

# Standard Eight: Physical and Technological Resources

## OVERVIEW

Northeastern University is a 110-year-old urban institution that has strong ties to its community. The University consists of the Boston campus, which houses the majority of University facilities and programs; six satellite locations; and various other small holdings. The total area of space within the University's 114 owned and managed facilities is 7.1 million gross square feet. Its land holdings total 414 acres.

The University's physical facilities have been well-managed in a manner consistent with institutional goals. Northeastern's rise in the *U.S. News and World Report* rankings over the past ten years — from the third tier to a top-tier position of ninety-six in Fall 2007 — is in part due to focused and coordinated goal-setting that has allowed the University to make facilities, infrastructure, and technology decisions that support Northeastern's vision.

## Physical Resources

### DESCRIPTION

Northeastern's main campus is located along Huntington Avenue in the culturally and educationally rich and diverse Fenway, Mission Hill, and Roxbury neighborhoods. The Museum of Fine Arts, the Isabella Stewart Gardner Museum, and Symphony Hall compose a significant part of the neighboring cultural establishment. Harvard Medical School, Wentworth Institute of Technology, the School of the Museum of Fine Arts, the New England Conservatory, and Roxbury Community College are among Northeastern's academic neighbors.

The Boston campus has a total of 6.86 million gross square feet in 87 buildings on 73 acres. Within these facilities, the university locates the majority of its academic programs and administrative services. Northeastern houses 7500 students in 33 university-controlled residence hall facilities.

Campus recreation and athletic facilities include the Marino Center, a modern recreation and fitness space; Matthews Arena, a multipurpose arena for hockey and other University events; and Cabot Gymnasium, an athletic complex largely devoted to varsity athletics, which includes a basketball venue, a natatorium, and a multipurpose field house. The Badger and Rosen SquashBusters facility on the Boston campus houses a sports program that both teaches squash to inner-city students and provides them with the tools to excel academically; it also functions as an additional athletic center for the University. Other athletic facilities near the Boston campus include Parsons Field, a football-baseball complex in nearby Brookline, and Henderson Boathouse, an architecture award-winning structure on the Charles River.

Six satellite locations support the University's operations. The Burlington campus — located approximately 18 miles north of the main campus, near the Route 128/93 technology and busi-

ness areas — provides facilities for College of Professional Studies programs and is a critical location for serving students who live or work north of Boston. The campus has three buildings, totaling 61,000 gross square feet, on 14.26 acres. Facilities include 24 classrooms, three computer labs, a large auditorium, student service and administrative space, teaching labs for the EMT/Paramedic program, and a biology teaching lab.

The Dedham campus, located in a suburban area near Route 128, approximately eight miles southwest of the main campus, comprises 20 acres and includes a 36,000 gross square-foot building and the University's intercollegiate outdoor track-and-field facility, built in 1985. The facility includes a few classrooms and a computer lab that are used as instructional space by the College of Professional Studies. Recently, renovations have been made to house various administrative-support functions.

In the heart of Boston's Financial District, the Batterymarch Conference Center provides state-of-the-art instruction space for the College of Professional Studies and the College of Business Administration. The center also offers conference and meeting space for use by Northeastern departments and for rent to outside businesses and organizations. The facility has 21 classrooms, three computer labs, and a dining area.

Approximately 20 miles northeast of Boston in Nahant, the Marine Science Center supports marine biology and oceanography instruction and research. The campus consists of the Edwards Laboratory, a one-story research and teaching facility, and the Murphy Battery, a converted World War II gun bunker that houses various research and outreach functions.

The university maintains two conference facilities. The Warren Conference Center and Inn — located 30 miles west of Boston in Ashland, on 200 acres adjacent to the Ashland Reservoir — is a full-service conference and training facility. It offers dining and lodging in addition to meeting space and recreational facilities. Henderson House — an elegant conference facility located 12 miles west of Boston in suburban Weston — hosts business and professional meetings, academic seminars, and special catered events.

In Fall 2007, Northeastern had 178 Registrar-scheduled classrooms available for instruction. Of these classrooms, 9 percent have 81 seats or more, 38 percent have between 41 and 80 seats, and 53 percent have 40 seats or fewer. In addition, there are approximately 57 spaces on campus that are described as non-Registrar-scheduled classrooms or specialty labs.

The University Classroom Advisory Committee, whose membership includes faculty members and administrators, assesses classroom standards, quality, and development, and advocates for classroom technology.

Northeastern's Information Services office recently instituted a classroom technology standard that specifies that all classrooms include a control panel, a video/data projector, a DVD/CD combo, auxiliary inputs, laptop connectivity to a projector, and wireless Internet access. Every Registrar-scheduled room now meets this standard.

Northeastern currently identifies approximately 191,000 square feet as laboratory research or support space, approximately 4.4 percent of the University's total assignable space. Most research laboratories are located in the Egan, Mugar, Snell, Dana, Nightingale, Hurtig, Robinson, and

Richards buildings. Their usage reflects the diverse range of research programs on campus, from wet chemical and biological laboratories to multi-use laboratories in engineering and physics. There are also offices and non-laboratory spaces in which faculty, research scholars, and students pursue non-laboratory research.

Northeastern has approximately 42 spaces usable for special events and performances, ranging in size from 165 to 18,106 square feet. Theater capacity in these spaces ranges from 10 to 5,000 seats; the average capacity is 40. The majority of these spaces have a 50 to 75 percent usage for internal University purposes.

Responsibility for all the University's physical and technological resources falls under the Senior Vice President for Administration and Finance. Reporting directly to this position is the Vice President for Facilities, who is responsible for the majority of the University's facilities, their day-to-day operation and maintenance, the overall planning of facility renovations and capital improvements, and the design and ultimate construction of facility renovations.

The Facilities division is a 24/7 operation involving 196 full-time employees and many outside contracts. The Facilities division is directly responsible for a \$60 million (in fiscal year 2009) operating budget, additional annual renovation funds of approximately \$25 million, and \$16.6 million in deferred maintenance funding. In fiscal year 2009, the capital construction budget for a current project, Parcel 18, is \$200 million.

The Director of Business Services, also reporting to this senior vice president, is responsible for all auxiliary services, the Purchasing department, and parking. The Director's unit also manages various facilities through outside management companies and provides real-estate services in the areas of property purchases, leases, and contracts.

The Public Safety division, which includes the Campus Police and the Fire Safety unit, is responsible for preventing and resolving events that could endanger campus safety. The division maintains alarm systems, responds to trouble calls from these systems, maintains and monitors cameras around campus that provide response information, and offers outreach and training.

## **APPRAISAL**

**Classrooms.** Current University Registrar data show that Northeastern classroom space is at or near 100 percent utilization during the majority of course sequences. During some course sequences, non-classroom space — e.g., department conference rooms and meeting rooms in the Curry Student Center — must be utilized. Simply put, the university's classroom demand exceeds its classroom capacity. This is evident in all classroom size categories.

The University Registrar has done a very good job of balancing course requirements with classroom availability. However, inflexibility in classroom availability has become extreme over the ten years since the last self-study. From Fall 1997 to Fall 2007 the number of full-time undergraduate students grew by 28 percent. While not all full-time students are on campus each semester due to co-op, there has been a general increase in in-school semesters for undergraduate students. This increase has been particularly marked for upperclassmen due to increased retention. The University has therefore needed to schedule larger numbers of upperclass sections with relatively smaller enrollments, placing additional pressures on classroom space.

**Laboratories.** The various pedagogical, student-access, and specialized hardware and software needs of the University's specialty labs makes it difficult to draw general conclusions about whether they are adequate or appropriately equipped. Specialized personnel at the college and department levels are better able to make such assessments than are centrally located personnel.

Northeastern's laboratory space has increased by about 10,000 square feet over the past ten years, but the research expenditure base has increased more significantly during that same period. The University has optimized its use of laboratory space through improved efficiency in lab allocation and reassignments based upon productivity, and research expenditures per square foot of laboratory space have grown substantially. Northeastern's rate of improvement in research expenditures cannot be sustained over the long term, however, without an increase in laboratory space.

The quality of the University's laboratory space varies from modern, recently renovated laboratories to older facilities. The University actively renovates laboratories and upgrades its building infrastructure to support laboratory space, most recently at annual costs of approximately \$4 million to \$8 million. The mechanical infrastructure in lab buildings is assessed and replaced in a planned approach. The quality and safety of the renovated labs coming online are high and meet the sophisticated needs of modern research.

Lab renovation projects are approved and funded via the Transitional Infrastructure Plan, a project review and funding mechanism that bridges the period leading up to the new Institutional Master Plan. As new faculty researchers are hired, new grant awards won, and the research base increased, this mechanism allows for the reallocation and the renovation of space to meet research needs.

**Special event space.** The University is particularly limited in mid-range banquet-style function rooms for special events. Matthews Arena can seat 1,500 in a banquet style. The Curry Student Center West Addition can seat 300. The Alumni Center, built in 2006, is a flexible space geared toward alumni events but also available for general University use. The Fenway Center, a former church converted to a multipurpose student-centered space, is the University's most recent addition to special-event space, filling a long-unmet need as a small venue for concert performances, lectures, and banquets. Raytheon Amphitheatre is another flexible multipurpose space that hosts seminars and lectures as well as receptions and sit-down dinners.

The University has substantial unmet needs for spaces in which to host special events. The lack of facilities that could comfortably accommodate a sit-down dinner for 300 to 600 people limits the events and conferences the University can hold on campus. The lack of quality hotel rooms adjacent to the University limits its capacity to bring groups on campus for multi-day events. The lack of appropriate performance space constrains opportunities for students and faculty. All these needs will be assessed in the Academic Plan implementation and institutional master planning processes.

**Student housing.** Northeastern's residential environment plays an increasingly important role in attracting and retaining qualified students. It also plays a vital part in building and maintaining positive relations with the University's neighbors, which, in turn, establishes a positive relationship with the city of Boston, ensuring active support for other development needs. Indeed, the

University's drive to become more residential represents a convergence of University, city, and community goals.

Since the last accreditation process, the University has, along with the Northeastern University Community Task Force, reviewed the addition of housing to the existing ten-year Institutional Master Plan. Since 1999, the University has added 2,989 beds to its on-campus supply, bringing the on-campus housing capacity to 50 percent of undergraduate student enrollment. Most recently, the University has worked to consolidate its housing on campus through the phasing out of leased properties in the surrounding neighborhoods.

**Athletics and recreation space.** Facilities in direct support of the athletic and intramural programs, though well-managed and well-maintained, are in various ways inadequate to support these high-intensity and important functions. Increasing participation in athletic and recreational programs has made the scheduling of activities more difficult. Additional recreational space for intramural and student activities, viewed as a key element of the total student experience, is needed.

## **PROJECTION**

As one of the first signers of the Campus Sustainability pact (<http://www.presidentsclimatecommitment.org/html/commitment.php>), Northeastern will continue to develop systems for reviewing its environmental impact as it develops its infrastructure.

**Classrooms.** Northeastern must provide appropriate classroom space that will support the goals of its Academic Plan. As the University implements the Academic Plan and launches its Institutional Master Planning process, the classroom types and numbers needed will be determined through analysis of curricula, enrollments, and retention rates. The University will study matchmate institutions to determine an appropriate demand-to-capacity ratio.

Because state-of-the-art classroom technology standards are changing constantly, Northeastern is developing a plan to ensure a robust annual review as well as the maintenance, replacement, and upgrade of all classroom technology in Registrar-scheduled classrooms. Colleges and departments will be provided the appropriate means to oversee specialized labs that cannot be efficiently and effectively monitored by the central administration.

**Laboratories.** The University's specific goals for research are currently being assessed in light of the Academic Plan but will certainly entail a corresponding growth in laboratory space. Research support activities will also require new space, including additional IS facilities and animal care facilities to accommodate the planned increase in biomedical research. Space will be built or leased to meet these goals.

**Special event space** is essential to a prominent urban institution that is research-intensive and committed to experiential learning. A hotel planned for a portion of the Parcel 18 site will help fill the need for hotel space convenient to the University. Other facility deficiencies will be rigorously assessed in the planning processes.

**Student Housing.** Following a nearly two-year-long process with the Community Task Force, 1,800 new beds will result from the construction on Parcel 18 site (1,200 beds) and the replacement of Cullinane Hall with a residence hall (600 beds).

These projects, together with the 229 beds in Residence Hall F and the phasing out of leased beds in the surrounding community, will result in a net gain of 777 new beds, bringing the total on-campus housing to 8,320 beds, or 55 percent of full-time undergraduate enrollment, by the year 2011. The University's planning processes will develop future goals for on-campus housing for the next Institutional Master Plan.

***Athletic and recreation space.*** Northeastern will further assess its opportunities to support athletics facilities as part of the overall strategic plan and master plan processes. A clear vision for the athletics programs over the next five to ten years will help inform how the facilities component is addressed in the next master plan.

## Technological Resources

### **DESCRIPTION**

Northeastern provides information-technology (IT) services to the University community through a blended centralized/decentralized model that balances economies of scale and centralized services with local organization- or discipline-specific support.

The Vice President for Information Services oversees the IS division which has responsibility for core services at all campuses and serves both academic and administrative functions. The division manages approximately 60 percent of the IT personnel on campus and approximately 80 percent of non-personnel investments in IT. The balance resides in the colleges, departments, and administrative units.

The particular blend of technology resources in a given unit is determined by the specific unit's needs beyond the foundation IS provides. Although virtually all units have some level of IT services and expertise, some units require substantial additional IT resources and services. As noted in Standard Seven, chief among them are the College of Computer and Information Science, the College of Engineering, the Libraries, and the College of Professional Studies.

Technology resources maintained centrally by IS include Internets 1 and 2; NUnet (campus networking) and ResNet (residential networking with at least one port per student bed), both of which are 100mb switched and total more than 20,000 ports; NUwave (wireless serving 100 percent of the main campus, excluding residence hall rooms); telecommunications, including land-line telephones and voicemail, and phone/e-mail-based emergency communications; and cable television.

IS maintains and supports standardized audiovisual equipment (projector, screen, DVD/VCR player, audio controls, and so on) in every Registrar-scheduled classroom; student computing labs (some with specialized equipment in engineering and health sciences) totaling more than 1,500 workstations in more than 75 locations (InfoCommons and the Cyber Café, in the library, make 150 workstations available around the clock); computer-refresh cycles for faculty, staff, and student labs; the library's catalogue system; streaming media facilities and delivery; and Blackboard, the university's standard learning management system.

Information Services is also responsible for the delivery of office productivity applications; storage; hosting; high-performance computing clusters, both centrally and college supported; desktop support; myNEU portals for access to administrative and academic applications; and major enterprise applications suites spanning student administration, finance, human resources/payroll, and advancement.

In addition, Information Services supports all major University business processes, including Northeastern's identity-management process, which uses NU-specific IDs instead of Social Security Numbers as the key identifier.

## **APPRAISAL**

Current network, security, and enterprise applications are adequate to handle the volume of faculty, staff, and student demand on these services. As of Summer 2007, all classrooms were fitted with audio-visual equipment, and the configuration of that equipment has been standardized where possible.

The area of research computing is requiring more attention as space, environmental concerns, and requirements for storage, administration, and other support increase. Although the network itself is sufficient to address the research population's bandwidth needs, the space constraints described in other sections of this standard are beginning to affect efficiency.

Community satisfaction surveys (see Standard Seven) indicate a reasonably high level of satisfaction with the availability and currency of our technological infrastructure.

## **PROJECTION**

It is clear that Northeastern's demands for a powerful and effective technology infrastructure will only increase. Information Services and the colleges will need to plan and closely collaborate to reach the most efficient utilization of technology resources.

To achieve the Academic Plan's goals, Northeastern must continually address the changing technology expectations of faculty, staff, and students, including providing the necessary infrastructure for mobile computing and access to information. This will require ongoing collaboration between IS and the college-based systems and academic-technology groups that directly support college laboratories; the electronic delivery of education, including distance education; and research programs.

As noted previously, the Unified Digital Campus project will replace and integrate the University's finance, advancement, and student systems. The finance module was implemented in July 2008 and the rest will be implemented by Fall 2009. This will improve business processes and decision support, and will provide broad availability of information and community self-service.

There is significant need for additional investment of space and funding to support the goals of the Academic plan with high-performance or data-intensive computing facilities, hardware, and software; to meet escalating requirements for electronic storage, archiving of digital materials, and digitization of paper-based materials to sustain the academic enterprise; to enhance classroom technology and design; and to create learning spaces with technology where students and faculty can collaborate. Discussion between IS and the senior vice presidents has begun on the need for

enhanced data center capabilities, with resolution expected in late 2008. Archiving, digitization, classroom technology, and learning space development are areas for the forthcoming IT advisory board discussion.

### **INSTITUTIONAL EFFECTIVENESS**

Northeastern has been effective in planning for and deploying its physical and technological resources. At key points, when goals and objectives have shifted, resources have been realigned to meet University needs. Similarly, budget allocations have been realigned to support these shifts.

High-level planning and goal-setting occur at the senior level on a continual basis, with effective mechanisms and personnel at the next level to implement these goals.

The Academic Plan implementation and Institutional Master Plan processes will provide a framework for collaborative and creative self-assessment, goal development, and the determination of resource requirements that will ultimately aid Northeastern in achieving its aspirations.