

STANDARD EIGHT: PHYSICAL AND TECHNOLOGICAL RESOURCES

Description

Introduction

The University of New Hampshire's physical resources consist of some 5.7 million square feet of building space, approximately 260 acres of central campus, and another 2,100 acres of fields, farms, and woodlands.

2.4 million square feet of building space is dedicated to academic and administrative use and 3.3 million square feet to residence, student services, auxiliary enterprises, agriculture buildings and other support facilities. The University also leases facilities in Durham, Manchester, Nashua, the Pease International Tradeport in Portsmouth, and in other locations in New Hampshire. Upon completion of full integration of the UNH Law School (expected 2014), we will have a presence in Concord.



Since the University's last accreditation in 2003, [new construction and major renovation projects](#), as well as systematic planning efforts, have improved facilities and increased accommodations for teaching, research, service, and student activities and housing. Particular progress has been made in science, technology, engineering and mathematics teaching and research facilities as whole building

renovations have been completed in the engineering and mathematics, physics, natural sciences and chemistry buildings. However, there remains a pressing need for continued action in this area since many facilities supporting the liberal arts are badly outdated. The recently completed [campus master plan](#) lays out a careful strategy to meet current and future needs. Noteworthy in the master plan is the inclusion of three enrollment scenarios: future growth, steady enrollments, and a decline in enrollments. These scenarios allow for the uncertainty facing higher education today and show how the physical assets on campus would be adjusted depending on which of these trends emerges. Technological resources will also be calibrated in accordance with the three possible scenarios. Since the 2003 accreditation, technological resources, including infrastructure, materials, services, training, and user interfaces have increased dramatically and continue to evolve.

We describe below the current state of our physical and technological resources at UNH, along with the planning procedures and updating required to remain current while anticipating future needs. This Description section is followed by the Appraisal and Projections sections.

The Durham Campus

The main campus of the University is located in Durham, one of the oldest towns in northern New England. The rural landscape and the area's colonial heritage lend a distinctive character to the setting. Many of the original University buildings are still in use today and have significant architectural features that bring a sense of historical continuity to the present day campus. Newly constructed and renovated buildings maintain the physical cohesion of the campus while incorporating state-of-the-art technology. Several buildings are situated on the south side of Durham's Main Street and have sloping lawns forming their front lawns. Additional facilities stretch out from the central campus into wooded areas and are surrounded by fields and farmland. This careful arrangement gives the University of New Hampshire's Durham campus its cherished "New England College" atmosphere and plays an important role in shaping the image of the University.



The University of New Hampshire at Manchester

To serve the concentrated population in the Concord, Manchester and Nashua corridor, UNH Manchester opened in 1985. Enrollment has continued to grow, and leases in surrounding buildings have provided expansion beyond the mill building, which was titled in 1990. In general, the high ceilings, exposed brick walls, oversized windows overlooking the Merrimack River, and the variety of "student spaces" give UNH Manchester an upscale, urban ambiance well-suited to its commuter population of students. UNH Manchester provides a limited number of dormitory rooms for students.



The University of New Hampshire School of Law

The merger of the University with the former Franklin Pierce Law School will also bring the law school campus into the facilities portfolio. Like UNH Manchester, it is anticipated that the law school will have on-site management of day-to-day facility operations and maintenance, and will work with the Durham Facilities staff on planning, real estate, environmental compliance and capital projects.

Physical and Technological Resources

Since the 2003 UNH NEASC accreditation, \$257,036,000 has been invested in the construction of 13 new buildings, and an additional \$198,710,000 has been invested in 12 major building renovations. The average age of campus buildings is less than that of peer institutions. Since 2002, UNH has received \$140 million in state funds toward renovation of science, technology, engineering and mathematics (STEM) facilities. Physical resource and space planning, as well as technology infrastructure roadmaps, occur on a regular basis through a

variety of avenues, such as the Campus Master Plan; the Space Allocation, Adaptation and Renewal Committee; the UNH Strategic Technology Plan; and external vendor assessments. The ten-year cycle of updates to the Campus Master Plan provides the opportunity to adjust the long range plans for campus development while occurring at an interval sufficient to retain stability. The Strategic Technology Plan is updated every 5-7 years.

In terms of technological resources, UNH maintains a wired and wireless network (54,000+ unique devices) with an uptime of 99.99%, several enterprise class data centers, and over 200 terabytes of storage (exclusive of research data) to meet institutional needs. A network of emergency phones and notification systems are in place. We are currently constructing approximately 750 miles of fiber optic, aerially-attached cable across all 10 counties in NH to augment UNH's research, collaboration, and outreach capabilities. [ConnectNH](#) connects over 50 organizations across NH, using IBEAM (Infrastructure to Broaden Economic Advancement and Mindshare) and other commercial providers' networks to bring videoconferencing services and educational programs to New Hampshire. The IBEAM network has brought a 5000% bandwidth capacity uplift during the last decade, with nearly no increase in operating expenses.

UNH utilizes a number of hardware, software, and human resources to efficiently design and manage our facilities – everything from academic needs such as classroom learning environments to management of our cabled and wireless network infrastructure. Throughout the management, maintenance, and operation of technological and physical facilities, UNH maintains a balance between in-house staffing and out-sourced or contracted services. Information Technology and Facilities Divisions are managed and staffed by professionally qualified and experienced personnel.

Classroom outfitting and renovation planning is managed by a Classroom Working Group comprised of representatives from IT, Registrar, Facilities, Campus Planning, Faculty Senate, Student Senate, and two Academic Deans. This Group maintains an integrated classroom renovation [priority list](#) for action when funds are made available.

In AY 2013-14, the University maintains:

- In Durham: 119 Registrar-Controlled Classrooms for academic use; 116 of these are technology-enhanced classrooms.
- In Manchester at UNH Manchester's University Center: 29 classrooms (16 technology-enhanced), plus an auditorium and conference room that sometimes becomes a classroom; and additional classrooms (8), labs, and study spaces are included in the 22,000 square feet at Pandora Mill.



The \$50 million Peter T. Paul College of Business and Economics building, opened in spring, 2013, brings state of the art space to UNH. In addition to large, technology-equipped classrooms, it has classrooms designed for discussions and seminars with modular/seminar tables, smart boards, and current technology for use by smaller groups of students.

The advent of Discovery general education courses, employing inquiry-oriented instructional methods and carrying smaller enrollment caps, has created an increased demand for technologically-enhanced classrooms that can also accommodate small groups.

Because of a high-priority initiative on improving STEM facilities over the last 10+ years, laboratory facilities are either new (physics) or have been upgraded during significant building renovation to house state of the art equipment (life sciences, chemistry, earth and space sciences).

UNH employs a number of policies and practices that ensure access, safety, security, and a healthful environment throughout its buildings and other campus spaces. For example, Environmental Health and Safety has implemented a model chemical management and minimization software program that has been exported and is being used by many other higher education institutions. UNH also maintains a current Spill Prevention Control and Countermeasures Plan. Important information these policies and practices is available on the [UNH Research website](#) under “Compliance and Safety.”

Key leadership positions within Facilities and IT are held by registered and/or certified professional engineers or architects. UNH complies with all code-mandated inspections and certifications, performing annual indoor & outdoor safety inspections. Environmental safety and security considerations are factored into every element of the Enterprise Data Center design, including security cameras and card swipe access. Robust campus [standards](#) guide facility construction and renovation designs to achieve quality, durability and efficiency in new and newly renovated buildings. In a formal annual process, conditions are reviewed, and the list of needed major maintenance and repairs is updated and prioritized. Available funds are assigned to the highest priority needs. Physical resource and space planning occurs on a regular basis through several avenues. The current planning horizon extends to 2032. In 2008, UNH retained the Vanderweil Facility Advisors to [evaluate](#) the condition of 35 major academic buildings. There is one building on the UNH-Durham campus that is not handicap-accessible and others with limited access. The [space allocation committee](#), which has broad representation, manages funds for the upkeep of facilities.

In line with the Campus Master Plan, IT updates its Strategic Technology Plan regularly, most recently in 2010. This Plan focuses on academic technology and considers critical developments in technology such as the expanding importance of cyber-infrastructure, increasing mobility of technology users and devices, and the rapid growth of digital content. Every 5-7 years a comprehensive formal assessment and update is conducted. UNH also annually reviews and updates the IT comprehensive equipment replacement plan.

UNH has policies and procedures in place to ensure the reliability, integrity, and security of data, along with individual privacy. In terms of the [reliability](#) of these systems, UNH provides redundant Internet/Internet2 service to our Durham and Manchester campuses and to the other institutions in the University System of New Hampshire (USNH). The data centers have power backup and critical systems are redundant at remote NH sites. Routine replacement of the enterprise computing server, network, and telephone equipment is budgeted through UNH IT’s comprehensive equipment replacement plan.

Security of student identity, data integrity, warnings of attempted security breaches, assurance of private networking, etc. are given high priority at UNH. [STD 8.5 Chart 2](#) illustrates our due diligence in the areas of security monitoring; policies, procedures, and practices; and awareness. Current IT Security information is maintained on the [IT Security website](#) to continually inform the campus community about these areas. For example, the campus is notified whenever there is a potential threat, such as a “phishing” attempt.

UNH also puts a high priority on the health and safety of its students and staff. [UNH Health Services](#) provides a wide variety of physical and mental health services to the UNH community,

from radiologic diagnostics to meditation classes. We are moving toward a “walking campus” in Durham as evidenced by the extended central quadrangle that allows access to only handicap, emergency, and supply vehicles. The campus is well-lit, and there are emergency phones in the buildings. Parking lots located at a distance are served by bus transportation that also extends beyond UNH to nearby communities. Emergency phones are located throughout the campus, and a walking escort by security personnel is provided upon request. UNH Manchester has full-time security personnel in the buildings. Safety alerts are broadcast in a timely manner by the UNH Police Chief. UNH is fully compliant with the Cleary Act. E-mails and instant messages notify the campus community of any incident that might pose a safety threat. Also, for the safety of our community, operations are curtailed during inclement weather if driving is deemed hazardous or campus arteries are blocked.

Appraisal

UNH employs a campus master-planning approach that includes all constituents of the UNH community and participation from the town of Durham. The 2012 [Campus Master Plan](#) aligns with UNH’s 2010 Strategic Plan. The campus plan accounts for unpredictable factors facing higher education today and still advances UNH’s strategic goals. As student enrollments fluctuate, academic technology trends such as interactive hands-on instruction and online learning evolve, apartment style suite living is adopted and open office environments grow, UNH has postulated planning scenarios to realistically support its mission. The *Flat Scenario* assumes that there is no pressure on facilities from either enrollment growth or expanded faculty and staff counts. The *Max Scenario* accounts for significant pressure on facilities due to continued enrollment growth, expansion of research, and decompression of “built-up” residence halls. The *Min Scenario* assumes diminished pressure on facilities resulting from a 10% decrease in enrollment due to demographic trends, such as the lull in traditional college age students, unforeseen international events, and greater use of online/distance learning.

Governance and steering committee partnerships between campus entities and IT have worked diligently to support UNH strategic initiatives. The [UNH Strategic Technology Plan](#) stresses the commitment of UNH IT to support the academic and administrative functions of the University. The IT Project Management Office has introduced a campus-wide governance model to help ensure that new IT projects adhere to the Strategic Technology Plan, UNH Academic Plan, and UNH Strategic Plan. To date, this approach has been working well.

Review of data that support the descriptions in this narrative affirms that UNH is cognizant of and strictly adheres to legal requirements for access, safety, and security during construction/major renovation of buildings and for ongoing maintenance. Environmental and ecological concerns are priorities. The formal process for identifying, prioritizing and funding major maintenance and repair projects assures available resources are applied to the greatest needs on a consistent and uniform basis across facilities. UNH enterprise data centers demonstrate alignment with the UNH Strategic Plan in energy consumption, reliability, and security. Funds are set aside annually to correct accessibility barriers. Comparative data demonstrate that UNH is effectively maintaining its campus physical plant as well or better than peer institutions. Technology is integral to UNH and is a key enabler of its mission and strategies. With consultations with University leadership and the UNH community, the Strategic Technology Plan has identified strategies that are responsive to the vision and programmatic initiatives of UNH’s Strategic Plan.

UNH was named as one of the country's most sustainable colleges by The Princeton Review for the fifth consecutive year in a row.

Below is an appraisal of resources separated into physical resources and technological resources, in order to provide a detailed account of our effectiveness regarding the general description above. In each case, both strengths and challenges are discussed. The section is followed by a set of projections for each type of resource.

Physical Resources

In 2007, UNH hired an outside consulting company Sightlines, which specializes in strategic benchmarking and practice metrics. Data from two Sightlines engagements ([2008](#) and [2012](#)) provided a basis for forecasting campus planning needs, aligning plans with strategic initiatives and reviewing comparative productivity.

Strong state support for renovation projects from 2003 to 2010, debt financing of new dormitories and a dining hall, and success in obtaining grant funding for research facilities and infrastructure, has helped UNH provide physical resources to support its commitment to provide a comprehensive, high-quality learning and living environment. We have also successfully renovated or constructed new buildings that house departments in the science, technology, engineering, and mathematics (STEM) disciplines. With one exception (Kendall Hall), all of these buildings are less than 20 years old (and are new or newly renovated). They provide the infrastructure needed to support a major UNH initiative to enhance teaching, learning, and research in the STEM disciplines. The construction of Paul College of Business and Economics is another example of UNH's commitment to brick and mortar investment. In keeping with priorities of the Strategic Plan, several enterprise class data centers have undergone recent improvements, and laboratory space and facilities for UNH Manchester's Engineering Technology programs have doubled. The examples cited here, as well as other new building construction and major renovations, have significantly increased capacity and adequacy for meeting institutional physical infrastructure needs.

To continue improvement and expansion of facilities, UNH put forward an aggressive request for state capital funding for the FY 13/14 biennial budget. Regrettably, funding was not forthcoming. The top priority project is renovation of Hamilton Smith Hall, which houses the English and Philosophy departments and is one of the most heavily used classroom buildings on the Durham campus. New construction (\$42,000,000) for a Center for the Arts and a Water Treatment Plant, and major renovation (\$146,000,000) of another 9 buildings, is proposed over the next five years. The [detailed listing of priority deferred maintenance needs](#) across campus (E&G) now has an estimated value of \$32,000,000. In FY12, of the \$8,872,000 in R&R funds, the space allocation committee set aside [\\$6,200,000](#) toward addressing these deficiencies.

The Classroom Working Group, in collaboration with Facilities, IT, University Library, and Registrar, ensures that evolving pedagogy is supported by an adequate number of properly equipped classrooms and other teaching and learning spaces, although there is some lag here. Their recommendations were instrumental in increasing the number of technology-enhanced classrooms by 128% over the past decade.

Despite the adequate number of available classrooms, UNH at Durham has the typical traditional-campus challenge of class scheduling that crowds the middle of the day. At UNH Manchester, which serves commuters and many non-traditional students, facilities are taxed during evenings, Mondays through Thursdays. The [2012 classroom study](#) noted that UNH also

has an unusually high incidence of non-standard class schedules, which means one class session may require a classroom for more than one standard period. We continue to work on alleviating these scheduling strains. Increases in online courses, hybrid courses, and compressed delivery formats during the summer session and “J” (January) term have somewhat eased classroom space concerns. Climate control is another challenge, particularly in some older UNH buildings. However, most major buildings have digital control systems managed centrally by Facilities, an important strategy to meet the goals of the UNH [Climate Action Plan](#) to save energy. The plan is the culmination of more than 30 years of energy efficiency efforts at UNH.

The space allocation committee’s annual solicitation regarding campus needs has been successful in terms of prioritizing space allocations and, with appropriate financial and scope oversight, will continue to do so. State funding for academic building modernization will remain uncertain for several years. The University will continue to apply its own resources to the most critical needs but may be unable to keep up with what will be a mounting backlog of major maintenance, repairs, and modernization needs.

Technological Resources

Technology change and education market disruption are twin drivers that underlie the exponential growth of goods and services in information technology at UNH. We demonstrate successes and face challenges in this arena. The IT department has reorganized in order to optimize IT resource utilization, reduce costs, improve scalability, align IT with the university’s strategic plan, and shift from a technology-based to a service-based culture. Developing stronger partnerships with business and academic units, along with embedding a campus-wide project management approach, is integral to this new culture. A major benefit will be the project-based synergy among experts in infrastructure, service, product delivery, and training. A recent example of service-based project management is the collaboration among administrators, faculty, administrative assistants and IT personnel for the planning and delivery of our NEASC Self Study using tailored SharePoint technology for planning and a static website for delivery.

UNH has been successful in moving toward ubiquitous wireless coverage, a need created by the explosion in the number of mobile devices used by all constituents. Successful migration of departmental servers to enterprise data centers has improved technological security, reliability, and energy efficiency. Virtual machine technology is an example of how the physical server count has been reduced to less than 25% of the inventory, with a corresponding [reduction in power consumption](#). Network, phone, and application services have 99.99% uptime; the IT enterprise data center has 100% uptime despite New Hampshire storms.



UNH successfully informs its constituents of good IT security practices through education and training workshops, periodic e-mail notifications from both IT and HR (e.g., change password policy, de-provisioning of accounts policy), articles in the IT newsletter [Signals](#), and the online [Student IT Guide](#). In two recent, unrelated incidents, a staff member and a student reported possible security breaches to the Information Technology office. The first was a university credit card inquiry that turned out to be legitimate but prompted review of user identification procedures. The second was a phone call falsely informing a student about a scheduled appointment that “required verifying information.” Instead of responding to the caller,

the student reported the incident to IT. We believe that the regular IT security alerts have increased proactive reporting of suspicious activity on our campuses. Each October, UNH recognizes National Cyber Security Month by offering informational programs and resources about laws and university policies. Emphasis is placed on practical tools and good computing practices.

IT Security and UNH Police routinely collaborate and cooperate to respond appropriately to reports of potential credit card fraud, identity theft, the loss or theft of any mobile device used to access UNH information or services and other appropriate cases. The Dean of Students and student judicial system authorities collaborate with IT to respond to violations and to enforce the Acceptable Use Policy. Recent foundational improvement for disaster recovery and business continuity preparation include annual tabletop exercises, a unified project plan for responding to a disaster, installation of improved networking capacity between selected USNH institutions, and significant migration to virtual technologies.

The Blackboard Learning System has been challenging in both scalability and ease of use for faculty and students. UNH's upgrade to Blackboard 9.1, Service Pack 9, in the summer of 2012 addressed many of the concerns expressed with the previous version by streamlining tools that support instructor efficiency. Related expansion issues indicate the need for large amounts of critical electronic storage and suitable classrooms.

Projections

Facilities will benchmark maintenance and grounds staffing against staffing standards published by the Association of Physical Plant Administrators (APPA) in FY14.

Facilities will review service request/work orders and maintenance material support processes to identify opportunities for optimizing service delivery in FY14.

IT will implement ubiquitous wireless across academic spaces, with the exception of older buildings scheduled for near-term overhaul, by the end of calendar year 2015. This requires approval/implementation of a central funding cost recovery model for network services being developed by IT for the FY15 budgeting process.

IT will propose and begin implementing a new data retention plan by the end of calendar year 2015.

The Director of Project Management and Process Engineering will pilot a new IT Project Intake Process that shifts decision-making to university leaders who will be able to review all campus proposals requesting IT services. IT will collaborate to identify available resources.

Institutional Effectiveness

Overall, UNH's improved physical and technological infrastructure affords students, faculty, and staff a positive, safe, and welcoming study and research environment on both the Durham and Manchester campuses. UNH utilizes a number of enterprise software applications and frameworks to efficiently plan, administer, and evaluate its programs and services. [STD 8.7 Chart 1](#) lists many of these. As captured in the description and appraisal sections, UNH has an

effective history of cyclical data collection, planning, implementation, and review to address the areas of physical and technological resources. Due diligence to this cycle will be crucial for prioritizing correction of deferred maintenance and maintaining currency amidst increasing technological needs.

[STANDARD EIGHT DATA FIRST FORMS](#)