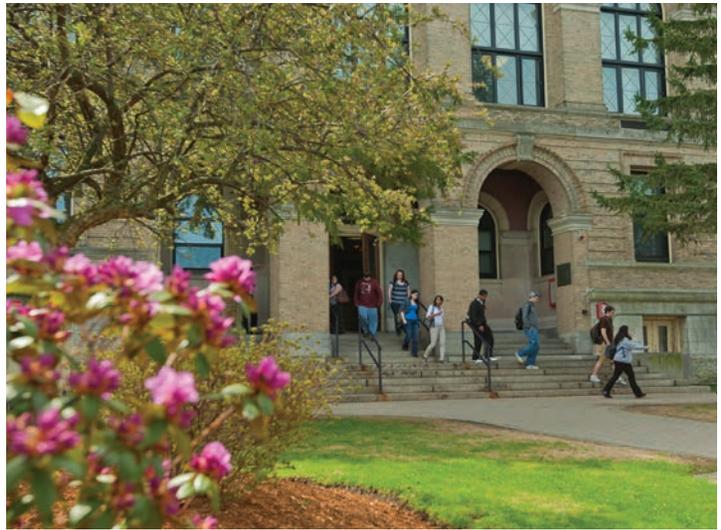
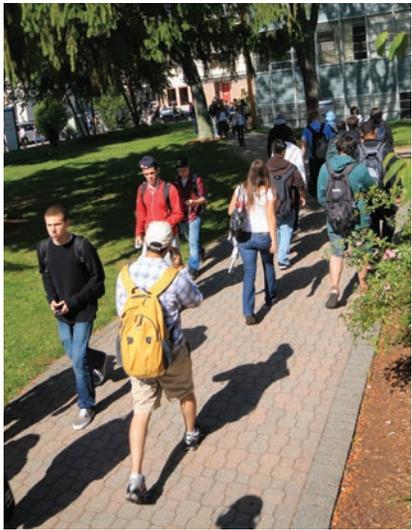


University of Massachusetts Lowell
Strategic Development Plan 2011-2016



August 2012

Acknowledgements

Strategic Development Plan 2011-2016 University of Massachusetts Lowell

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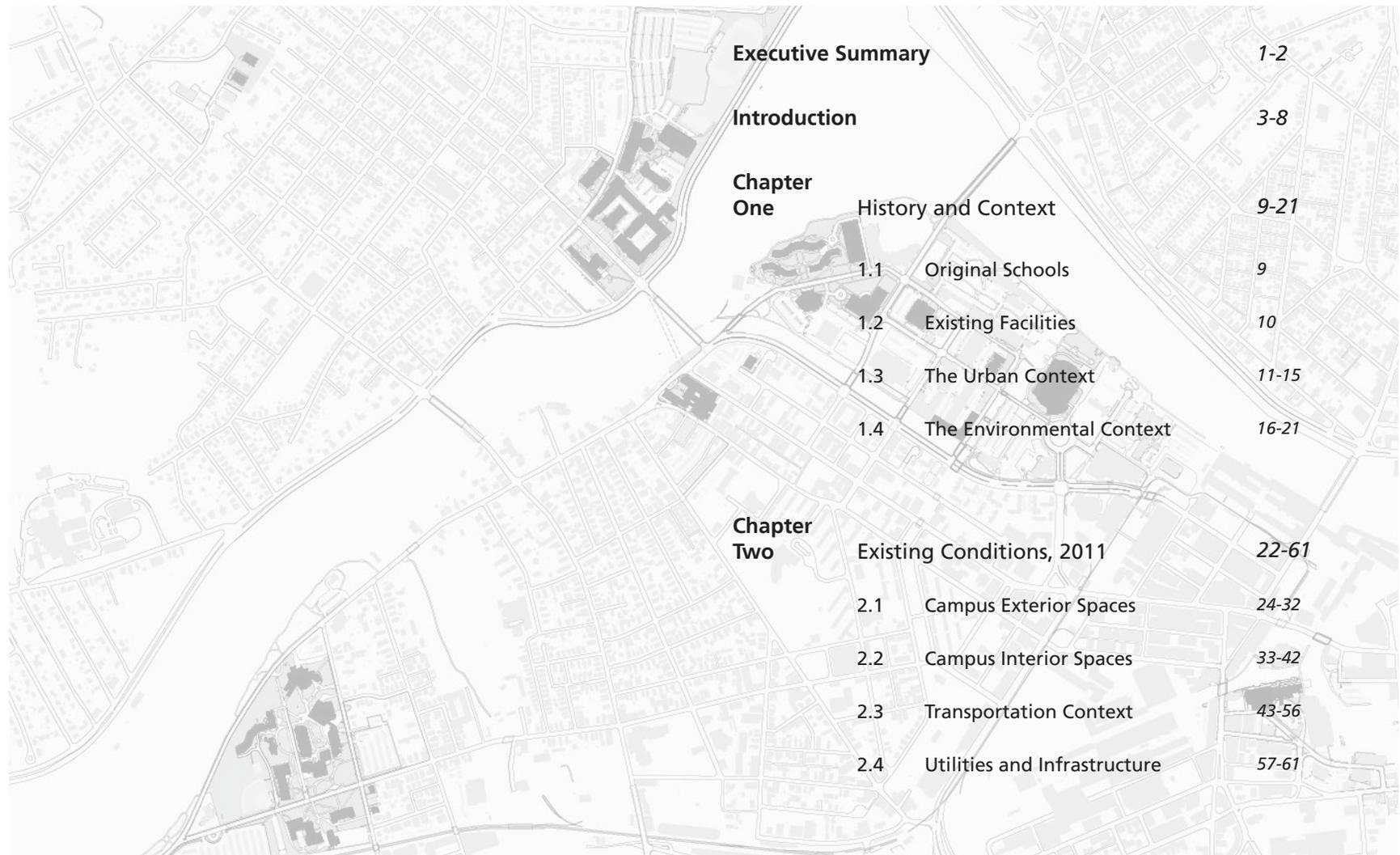
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Table of Contents



Executive Summary		<i>1-2</i>
Introduction		<i>3-8</i>
Chapter One	History and Context	<i>9-21</i>
	1.1 Original Schools	<i>9</i>
	1.2 Existing Facilities	<i>10</i>
	1.3 The Urban Context	<i>11-15</i>
	1.4 The Environmental Context	<i>16-21</i>
Chapter Two	Existing Conditions, 2011	<i>22-61</i>
	2.1 Campus Exterior Spaces	<i>24-32</i>
	2.2 Campus Interior Spaces	<i>33-42</i>
	2.3 Transportation Context	<i>43-56</i>
	2.4 Utilities and Infrastructure	<i>57-61</i>

Table of Contents, *continued*

Chapter Three	Planning for the Future	62-81	Chapter Five	Environmental Effects	100-109
3.1	Goals and Objectives	62-63	5.1	Water Management	100-102
3.2	Planning Assumptions	63-66	5.2	Solid and Hazardous Waste	102
3.3	The Planning Process	67	5.3	Community Outreach and Construction Period Considerations	103-105
3.4	New Space Requirements	68-71	5.4	Historical and Archeological Resources	105
3.5	Renovated Interior Space	71	5.5	Transportation	106
3.6	System Planning	72-81	5.6	Utilities and Infrastructure	107
			5.7	Energy Use	107-109
Chapter Four	Current Capital Projects Plan	82-99	Appendix		
4.1	Current Projects	83-89		• <i>List of Figures and Tables</i>	
4.2	Two-to-Five-Year Projects	90		• <i>Certificate of the Secretary of Energy and Environmental Affairs Establishing UMass Lowell's Special Review Procedure, March 23, 2012</i>	
4.3	UMass Lowell in 2016	91-99		• <i>Distribution List</i>	

Executive Summary

Strategic Development Plan 2011-2016 University of Massachusetts Lowell



Executive Summary



Since 2007, the University of Massachusetts Lowell (hereinafter UMass Lowell or the University) has been in the midst of a period of dramatic physical growth and transformation. This activity has been driven by energetic new leadership, marked increases in enrollment, a more ambitious faculty research agenda, and a commitment to ensuring that facilities are compatible with newer ways of teaching and learning.

The University has pursued this growth based on a strategic development framework that provides direction and flexibility to address changing needs. Built upon a series of rolling master plans, sector plans and system and capital plans, this approach has allowed UMass Lowell to focus in depth on key areas such as the campus transportation network, climate action and sustainability, and existing facility condition, as well as to provide focus to particular geographic and academic areas. The strategic framework is

also closely aligned with the University's 2020 Strategic Plan that lays out a blueprint to guide the campus toward national and international recognition as a world-class institution over the next several years.

These planning efforts, which are discussed in greater detail in this Strategic Development Plan, have resulted in a robust, ongoing capital program which is comprised of seven major projects now in various stages of planning, design and construction. The capital program touches all areas of campus life and includes two academic buildings, a new student services center, one residence hall, two parking garages and a new home for the Manning School of Business. Consistent with UMass Lowell's history as an urban university, physical growth is being pursued with a focus first on re-purposing and renewing existing facilities, and then pursuing new construction only as needed. For the most part,

new structures are being built on existing UMass Lowell property, which not only makes good use of existing resources, but also reinforces UMass Lowell's identity as an urban school and contributes to our sustainable transportation goals.

During this time of dramatic growth and physical change, the leadership of the University has continued its tradition of working closely with the City of Lowell, the National Park Service, local business groups such as the Lowell Plan, neighborhood based non-profit groups and others, reinforcing a strong collaborative tradition and supporting the University's practice of developing the urban fabric of "one campus/one city." Outreach to our neighbors, the student body, faculty and staff has been pursued through a series of regular student forums, attendance at regular neighborhood meetings, ongoing coordination with the City's leadership, special events and ongoing communication through the University's publications and website. The forums have provided very helpful feedback as the campus evolves to meet changing needs.

Through a series of strategic acquisitions and with the addition of several new facilities, UMass Lowell expects to grow from 3.4 million gross square feet in 2011 to approximately 4.1 million gross square feet in 2016. The University has ad-



Southwick Hall, on University Avenue, North Campus

opted a series of approaches that are designed to limit the undesirable effects of growth and will, in many cases, improve existing conditions. As UMass Lowell continues to grow and evolve, the ongoing work of assessing the changing needs of the academic community will also continue. We look forward to sharing the results of that ongoing analysis in the future.



Introduction

Strategic Development Plan 2011-2016 University of Massachusetts Lowell



Introduction



The last several years have been a period of significant growth at the University of Massachusetts Lowell (hereinafter UMass Lowell or the University). From 2007 to 2011, total enrollment grew by thirty-seven percent to over 15,000 students—with an additional fifteen to twenty percent increase expected by 2016—and research has expanded by over thirty percent. These trends, along with renewed attention to the quality of University facilities, a shortage of space suitable for current methods of teaching and learning, and the need to address deferred maintenance, have prompted an active capital program which is now underway.

Since 2007, when Marty Meehan became Chancellor of the University, seven new major capital projects have been initiated; three large new facilities have been acquired; and a series of rolling, sector and topic-based planning efforts have been undertaken to assess the full extent of

University needs in light of current and future academic and strategic goals.

This period of vibrant activity is reflected in renewed attention to the environmental effects of University growth and operations. In 2007, the University of Massachusetts system signed on to the American College and University Presidents Climate Commitment, establishing a goal of achieving carbon neutrality by 2050. In keeping with this commitment, attention to climate effects is now informing development and planning on campus.

This Strategic Development Plan describes recent and current planning efforts, the framework they establish for growth, the current five year capital program, and 2011 and 2016 snapshots, in order to describe the environmental effects of UMass Lowell's growth and evolution and how they are being addressed.

Evolution of the Special Review Procedure

In August 2011, the University of Massachusetts Lowell filed an Environmental Notification Form (ENF) with the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) Massachusetts Environmental Policy Act (MEPA) office for a 650-space parking garage on the University's North Campus. The North Campus Parking Garage project was necessary to meet increased demand for parking created by several years of enrollment growth.

Under the Certificate of the Secretary of Energy and Environmental Affairs for the North Campus Parking Garage, an Environmental Impact Report (EIR) was not required. One condition of the certificate was that UMass Lowell propose a Special Review Procedure (SRP) covering new projects anticipated in the next five years, prior to the submission of future ENFs.

The Special Review Procedure was established by the Secretary of Energy and Environmental Affairs and the University of Massachusetts Lowell in a Certificate dated March 23, 2012 and signed by both parties. UMass Lowell submitted an ENF on the South Campus Parking Garage, a 760-space garage, on April 2, 2012, as an early filing under the SRP, and received a Certificate from the Secretary on May 11, 2012. Under the SRP, a

Strategic Development Plan (SDP) was required as an Expanded Notice of Project Change (NPC) on the South Campus Parking Garage project. The scope of the SDP was to include cumulative environmental effects, analysis of alternatives, and appropriate mitigation for projects in the University's Five-Year Capital Projects Plan (2011-2016). Figure 1.1 illustrates University conditions in 2011, and Figure 1.2 illustrates the expected footprint of new facilities in 2016.

An existing conditions assessment was carried out by the University in collaboration with the Division of Capital Asset Management (DCAM) in 2009, setting the stage for on-going master planning work on a rolling basis for UMass Lowell's three campuses—North Campus, South Campus, and East Campus.

While this work was underway, the University received state funding for a new academic building on its South Campus. This project, the Health and Social Sciences Building, was programmed to serve the needs of the Psychology, Criminal Justice, and Nursing programs.

With work underway to increase academic space on South Campus, the University turned its attention to the physical needs of the Colleges of Science and Engineering on North Campus. A North Campus Science and Engineering Plan

was begun in 2010 and completed in November of 2011 with a focus on lab and research space modernization. In anticipation of the opening of the Health and Social Sciences Building early in 2013, a South Campus Sector Plan was recently initiated to look at growth needs over the next five to ten years, and to identify space needs and opportunities for building and infrastructure upgrades, analyze campus site organization and, potentially, identify needed additional new construction. That work will be complete in fall 2012.

The University's Strategic Development Plan will provide the following information in support of this submission:

- 1 **History and Context**
- 2 **Existing Conditions, 2011**
- 3 **Planning for the Future**
- 4 **Current Capital Projects Plan**
- 5 **Environmental Effects**

University Buildings, 2011*

NORTH CAMPUS (18 buildings)

49 East Meadow Lane	1971
61 East Meadow Lane	1971
Alumni Hall	1950
Ball Hall	1958
Costello Gymnasium	1967
Cumnock Hall	1954
Eames Hall	1949
Falmouth Hall	1907
Grounds Maint. Garage	1966
Kitson Hall	1902
Lydon Library	1969
North Power Plant	1910
Olney Hall	1974
Olsen Hall	1974
Pasteur Hall	1938
Perry Hall	1950
Pinanski Center	1968
Southwick Hall	1902

SOUTH CAMPUS (15 buildings)

150 Wilder Street	1905
820 Broadway Street	1890
Allen House	1854
Bellegarde Boathouse	1984
Coburn Hall	1894
Concordia Hall	1966
Dugan Hall	1962
Durgin Hall	1976
Mahoney Hall	1960
McGauvran Building	1974
O'Leary Library	1974
Sheehy Hall	1989
South Campus Dining	1972
South Power Plant	1966
Weed Hall	1966

EAST CAMPUS (11 buildings)

Ames Textile Mill	1968
Bourgeois Hall	1960
Donahue Hall	1989
East Parking Garage	2007
Fox Hall	1973
Institute for Plastics Innovation	1971
Leitch Hall	1960
Campus Recreation Center	2001
Tsongas Arena	1997
University Crossing	1959
Wannalancit Mills	1862

THE ICC (1 building)

1	Inn & Conference Center	2009
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*Please see Chapters Two and Four for detailed maps by campus, with building locations.

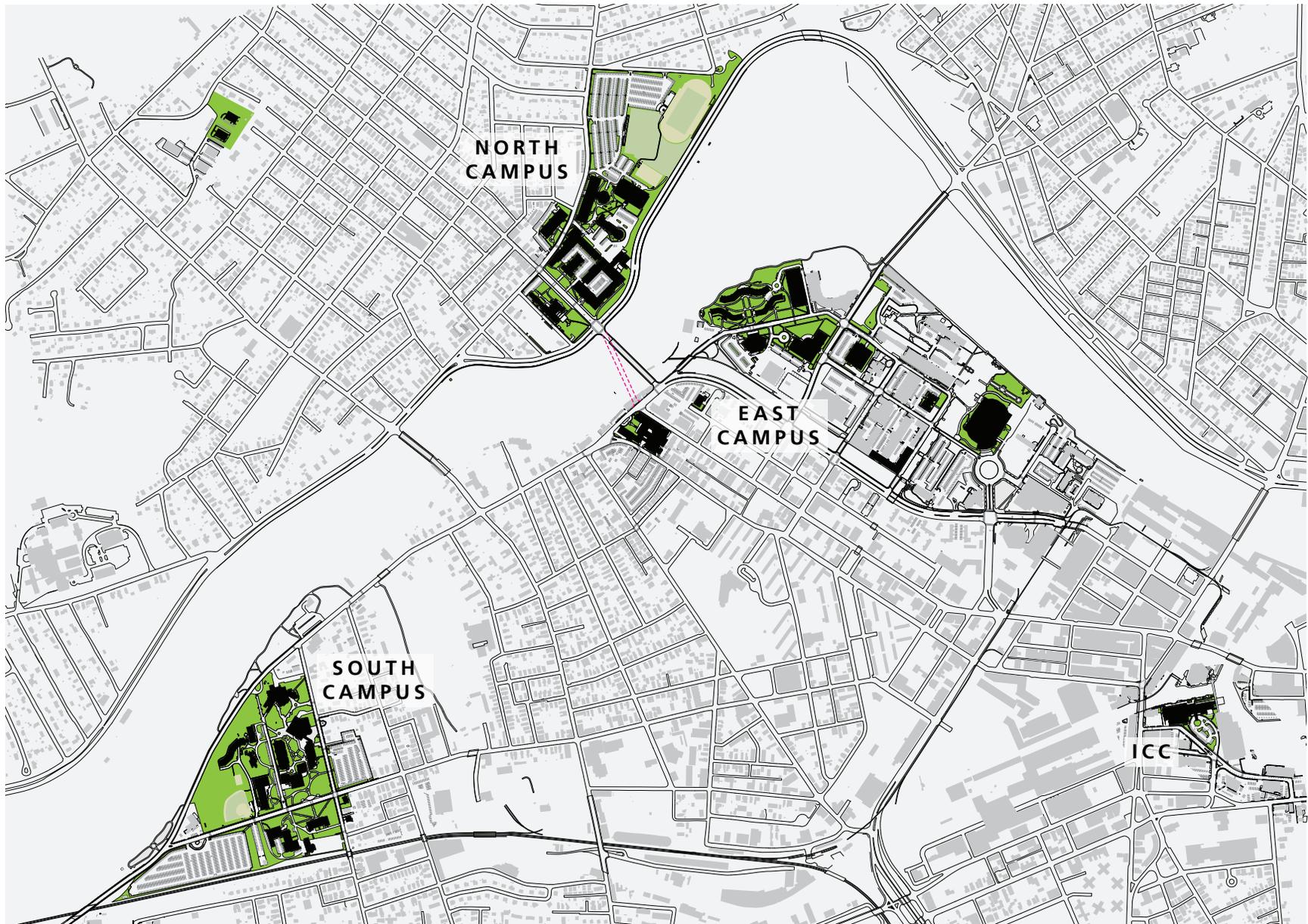


Figure 1.1: University of Massachusetts Lowell: Existing Conditions Map of North, South, and East Campuses, 2011

University Buildings, 2016

NORTH CAMPUS (20 buildings)

49 East Meadow Lane	1971
61 East Meadow Lane	1971
Alumni Hall	1950
Ball Hall	1958
Costello Gymnasium	1967
Cumnock Hall	1954
Demolished: Eames Hall	1949
Falmouth Hall	1907
Grounds Maint. Garage	1966
Kitson Hall	1902
Lydon Library	1969
North Power Plant	1910
Olney Hall	1974
Olsen Hall	1974
Pasteur Hall	1938
Perry Hall	1950
Pinanski Center	1968
Southwick Hall	1902

New Projects

ETIC	2012
North Campus Garage	2012
Manning School of Business	2016

SOUTH CAMPUS (17 buildings)

150 Wilder Street	1905
820 Broadway Street	1890
Allen House	1854
Bellegarde Boathouse	1984
Coburn Hall	1894
Concordia Hall	1966
Dugan Hall	1962
Durgin Hall	1976
Mahoney Hall	1960
McGauvran Building	1974
O'Leary Library	1974
Sheehy Hall	1989
South Campus Dining	1972
South Power Plant	1966
Weed Hall	1966

New Projects

Health & Social Sciences Building	2013
South Campus Garage	2013

EAST CAMPUS (11 buildings)

Ames Textile Mill	1968
Bourgeois Hall	1960
Donahue Hall	1989
East Parking Garage	2007
Fox Hall	1973
Leitch Hall	1960
Campus Recreation Center	2001
Tsongas Arena	1997
Wannalancit Mills	1862

New Projects

University Suites	2013
University Crossing	2014

THE ICC (1 building)

1 Inn & Conference Center	2009
---------------------------	------

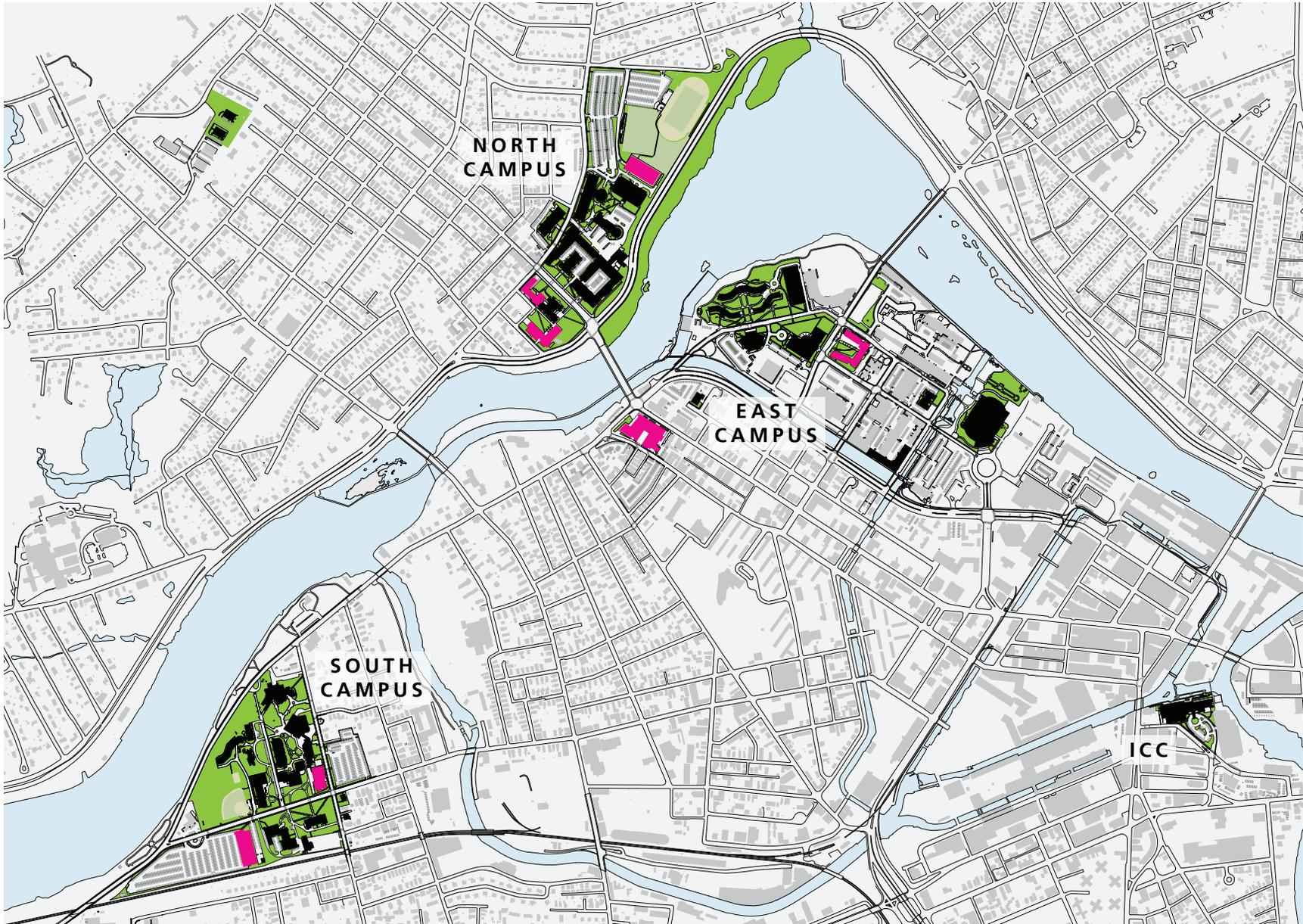


Figure 1.2: University of Massachusetts Lowell: Future Conditions, 2016



Chapter One History and Context

Strategic Development Plan 2011-2016 University of Massachusetts Lowell



History and Context

1.1 Original Schools

UMass Lowell's present campus and physical context are defined by the historic campuses of Lowell State College and Lowell Technological Institute, which merged in 1975 to become the University of Lowell, and then became part of the University of Massachusetts system in 1991. The campuses combine Lowell's long and storied industrial and educational traditions.

Lowell State College is now UMass Lowell's South Campus. Originally Lowell Normal School, it was founded in 1894 and occupied what is now Coburn Hall. Lowell Normal School was the state's last Normal School; Frank F. Coburn was the City's advocate, lobbying the state to locate the school in Lowell. The school later became a teacher training school, and in the 1970s, during Daniel O'Leary's presidency, the college expanded both its areas of study and its campus to become Lowell State College.

Lowell Technological Institute, now North Campus, has its origins in Lowell's textile mills. In 1895, the State Legislature offered a grant of \$25,000 to each of the state's four major textile manufacturing cities to found a Textile School. Lowell offered to build the school, and Lowell Textile School opened two years later in downtown Lowell. The school taught the theory and technique of the textile industries, and as its course offerings and student population grew, it established what would become UMass Lowell's North Campus with the building of Southwick Hall. This move provided the school with more space in which to expand both its physical boundaries and course offerings as it transitioned from a trade school to Lowell Technical Institute in 1953.



Top: Coburn Hall, South Campus—home to Lowell's Normal School, 1899; bottom: Southwick Hall, North Campus—home to Lowell's Textile School, 1918

1.2 Existing Facilities

University-Wide

UMass Lowell comprises forty-five buildings and 3.4 million gross square feet among its three campuses. There has been limited new construction on campus over the last thirty years; the last buildings constructed were Sheehy Hall on South Campus (1989), Donahue Hall on East Campus (1989), and a recreation center and garage on East Campus (2001 and 2007, respectively). Similarly, deferred maintenance and modernization of existing buildings was limited in those years. Existing space and facilities are discussed in more detail in Chapter Two.



Campus Recreation Center, East Campus

1.3 The Urban Context

University-Wide

As illustrated on Figure 1.7, UMass Lowell is an urban university, physically woven into the fabric of the City. While academic, research, and support functions are spread among three campuses— North, South, and East—each one is relatively compact. North and South are primarily academic in use, while East Campus supports the University’s student residences, dining, recreation, as well as some research, administration space, and the 6500-seat Tsongas Arena. In terms of character, North is the most densely developed and typically urban, while South has a more traditional, collegiate feel. East is a combination of historical mill buildings and more contemporary development. All campuses are in close proximity. North and East are separated only by the Merrimack River, and South Campus is one mile away along Pawtucket Street. Downtown Lowell and the University’s Inn and Conference Center (ICC) are within a mile of each campus, and are easily accessible by Lowell Regional Transit Authority (LRTA) buses and UMass Lowell shuttles.

Beyond proximity, the University is physically and visually connected to downtown Lowell via the historic canals, which border North and East Campuses and run through the downtown. Downtown Lowell offers an increasing range of



A historic Lowell canalway, adjacent to the University’s downtown Inn and Conference Center

retail, dining, and entertainment choices to students, faculty, and staff.

As the University grows to accommodate increased enrollment, it is doing so in a way that reinforces the sense of one UMass Lowell community; the acquisition of the former St. Joseph’s Hospital and its transformation into University Crossing, the University’s first campus center, speaks to that goal. Further, as development takes place on the campuses, it is being pursued primarily through infill within existing University footprints. The University places a high priority on

its positive, working relationships with the City of Lowell, the National Park Service, and the Lowell Plan—and works collaboratively with them on a wide variety of planning, infrastructure, civic, cultural, and economic development initiatives.

UMass Lowell also owns a former Massachusetts Department of Youth Services (DYS) campus in Chelmsford at the Lowell City line, approximately 1.75 miles west of South Campus. The parcel is about thirty-two acres, and includes four abandoned buildings in poor condition and one structure leased to

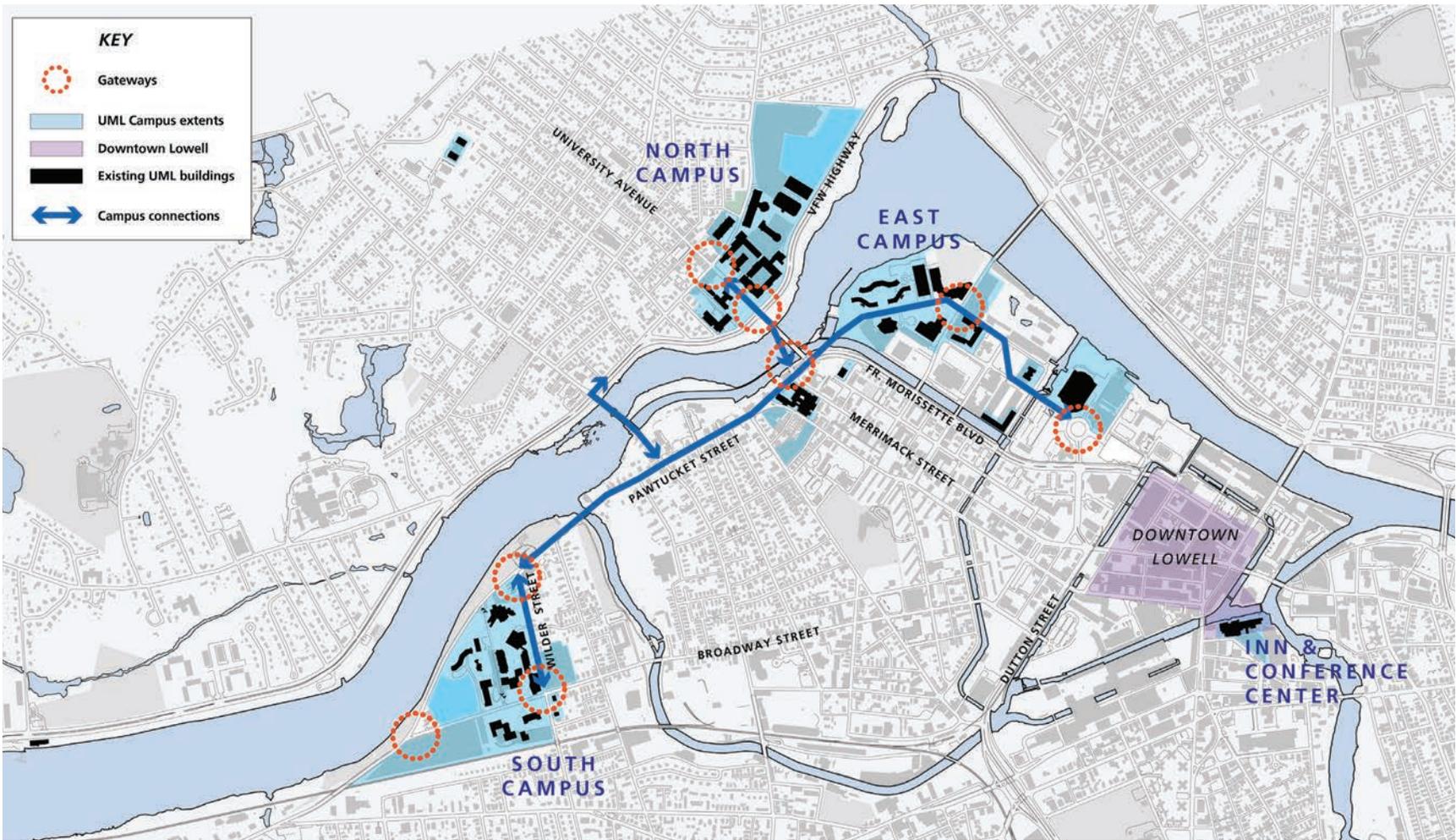
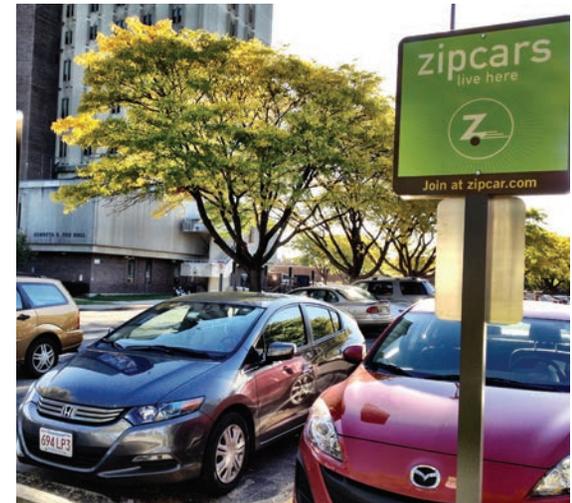


Figure 1.3 The University's Urban Context

DYS for use as a youth residence. There are no plans for reuse or occupancy of this site.

Access between campuses is enabled by multiple modes of transportation: UMass Lowell shuttles, cars, Lowell Regional Transit Authority (LRTA) buses, walking, and bicycling. As the University has pursued the goal of housing fifty percent of the undergraduate student body in on-campus housing, it has intensified its program of transportation demand management (TDM), encouraging more pedestrian and bicycle traffic to and from the campuses, actively promoting ride-sharing, and providing the infrastructure to encourage multi-modal travel. These efforts will be described in more detail in Chapters Two and Three.

The University and the City benefit from the rich cultural history of Lowell, birthplace of the American Industrial Revolution. The presence of the Lowell National Park is a rich source of cultural programming and identity for the entire community. Through a unique partnership between the University and the Park Service, the renowned Tsongas Industrial History Center provides educational programs for students in grades three through graduate school. In addition, the presence of many historic buildings—on campus and in Lowell—adds richness to the urban context. Parts of East Campus are located within the Downtown Lowell Historic District



Students travel by multiple modes of transportation



The Lowell Riverwalk connects students to downtown (including the new University Suites residence hall). Among the University's forty-five buildings, eighteen are at least fifty years old. The style and character of these legacy structures reflect the heritage of the City and the University.

UMass Lowell's proximity to the Merrimack River produces a variety of important views. Views towards the University reinforce its identity, while views from the University, especially towards the river, provide a sense of place that is simultaneously urban and natural. Views between the three campuses provide a sense of cohesiveness and aid in way-finding and orientation.

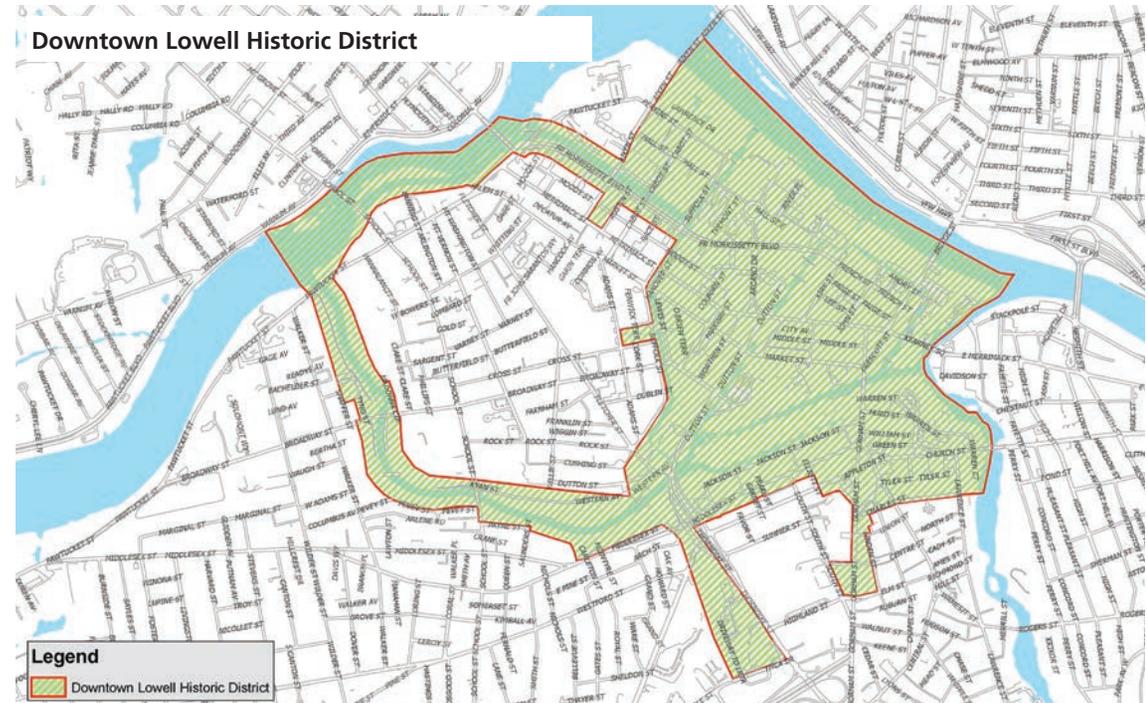


Figure 1.4 Downtown Lowell Historic District

Each Campus also has natural gateways and thresholds that help define the University's edges and reinforce connections. These gateways have been enhanced with signage and landscaping within the past two years, establishing clear direction to visitors about their location and destination.

With over 550 new exterior signs, those walking and driving to UMass Lowell destinations are able to find their way with a new ease and efficiency. In addition, the improved wayfinding—which includes granite monuments marking the entrances to each Campus, new exterior building signs, University arrival directional signs, map kiosks, and bus route/University maps at bus stop shelters—has also brought a new, consistent, and contemporary identity to the three-campus University.



Components of the University's new signage program

1.4 The Environmental Context

UMass Lowell is located in a densely developed urban environment and not within particularly sensitive environmental regulatory areas. The primary environmental issues spring from transportation, energy use, and storm water management.

Rare Species

A review of the Massachusetts Natural Heritage Atlas, Thirteenth Edition, dated October 1, 2008, indicates that the North and South Campus sites are not Priority Habitats of Rare Species and Estimated Habitats of Rare Wildlife. The East Campus is not a Priority Habitat of Rare Species, but abuts the Merrimack River which is a Priority Habitat of Rare Species and also an Estimated Habitat of Rare Wildlife.

Wetlands, Waterways, and Tidelands

There are no wetlands or tidelands on occupied portions of UMass Lowell property. UMass Lowell does own eleven acres along the Merrimack River north of the University Avenue Bridge, comprising bank, bordering vegetated wetland, and riverfront area under the Massachusetts Wetland Protection Act. There are no plans to alter this area—it will remain as green space for the foreseeable future.

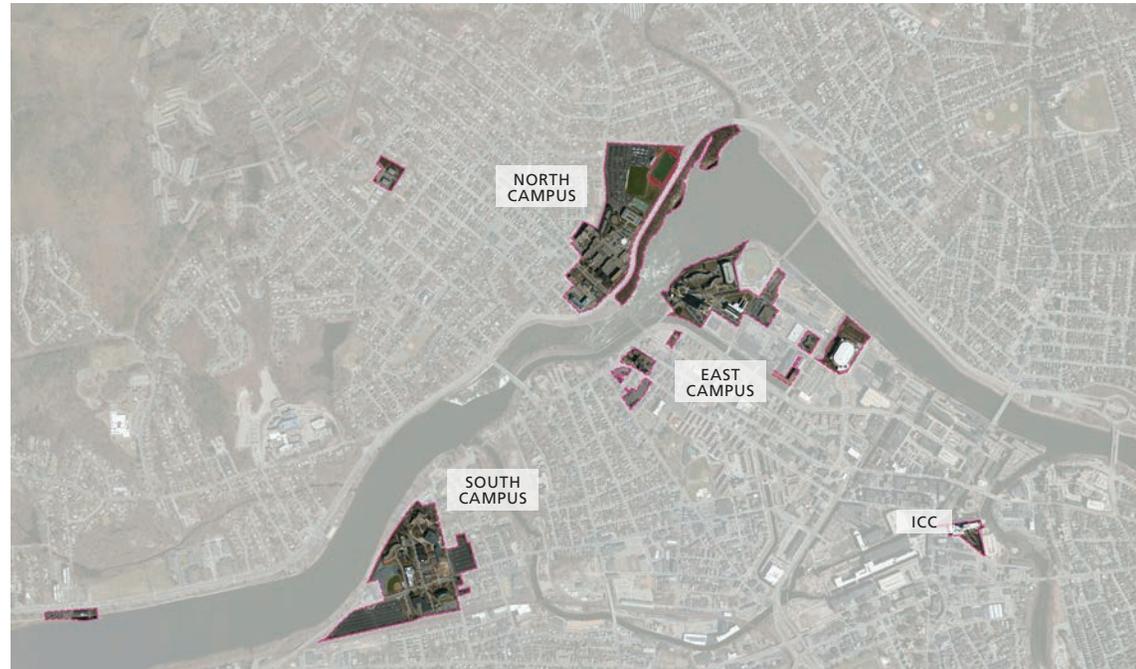


Figure 1.5 Aerial view of the City of Lowell and the three UMass Lowell campuses

Floodplain

The floodplain information for the areas near the University are illustrated on the next three pages. This information is from the Federal Emergency Management Agency (FEMA) and is current as of January, 2012.

North Campus

The majority of the North Campus (Figure 1.6) is located outside the floodplain boundaries. No occupied part of the campus is within the 100-year floodplain, though the riverfront land along the Merrimack owned by UMass Lowell is in the 100-year flood plain. There are no plans to develop that river front area. A small part of the northeast section of the North Campus is within the 500-year floodplain.



Figure 1.6 North Campus Floodplain, University of Massachusetts Lowell

MEPA Flood Zones

- 100-year Floodplain
- 500-year Floodplain
- Campus Boundary

South Campus

Nearly all of South Campus (Figure 1.6) is outside the 100-year and 500-year floodplains, save for small areas along the Merrimack. These areas are not occupied and present no risk.

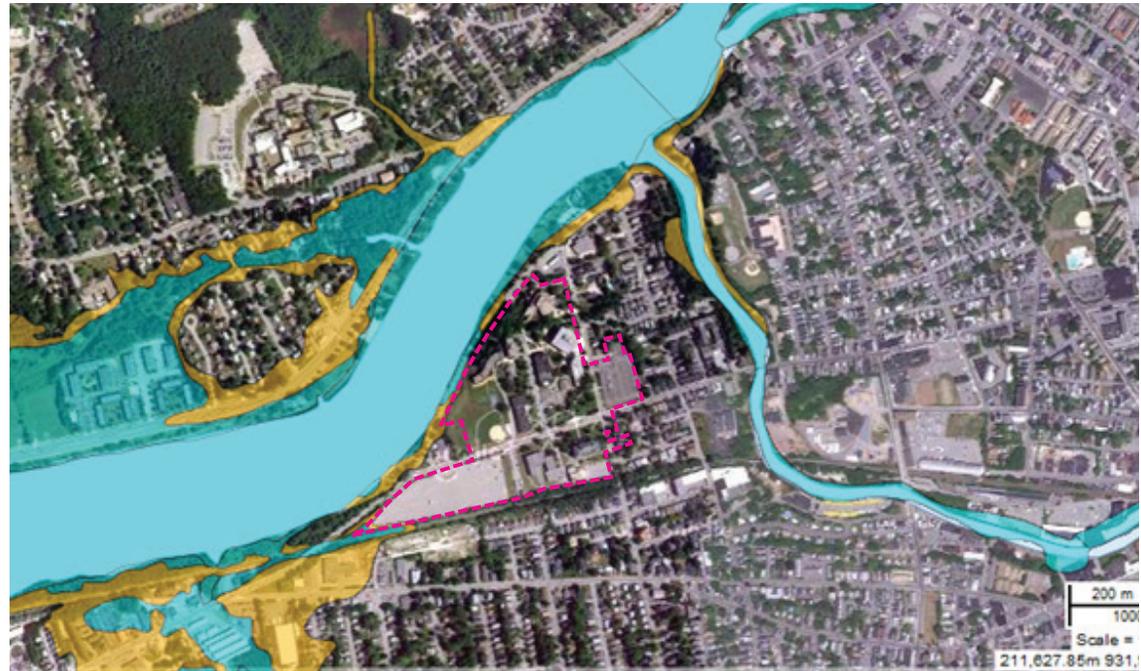
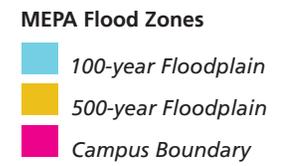


Figure 1.7 South Campus Floodplain, University of Massachusetts Lowell



East Campus

A small band of East Campus (Figure 1.8) along the northeast border of the campus is within the 100-year flood plain; this area includes surface parking and does not include any buildings.

On balance, flooding presents little or no risk to the University. Care is taken in locating and designing riverfront uses to avoid any adverse effects.

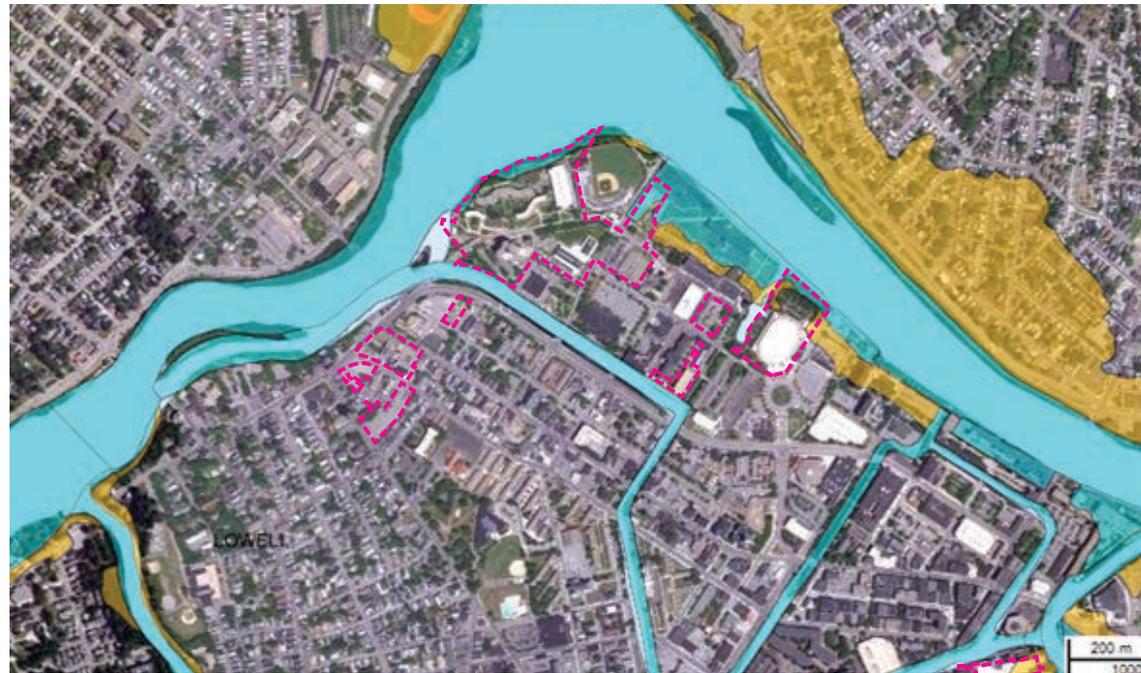


Figure 1.8 East Campus Floodplain, University of Massachusetts Lowell

MEPA Flood Zones

- 100-year Floodplain
- 500-year Floodplain
- Campus Boundary

Water Supply, Wastewater, Stormwater Management

UMass Lowell gets its water from the Lowell Regional Water Utility (LRWU), discharges its sanitary sewer to the Lowell Regional Wastewater Utility (LRWWU), owns and maintains all its steam lines, and receives gas and electricity from National Grid. The City owns and maintains all catch basins and manholes located in public ways, while UMass Lowell owns and maintains such structures on its property.

The City is undertaking a long-term project to separate storm and sewer drains, a process in which the University participates when one of the campuses is in the work area. UMass Lowell has participated in two projects to date, on North Campus in 2006 and on East in 2010. Close attention is paid to managing stormwater on-site for new projects to avoid overloading combined sewer and stormwater drains that have not yet been separated. Training is provided to University employees regarding proper disposal protocols.

Throughout the University, stormwater quality is a priority: parking lots are swept annually, catch basins are cleaned annually, maintenance of water quality structures is performed as detailed by the manufacturer, and the salt used for winter maintenance is stored at a secure shed on South Campus.

Transportation

The multi-campus environment poses certain challenges for access to and between University locations. In order to address this challenge, as well as the historical pattern of drive-alone commuting to UMass Lowell by students, faculty, and staff, the University undertook its first comprehensive Campus Transportation Plan in 2011. The goals, findings, and recommendations emerging from the Plan are discussed in Chapters Two and Three. The process of focusing attention on the need to promote more sustainable modes of transportation has already led to some important shifts in policy, planning, and coordination with the City of Lowell, including the hiring of a UMass Lowell Transportation Demand Management (TDM) coordinator. The University participates in the MA DEP Rideshare Program, and conducted its most recent rideshare survey in 2012. With a planned expansion in TDM activities, a goal of housing fifty percent of undergraduate students, continued monitoring of parking pricing, and other policies, UMass Lowell expects to see a substantial increase in the non-auto share of travel to and around the University by 2016.

Energy

In 2012 the University updated its Climate Protection Plan (CAP), which provides a pathway to achieve zero net energy by 2050. In the short term, the University has taken many steps to reduce energy use, as discussed more fully in Chapter Three.

There are a number of key recent actions, including:

- Conversion from oil to natural gas as primary fuel
- Adoption of a minimum standard of LEED Silver for all new construction
- Replacement of boilers at North Campus Power Plant in summer 2012
- Replacement of the Tsongas Center's Freon-chilled ice rink bed with a high efficiency, indirect refrigeration system in 2011
- Rolling system of lighting efficiency audits and improvements, University-wide
- Survey of leaking steam traps and replacement with energy efficient traps

- Generation of on-campus renewable energy through solar photovoltaic panels
- Adoption of building automation software (BAS) to better manage energy demand and load response
- A renewed focus on sustainability in planning, design, and operations
- Commitment to University-wide education and awareness regarding energy conservation

The University has established a goal of reducing annual energy use by more than the equivalent of 14,000 metric tons of carbon dioxide (MTCO₂) by 2020.

Solid and Hazardous Waste

Since 2008, UMass Lowell has had a “Zero Sort” recycling program in effect throughout the University, with annual increases in the amount and percentage recycled. With respect to hazardous waste, as might be expected, when there is excavation typical urban soils are sometimes found, which are managed in accordance with Massachusetts Department of Environmental Protection (MassDEP) regulations and policy. Recently, during excavation for the University Suites residence hall on East Campus, typical urban soils requiring attention were identified and were managed on-site and off-site by the construction management firm consistent with MassDEP policy and procedure.



Wannalancit Mills, built in 1862

Historic Resources

UMass Lowell is located in an area rich in historic resources, including the presence of many buildings fifty years of age or older. As the University expands, modernizes, and renews its facilities, it values Lowell’s unique historical context, as well as the historical nature of many of its own buildings. Based on a 2010 Memorandum of Agreement between the University of Massachusetts Building Authority (UMBA), the University of Massachusetts Lowell, and the Massachusetts

Historic Commission (MHC), UMass Lowell has agreed to undertake a survey of University buildings that are fifty years of age or older. The survey will include the completion of MHC Inventory Forms and filing of completed forms with MHC. The survey will also inform the ongoing University planning efforts as it continues to renew and reuse its historical and other buildings. This is now underway and is expected to be complete in fall 2012.





Chapter Two Existing Conditions

Strategic Development Plan 2011-2016 University of Massachusetts Lowell



Existing Conditions



This chapter provides an overview of UMass Lowell's campus today, considering the present size, utility, and location of sites and buildings, followed by an overview of the transportation network, utilities, and infrastructure.

Each of the academic campuses bears the remnants of its history as an independent institution (North and South Campuses) or district (East Campus), with the result that there is some duplication of facilities, though the total is still insufficient to serve recent and expected growth. Each academic campus has libraries, academic buildings, athletic facilities, dining, residences, etc. The major academic schools are now distributed among the three campuses, though there are core locations for each. The College of Sciences, Francis College of Engineering, and the Manning School of Business are centered on the North Campus, with some additional research facilities on East. The College of Fine Arts, Humanities, and Social Sciences (FAHSS) is centered on South

Campus, as are the Graduate School of Education (GSE) and the School of Health and Environment (SHE). FAHSS and SHE also both have departments located on North. Student life, administrative, and service facilities are generally spread among the campuses, though East Campus is the primary focus for student life.

The open space, spatial character, and physical vocabulary of each campus are distinct, and the task of functional integration and spatial identity is one of the University's current challenges.

The low investment decades—from about 1985 to 2007—created a backlog of need in several ways. Academic and residential facilities were maintained, but not modernized to keep up with contemporary academic needs; deferred maintenance grew and operating systems were continued with few updates. This backlog of functional and physical renewal needs is accompanied by a simple shortage of space—the result of

enrollment growth, new ways of providing teaching and learning which call for more space per student, and increases in research and other academic life functions which are now under-sized. Many campus outdoor spaces are similarly ripe for improvement and renewal.

These physical plant challenges notwithstanding, UMass Lowell has many strengths upon which to build a vibrant future. The Merrimack River is a key part of the City's history and the University's identity, offering breathtaking views, a link to the City's past, and a feeling of openness in an urban environment. UMass Lowell is knit into a diverse, storied, and welcoming host City. The three campuses of the University provide a solid foundation for growth, change, and excellence.



View to the Merrimack River from Allen House, South Campus

2.1 Campus Exterior Spaces

University-Wide

The central spaces—symbolic areas of lawn, quad, or views that serve as organizing elements for many campuses—are under-articulated at UMass Lowell. There are nascent versions of such spaces, often developed in relation to major building sites, but there is much to be done to improve the spatial organization of the campuses, which now center on major arterial roads. Each of UMass Lowell’s campuses includes streetscapes, plazas, quadrangles, and athletic fields, and they are discussed by campus in the following pages.

Overall, as Table 2.1 shows, impervious surfaces exceed pervious surfaces, as might be expected in a urban University. This provides the opportunity to address most University space needs without creating additional impervious space.

University-wide, over forty-eight percent of the land surface is “green,” providing much opportunity for future planning to reinforce the University’s outdoor spaces as a focus for student life and to provide additional environmental benefits.

Campus Green Space and Impervious Surfaces, 2011

	North Campus ¹	South Campus	East Campus ²	TOTAL UML
Total Green Space	32.05	18.21	15.47	65.73
Roof Areas	6.96	5.04	10.87	22.87
Other Paved Areas	13.82	15.84	16.72	46.38
Total Impervious Area	20.78	20.88	27.59	69.25

(1) Includes 11.0 acres of undeveloped Merrimack River frontage.
 (2) Includes University Crossing and the Inn & Conference Center.

Table 2.1 *Summary of Campus Green Space and Impervious Surfaces, 2011, in acres*

The University Landscape

Over the last few years, significant improvements have been made to existing landscaped areas on all three campuses. With the hiring of a new grounds manager in 2009, there has been a renewed focus on implementing a landscape restoration and improvement program based on sustainable practices.

Over these past three years, landscape restoration projects have included improvements to paved and planted areas. UMass Lowell is implementing a number of sustainable landscape practices, among them:

- Use of perennials, low maintenance, or native species whenever possible
- Recycling and redistributing plantings to create more and better balanced landscaped areas
- Healing of worn lawns, particularly on East Campus, through a dedicated program of re-seeding and aerating the earth. Working with a mix of grass seed that includes drought-hardy varieties has led to great success in bringing campus lawns back to health, as well as reducing the amount of water needed for irrigation.



The quad by Weed Hall, South Campus

Notable landscape project milestones include:

- Planting of more than fifty new trees University-wide
- Care and cataloging of the University's wealth of mature trees—over forty-two distinct species—resulting in UMass Lowell becoming the first Massachusetts' college or university to earn the "Tree Campus USA" designation from the national Arbor Day Foundation
- Redesign and restoration of entrance area paving and plantings at significant campus sites, including: Allen House, Weed Hall, Cumnock Hall, and along Solomont Way
- Healing and restoration of lawns at the Recreation Center and residence halls to better support their regular, energetic use by students
- Upgrade of University-wide irrigation controls for more efficient water use
- Creation, with UMass Lowell students, of a student community garden on East Campus

North Campus

North Campus is framed by two streetscapes—University Avenue and Riverside Street—and the Merrimack River. University Avenue is the central spine to the Campus, bordered by the front lawns of prominent and historic buildings such as Southwick Hall and Cumnock Hall. This is the current location of the UMass Lowell shuttle stop and with planned new facilities and the new MassDOT University Avenue bridge in construction, the University Avenue lawn frontage will continue as a major organizing campus green space.

Riverside Street is an important regional connection bordered by Olsen Hall's planters and small plazas, small lawn areas at Ball and Olney halls, and the Riverside Parking Lot and its collection of mature honey locust trees. The Merrimack River is separated from the campus by an unimproved, steep river bank, and by the Veterans of Foreign Wars Highway, a major regional arterial roadway. Even so, the river is vividly present through views and adds to North Campus' sense of place.



Cumnock Hall on University Avenue

This North Campus map, Figure 2.1, identifies the pervious and impervious areas of the North Campus in 2011. The Cushing Field Complex, located at the northeastern edge of North Campus, is a multi-purpose track and athletic field. There are three somewhat more open areas which serve as informal quads, and the rest of the Campus area is either paved/roofed impervious space, including walkways, or more formal landscaped green space. As Table 2.1 shows, North is the “greenest” campus, with over fifty-three percent pervious surfaces.



Figure 2.1 North Campus: Green and Impervious Surfaces, 2011

South Campus

Though very different in spatial quality, South Campus is also framed by two main streets—Broadway and Wilder—and by the Merrimack River. On South, a more traditional campus site organization defines several quad areas, as well as a landscaped edge facing the river.

The map of South Campus in 2011, Figure 2.2, on the next page, identifies the site's green spaces and impervious areas.

The Wilder Street frontage features walks, small lawns and plazas, and loading areas. Wilder's heavy concentration of service accesses expresses its long term function as a service corridor. The South Campus Bus Stop and Plaza is located adjacent to a plaza and major gateway between McGauvran and O'Leary along the Wilder frontage.

Broadway is the primary access to major South Campus site areas, and is likely to be enhanced over time as a more pedestrian-friendly "front door" for the Campus.



Coburn Hall with its formal lawn, South Campus

The river is separated from South Campus by a steep, forested bank and is primarily engaged through views from the upper part of the Campus.

The South Campus Quad is a semi-traditional campus open space featuring lawns, walks, and trees and is defined by the edges of Weed Hall, O’Leary Library, McGauvran, and South Dining, extending in some ways to Durgin Hall. Coburn Hall is fronted by a traditional, formal campus lawn with paths and mature trees, opening onto Broadway. Allen House is on a hill and includes sloping lawns and a majestic view of the Merrimack River on the western part of South Campus. A second informal quad is formed between Durgin Hall, O’Leary Library, and Concordia residence.

The South Campus Athletic Fields occupy an area roughly triangular in shape and include a soft-ball field and a basketball court, with an attractive view of the Merrimack River. Overall, South Campus is nearly forty-seven percent pervious, largely due to the presence of sports fields and river frontage.



Figure 2.2 South Campus: Green and Impervious Surfaces, 2011

East Campus

Pawtucket Street is East Campus's central spine, with several lawn areas in front of Fox, Bourgeois, and Leitch Halls and a University shuttle bus stop. These buildings' entrance areas and streetscapes are host to various street furniture, bike racks, and University signage. The quad between Donahue, Bourgeois, and Leitch Halls is a strongly-defined lawn that includes several mature trees. This area is typically used as a pedestrian entry to Donahue Hall.

The University's September 11th Memorial, set behind Leitch Hall, is a commemorative landscape overlooking the Merrimack River. Dedicated in 2004, it includes a sculpture and plantings commemorating alumni and members of the University community lost in the September 11, 2001 attacks on the nation.

The Recreation Center's Lawn—framed by mature trees and a paved patio area—is often used for intramural sports and University outdoor events. The Park at the Tsongas Center is also an important outdoor University event space: set between the northern edge of the arena and the Merrimack River, and the western edge of arena and the Suffolk Canal, it is distinguished by lawns, paths, benches, and mature trees oriented toward river and canal views.



Campus Recreation Center lawn, with Fox Hall tower in the distance

The front plaza of University Crossing, a semi-enclosed courtyard, is part of the former St. Joseph's hospital property, overlooking Pawtucket Street. It is expected to be improved as part of the new University Crossing project. Taken together with the Inn and Conference Center (Figure 2.4) and University Crossing, East Campus (Figure 2.3) is the most urban of the three campuses, with about thirty-six percent green space.



Figure 2.3 East Campus: Green and Impervious Surfaces, 2011



The Inn & Conference Center (ICC), Downtown Lowell

The University's Inn and Conference Center's north side fronts the historic Lower Locks, connecting the Pawtucket Canal and the Merrimack River to the Concord River. It includes a covered, outdoor seating area adjacent to the National Park Service's Canal Walk, for users of the dining area and canal boat boarding for the National Park's tours. The remainder of the site is primarily paved, with some edge landscaping.

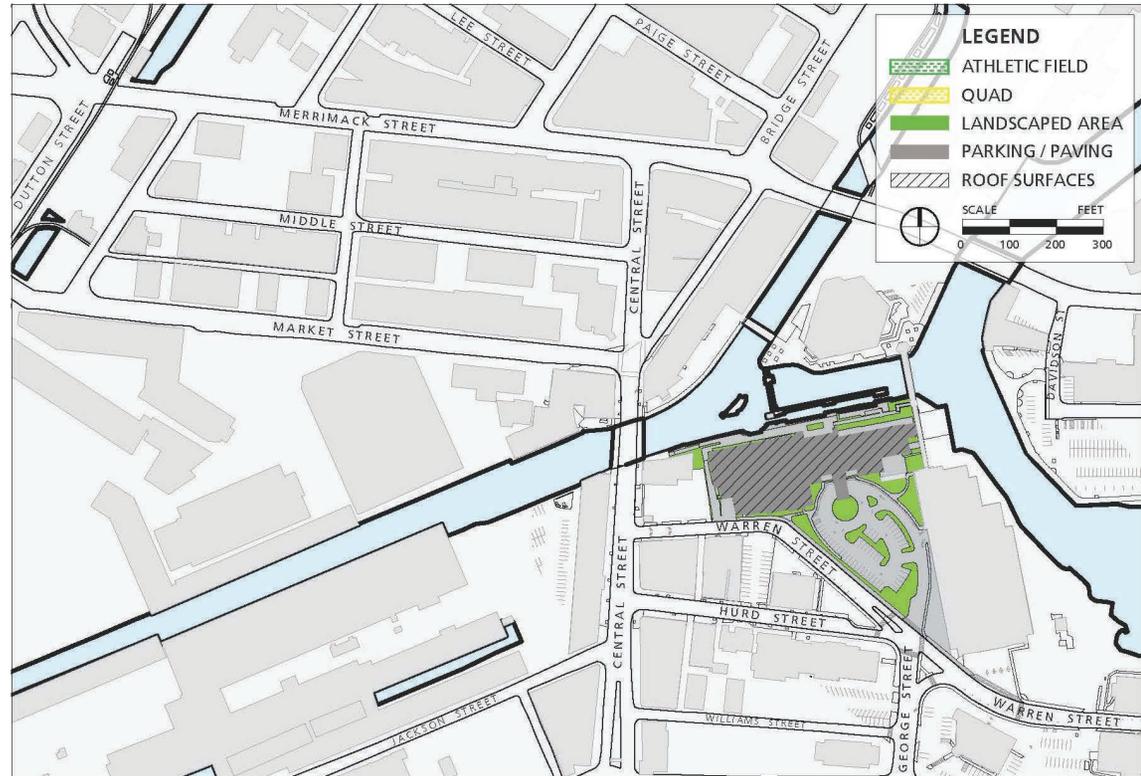
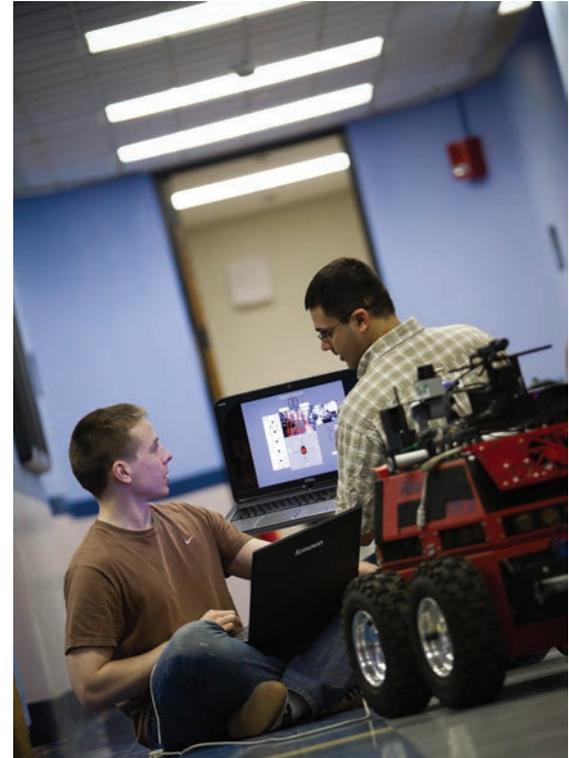
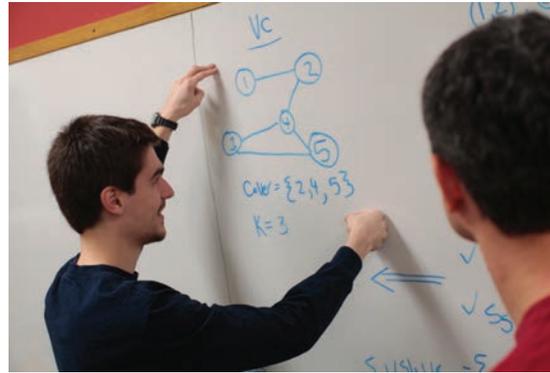


Figure 2.4 The Inn and Conference Center, Green and Impervious Surfaces, 2011

2.2 Campus Interior Spaces

UMass Lowell carries out its activities in 3.4 million gross square feet of space across its three campuses, as of December, 2011. Of that square footage, slightly more than half is academic and research space. Student support spaces—residential and athletic—and administration and service spaces make up the rest. Each campus has a mixture of common facilities and academic spaces focused around particular academic units.

The history of University development is evident in the existing building stock. North and South Campuses each have foundational buildings from the early 20th century. Coburn Hall on South Campus and Southwick building on North Campus served as the original locations for Lowell Normal School and the Lowell Textile School. Together with Allen House on South Campus, these are the primary historic buildings on campus. Significant waves of construction took place after World War II, especially during the 1970s. South Campus, in particular, is made up primarily of buildings from this time, with their heavy concrete construction and limited flexibility. North Campus is from an earlier era.





O'Leary Library, South Campus

Most University buildings are three to four stories high, in keeping with the general character of their neighborhoods.

Table 2.2 illustrates University space distributed by type, University-wide and on each campus. As noted previously, there are shortages of space and the current planning and capital program seeks to address these needs to the extent feasible.

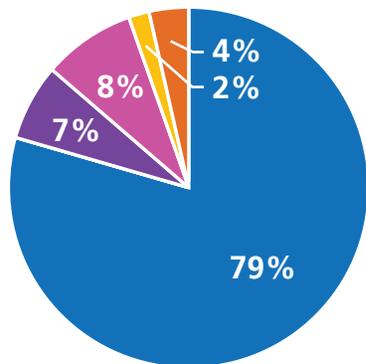
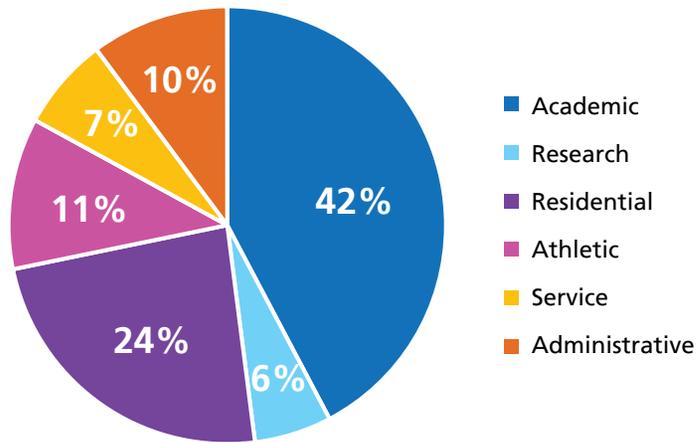
Existing Building Use, 2011

	North Campus	South Campus	East Campus ¹	TOTAL UML
Academic	908,704	520,994	9,422	1,439,120
Research ²	0	0	193,923	193,923
Residential	78,099	117,201	615,105	810,405
Athletic	94,833	11,981	274,120	380,934
Service	21,169	8,044	204,143	233,356
Administrative	40,486	16,673	290,000	347,159
Total GSF	1,143,291	674,893	1,586,713	3,404,897

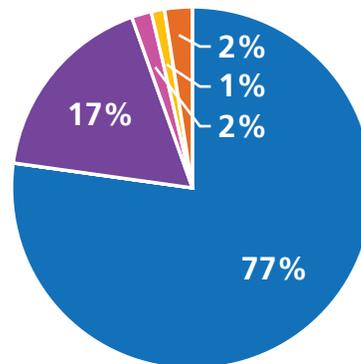
(1) Includes University Crossing and the Inn & Conference Center. (2) Buildings categorized by dominant use, by FICM codes.

Table 2.2 Existing University-wide Building Use, 2011

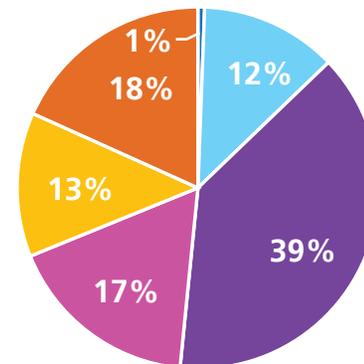
All UML Campuses, 2011



North Campus, 2011



South Campus, 2011



East Campus, 2011

Table 2.3 University of Massachusetts Lowell Building Use, 2011

North Campus

North Campus is primarily comprised of inter-linked academic buildings serving engineering, science, and management disciplines. There are specialty research facilities interwoven on this campus. Many of the core buildings were constructed during the 1950s and 1960s. The Olsen Science Building was added in the 1970s. Most academic buildings on North Campus have not undergone major modernization. In the meantime, teaching and learning in science and engineering have changed in their methods and space requirements. The growth of management activities and the increasingly interdisciplinary nature of research, teaching, and learning in these disciplines suggest that major renewal and modernization, as well as expansion, are needed on North Campus.

The major North Campus athletic facility, Costello Athletic Center, is complemented by the nearby fields and track. Central administration facilities include Cumnock Hall and the Grounds Maintenance building. Unified services provided to all three campuses from this location require more space.



Alumni Hall, North Campus

Academic support facilities include the Lydon and Alumni libraries. As with many other Campus activities, the nature of libraries is changing toward more participative group study, technologically enabled learning, and collaborative research approaches.

NORTH CAMPUS (18 buildings)

1	49 East Meadow Lane	1971
2	61 East Meadow Lane	1971
3	Alumni Hall	1950
4	Ball Hall	1958
5	Costello Gymnasium	1967
6	Cumnock Hall	1954
7	Eames Hall	1949
8	Falmouth Hall	1907
9	Grounds Maint. Garage	1966
10	Kitson Hall	1902
11	Lydon Library	1969
12	North Power Plant	1910
13	Olney Hall	1974
14	Olsen Hall	1974
15	Pasteur Hall	1938
16	Perry Hall	1950
17	Pinanski Center	1968
18	Southwick Hall	1902

Exterior Spaces

- A Riverside Parking Lot
- B Cushing Field Complex
- C Tennis Courts
- D Pinanski Quad
- E Cumnock Quad



Figure 2.5 North Campus Building Use, 2011

South Campus

South Campus is the core location for the College of Fine Arts, Humanities, and Social Sciences, the School of Health and Environment, and the Graduate School of Education. These schools are in the midst of rapid growth, as well as rapid evolution in teaching and learning approaches. Interdisciplinary activities are very much a growth direction for academic groups on both campuses, and development and use of South Campus needs to continue to support this academic direction. Physically, much of this campus was built in the 1970s, with the strengths and weaknesses of that period of architecture.

Presently, O'Leary Library provides an academic learning commons, library services, academic support, and faculty office space. Durgin is the home of UMass Lowell's distinguished music program; McGauvran now houses fine arts space and student activities. The South Campus Dining Hall includes residential dining and a branch of the University bookstore, as well as loading and receiving activities. Weed Hall, also from the 1970s, is now the core facility for the School of Health and Environment. In addition to faculty office space and classrooms, it houses the School's laboratories and specialized teaching spaces for programs like physical therapy and nursing. A new Health and Social Sciences Building (HSSB) is now under construction by DCAM. HSSB, opening in

2013, will provide a primary location for psychology, criminal justice, and some nursing facilities. Coburn Hall, the original South Campus building, now provides classroom space and faculty offices for humanities departments. Although it is a distinguished building, it has not been renewed comprehensively since its construction in 1897, and is in need of full renewal. Dugan Hall provides office space and some classrooms. South Campus also has a power plant. Mahoney Hall includes a small gymnasium, theatre, classrooms, and faculty office space.

There are two residence halls on South Campus: Concordia, with 181 beds, is obsolete, and Sheehy, with 260 beds, is relatively new and in good condition. A South Campus parking garage, with 760 parking spaces, is under construction by the UMass Building Authority on an existing parking lot and is expected to open in 2013.

South Campus has more traditional campus open spaces and site organization than either North or East; however its ground plane is in need of renewal and increased spatial clarity. In addition to a small recreational gymnasium in the Mahoney Building, the South Campus has outdoor softball fields that serve as the major athletic resource at this location.

South Campus is a moderate walk from North and East Campuses, twenty to thirty minutes,



Allen House, South Campus

however pedestrian and cycle routes between the campuses are not appealing. The shuttle service and increased cooperative engagement with the City to improve the environment for walking will need to continue to help reinforce the connection to South Campus for the entire academic community.

The South Campus Sector Plan currently underway is expected to propose both renewal of existing facilities and possible additional academic space.

SOUTH CAMPUS (15 buildings)

1	150 Wilder Street	1905
2	820 Broadway Street	1890
3	Allen House	1854
4	Bellegarde Boathouse	1984
5	Coburn Hall	1894
6	Concordia Hall	1966
7	Dugan Hall	1962
8	Durgin Hall	1976
9	Mahoney Hall	1960
10	McGauvran Building	1974
11	O'Leary Library	1974
12	Sheehy Hall	1989
13	South Campus Dining	1972
14	South Power Plant	1966
15	Weed Hall	1966

Exterior Spaces

- A Riverview Field
- B South Campus Quad
- C Wilder Parking Lot
- D Riverview Parking Lot

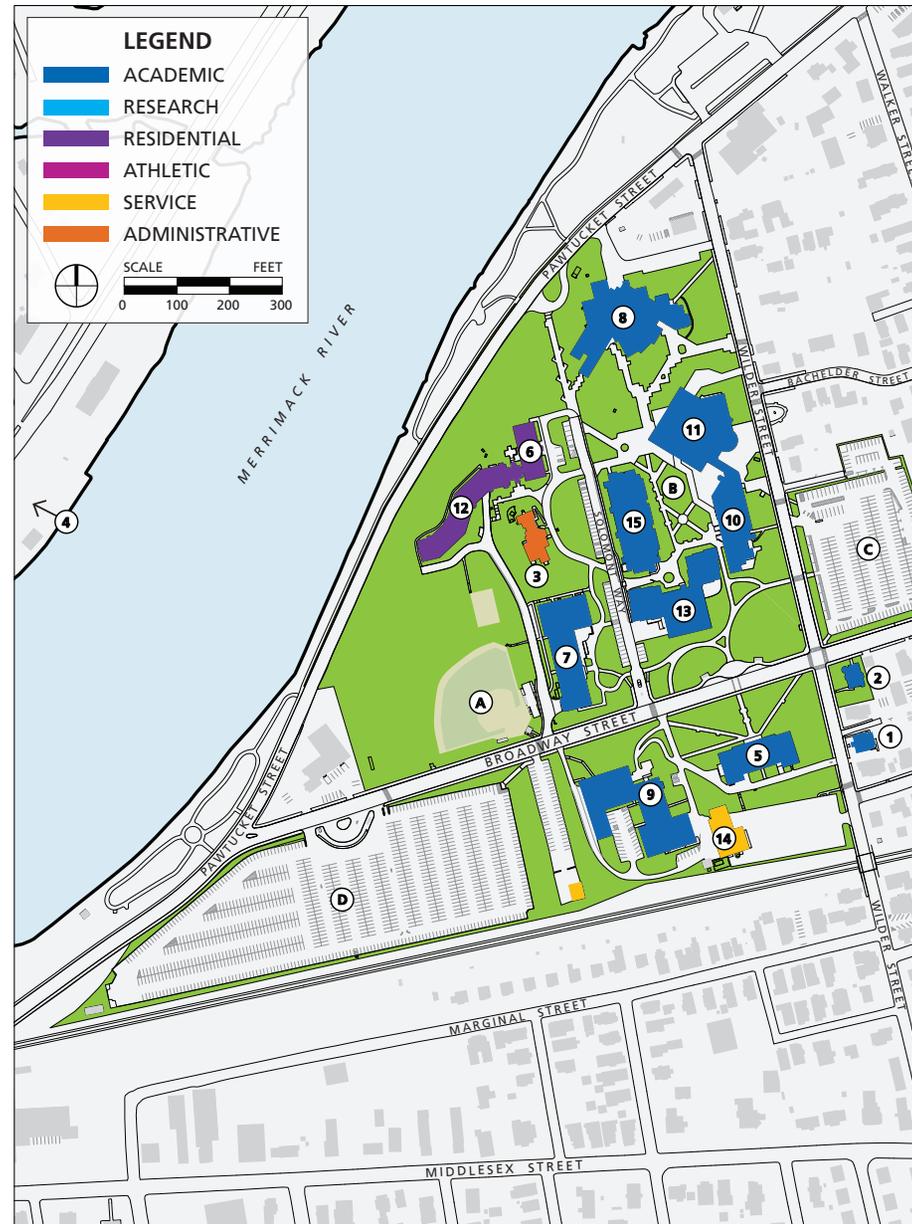


Figure 2.6 South Campus Building Use, 2011

East Campus

Student housing at UMass Lowell is focused on East Campus. One small dormitory, Eames Hall, remains on North Campus; and two (Concordia and Sheehy) remain on South. East Campus' role as a focus for residential, athletic, and student life activities is very clear and expected to continue. East Campus includes Leitch, Bourgeois, Donahue, and Fox Residence Halls, as well as the new University Suites residence, now under construction by the UMass Building Authority on Aiken Street. These are served by the East Garage and surface parking, as well as the campus shuttles. The main student dining facility is in Fox Hall. Also on East are the Campus Recreation Center and the Tsongas Arena, as well as Wanalancit Mills and the Ames Building, which both support research and administrative uses.

In 2010, the Massachusetts Building Authority and the University purchased the Tsongas Center from the City of Lowell and, in 2011, acquired the former St. Joseph's Hospital building, at the corner of Merrimack and Pawtucket Streets, which had sat substantially vacant for several years. Re-named University Crossing, in keeping with the role it will play in bridging the three campuses and providing a central location for student-



Donahue Hall, East Campus

tered activities, it is the most recent addition to East Campus. As illustrated on the East Campus site plan, University Crossing location is a lynch pin for pulling together the disparate campuses into a unified whole. This project is discussed in more detail in Chapter Four.

EAST CAMPUS (11 buildings)

1	Ames Textile Mill	1968
2	Bourgeois Hall	1960
3	Donahue Hall	1989
4	East Parking Garage	2007
5	Fox Hall	1973
6	Institute for Plastics Innovation	1971
7	Leitch Hall	1960
8	Campus Recreation Center	2001
9	Tsongas Arena	1997
10	University Crossing	1959
11	Wannalancit Mills	1862

Exterior Spaces

- A Riverwalk (City of Lowell)
- B Rec Center Quad
- C Perkins Parking Lot
- D University Crossing Parking Lot

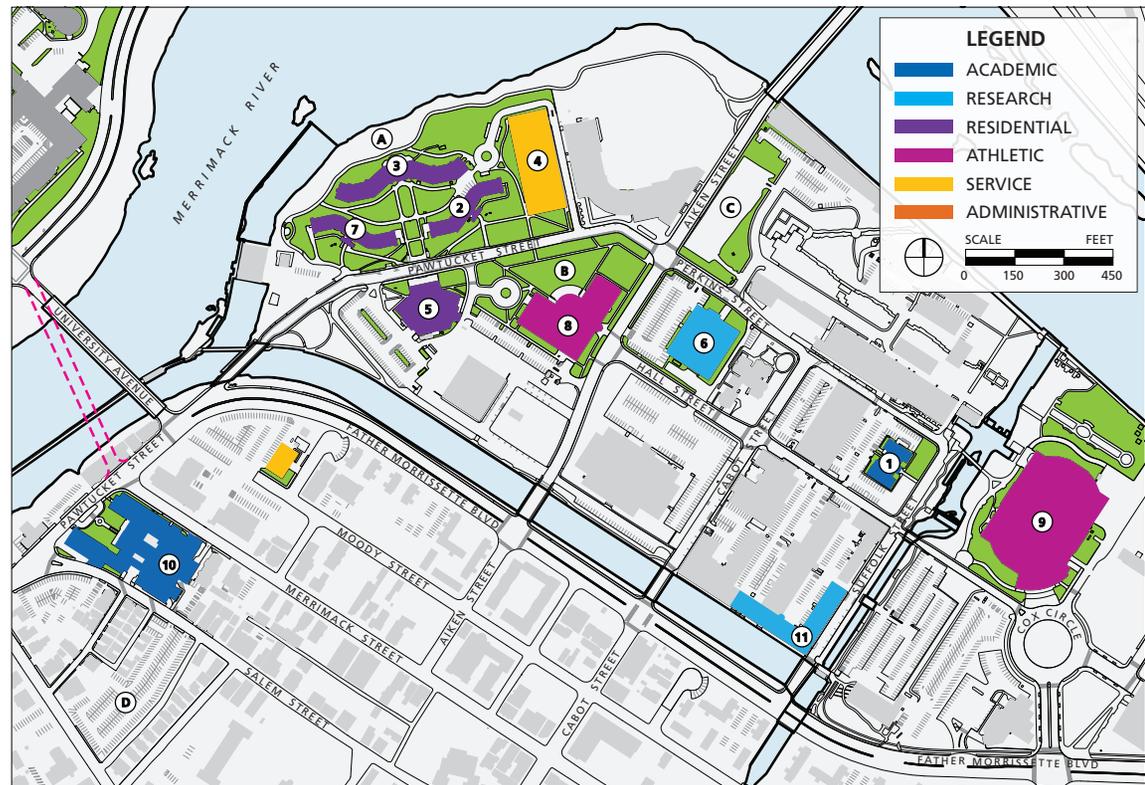


Figure 2.7 East Campus Building Use, 2011

The Inn and Conference Center (ICC)

In 2009, the University of Massachusetts Building Authority purchased a Doubletree Hotel in Lowell's downtown on behalf of UMass Lowell, and transformed it into the Inn and Conference Center (ICC), a residence for 500 students, with thirty-one guest rooms and event space.

The Inn and Conference Center meets several needs: during the academic year it serves as a residence hall on the upper floors and a publicly available academic conference center, with a small capacity for overnight Inn guests; during the summer, the residence hall rooms become part of the Inn's room inventory.

THE ICC (1 building)

1 Inn & Conference Center 2009

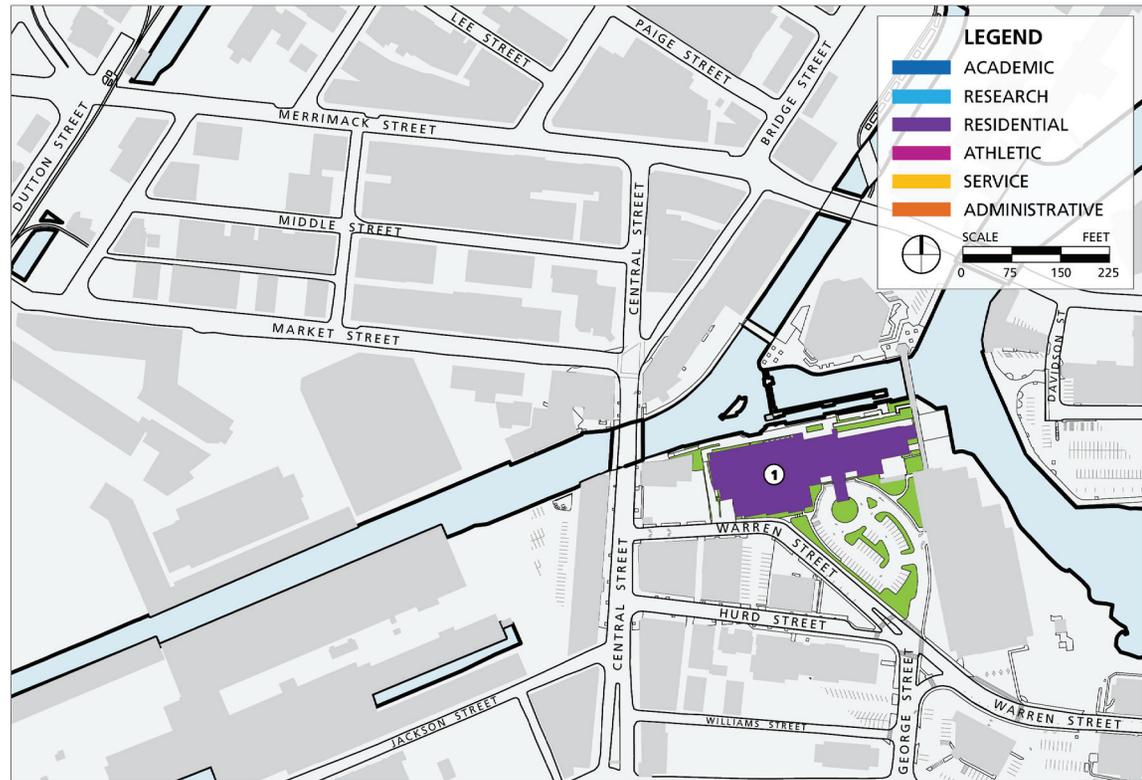


Figure 2.8 Inn and Conference Center Building Use, 2011

2.3 Transportation Context

University-wide

UMass Lowell has a major presence in the City, where it is the second largest employer and has become a very recognizable part of Lowell's identity. University and City life overlap in many ways, not least of which is in sharing the City's transportation infrastructure. UMass Lowell is adjacent to several Lowell neighborhoods: Pawtucketville to the North, the Highlands to the South, and the Acre near East Campus and University Crossing. The Inn and Conference Center is an emerging presence in downtown. As the University increasingly seeks to function as one campus, transit between the various locations takes on increasing importance.

A number of factors contribute to the challenge of creating "one campus/one community." First, the Merrimack River bisects the University. The six river-crossing bridges within Lowell serve several communities north of the Merrimack, including some in southern New Hampshire, and concentrate regional traffic flows within the City. In addition, UMass Lowell's location within a dense urban core surrounded by suburban communities creates a strong orientation toward automobile travel to the University. And finally, the presence of privately-owned canal bridges—which



A UMass Lowell bus shuttle stop with shelter and seating

date back to the heyday of the Industrial Revolution—act as a constraint on travel between campuses, because many of them do not support the weight of intercampus shuttle buses.

Notwithstanding these challenges, the University's transportation needs are well-served in other ways. The City and the University are served by public transportation, notably MBTA Commuter Rail service to the Gallagher Terminal downtown and Lowell Regional Transit Authority (LRTA) bus service from Gallagher to North, South, and East

Campuses. The University has greatly increased the scale, frequency, and reliability of its inter-campus shuttle service over the last several years, carrying more than 3,500 passengers on its busiest days, in spite of the challenges posed by the limited number of river crossings, the need to plan routes around canal bridges, and the weekday congestion experienced on Lowell's local streets.

Finally, the close-grained urban environment presents opportunities as the University moves toward a more residential campus and explores

ways to encourage non-automobile modes of travel both to and between campuses. With its dense roadway network and relatively short distances between campuses and to downtown, UMass Lowell is poised to emerge as a much more pedestrian and bicycle friendly place. Chapter Three describes some of the key findings and recommendations of the 2011 Campus Transportation Plan. These recommendations point to new directions already being taken by the University to manage drive-alone trips and reduce parking demand, improve transportation infrastructure, and introduce new policies, in order to create a more multi-modal and sustainable University environment.

Regional Context

UMass Lowell is located about thirty miles to the northwest from Boston, sixteen miles from Lawrence, and forty-two miles from Worcester. Lowell is well-served by Interstates 495 and 93, as well as state routes 3, 3A, 110 and 38. Fairly easily accessible by automobile from the Boston metro area and southern New Hampshire, it is less well served by public transit.

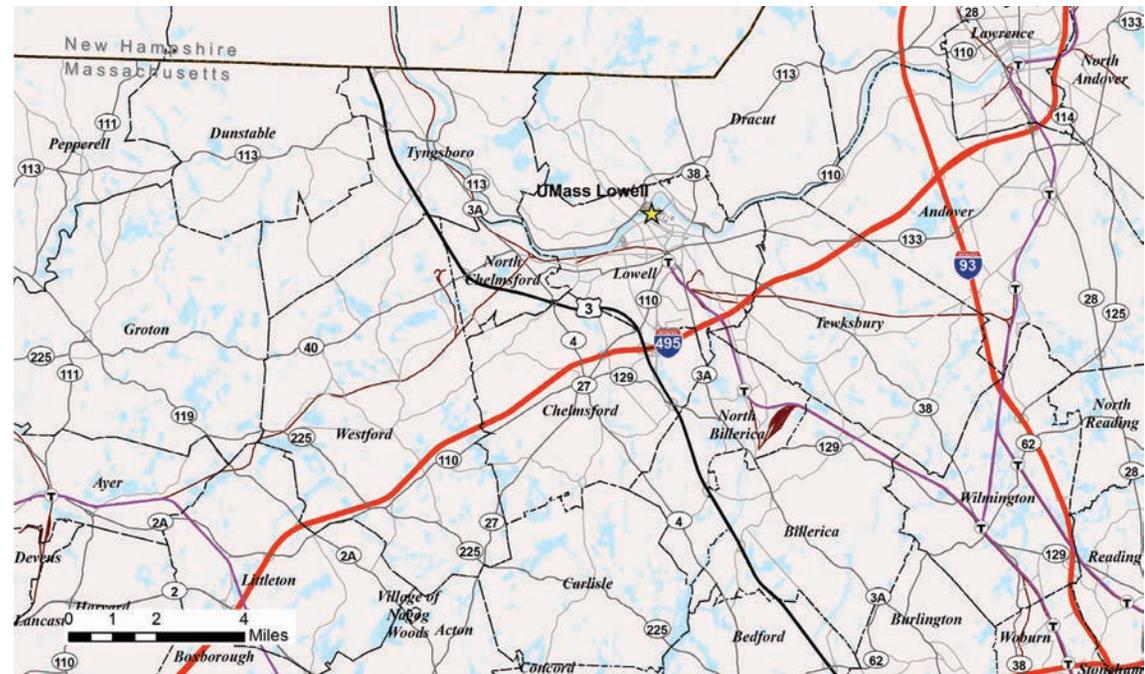


Figure 2.9 UMass Lowell's regional roadway context

Public Transit

Two transit agencies provide service to the University. The Lowell line of the Massachusetts Bay Transit Authority (MBTA) commuter rail system has its endpoint at Lowell's Gallagher Station, within 1.5 miles of the three UMass Lowell campuses. The commuter rail operates between Gallagher Station and North Station in Boston with seven intervening stops, including West Medford, Winchester, and Woburn, among others.

Lowell Regional Transit Authority

The Lowell Regional Transit Authority (LRTA) provides bus service throughout the Lowell area including to and from the transit terminal.

Three routes serve UMass Lowell campuses directly:

- Route 6 (Figure 2.10) connects the Gallagher Terminal and downtown Lowell with South Campus
- Route 7 (Figure 2.11) connects the Gallagher Terminal, Downtown, and the Pawtucketville neighborhood with North Campus
- Route 9 (Figure 2.12) connects the Gallagher Terminal with Downtown, East Campus, and the Acre neighborhood

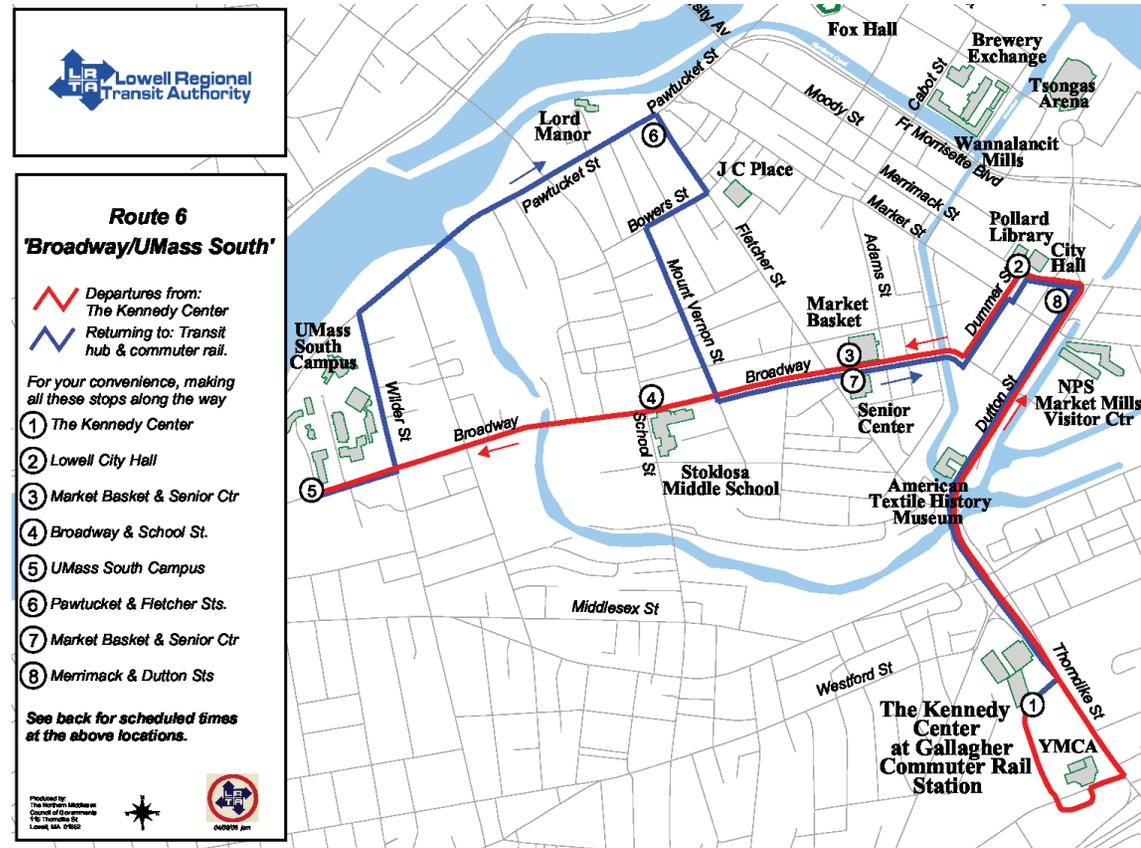


Figure 2.10 LRTA Bus Route 6 "Broadway/UMass South"



The LRTA's "Downtown Circulator"

Service does not always coordinate conveniently with MBTA arrivals and departures for access to UMass Lowell campuses and facilities, suggesting the need for greater coordination and improvement in scheduling of arrivals and departures. The University has initiated more frequent contact with the LRTA to discuss service enhancement and improved transit opportunities.

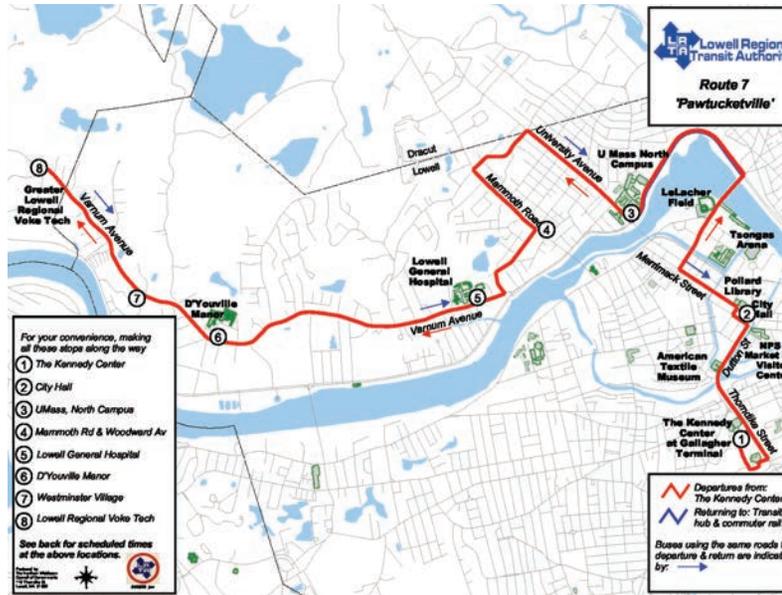


Figure 2.11 LRTA Bus Route 7 "Pawtucketville" provides service to North Campus

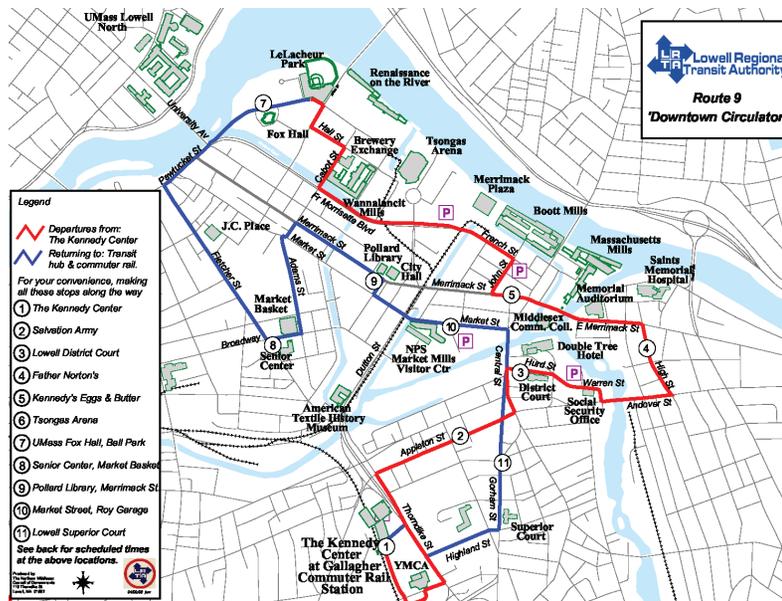


Figure 2.12 LRTA Bus Route 9, the "Downtown Circulator"



UMass Shuttle routes

UMass Lowell Shuttles

The UMass Lowell Shuttle system operates routes between UMass Lowell campuses and facilities throughout Lowell, as well as service to Gallagher Station when the LRTA is not operating. Regular shuttle service experiences typical headways of fifteen minutes, with typical travel time of twenty minutes between campuses. The shuttle system has a typical daily ridership of over 3,000 and over 3,500 on its busiest days.

Shuttle Bus Routes, 2011

Line	Shuttle Stops	Headway
Blue Line	North Campus, School Street, South Campus	10 minutes
Red Line	East Campus, Salem Street Parking Lot, South Campus	15 minutes
Green Line - North	East Meadow Lane, North Campus	15 minutes
Green Line - South	East Meadow Lane, Moody Street, Merrimack Street, Salem Street, South Campus	15 minutes
Yellow Line - North	Inn & Conference Center, Aiken Street, North Campus	10 minutes
Yellow Line - South	Inn & Conference Center, South Campus	15 minutes
Orange Line	North Campus, East Campus, Salem Street, Moody Street, Merrimack Street, Wannalancit Mills	15 minutes
Silver Line <i>(evening, night, and weekend service)</i>	East Campus, South Campus, North Campus, East Meadow Lane, Inn & Conference Center, Gallagher Station (the latter when LRTA is not in service) <i>Operates: Mon-Wed (6pm-2am), Tues-Fri (6pm-2:30am), Sat (10am-2:30am), Sun (10am-2am)</i>	Varies; On call after 1am

Table 2.3 UMass Lowell Shuttle Bus Routes, 2011

Trip Origins to Campus

Based on data provided to the University when parking passes are purchased, Figure 2.13 shows that faculty, students, and staff commute to UMass Lowell from a range of locations in Merrimack Valley, Southern New Hampshire, and beyond. The highest density of commuters from outside Lowell comes from the nearby towns of Chelmsford, Dracut, and Methuen. There are clusters of commuters north of 495 in the towns noted above, a group along the Route 3 corridor including southern New Hampshire, a cluster near Lawrence and Andover, and a smaller group from Cambridge-Somerville-Medford. These patterns will take on relevance as Transportation Demand Management (TDM) options are discussed later in this document.

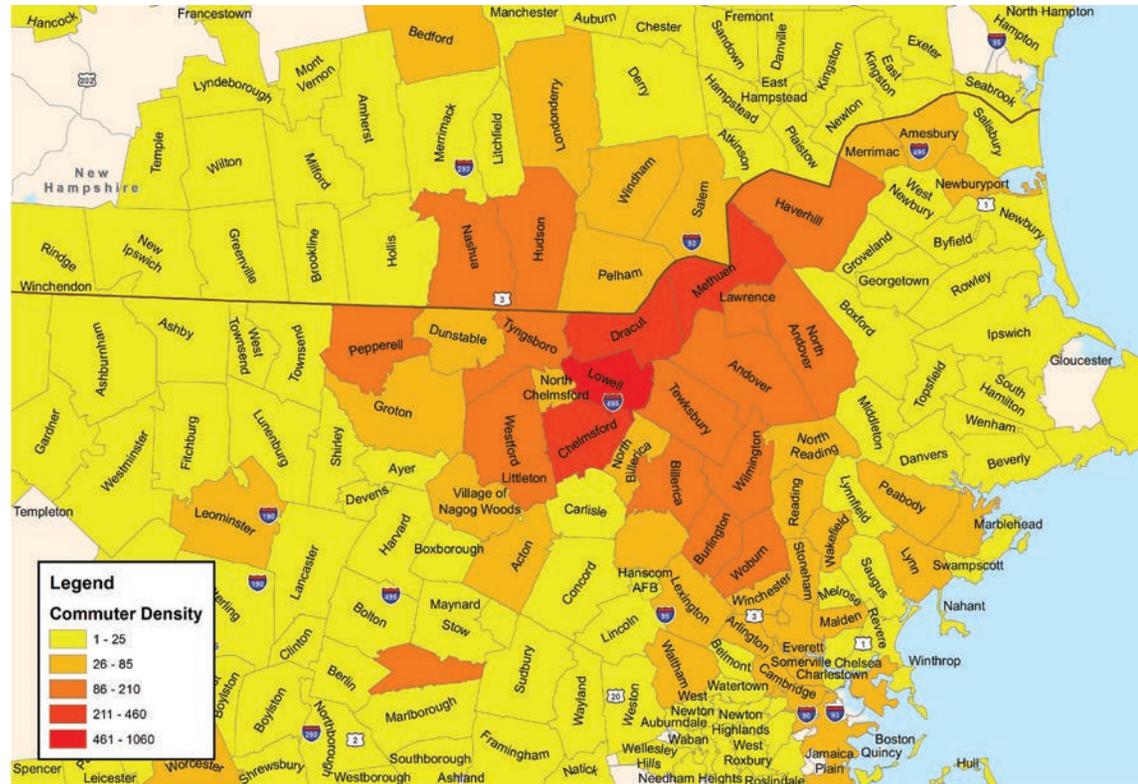


Figure 2.13 UMass Lowell Commuter densities by municipality, 2010

Physical Environment for Walking/Bicycling

While distances between the three main campuses are relatively short (as seen in Figure 2.14), the quality of infrastructure is often poor, with a lack of pedestrian signals at key intersections, non-existent or poor crosswalks, areas of broken and missing pavement, narrow sidewalks, and lack of bicycle facilities (including bike lanes, bike parking) all contributing to an environment that is inhospitable to walking or biking.

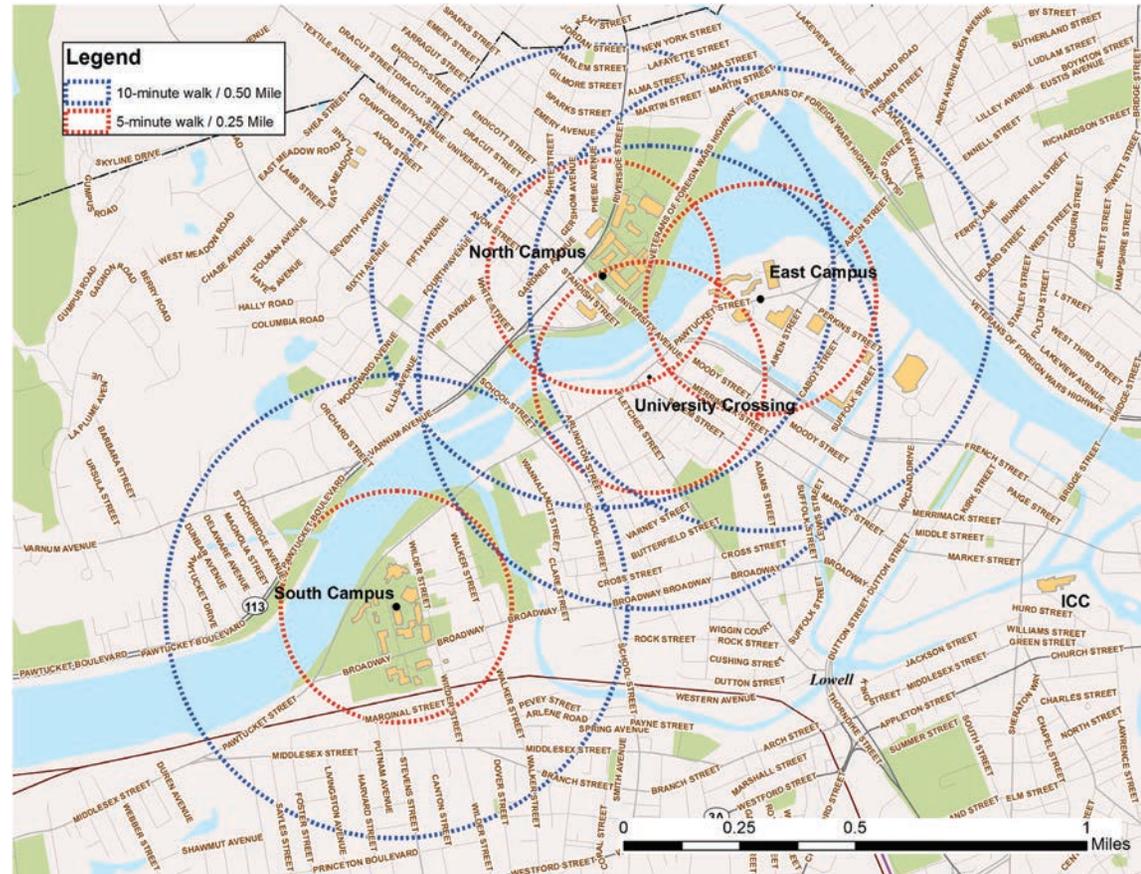


Figure 2.14 5 and 10 minute Walking Radii between UMass Lowell's three campuses

Parking Supply

The recent growth in enrollment has challenged University parking facilities, with peak periods where lots are virtually full, leading to excessive recirculating as arriving students and faculty search for parking. In the near term, this need has been met by many efforts: short-term leases of remote parking areas (1001 Pawtucket), temporary conversion of vacant land to parking (South Campus area next to ball field), introduction of parking lot assignments and a “park once” policy, strengthened and expanded shuttle service and other means.

Even with all these measures, which have greatly reduced excessive circling, it is essential to provide additional parking to support transportation demand management measures. Over the longer term, two new structured parking garages are being added to the University. A 650-car structure is underway on North Campus for opening in fall 2012. New construction began on an additional 760-car structure on South Campus in summer 2013.

Parking Supply, 2011

NORTH CAMPUS (2179 spaces)

1	Costello / Pinanski	143
2	Cumnock	82
3	Eames	55
4	East Meadow Lane	55
5	Olsen	67
6	Riverside	1,007
7	Southwick	70
8	1001 Pawtucket Blvd.	700

SOUTH CAMPUS (1976 spaces)

1	Coburn	69
2	Durgin	25
3	Lovejoy	20
4	Mahoney Lower	52
5	Mahoney Upper	32
6	Riverview	1,101
7	Solomont	47
8	Wilder	355
9	Overflow Lot - Softball	275

EAST CAMPUS (1605 spaces)

1	Ames Parking Lot	51
2	Campus Rec Center	58
3	East Campus Garage	630
4	Fox	90
5	IPI	103
6	Perkins Street	140
7	Salem Street Lot A	67
8	Salem Street Lot B	145
9	Tsongas Lot B	133
10	Tsongas Lot D	51
11	Wannalancit: Tremont Lot	71
12	Wannalancit: Visitor Lot	17
13	Wannalancit: East Lot	49

THE ICC (320 spaces)

1	Inn & Conference Center: Lower Locks Garage	320
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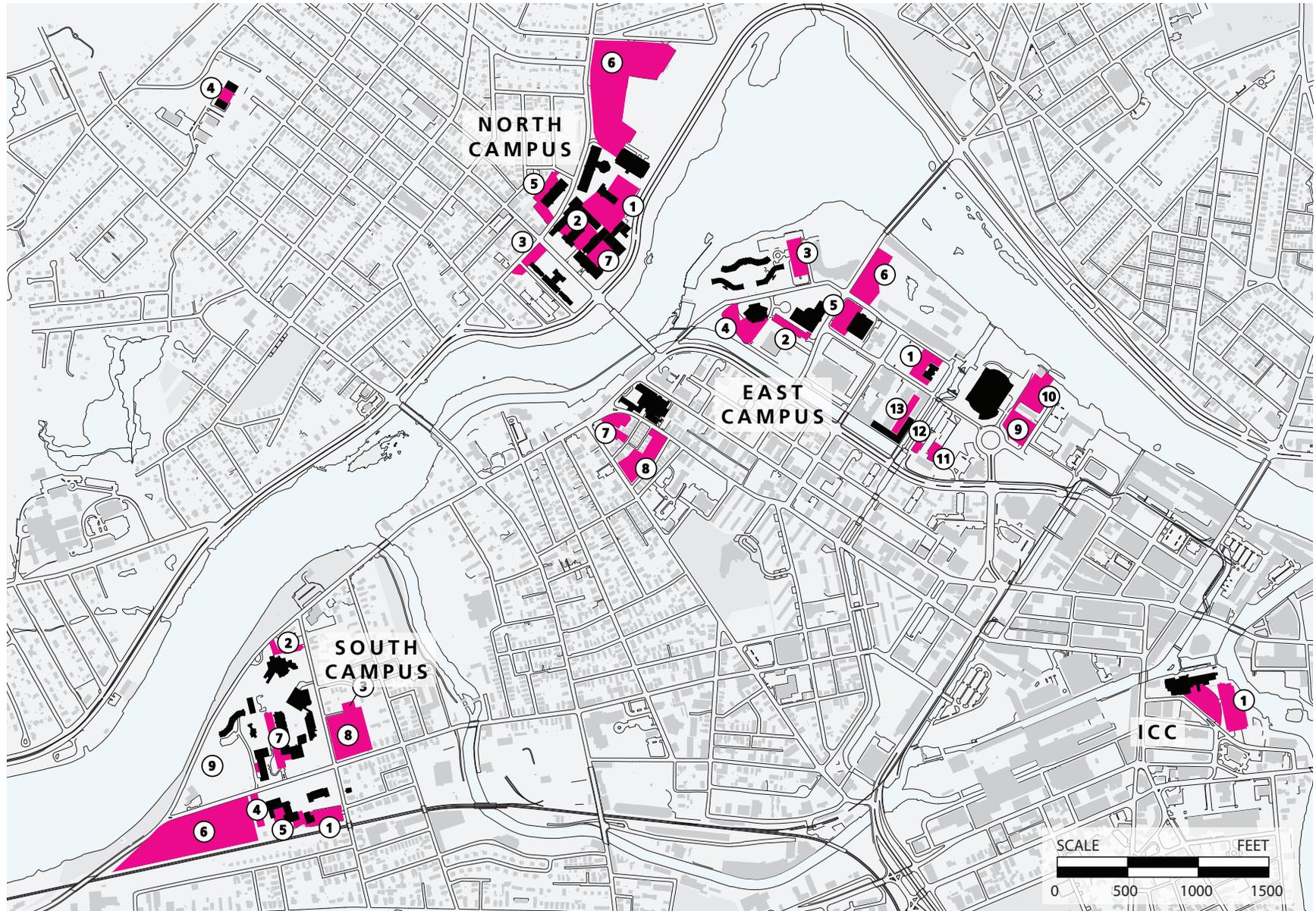


Figure 2.15 University-wide parking garages and lots, 2011

Early Transportation Demand Management Actions

As UMass Lowell has shifted its focus over the last few years toward achieving greater sustainability, some important early steps have been taken to influence mode choice for trips to and between campuses, including:

- Faculty/staff/students have been charged monthly for on-campus parking since 2009
- Shuttle bus service between campuses and to downtown Lowell has been expanded, now serving up to 3,500 riders/day
- Resident students are prohibited from driving between campuses by restricting student parking to a single, assigned lot
- Since fall 2011, commuting freshmen are required to park at a remote lot and are shuttled to the University
- Pedestrian and Cycling Route Maps with preferred routes are now distributed University-wide (Figures 2.16 - 17)
- Zipcar was brought to the University for first time in 2011—a Zipcar pick-up/drop-off location is on East Campus near Fox Hall
- UMass Lowell's Freewheelers (Figure 2.18), a bike share pilot program, was started in fall 2011, offering free bikes for intercampus travel



- The University partners with MassRIDES to offer NuRide, a free online service offering rewards for commuting by public transportation, biking, walking, carpooling or vanpooling
- Social Media: UMass Lowell now posts transportation and parking information to Twitter and Facebook pages
- The FixMyRide Bike Repair Shop: the University's on-campus bike repair shop provides low cost repairs for the UMass Lowell community.

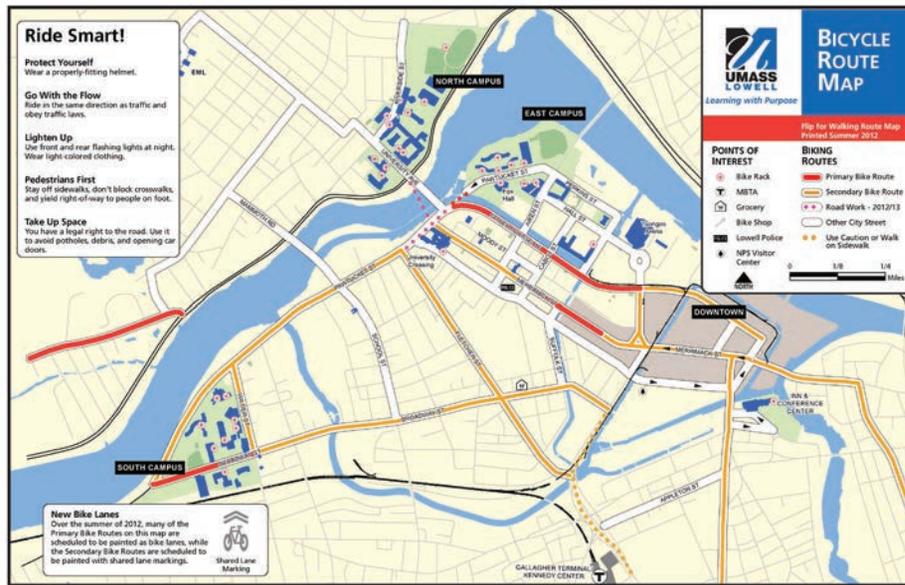


Figure 2.16 Bicycling routes at UMass Lowell, 2011

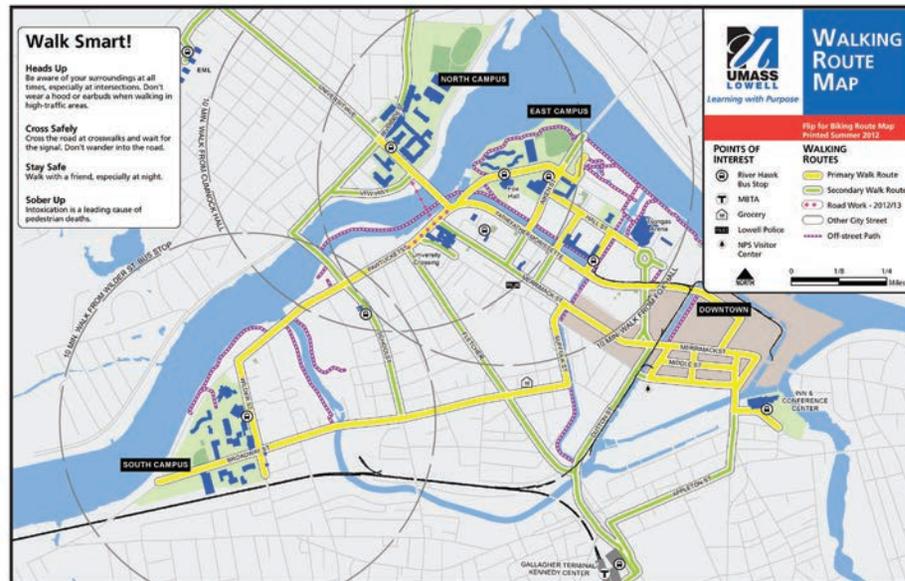


Figure 2.17 Pedestrian routes at UMass Lowell, 2011



Figure 2.18 Promoting the University's bike sharing program

Figures 2.19 to 2.22, on the next three pages, illustrate the locations of a number of the University's transportation management efforts including, Freewheeler's bike share stations, bike parking, carpool stations, and Zipcar pick-up/drop-off. Locations are expected to expand in reaction to demand during the planning period.

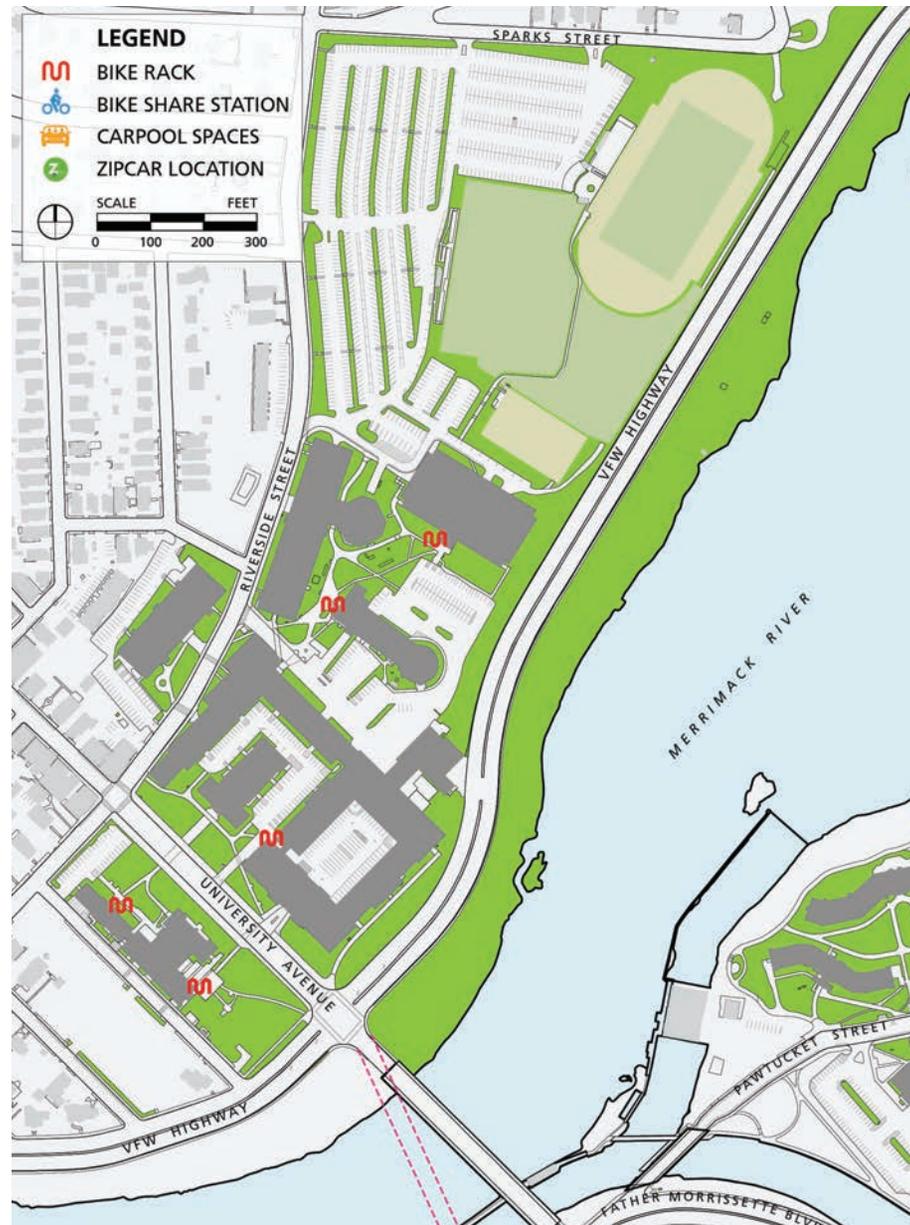


Figure 2.19 Sustainable transportation components, North Campus, 2011



Figure 2.20 Sustainable transportation components, South Campus, 2011



Figure 2.21 Sustainable transportation components, East Campus, 2011

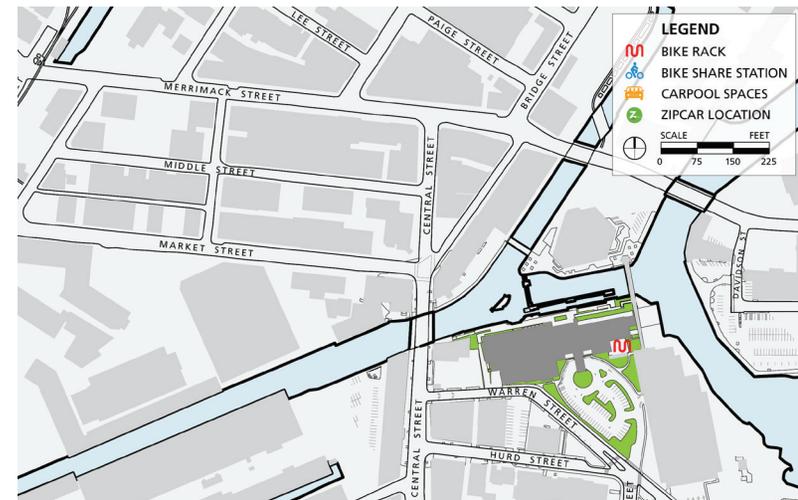


Figure 2.22 Sustainable transportation components, the ICC, 2011

2.4 Utilities and Infrastructure Existing Conditions

UMass Lowell relies upon a typical urban infrastructure for water and power. This system is operated and maintained with the City of Lowell with respect to water, while the University maintains power through its power plants and outside providers. New UMass Lowell projects are designed to minimize effects on these systems.

Water, Steam, and Power

University-wide

The University gets its water from the Lowell Regional Water Utility, which operates the water treatment plant that processes water from the Merrimack River to provide drinking water to Lowell and surrounding communities. Wastewater is discharged to the Lowell Regional Wastewater Utility sanitary sewer, which treats combined wastewater, stormwater, and domestic septage before sending it as clean effluent to the Merrimack River.

Steam is generated on North and South Campuses, and the steam lines are owned, operated, and maintained by the University. Gas and electricity are metered, transported and distributed by National Grid. UMass Lowell designated natural

gas as its primary fuel source in FY2010, and has been phasing out fuel oil for the power plants since FY2009.

North Campus

On North Campus, heat is provided by high pressure steam from the North Power Plant. The network of steam piping runs from the plant to Pinanski, the North Quad, and the Costello Gym, while the remainder of the campus is connected to the network via steam tunnels from those three points.

National Grid natural gas is located in University Avenue, Riverside Street, and VFW Highway. The latter high pressure gas main supplies the North Power Plant.

Electrical power is provided by National Grid and metered at the North Power Plant. Distribution is handled through a network of duct banks and manholes. Recent sub-metering of utilities at each building is intended to improve tracking of power consumption on campus and support conservation measures.

The new Emerging Technologies and Innovation Center is supplied natural gas and electricity directly by National Grid.

South Campus

On South Campus, heat is provided by high pressure steam from the South Power Plant. A network of steam piping runs to Coburn and Mahoney, then to Solomont Way. The remainder of the campus is fed by this main run along Solomont Way.

Natural gas piping runs along Solomont Way from the main at Broadway Street. Individual buildings are fed from the run along Solomont Way.

Electrical power is provided by National Grid and metered at South Power Plant. All buildings are fed by South Power Plant except for Durgin Hall, which is fed directly by National Grid. Distribution is handled through a network of duct banks and manholes. The recent sub-metering project provides a basis for tracking of power consumption on campus.

East Campus

On East Campus, buildings are served individually from public services in the roadway, because this campus does not have a central plant. Natural gas is provided along Pawtucket Street to the residence halls and the Campus Recreation Center, along Perkins Street to the Aiken Street site for the new University Suites residence hall, and along Cabot Street to Wannalancit Mills and Ames Textile Mill. Electrical power is provided by National Grid. The ICC is also served by utilities in the street.

Stormwater Management

University-wide

All of the University's campuses are located within the Merrimack River watershed, and contribute stormwater runoff to the Merrimack River. As is the case in most urban areas, storm and sewer drains are undergoing a long-term process of being separated. These projects are implemented by the City of Lowell, with participation from the University when work is on UMass Lowell property.

UMass Lowell has completed two stormwater management plans: one for North Campus in 2006, and one for all campuses in 2009. The 2006 plan identified major problems—sewer/storm drain interconnections, discharges to waterways, etc.—which were corrected from 2006 to 2008. It also provided assessments of the North Campus' storm and sewer systems, identifying specific projects that could be undertaken in order to mitigate stormwater runoff volume and implement more Best Management Practices (BMPs). The 2009 plan provided an assessment of all of the University's campuses, and also concluded that discharges from storm and sewer drains will not affect the watershed's endangered species.

The University has several goals for managing stormwater on its campuses: to improve the storm drain system in ways that minimize maintenance;

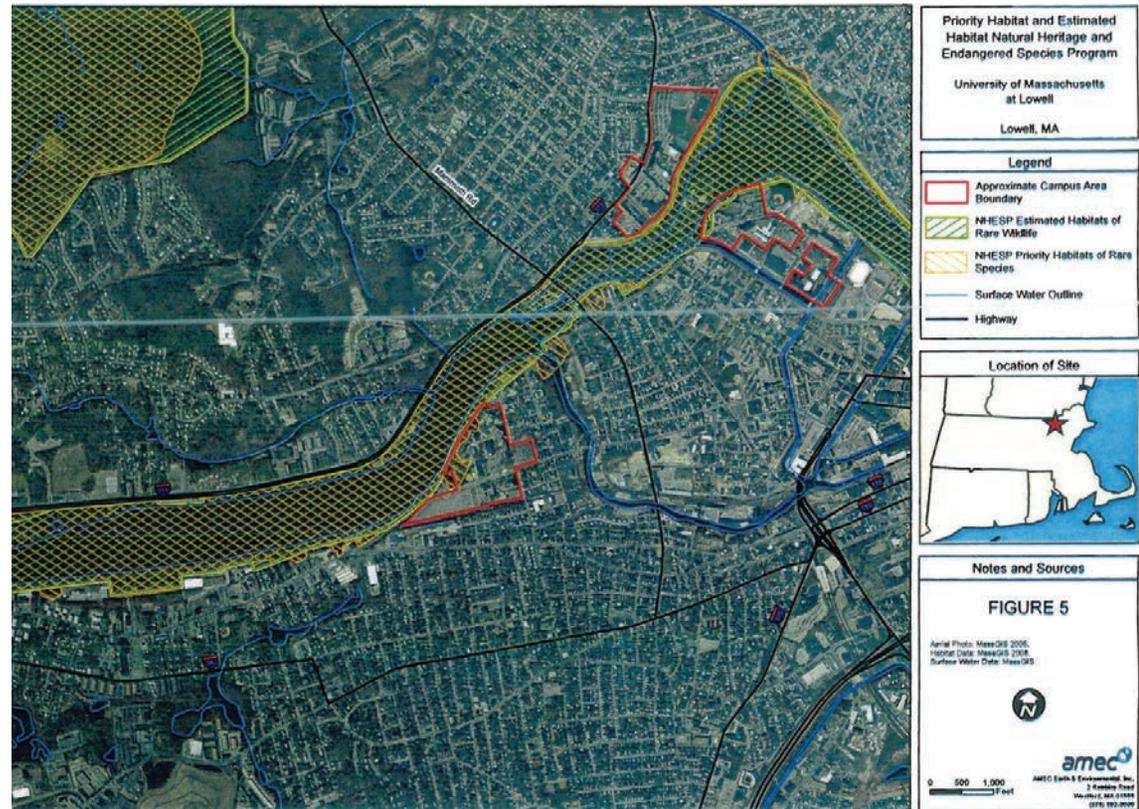


Figure 2.23 Priority Habitat, Estimated Habitat Natural Heritage and Endangered Species Program, UMass Lowell

to green the campus; and to be a good neighbor to the City of Lowell. Towards these goals, all new buildings are designed to at least LEED Silver, which includes initiatives such as managing stormwater onsite, and maximizing planted areas. New buildings are also designed to minimize any increases in impervious surfaces and to develop maintenance practices that will help to minimize stormwater and pollutants in runoff.

The University's three campuses also border, but do not substantially include the Natural Heritage and Endangered Species Program (NHESP) priority habitats (Figure 2.23, above). No work is planned for the river-front and bank areas abutting the habitat.



Figure 2.24 North Campus outfall locations, UMass Lowell

North Campus

On North Campus, stormwater runoff is discharged to stormwater drains or combined storm/sewer drains. The City of Lowell undertook a sewer/stormwater separation project in the Emery and Sixth Street zone, which includes North Campus, in 2005. The University coordinated

with the City for this project, which reconfigured the stormwater flow on the North Campus. Stormwater runoff from the bulk of North Campus (Cumnock Hall, Southwick Hall, Falmouth Hall, Kitson Hall, Pasteur Hall, Ball Hall, Engineering Building, and surrounding parking areas)

now infiltrates through three leaching basins installed underneath the Cumnock Hall parking lot. The overflow goes to the municipal sewer on Riverside Street. The Riverside Parking Lot is tied directly to the municipal stormwater drain, as part of the Riverside/Sparks separation project.



Figure 2.25 South Campus outfall locations, UMass Lowell

South Campus

On South Campus, runoff discharges into several different networks, the majority to municipal storm drains. Only a few South Campus buildings are left on a combined sewer: Dugan Hall, Co-burn Hall, and the South Campus Power Plant. The Riverview Parking Lot has its own storm drain system that discharges directly into the

Merrimack River via an outfall (shown in Figure 2.25). The remainder of the campus discharges runoff to municipal storm drains on Pawtucket, Broadway, and Wilder Streets.

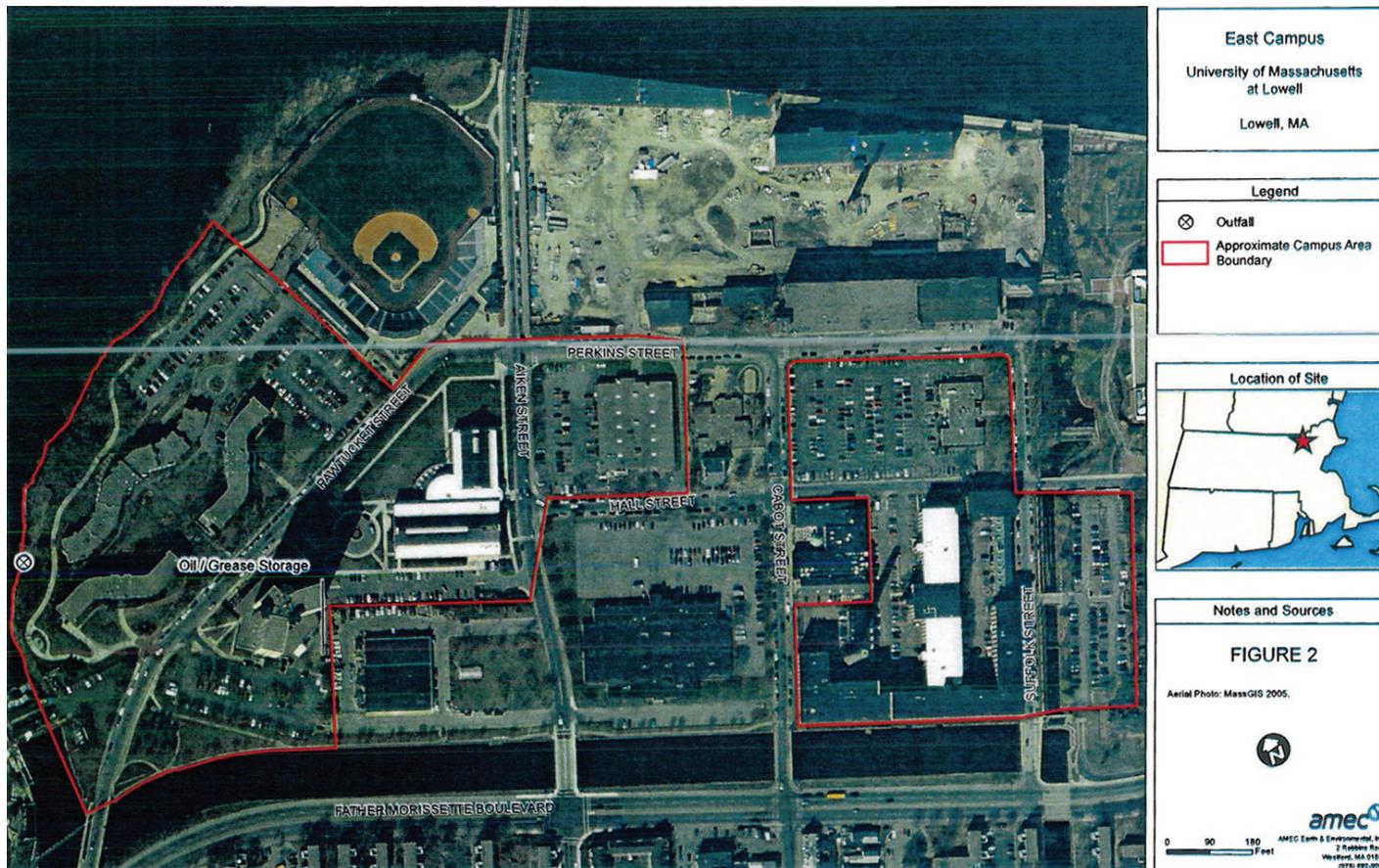


Figure 2.26 East Campus outfall locations, UMass Lowell

East Campus

On East Campus, runoff discharges into the stormwater drain on Pawtucket Street. The University cooperated with the City of Lowell in 2010 on the Cabot Street CSO separation project, covering an area of 41 acres bounded by the Merrimack River, Northern Canal, and Lawrence Waterway. The project included sewer separa-

tion and infiltration/inflow reduction, addressing the localized sewer backups and street flooding caused by excessive system surcharging. The new drainage system discharges stormwater runoff to the Merrimack River via a new outfall adjacent to the East Parking Garage, on an existing City utility easement.



Chapter Three Planning for the Future

Strategic Development Plan 2011-2016 University of Massachusetts Lowell



Planning for the Future



Previous discussions have highlighted some of the issues surrounding UMass Lowell's physical environment. This chapter talks about the University's approach to planning to address these challenges. The following sections identify planning goals, assumptions, and processes. The resulting University development needs are highlighted here as context for the capital development program.

3.1 Goals and Objectives

The University recently completed a multi-year strategic planning process entitled, "UMass Lowell 2020." It provides a blueprint for how UMass Lowell will achieve national and international recognition as a world class institution over the next decade.

Goals from the strategic plan which influence the built environment include:

- Recognize and support UMass Lowell as one campus/one academic community

- Build on Lowell's collaborative tradition and practice in developing the urban fabric of one campus/one city
- Renew, modernize, and right-size University facilities

Based on those goals, UMass Lowell Facilities Planning developed the following guidelines for its work:

- Establish a rolling master planning process which responds flexibly to the evolving needs of the UMass Lowell academic community
- Take advantage of opportunities to knit together the multiple campuses, improving functional relationships and student experience
- Provide more opportunities for mingling and interaction between students and faculty to promote learning
- Support the University's goal of small classes of no more than nineteen students and large classes of no more than forty-nine students

- Work toward the goal of housing fifty percent of full time undergraduates on campus
- Improve the arrival experience to UMass Lowell through attention to gateways
- Focus strategic acquisitions on consolidating core campuses, completing campus edges and providing enhanced connections
- Improve campus legibility and connectivity through signage, bus stops, pedestrian

3.2 Planning Assumptions

Enrollments at UMass Lowell have leapt forward, increasing by thirty-seven percent in the past four years. Enrollment growth is expected to continue, though at a less dramatic pace, resulting in an overall enrollment of about 18,000 in the fall of 2015.

Although the fundamental demographics in New England suggest that college age populations will decline over the next ten years, there are countervailing forces that have pushed enrollments considerably higher than expected—and suggest that demographically driven declines are not directly predictive of future enrollments.



Enrollment at UMass Lowell has increased by over thirty-seven percent in the past four years

There are a number of these forces:

- Increased need for college degrees for employment—Massachusetts in particular has its greatest job growth in areas requiring education beyond high school
- Lower cost of attending public rather than private universities
- Improved opportunities in strong academic programs
- Thoughtful integration of online and technology-based education
- Clear improvements in student success supported by more residences on campus
- Increased availability of international and cooperative educational opportunities
- Improved retention rates, transfer opportunities, smaller class sizes, and related academic initiatives that bolster both academic quality and enrollment

The enrollment change over the last few years is identified in Table 3.1, together with projections for enrollments over the next few years. These projections are constantly monitored for changes in order to fit UMass Lowell’s plan to meet student needs and to support the academic and economic development needs of the Commonwealth.

Faculty numbers (shown in Table 3.2) have clearly increased and will continue to do so for a variety of reasons. Achieving and maintaining appropriate faculty/student ratios is necessary to support academic quality. This in turn is driven by increased enrollments, by increased research, and by improvements in the proportion of full-time to adjunct faculty, among other factors.

Enrollment - Actual and Projected, 2008-2016

Headcount	Fall 2007	Fall 2008	Fall 2009	Fall 2010	Fall 2011	2015 Projection
Undergraduate	6,659	7,316	8,031	8,675	9,026	10,000
Graduate	2,745	2,765	3,054	3,426	3,702	5,000
Total Day Headcount	9,404	10,081	11,085	12,101	12,728	15,000
CSCDE	2,231	2,396	2,517	2,585	2,711	3,000
Total Headcount	11,635	12,477	13,602	14,686	15,439	18,000

Table 3.1 UMass Lowell’s enrollment figures and projections, 2007–2015

Faculty Growth, 2007 to 2011

	AY2007	AY2008	AY2009	AY2010	AY2011 ¹
Full-Time Faculty Members	405	406	414	425	434
Increase	6%	0.2%	2%	3%	2%

(1) Does not include Continuing Studies & Corporate Education

Table 3.2 Faculty growth, 2007 to 2011

Student Residences

UMass Lowell traditionally has had a large commuting student population. Research in recent years has documented the significant benefits in personal and academic achievement and greater retention associated with living on campus. Today's successful student residences need to have of variety of living configurations and a level of technology, common spaces, and learning opportunities that were typically not included in the traditional housing formats that make up most of the University's housing stock.

The strategic plan sets the goal of housing fifty percent of undergraduates in UMass Lowell housing, though rising enrollments have made this a moving target. The recent housing program has increased the number of residences on campus by close to 800 beds in the last few years, largely through use of short term leases and purchase of the ICC. Housing demand reflects many influences: the economics of living on campus, the advantages of the University experience, the attractiveness of the housing, the range of the programmatic offerings—among other factors—as well as the raw number of traditional full time undergraduate students. Housing demand, therefore, can be thought of as falling within a planning range of forty to fifty percent of the full time undergraduate population.



Architectural rendering of the new University Suites residence hall on East Campus

As of 2011, UMass Lowell has approximately 3,200 beds. The current plan includes construction of a new 472 bed residence hall on East Campus, University Suites, described in further detail in Chapter Four. With the completion of University Suites and the long term lease of 500 beds adjacent to South Campus beginning in fall of 2013, much of the immediately pressing need for undergraduate housing seems to be met. A close watch is kept on housing demand and, in addition to the current projects that are increasing residential capacity; the University has the option

of using its leasing program to provide housing immediately in response to changing demand.

Another aspect of the residential program is the move to focus more student life—especially housing and residential dining—onto East Campus. In addition to reinforcing the vitality of the residential community, this trend makes best use of the student life facilities in the area and provides greater support to resident students through concentrated programs and opportunities. Some older residence halls are planned for

removal: they are generally too small to support contemporary residential community models, have significant deferred maintenance needs, and are exceedingly difficult to bring into compliance with modern building and accessibility codes.

Research

Increased research volume, as noted in Table 3.3, has many benefits for the economy as well as the academic community. It does, however, lead to increased need for both specialized spaces to support research and more space to support graduate students and research teams. This need is most evident in science and engineering disciplines, but also affects health and environment programs and others, to lesser degrees.

Research space demand is difficult to predict, although the overall trend at the University does provide a likely basis for planning. Recent and proposed academic projects, together with leasing in the Lowell area, appear to be suitable to meet the immediately identifiable need. There is every expectation, though it is not readily quantifiable, that the University’s research program will continue its growth, and this is one of the areas which may lead to additional need for academic facilities, beyond those now in planning.

Total Research and Development Expenditures, FY2007 to 2015

	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011 (est.)	2015 Goal
Research dollar volume <i>(in thousands)</i>	\$36,000	\$41,000	\$57,000	\$59,000	\$60,000	\$75,000
Increase		14%	39%	4%	2%	25%

Table 3.3 Research dollar volume (in thousands) from 2007 to 2015

Online Course Registration Growth, 2007 to 2011

	AY 2007	AY 2008	AY 2009	AY 2010	AY 2011	2015 Projection
Online Course Registrations	10,476	12,367	14,427	16,698	19,202	28,000
Increase		21%	17%	16%	15%	45%

Table 3.4 Online course registration growth from 2007 to 2011

On-Line Education

A significant factor in academic growth is the demand for online courses and blended courses—which include both an in-class and online element. This already significant enrollment (Table 3.4) is expected to continue to grow. This does not translate directly into additional academic space needs, since by definition much of the activity may not be on campus, however it cannot be assumed to reduce space needs.

Blended courses are a strong growth area for universities across the country, and the development of online programs at UMass Lowell will continue to be monitored as a potential generator of further physical growth or need for specialized space.

3.3 The Planning Process

The University has adopted a contemporary approach to planning for these changes. It involves establishing a strategic development framework which provides both direction and flexibility to address interacting and changing needs. This framework is closely tied to the 2020 Strategic Plan, and seeks to provide physical support for the academic evolution identified in that plan. The planning process also includes a robust and on-going community outreach effort.

Coordinated Planning

Accompanying the development framework is a series of rolling master plans, sector plans, system plans, and coordinated capital plans. This approach keeps planning activities and outcomes responsive to changing conditions while capturing the benefits of thinking ahead. The other benefit of this approach is that individual plans can focus in depth on the particular needs of their subject matter. The comprehensive master plan typically cannot provide sufficient thoroughness in all the areas needed to develop and manage a successful University, and cannot always provide the temporal flexibility for appropriate academic consideration of alternatives. The following section discusses some of the major planning efforts that have been undertaken in this context. The

capital program outlined in Chapter Four is a result of these completed and ongoing efforts.

Since 2007, when a change in leadership prompted a fresh look at all aspects of campus life, UMass Lowell has been engaged in a comprehensive assessment of facility needs through a series of planning efforts. Some of these plans are geographic, others focus in-depth on particular topics or issues.

Notable among these are the 2009 Stormwater Management Plan, the 2010 Science and Engineering Renewal Plan, the 2011 ISES Deferred Maintenance Facility Assessment, and the 2011 University-wide Transportation Plan.

In 2009 the Massachusetts Division of Capital Asset Management (DCAM) engaged consulting architects Perry, Dean, Rogers to generate the basis for a master plan, inclusive of the three campuses. The plan did not address residential or service space. During that effort the team completed a comprehensive existing conditions document which explored enrollment trends, current space usage, future space needs, and site analysis for the three campuses, and identified the early-action need for the new South Campus Health and Social Sciences building (HSSB), which is now under construction.



Figure 3.1 From the 2010 Science and Engineering Renewal Plan, an analysis of North Campus building capacity for renovation

3.4 New Space Requirements

The following sections review the planning for the University as a whole and by campus, with some additional discussion of University-wide topics.

University-Wide Space

There is need to continue growth in both academic and research space on North and South Campuses. The sources of this need include several factors:

- “Right-sizing” of current programs—many are in spaces too small for their current enrollments, even before additional new students arrive.
- Obsolescence—standards for academic space, especially for research, technology, instructional laboratories, and interdisciplinary space have evolved since UMass Lowell’s academic facilities were built. In almost every case, the changes produce pressure for more and different space for these activities.
- Growing research activity—this is a core function of the University, and active contributor to the welfare of the area and the state, however research needs more space than general-purpose academic activities, especially for the sciences and engineering.

- New Academic Programs—in many cases, additional academic offerings evolving from the University’s successes, as well as the changing landscape of higher education, require additional space. The amount needed is subject to the growth and success of those new programs, introducing an additional element of uncertainty into projections.

Student Residences

UMass Lowell continues in its goal to have fifty percent of undergraduate students live in University housing. The growing undergraduate population suggests there may be a need for additional long-term beds in the next five to ten years, and the University will continue to seek to make progress toward this goal.

The simplest solution to additional space needs is, of course, to build new buildings. UMass Lowell has, to the extent feasible, adopted a different approach, in which re-purposing, renewal, and rehabilitation are first choices, with new buildings as a second choice. This approach has many expected benefits, including greater flexibility to meet the many University needs, greater potential for economic benefit, and the fundamentally sound environmental decision to make the greatest use of existing resources.

Student Activities and Services

Student activities and services is another major area of space needs. Clubs, health services, financial aid, the Registrar, bookstore, event spaces, and many other student-focused services are now scattered over the three campuses, in large part due to the history of UMass Lowell’s development, and in most cases the spaces are both scattered and inadequate.

Space Growth to Accommodate New Trends and Centralizing Services

In quite a few areas—public safety, information technology, card services, dining and retail bookstore, food service, maintenance shops, loading, mailroom, and delivery—there is the need for more space and for locations which can provide services to all three campuses in an effective and coordinated way.

North Campus

Starting in 2010, the University's consultants, Perry, Dean, Rogers, in conjunction with SST Planners, provided UMass Lowell and DCAM with a focused review of near and long-term space needs on North Campus. The goal of the study was to assess the adequacy of existing facilities to support current and future research and academic activities; update the expected growth of population; and develop and evaluate alternative responses to anticipated space requirements. Science and engineering space needs were identified based on both projected expansion of research and unmet demand from recent growth in academic programs and enrollments. This work indicated a long term need for additional research space, faculty office space, and adjustment of the teaching space portfolio from general classrooms to teaching labs.

The plan for North Campus has the following key features:

- Move administrative and support spaces off North Campus to allow expansion of the core academic disciplines on this campus
- Match academic programs' need for high levels of technically-intensive space with buildings' capacity to provide this space and relocate programs with lower technical requirements to appropriate spaces
- Continue the established direction in North Campus schools of supporting interdisciplinary teaching, learning, and research, maximizing use of shared and core technical facilities
- Provide campus common spaces, academic support, and services that facilitate interaction among disciplines and among members of the academic community, students, faculty, researchers, alumni, and economic development partners
- Provide appropriate space for the Manning School of Business
- Provide modernized contemporary science and engineering lab spaces for research and teaching
- Develop a systematic program for renewal of building systems and services in existing buildings including deferred maintenance, energy modernization, and other improvements



Architectural rendering of new lab space at ETIC, opening on North Campus in fall 2012

This development strategy for North Campus was completed in 2011, and resulted in identification of three immediately needed projects—the Manning School of Business, the Perry Engineering building renewal, and Phase One of the Olsen Building renewal.

The Manning School has recently instituted Professional Masters programs, Doctoral specialties, and other efforts that take advantage of the well-established academic connections between the Science, Engineering, and Management Schools. This association is at the heart of UMass Lowell's history of bringing technical research and innovation into the regional economy. The preliminary academic planning for the Manning School calls for an increase in enrollment to 3,000 students and a corresponding increase in full time faculty. This growth cannot be accommodated in existing space. The School's growth and modernization needs will require a significant increase in assignable net square feet (ASF) from the current level.

A corresponding multi-year, multi-project program of space renewal, renovation, and realignment was recommended. This plan speaks to reuse and reassignment of other academic space on North Campus. It takes into consideration the new Emerging Technologies and Innovation Center research facility (ETIC)—opening in fall

2012—and the need for a suitable supply of general classrooms. There is a broader need on North Campus to add general and specialized classrooms for use by all of the North Campus schools, and to provide some of the flexibility necessary to increase the amount of teaching labs for Science and Engineering within the existing North Campus building stock.

Additional projects were also identified and are expected to follow this first group. Although most are comprehensive modernizations of existing facilities, if the research program proves as successful as anticipated, an additional research facility could be needed. Depending on when space is needed, this need may also be met by leasing space.

South Campus

Continuing the trend of developing rolling master plans focused on the specific needs of each campus, the University partnered with DCAM and hired Perkins and Will Architects to write the next chapter of space needs and opportunities for South Campus. There is also a generational opportunity to reconfigure, renovate, and realign interior and exterior space on South, once the Health and Social Sciences Building (HSSB) opens in spring 2013 and older buildings are vacated in 2013 and 2014. That study is now underway; it is scheduled to be complete by late 2012.

This study is expected to update space needs for the next five to ten years and identify approaches for re-purposing the buildings vacated by moves into HSSB and University Crossing.

If anticipated new academic programs within the South Campus' schools are put in place, they may require academic space beyond that previously envisioned; however, the timing and scale of these new programs is as yet unclear. The plan will also offer a concept for South Campus that better defines campus pathways and open space opportunities and identifies areas for possible future academic and service growth.

East Campus

East Campus is the emerging residential and student life precinct on campus. The goal of adding student beds is focused on new buildings in that area. With the opening of University Suites in fall 2013, UMass Lowell will have 2,900 beds on East Campus, including the Inn and Conference Center (ICC) and East Meadow Lane locations. The main dining hall for residential students is in Fox Hall, while the Campus Recreation Center, LeLacheur Stadium, Tsongas Center, and nearby downtown Lowell all provide support for the growing residential student community. With the addition of the University Crossing project, appropriate and integrated space for student life and services will be provided in this planning period.

In keeping with the overall planning approach, non-academic and some research space has been moved to formerly underused properties—principally Wannalancit Mills on East Campus—making room for needed academic expansion and swing space on North and South Campuses.

In 2009, the University acquired a former Doubletree Hotel and converted it to the Inn and Conference Center, then renovated it to create 500 student beds with thirty-one rooms remaining for inn service. The Tsongas Center has also been acquired and refurbished for a new, expanded schedule of use and events, including varsity sports.



The Tsongas Center

3.5 Renovated Interior Space

As noted earlier, the University's approach prioritizes renewal and re-use of existing facilities, wherever possible. The growth of the University population and the changes in space requirements over the years, have meant that it is not possible to meet all space needs within existing structures, and some new construction is necessary. That construction, together with better use of existing space, allows re-assignment, renewal, and re-use of existing buildings. Planning is

underway for this work, which seeks to address deferred maintenance, consolidation and expansion of departments and programs as needed, and assignment of activities to buildings which have the structure and services to appropriately support those activities.

3.6 System Planning

The Campus Transportation Plan

In early 2011, the University engaged the firm Vanasse Hangen Brustlin (VHB) to prepare the University’s first comprehensive Campus Transportation Plan (CTP). Working in consultation with the City of Lowell, the goal of the effort was to explore ways to knit together the three UMass Lowell campuses, improve access to and between campus locations, encourage all modes of travel, and contribute to the University’s reduction in greenhouse gases by reducing commuting trips. This last goal was especially important as student, faculty, and staff commuting trips constitute one-third of greenhouse gas emissions generated by the University. The strategy of the Campus Transportation Plan was to advance a coordinated set of recommendations that would reduce trips by facilitating all modes of travel to and between campus locations: walking, bicycling, University shuttles, and public transit, in addition to drive-alone vehicle trips.

Based on the data collected, the CTP recommendations fell into four categories:

- Infrastructure improvements to build better environments for walking, bicycling and driving
- Transportation Demand Management (TDM) to reduce trips and parking demand

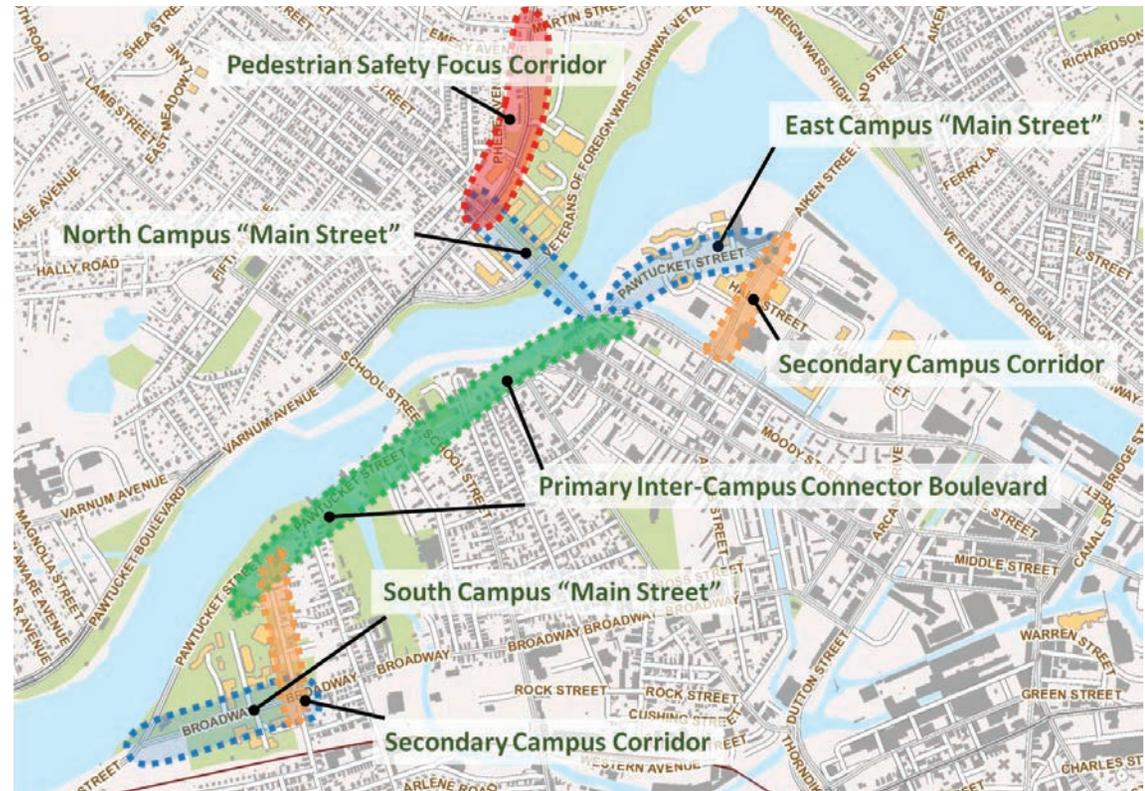


Figure 3.2 Areas of Opportunities from The Campus Transportation Plan, 2011

- Parking management, addressing demand and supply through pricing and other strategies
- Policy initiatives (such as “park once and leave your car behind”) to demonstrate leadership in building a sustainable University

The very act of initiating the CTP and involving the University community in the effort has begun to bring about a culture change at UMass Lowell. Future planning now routinely includes

consideration of how walking and bicycling can be woven into project design. There is a greater understanding that parking pricing; messaging; working closely with the City, LRTA, National Park Service and others; and other policies can influence travel behavior. Finally, the University and the City have begun meeting regularly to track implementation of the Plan’s recommendations, particularly with respect to infrastructure improvements on City streets on or near the campuses.

Infrastructure Improvements: Findings

As noted in the Existing Conditions discussion in Chapter 2, while UMass Lowell is located in a dense urban area, it is surrounded by many suburbs and small towns from which faculty, staff and students commute. This has led to a historical pattern of drive-alone commuting trips to the University. Some of the physical constraints noted earlier—limited river crossings, narrow streets, and privately-owned canal bridges—contribute to the traffic congestion experienced near the University on a daily basis.

The Transportation Plan took a closer look at the infrastructure environment at sixteen key intersections near North, South, and East Campuses. Not surprisingly, a number of intersections experience “Level-of-Service E” (LOS E), defined as vehicular flow at capacity; or “Level-of-Service F” (LOS F), defined as a breakdown in vehicular flow, during peak commuting periods. The UMass Lowell community both contributes to and is affected by this congestion. Addressing this challenge is something the University cannot do on its own, but it does point to the need to reduce peak hour trips to the greatest extent possible, as well as to work with the City and the state to make improvements to signal equipment and timing to improve current conditions.

The CTP study effort also looked more closely at the general environment for walking and bicycling on and between campuses. Distances between campuses are relatively short (see Figure 2.14), but those trips can seem much longer due to narrow sidewalks, poor bicycle accommodation, safety conditions, and the like. As VHB took a closer look at these conditions, they identified a number of deficiencies:

- Lack of pedestrian signals at key intersections, including University Ave/Riverside Street on North; Pawtucket/School Streets; and Broadway/Wilder on South
- Very long crosswalks at University Ave/VFW Highway, a key crossing from East to North
- Poor pedestrian conditions on Pawtucket Street from East Campus to Wilder Street, with areas of declining pavement conditions, faded striping, missing crosswalks and signage
- Pedestrian phase delays at many intersections due to exclusive phases (rather than concurrent phases)
- Narrow sidewalks in many areas, including at the Pawtucket Street canal bridge to East Campus
- Missing crosswalks on Riverside Street on North, from University Ave to Sparks Street

Addressing some of these physical deficiencies would send a message to UMass Lowell students, faculty, staff, and the wider community, that walking and bicycling are safe, healthy alternatives to driving, especially for intercampus trips.

Transportation Demand Management (TDM): Findings

Commuter trips to the University are a source of a good deal of the traffic experienced near UMass Lowell at peak periods. To get a better sense of commuter origins and to assess what kinds of alternatives might be appealing, VHB analyzed address information provided to the University when parking decals are purchased. With very few carpools on campus at the time of the study, VHB concluded that purchase of a permit was a fairly good proxy for single occupant trips to UMass Lowell, finding the following:

- Over ninety percent of full-time faculty and staff use single-occupancy vehicles to get to the University
- Between seventy and eighty percent of commuting undergraduate students drive alone
- About forty-five percent of residential students bring a car to the University

In terms of distances travelled, while the average commute distance is twelve miles and some

nineteen percent travel more than twenty miles, thirty-six percent of faculty and staff and twenty-six percent of students live within five miles of the University. In addition, twenty percent of faculty/staff and fourteen percent of students live within three miles and about five percent of both groups live within a mile of the University (Table 3.5, at right).

These figures suggest that there is a group of commuters for whom commuting options might hold real interest, enabling UMass Lowell to contribute to lessening congestion and reduce its own need for expensive parking on campus.

Another aspect of the CTP involved researching the transportation and parking programs of peer institutions, especially those considered to have exemplary programs. The salient finding that emerged was that information and outreach are critical to success with transportation demand management programs. In those schools that have made substantial progress in encouraging new, non-auto modes of travel, the presence of a dedicated TDM Coordinator on campus was determinative.

Commuter Driving Distances, 2011

Distance from Campus (mi)	Student Parkers	Faculty/Staff Parkers	Satellite Parkers
0 to 1	4%	6%	7%
1 to 3	14%	20%	17%
3 to 5	8%	10%	5%
5 to 10	23%	18%	20%
10 to 20	32%	27%	29%
20 to 50	18%	18%	21%
50+	1%	1%	1%
Mean (mi)	12.4	11.6	12.9
Median (mi)	10.1	9.0	10.5

Table 3.5 Commuter driving distances, from the Campus Transportation Plan, 2011

Other important lessons emerged from the analysis of similar institutions:

- TDM is generally pursued in order to reduce the costs and physical effects of providing parking facilities on campus, and to contribute to climate protection.
- Outreach and information are critical; a TDM Coordinator is extremely important. Social media and other technologies offer great opportunities to spread the message.
- Flexibility is helpful: for example, providing a flexible parking pass program and having car share programs like Zipcar on campus allows commuters to change modes occasionally, contributing to a decrease in demand for parking.
- Weather is not always a barrier to walking and biking, with those mode choices not just correlated with warmer climates.
- Distances between UMass Lowell campuses are actually shorter than at many other universities.
- Living near the University can be very beneficial in reducing drive-alone trips.
- Eight percent of commuters live within a mile (or walking distance) of the University, twenty-one percent live within three miles (or bicycling distance), and three percent live within a quarter-mile of an LRTA bus route that will bring riders to the University. The greatest market for new transportation solutions may be among those who might car-pool to work, with ninety-two percent living more than one mile from the University.

These guideposts will be helpful as we look at more specific TDM efforts and other recommendations in the discussion to follow.

Parking Policy and Pricing: Findings

The need for on-campus parking is a fact of modern university life. However, as enrollment grows at UMass Lowell, there is increased interest in making sure that parking is “right-sized,” and that physical and financial resources dedicated to parking are balanced with other University needs. As part of the CTP, VHB assisted the University in surveying current and future need, based on enrollment trends, planned new facilities, faculty growth, closure of some temporary overflow parking at more remote locations, and changes in supply due to new construction on some existing parking lots.

In short, the analysis demonstrated a need for garages on North and South Campuses. Based on current enrollment projections, with those structures in place, parking demand would be met through the 2014 -2015 academic year. Shortly thereafter, a small deficit in parking spaces emerges (+/- 100 spaces) in 2015-2016, demonstrating that an active TDM program is essential to keeping demand and supply in balance.



Architectural rendering of the new North Campus Garage, opening fall 2012

Policy Initiatives: Findings

As part of the CTP, the University was interested in learning more about the extent of intercampus travel during a typical weekday. How much are these trips contributing to congestion and parking shortages? While there is no perfect way to measure such trips, based on parking lot use by campus (as measured by the controlled gates), VHB was able to estimate that there are roughly 400 trips per day by car between campuses. While not a very large number of trips, any

reduction—either through greater use of the intercampus shuttle system or by more walking and bicycling—would make a positive contribution. The changes to TDM policy and infrastructure outlined above would contribute to such shifts, along with a strong message from the leadership of the University that “leaving your car behind” whenever possible is good practice.

Infrastructure Improvements: Action Steps

With respect to infrastructure, four priority recommendations grew out of the analysis phase:

1. Explore, with the City of Lowell, new traffic signal equipment and pedestrian accommodations, starting with the following high priority locations:
 - a. University/Riverside
 - b. Broadway/Wilder
 - c. Pawtucket/School
2. Explore, with the City of Lowell, restoration of full turning movement at Broadway and Pawtucket Street on South Campus, which will improve access to South and will divert traffic coming out of the new garage away from Wilder Street
3. Study the opportunity to create a more “main street” environment on Broadway (on South) and Pawtucket (on East) through measures such as bicycle lanes, colored pavement, traffic calming, and new crosswalks
4. Work with the City to study corridor-wide enhancement to Pawtucket Street from University Crossing to Wilder Street as an important step in promoting walking and bicycling to South Campus

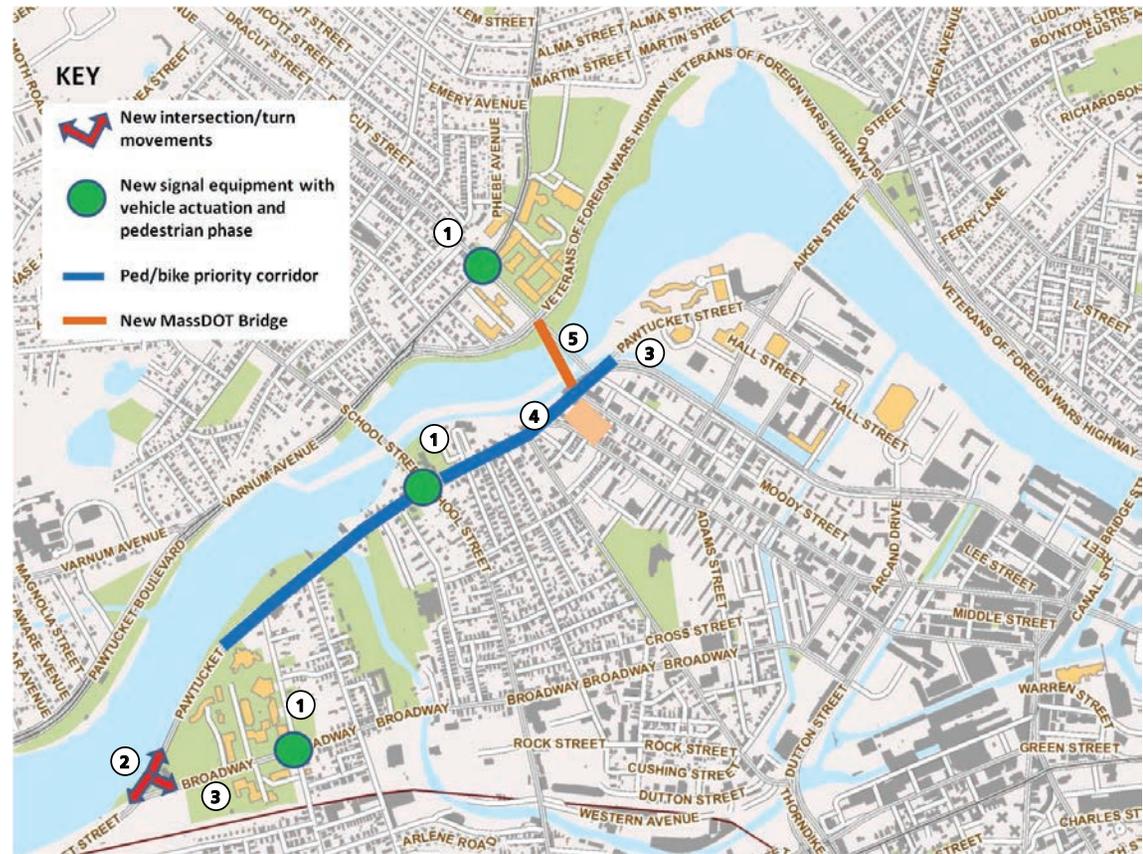


Figure 3.3 Priority Infrastructure Roadway Improvements from the Campus Transportation Master Plan

5. The new University Avenue Bridge, now being built by MassDOT, will transform circulation between the North and East Campuses and University Crossing. UMass Lowell buses will be able to cross the new bridge, improving route efficiency.

The bridge itself will have wider sidewalks and bicycle lanes. Modernized signal equipment at University/VFW Highway, Pawtucket/Merrimack, and Pawtucket/Salem will reduce conflicts between pedestrians and vehicular traffic.

**Transportation Demand Management (TDM):
Action Steps**

To quote UMass Lowell's Campus Transportation Plan:

"TDM is the art of influencing travel behavior for the purpose of reducing the demand for single occupant vehicle use. It is not only a crucial component of a balanced and sustainable plan, but can yield positive return with relatively modest investment."

In a sign that the message is being heard throughout UMass Lowell, the University has hired its first TDM Coordinator, a step found to be critical in achieving and maintaining success in travel behavior change. The TDM Coordinator has already begun working closely with Transportation Operations, Student Affairs, Facilities, and other departments to spread the word about transportation options. He will also play a key role in attracting private resources such as Zipcar to the University and will monitor the success of various strategies, so investment can be made in the most promising areas.

Going forward, there is much more to be done. Some of the leading ideas include:

- Expanded bike share program (planned for Fall 2012 under Student Affairs department management)
- Expanded bike parking on campus (underway)
- Installation of bicycle racks on buses
- Exploration of incentives for faculty and staff to live near the University
- Arrangements for flex work and telework by employees
- Increased proportion of distance learning classes
- Expanded outreach to students during orientation about mode choices (ongoing)
- Preferential parking for clean fuel vehicles
- Coordination with the LRTA for better route coordination between Commuter Rail and LRTA bus service
- Pre-tax payment for transit passes
- Use of social media to get the word out about options
- Development of a comprehensive safety program for bicyclists and pedestrians



Figure 3.4 Design concepts for potential new University 'main streets': before and after images of Pawtucket Street along East Campus.

Parking Policy and Pricing: Action Steps

The University began charging the UMass Lowell community for parking in 2009, increasing appreciation for the real cost of providing parking lots, structured parking, maintenance, and staffing. A standing Parking Committee has been created, made up of faculty, staff, and student representatives, to consider ongoing parking policy changes and make recommendations to the senior administration.

Some of the early actions already taken up by this committee include:

- Adding “teeth” to parking enforcement by sending UMass Lowell tickets to the state RMV for further enforcement
- Assigning parking locations (for example, in 2011, commuting freshmen were required to park at a remote lot)
- Providing hourly paid parking options, so commuters can avoid buying a monthly pass
- Preferential parking for carpools/vanpools
- Over the next academic year, this group will continue to meet monthly and will evaluate other incentives and policies to affect a shift away from only drive-alone car trips.

Policy Initiatives: Action Steps

Finally, the policy messages communicated by the leadership of the University will be an important component of success in changing the University culture with respect to transportation.

Some important goals have already been embraced or are under consideration, including:

- Building more residence halls with the goal of housing fifty percent of undergraduates
- Encouraging faculty and staff to live in Lowell
- A “park once” policy, reminding commuters that during the day they can use the shuttle system, LRTA buses, and consider walking to errands and mid-day meetings
- Exploring the opportunity to address peak parking demand by influencing class schedules

Infrastructure Requirements

Infrastructure at the University has remained largely the same over the past few decades, save for the administration’s decision in 2009 to focus on natural gas instead of fossil fuels. North and South Campuses are supplied by a power plant on each campus, while East Campus and the ICC are served directly from the grid. The University has regularly maintained its distribution system over time, and will continue to do so.

In addition to the maintenance of the system, larger projects are occasionally necessary to improve energy efficiency on campus. The University is currently modernizing the North Power Plant—which serves all of North Campus—and converting it from oil to natural gas.

Climate Action Plan

The Climate Action Plan (CAP) was undertaken in 2011-2012 to address the University's commitment to mitigate the climate-related effects of its facilities and operations. The University is a signatory of the American College and University Presidents' Climate Commitment (ACUPCC), and the CAP is a requirement of that commitment. The CAP establishes a framework for the implementation of the University's goal of achieving carbon neutrality, discussing greenhouse gas emissions reduction strategies and begins to identify specific projects. The CAP also suggests initiatives to increase learning and awareness of climate change and sustainability.

The CAP provides a baseline for tracking climate-related effects, with an inventory of FY2011 greenhouse gas (GHG) emissions. This baseline is used to generate "Business-As-Usual" (BAU) projections for future GHG emissions. Currently, the University's top three sources of GHG emissions are: on-campus stationary sources (natural gas, distillate oil, etc.), purchased electricity, and student commuting. The CAP then suggests mitigation strategies to achieve the University's carbon neutrality goals, focusing on the most significant contributors to GHG emissions.

The University's goal in Phase One of the CAP is to reduce annual GHG emissions by more than

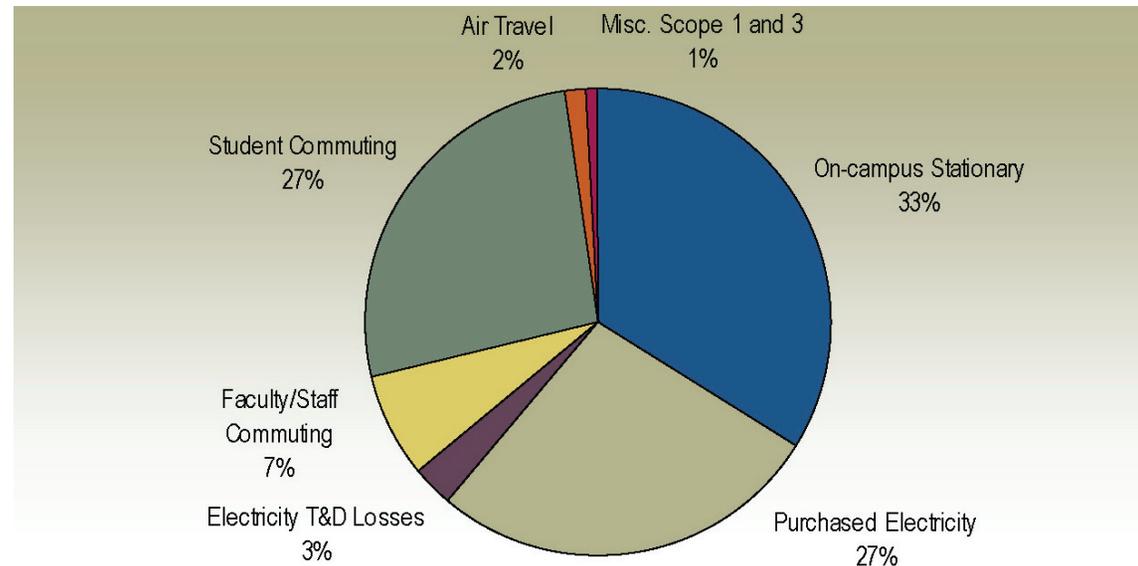


Figure 3.5 FY2011 UMass Lowell GHG Emissions

14,000 MTeCO₂ (metric tons of carbon dioxide equivalent) by FY2020. The University has identified an initial group of GHG reduction projects, described in the next section, focused on reducing emissions from significant contributors that are within the control of the University. Other projects will be considered that will target building HVAC and envelope improvements and additional opportunities to replace fuel oil with natural gas within existing systems.

The University will also develop a methodology for calculating annual GHG emissions to maintain consistency and accuracy in measurements from year to year. Collection of more accurate

data on student, faculty, and staff commuting, including that which was collected for the Campus Transportation Plan, will help in developing measures to reduce commuting miles. Through University marketing and academic courses and research, the University will increase the profile of its commitment to reduce GHG emissions.

Climate Action Plan Implementation Committee

The CAP Implementation Committee is comprised of representatives from the Office of the Chancellor, Administration and Finance, Public Affairs, Residence Life, Facilities, Emergency and Environmental Management, Transportation, and the Office of the Provost. This committee will guide the University in developing initiatives to fulfill its CAP goals, creating subcommittees when appropriate. The University has agreed to a campus-wide study with DCAM, an “Accelerated Energy Conservation Program”, to be kicked-off in 2012. The study will identify new energy projects.

The adjacent list, Table 3.6, includes recently completed and ongoing projects. According to the CAP, the mitigation required to meet the target for Phase One is a reduction of 14,000 MTeCO₂ (the metric ton equivalent of carbon dioxide) over “Business as Usual” (BAU), by FY2020. The estimated cumulative effect of the projects is listed below. The implementation committees will develop further strategies to reach the Phase One target.

FY 2012 Energy Efficiency Projects

Project Name	Building	Project Status	Project Description	Estimated Savings GHG (MTeCO ₂ /yr)
N. Campus Power Plant	N. Campus Power Plant	Underway	North Campus Steam Plant energy efficiency upgrade	4,750
Chiller Replacement	O’Leary, Durgin, Weed	Underway	Replace obsolete chillers with new magnetic levitation centrifugal chillers	2,020
Building Controls	Weed, Donahue, Sheehy, Concordia, ICC	Underway	Replace pneumatic controls with automated logic Building Automation System (BAS) for energy conservation	400
Lighting Efficiency	Durgin, Coburn, Pasteur, Kitson, Lydon, Cumnock, McGauvran, Alumni	Underway	Lighting efficiency audits and improvements	550
Steam Survey	Various buildings	Ongoing	Survey steam traps for leaking steam and replace with energy efficient traps	468
Photovoltaic Panels	Dugan, Costello, Leitch, Bourgeois	Complete	Photovoltaic roof installation with 205 KW output will save 274,000 kWh per annum	115
Olney HVAC	Olney	Complete	Replaced Olney 150 HVAC	100
Ice Bed Refrigeration Replacement	Tsongas Arena	Complete	Install high efficiency refrigeration system	90
South Powerplant Breaching, Boiler Controls	South Power Plant	Complete	Replaced equipment for greater efficiency	50
TOTAL ESTIMATED SAVINGS				8,543 MTeCO₂

Table 3.6 FY 2012 Energy Efficiency Projects



Photovoltaic panels have been installed on East Campus' residence halls

Completed Projects

The University has already initiated projects intended to mitigate climate effects, in three general areas: on-campus stationary operations, transportation, and academic learning and awareness.

UMass Lowell's on-campus stationary operations and educational programs include the following (the University's transportation efforts are presented earlier in this chapter):

On-Campus Stationary Sources

- Conversion to natural gas as a primary fuel
- Energy efficiency projects: North Campus Central Steam Plant Energy Efficiency Project, steam efficiency projects
- Commitment to achieve at least LEED Silver design on all new buildings; development of Sustainability Initiatives and Green Design Guidelines for all University projects
- Generation of on-campus renewable energy through solar photovoltaic power
- Implementation of energy management programs involving energy procurement, building automation software, enterprise energy management software, energy demand and load response programs

Educational/Awareness

- Climate Change Initiative: charting the path to incorporate climate change themes into more aspects of curriculum and research, focusing on climate communication and community outreach
- Over seventy climate-related academic courses, incorporating sustainability, environment, health, energy management, renewable energy, climate change
- Online courses, which reduce commuter trips to the University by students and faculty
- Research opportunities into renewable energy and zero emissions vehicles
- Award-winning Solar Energy Club



Chapter Four Current Capital Projects Plan
Strategic Development Plan 2011-2016 University of Massachusetts Lowell



Current Capital Projects Plan



Previous chapters have identified UMass Lowell's framework for physical evolution and responsive planning, as well as the scale of need for additional space. This chapter describes the major capital projects underway or proposed to address identified needs. These projects, together with the optimization of existing facilities, will make significant progress toward meeting the University's academic, research and student life needs.

Projects include the following:

- Emerging Technologies and Innovation Center (ETIC), North Campus
- North Parking Garage, North Campus
- University Suites Residence Hall, East Campus

- University Crossing, East Campus
- Health and Social Science Building (HSSB), South Campus
- South Parking Garage, South Campus

The following project is anticipated to begin the study/design process in summer 2012:

- Manning School of Business, North Campus

This chapter concludes with a look at the UMass Lowell campus in 2016.

4.1 Current Projects

North Campus

The Emerging Technologies and Innovation Center (ETIC)

The University's Emerging Technologies and Innovation Center will be a vital new hub for manufacturing technologies and industry partnerships. The 84,000 square foot Center, featuring cutting edge lab and research space for nanotechnology and plastics engineering, opens in the fall of 2012.

The project's site development also reflects the University's goal to create welcoming open spaces that strengthen the campus fabric whenever possible. The project includes a 48,000 square foot open space area at the corner of University Avenue and VFW Highway. The project also created a new 19,500 square foot quad next to Lydon Library. The quad's landscape design incorporates a rain garden to absorb the building's rain runoff and provide an environmentally sustainable way to address stormwater at the ETIC site.

The research functions outgrew their current space several years ago. Alternative locations and configurations on North Campus, including replacement of Cumnock Hall and a site on the Riverside parking lot, were considered during program planning in 2006-2008.



Architectural rendering of the new Emerging Technologies and Innovation Center, opening fall of 2012

North Campus Garage

This 650-space parking garage will support North Campus commuters. As noted in the Environmental Notification Form filed in July 2011, the garage is being built in a developed area of the campus and will add only 0.08 acres of new impervious area. The project will also improve storm water management, with runoff from the garage roof and driveway designed to be collected and channeled into a groundwater recharge system.

Initial efforts to address parking issues exclusively through Transportation Demand Management and shuttles failed in 2009. Once the need for this project was confirmed by the Campus Transportation Plan, alternative sites on North Campus were considered, primarily alternative locations on Riverside lot.



Architectural rendering of the new North Campus Garage, opening fall of 2012

North Campus Power Plant

The North Campus is heated by a central power plant, with equipment that dates back to the 1950s. During the summer 2012, the system is being fully upgraded with the installation of two new dual fuel boilers, along with new economizers and controls. It is anticipated that an annual reduction of 10,000 to 16,000 MMBtus will result annually from the new equipment. The replacement of the two boilers will allow the plant to run cleaner fuel, and replacing the existing single

stack with three smaller stacks allows for better system control and energy efficiency. All mechanical, fire protection, electrical, and plumbing systems will be brought up to code. The project will be complete for the fall 2012 heating season.

East Campus

University Suites

The first new University residence hall since the 1989, University Suites will both help meet increased housing need as enrollment grows, as well as providing a competitive, attractive housing option to help encourage more residential students overall. Located at the corner of Aiken and Perkins Streets on East Campus, this 472-bed, suite-style residence hall will open in the fall of 2013. A U-shaped building, it features an interior courtyard facing the Campus Recreational Center across the street.

The new residence hall's LEED Silver level design includes a stormwater management system that will collect runoff from the building roof, filtering and storing it in an underground cistern for reuse on site. And, in addition to creating a new, green, campus plaza of 25,000 square feet, the residence hall also supports the University's sustainable transportation initiatives by adding forty bike racks, and hosting a new bus lay-by on Aiken Street for UMass Lowell shuttle service to North and South Campuses and the Inn and Conference Center. In the project's study phase design alternatives studied included siting the hall on a different parking lot on East Campus, and the exploration of a variety of different configurations on the chosen site.



Architectural rendering of the new University Suites residence hall, opening fall of 2013

University Crossing

In January of 2011 the University purchased the former St. Joseph's Hospital at the corner of Merrimack and Pawtucket Streets in Lowell. The portion of the site which fronts on Pawtucket Street will be redeveloped as a new one-stop center for student services such as financial aid and registration, student clubs and activities, a central bookstore, dining facilities, campus police, transportation services, and University administration.

Located at the corner of Merrimack and Pawtucket Street, and steps away from University Avenue Bridge, it will provide an important connection between UMass Lowell's three campuses and the downtown business and cultural district, all located within walking distance.

The project is in design and scheduled to be complete in 2014.

Options studied for this project included alternative uses, including all residential use, and full rehabilitation rather than partial new construction.



Concept rendering of the new University Crossing, opening in 2014

South Campus

Health and Social Science Building

This 69,000 square foot academic building is located on the corner of Wilder and Broadway on South Campus. When it opens in Spring 2013, it will include classroom space, conference/seminar rooms and faculty offices serving the criminal justice, nursing and psychology programs.

A new plaza of 8,000 square feet will be constructed on the west side of the HSSB and will include benches, seatwalls, and planted beds in front of the building's western entry. The project will also restore the lawn space between South Dining and Broadway Street, currently occupied by construction staging.

Alternatives considered for this project—which addresses a critical shortfall of academic space— included the present location of the Mahoney Building, and parking lots on South Campus.



Architectural rendering of the new Health and Social Sciences building, opening in 2013

South Campus Garage

This 760-car garage, which broke ground in summer 2012, is designed to meet the need for parking on South Campus. The project's features include separate sanitary and storm water drains, the use of recycled materials, low energy lighting and the incorporation of no or low volatile organic compound coatings. The garage increases the amount of impervious surface area by only 0.36 acres. Construction of this new garage will be complete by 2013 and will enable the University to discontinue use of temporary parking near the ball fields across Broadway, as well as temporary parking being leased at 1001 Pawtucket Blvd. After this garage's need was established by the recent transportation plan, alternative sites were also considered, including the current soft-ball field and other locations on the Riverview parking lot.

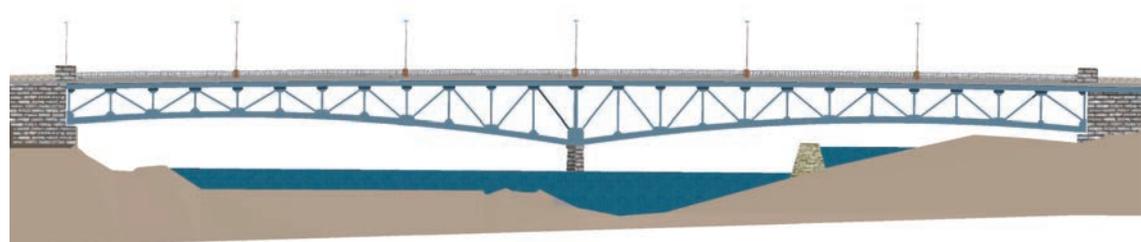


Architectural rendering of the new South Campus Garage, opening in 2013

Project by Others

University Avenue Bridge

MassDOT is constructing a new University Avenue bridge to replace the existing bridge, which is at the end of its useful life. The new bridge will incorporate sufficient space to provide bike lanes and will align with Merrimack Street on the south bank to provide a direct route into Lowell's downtown. The new bridge will also reestablish pedestrian sidewalks on both sides of the bridge. The bridge will be open for traffic in fall of 2013.



The MassDOT University Avenue Bridge, complete in 2014

4.2 Two-to-Five-Year Projects

North Campus

New Manning School of Business

UMass Lowell has completed a concept plan for this building, a new home for business education, research, interdisciplinary learning and industry interaction.

A North Campus site was identified at the corner of University Avenue and Riverside Street. The 65,000 square foot building is anticipated to include classrooms, faculty office space, and a business development center. The School will accommodate business enrollment growth from 2,100 to 3,000 students and provide space for research and outreach to local, regional, and national businesses. The location, adjacent to the new ETIC research facility and the central library, provides a focus for the connection of research and business innovation, and reinforces the new professional masters programs in the Manning School.

Alternative locations explored included North Campus parking lots, green spaces, and courtyards.



Early concept sketch of the new Manning School of Business

4.3 UMass Lowell in 2016

Land Use in 2016

Figures 4.1, 4.2, 4.3 on the following pages illustrate how the three campus areas will look once this program of facilities is completed. The new facilities contribute to enhancing the development of the individual campus areas as well as the overall University.

On North Campus, the Emerging Technologies and Innovation Center and Manning School of Business projects expand and strengthen the University's "innovation zone" resulting from science and engineering research and its enhanced connection to business and economic development. They also break the logjam in North Campus space and provide opportunities for expansion, reassignment, and renewal of existing teaching and research facilities on this campus, as an alternative to further new construction.

On South Campus, the new Health and Social Science Building (HSSB) takes another step toward creating a central academic quad or village stretching from Coburn Hall to O'Leary. The Health and Social Sciences Building includes the creation of a shaded plaza on the west side of the building, with many trees and benches. Future projects are expected to call for removal of

the South Campus Dining building and creation of a main South Campus green space in this area.

On East Campus, University Suites enhances the residential community and provides the suite style housing, with learning communities, needed for contemporary student life. University Suites also adds a 24,000 square foot open space that provides a significant outdoor area for the community for formal and informal gathering. The new courtyard has both paved and green areas where students can relax and study.

University Crossing creates the much-needed unifying University center, drawing together the renewed and enhanced campuses into one academic community. Student activities and services, some administrative functions, bookstore, dining and the Executive team are located here. In addition to the direct benefits of the space, University Crossing moves most non-academic uses off of South Campus, allowing the opportunity to accommodate more academic expansion and improvement in existing buildings there.

The new North and South Garages support the overall multi-modal transportation planning process and confirm the parking/service areas on each campus.



The Emerging Technologies and Innovation Center with new quad connecting to Lydon Library



Figure 4.1 North Campus Land Use, 2016

NORTH CAMPUS (20 buildings)

1	49 East Meadow Lane	1971
2	61 East Meadow Lane	1971
3	Alumni Hall	1950
4	Ball Hall	1958
5	Costello Gymnasium	1967
6	Cumnock Hall	1954
7	Demolished: Eames Hall	1949
8	Falmouth Hall	1907
9	Grounds Maint. Garage	1966
10	Kitson Hall	1902
11	Lydon Library	1969
12	North Power Plant	1910
13	Olney Hall	1974
14	Olsen Hall	1974
15	Pasteur Hall	1938
16	Perry Hall	1950
17	Pinanski Center	1968
18	Southwick Hall	1902

New Projects

19	ETIC	2012
20	North Campus Garage	2012
21	Manning School of Business	2016

Exterior Spaces

- A Riverside Parking Lot
- B Cushing Field Complex
- C Pinanski Quad
- D Cumnock Quad



Figure 4.2 South Campus Land Use, 2016

SOUTH CAMPUS (17 buildings)

1	150 Wilder Street	1905
2	820 Broadway Street	1890
3	Allen House	1854
4	Bellegarde Boathouse	1984
5	Coburn Hall	1894
6	Concordia Hall	1966
7	Dugan Hall	1962
8	Durgin Hall	1976
9	Mahoney Hall	1960
10	McGauvran Building	1974
11	O'Leary Library	1974
12	Sheehy Hall	1989
13	South Campus Dining	1972
14	South Power Plant	1966
15	Weed Hall	1966

New Projects

16	Health & Social Sciences Building	2013
17	South Campus Garage	2013

Exterior Spaces

- A Riverview Field
- B South Campus Quad
- C Wilder Parking Lot
- D Riverview Parking Lot

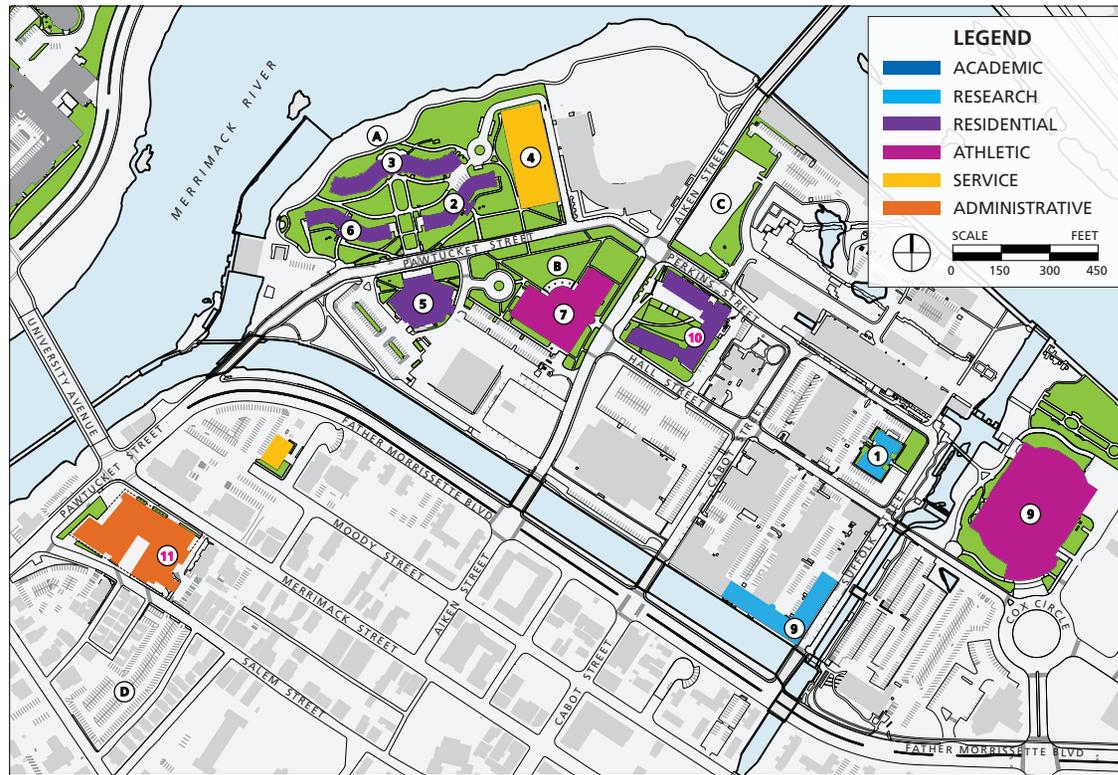


Figure 4.3 East Campus Land Use, 2016

EAST CAMPUS (11 buildings)

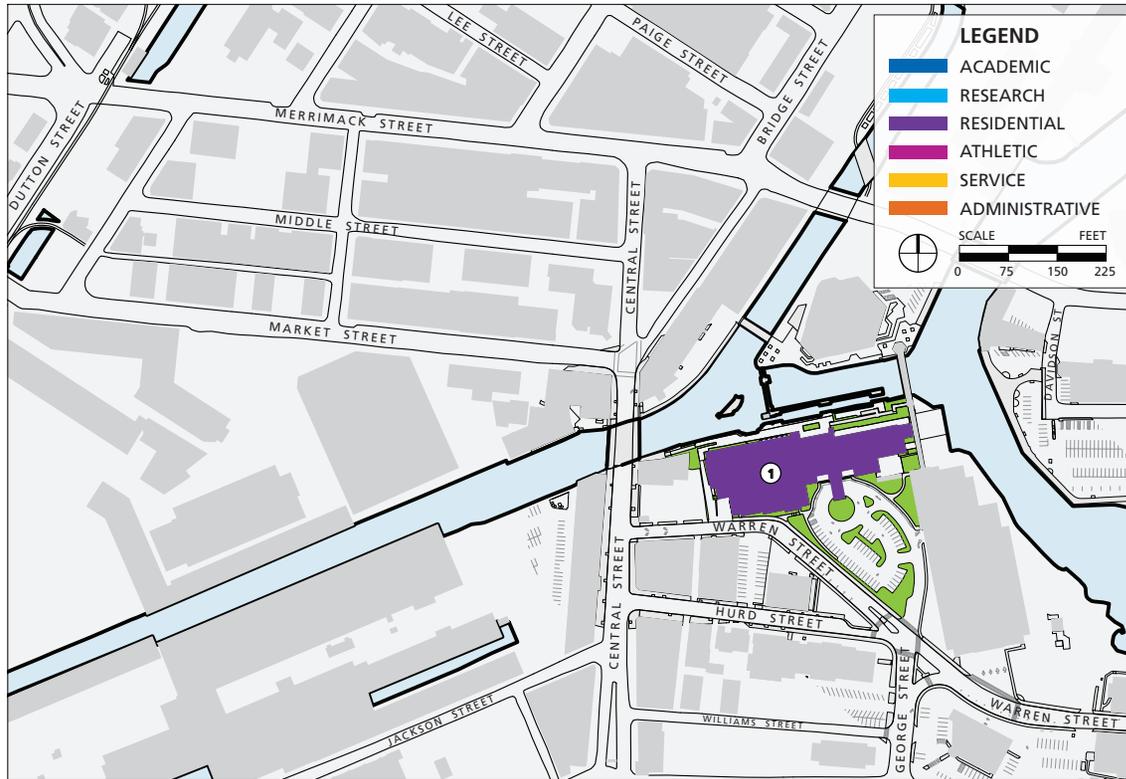
1	Ames Textile Mill	1968
2	Bourgeois Hall	1960
3	Donahue Hall	1989
4	East Parking Garage	2007
5	Fox Hall	1973
6	Leitch Hall	1960
7	Campus Recreation Center	2001
8	Tsongas Arena	1997
9	Wannalancit Mills	1862

New Projects

10	University Suites	2013
11	University Crossing	2014

Exterior Spaces

- A Riverwalk (City of Lowell)
- B Rec Center Quad
- C Perkins Parking Lot
- D University Crossing Parking Lot



THE ICC (1 building)

1 Inn & Conference Center 2009

Figure 4.4 ICC Land Use, 2016

Campus Space Profile, 2016

Adding these projects to the existing space on campus does take very helpful steps toward addressing University space deficits. Tables 4.1 and 4.2 compare the current and future space conditions, and Tables 4.3 and 4.4, on the following pages, display the resulting space pattern in 2016.

All of the facilities are being built on previously paved areas, or are replacing existing facilities on the same sites, so these improvements help meet identified space needs with a minimum of negative environmental effects.

Existing Building Use, 2011

	North Campus	South Campus	East Campus ¹	TOTAL UML
Academic	908,704	520,994	9,422	1,439,120
Research ²	0	0	193,923	193,923
Residential	78,099	117,201	615,105	810,405
Athletic	94,833	11,981	274,120	380,934
Service	21,169	8,044	204,143	233,356
Administrative	40,486	16,673	290,000	347,159
Total GSF	1,143,291	674,893	1,586,713	3,404,897

(1) Includes University Crossing and the Inn & Conference Center. (2) Buildings categorized by dominant use, by FICM codes.

Table 4.1 *Campus Interior Space, 2011*

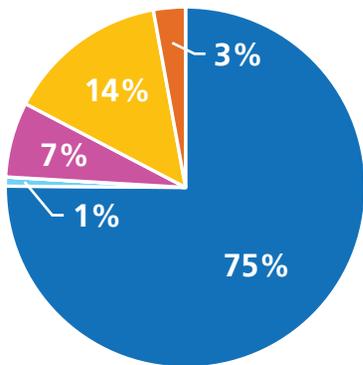
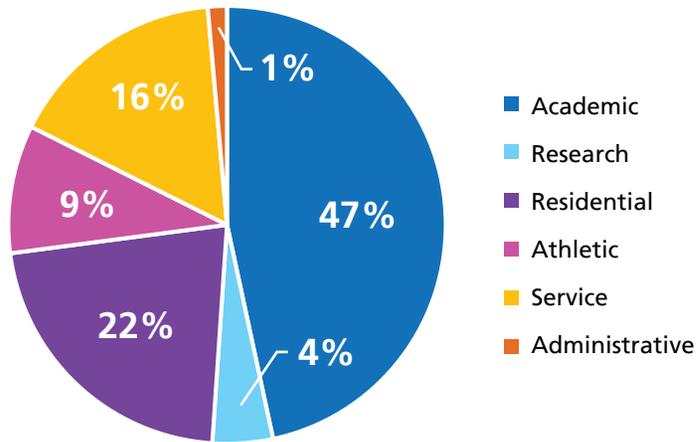
Existing Building Use, 2016

	North Campus	South Campus	East Campus ¹	TOTAL UML
Academic	1,057,704	589,994	229,422	1,877,120
Research ²	11,525	0	163,566	180,091
Residential	0	117,201	762,105	879,306
Athletic	94,833	11,981	274,120	380,934
Service	203,644	245,044	204,143	652,831
Administrative	40,486	16,673	0	57,159
Total Square Footage	1,408,192	980,893	1,638,356	4,027,441

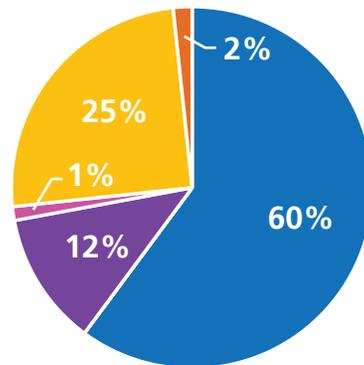
(1) Includes University Crossing and the Inn & Conference Center. (2) Buildings categorized by dominant use, by FICM codes.

Table 4.2 *Campus Interior Space, 2016*

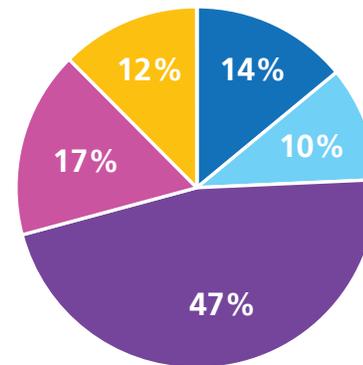
All UML Campuses, 2016



North Campus, 2016



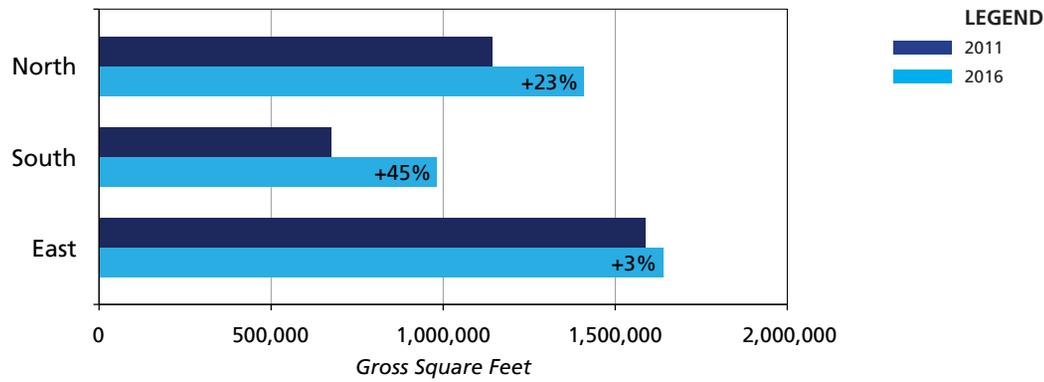
South Campus, 2016



East Campus, 2016

Table 4.3 University of Massachusetts Lowell Building Use, 2016

Total GSF by Campus, 2011 and 2016



Total GSF by Space Type, 2011 and 2016

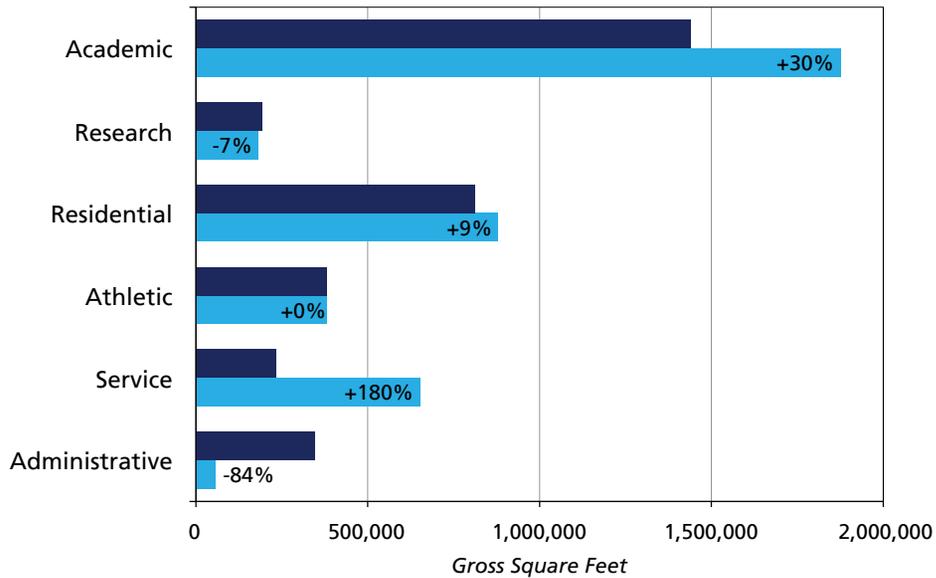


Table 4.4 University of Massachusetts Lowell Building Use, 2011 and 2016

Summary of Campus Green Space and Impervious Surfaces, 2011 (in acres)

	North Campus ¹	South Campus	East Campus ²	TOTAL UML
Total Green Space	32.05	18.21	15.47	65.72
Roof Areas	6.96	5.04	10.87	22.88
Other Paved Areas	13.82	15.84	16.72	46.38
Total Impervious Area	20.78	20.88	27.59	69.26

(1) Includes 11.0 acres of undeveloped Merrimack River frontage.

(2) Includes University Crossing and the Inn & Conference Center.

Table 4.5 *Summary of Campus Green Space and Impervious Surfaces, 2011*

Tables 4.5 and 4.6 compare pervious and impervious areas across UMass Lowell, before and after these projects.

Summary of Campus Green Space and Impervious Surfaces, 2016 (in acres)

	North Campus ¹	South Campus	East Campus ²	TOTAL UML
Total Green Space	30.52	17.42	16.87	64.81
Roof Areas	8.71	6.32	10.90	25.93
Other Paved Areas	13.61	15.35	15.28	44.24
Total Impervious Area	22.32	21.67	26.18	70.17

(1) Includes 11.0 acres of undeveloped Merrimack River frontage.

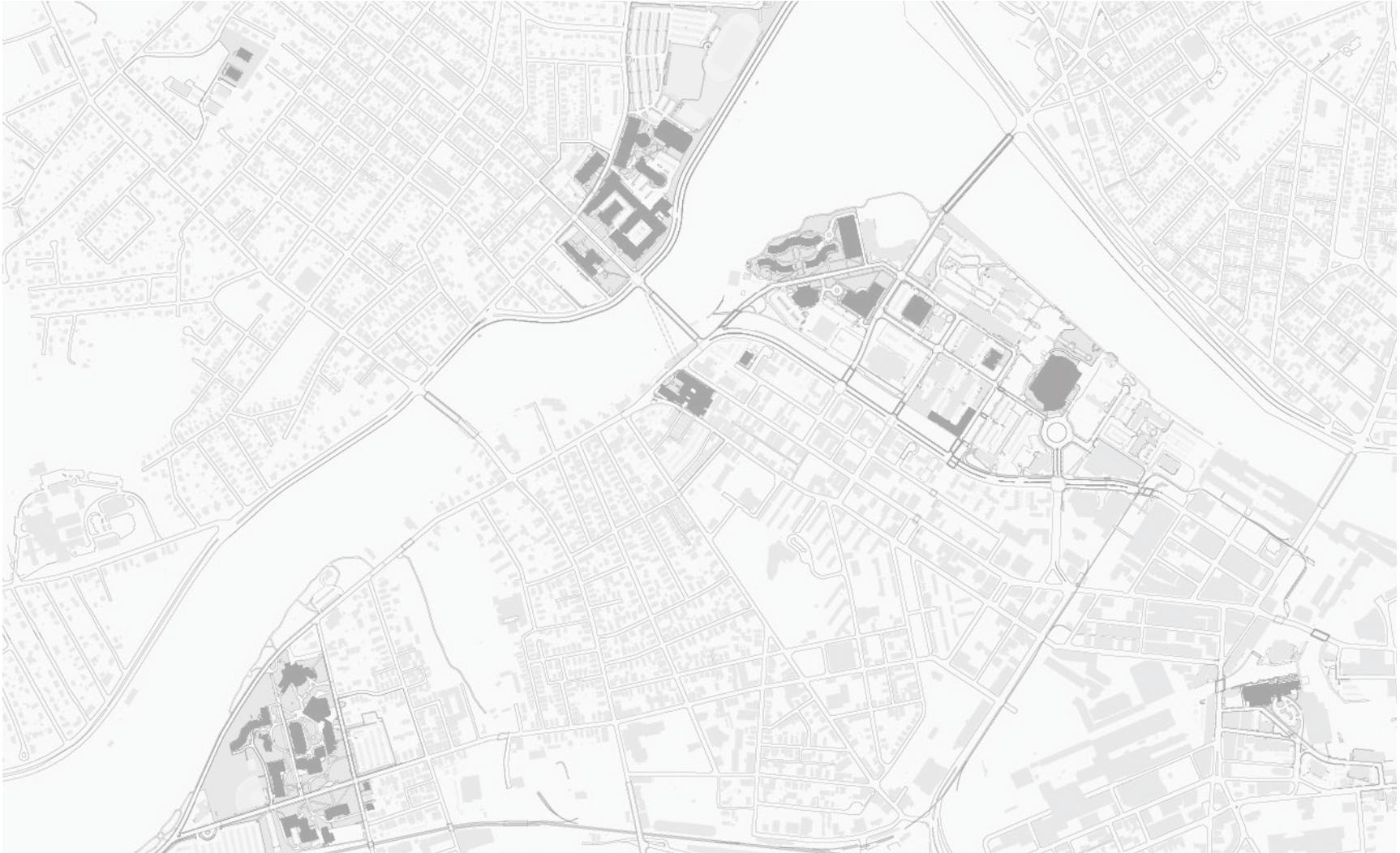
(2) Includes University Crossing and the Inn & Conference Center.

Table 4.6 *Summary of Campus Green Space and Impervious Surfaces, 2016*



Chapter Five Environmental Effects

Strategic Development Plan 2011-2016 University of Massachusetts Lowell





Environmental Effects

The ongoing modernization of the UMass Lowell campus is expected to have positive environmental impacts over the next several years. Through a combination of new construction, selective demolition of obsolete buildings and ongoing upgrade and deferred maintenance of older buildings, along with a focus on more sustainable site and landscaping features, the University is moving toward greater sustainability and energy efficiency. Along with changes to operational practices in transportation, fuel choice, site and building management, recycling, and construction management, UMass Lowell is working to limit and reduce environmental effects.

5.1 Water Management

Water and Wastewater

In FY2011, the University purchased 80,251 CCF (100 cubic feet) of water from the City of Lowell, and produced an estimated 72,200 CCF in wastewater.

The University uses low-flow fixtures in new projects and renovations. At the new Emerging Technologies and Innovation Center, wastewater will be reused to supply the cooling towers, diverting up to 419,000 gallons a year from the local wastewater treatment plant. Water conservation and recycling will be explored further by the University's Sustainability Manager, specifically an initiative in which "once-through" cooling of lab experiments will be reviewed to identify and adopt, where practical, closed loop cooling using a lab or process chiller.

In addition, the University is working toward reductions in water use through landscaping practices, that focus on increased use of native species, use of drought-resistant plants in order to reduce irrigation, and better control of irrigation systems.

Stormwater

An estimated 89,110 CCF of stormwater was generated by the University's three campuses in FY2011. As noted earlier, the University's policy of renovating instead of building new wherever possible, and of siting buildings on already impervious surfaces, reduces effects on stormwater generation.

The University also has been designing new buildings to manage stormwater on-site, through strategies like water-efficient landscaping, catch basins, and irrigation tanks. These strategies help reduce the peak rate and volume of stormwater runoff, containing it on site instead of sending it into the municipal drainage system. All projects minimize the amount of impervious surface created by the new buildings, with some of them, including University Suites, collecting stormwater runoff for on-site irrigation of plantings, thus diverting it from the municipal drains. Other projects, such as ETIC, use rain gardens as a way of naturally containing stormwater runoff on-site.

In addition to new stormwater management strategies, some projects include upgrades to the existing municipal drainage system, where the project's on-site system links to the municipal drains, as at the ETIC building on North Campus.

Stormwater Management in Projects

North Campus

Emerging Technologies and Innovation Center

Stormwater will be managed on-site in this project, primarily through the site's 67,500 square feet of open space, and rain gardens. The rain gardens will be adjacent to the main entrance. These areas will be comprised of a sand/soil water quality filter that will contain various types of plantings that help clean and filter stormwater runoff in and around the plaza, walks, and lawn areas. The plantings will be selected to meet zone hardiness and provide shade and thrive in an urban environment. Stormwater overflow will be set in each garden area and flow into stormwater drains running under the site to the municipal stormwater drains on the southern side of VFW Highway. The municipal drain piping will be upgraded as a part of this project.

North Parking Garage

The North Parking Garage project, with 650 spaces, will create only 0.08 acres of new impervious surface area. Stormwater will be managed on-site: collected from the parking garage roof and driveway, channeled into a groundwater recharge system (a subsurface detention/infiltration system), and piped to the existing drainage system on Sparks Street. The garage will be serviced by separate sanitary and stormwater drains.

South Campus

Health and Social Sciences Building

The Health and Social Sciences Building, comprised of academic and research space, will manage stormwater on-site through a combination of landscaping and underground catch basins. Stormwater will then be discharged to the municipal storm drain on Wilder Street, which flows to the Merrimack River. The building will connect to an existing sewer line on Wilder Street. Storm and sewer lines are already separated on the building site and its surrounding areas. Landscaping includes a combined planted and hard-scape plaza of 8,000 square feet on the west side of the building.

South Parking Garage

The South Parking Garage, with 720 spaces, will add 0.36 acres of new impervious surface area. The garage will be served by separate sanitary and stormwater drains. Stormwater will be handled on-site, collected and channeled into a groundwater recharge system. An under-drain will be provided to ensure the system remains operational, since the existing on-site soils consist primarily of urban fill. Additional best management practices will include deep-sump, hooded catch basins and a structural water quality device. No new stormwater outfalls will be created. Landscaping will contain drought-tolerant plantings.

On covered parking tiers, all car drippings and associated contaminants will be directed to oil/grit separators, then discharged to the municipal sewer system for treatment. Snow will be removed from the top tier of the garage and plowed to an unoccupied area of the Riverview Lot site or trucked off site. Snowmelt will be directed to on-site stormwater management facilities.

East Campus

University Suites

University Suites, a 472-bed residence hall, manages stormwater through both landscaping and underground irrigation tanks. Runoff from the roof of the building will be collected and piped to an irrigation cistern underneath the building, where it is filtered and distributed around the site as needed. Overflow from the cistern will discharge into the municipal storm drain on Perkins. The building design includes a 24,000 square foot courtyard which will be primarily green space, replacing the former IPI building's surface parking lot.

University Crossing

University Crossing, the new campus center, is expected to have landscaping that includes rain gardens, trees, and water efficient plantings. Sustainable, low water emitting drip irrigation will be provided to all planted areas. Stormwater

runoff from the roof areas of the building will be collected in tanks underneath the building, and then discharged to the municipal storm sewer.

Wetlands

There are no wetlands or tidelands on occupied portions of UMass Lowell property. UMass Lowell owns eleven acres along the Merrimack River north of the University Avenue Bridge, comprising bank, bordering vegetated wetland, and riverfront area under the Massachusetts Wetland Protection Act. There are no plans to alter this area—it will remain as green space for the foreseeable future.

5.2 Solid and Hazardous Waste

Solid Waste

The University disposed of 2,350 tons of solid waste and recyclable materials in FY2011. 4620 tons of this waste was recycled through the "Zero Sort" program, which recycles paper, cardboard, glass, plastic, and metals. A further 820 tons was recycled through other programs, including scrap metal, construction and demolition waste, computers and electronics, oil, soil, composted lawn and yard waste, batteries, ballasts, light bulbs, silver, empty metal drums, and lab glass. The total amount of recycled material results in



a 54% recycling rate for FY2011—inclusive of construction material—a significant improvement on the recycling rate of 38% in FY2010. The University is considering a pilot program in composting food waste, to further improve its recycling rate.

Hazardous Materials

Testing for hazardous materials is done in all capital projects during the design phase. If hazardous materials are discovered, they are abated before construction begins, and disposed of according to the appropriate regulations. Disposal of hazardous materials discovered during construction is coordinated between the University, UMBA or DCAM, the design team, and the contractors, in accordance with state regulations and the project's permit for removal of hazardous materials.

5.3 Community Outreach and Construction Period Considerations

The University is committed to minimizing the negative effects of construction, on behalf of both academic and urban neighbors, as well as connecting consistently with the larger Lowell community to share project updates and respond to questions and concerns.

Community Outreach

Engagement with the broader Lowell community has been a priority of the University throughout the planning and execution phases of campus renewal. Over the last few years, and particularly over the last two years as construction activity has commenced, University officials at all levels have been engaged in meetings with their counterparts in the City of Lowell, neighborhood groups, business groups, and officials from the National Park Service. These meetings have been designed to provide up-to-date information on capital project development, current status of work at the University, acquisitions, future plans, and anticipated construction period activity.

A number of meetings and briefings have been convened since early 2010:

- Four meetings with the Lowell City Council (or its Committee on Education Partnerships) specifically on the UMass Lowell capital program
- Several meetings with neighborhood groups describing the general capital plan and providing project-specific updates, including groups representing Pawtucketville, East Pawtucketville, and the Acre
- Community event announcing UMass Lowell's purchase of the St. Joseph's Hospital property
- Twice yearly student forums, hosted by the Chancellor, to discuss the ongoing capital program and physical transformation of the University
- Project specific meetings, including three meetings with a Task Force of Merrimack Street neighbors to discuss how the new University Crossing student center will engage and contribute to the surrounding community
- Project specific meeting to discuss project design, construction schedule, and project contact names for the University Suites residence hall
- Regular quarterly meetings between the UMass Lowell senior leadership team and the City of Lowell City Manager and senior City leadership
- Regular briefings to the Lowell Plan, providing updates on the capital plan
- In addition, news regarding the capital program and ongoing progress is provided on a regular basis through UMass Lowell publications, including the website, alumni magazine, and other outlets.

Construction Period Considerations

For all capital projects, key goals include building to LEED standards, a high level of recycling of construction debris, vehicular and pedestrian traffic management and safety plans, noise and dust control measures, designation of an on-site contact for community concerns, snow and storm water management, monitored excavation and, when needed, treatment and disposal of contaminated soils or other substances.

To this end, each project's construction team is providing a thoughtful program of construction period mitigation. Summaries for selected projects are below.

South Campus

South Garage

A Construction Waste Management and Disposal Plan is being developed for the South Campus Parking Garage project. The construction management firm will use all reasonable means to divert construction and demolition waste from landfills and incinerators. The goal is to closely manage the waste removal process in order to reduce costs and protect the environment by properly identifying all job site materials to be recycled. Soils have been tested and excess soils will have controlled off-site disposal and will use appropriate and/or other documentation to track disposition of excavated soils.

104

A Storm Water Pollution Prevention Plan has been established by the construction management firm and an Environmental Protection Agency (EPA) Notice of Intent was filed in June 2012.

The project Traffic Management Plan has been developed and provided to all subcontractors to ensure they understand the requirements of the project. The Traffic Management Plan addresses traffic and pedestrian safety throughout the duration of the project. The Logistics Plan has been reviewed by the State Building Inspector, UMass Lowell, and the City Engineer. The project has received a MassDOT permit to identify the trucking route for oversize loads.

The contractors are working with each subcontractor to deal with noise, dust, and vibration issues associated with construction to ensure that project construction effects are minimized.

East Campus

University Crossing

A Construction Waste Management and Disposal Plan is being developed for the University Crossing project. All waste will be identified in terms of generation point, quantity/weight, estimated waste percentage, target for salvage, or recycling. At a minimum, seventy-five percent of total non-hazardous waste for the project will be salvaged or recycled in accordance with the

MA State Building Code and LEED requirements and a higher percentage will be targeted. The construction management firm will use all reasonable means to divert construction and demolition waste from landfills and incinerators.

All hazardous materials waste will be fully monitored and tracked throughout the abatement process.

Soils have been tested and excess soils will have controlled off-site disposal and will use material shipping records and/or other documentation to track the disposition of the excavated soils.

A Storm Water Pollution Prevention Plan has been established by the site contractor and an EPA Notice of Intent was filed in May 2012.

The construction contractor has developed a Traffic Management Plan for the project. This Plan has been reviewed with the City of Lowell Engineering Department. The construction management firm has provided the Traffic Management/Logistics Plan to all subcontractors to ensure they understand the requirements of the project. The Traffic Management Plan will address traffic and pedestrian safety throughout the duration of the project. The Plan will be revised to deal with each phase of the project from demolition of the existing St. Joseph's Hospital to renovation of Salem Street and construction of the new building.

The construction management firm is working with each subcontractor to deal with noise, dust, and vibration issues associated with construction to ensure that any adverse effect on the neighborhood is minimized.

University Suites

Construction phase mitigation measures being employed at the University Suites project include the following:

- Recycling of the IPI Building demolition materials
- Dust prevention measures during demolition, including watering down all debris
- Dust control during hazardous materials removal
- Ground vibration monitoring during pile driving, with monitoring station set up in the Lowell Day Nursery
- The Site Logistics plan shows construction access gates and erosion control measures
- Traffic control for concrete and steel delivery trucks has been actively managed by the construction management firm
- Construction site fencing with solid scrim has been erected on all sides of the project site to control dust and debris



Southwick Hall, North Campus, built 1901-1903

5.4 Historical and Archaeological Resources

Subject to an agreement the University of Massachusetts Building Authority and the University of Massachusetts Lowell entered into with the Massachusetts Historic Society in April of 2010, UMass Lowell has undertaken a Historic Resources Survey. This work includes a review and evaluation of which buildings are appropriate to include in the survey in consultation with the UMass Lowell Planning staff, the Massachusetts

Historical Commission, the Lowell Historic Board, and the National Park Service. The process will involve collecting information for the Massachusetts Historic Commission's standard inventory forms, including information regarding the location, appearance, and condition of each building, as well as photographic documentation for each building.

5.5 Transportation

Over the last few years, UMass Lowell has begun a shift toward achieving greater sustainability in the planning and operation of its transportation systems. Even before completing the first Campus Transportation Plan (CTP) in 2011, the University undertook a number of new initiatives, including the first bike share program, UMass Lowell Free-wheelers; bringing the car-sharing service Zipcar to the University; distributing new pedestrian and cycling route maps to the University community; expanding shuttle service, with shorter headways and longer hours of service; partnering with NuRide, a free online service offering rewards for commuting by non-auto modes; and charging for student, faculty and staff parking.

Some projects initiated by others, such as the new University Avenue Bridge now being built by MassDOT, will transform circulation between North and East Campuses, improve the route efficiency of the University shuttle system, and upgrade key intersection on both sides of the bridge, particularly in the vicinity of University Crossing.

The CTP provides a roadmap for achieving a higher degree of sustainability in the next few years, even as the University grows. The University will be working closely with the City to



Early concept for improvements to Broadway along South Campus, from the Campus Transportation Plan, 2011

advance progress on improving key intersections, with initial attention to University/Riverside on North, Broadway/Wilder on South, and Pawtucket/School. Other areas, such as the intersection of Pawtucket/Broadway on South, will be studied to see if full turning movements can be implemented, improving access to and from South Campus and the new garage there. The University will also be exploring with the City the possibility of creating “campus main streets,” including bike lanes and pedestrian improvements, on East and South, opportunities identified in the CTP.

Transportation demand management is receiving new attention at UMass Lowell. With the hiring of the University’s first TDM Coordinator, we expect to see intensified effort in terms of communication of commute options through Residence Life, orientation, student clubs and social media; an enlarged bike share program under the Office of Residence Life in fall 2012; more bicycle parking on campus; preferential parking for clean fuel vehicles and carpoolers; ongoing coordination with the LRTA to improve coordination of service to the Commuter Rail line; safety pro-

grams for bicyclists and pedestrian; and ongoing research into best practices, combined with evaluation of efforts to facilitate investment in the most successful strategies.

Parking pricing is an important tool in reducing drive-alone trips. A standing Parking Committee meets regularly to evaluate and recommend changes to parking policy. Future initiatives may include higher prices, preferential parking, more enforcement of parking violations, providing hourly paid parking options and others. Finally, UMass Lowell's policy is an important aspect of building a more sustainable University. The University administration is encouraging faculty and staff to use the shuttle system for intercampus trips, along with the student body—a "Park Once" policy. Future initiatives may include adjusting class schedules to reduce peak loads on shuttles, encouraging faculty and staff to live within walking distance to the University, allowing more flexible work and telecommuting arrangements, and increasing the amount of distance-learning classes, among others.

5.6 Utilities and Infrastructure

As noted earlier, years of low investment in the physical plant created a backlog of deferred maintenance needs across campus. In the last several years, a number of projects have been completed that will have a significant impact on utility and other infrastructure systems, energy use, and the functionality of the campus, including the North Campus Power Plant boiler replacement (2012), conversion from oil to natural gas as the primary heating fuel, and modernization of the electrical distribution system on North Campus (2012); and on South Campus, the power plant has had boiler and breaching control equipment replaced for greater efficiency.

The South Campus Sector Plan, now underway, will make recommendations regarding the upgrade of infrastructure systems so future growth on South can be accommodated.

As additional existing core and historic campus buildings are comprehensively modernized, and others are slated for demolition, the University will continue to update basic infrastructure elements and reduce its backlog of deferred maintenance needs.

5.7 Energy Use

In FY2011, the University consumed 40,671,300 kilo watt hours (kWh) of electricity and 278,100 deka-therms ("DTH"— 1,000,000 BTUs) of natural gas. The University has been reducing the amount of fossil fuels it uses since it designated natural gas as its primary fuel source in FY2009. The North Power Plant project will further improve the efficiency of energy consumption and distribution on campus. In addition, the University has a range of smaller projects that will improve efficiency in steam, chillers, and lighting. The University has been increasing the use of building automation software to reduce energy consumption for steam and chillers throughout the University, as well as installing new energy efficient chillers on all campuses.

In partnership with the Executive Office of Energy and Environmental Affairs, the University has installed equipment to submeter all of its buildings, funded by an ARRA grant. The submetering project, a pilot program among the University's campuses, will provide UMass Lowell with the means to better understand energy consumption on campus, and minimize waste. This system, which uses ENERNOC software, meters electrical power, natural gas, steam and condensate flow, and will be used to dynamically monitor and manage energy consumption. The data will also

allow UMass Lowell to measure energy consumption levels before and after energy conservation measures, to gauge their success.

Energy Use in Projects

All University projects, including renovations, are being designed to LEED Silver, which addresses many forms of energy conservation. The following notes some project highlights.

North Campus

Emerging Technologies and Innovation Center

Based on the energy model for the project, the building will operate at a thirty-one percent savings over the ASHRAE 90.1 baseline, exceeding the Massachusetts Stretch Energy Code target of twenty percent better than ASHRAE 90.1. At the ASHRAE 90.1 baseline, the building would consume 3.8 million kWh annually; with the building as designed, it will consume 3.1 million kWh annually.

North Parking Garage

The new garage has high efficiency LED lighting throughout the building.

North Campus Power Plant

This project will replace two 1950s vintage No. 6 oil-fired boilers with two fully automated,

natural gas fired boilers. The new boilers will operate at over eighty percent efficiency, reducing the required energy input at the plant by more than seventeen percent.

South Campus

Health and Social Sciences Building

This new academic building is designed to reduce energy consumption related to heating and cooling by optimizing chilled beam technology. The building system design will reduce greenhouse gas emissions by 112 MTeCO₂ per year, and the building overall is designed to operate at a twenty-three percent savings over the ASHRAE 90.1 baseline.

South Parking Garage

This project will use low energy lighting, on both the interior and the exterior of the building. Interior lighting will be reduced during daytime hours in order to conserve energy.

East Campus

University Suites

This 472-bed residence hall is designed to operate at a twenty-three percent savings over the ASHRAE 90.1 baseline. The majority of the building's interior and exterior lighting is through LED fixtures, with occupancy sensors in common areas to further reduce energy consumption.

University Crossing

This new center is designed to operate a twenty percent savings over the ASHRAE 90.1 baseline. The atrium is expected to use specialized LED products for extra-long lamp life, as well as lighting controls, to reduce energy consumption. Daylight-responsive dimming of the lighting in office areas is being explored.

Greenhouse Gas Emissions

The University is committed to reducing its greenhouse gas (GHG) emissions. Phase One of the Climate Action Plan aims to achieve a reduction of 14,000 MTeCO₂ in GHG emissions over the BAU level by 2020. The University has an initial list of energy efficiency projects that are expected to provide an estimated ten-to-twelve percent reduction over the BAU level in annual emissions (please see Chapter Three's Table 3.6).

Additional initiatives will be developed by the CAP Implementation Steering Committee, which is comprised of a diverse group of members from the administrative, student affairs, and academic areas of the University. The diversity of this committee will help to address sustainability comprehensively across the University's activities and operations.

In addition, the steps to be undertaken to build a more sustainable University with respect to transportation will have positive effects in terms of limiting or reducing greenhouse gas emissions. As the physical, programmatic and policy infrastructure is developed, we would expect to see fewer cars on campus (particularly for the residential student body), more carpooling, more intensive use of the shuttle system and more walking and bicycling between campuses.

Sustainability

The University will continue to focus on minimizing its effect on the environment, through many strategies in designing new buildings and operating existing ones. New buildings are being designed to meet the standards of LEED Silver.

Pilot programs in renewable energy are currently underway on campus. Photovoltaic energy generators have been installed on four buildings' roofs: Costello Gym, Dugan Hall, Leitch Hall, and Bourgeois Hall. The College of Engineering has also installed four wind turbines on the roof of Ball Hall, as part of a research project.



Ball Hall's wind turbines, North Campus

As the University grows, strategies for sustainability become increasingly important. The capital projects underway, as well as those that are planned for the next few years, have employed sustainable strategies in both building design and operations; the effectiveness of those strategies will inform future projects. The cumulative effect of the University's multi-faceted efforts for sustainability will continue to lighten its environmental effect.



Appendix

Strategic Development Plan 2011-2016 University of Massachusetts Lowell





Appendix: List of Figures and Tables

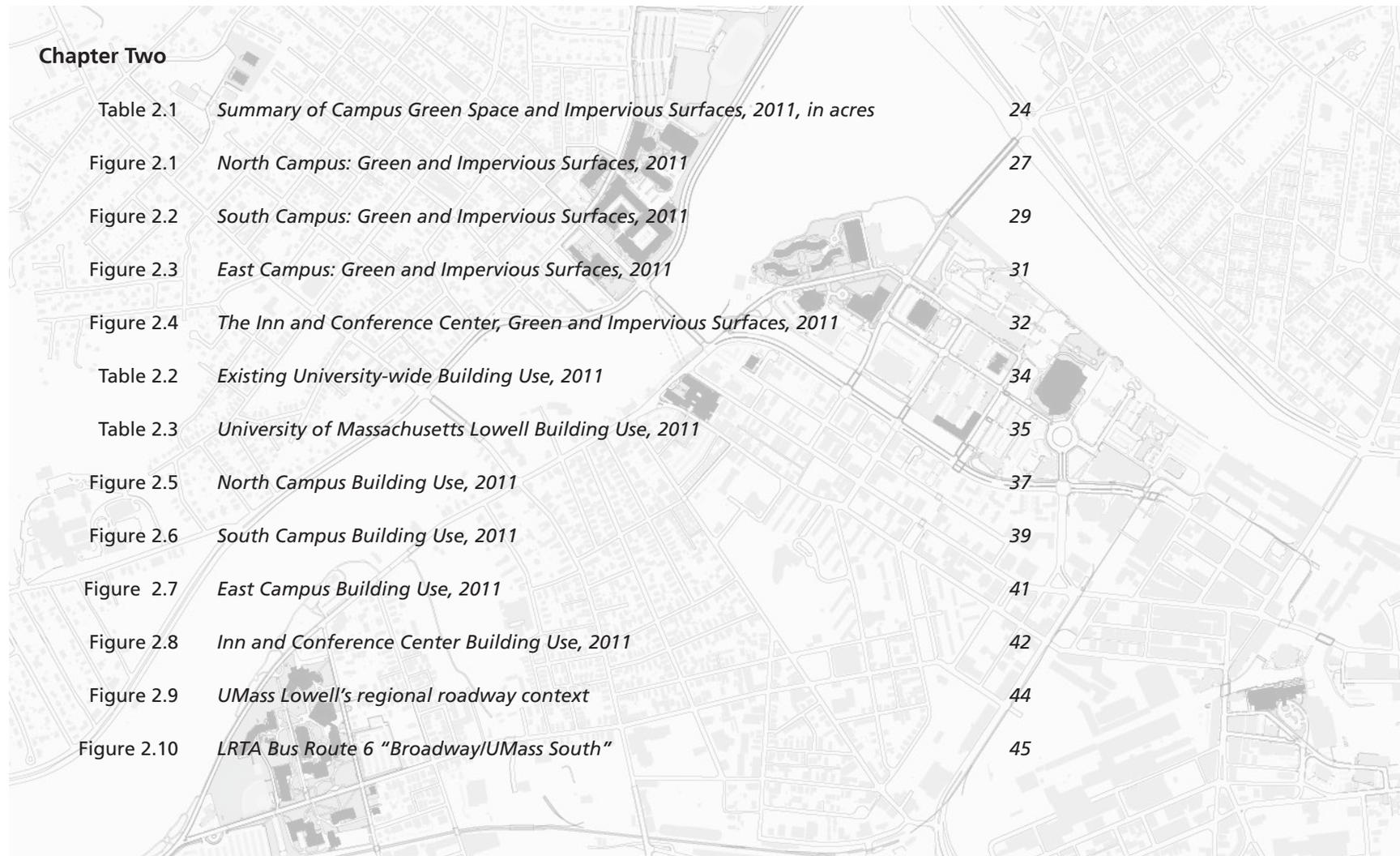
Introduction

- | | | |
|------------|---|---|
| Figure 1.1 | <i>University of Massachusetts Lowell: Existing Conditions Map of North, South, and East Campuses, 2011</i> | 6 |
| Figure 1.2 | <i>University of Massachusetts Lowell: Future Conditions, 2016</i> | 8 |

Chapter One

- | | | |
|------------|--|----|
| Figure 1.3 | <i>The University's Urban Context</i> | 12 |
| Figure 1.4 | <i>Downtown Lowell Historic District</i> | 14 |
| Figure 1.5 | <i>Aerial view of the City of Lowell and the three UMass Lowell campuses</i> | 16 |
| Figure 1.6 | <i>North Campus Floodplain, University of Massachusetts Lowell</i> | 17 |
| Figure 1.7 | <i>South Campus Floodplain, University of Massachusetts Lowell</i> | 18 |
| Figure 1.8 | <i>East Campus Floodplain, University of Massachusetts Lowell</i> | 19 |

Appendix: List of Figures and Tables, *continued*



Chapter Two		
Table 2.1	<i>Summary of Campus Green Space and Impervious Surfaces, 2011, in acres</i>	24
Figure 2.1	<i>North Campus: Green and Impervious Surfaces, 2011</i>	27
Figure 2.2	<i>South Campus: Green and Impervious Surfaces, 2011</i>	29
Figure 2.3	<i>East Campus: Green and Impervious Surfaces, 2011</i>	31
Figure 2.4	<i>The Inn and Conference Center, Green and Impervious Surfaces, 2011</i>	32
Table 2.2	<i>Existing University-wide Building Use, 2011</i>	34
Table 2.3	<i>University of Massachusetts Lowell Building Use, 2011</i>	35
Figure 2.5	<i>North Campus Building Use, 2011</i>	37
Figure 2.6	<i>South Campus Building Use, 2011</i>	39
Figure 2.7	<i>East Campus Building Use, 2011</i>	41
Figure 2.8	<i>Inn and Conference Center Building Use, 2011</i>	42
Figure 2.9	<i>UMass Lowell's regional roadway context</i>	44
Figure 2.10	<i>LRTA Bus Route 6 "Broadway/UMass South"</i>	45

Appendix: List of Figures and Tables, *continued*

Chapter Two, continued

Table 2.11	<i>LRTA Bus Route 7 "Pawtucketville" provides service to North Campus</i>	46
Figure 2.12	<i>LRTA Bus Route 9, the "Downtown Circulator"</i>	46
Table 2.3	<i>UMass Lowell Shuttle Bus Routes, 2011</i>	47
Figure 2.13	<i>UMass Lowell Commuter densities by municipality, 2010</i>	48
Figure 2.14	<i>5 and 10 minute Walking Radii between UMass Lowell's three campuses</i>	49
Figure 2.15	<i>University-wide parking garages and lots, 2011</i>	51
Figure 2.16	<i>Bicycling routes at UMass Lowell, 2011</i>	53
Figure 2.17	<i>Pedestrian routes at UMass Lowell, 2011</i>	53
Figure 2.18	<i>Promoting the University's bike sharing program</i>	53
Figure 2.19	<i>Sustainable transportation components, North Campus, 2011</i>	54
Figure 2.20	<i>Sustainable transportation components, South Campus, 2011</i>	55
Figure 2.21	<i>Sustainable transportation components, East Campus, 2011</i>	56
Figure 2.22	<i>Sustainable transportation components, the ICC, 2011</i>	56

Appendix: List of Figures and Tables, *continued*

Chapter Two, continued

Figure 2.23	<i>Priority Habitat, Estimated Habitat Natural Heritage and Endangered Species Program, UMass Lowell</i>	58
Figure 2.24	<i>North Campus outfall locations, UMass Lowell</i>	59
Figure 2.25	<i>South Campus outfall locations, UMass Lowell</i>	60
Figure 2.26	<i>East Campus outfall locations, UMass Lowell</i>	61

Chapter Three

Table 3.1	<i>UMass Lowell's enrollment figures and projections, 2008–2016</i>	64
Table 3.2	<i>Faculty growth, 2007 to 2011</i>	64
Table 3.3	<i>Research dollar volume (in thousands) from 2007 to 2015</i>	66
Table 3.4	<i>Online course registration growth from 2007 to 2011</i>	66
Figure 3.1	<i>From the 2010 Science and Engineering Renewal Plan, an analysis of North Campus building capacity for renovation</i>	67
Figure 3.2	<i>Areas of Opportunities from The Campus Transportation Plan, 2011</i>	72
Table 3.5	<i>Commuter driving distances, from the Campus Transportation Plan, 2011</i>	74

Appendix: List of Figures and Tables, *continued*

Chapter Three, *continued*

Figure 3.3	<i>Priority Infrastructure Roadway Improvements from the Campus Transportation Master Plan</i>	76
Figure 3.4	<i>Early concept for potential new University 'main streets': before and after images of Pawtucket Street along East Campus</i>	77
Figure 3.5	<i>FY2011 UMass Lowell GHG Emissions</i>	79
Table 3.6	<i>FY 2012 Energy Efficiency Projects</i>	80

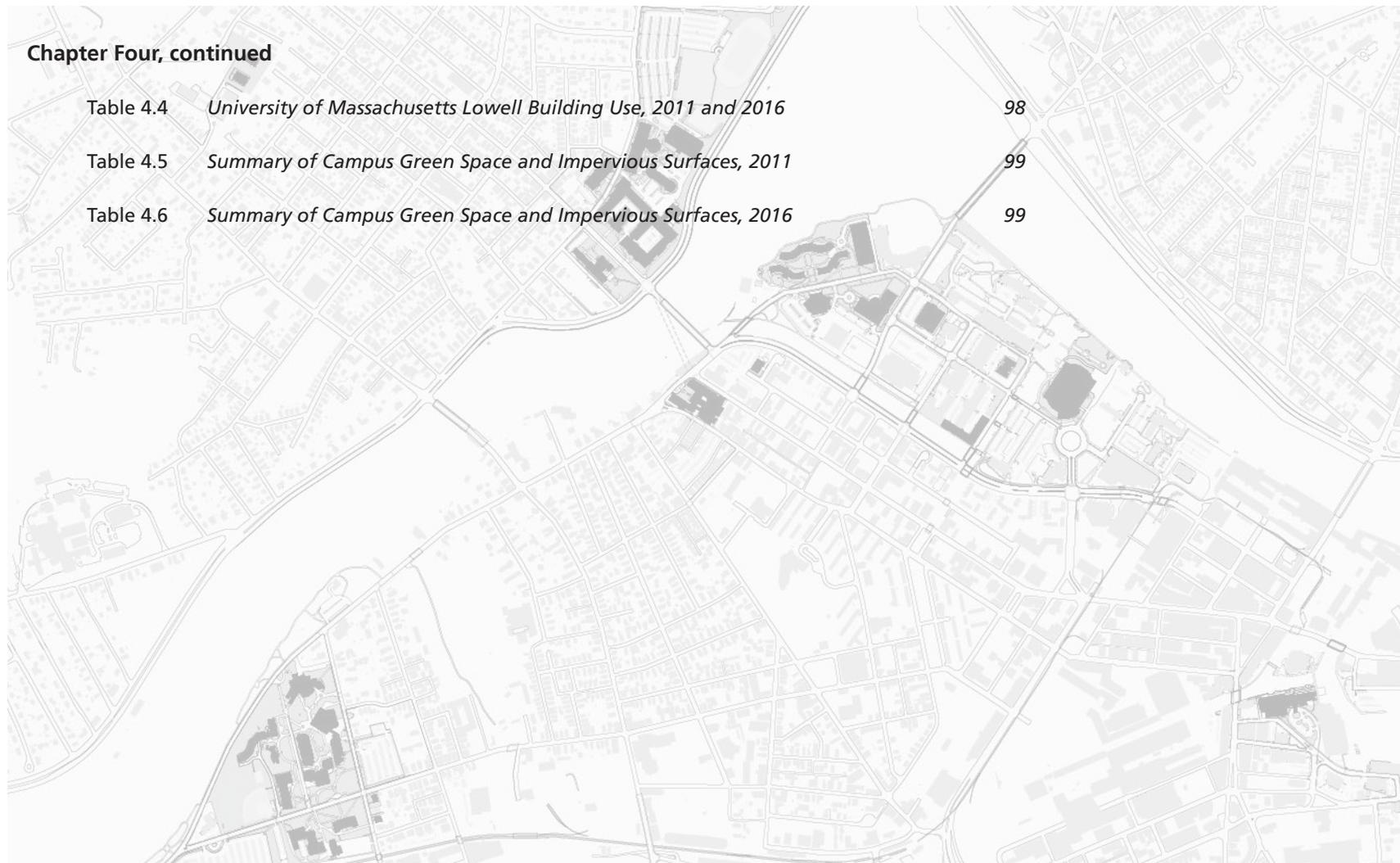
Chapter Four

Figure 4.1	<i>North Campus Land Use, 2016</i>	92
Figure 4.2	<i>South Campus Land Use, 2016</i>	93
Figure 4.3	<i>East Campus Land Use, 2016</i>	94
Figure 4.4	<i>ICC Land Use, 2016</i>	95
Table 4.1	<i>Campus Interior Space, 2011</i>	96
Table 4.2	<i>Campus Interior Space, 2016</i>	96
Table 4.3	<i>University of Massachusetts Lowell Building Use, 2016</i>	97

Appendix: List of Figures and Tables, *continued*

Chapter Four, continued

Table 4.4	<i>University of Massachusetts Lowell Building Use, 2011 and 2016</i>	98
Table 4.5	<i>Summary of Campus Green Space and Impervious Surfaces, 2011</i>	99
Table 4.6	<i>Summary of Campus Green Space and Impervious Surfaces, 2016</i>	99

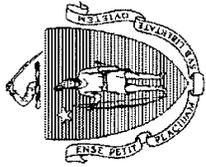


EOEEA Certificate

Strategic Development Plan 2011-2016 University of Massachusetts Lowell







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March 23, 2012

**CERTIFICATE OF THE SECRETARY OF ENERGY AND ENVIRONMENTAL AFFAIRS
ESTABLISHING A SPECIAL REVIEW PROCEDURE**

PROJECT NAME : Strategic Development Framework for University of
Massachusetts Lowell
PROJECT MUNICIPALITY : Lowell
PROJECT WATERSHED : Merrimack River
EEA NUMBER : TBD
PROJECT PROponents : University of Massachusetts Lowell
DATE NOTICED IN MONITOR : N/A

Pursuant to the Massachusetts Environmental Policy Act (G.L. c.30, ss. 61-62I) and Section 11.09 of the MEPA regulations (301 CMR 11.00), as Secretary of Energy and Environmental Affairs, and with the consent of the Proponent, I hereby establish a Special Review Procedure (SRP) to guide the review of a Master Plan for University of Massachusetts Lowell (UMass Lowell).

Project Description

Since 2008, the University of Massachusetts Lowell (UMass Lowell), with the assistance of the University of Massachusetts Building Authority (UMBA) and the Division of Capital Asset Management (DCAM), has been developing a comprehensive, contemporary planning approach that provides a Strategic Development Framework for the emerging Campus. This framework is consistent with Strategic Plan 2020, the University's academic planning document and is based on sequential sector plans for the three areas of the UMass Lowell Campus that will maximize the use of existing facilities, add specialized facilities as needed, and allow for strategic academic reuse and realignment of vacated facilities. The University also recently completed a Campus-wide Transportation Plan and a Campus-wide Climate Action Plan. These planning efforts have resulted in proposals for new facilities and reuse of existing facilities at

UMass Lowell, as outlined in the attached *Capital Projects Update* (March 2012) and reflected on the attached *Emerging Campus Map* (March 2012). Taken together, the projects in the *Capital Projects Update* will carry UMass Lowell from its 2010 student population of about 12,000 to a population of about 16,000 by 2016. It will provide housing for an additional one thousand or more students on campus, with the aim of housing half of all students. It will add about 800,000 gross square feet (gsf) to the existing 3.4 million gsf, allowing for new academic programs and better organization for and service to existing programs.

Project Background

In August 2011, the University of Massachusetts Lowell (UMass Lowell) filed an Environmental Notification Form (ENF) for the North Campus Garage (EEA# 14777) that did not require the preparation of an Environmental Impact Report (EIR). The project, as described in the ENF, entailed the construction of a 650-space parking garage on UMass Lowell's North Campus. In accordance with the ENF Certificate issued on September 9, 2011, the University was directed to develop a Special Review Procedure (SRP) for any new projects at UMass Lowell prior to the submission of any future ENFs for projects on the campus.

MEPA Jurisdiction

Development on the UMass Lowell campus is subject to review under MEPA because it will be undertaken and financed by a State Agency and, either on an individual or collective basis, projects will likely exceed MEPA review thresholds at 301 CMR 11.03. Therefore, MEPA jurisdiction is broad and extends to all aspects of any project that are likely, directly or indirectly, to cause Damage to the Environment, as defined in the MEPA regulations.

SPECIAL REVIEW PROCEDURE

The size and complexity of campus-wide development, combined with its long-term planning and construction timeframe and multiple phases, will benefit from the establishment of an SRP. This SRP will benefit the environment and serve the purposes of MEPA by providing meaningful opportunities for public review, analysis of alternatives, and consideration of cumulative environmental impacts.

UMass Lowell Master Plan/ Strategic Development Plan

In accordance with 301 CMR 11.05(7), UMass Lowell will present potential cumulative environmental impacts, analysis of alternatives, and appropriate mitigation measures for projects covered under its Master Plan for the next five years in an Expanded Notice of Project Change (Expanded NPC) described in additional detail below. This analysis will include cumulative

impacts of implementation of the Master Plan/Strategic Development Plan, including an evaluation of: new construction; student housing; transportation; long-term parking needs; infrastructure impacts including stormwater, water, wastewater, energy, utilities, telecommunication, and technology; sustainability; stormwater management; water quality and groundwater; greenhouse gas emissions; construction-period impacts; and potential impacts to wetlands and historical and archeological resources, as applicable.

The Master Plan/Strategic Development Plan will be developed with a respect for a variety of considerations, including: student life, green/sustainable facilities and environmental priorities, integration of space functions, compatibility with natural surroundings, integration with the surrounding community, transportation and parking, and future growth and development.

An SRP is particularly appropriate for the review of the UMass Lowell Master Plan because the Master Plan/Strategic Development Plan involves phased development over a period of time. Both the projects themselves and the public and agency review of their environmental impacts will benefit greatly from flexibility within the review process.

Master Planning Area

This Special Review Procedure covers the geographic area as depicted in the attached *Emerging Campus Map* (March 2012). If the geographic area is expanded, the SRP may be amended accordingly.

Submission of the Master Plan/Strategic Development Plan

UMass Lowell intends to file a Master Plan/Strategic Development Plan (SDP) as an Expanded NPC, which will be circulated for a 30-day public comment period in accordance with 301 CMR 11.05(7) and 11.06(1).

The Expanded NPC on the Master Plan/SDP will include all the projects outlined in the attached *Strategic Development Plan (SDP) Outline* (February 2012) and the *UMass Lowell Capital Projects Update* (March 2012), which constitute the projected Five-Year Capital Projects Plan for the entire campus. The Master Plan/SDP will discuss and analyze the cumulative environmental effects of all Projects in Construction, with the exception of the previously reviewed North Campus Garage (EEA#14777), and all Projects in Planning, as outlined in the *UMass Lowell Capital Projects Update*. With respect to the Projects in Construction, it is acknowledged that such review of cumulative environmental impacts will be looked at in the context of how they may affect future projects on campus, but will not impose any specific requirements on the projects underway.

Prior to the submission of the Master Plan/SDP, UMass Lowell will submit a detailed ENF for the South Campus Garage, a 760-car parking structure. The South Campus Garage project as well as the Master Plan/SDP will be reviewed pursuant to this Special Review Procedure. Therefore, the Master Plan/SDP will be filed as an Expanded NPC on the South Campus Garage project and will retain the same project number as the South Campus Garage project.

After reviewing the Expanded NPC on the Master Plan/SDP and the public comments received, the Secretary of Energy and Environmental Affairs will determine whether the Master Plan/SDP will require the submission of an Environmental Impact Report (EIR). If the Secretary determines that additional review of the Master Plan/SDP is required, then there shall be a presumption that UMass Lowell shall prepare a Single EIR in accordance with 301 CMR 11.07(5).

Subsequent Filings

After the review of the Master Plan/SDP for projects undertaken in connection with the Five-Year Capital Projects Plan, UMass Lowell will submit a Notice of Project Change (NPC) at the end of each five-year development period (beginning in 2016) if any major new capital projects are anticipated in the coming five years. The periodic NPCs should provide, at a minimum, a level of detail consistent with an Environmental Notification Form (ENF) and include an overview of any proposed new development, analyses of project alternatives and potential cumulative impacts, and identification of proposed mitigation measures, as applicable. The periodic NPCs will also include an update on the status of Campus-wide infrastructure improvements, Campus-wide mitigation measures (such as Transportation Demand Management and greenhouse gas emissions management), new development projects within the Capital Project Plan area, and any significant changes to the UMass Lowell's Strategic Development Framework.

Additionally, UMass Lowell must submit an NPC prior to commencement of any project that is not anticipated in the then current Master Plan/SDP, but that is proposed to move forward prior to the submission of the next periodic NPC. For these projects, the submission of a NPC is required regardless of whether the project, on its own, exceeds MEPA review thresholds. However, NPCs will not be required for demolition or rehabilitation of existing space.

Periodic and project-specific NPCs will be noticed in the Environmental Monitor for review by state permitting agencies and the general public. If the effects of any individual project or collective set of projects described in an NPC meet or exceed mandatory EIR thresholds, UMass Lowell may request a Single EIR or a partial or full Waiver from the requirement to submit an EIR provided that the NPC provides a level of detail sufficient to support the request, in accordance with the relevant provisions for Expanded ENFs within the

MEPA regulations. In reviewing any submission by UMass Lowell under this SRP, I retain the discretion as Secretary to require, or not to require, the preparation of an EIR, whether the project exceeds mandatory EIR thresholds or not, consistent with the provisions of the MEPA regulations governing NPCs at 301 CMR 11.10.

The SDP and each periodic or project-specific NPC must be circulated in accordance with the MEPA regulations 301 CMR 11.16 and to all commenters listed on previous Secretary's Certificates. State permitting agencies may take any required Agency Actions for individual or collective projects after a finding either (1) that no further MEPA review is required based on an NPC, or (2) if an EIR is required, that it adequately complies with MEPA.

Public Process

Each project-specific filing must be circulated to:

- all commenters on the North Campus Garage project (EEA#14777);
- all commenters on the Phase 1 South Campus Garage project;
- all commenters on the Master Plan/SDP;
- all required parties under Section 11.16 of the MEPA regulations; and
- all commenters on subsequent NPC filings if not included in the above.

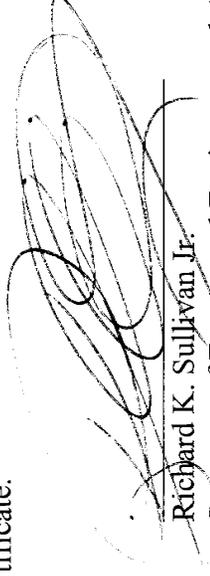
A site visit and consultation meeting public meeting will be scheduled and noticed in the Environmental Monitor for each project-specific filing. As part of this SRP, UMass Lowell has agreed that it will continue with its periodic and project-specific public outreach efforts to supplement the circulation and review of documents under this SRP. I commend them for this effort.

Conclusion:

The Proponent's signature below indicates consent to the establishment of a Special Review Procedure as outlined in this Certificate.

3-29-2012

Date



Richard K. Sullivan Jr.
Secretary of Energy and Environmental Affairs

3-27-12

Date



Martin Meehan
Chancellor, UMass Lowell

EEA #14881

Certificate Establishing a Special Review Procedure

03/23/2012

Attachments:

Strategic Development Plan (SDP) Outline
UMass Lowell Capital Projects Update
Emerging Campus Map

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