services to one converged network communications solution. This will cut hardware, cabling, and maintenance costs while providing expanded and integrated online services.

Bowdoin has been connected to the Internet II network since 2004. Network security has improved as a result of the network equipment upgrade of 2004. Security steps include the installation of multiple firewalls, the division of the network into segmented VLANs, tools for bandwidth shaping, and the development of a comprehensive security policy (TR8.6).

The Bowdoin central data center holds all of the College's heterogeneous servers and systems: WinTel servers, Apple servers, UNIX and Linux servers, research and database clusters, and network core gear. The data center was enlarged in 2001 and new HVAC

equipment and a fire suppressant system were installed. In 2004, a new high-capacity uninterruptible power supply or UPS was installed, as was a new and larger generator.

In 2004, the College began a server consolidation based on a migration to a virtualized environment of HP blade systems/VMware, shared storage systems, and virtual machines. Formerly, vendor needs forced the College to have one application per server. We now run as many as 15 applications in one server (blade), realizing considerable economic benefits, more efficient use of rack space, higher availability and fault tolerance, and more efficient systems management.

In response to increased demands from faculty, staff, and students for uninterrupted services, highly available cluster environments have been built to support fund raising, financial services, e-mail, and learning environments.

Demands for digital storage of academic materials are rising exponentially. In response, Bowdoin doubled its enterprise-class mass storage in 2004 by extending the online storage to 24 Tb of tier-one Network Appliance mass storage and 8 Tb of tier-two Apple xSan. These additions are designed to meet the storage needs for the next three years and be extensible into the near future. Regular increases in online storage, management, and distribution of Bowdoin's digital assets will become part of the base IT budget.

Bowdoin's telephone system is the ROLM 9751 switch and voice messaging system that was installed in 1992. Voice recognition software was added in 2004 to allow voice dialing. IT has begun piloting the next generation of telephony, VoIP (voice-over Internet protocol). Cell services are being upgraded by adding a cell tower on campus. There are five locations and one portable unit on campus for high-end video conferencing that support both ISDN and IP conferencing.

Classrooms and technology laboratories: To provide consistent and reliable technology support in the classroom, IT has designed standard packages of equipment that are easy to use, affordable, continuously monitored, and that support all digital formats. In the last two years, 60% of the classrooms have been refitted with these standard packages, and several others have been provided with more specialized arrays suitable to their uses (e.g. high-resolution projectors). Lecture podiums are designed to hide laptops and control gear when not in use. Electronic control panels are consistent across locations. The College has at least a dozen computer labs ranging from three 24-seat PC labs to a 5-seat Macintosh lab.

Desktops: Bowdoin College owns 750 primary faculty/staff desktops and 231 laptops. Of these, about 30% are Macintosh, 70% are Windows, and a few are UNIX or Linux. All College-owned desktops are replaced at least every 4 years. There are 207 additional desktops in labs. There are 324 printers on campus. Bowdoin is moving from individual printer/copiers to networked multifunction printing/copying devices that are strategically placed to cut costs and provide better service to students, faculty, and staff.

Software Infrastructure

IT designed, developed, and launched a completely redesigned Bowdoin Web site in 2004 with collaboration from the Library, the Office of Communications, and the Office of the Dean for Academic Affairs. The Blackboard learning management suite replaced the College's proprietary course management system in July 2005 (Standard 7).

Several improvements were made to the Bowdoin e-mail system in 2005. Two (redundant) SPAM and virus filtering devices were installed to block unwanted e-mail before it reaches our mail environment. The Sun One e-mail server environment was repositioned in a Sun cluster with multiple mail servers installed to divide the load and provide redundant services to the community.

Bowdoin has had for years a customized and underused content management system (CMS) that provides for limited Web self-service by administrative users. IT installed a commercial CMS over the summer of 2006 to support a Web self-service solution for the whole campus in the fall.

Administrative applications: To support the institutional mission, Bowdoin's management systems have been upgraded significantly during the last few years to provide more effective tools. Much of this work was focused on replacing aging College-developed systems with vendor-based systems based on "best of breed" assessment.

The College has implemented Blackbaud's Alumni/Development and Financial Raiser's Edge systems (the latter with a College-developed reporting tool to provide easy to use financial reporting features for more than 300 staff members). Other recent conversions include inventory tracking, work order, and key systems for Facilities; an Admissions system (Powerfaids); a dining service inventory and meal-planning system; and NetCommunity for Development. Human Resources/Payroll offices are in the process of converting systems from one selected in 1999 to prepare for Y2K to one allowing a more technically proficient means of capturing and reporting on human resource data. In addition, the College has installed a 24/7 door security system for all residences and all new office/classroom buildings. A one-card system provides meal-plan control and ties to vending machines.

Online student registration and student records system conversion is the next major software development project. A vendor has been selected and will work with the College to adapt its system to our requirements. We expect implementation in Fall 2007.

Institutional Effectiveness

The effectiveness of Bowdon's physical resources is monitored primarily through committees and specific planning efforts. The Master Plan, endorsed by the Trustees in 2004, is the core planning document for the campus facilities. The Facilities and Properties Committee, a committee of the trustees, engages in evaluation, budgetary, short term and long term planning for new construction, property acquisition and the

upkeep of the physical plant. The Campus Planning and Design Committee, a committee of faculty and staff, carries out the principles of the Master Plan, reviews major capital projects and associated design issues. An Environmental Management System (“EMS”) has been adopted by senior management and will be shared with the campus community in the fall, 2006. Led by the Director of Facilities Management and Operations, the EMS will benchmark certain environmental goals such as recycling and air emissions on an annual basis. There is also a Master Landscape Architectural Plan. Both the Master Plan and the Landscape plans are reviewed regularly or at least every five (5) years. Under development is a plan for preventative and regular maintenance of the College’s physical assets. With the assistance of an outside consultant, the College has developed a comprehensive database of buildings that includes information on lifecycle and deferred maintenance items. This database will be updated annually and will serve as an evaluation and planning tool for the development of priorities and budgets for major maintenance (non capital) items.

An ambitious program of renovation and new construction has provided support for initiatives in residential life and the academic program and has renewed many campus buildings. The College is fortunate to be the steward of a beautiful, historic campus. Challenges for stewardship of the campus include developing a budget for routine and continual maintenance and developing further planning for academic space upgrades. As with most campuses, space needs to be configured with an eye to the future and possible reuse. The College will also need to update its master landscape plan to preserve the beauty of campus grounds.

As the College grows to 1,700 FTE students and hires new faculty and instructional staff as an outcome of the capital campaign, pressure for new space will emerge. New space requirements together with aging buildings and rising energy costs create real challenges for the future. For example, the academic program requires improved space for visual arts, an arts library, renovated classrooms, and space for new initiatives, including the Center for the Common Good. In addition, aging facilities at Rhodes Hall and the need for additional administrative space require attention and possible transitional space. Senior officers have taken responsibility for this planning.

By Fall 2007, all of the first-year residence halls will have been constructed or completely renovated. The attention will then shift to improving the quality and quantity of housing for the upper classes.

The College remains committed to complying with the ADA in all future construction and major renovations, and this is an important review element for the Campus Planning and Design Committee. Special emphasis will also be placed on life safety and infrastructure needs.

As the College looks forward, it must continue to be sensitive to its neighbors and its surroundings. A thoughtful plan for the use or disposition of College properties will be needed. Parking plans must also be developed with sensitivity. Of particular importance

to the College will be the conversion of the Brunswick Naval Air Station to civilian use by 2011, and developing plans for the College to acquire property for possible future use.

The College has significantly strengthened the IT infrastructure while attempting to control costs. In 2006 the College is well positioned to support fully both the academic program, including the research needs of faculty and students, and the administrative functions of the College. The physical infrastructure is current and able to meet anticipated needs for the near-term.

The maintenance of the information technology infrastructure and security is dependent on continuous measurement. Every two years an outside agency (OLESEC) is brought in to evaluate technology and data security at Bowdoin. The network traffic server operations are measured and monitored hourly for anomalies. The file servers, which store over 30 terabytes of research and teaching materials, are monitored for when servers are near their capacity.

The greatest infrastructure challenges for IT include full implementation of a voice-over IP system to replace the aging digital phone switch and adapting software to support online registration and Student Records. Both processes are well underway. More broadly, IT will continue to seek creative and cost-effective ways to manage the growing costs of IT infrastructure renewal and to meet the rapidly expanding storage requirements pressed, for example, by new uses of technology in art and the sciences particularly, as well as by student demand. Partnerships with vendors and active participation in planning have proven to help meet these challenges, and the College will continue to pursue them.

