

## STANDARD EIGHT—PHYSICAL AND TECHNOLOGICAL INFRASTRUCTURE

### DESCRIPTION

#### University Facilities and Locations

UMass Dartmouth's 710 acre [main campus](#) was designed by eminent architect Paul Rudolph of Desmond & Lord. In 1966, the Group I Liberal Arts and Science complex was the first to be completed; six campus buildings and the first four residence halls (providing 1,294 beds) were completed in 1972. The remaining residence halls were completed by 1976, and the last Desmond & Lord project, the Visual & Performing Arts Building, was completed in 1978. The campus currently consists of 20 academic and support buildings, 28 residence halls, and 31 parking lots capable of holding approximately 5,000 cars.

Since the 2000 Self-Study, a number of new buildings have been constructed on campus to meet the growing needs of the University. These structures include 8 new residence halls that added approximately 2,300 beds, bringing the campus total to 4,495 beds; the Woodland Commons building, which provides 10,942 ft<sup>2</sup> of space used for conferencing and community activities; and a 2,536 ft<sup>2</sup> Health Services building. In addition, the 19,833 ft<sup>2</sup> Charlton College of Business building, funded by private donations, was opened in 2004, and a 22,000 ft<sup>2</sup> addition to the Violette Research Building, including a Biosafety Level 3 research facility, opened in 2007. Upgrades to classrooms yielded 74 technology-enabled classrooms.

As the University has evolved, it has become more deeply embedded and engaged in the communities it serves through the establishment of several new instructional locations in New Bedford, Fall River, and Fairhaven:

[School for Marine Science and Technology \(SMAST\)](#): The second campus-owned facility was built in 1998 on the peninsula in the south end of New Bedford. The building is equipped with laboratories for research and a pier that provides researchers with direct access to seawater needed for experimentation. During the past year, a new seawater intake system was installed to improve reliability and capacity. This building is also equipped with a 90,000-gallon acoustic seawater tank used for marine research as well as for survival training for the New Bedford-based commercial fishing fleet.

[Star Store](#): This facility has ten years remaining on a capital lease that will transfer ownership to the University when the term expires. Located in downtown New Bedford, the Star Store is an extension of the College of Visual and Performing Arts. A private developer for the University renovated the building in 2001 to create studios, classrooms, and galleries that occupy 115,000 ft<sup>2</sup> of floor space. Studios and other work spaces are equipped with state-of-the-art kilns, spray booths and work stations. The University leases classroom space in this building to Bristol Community College, which conducts credit and non-credit programs.

[Advanced Technology Manufacturing Center \(ATMC\)](#): Located in Fall River, the ATMC, built in 2001, is a 36,000 ft<sup>2</sup> leased facility that provides faculty labs and a Venture Business Incubation Center for high technology start up companies. These partnerships with industry enable UMass Dartmouth to serve as an intellectual catalyst and contribute to the local, regional and state economies. The ATMC also provides space for meetings, conferences, and corporate

training sessions. More than 90 students each year intern at the ATMC or its affiliated companies. A state capital authorization provides for this building to be purchased in the near future.

**The Center for Labor Education:** Located in downtown New Bedford, this leased community outreach center addresses the needs of adult learners from basic skills through workforce training and beyond. The Center occupies 6,158 ft<sup>2</sup> with six classrooms and four offices in the lower level and is convenient to public transportation.

**Professional and Continuing Education (PCE) Center:** Located in downtown Fall River, this leased facility encompasses approximately 30,000 ft<sup>2</sup>; The Center houses programs in Crime and Justice Studies, Management, Education, Business (including the MBA), and the RN-to-BSN program in Nursing. Non-credit courses and non-degree training opportunities are also offered.

**Fairhaven Outreach Center:** The 26,140 ft<sup>2</sup> leased facility in Fairhaven houses faculty and staff from SMAST, the Center for Marketing Research, the Kaput Center for Research and Innovation in STEM Education and the Center for University School and Community Partnerships. Classroom spaces are shared by these programs that engage in the community and contribute to economic, social, and cultural development.

The University maintains both the main campus and the SMAST site. The leased locations are maintained under contract by the building owners. All University buildings are within a 15-mile radius of the main campus and are designed, constructed, and maintained to meet local, state and federal building codes, guidelines, and environmental compliance. There are clear arrangements in place to assure the ongoing availability of these sites for the long term. The total value of campus buildings and land is \$766 million.

The Office of **Facilities Planning, Design and Construction (FPDC)** provides campus support for space planning, programming, design, and construction administration. This group has major responsibility to plan and execute programmatic renovations and to design and plan new capital buildings and projects. Facilities maintenance for all campus buildings is managed through the Facilities & Physical Plant Department. The director is responsible for the day-to-day operations of all academic, residential, and support buildings; the athletic complex; and the central steam plant. The recently created position of Associate Vice Chancellor for Administrative Services provides leadership and direction for both the Planning and Operations division.

*Planning* - The University's first comprehensive campus and facilities master plan was developed in 2005 by a private consultant with broad University participation and input. FPDC maintains the **Campus Master Plan** and based on its findings as well as emerging needs creates the annual **Capital Plan**, a rolling five-year plan, for the approval of the University Board of Trustees. The FPDC provides planning, design services, and construction oversight for all new construction and renovation projects and oversees the processes for space allocation and annual small renovations and alterations, reviewing requests for alignment with strategic and programmatic goals, technical accuracy, and code-compliance.

Campus Security, Health and Safety, and Sustainability are reflected in the institution's physical management. FPDC maintains the campus Spill Prevention Control and Countermeasure Plan and conducts periodic training of employees to ensure compliance. The office also ensures that

all building projects are fully compliant with the Massachusetts Building Code, ADA, and all pertinent environmental regulations. The University Safety Officer, a professional technician in Medical Laboratory Science, is responsible for the oversight of occupational health and safety issues and Resources Conservation and Recovery Act (RCRA) compliance.

The [Department of Public Safety](#) provides a comprehensive program of police and public safety services. The [Crime Prevention](#) program maintains public awareness of crime on campus and promotes preventive safety measures. The department reviews lighting and brush issues on campus and identifies new strategies to reduce crime and the fear of crime on campus. [The Guide to Campus Safety and Law Enforcement](#) and the [UMass Dartmouth Emergency Guide](#) present safety and emergency information and procedures for the campus community.

The [Health Services Office](#), located among the residence halls, is staffed by nurses and nurse practitioners, a consulting physician, a dermatologist, and a nutritionist who provide for student health care needs. [The Center for Access & Success](#), a fully accessible facility in the Liberal Arts building, provides access and academic accommodations as required by Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. The [Office of Campus and Community Sustainability](#), created in 2006, organizes sustainability activities for the campus and region while integrating physical plant operations, research, community outreach, and academic program activities to suffuse all campus activities with sustainability principles. The Office is located in the Textiles building.

### **Technology Infrastructure**

UMass Dartmouth maintains networks for data, telephone, and cable TV services to support classrooms, laboratories, research facilities, offices and residence halls on the main campus. These systems are distributed campus-wide over an extensive fiber optic (single and multimode) and copper (CAT 3-6) cable plant. The University maintains similar networks at all 6 off-site instructional locations. Each location connects into [UMass Dartmouth's Metropolitan Area Network](#) (MAN) at data rates ranging from 20 to 100 Mbps (megabytes per second). More than 14,000 ports on over 300 switches and routers support the University's wired data network. User link speeds vary from 10 Mbps (megabits per second) in residence halls to 10 Gbps (gigabits per second) in the Data Center; these links allow campus users to connect to campus applications and the Internet. There are currently some 12,700 registered devices on the network, primarily residence hall connections (~6,800) and faculty and staff connections (~3,500), with the remaining connections used for printers, scanners and other network devices. The University supports a large wireless data network (WiFi) via more than 140 access points. The [wireless coverage](#) includes all inner-ring outdoor green spaces, as well as common spaces, cafeterias, and the technology-enabled classrooms.

UMass Dartmouth possesses 4 broadband channels, WND425 G1-G4, licensed by the Federal Communication Commission; these are available to build out WiMax technology that has the capacity to enable wireless access across the campus and region.

The network operations center is located in the Data Center on the UMass Dartmouth main campus. The University's increasingly virtual Data Center houses 120 enterprise systems as well as all security and network traffic-shaping technologies for the campus. From the Data Center, all network access is aggregated to Internet and Internet2 as well as UMass intercampus access

to systems such as PeopleSoft via a connection to the UMass President's Office University Information Technology Services' (UITS) state-wide network (named MITI) at the Prudential Building in Boston. This primary link is a Verizon Ethernet leased circuit capable of supporting up to 1 Gbps of traffic. Currently, we provide access to 200 Mbps of Internet bandwidth via this link. The University distributes Comcast cable television programming via a hybrid fiber/coaxial campus network primarily supporting the residence halls. The University's telephony system is supported by an Avaya IP-enabled distributed PBX telephone exchange that hosts extensions for all on-campus and most remote-site extensions (Outreach Center in Fairhaven, ATMC in Fall River, and the Star Store and SMAST in New Bedford). All local and long distance telephone service is aggregated over 10+ T1/PRI circuits from Verizon and AT&T.

The UMass Dartmouth technical infrastructure and the Data Center provide 24/7 availability to the campus network and network services, including web servers, email, collaboration tools, file services, administrative systems, learning management systems, and more, as well as to Virtual Private Network (VPN) for secure access. A natural-gas generator and room-based uninterruptable power supplies provide backup power when power to the campus is interrupted. A centralized data backup system is in place for all critical systems. This system uses virtual tape for fast backup and data recovery. Physical tape is also used to maintain offsite a copy of backup data offsite that is refreshed weekly. Data Center access consists of redundant entry access systems utilizing proximity access (electronic key with logging), physical key access, and code-based alarm systems. There is also video surveillance with digital video recorders.

#### **Technical Integrity and Security:**

Each member of the campus community must register on the UMass Dartmouth network prior to accessing network services, including Internet, email, file and print services, Calendar, COIN, myAlert, and any other service. Both at the time a new UMass Dartmouth logon account is issued and at the beginning of each academic year, all members of the UMass Dartmouth community receive an email with the link to the [UMass Dartmouth Responsible Use Policy](#); that link, in turn, provides links to the University of Massachusetts [policies](#), procedures and [security guidelines](#). CITS has established and enforces a number of [procedures and protocols](#) to ensure data integrity and [security](#).

#### **APPRAISAL**

The FPDC Department has established standards for space allocations and for construction procedures, materials, and equipment. It is in the process of completing a utilization study of research and teaching labs that will drive resource allocation and prioritize upgrades. The department is responsible to oversee annual funds of \$250,000 to address environmental, safety, and functional needs as well as code compliance. A three-step process for solicitation of requests, prioritization of need and alignment with the Master Plan, and approval has been implemented. The [Facilities Master Plan](#) guides campus growth and has been thoroughly integrated with the [Capital Plan](#) to ensure future projects for funding under the Capital Plan.

With assistance from the state's Division of Capital Asset Management (DCAM), the University has engaged NORESCO, an energy services company, to reduce energy costs, improve building heating and cooling controls, and reduce the campus' carbon footprint. The partnership will lead to an estimated \$35 million of capital improvements, funded by the guaranteed energy savings.

The project includes the repair and modernization of mechanical equipment and installation of photovoltaic solar arrays, energy-efficient fixtures and equipment, and a cogeneration plant that will consist of a gas turbine to produce electricity and steam for campus consumption and heating. The installation of a wind tower to produce renewable energy is a potential project pending analysis of data collected by a Meteorological (MET) tower already installed under a math technology collaborative grant. It is expected that enough data will be gathered to document the efficacy of constructing a 1.5-MW wind turbine by winter 2010.

Deferred maintenance and other projects completed in recent years include reroofing half of the campus buildings (primarily residence halls); a \$21 million renovation of the Cedar Dell residence complex; upgrades to the fire alarm systems for residence halls (ongoing for some other buildings); installation of an electrical service entrance adding much needed capacity and redundancy to the distribution system; and resurfacing of seven parking lots, including new curbing and conduits for the future expansion of the blue light safety system. Renovations to athletic facilities include the installation of a multisport turf field, construction of tennis courts, resurfacing of the outdoor track, and a significant renovation of the swimming pool. Other renovations include the campus bookstore, relocation of the Student Affairs Office, and creation of a Campus Center conference room and an area for reflection.

Improvements to classrooms and learning spaces have focused on providing greater access to state-of-the-art technology. There are now 74 technology-enabled classrooms; with four classrooms upgraded in August 2009. Renovations to the lower level of the Textile Building created a 48-seat computer lab for Business programs; a computer lab for Nursing and additional office space were provided in the Dion Building. A chemistry laboratory was completely renovated during the summer of 2009, replacing outdated lab benches with 32 hood-equipped workstations and effectively doubling the lab's capacity. Renovations to the Library completed in January 2009 provided temporary spaces for the Learning Commons, Scholarly Commons, and new space for the Honors Program. A major construction project in the Library (expected to be completed in 2012) will provide permanent spaces for the Learning and Scholarly Commons, a new Browsing Area, large conference space, small group and individual study space, and a cafe.

Several challenges will require innovative solutions as well as additional resources. Growth in the student population strains the availability of classrooms with adequate student seating at certain times of the day. Large classrooms with appropriate seating and technology, and seminar style rooms with movable tables and chairs are in high demand. Three large lecture halls in the auditorium are underutilized because they lack the instructional technology suite; upgrades in a number of small seminar rooms would provide additional classroom options. Further, additional budget resources are needed for maintaining and upgrading classroom technology on a regular basis. A detailed assessment of class scheduling, full utilization of campus programming hours and aligning of space with curriculum needs with input from all stakeholders (facilities staff, faculty, the Registrar's Office, CITS, PCE, students) are needed to effectively plan for and implement improvements.

While the hiring of new faculty resulted in significant renovation and upgrades in some research and teaching laboratories, other older labs are in need of additional work to meet evolving academic and research needs. The FPDC recently conducted an assessment of lab utilization in Biology, Chemistry, Biochemistry, Medical Laboratory Science, Psychology and Engineering,

technology and equipment needs, and relevant safety and environmental issues. In contrast to the Star Store, the studio classrooms in the CVPA require renovation and updating. Identifying the resources to move these projects forward in the near future is an important priority.

Following a benchmarking survey by the American College Health Association, the Health Services Office conducted an infrastructure assessment that indicated additional space is needed to accommodate two exam rooms and improve patient flow. The recent infrastructure assessment was submitted to the Vice Chancellor for Student Affairs will now undergo a formal review by FPDC.

Campus safety advancements include the installation of code blue lights in several areas and the establishment of the Dart Van Shuttle to provide safe transportation for students during evening hours. Students, faculty, and staff are notified of campus emergencies by a system that uses web, email, telephone voicemail and the [myAlert emergency notification system](#). To ensure student participation, emergency contact information is required for all students prior to registration. In addition, a 1200-watt [public address and warning system](#) was installed in December 2008.

### **Technical Infrastructure**

UMass Dartmouth provides a reliable technical infrastructure. However, 25 percent of the cable plant is the original installed wire, and thus is out of date with current standards and requirements; the aging infrastructure in the traditional housing residence halls, for example, needs to be refreshed. Wireless coverage is extensive but needs to be expanded. Building out the campus' WiMax broadband channels would enable wireless coverage throughout the main campus as well as wide area coverage for the offsite locations and region.

Currently, the campus does not have a redundant network path to the Internet nor does it have a safe harbor/hot site for critical systems. To address this, the institution is in the process of establishing a link with the Ocean State Higher Education Administrative Network (OSHEAN) and deploying a hot site in its Safe Harbor data center in Springfield, MA.

### **Technical Integrity and Security**

In Fall 2008, UMass Dartmouth participated in a State of Massachusetts external IT audit. This network security audit was successful and cited only a few items. One finding cited low levels of staffing in IT security that prevent proactive identification of potential security risks. In FY 10, network security software is being purchased to address Payment Card Industry compliance. To complete the firewall for UMass Dartmouth, a hardware appliance must also be acquired.

## **PROJECTIONS**

**Physical Plant:** UMass Dartmouth plans to undertake a number of initiatives in alignment with its strategic goals and in recognition of the current fiscal situation. Thus, projects focus on improving the learning environment and driving down costs. The Associate Vice Chancellor and the FPDC will lead these projects, with collaboration from appropriate stakeholders.

**Schedule and Activities:** (Please note this schedule is in priority order).

- In AY 2009-12, a \$43 million Library renovation will be completed to improve student learning spaces and enhance individual and group study opportunities.



- In AY 2009-2012, the Facilities Department will continue to work with DCAM and NORESKO, an energy services company, to define the specific scope of work and savings projections of approximately \$35 million for a cogeneration project. Construction is scheduled to start in mid-2010 and the project will be completed in 2012.
- An addition to the Charlton College of Business is planned to address needs for additional classrooms. Supported by private donations, the preliminary design calls for small and large classrooms and specialized spaces. The construction schedule has not yet been determined.
- In 2010, the Facilities Operations Department will be reorganized to create a more efficient and effective workforce and better prepare the department to address its planned focus on deferred maintenance and the challenges of an aging infrastructure. Under this new leadership, the FPDC Department will continue to partner with professional firms to identify deferred maintenance, analyze space use, and guide campus growth and investment.
- In the summer of 2010 (pending funding), new roofs will be installed on four residence halls.
- In AY 2010-2015, a \$20 million expansion of SMAST will provide an additional 40,000 ft<sup>2</sup> for research, instruction, and other activities. The expansion will consolidate SMAST's operations at one location.

**Classrooms and Learning Spaces:** As the undergraduate and graduate populations continue to grow, both the physical accommodations and the technology available in classrooms, labs, studios and other learning spaces will be improved to provide an appropriate learning environment and opportunity for instructional innovation by faculty. To accomplish these goals, the FPDC, CITS, and Academic Affairs will collaborate on the following initiatives.

**Schedule and Activities:**

- In Spring 2010, in support of admissions and enrollment goals, FPDC will complete construction of a presentation room for admissions activities with prospective students.
- In AY 2009-10, the Registrar's Office and FPDC will collaborate to use the Lab Assessment and Utilization Study to facilitate more efficient class scheduling in labs for Fall 2010.
- Beginning in Spring 2010 and ongoing, a Learning Spaces Planning Committee will establish, prioritize, and review standards for classrooms, identify areas for improvement, and estimate costs for adding or improving learning spaces.
- In AY 2010-12, targeted and phased upgrades of classroom technology will begin in large lecture halls in the auditorium, seminar rooms, and labs and studios.

**Technical Infrastructure:** These projections focus on ensuring robustness, security, and scalability of UMass Dartmouth's technology infrastructure. Recognizing the restrictions on resources available to address the range of improvements identified through the Self-Study, CITS, in collaboration with FPDC, will initiate the projects below in priority order. Specific timelines are indicated where appropriate.

**Schedule and Activities: Please note this schedule is in priority order.**

- In AY 2009-10, CITS will establish a Technology Planning Council with representation from the UMass Dartmouth community and the President's Office to develop processes for ongoing IT planning and produce a plan for technology.
- In AY 2009-11, CITS will work with UMass system campuses and the President's Office to establish a virtual computing lab, providing internet access to computer lab software from remote locations. A pilot of the project will be implemented in September 2010.
- Beginning in FY 2010 and continuing into FY 2011, CITS will establish a redundant network path for UMass Dartmouth to provide campus connectivity if one path is down.
- Beginning in FY 2011 and continuing over two additional fiscal years, CITS will establish a hot site/safe harbor for critical data systems to ensure data access in case of a disaster such as a hurricane.
- The University will expand wireless access on campus using the institution's broadband channels by beginning to build out WiMax, as the physical structure of the buildings does not lend itself to a traditional building-based wireless installation.
- CITS will work with Administrative and Fiscal Services to identify resources to fill a staff position for IT Security in CITS to address findings in the State IT audit.
- CITS will establish secure firewall hardware to address long-term security needs.
- CITS will initiate the upgrade of the fiber optic plant in two phases: (1) the Liberal Arts Building and Science and Engineering Building and (2) freshman residence halls.

**INSTITUTIONAL EFFECTIVENESS**

Over the past decade, UMass Dartmouth has made significant strides in facilities and technical infrastructure planning. Processes are in place to guide planning efforts, and essential tools that have been brought into play include the Facilities Master Plan, the Capital Plan, and the Educause Core Data Survey. (See Workroom.) The development of Technology Planning Council and the reorganization of the Facilities Division will provide organizational structures to continue these improved planning and assessment activities.