

Draft

The self-study is in the early drafting stages, leading toward a preliminary draft in early July, 2009. This material reflects a work-in-progress, with some areas still to be completed and with the entirety likely to undergo many edits and changes over time. Comments and feedback at this stage are welcome.

Standard Eight: Physical Resources

Introduction

As the University's "flagship" institution, the Amherst campus has many strategic challenges. Primary among the challenges is the need to maintain a strong, nationally competitive faculty in order to maintain top quality instructional and research programs that will in turn attract and retain top quality students. This requires adequate and well maintained physical resources. The maintenance and development of the Amherst campus physical resources is structured to support the strategic challenges and campus goals of improving teaching, increasing research, enhancing student life and recruiting/retaining quality students and faculty. The underlying strategy in providing adequate facilities is to balance investments between new construction, facilities modernization and sustaining existing facilities through the reduction of deferred maintenance.

On-going planning efforts have produced several studies of our facility assets including the development of a comprehensive database of facilities condition and space utilization information. In addition the campus has initiated comprehensive studies of science, engineering, classroom and academic space utilization and needs. This facilities data provides important detailed information that guides our on-going development of the physical campus and capital planning process. This continues our commitment to provide new and modernized facilities to meet the demands of an increasingly competitive market in higher education. It also recognizes that our deferred maintenance backlog and growing inventory of obsolete space must be addressed to remain competitive as a leading public research university.

UMass Amherst's greatest challenge in providing adequate physical resources is obtaining adequate funding. In the past decade, State participation in funding capital activity has been approximately 10% of the overall capital expenditures. As a result, the campus has had to rely heavily on funding capital activity through borrowing. The State participation in the current five-year capital plan is 33% of the overall planned expenditures. The campus recognizes that maintaining and developing adequate physical facilities is one of our greatest challenges. In the next decade the campus will need to rely more on State capital outlay to address our facility needs.

DESCRIPTION

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UMass Amherst is the flagship institution of the five-campus University of Massachusetts system. The campus has a community of approximately 30,000 with an undergraduate enrollment of 20,000 and nearly 6,000 graduate students. It is the largest public institution of higher education in Massachusetts. The campus is comprised of over 10 million gross square feet of space on approximately 1,400 acres of land. As such, facilities and equipment are essential to the institution, and their planning, construction, operations and maintenance have for many years been professionally managed, maintained and operated by a highly qualified staff at UMass Amherst.

Real Property Assets

1. Ownership: Ownership and ultimate responsibility for most of the real property at UMass Amherst rests with the commonwealth. Several buildings including residence halls and academic facilities were constructed and are owned by the University of Massachusetts Building Authority (UMBA). The UMBA is a distinct, public organization established by the Massachusetts Legislature in 1960. Its mission is to build facilities on the UMass campuses that could be financed from student fees and charges. In addition, a small amount of property is owned by the UMass Foundation and is licensed to the campus. The Foundation is a Massachusetts Chapter 180 private, not-for-profit corporation, which was established to provide a depository for charitable contributions, and to manage and allocate the assets of the Foundation in a prudent manner.

As a public institution, the campus is a “user agency” under the *Massachusetts General Laws*, and its real estate and facilities planning, design and construction comes under the control of the Commonwealth’s Division of Capital Asset Management (DCAM). In addition to working with the DCAM, the campus maintains liaisons with the Department of Public Safety, the Office of Civil Rights, the Department of Environmental Protection and various other state and federal agencies, to ensure compliance with current statutes, codes and regulations pertaining to its building environment. Responsibility for day-to-day management of state-owned property lies with the campus, but the campus can not act independently. Final responsibility rests with the commonwealth.

2. Size: In the 145 years since it was established, the main campus of UMass Amherst has grown to encompass 1,463 acres, 893 in the Town of Amherst and 570 in the Town of Hadley. Research field stations, located in nine other communities, account for additional 2,639 acres. Buildings on the entire campus comprise over 10.7 million gross square feet, with over 10.5 million gross square feet on the main campus (Amherst and Hadley) and an additional 0.2 million at the field stations. The main campus includes 23 miles of roadways, 50 miles of sidewalks, 250 acres of lawns, 258 acres of parking lots, 62 miles of electrical lines and 27 miles each of steam lines and water lines.

Table 1. Acreage and Buildings as of December 31, 2008

Location	Land Acres	Buildings (GSF)
Main Campus		
Amherst	893	9,944,432

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Hadley	570	597,711
Total Main Campus	1,463	10,542,143
Field Stations		
Belchertown	222	33670
Concord	1	6,300
East Wareham	21	24,211
Gloucester	7	3,628
Leverett	29	0
New Salem	0	510
Pelham	1,197	639
Shutesbury	3	64
South Deerfield	264	74,733
Sunderland	736	1,085
Waltham	59	59,555
Total Field Stations	2,639	204,395
Amherst Campus Total	4,102	10,746,538

Between 1998 and 2008, UMass Amherst has added 985,334 gross square feet of new buildings, while 57,045 gross square feet of buildings have been removed due to deteriorating condition and to clear sites for new construction. Tables 2a and 2b summarize changes in the campus' space in the past decade.

Table 2a. Structures Added at UMass Campus 1998-2008

Bldg. No.	temp	Name	G.S.F.	Town	Year Built	acad	Address
648	T	Facilities Planning Office Trailer	1,056	A	1998		289 Commonwealth Avenue
651		Engineering & Computer Science Center I	78,634	A	1999	a	140 Governors Drive
652	T	Toddler House	3,059	H	1999		Clubhouse Drive
653		Animal Care Facility	13,557	A	1999	a	137 Hicks Way
654	T	Southwest Softball Field Utility Hut	200	H	2000		150 Stadium Drive
661	T	Pesticide Facility	400	BE	2001		
665		Alfond Hall	49,500	A	2002	a	
666	T	Recycling & Moving Facilities Trailer	2,756	A	2002		151 Tillson Farm Road
669	T	WMUA Mod.Unit - Cell Tower Compound	374	A	2002		
666	T	Rudd Field Service Building	140	H	2002		100 Stadium Drive
682	T	Storage Shed #3	47	EW	2002		
657		Engineering Laboratory II	81,304	A	2004	a	101 North Service Road
667		South Deerfield Turf Facility	3,366	SD	2005	a	23 River Road
669		Effluent Treatment Facility	210	H	2005		230 Mullins Way
674	T	CASA/ERC Instrument Trailer	635	A	2005	a	376 East Pleasant Street
683	T	Storage Shed #4	105	EW	2005		
670		North A	81,680	A	2006		56 Eastman Lane
671		North B	81,680	A	2006		58 Eastman Lane
672		North C	81,680	A	2006		54 Eastman Lane
673		North D	81,680	A	2006		52 Eastman Lane
679		Ag Engin Annex A	2,843	A	2006	a	246 Natural Resources Road

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680	Ag Engin Annex B	2,805	A	2006	a	254 Natural Resources Road
664	Central Heating Plant	132,912	H	2007		200 Mullins Way
675	Steam and Condensate Building	5,720	A	2007		30 Campus Center Service Road
684	Grounds Maintenance Facility	8,845	A	2007		128 Tillson Farm Road
685	Tractor Repair Facility	3,394	SD	2007		91 River Road
686	T Tennis Storage Shed #1	63	H	2007		100 Mullins Way
687	T Tennis Storage Shed #2	102	H	2007		100 Mullins Way
688	Hay Barn	3,226	SD	2007		91 River Road
689	T Tobin Modular Unit	1,950	A	2007		139 Hicks Way
128	Skinner Hall addition	14256	A	2008	a	651 North Pleasant St.
676	Integrated Science Building	188,332	A	2008	a	661 North Pleasant Street
677	Studio Arts Building	52,881	A	2008	a	110 Thatcher Road
691	East Cooling Tower	2,750	A	2008		251 Thatcher Road
692	Salt Storage Building	3,192	A	2008		265 Tillson Farm Road
grand total new 1998-2008		985,334	GSF			

Breakdown of use 1998 - 2008

Academic space (a)	488,113
Admin/support space	497,221
	<u>985,334</u>
Agriculture-related sub-set	10,538
Temporary buildings (T) sub-set	10,887

Structures added or Underway 2009 - 2010

681	PVTA Transit Facility	17,083	H	2009		259 Holdsworth Way
678	Recreation Center	119,263	A	2010		161 Commonwealth Avenue
693	Police Station	26,210	A	2010		585 East Pleasant Street
	UMass Marching Band	14,200	A	2010		TBD
	Bowditch Greenhouses	15,000	A	2010	a	TBD
grand total new or underway 2009-2010		191,756	GSF			

Breakdown of use 2009 - 2010

Academic space (a)	15,000
Admin/support space	176,756
	<u>191,756</u>
Agriculture-related sub-set	15,000

Table 2b. Structures Removed from the UMass Amherst Campus 1998-2008

Table 2b - Buildings Razed 1998 - 2008

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Bldg #	Building Name	GSF	Town	Date Built	Date Razed	Address
Razed Buildings - Agriculture-related						
70	Farm Garage	1184	A	1929	2006	175 Commonwealth Avenue
98	Fernald Hall Greenhouse	725	A	1910	2006	272 Stockbridge Road
52	Milker's Bungalow	1233	A	1914	2007	390 Hicks Way
386	Tillson Farm Poultry Building #4	8823	A	1967	2007	Tillson Farm Road
189	Dairy Barn	10185	A	1910	2008	165 Commonwealth Avenue
193	Farm Machinery Shop	7618	A	1941	2008	175 Commonwealth Avenue
195	Small Machinery Shop	5712	A	1928	2008	155 Commonwealth Avenue
	Agriculture-related	35480	GSF			
Razed Buildings Not Agriculture-related						
511	PVTA Bus Storage Bldg	7360	H	1973	2008	257 Holdsworth Way
112	Marshall Hall Annex	10275	A	1947	2006	
103	Forestry Lab Annex	3730	A	1867		148 Stockbridge Rd.
433	Traffic Control Booth #4	100	A	1969		669 North Pleasant Street
434	Traffic Control Booth #4	100	A	1969		151 Commonwealth Avenue
	Non-Agriculture-related	21565	GSF			
	Total Razed	57045	GSF			

3. **Age:** Table 3 identifies the age and numbers of buildings in significant increments. As of 2008, 20% (91) of all buildings are 20 years old or less, and another 30% (139) are 40 years old or less. However, 37% (178) of all buildings are between 40 and 80 years old, with the remaining 13% (58) over 80 years of age. Of those, seven buildings were built over 120 years ago. In summary, 50% of our facilities are over 40 years of age at which time systemic corrective action is required to maintain the structures at an acceptable level. The current high level of deferred maintenance projects reflects the aging building stock.

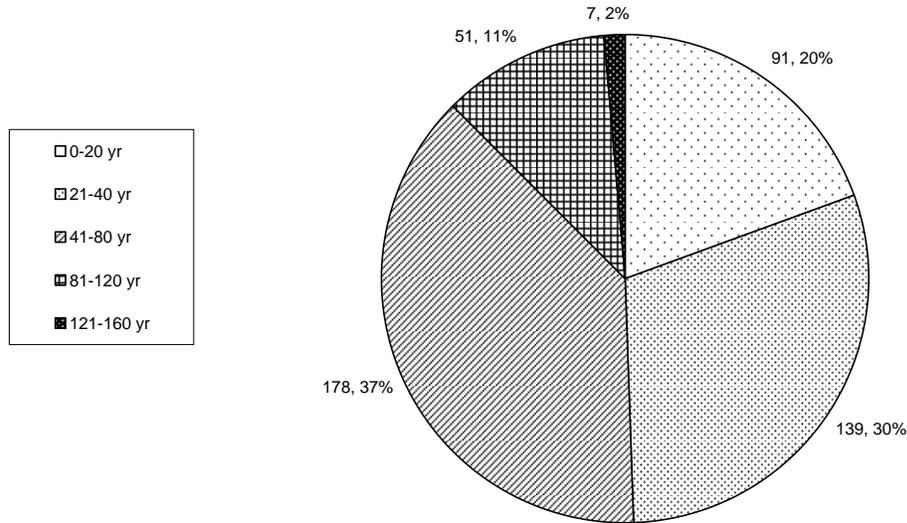
Table 3. Overall Incremental Age of Buildings

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Number of UMA Buildings by Age



4. Types of Space: Table 4 summarizes University net usable space by user-type category. The space use classifications are based on those identified in the *Facilities Inventory and Classification Manual* published by the U.S. Department of Health, Education and Welfare. Square footage is identified as gross, net or net assignable (NASF) based on the standards delineated by the *Manual*. With these elements as the foundation of the Space Data Base, all the information can be readily compared with similar institutions across the country.

Table 4. Net Useable Square Feet in 2008

Table 4 - Net Useable Square Feet in 2008				
			% of Net SF	% of Assignable
Assignable Space	all NASF			
Classrooms	234,081	3%	3%	
Laboratories	Instructional 320,388	4%	5%	
Laboratories	Research 561,820	6%	8%	
Office	1,199,198	13%	18%	
Libraries and Study	282,298	3%	4%	
Special use	627,048	7%	9%	
General use	497,519	6%	8%	
Support	742,720	8%	11%	
Health care	22,113	0%	0%	
Residential	2,175,564	24%	33%	
Alteration	15,559	0%	0%	

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Inactive	69,064	1%	1%
Total Assignable Space	6,747,372		100%
Non-Assignable Space			
Custodial	36,305	0%	
Circulation	1,605,849	18%	
Utilities	551,066	6%	
Rest Rooms	117,002	1%	
Unfinished	1,984	0%	
Total Non-Assignable	2,312,206		
Total Net S.F.	9,059,578	100%	
instructional and research	1,116,289		
% of assignable nasf	17%		

In 2009 and 2010, the University will add approximately 157,500 net square feet (nearly 192,000 gross square feet) of new building space to the campus. New construction includes a regional transit center, a recreation building, a police station, and practice and equipment space for the award-winning UMass Marching Band. Upcoming construction of new research greenhouses, included in the square footage calculation, will increase the instructional and research area to 1,125, 264 net square feet.

4a. Classrooms: The University classroom inventory, consisting of general-purpose classrooms, seminar rooms and auditoria, is managed by the Undergraduate Registrar's Office. The inventory consists of 234,081 net assignable square feet (NASF) and over 300 rooms with over 14,400 seats available at any one time for classes. Auditoria and large classrooms are the most heavily scheduled instructional spaces. The campus is planning to add auditoria and classrooms as part of construction of new academic buildings, as well as to upgrade and right-size existing academic facilities. A Comprehensive Academic and Classroom Facilities Plan is underway (2008-2009) to evaluate and assess the size, character, and distribution of existing classrooms on campus, and to develop a long-range plan to improve existing and add new classroom facilities to meet the University's long-term needs.

4b. Departmental Teaching Spaces: Classroom laboratories and individual study spaces are assigned to and managed by the academic departments. This use category represents 320,388 NASF and 5,500+ stations available at any one time. Existing spaces are equipped both from departmental and central campus funds. They are refurbished either during major renovations or as small rehabilitation projects. A new Integrated Sciences Building, and addition and renovation to Skinner Hall for Nursing and a new Studio Arts Building are several projects that have recently been completed. The need for additional teaching laboratories is being addressed in the Comprehensive Science and Engineering Facilities Plan, and initially through the new science building currently in design.

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4c. Research Laboratory/ Lab Support Spaces: Research lab space represents 561,820 NASF which is assigned to (and managed by) academic departments and does not include offices for faculty, graduate students, and technicians, or for shops and other general support spaces. New buildings, that include research space, have been built recently for Chemistry, Electrical & Computer Engineering and the Polymer Science & Engineering departments. Existing spaces are renovated and equipped using funds from research grants, research overhead, major renovation grants, and annual operating funds. The need for additional research laboratories and support space is being addressed in the Comprehensive Science and Engineering Facilities Plan, and initially through the new science building currently in design.

4d. Other Space Types: Many departments and support services help sustain student life on campus. Athletics, Campus Activities, Dean of Students, housing Services (non-residential), Undergraduate Affairs, Auxiliary Services, and Enrollment Services all support an active community. Space of this nature totals approximately 777,000 NASF. Athletics facilities comprise roughly 233,000 NASF of this total, while the Auxiliary Services Hotel is 36,000 NASF. Space categorized as instructional and research makes up 16% of the University's campus net assignable square footage, but instruction is not limited to these space types. Office space, including faculty offices, makes up about 18% (1,199,198 NASF) and library and study space approximately 4% (282,298 NASF). The need for additional academic departmental office and support space is being addressed in the Comprehensive Academica and Classroom Facilities Plan. As a residential campus, UMass Amherst also has a large inventory of space categorized as residential which includes dormitories and apartments (almost 32% of the net assignable space, or 2,175,564 NASF).

5. Adequacy and Quality of Space:

The adequacy of campus space to support its mission of instruction and research is uneven at best. As on most campuses, instructional space is tightly scheduled during peak classroom hours, with not enough rooms to meet the full demand of faculty for accessible, appropriate classroom space. The condition of instructional space is as much an issue as the quantity, especially for large classrooms that accommodate 200 or more people. Recent renovations and restorations of some facilities (such as Mahar Auditorium, the largest classroom on campus) have been very successful, but they have not been extensive enough to solve the campus's scheduling difficulties. A small number of classrooms are targeted each summer for upgrades of equipment, power, and general refurbishing. This too has been very successful given limited funding, but a much more intensive effort is needed in order to modernize the classroom inventory to contemporary and future instructional needs.

As for the quality of research space, some departments (e.g., Polymer Science) enjoy state-of-the-art facilities while other strong research departments (e.g., Entomology, Veterinary Science) struggle in space that is grossly outdated. This subject is discussed further in Standard Four, Research & Scholarship.

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The space needs assessment tool provides a standardized basis for determining the current and future needs of campus units based on their current and planned staffing, teaching, research and administrative activities. Deans, directors and vice chancellors, to assure appropriate forecasts, review assumptions it makes about future activities. These assessments are done to determine overall space needs and are reviewed as part of the planning process for new construction, acquisition, major renovation and reallocation of space. To prepare for forecasting, the campus has developed standardized forms for space requests and standardized methods of reviewing the allocation process itself. Executive summaries of current space assignments and space needs for five-year intervals are prepared and shared with units and Vice Chancellors. The Office also attempts to identify the best uses for underutilized space on campus. In May of 2005 a Space Utilization Study - Summation of Findings Report was prepared by Comprehensive Facilities Planning, Inc. that described space needs of each school and department. This analysis was the precursor to construction of the Integrated Sciences Building and the Comprehensive Science/Academic Facilities Plans currently underway today.

6. Utilities Infrastructure:

The UMA has put a significant effort into improving the condition and reliability of its utilities infrastructure. The recent capital construction projects included replacing the UMA's obsolete power plant with a state of the art cogeneration facility.

We have replaced the two main electrical substations and much of the electrical distribution systems. The UMA has also moved the campus owned electric distribution system underground to protect it from weather related failures. Several miles of deteriorated steam lines have been replaced throughout the campus and in the summers of 2009 and 2010 there will be major steam, water, electric distribution replacement projects done in the northeast and southwest corners of the campus. In late October of each year we do an infrared flyover and use that data to find hot spots in steam lines, electrical connections and roof leaks.

The Central Heating Plant is a state of the art cogeneration plant, using best available control technology. The permit requirements for this plant make it the cleanest burning gas/oil cogeneration facility in Massachusetts. The UMA can generate 14 megawatts of electrical power which is the entire campus electric load for 70% of the calendar year. The UMA now has the ability to take power from two separate electric utility feeds or generate its own power. The electric distribution system is more reliable than the local utility.

In 2004 the UMA issued a Request for Bids for energy service contractors to propose utilities cost reduction projects that would reduce the campus' cost of utilities and address some of the deferred maintenance that had been building up. After reviewing the submittals the UMA entered into a \$42 million performance contract with Johnson Controls Inc. (JCI). This contract guaranteed that the UMA would reduce its utilities costs by \$6.5 million per year. The project covered the entire 10 million square feet of campus space. Once all work was complete the UMA reduced its steam use by 24%.

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electric use by 9% and water use by 43%. With the success of this project the Vice Chancellor for Administration and Finance implemented an in-house performance contracting effort where the Physical Plant can propose energy reduction projects that have a 7 year or less simple payback through utilities reduction.

In 2008(?) the president of the University of Massachusetts system signed the American College and University Presidents Climate Commitment on behalf of the five University of Massachusetts campuses. As a result of this commitment the UMA has formed an Environmental Performance Advisory Committee (EPAC) that reports to the Chancellor. This committee has been charged with meeting the milestones detailed in the climate commitment. To date the EPAC has quantified the campus' carbon footprint, detailed the efforts that are in place to reduce the UMA's carbon footprint and is in the process of developing the UMA Climate Action Plan.

In 2007 the UMA began a Campus Landscape Improvement Project (CLIP). This project was a complete review of the campus landscape standards including landscape furniture, exterior lighting, planting materials and locations, pedestrian and traffic flow, condition analysis of the roadways, walkways and turf and plants. This study led to the adoption and publication of CLIP standards and the identification and prioritization of landscaping improvement projects. A major project identified by the CLIP study was the renovation of the Southwest Concourse. This open area is part of the Southwest Dormitory complex which houses 5,500 students. The concrete pavement had deteriorated and was an unsightly area with broken pavement and little planting. The new project will replace all underground utilities, restore the pavement to a smooth accessible material and install needed green-scape. Design is nearly complete and construction will be performed over three summers, beginning this year.

The new capital construction projects have eliminated several major parking lots. As a result the parking needs of the campus are becoming strained. The campus is studying the need for parking garages and peripheral lots with shuttle services to try to address the blossoming need for more parking. The Campus Master Plan, currently being advertized, will address and make recommendations on this issue, balancing parking and transportation needs with the desire for a better quality pedestrian experience of the campus.

Organizational Management

Administrative Functions

The administrative units responsible for the campus physical resources and health and safety are structured under the Vice Chancellor for Administration and Finance executive area. Facilities and Campus Services, Environmental Health and Safety, Public Safety and the Controllers Office each contribute to the development and management of facilities and the protection of environment, health and safety for the campus. Three divisions under the Facilities and Campus Services – Facilities Planning, Campus Planning and Physical Plant are responsible for the planning, design, construction and maintenance of the campus built environment including buildings, grounds, infrastructure

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and utilities. Through a fundamental reorganization, Facilities Planning and Campus Planning have been recently realigned to form two distinct functional units in order to position the upcoming Campus Master Plan more strategically within the University administrative structure. Environmental Health and Safety and Public Safety is responsible for the health, welfare and environmental protection of the campus staff and students, advises on fire protection and code compliance issues, and is the liaison with local and state environmental and safety regulatory agencies. The Department of Public Safety is responsible for the security of the campus including buildings. The Controllers office includes the Procurement Department that manages the public bidding process for all construction related contracts and ensures that the campus is in compliance with all applicable state procurement laws. The Procurement Office through its Property Office keeps track of equipment items with a value of greater than \$1,000.

In addition to the above, the Undergraduate Registrar's Office schedules courses in the general University classrooms, seminar rooms and auditoria. The Classroom Improvement Committee reviews conditions and priorities and recommends spending plans for general teaching spaces. The Faculty Senate Space and Calendar Committee reviews and recommends changes to the general teaching spaces, and the Faculty Senate Campus Physical Planning Committee reviews major renovation and new construction projects. Finally, academic renovations and new construction are reviewed and approved by the Dean's Council, and the Chancellor's Executive Advisory Council.

The University has developed various ways of managing, maintaining, and measuring the adequacy and condition of its physical resources: a space inventory together with a space needs assessment modeling tool, a reorganized design and construction service, a comprehensive facilities audit, a comprehensive work management system, and an equipment inventory system. In addition, the University has invested considerable resources in recent years in a Geographic Information System (GIS) as the basis for all of its planning documentation.

Campus Planning

The Campus Planning Division (CP) is administered by a director who oversees the creation, maintenance and implementation of the long-range facility vision and plan for the University. CP is responsible for the development of the Campus Master Plan, as well as overseeing its integration with Facilities Planning and Physical Plant.

The new comprehensive Campus Master Plan (CMP) for the Amherst campus will start in the fall of 2009 and be completed in 2011. As the first comprehensive master plan since the 1960's, the CP will provide a flexible framework and compelling vision for the medium and long-range physical development of the campus over the next twenty-five years. The CMP will be developed in close coordination with the University's new Strategic and Academic Plans. Some key tasks of the CMP include: examination and identification of appropriate buildings and landscape sites for future development; recommendations for improving and enhancing the physical environment, including landscape and open space improvements to the campus; and development of a plan for

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addressing the \$1.5B of deferred maintenance on the campus, including new construction, major renovations and demolition.

Campus Planning also:

- acts as resource to the senior administration on physical campus planning for other aspects of the University's planning
- provides data and analysis for input into the Capital Plan
- is responsible for all planning initiatives associated with the University's satellite facilities
- assists with outreach on behalf of the University to the larger academic community, the town and the region on planning issues of mutual interest
- oversees and/or performs multiple levels of planning that help develop the principles of the CMP into implementable projects, including district-level plans for smaller areas of the campus
- develops and maintains a well-defined and legible pedestrian circulation plan for the campus, including plans for minimizing conflicts with vehicular and service circulation
- recommends natural areas of the campus which should be preserved or developed, such as a campus arboretum, as a means to provide landscape standards, public outreach, and a campus-wide learning environment
- designates open spaces on campus for gathering and socialization, and identifies enhancements to those spaces
- develops and maintains the campus planning database, including GIS and BIM
- actively engages with Facilities Planning and Physical Plant to help ensure that facility decisions and designs are guided and informed by the CMP.
- CP is staffed by a qualified team of experienced facilities planners and architects. All senior level planners are registered professionals. The staff maintains its professional expertise through various professional associations and organizations, and regularly attends and/or presents at professional conferences.

Facilities Planning

Through a fundamental reorganization, facilities planning and campus planning have been realigned to from two distinct functional units. The Facilities Planning Division is administered by a director who oversees five specialized areas: Space and Asset Management, Facilities Planning, Capital Project Management, Engineering/Architectural Design/Project/Work Administration and Administrative Services. The organization is relatively flat and was developed to respond to the broad and diverse range of campus needs in project planning, design and construction services. The horizontal structure also enhances the level of integration routinely required by multi-disciplined activities conducted within the Division. Facilities Planning assigns project-based accountability to one individual in an effort to provide efficient and effective customer service and produce a "best product." This single point of contact is the cornerstone of its organizational philosophy.

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Facilities Planning has also developed a number of standards that guides the design and construction process for new and existing campus facilities. This includes a comprehensive signage policy and plan, room numbering standards, a campus lighting plan and a policy regarding temporary structures.

Facilities Planning is staffed by a qualified team of facilities planning, architects, engineers, project managers and business administration. All management and senior level staff are registered professionals representing the full spectrum of architectural and engineering disciplines. The staff maintains and enhances its professional expertise through various professional associations and organizations.

Space Management: The Office of Space and Asset Management is responsible for:

- The Space Inventory system. Using Federal Guidelines, this system was developed to provide uniform information about campus space for decision-making regarding allocation and use. The data is used by the Office of Space and Asset Management to review options and recommend actions to the Director of Facilities Planning, the Associate Vice Chancellor for Facilities and Campus Services, the Capital Asset Board, and other decision-makers on campus. Data is also used by directors and department heads to assess use and reallocate within their units. The inventory information is the basis for reporting to federal, state and campus agencies and units for various purposes, such as research space reporting to the NSF, building information to the State and A-21 information used in negotiating the Federal Indirect Cost Recovery Rate. Various campus units consistently use space information in their operations, and several special campus-wide projects use the database as a repository for information and reporting, such as fume hood evaluations and monitoring records. Space Management also maintains a library of scaled and electronic (AutoCad) floor plans for each building. Accurate, up to date space utilization data is maintained by regular review of personnel locations, room assignments, and room uses with each department on campus. The accurate floor plans and space data form the basis of renovation projects and emergency egress planning.
- Space Allocation Management. Space planning analyzes current and future needs of academic and administrative units with regard to personnel requirements, functional and organizational criteria. A program is developed for each individual unit in accordance with campus standards. This information and space needs data provide the basis for recommendations on various space issues. The Office also develops reallocation plans for vacated or underutilized space and locating space to solve particular problems when possible. This often requires consultation and mediation among campus units to maximize space utilization. Major space assignments come to the Capital Asset Board for approval. Assignments may be permanent or temporary, and official reallocations of space are all recorded in a Space Allocation Memorandum, which serves as the official record. The specific requirements of the Americans with Disabilities Act concerning access are always considered as part of space reallocation decisions.

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Physical Plant

The Physical Plant is responsible for all operations, maintenance and repair services for all real property assets with the exception of housing. They also maintain the underground piping and electrical distribution systems and operate the Power Plant in support of all campus facilities. Building and Grounds combines services for custodial cleaning and grounds management.

The Physical Plant has established a Customer Service and Work Management Department which focuses receipt and management of all work priorities in a single location. Service Representatives provide single-point contacts with customers and a Service Guide has been published to explain the Division's structure and procedures. Bi-annual Building Coordinator meetings are held to update customers on activities and to receive concerns and feedback on programs.

The Physical Plant Division, staffed by experienced administrators, engineers and trades people, has developed a strategy to augment its staff with contracted services. Physical Plant staff concentrates its efforts on campus operations and maintenance while major renovation and rehabilitation projects are managed by the Facilities Planning Division.

The Facilities Planning, Campus Planning and Physical Plant Divisions continuously work at maintaining an open and constant flow of communication between the divisions. There are monthly coordinating meetings between the leadership teams of the organizations to discuss design standards, building conditions and how to work together on projects. Facilities Planning has requested someone from the Physical Plant leadership team be assigned to actively participate in the design and construction of each major project. Members of both Facilities Planning and Physical Plant Divisions served on the team that developed the Integrated Facilities Plan describe above. Campus Planning regularly seeks input from Physical Plant's maintenance and operations staff in developing long-range plans for the campus.

Building Maintenance:

The building maintenance trades staff is distributed throughout the campus in six geographic zones and are dispatched daily from shops located in buildings remote from the central Physical Plant. The workload is primarily preventative maintenance and small-effort M&R support to customers. Minimal shop stock is maintained at each location. Emphasis is on fast response, customer support and high levels of PM. Each zone has an approved staffing of an Institutional Working Foreman, 1 carpenter, 1 control technician, 2 electricians, 3 HVAC mechanics and 2 plumbers. Specialized Shops include the Fire Alarm Shop and the Lock Shop. Mechanical Maintenance Shop has an approved staffing of an Institutional Working Foreman, 1 electrician, 1 machinist, 1 mason, 1 mason apprentice, 1 motor mechanic, 1 painter/sign maker, 1 pump repair technician, 1 sheetmetal mechanic, 1 roofer and 1 welder. Contract Surveillance has an Institutional Working Foreman, 2 contract surveillance officers and 2 estimators.

Building and Ground Services:

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Building and grounds services combines services for custodial cleaning and grounds management. Custodial Services maintains the cleanliness and orderly appearance of all academic and administrative buildings. Grounds management provides quality landscape and hardscape maintenance, recycling, waste collection, and floor maintenance services consistent with responsible fiscal and environmental stewardship. All shops support snow removal operations, and provide the following specialized services: Landscape Services, Construction Services, Pest Control, Small Engine Shop, Waste Management and Moving Service.

Utilities

The Central Heating Plant provides steam heat and electrical power for all buildings campus wide from a new gas/oil fired central power plant using three boilers, @ 125,000 pounds per hour each, a 10 megawatt combustion gas turbine connected to a heat recovery steam generator capable of 100,000 pounds per hour of steam and a 4 megawatt backpressure steam turbine.

The Electrical Maintenance Section provides operation and maintenance of the exterior electrical distribution system for all campus buildings involving the distribution of 20 Megawatts of power with an approximately yearly usage of 112,000,000kwh. They also provide maintenance and repair of all system components including transformers, switches, poles, street lights, traffic lights, breakers, transfers, and associate equipment, and works closely with off-campus utilities (Western Massachusetts Electric) to insure continuity of quality and quantity of power.

The Mechanical Maintenance Section operates and maintains:

- 26 miles of the campus steam distribution and condensate return systems, and when required replaces steam lines and performs the annual steam shutdown maintenance project.
- 35 miles of the water distribution system. The system is from the five Town of Amherst water meters to the building services. They also provide maintenance and repair for all backflow prevention protection, campus irrigation, and fire hydrants.
- Storm water piping and catch basin system.

The Campus Electrical Utility Engineer is responsible for monitoring and the analysis of campus electrical energy and power quality, engineering in support of campus electrical systems maintenance and operations, building commissioning, and Electrical Utility Design Standards.

The Campus Energy Engineer is responsible for monitoring and the analysis of campus energy and water consumption, engineering in support of campus utility systems maintenance and operations, energy management system design and operations, building commissioning, and HVAC design standards.

Energy Conservation:

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The university has put an extensive effort into reducing its utilities use. In 2004 the campus implemented a \$40 million energy performance contract with Johnson Controls Inc. This contract involved 43 separate energy conservation measures and covered the entire Amherst campus. This effort resulted in a metered reduction of 25% on the campus steam use, 43% in water use and 9% in electrical use. Since the original performance contract, the Physical Plant has actively sought out ways to further reduce the campus' energy use. Annual infrared flyovers are performed to find places where steam lines and roofs are losing heat and electric cables are overloaded. A campus-wide building automation system is used to minimize the use of energy in facilities while still maintaining comfort.

Sustainability:

In 2008, (?) the president of the University of Massachusetts system signed the American College and University President's Climate Commitment and the UMass campus has been actively working to fulfill the obligations under the climate commitment. An Environmental Performance Advisory Committee (EPAC) has been formed, and they completed the greenhouse gas inventory and have started the campus Climate Action Plan. The Facilities Planning Division has designed sustainable features into the recently completed Integrated Sciences Buildings, and is currently designing a new police station to meet a LEED gold standard. It has been determined that all future new construction will comply with LEED certifications. The Campus Master Plan will strongly emphasize sustainability in all aspects of the campus' future physical development.

Property Office

The Property Office (with the Procurement Office) supports campus activities by providing a centralized equipment inventory management and reporting system which complies with federal, state and institutional requirements and provides information about equipment for the campus. Records are maintained on all equipment that costs \$1,000 or more. Information is obtained on receipt of the equipment through an automated interface with the procurement system: each piece of equipment is located, assigned an identification number and added to the Fixed Asset database. Property Office staff takes physical inventories. All equipment is scanned and reconciliation reports are generated for departments to verify and update.

Environmental Health and Safety

Environmental Health and Safety (EH&S) conducts regular life safety and general safety inspections of all facilities. Facilities are scheduled for inspections depending on occupancy type and the degree of hazard the facility may present. Inspections assure that the State Building Code, Massachusetts Fire Prevention Regulations and other safety standards are met. Reports are generated and passed on to responsible parties for corrective action, when needed.

In addition, EH&S makes regular inspections of all fire protection equipment and systems: fire extinguishers, fire alarm systems, sprinkler and standpipe systems and fixed extinguishing systems. EH&S also conducts full tests of fire alarm and sprinkler systems

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annually or semi-annually depending upon building type. They maintain a chemical inventory, conduct internal audits, and perform local and regional Emergency Operations Center exercises. EH&S serves as liaison with the local Fire Chief and the Massachusetts Department of Environmental Protection. -EH&S staff also accompany officials on inspections involving health, safety and environmental matters. There is a close relationship between EH&S, Facilities and Campus Planning and the Physical Plant. EH&S personnel are recruited to serve on all construction project teams and the Physical Plant has EH&S environmental and safety personnel permanently assigned to the Physical Plant to provide constant environmental and safety support to the daily Physical Plant work force.

Compliance:

All new construction and renovations comply with the current Massachusetts State Building Code and all National Codes referenced within and the following Architectural Access Codes: CMR 521-Architectural Access, the ADA, Chapter 504. All designs are reviewed with the State Building Inspector, The State Plumbing Inspector, Town Fire Marshalls, and Town Electrical Inspectors to ensure that designs comply with all applicable codes and regulations.

The Massachusetts Governor established new sustainability goals for state building projects with Executive Order #484, signed on April 18, 2007. This order mandated that all new building projects funded by the Commonwealth of Massachusetts meet or exceed certain guidelines articulated in the United States Green Building Council’s LEED program, hence the term “LEED Plus”. In addition, the University has written design standards for building construction including a sustainable design program, and all new construction has a goal of LEED Silver certification.

The University employs only State of Massachusetts licensed design professionals for both renovation and new construction. Facility design at the University is provided by either external design consulting firms selected through a state proscribed designer selection process or by licensed design professionals on staff.

The Facilities Planning Division assigns a Project Manager to each construction project. These Project Managers have many years of experience in project design and construction and they provide oversight for each project from inception to completion. Project managers and Division procurement staff have gone through the state’s Massachusetts Certified Public Purchasing Official program on design and construction, and our project managers are licensed professionals in architecture or engineering.

UMass Amherst is subject to public procurement procedures pursuant to Massachusetts General Laws (M.G.L.). Chapter 193 of the Acts of 2004, entitled “An Act Further Regulating Public Construction in the Commonwealth” was the most significant reform to the Massachusetts public building construction contracting in the last 25 years.

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M.G.L.c.7 contains procedures for selecting designers for building project through an advertised, competitive, qualifications-based selection process. Designers of building projects at the University are selected by the Design Selection Board and approved by the Division of Capital Asset Management.

M.G.L.c. 149 governs all contracts for the construction, reconstruction, installation, demolition, maintenance or repair of a building. These contracts are generally referred to as vertical construction projects. All contractors and their filed sub-contractors employed by the University are certified by the State's Division of Capital Asset Management to ensure quality.

M.G.L.c.30, 39M governs all contracts for construction, reconstruction, alteration, remodeling or repair that do not include work on a building. These contracts are generally referred to as public works projects, or horizontal construction projects.

The Department of Environmental Health & Safety operates a comprehensive environmental health and safety program on the Amherst Campus. The Department uses a multi-disciplinary approach. Responsibilities within the Department are organized by program area. Services of The Environmental Health and Safety Program include the review of any operation that can pollute the air, water, and environment, and recommendations of ways to maintain a clean, safe, and healthy environment.

Executive Oversight Components

Capital Asset Board: The Capital Asset Board (CAB) has been established to ensure that the use of campus space, property and capital is consistent with the overall mission, campus priorities, best use and obligations of the campus. The CAB is made up of the Provost, Vice Chancellor for Administration and Finance (Chair), Vice Chancellor for Student Affairs, Associate Vice Chancellor for Facilities and Campus Services, and the Chief Information Officer. The Division of Facilities Planning is the administrative office responsible for the on-going planning and management of space and capital assets. They as well as the Physical Plant staff function as the primary administrative advisors to the CAB.

Executive Oversight Committees: For every major capital project of significant size and/or importance, an Executive Oversight Committee is convened consisting of the Chancellor, the Vice Chancellor for Administration and Finance, the Associate Vice Chancellor for Facilities and Campus Services, the Director, Facilities Planning and where appropriate the Provost, affected Deans, Vice Chancellor for Academic Affairs, and others deemed to be essential to the project. This committee is responsible for giving direction and approval to the various projects on scope, budget, schedule, conformance with University policies and strategic and campus planning goals and objectives, and all major aspects of development and implementation.

Faculty Senate: The Faculty Senate at UMass Amherst is a representative body which is responsible for faculty participation in university planning and governance. One of the Faculty

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Senates Committees is the **Campus Physical Planning Committee (CPPC)**. The CPPC recommends policies related to the development of campus facilities, infrastructure and grounds; acts in concert with other appropriate University committees, offices, and individuals to recommend priorities for new buildings and structures; reviews conceptual designs for new buildings and infrastructure; and recommends policies concerning the scheduling and utilization of University academic space. The CPPC is composed of twelve Faculty Members, including one from each of the Schools and Colleges and one from the Professional Library Staff; a faculty member from the Department of Landscape Architecture and Regional Planning; and a variety of other representatives.

University Public Art Committee: The University Public Art Committee (UPAC) has been established to define, manage, plan, and provide stewardship for public art displays on university property, including interior and exterior spaces, as well as major public and ancillary public spaces. (excludes gallery space) The UMass campus is a unique environment, which is enhanced by outdoor and indoor sculptures, murals and other works of art. This art contributes to the creative energy of the campus and provides enjoyment for students, faculty and staff.

Security Implementation Committee: The Security Implementation Committee (SIC) was established in September 2008 to enhance the University's safety and security program. In 2006, a Campus-Wide Security Review was performed by Ove Arup & Partners, Inc. (ARUP). The purpose of the review was to identify and review current campus security systems, procedures and staffing at UMass, and provide options to enhance and improve the effectiveness of those security efforts. The review was performed in conjunction with the Campus-Wide Fire Alarm & Security Reporting System upgrade effort that was also being conducted by ARUP. The final report was received by UMass in which ARUP presented their key findings and observations and identified enhancement options, including the establishment of the SIC. The purpose of the SIC is to review the findings, make recommendations, oversee the integration of all life safety, security, crime prevention, and property protection responsibilities meet the University's needs and comply with all regulatory authorities.

ASSESSMENT

Strategic Plan

The University's Framework for Excellence, The Flagship Report, Spring 2009, identifies the physical plant as perhaps its greatest challenge. Before the recent building program that invested \$760M in renovations and new construction, the campus had gone many decades without any significant investment in its facilities. As a result, many of the buildings on campus were not adequate for the purposes of contemporary science and modern education. The capital construction projects that have been or will soon be completed since the start of the recent building program include the renovated Skinner Hall for Nursing, the long overdue construction of a new and more sustainable Central

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Heating Plant, the Studio Arts Center, the state-of-the-art Integrated Sciences Building, the University Transit and Regional Traveler Information Center, and the Recreation Center. Construction will soon begin on a new Police Station and the Bowditch Greenhouse.

However, there are still many serious problems remaining. The Framework for Excellence focuses not only on the academic aspirations for the University's future, but clearly identifies the physical plant, utility infrastructure and information technologies as urgent needs that will contribute to this future. The Higher Education and Life Sciences Bond Bills have provided the University with the much needed opportunity to rectify some of the programs and facilities with the great needs. To address these, the campus is undertaking several focused initiatives. The Comprehensive Science and Engineering Facilities Study focuses on the new emphasis on the integration of the life, chemical and physical sciences, as well as addressing antiquated building systems and cramped conditions that drive the need for a substantial amount of new science and laboratory space. Likewise, the University's Comprehensive Academic and Classroom Facilities Study focuses upon the need to expand those facilities to accommodate growth, modernize existing classrooms, replace obsolete classroom space, and relocate and consolidate academic departments that have grown without the benefit of functional adjacency and contiguity. Both Comprehensive Plans will be included as major components of the upcoming Campus Master Plan.

(Text to be added on outcomes of Science and Academic Studies.)

Condition – The Integrated Facilities Plan

In order to develop an effective facilities management strategy, the campus has established a comprehensive program to assess the condition of facilities. For the past 6 years the campus has been working with a company called Sightlines which has the largest verified condition database in the country, and is a multifaceted knowledge company that leads campuses through a discovery process for facilities management, and environmental stewardship. Additionally, Sightlines offers its members in-depth consulting and technology services. Sightlines services include facilities condition reviews specific to the UMA campus and benchmarking information to enable UMA to compare its facilities to peer institutions. The Sightlines service includes recommendations for reinvestment in the facilities to maintain their current condition and what investments are needed to improve the condition of the facilities. This detailed information describes the campus' facilities portfolio and is organized in a database that is web based. This program allows facilities personnel to identify specific maintenance and repair requirements and to distinguish between maintenance and repair deficiencies and functional needs. This effort was further enhanced by the Vice Chancellor of Administration and Finance who led an effort to list every building on campus, detail all of the deficiencies in each building and to determine the future of each building. This effort resulted in the publication of the Building Disposition Plan. Once the Building Disposition Plan was completed the Physical Plant and Facilities and Campus Planning

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administrative staff initiated a project with Sightlines to include the Building Disposition Plan in the UMA facilities portfolio and to develop a means to electronically download information about the facilities that changes the value of the facilities portfolio. With the implementation of this project the facilities condition information is always current. All of the collaboration between the UMA and Sightlines has resulted in what Sightlines call an Integrated Facilities Plan (IFP). The IFP supplements the space needs assessment modeling described earlier, by adding a physical condition component, providing another important piece of information for decision-making about space assignments.

The adequacy of campus space to support its mission of instruction and research is uneven at best. As on most campuses, instructional space is tightly scheduled during peak classroom hours, with not enough rooms to meet the full demand of faculty for accessible, appropriate classroom space. The condition of instructional space is as much an issue as the quantity, especially for large classrooms that accommodate 200 or more people. The recent capital construction effort has added auditorium and classroom space to the campus inventory and the Comprehensive Academic and Classroom Facilities Plan that is underway will result in the construction of a new classroom building, as well as in a long-range plan for the correction of deficiencies in existing academic facilities.

As for the quality of research space, some departments (e.g., Polymer Science, Engineering, Computer Science) enjoy state-of-the-art facilities while other strong research departments (e.g., Plant and Soil Sciences) struggle in space that is grossly outdated. This subject is discussed further in Standard Four, Research & Scholarship.

For meeting the challenges of facilities on the UMA campus, there is a team of talented professionals who have used excellent tools to assess the physical needs of the campus. Both the space assessment, undertaken by all parties responsible for the facilities in the office of the Vice Chancellor for Administration and Finance, and the Integrated Facilities Plan developed with Sightlines for the UMA campus, has yielded important and useful information to be used for planning. The IFP, for example, revealed that the campus has about \$1.5 billion in deferred maintenance and deferred modernization and through the Sightlines database we have the ability to compare the UMA condition and needs to peer institutions. Using the vast amount of information available it is clear that the UMA has a significant amount of deteriorated space that must be replaced. The IFP and Building Disposition Plan has detailed which space can be maintained and repaired, what can be repurposed and what space must be demolished. The current Comprehensive Science and Engineering Plan and the Comprehensive Academic and Classroom Facilities Plan are the next step in determining how we can get the most square footage as possible built with the money available, who has the greatest space need and how can we get people out of inadequate space and then how do we deal with the space that is left behind, renovate, repurpose or demolish.

There are qualifications to such an assessment, and not the least is the question whether future campus physical needs warrant a full reconstruction of the campus *as it was*. Similarly, if one adds demolition (without replacement) as an appropriate option, total

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deferred maintenance is lowered. However, new campus needs will require new facilities, so that total need, no matter how it is calculated, will not decrease.

Larger issues, such as the use of classroom space, especially large lecture halls, in an increasingly electronic environment, will also have to be carefully considered. Nevertheless, there is little doubt that state-of-the-art classrooms and modern, expensive laboratory space are, and will continue to be, essential to the institution's mission.

Adequacy/Quality of Staff

Since fiscal year 2000 the Commonwealth of Massachusetts as well as the national economy has gone through several downturns. The UMA budget has suffered from those drops in the economy and the Physical Plant staffing level has dropped as a result of decreasing budget support. The chart below details the effect that budget reductions has had on the Physical Plant's staffing levels.

Fiscal Year	Physical Plant FTE
2000	586
2001	526
2002	509
2003	427
2004	429
2005	442
2006	436
2007	439
2008	438
2009	436

This dramatic drop in the number of FTE's in the Physical Plant is exacerbated by the high level of deferred maintenance/modernization and the construction of new facilities. During the time period described in the chart above the E&G part of the UMA campus expanded by 403,000 square feet. While the personnel in the Physical Plant are competent, their ability to keep up with the growing workload is very difficult. In addition, their skills are being challenged with the increasingly complex and technical systems and equipment being installed in new construction projects. To their credit the University Board of Trustees has recognized the problem of under-funding maintenance and passed a policy that states any new construction must have an annual maintenance support equal to 3% of the construction cost exclusive of utilities costs and a fund must be set up and contributed to annually equal to 1 ½% of the construction cost; this fund will be used to cover the future capital replacement costs associated with these buildings as they age. The new Central Heating Plant has taken \$130 million of deferred maintenance away from the campus and the new science building and associated science facilities study and the new classroom building and associated academic space study will remove an additional \$250 million of deferred maintenance. However, greatly appreciated is the funding for the maintenance of new facilities, the remaining existing

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buildings still languish and continue to deteriorate under chronic inadequate funding for deferred maintenance. The current science and academic planning efforts and the upcoming Campus Master Plan will address these needs. Very preliminary indications are that required funding will be well in excess of \$2 billion.

The residential facilities on campus are in somewhat better condition than the E&G due to their access to capital funds through the room charge rate. A Residential Strategic Plan was developed in 2002 by Biddison Hier, Ltd., that recommended the highest and best use of housing facilities, along with preliminary estimates. Unfortunately, the recommendations of this ambitious plan were so costly that they were not able to be implemented due to the lack of both funding and swing space. Housing improvements are currently focusing on life safety code related projects such as providing fully sprinklered facilities, but much of the need identified in 2002 still stands. A new housing study has just begun that will evaluate the condition of existing housing stock with the goal of identifying a more realistic strategy and a more modest scope that can efficiently and cost-effectively improve the University's aging housing. It is expected that the renovations recommended in the new plan will be implemented over a long-term. Housing maintains a separate maintenance operations from the remainder of the university and is fully staffed and equipped.

Adequacy of Funding:

PROJECTION

Table 10a – Status of Capital Sources and Needs 2009-2018

Table 10a illustrates the Amherst campus planned sources of capital funding from 2009 to 2018 for all capital needs, and compares these amounts to the projected capital needs. The result is a deficit of over \$1,000M.

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SOURCES OF FUNDS	CAPITAL PLAN II		TOTAL OF PLAN II
	FY09 to FY13	FY14 to FY18	FY09 to FY18
Projected State	199	495	694
Committed Campus (excludes auxiliary)	199	91	290
Gifts/ Fed/ Other	3		3
	401	586	987

USES OF FUNDS	CAPITAL PLAN II <i>Projected Needs.</i>		TOTAL OF PLAN II
	FY09 to FY13	FY14 to FY18	FY09 to FY18
Science	304	725	1,029
Other Academic	243	240	483
Other: deferred maint. student life Infrastructure, admin	335	230	565
	882	1,195	2,077

SURPLUS/ DEFICIT	(481)	(609)	(1,090)
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In 2009, the Amherst campus will complete a comprehensive science and engineer facilities plan. Table 10b illustrates the aging of science and engineering facilities and provides an estimated deferred maintenance backlog. This analysis shows that 1,672M gross square feet of science and engineering space is more than 40 years old in 2009, with an approximate deferred maintenance backlog of over \$500M.

Table 10b – Renewal Cost of Science Facilities

	1880-1909	1910-1939	1940-1969	1970-1999	2000-2009
Total K GSF per period	138.9	184.5	1,349.4	917.4	255.2

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Cumulative K GSF	138.9	323.4	1,672.8	2,590.2	2,845.4
DM Cumulative K GSF		52.4	312.0	935.8	1,672.8
Renewal Cost in \$ millions		15.7	93.6	280.7	501.8

A major step in addressing the problem of the physical plant was establishing a Capital Asset Board to guide the campus among those decisions that are mandatory and those that are discretionary. Among the mandatory decisions are projects that seriously undermine the fabric of facilities (roof repairs, for example) or endanger those who live or work in them (ventilation problems) or prevent public facilities from being accessible to all. Those projects, once identified, require little discussion. Discretionary projects – what to renovate, demolish or construct – raise more challenging issues. The Capital Asset Board (CAB) has been established to ensure that the use of campus space, property and capital is consistent with the overall mission, campus priorities, best use and obligations of the campus. The CAB is made up of the Provost, Vice Chancellor for Administration and Finance (Chair), Vice Chancellor for Student Affairs, Associate Vice Chancellor for Facilities and Campus Services, Chief Information Officer, and a representative from the Faculty Senate. The division of Facilities Planning is the administrative office responsible for the on-going planning and management of space and capital assets. They as well as the Physical Plant and Campus Planning staff function as the primary administrative advisors to the CAB. The CAB clearly is the best group to provide advice about how the campus should use limited resources to address a major challenge.

The action steps planned include educating constituents (the campus, alumni, trustees, legislators), comprehensive planning (space, academic, facilities, financial), and developing funding strategies. The options for funding include Building Authority and state general obligation bonds, the capital campaign, the annual operating budget, public-private partnerships and federal appropriations. At present, the campus has a \$987 million, five-year (2009-2013) capital program that is comprised of:

- \$323 million in General Obligation State Bonds
- \$529 million in debt financed through the Building Authority
- \$5 million through private donations, and
- \$130 million from the annual campus operation budget.

Although large, this amount is clearly not enough. With a physical plant valued at \$2 billion and deferred maintenance of nearly equal value, more funding will be needed to repair the neglect of the past and position the campus to become the institution it aspires to be. Additional state support, institutional borrowing and fundraising among alumni and friends, as well as developing assistance from the UMass Foundation, the federal government and public-private partnerships, will be required.

And money is not the only remedy needed. The campus also needs some relief from the unduly bureaucratic process required by the state that puts major constraints on, and adds

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unnecessary cost to the process of planning, designing and building University facilities. Constructing a University facility using current Department of Capital Asset Management (DCAM) or UMBA regulations requires far too much time, and adds substantial cost to the overall project. With some of the most highly qualified professional design/construction project managers in the Commonwealth on staff in Facilities Planning, having DCAM or UMBA staff performing the very same functions in parallel is not only inefficient but adds a huge cost to every project. While the other UMass campuses do not have such professionals on staff and may indeed benefit from UMBA and DCAM support that is not true at UMA. Allowing UMass to manage its own projects should be seriously reconsidered as a major cost-saving measure.

Table 10c presents the capitalization of construction expenditures for projects completed by UMass Amherst or the University of Massachusetts Building Authority by fiscal year.

Table 10c – Capitalization of Construction Expenditures by Fiscal Year 1996-2008

	Construction Expenses Capitalized
1996	5,097,067
1997	15,326,805
1998	6,094,503
1999	6,365,027
2000	17,448,256
2001	6,904,205
2002	16,512,984
2003	29,537,058
2004	28,643,670
2005	15,292,544
Sub-total 1996 - 2005	147,222,119
2006	127,979,985
2007	184,353,365
2008	140,486,770

The following Table 10d illustrates the capital spending by major funding source per fiscal year for the last five fiscal years (FY2003 – FY2008)

Table 10d – Capital Expenditures by Fiscal Year (cash basis, in thousands \$)

	2004	2005	2006	2007	2008	Total
Campus Funds & State Local	15,060	24,562	29,074	44,296	38,147	151,139
DCAM Projects	6,406	7,371	3,887	2,662	388	20,714
UMBA	5,318	15,014	84,376	155,011	114,618	374,337
Total	26,784	46,947	117,337	201,969	153,153	546,190

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While measures are being taken to address the serious challenge of physical facilities and conversations concerning DCAM regulations have been held with political leaders, much more needs to be done. And unless more is done, the campus will face the choice of leasing space off-campus, converting current campus space (such as converting residence halls to offices) or the reduction or elimination of some current programs.

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