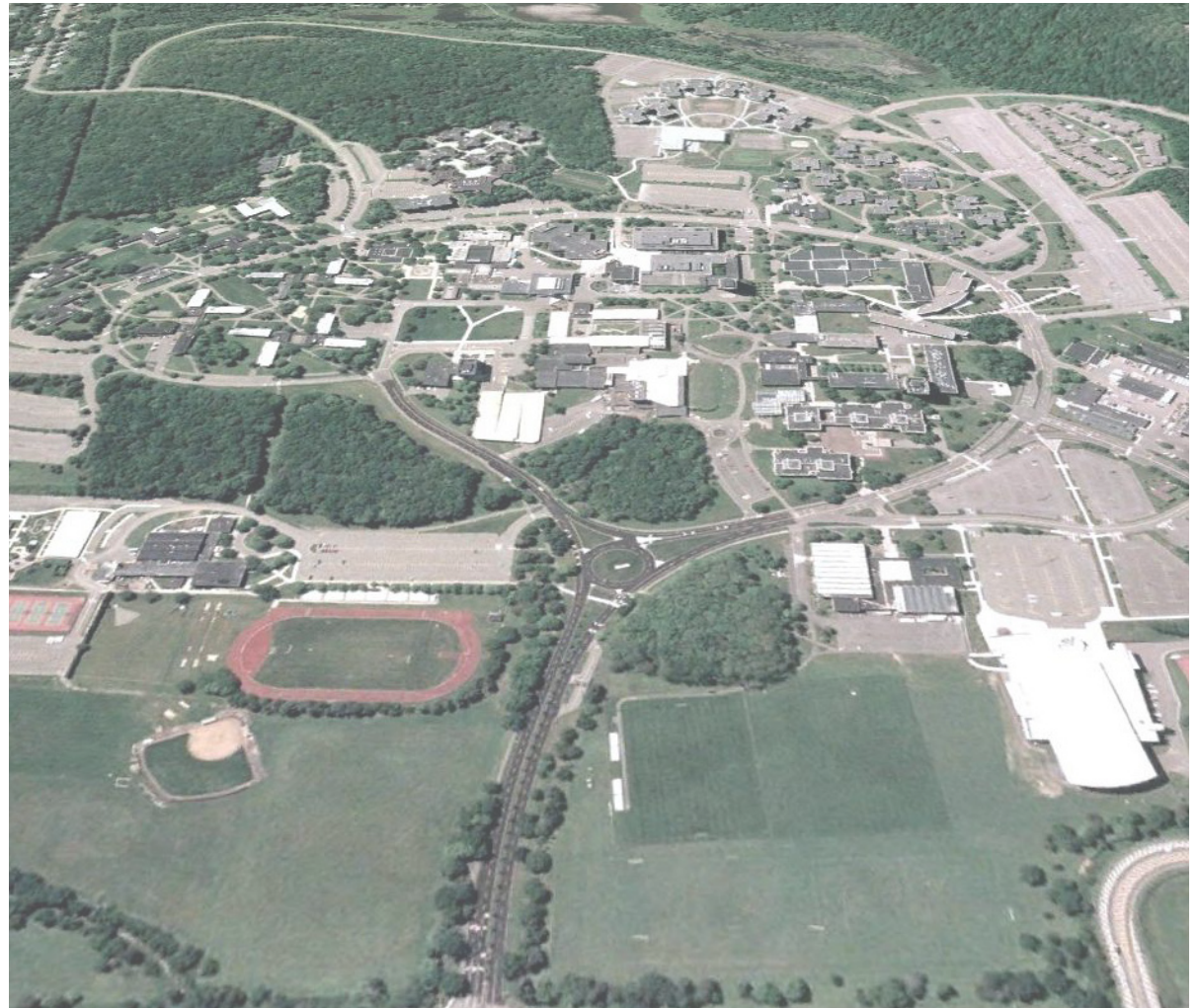


JULY 2010

PHASE 2: ASSESSMENT OF CONDITIONS



FACILITIES MASTER PLAN

CAPITAL PLAN YEARS 2013 TO 2023
STATE UNIVERSITY CONSTRUCTION FUND & BINGHAMTON UNIVERSITY
SUCF PROJECT NUMBER 07839

PERKINS
+ WILL

CONTENTS

2.0 INTRODUCTION	4	2.4 GEOGRAPHY	40	2.8 ENVIRONMENTAL	52
		2.4.1 Climate and Geography	40	2.8.1 Policies and Practices	52
2.1 LAND USE	6	2.4.2 Significant Slopes	40	2.8.2 Vistas and Views	54
2.1.1 Property Boundaries	6	2.4.3 Drainage	40		
2.1.2 Zoning Restrictions	8	2.4.4 Prevailing Winds	40	2.9 TECHNOLOGY	56
2.1.3 Community Land Use	10			2.9.1 Technology Administration	56
2.1.4 Campus Land Use	12	2.5 SECURITY	42	2.9.2 Campus Data System	56
2.1.5 Development Potential	14	2.5.1 University Police	42	2.9.3 Campus Voice System	60
		2.5.2 Site Security	42	2.9.4 Audio Visual Systems	60
2.2 CIRCULATION	16	2.5.3 Buildings & Facilities Security	43	2.9.5 Backup Power for Technology	61
2.2.1 Pedestrian	16	2.5.4 Communication & Notification	44	2.9.6 Vision and Capacity	62
2.2.2 Conflict points	16	2.5.5 Emergency Response & Evacuation	44		
2.2.3 Bicycle	18	2.5.6 Areas of Concern & Upgrades	45	2.10 PHYSICAL CONDITIONS	64
2.2.4 Transit	20			2.10.1 Infrastructure	64
2.2.5 Vehicular	22	2.6 LIFE SAFETY	46	2.10.2 Building Condition Assessment	78
2.2.6 Parking	24	2.6.1 Life Safety Systems	46		
2.2.7 Service	28			2.11 SUITABILITY	82
2.2.8 Emergency Access	30	2.7 ACCESSIBILITY	48	2.11.1 Overview	82
		2.7.1 Access and Circulation Conditions	48	2.11.2 Suitability Recommendations	84
2.3 LANDSCAPE	32	2.7.2 Accessible Parking	48		
2.3.1 Vegetation	32	2.7.3 Accessible Transit	50		
2.3.2 Campus Open Space	34	2.7.4 University Accommodation	50		
2.3.3 Hardscapes	36	2.7.5 Adaptive Technology	50		
2.3.4 Site Furnishings	38				

2.0 Introduction

Binghamton University is a public research University Center in the State University of New York (SUNY) system. The University includes six schools and offers comprehensive undergraduate and graduate programs in over 130 areas of study.

The University's 619-acre campus is located in Vestal, NY, in the Southern Tier region of Upstate New York. The University also includes a new downtown campus, as well as a number of smaller support facilities in the Southern Tier region.

The State University Construction Fund (SUCF) engaged Perkins+Will to conduct a Facilities Master Plan (FMP) report for the University. The intent of the FMP is to qualify and evaluate the University's existing facilities, and provide a plan for future capital projects to support the University's mission.

The study was initiated in January of 2010, and consists of five phases: Campus Profile, Assessment of Conditions, Analysis of Space Needs, Concept Alternatives, and Final Recommendations.

This report, Assessment of Conditions, is the fourth phase of five comprising the FMP. The document presents an assessment of the physical and operating conditions of the campus facilities and grounds. Several system-wide data sets have been utilized in delivering this analysis, including the Mission Review II (MRII), referenced in the Phase 1 Campus Profile report, and the Building Conditions Assessment Survey (BCAS). The detail of findings of the Assessment of Conditions will inform the recommendations and proposals in later phases of the FMP.

Additional materials support the data presented in this report including Appendix A: Buildings Manual and other reports and electronic data deliverables.

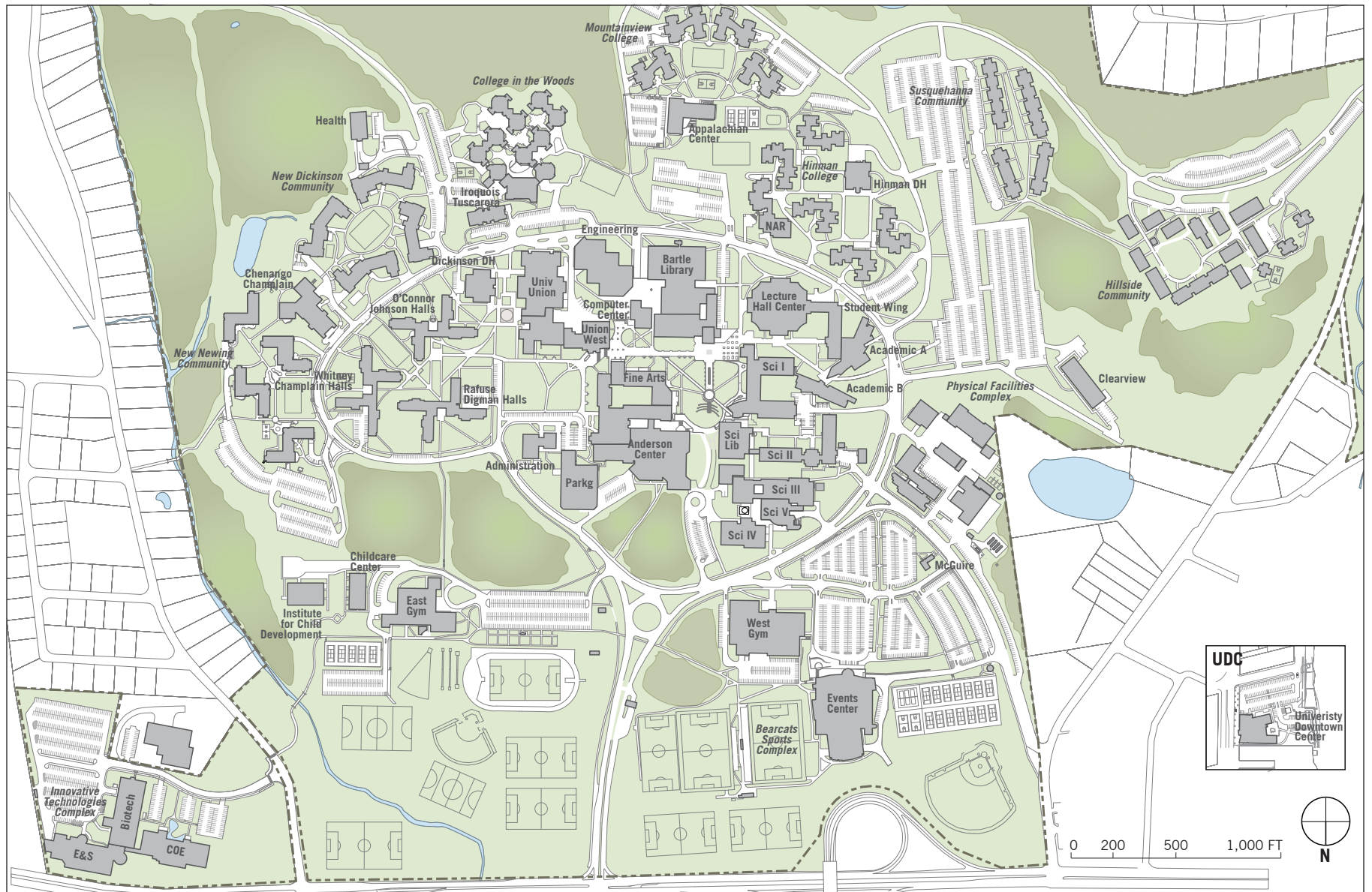


FIGURE 2.0A Binghamton University Existing Campus

2.1 Land Use

2.1.1 PROPERTY BOUNDARIES

Although Binghamton University owns or leases multiple properties in an area stretching from Conklin to Glendale, the primary campus is consolidated in the Town of Vestal and is located south of the Route 434 (Vestal Parkway) between the ITC (east of Murray Hill Road) to Bunn Hill Road (County Road 53).

The main campus properties including both State-owned and Binghamton University Foundation-owned properties are listed below and located in Figure 2.1.1A. In all, Binghamton University property comprises 33 parcels for a total of 1,505 acres. Additionally, the Binghamton Foundation established University Plaza LLC as a subsidiary, not-for-profit student housing corporation to develop University Plaza Apartments on Vestal Parkway. University Plaza LLC owns the project for 30 years on land leased from Newman Development. The University maintains no direct link to the private student housing development, which is managed by Ambling Management Co.

As of 2010 the following entities hold ownership to BU property:

- + State (620.7 acres)
- + Foundation (881.7 acres)
- + NYS Housing Finance Agency (4.2 acres)

Guidelines for the roles and limits of responsibilities for university foundations are outlined in SUNY Policies and Procedures (Campus-Related Foundations Guidelines document 9600 dated January 1, 2009). A university foundation should “receive and acquire, on behalf of the campus, real and personal property that supplement State of New York resources of the state and provide a mechanism to meet campus facility requirements in areas such as student housing that are self-funding in nature.”

The roles of the NYS Housing Finance Agency are defined in accordance with New York Code Section 47-A of Article 3, granting that agency the power to initiate state university facility construction and to issue state university construction bonds. The Agency currently holds several smaller portions of the main campus property in connection with this funding role on campus.

OWNED

1. BU Campus comprises 16 Foundation-owned parcels (317.4 acres), seven State-owned parcels (619 acres), four NYS Housing Finance Agency-owned parcels (4.2 acres).
2. University Downtown Center comprises two State-owned parcels in downtown Binghamton (1.7 acres).
3. 426-428 Commerce Road consists of two Foundation-owned parcels in Vestal (1.63 acres).
4. Glendale Property is one Foundation-owned forested parcel in Union (562.7 acres).
5. University Plaza Apartments (Owned by University Plaza LLC, subsidiary of Binghamton Foundation).

EXISTING PROPERTY BOUNDARIES KEY

- Binghamton Foundation
- NYS Housing Finance Agency
- State
- Easement (Pipeline)

LEASED

6. Library Annex at Conklin (Leased facility).
7. Center for Advanced Microelectronics Manufacturing at Endicott Technologies, Inc. (Leased facility).
8. Art Factory in downtown Binghamton, housing the Small Business Development Center (Leased facility).

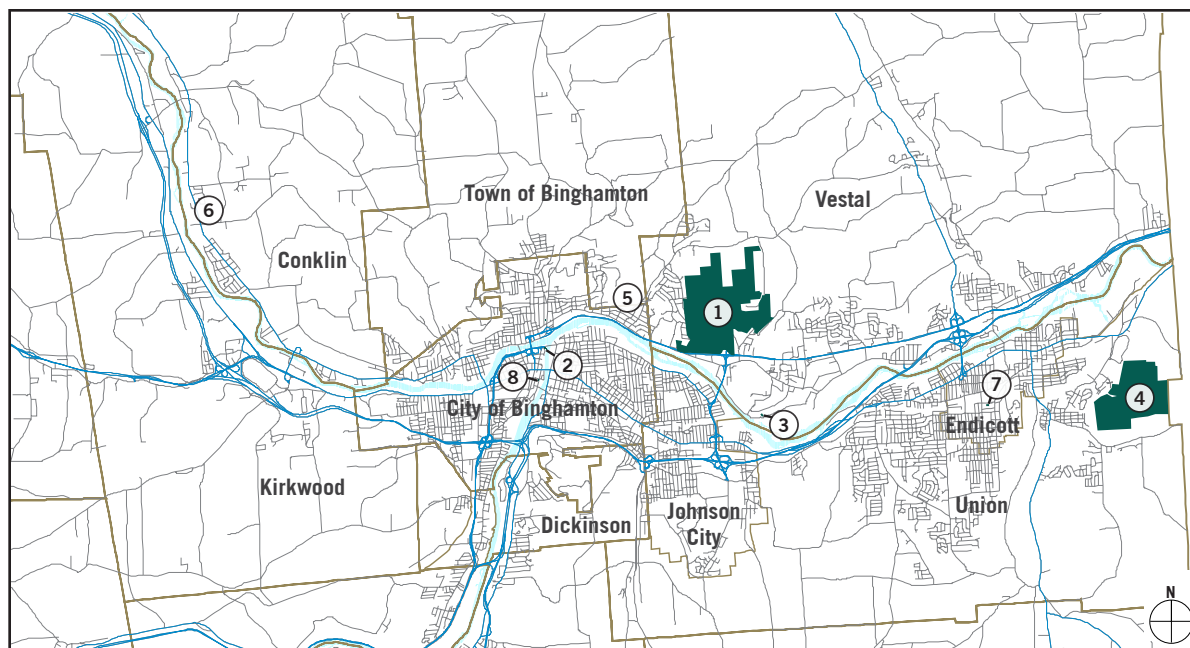
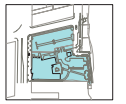


FIGURE 2.1.1A Existing Property Location Map

Broome County's real property information system and Unified Parcel Information System (UPIS) provide campus property data that has been further verified through municipal tax maps and survey data.



University
Downtown Center

0 1,000 Feet



FIGURE 2.1.1B Existing Property Boundaries

2.1.2 ZONING RESTRICTIONS

The bulk of the University's Vestal Campus lies within a Rural Residential (RR) district that would normally limit the height of development to three stories or 50 feet. As SUNY properties are not subject to local zoning requirements, these limitations do not apply. Beyond the campus, the properties that line the Vestal Parkway (Route 434) fall within variations of commercial districts (CD, C-1 and C-2) while areas south of the University are in varying types of residential districts (RR, RA-1 and RC).

Current zoning maps for the Town of Vestal in Broome County designate the majority of campus property as a Rural Residential District (R-R). Except for the Innovative Technologies Complex (ITC), one undeveloped parcel along Murray Hill Road falls within a One Family Residential District (RA-1) and portions of undeveloped parcels west of Bunn Hill Road are designated a Multiple Residential District (R-C). Article IV, Chapter 24, Zoning, of the Town of Vestal (Vestal Code) contains the District Regulations which apply to these districts. Figure 2.1.2A provides a brief summary of the parameters for principal district requirements.

As a campus of the State University of New York system, local zoning requirements do not place serious limitations on the use of these properties. In effect, permitted use and building envelope restrictions of the local jurisdiction do not apply. However, acknowledgement of the surrounding zoning context of the main campus helps inform the planning process with respect to such factors as principal site access, commercial development corridors, and the maintenance of natural areas.

Beyond the BU main campus, the University Downtown Center in the Downtown Business District (C-2) lies within the Binghamton Subzone of Broome County Empire Zone, a NYS program designed to stimulate economic growth through State tax incentives. Incentives include property tax abatement, and sales, wage and investment tax credits. As a tax exempt entity, the University does not directly benefit from such incentives but such credits may be of interest to potential University partners in the private sector. The City of Binghamton's downtown business district offers a synergistic mix of an accessible location, incentive to business development and proximity to BU, one of the SUNY system's Centers of Excellence.

Of the other non-contiguous campus properties, a remote storage facility on Commerce Road lies in an Industrial District









(ID) and the forested Glendale property in neighboring Union is zoned for Planned Unit Development.

ZONING DISTRICTS WITHIN THE MAIN CAMPUS

- + **RR Rural Residential.** The majority of the main BU campus,
- + **CD Medical District.** Innovative Technologies Complex campus,
- + **RA-1 One Family Residential.** Parcel at the east edge of the main campus along Murray Hill Road,
- + **RC Multiple Residential District.** Parcel west of Bunn Hill Road.

ZONING DISTRICTS OUTSIDE THE MAIN CAMPUS

- + **C-2 Downtown Business District.** University Downtown Center, City of Binghamton,
- + **I Industrial District.** 426-428 Commerce Road, Vestal,
- + **PUD Planned Unit Development.** 423 Western Heights Blvd, Union.

CURRENT ZONING MAP KEY	
	C2 Downtown Business District (Bing)
	C-1 General Shopping
	C-2 Community Business
	CD Commercial Development
	M Medical (Bing)
	RA-1 One Family Residential
	RC Multiple Residential
	RR Rural Residential

REQUIREMENT CATEGORY	RURAL RESIDENTIAL (R-R) DISTRICT	COMMERCIAL DEVELOPMENT (CD) DISTRICT
Height, max.	3 stories or 50 ft	4 stories or 50 ft
Lot Size, min.	57,600 sf or 1.3 acres (240 ft x 240 ft) with 240 ft road frontage	22,500 sf or 0.52 acre with minimum 150 ft lot frontage
Development Parameters	Bldg. Location: Shall facilitate future subdivisions into lots with 80 ft frontage.	Lot Coverage: 80 percent max. for principal building and accessory buildings
Yard Dimensions	30 ft front yard 5 ft side yard, 20 ft at corner yard 15 ft rear yard	30 ft front yard 5 ft side yard, 20 ft at corner yard 15 ft rear yard
Non-conforming uses	Must meet requirements of the county health department for adequate area and conditions for proper sanitary disposal.	N/A

FIGURE 2.1.2A Zoning Parameters

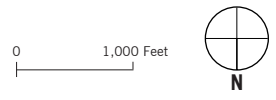


FIGURE 2.1.2B Current Zoning Map

2.1.3 COMMUNITY LAND USE

Binghamton University abuts residential areas to the south and sits alongside the commercial properties that line Route 434 (Vestal Parkway). The campus athletic fields and open space that line its northern edge contrast with the adjacent low rise commercial development.

The main campus of Binghamton University occupies a large land area, classified as Community Service as defined by the Broome County Department of Planning and Economic Development. The campus and its facilities are open to the public, supporting this designation. Several entities hosted on campus provide direct community services, such as the outpatient Psychology Clinic in Clearview Hall and the Institute for Child Development located east of the East Gym.

Three sides of the campus boundary are occupied by a mix of very low density residential use and vacant, unbuilt parcels. According to minutes of the Town of Vestal Planning Board (April, 2008, et. al.) several parcels adjoining the campus boundary have been proposed for development by a private developer for student apartment housing marketed to Binghamton University students.

The northern boundary of the campus runs along Vestal Parkway East (Route 434), a busy commercial corridor. As Route 201 connects to Route 434, the confluence of traffic at the northern edge of campus brings a wide variety of interests within the vicinity of the main campus entrances. The current businesses are characterized by a variety of strip-mall retail stores and services, which are dominated by common parking lots. The thinly spread organization and long distances between merchant areas of this commercial corridor does not promote pedestrian access although a preponderance of area businesses rely heavily on the patronage of the University community. All of SUNY's University Centers are characterized by a separation of campus from nearby commercial activity, making for a local context that promotes car ownership for convenience. Due to proximity and local land use, Binghamton, has the greatest potential to link its students with nearby services and amenities in a pedestrian friendly manner.

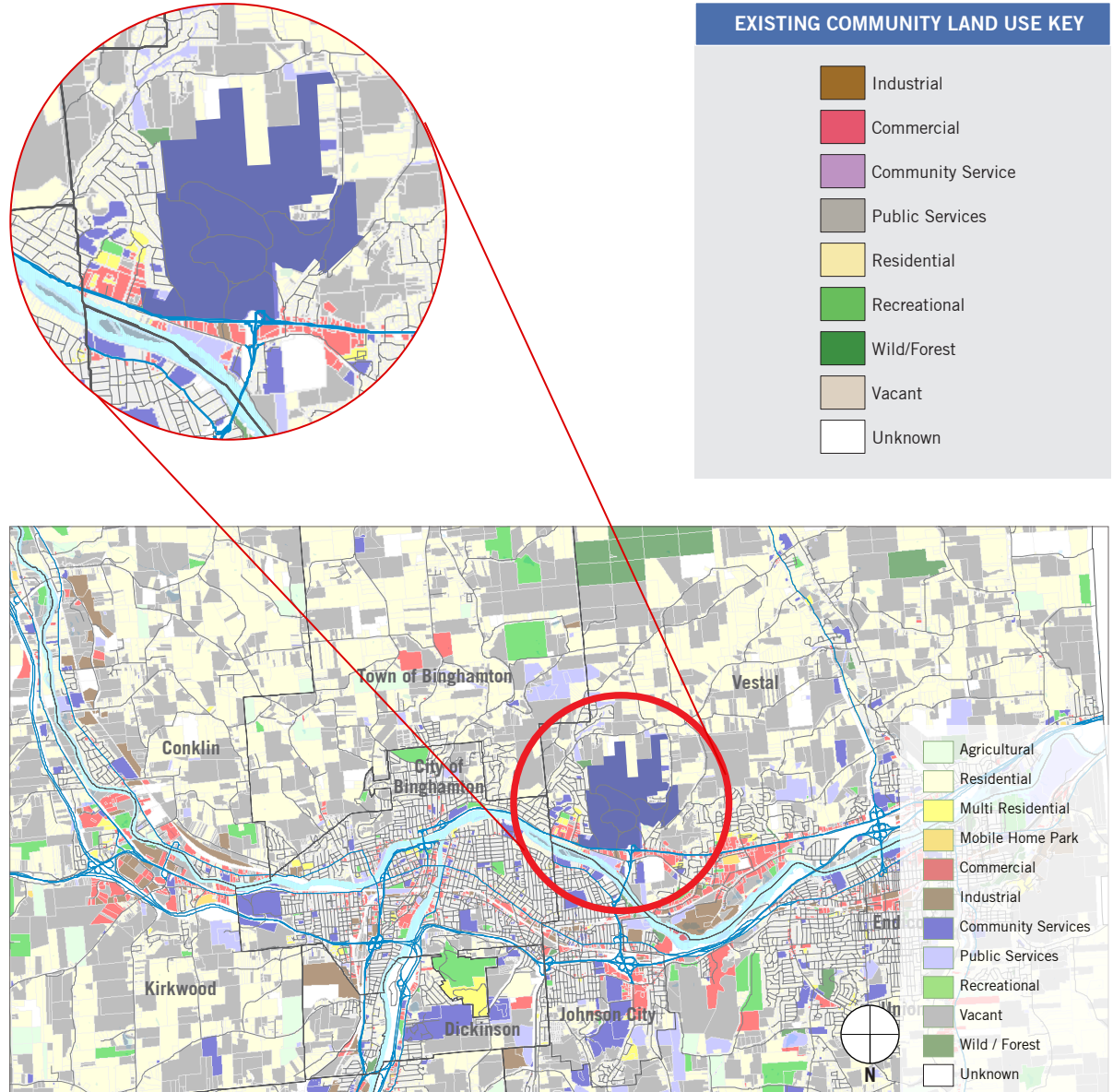


FIGURE 2.1.3A Regional Land Use

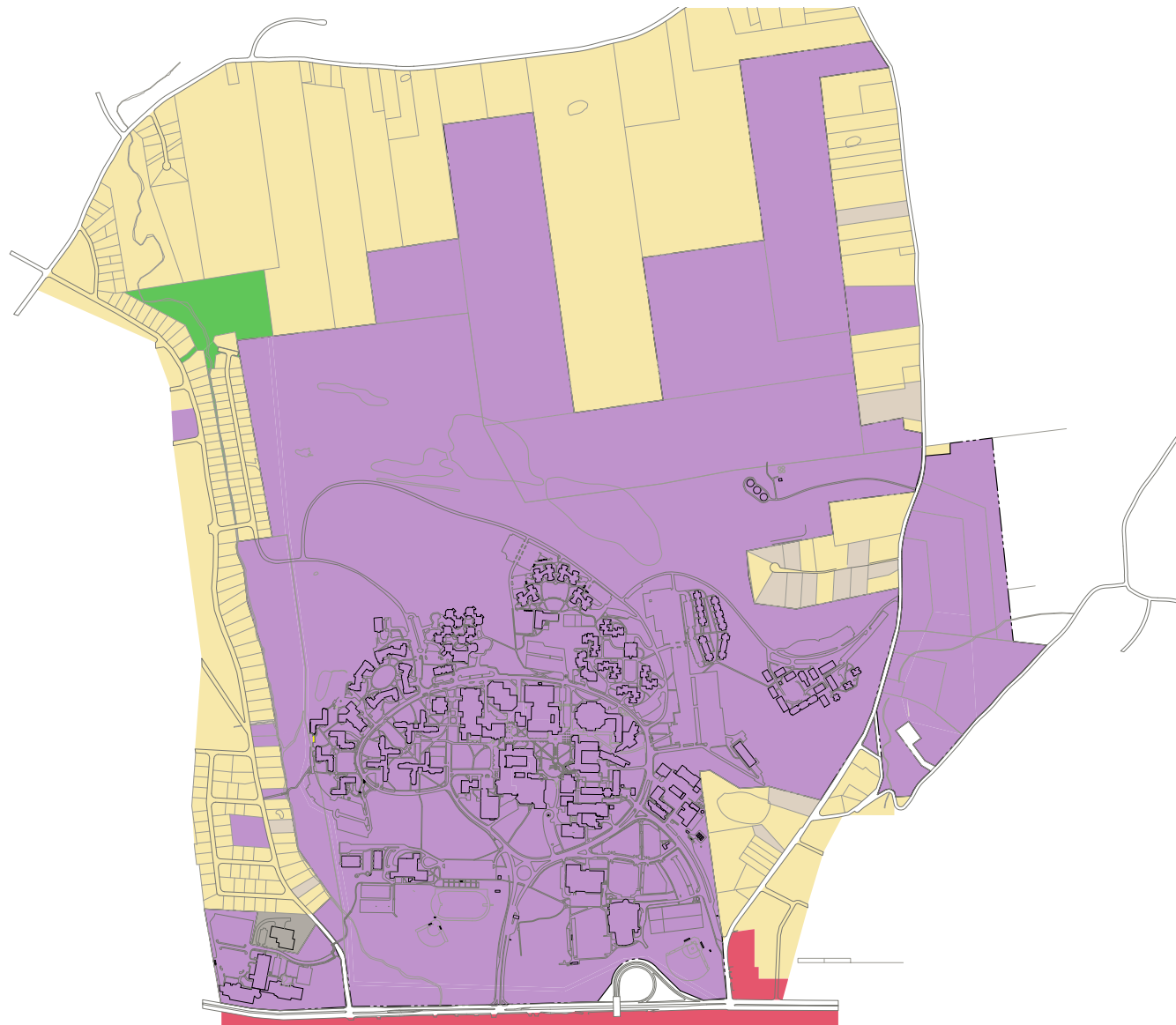


FIGURE 2.1.3B Existing Community Land Use

2.1.4 CAMPUS LAND USE

The main Binghamton University campus is composed of administrative and academic functions within the Brain, and residential, athletic/recreation and campus support functions beyond it. Several key functions given predominantly to research are located outside the Brain, including the ITC complex, the Institute for Child Development, Clearview Hall and the CAMM facility in Endicott. The Downtown campus is thematically similar to Academic A and B given its mix of professional and graduate degree programming.

The principal organization of the campus originally contained all academic functions inside the loop road or Brain. Within this zone, major precincts were defined. As the campus has grown, this strategy has evolved. The Binghamton campus today has expanded far beyond the confines of the loop road.

In 2007 the University Downtown Center (UDC) was constructed in downtown Binghamton to house the College of Community and Public Affairs. The UDC campus provides Binghamton University with a strategic urban location.










In 2003 the campus expanded with the addition of more than 25 acres to the northeast of the main campus, across Murray Hill Road. The Innovative Technologies Complex (ITC), has been developed for research facilities dedicated primarily to venture capital research in science and engineering fields. The site and original building were acquired from NYSEG which continues operations within a neighboring facility. The extensive renovation of the original building on the site was the first of a series of new construction projects, which will conclude with construction of two additional buildings to be completed by 2013.

Residential expansion has taken place exclusively outside the Brain. Most recently, the East Campus Housing project adds eight new residential halls and a new dining/collegiate center that replace the original Newing College and original Dickinson Community. Other recent residential expansion includes Mountainview College with its Appalachian Collegiate Center (2004-2008) and Mohawk Hall (2000).

Academic uses remain concentrated inside the Brain: the Academic Complex (A and B) consisting primarily of professional and graduate degree programs, a sciences complex and a performing and fine arts precinct. The sciences complex

encompasses the area around buildings Science I through IV and the new addition, Science V, which fills in the deck between III and IV. The arts precinct consists of the Fine Arts building and Anderson Center, and includes adjacent space such as the outdoor plaza for the John Arthur Cafe.

As the University removes housing functions from the original Newing College and original Dickinson Community, a significant planning opportunity exists to redevelop that western area of the Brain. Opportunities exist to adaptively reuse these buildings for new purposes, temporarily rehabilitate them for swig space to facilitate other development on campus, or replace them outright with purpose-built structures.

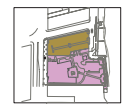
EXISTING CAMPUS LAND USE KEY	
	Academic / Research
	Administrative
	Campus Service
	Student Service / Activity
	Food Service
	Residential
	Athletic / Recreational
	Greenswards
	Campus Neighbors

CAMPUS LAND USES	DESCRIPTION
Academic / Research	Academic: the core campus with all instructional spaces, including the main campus quadrangles Primary research: the ITC, the Psychology Clinic in Clearview and the Institute for Child Development
Sciences	Science Buildings I through V, the associated Science Library and Greenhouses collectively form a teaching and research Science Precinct within the larger campus
Arts	The Fine and Performing Arts precinct is composed of, the Fine Arts Building, the Anderson Center, the enclosed courtyard along with associated external spaces.
Administrative	Couper Administration Building
Campus Service	Physical Facilities complex, campus plant and associated parking areas
Student Service / Student Activities	Appalachian Center, Childcare, Health Services, Iroquois Commons, Nelson A. Rockefeller Center, University Union
Food Service	Dining halls within or adjacent to residential communities
Residential	Residential community areas
Athletic/ Recreational	Athletic programs have use of all athletic fields (11). Recreation programs use fields #6-11; East Gym / West Gym house recreational programs
Greenswards	Natural areas and open spaces not associated with building groups

FIGURE 2.1.4A Campus Land Use Categories

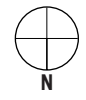


FIGURE 2.1.4B Existing Campus Land Use



University
Downtown Center

0 1,000 Feet



2.1.5 DEVELOPMENT POTENTIAL

Given Binghamton University's enrollment projections, which are outlined in Phase 1 Campus Profile and Phase 3 Space Needs, coupled with the current facilities deficit and the advanced age of existing facilities, a quantity of new development at the campus is inevitable.

This assessment of conditions examines the opportunities and constraints to campus development. The development potential map on the opposite page presents findings, outlining the areas of campus that are currently un-built or potential candidates for redevelopment. Sites at the main campus are placed into one of three categories with respect to development potential: developable, challenged development, and restricted development.

DEVELOPABLE

Areas of campus that are relatively unencumbered could serve as building sites for future campus expansion. First among these developable areas are the parking lots in the areas surrounding the Brain. Key candidates include: the paid Visitor's Parking Lot south of Bartle Library, the M Lots at the west campus, and the F Lots south of the Events Center. Development at existing parking lots would have an impact on the total quantity of parking available on campus, and likely require replacement of lost spaces in another location. Development at the F Lots would result in the loss of parking adjacent to the Events Center, a high-demand location.

Secondly, the East Campus within the Brain is a candidate for redevelopment once the buildings of the Original Dickinson Community are taken off-line. The area is a prime location for development of a new academic quadrangle due to its proximity to academic, administrative, and residential program as well as existing campus infrastructure. Additionally, due to its size, the East Campus is capable of supporting a large quantity of the capacity expansion associated with future growth.

Finally, there exist numerous opportunities for smaller-scale infill buildings within the Brain. Development at these sites allows new construction to tap into existing facilities and services, while facilitating renovation and renewal of legacy buildings. The success of the recent Science V addition testifies to the value of such programmatic insertions.

CHALLENGED DEVELOPMENT

Although the vast majority of the campus is characterized by open space, most of the land is categorized as challenged with respect to its development potential for a host of reasons. The following sites experience challenged development:

- + Athletic and recreation fields along the north side of campus have clearly defined uses and are important to a wide array of University programs. Field space on campus already experiences constraints due to recently reductions to accommodate the Events Center and its attendant parking lots.
- + Natural areas on campus, including those within and surrounding the Brain as well as the larger swath of natural areas on the south side of campus, are important in the character and culture of the University and contribute to a positive image of the campus. These areas also present topographical challenges to large-scale development.
- + Areas at a distance from the Brain have limited to no access to campus infrastructure, which is concentrated around existing development.

RESTRICTED DEVELOPMENT

Immediately south of the main development area at the main campus is a ridge of land where development is restricted. This area contributes to a positive image of the University's campus, characterized by wooded areas, marshes, and wetland areas. Due to the site factors, in conjunction with local zones of topographical challenges and restrictions, development on this site is severely challenged.

Additionally, development is restricted along the Sun Oil pipeline easement, which runs along the east side of campus and doglegs to run west along Route 434.




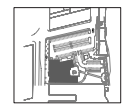
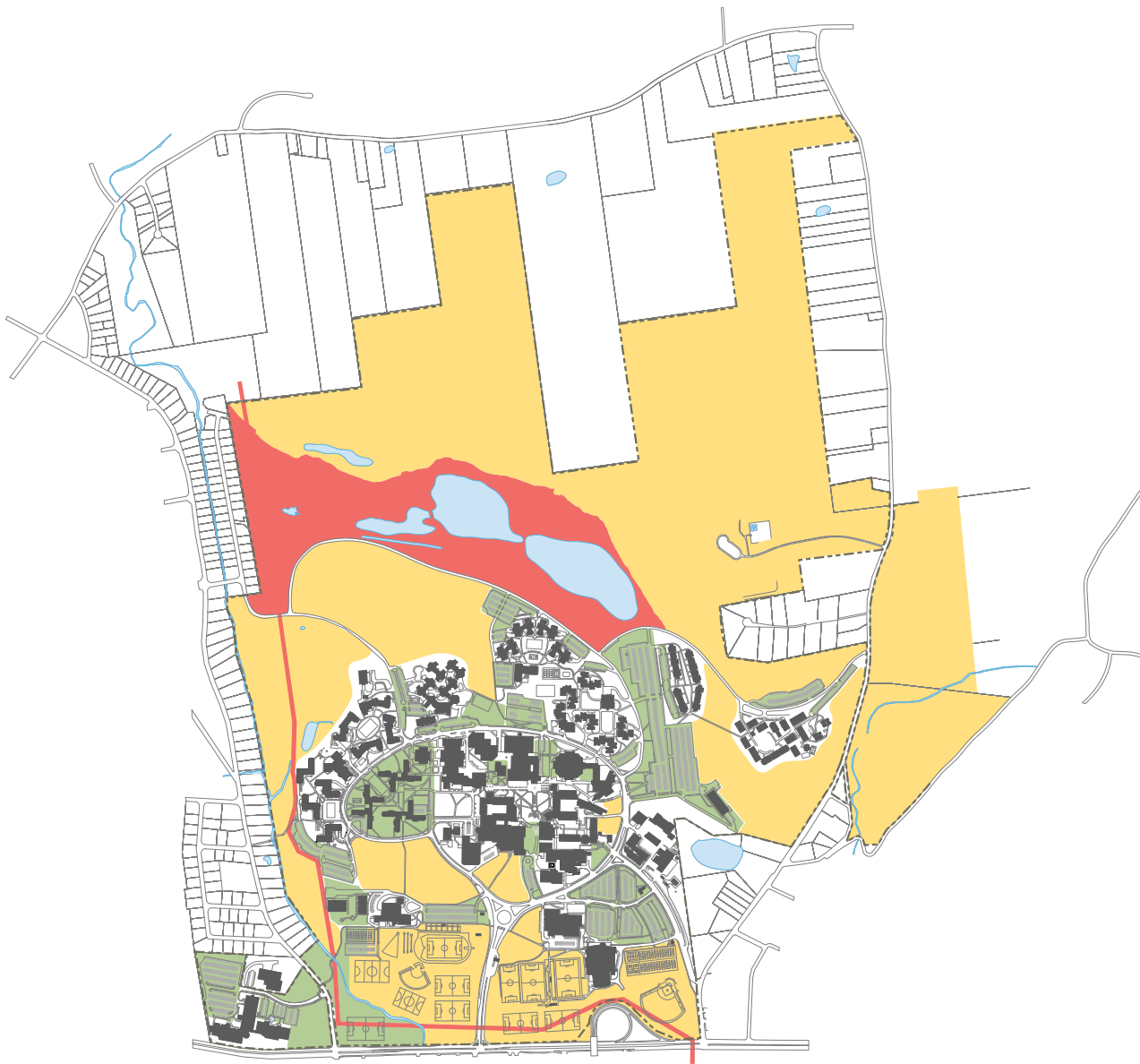
Color	Development Potential	Considerations
	Developable	Includes existing undeveloped and paved areas that have limited challenges or restrictions to development.
	Challenged Development	Includes areas with steep slopes, limited access to utilities, or other physical characteristics that may add excessive cost to development. Also includes programmed outdoor spaces that are important to University programs, such as natural areas, athletic fields, etc.
	Restricted Development	Includes wooded areas and marshes as well as the Sun Oil Pipeline easement.

FIGURE 2.1.5A Development Potential Key



University
Downtown Center

0 1,000 Feet

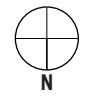


FIGURE 2.1.5B Development Potential Map

2.2 Circulation

2.2.1 PEDESTRIAN

The Binghamton campus covers a large area with varied slopes and terrain. Reliance on vehicle transportation remains high. The primary destination for pedestrians is the academic campus core, located inside the Brain. A number of buildings generate a high volume of pedestrian activity (Fig. 2.2.1A), notably Bartle Library, the Lecture Hall Center, and the University Union. Destinations outside the core also generate pedestrian movement, including the campus' parking lots, residence halls, and athletics and recreation facilities (Fig. 2.2.1A).

A system of strong axes organizes circulation within the core. The rehabilitation of the central quad, to be known as the Commons upon project completion, will provide site improvements to the north-south open space between Science I, the Science Library, the Fine Arts Complex, and the Anderson Center. It will create a highly public arrival area from the Anderson Center while maintaining service and emergency access to these areas.

One of the most difficult points of pedestrian circulation occurs from Mountainview College to the pathway between Bartle Library and the Lecture Center. Students take an informal path across a campus barrier for more direct access to the central campus. This path brings students through Lot W and the Visitor Paid Parking Lot. While the sanctioned path is more clearly defined and has a more gradual incline, in its length it directs students considerably to the east. It has been noted that in winter months it is very difficult to maintain, as snow melt from the hillside refreezes and renders that path inaccessible. This pathway is a candidate for future reconfiguration.

There are points of pedestrian access to nature trails from the residential communities. The trail system is further described in Section 2.8 Environmental.

Outside the main entrance at Bartle Drive, Vestal Parkway lacks sidewalks or a separated pathway connecting student housing with shopping at University Plaza, east of campus. Pedestrian safety is also a concern at the Bunn Hill Road entrance to the ITC. The sidewalk appears to be located to align with the driveway on the west side of Bunn Hill Road, suggesting a mid-block crossing. A crosswalk at the intersection does not exist.

Additionally, across Bunn Hill Road untrimmed trees along the south side of the parking lot block good sight distance for vehicles travelling north on Bunn Hill Road.









According to the 2009 study, *An Analysis of Binghamton University's Off-Campus and Non-Permanent Population: Modal Choice and Economic Impact*, nearly ten percent of students living off-campus walked to campus at least once per week in 2008. This is more than double the four percent reported for 2005. As pedestrian activity increases, the principal problem remains ensuring pedestrian safety in negotiating vehicular traffic and improving site circulation experiences.

2.2.2 CONFLICT POINTS

All residential communities constructed after 1964 and most parking, with the exception of the Parking Garage, are located outside of the loop road that encircles the Brain. This condition creates a series of pedestrian/vehicular conflict points where students must cross the road to access the central academic campus. Three different levels of conflict, frequent, occasional, and rare, have been identified below. Opportunity exists to consider alternate circulation patterns in and around the brain to reduce the impact of these conflict points.

General Campus Traffic (Frequent). Frequent pedestrian/vehicular conflicts occur all along the loop road as students cross from residential communities and parking areas into the academic core. Although cars are required to yield and yield signs are posted at major intersections, there are no traffic lights or stop signs to formally control their movement. Major crossing conflicts occur due to high volume parking at the F lots near athletic areas, Lot W / Visitor Paid Parking lots and Admissions / Lot M areas. Pedestrians also commonly pass through parking lots, in particular moving toward residential communities at CIW, Mountainview, Susquehanna and onward to Hillside.

For pedestrians with disabilities, encountering vehicle circulation is a problem without the aid of either audible crossing indicators, tactile strips, traffic signal signs or pedestrian-actuated signals. The *2009 Manual on Uniform*

PEDESTRIAN MAP KEY	
	Primary pedestrian corridor
	Pedestrian circulation
	Minor routes
	Parking area generator
	Pedestrian conflict (also see Vehicular Map)
	Bus shelter (also see Transit Map)
	Activity generator building
	Building Entrance

Traffic Control Devices (MUTCD), issued by the Federal Highway Administration, includes revisions to signs and pavement markings. States must adopt the National MUTCD as their legal State standard within two years. Approximately 25 pedestrian crosswalks exist along the loop road, which should be evaluated for compliance with the current standards.

Service (Occasional). Campus service locations create occasional pedestrian/vehicular conflicts during times of delivery or service access. Conflict points occur along the loop road at the rear side of the University Union and between Bartle Library and the Engineering Building. Refer to section 2.2.6 for full details on campus service access.

Emergency Vehicles (Rare). Emergency vehicles access campus along campus-defined routes. Vehicles must have the ability to access all buildings on campus with ease, including those within the Brain and residential communities. This poses potential for conflict with pedestrians, although only occurs on the rare occasion.

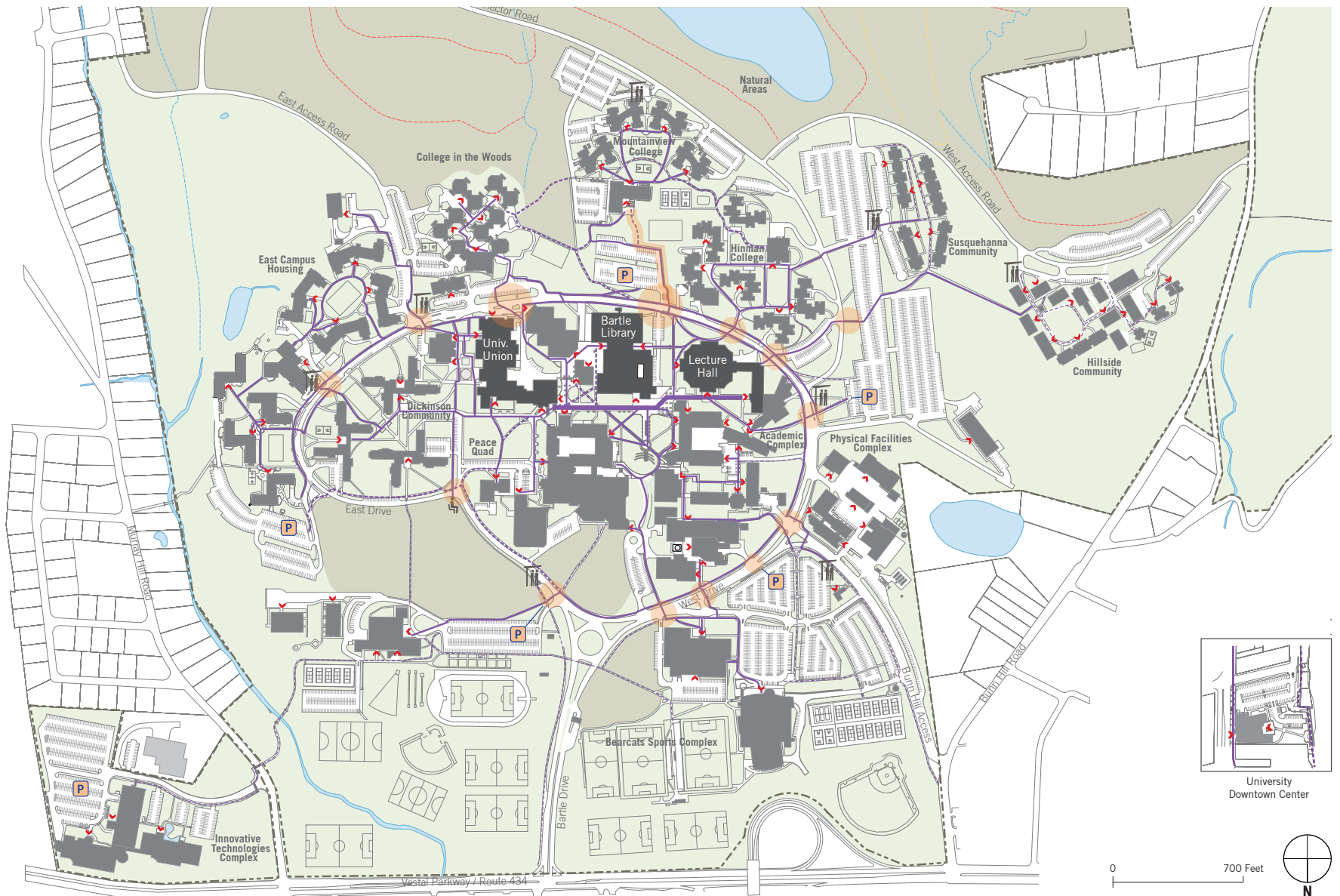


FIGURE 2.2.2A Circulation Map: Existing Pedestrian

2.2.3 BICYCLE

Current pedestrian and bicycle access to the Binghamton University campus is in need of improvement. The campus is not directly connected by trails or sidewalks to destinations west along the Route 434. There are sidewalks installed along the north side of the Vestal Parkway that lead to the Washington Street bridge, effectively connecting the University to downtown by bicycle. The lack of a sidewalk on the south side of the Parkway means students traveling from University Plaza by bicycle must cross twice before coming onto campus.

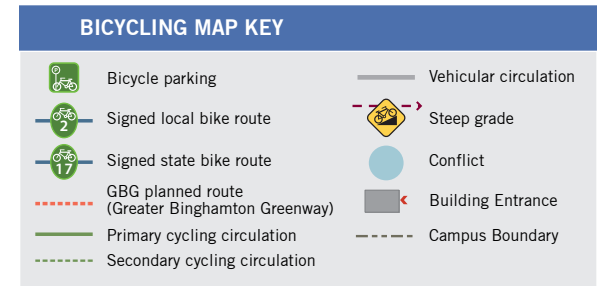
University Police advise that bicycles chained in areas such as stairwells or passageways that obstruct safe passage must be removed. It has been noted that students use ad hoc locations for securing bikes due to the lack of installed racks. Multiple styles of rack are currently installed. Most central is the covered bike shelter near the Lecture Hall, which uses a hoop-style lock rack and green framing matching campus bus shelters and has adopted as the campus standard. In response to campus demand the quantity of bicycle racks will be increased. Project 07A27 Campus Central Quad Rehab will add bike racks to the Commons while East Campus Housing will also include areas for bike storage in its plans. As the SUCF mandates design to a LEED-Silver standard for all new construction, it is expected that provision for bicycle storage will continue to grow.

A policy is needed that governs how bicycles may safely coexist with vehicles in some areas and where they might be using the same pathways as pedestrians. Greater daily use of bicycles on campus is a well-observed trend that is supported by both Binghamton University's *Climate Action Plan* and commuter bicycle rental program offered by Binghamton Outdoor Pursuits (BOP), part of Campus Recreational Services.

Bike racks are available on BCT buses and are planned to be installed on OCCT buses. This will permit students and staff to combine cycling and bus use, furthering their potential commuting range. In the 2009 study, *An Analysis of Binghamton University's Off-Campus and Non-Permanent Population: Modal Choice and Economic Impact*, about 3.8 percent of students living off-campus travelled by bike or motorcycle at least once per week to campus in 2008. The number of students residing off-campus in Vestal more than doubled from 13 percent in 2004 to 26 percent in 2008. However, just over 50 percent of off-campus students live within

the City of Binghamton. The report highlights a roughly five-mile long corridor beginning at the Chenango River, bordered by Main Street and the Susquehanna River, and extending west to Highway 201 in Johnson City, along which nearly 40 percent of the Broome County off-campus student population resides. Increasing numbers of students are living within a reasonable cycling distance from the campus.

A bicycle parking distribution plan as well as storage rack standards and coordinated signage are necessary to create a clear identity for acceptable parking areas and encourage bicycling as a viable transportation alternative to personal auto use on campus.



Bike Storage near Lecture Hall



Ad-hoc parking

Bike Rack at West Gym



FIGURE 2.23A Circulation Map: Existing Bicycling

2.2.4 TRANSIT

Scheduled transit services on campus are provided by Off Campus College Transport (OCCT), Broome County Transit (BCT), as well as commercial bus service (ShortLine / Coach USA) shuttle to Binghamton terminal connections.

Off Campus College Transport, Inc. (OCCT) is a completely student operated and managed service. Binghamton University students, faculty and staff are permitted to ride the OCCT buses without charge. OCCT operates 12 routes providing a campus shuttle, residential community shuttles, UDC site shuttle and service to various Vestal and Binghamton destinations and shopping centers. The blue buses are driven by students, who must complete the eight-week OCCT Training Program and earn a NYS Class B Commercial Drivers License.

The service actively uses Twitter and subscription text message listserv to provide service updates to users, and additionally solicits feedback from students for route schedule improvements. Charter fee service is available to Student Association funded groups, non-SA funded groups, BU departments and other non-BU organizations.

OCCT also operates two wheelchair lift-equipped vehicles, known as “Lift Buses” making it easier for people with disabilities to access on and off campus locations. Authorization to use the service are forwarded to OCCT from the Director of Services for Students with Disabilities (SSD), who determines eligibility.









The regular blue buses of OCCT are an aging fleet. They are maintained, repaired and housed off-site at the Commerce Road building. Mechanical failures due to the advanced age of the fleet pull buses from active service and further restrict scheduling availability. During the weekdays, the Residential Shuttle (9) runs every 15 minutes from 8am to 5:45pm, Campus Shuttle (10) runs every 20 minutes from 7:20am to midnight, and Main Campus Shuttle (11) runs every 20 minutes on weekdays from 8 am to 5:40 pm.

The majority of routes leave from the bus area at the University Union East Lobby, an enclosed waiting room recently completed in 2009. At peak times, as many as 4-5 buses may be queued to enter the pick-up zone, adding to congestion on the loop road. Bus shelters along the main roads of the campus are identified by their green color and barrel roof shape. Route number signage and operating times are posted at the shelters

and stops, but full schedules and Google mapped routes are only available online. GPS technology is not currently used to monitor locations of the bus fleet.

Apart from extensive use of personal automobiles, the BU population relies on bus service as a primary transit mode to travel between parts of campus, downtown Binghamton, regional shopping centers and key destinations beyond. A notable complaint among students is the perceived shortage of buses at night, particularly on weekends and nights, to return students from venues in downtown Binghamton.

Based on the 2009 study, *An Analysis of Binghamton University's Off-Campus and Non-Permanent Population: Modal Choice and Economic Impact*, about 54 percent of the off-campus student respondents traveled to and from campus at least once per week by OCCT and about 45 percent similarly used BCT in 2008. This represents increases of roughly 17 percent for OCCT ridership and 19 percent for BCT ridership over 2005. Opportunities exist to improve transit vehicles and service that would sustain this momentum.

TRANSIT MAP KEY	
	Off-Campus College Transport route (OCCT)
	Broome County Transit route (BCT)
	ShortLine shuttle <i>ShortLine</i> (Fri/Sun)
	Route terminus, approximate position of first stop
	Bus area at UU East Lobby
	Bus shelter
	Stop at bench
	Building Entrance
OCCT ROUTES	
1	JC Westside
2	Leroy Southside
3	Triple Cities
4	UDC Shuttle
5	Riviera
6	Oakdale Mall
7	Westside
8	Binghamton
9	Residential Shuttle
10	Campus Shuttle
11	Main Campus Shuttle
12	Downtown Express



OCCT blue bus in foreground, BCT bus beyond

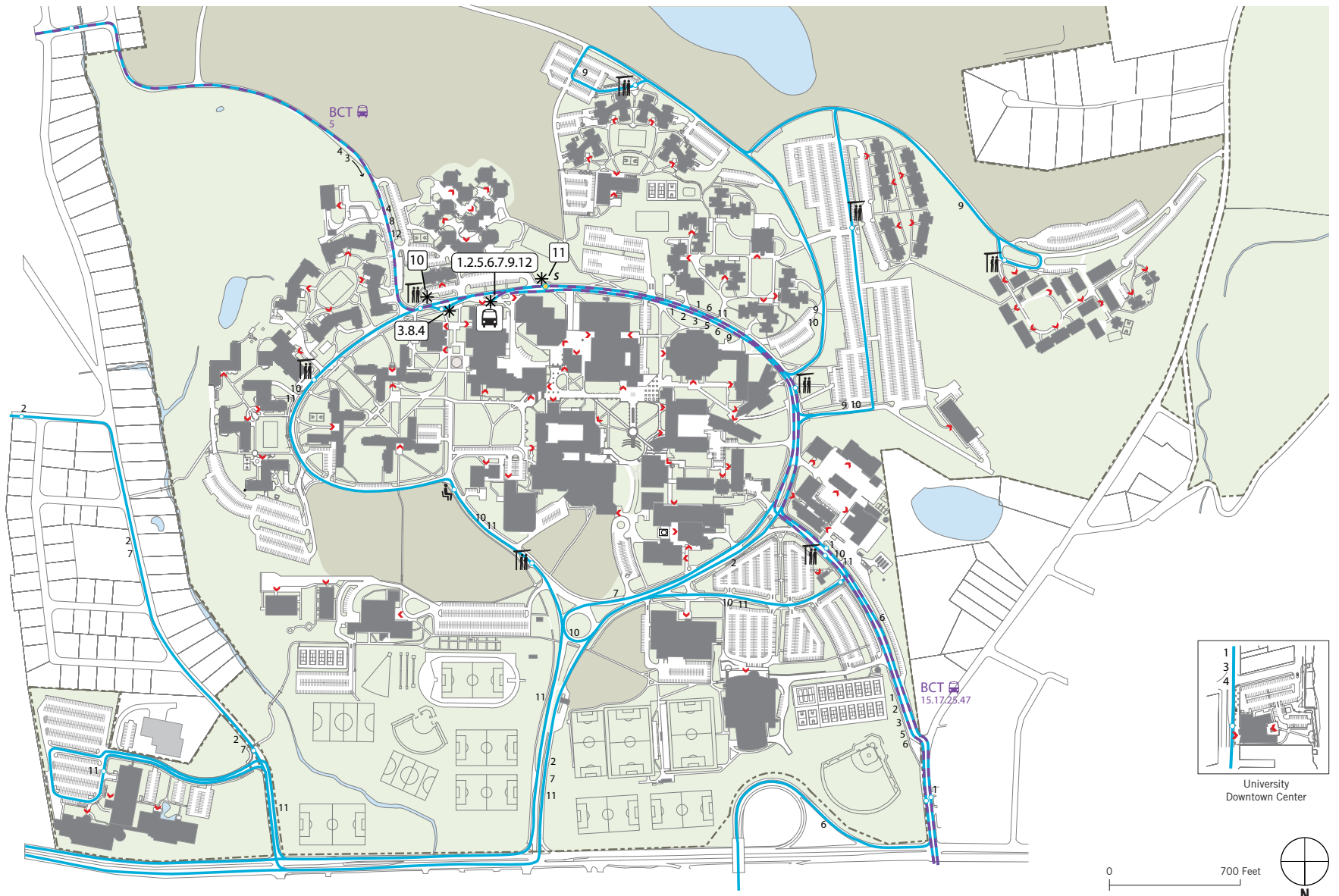


FIGURE 2.2.4A Circulation Map: Existing Transit

2.2.5 VEHICULAR

Binghamton University is located one mile west of the city of Binghamton, about one hour from Ithaca and one and a half hours from Syracuse. From most directions, the main entrance to campus is reached by following Route 17 to Route 201 that crosses over Route 434, Vestal Parkway. Vestal Parkway is a 45 mph roadway. Bartle Drive is a divided roadway with a two lane entry and two to three lane exit. The wide roadway and straight line geometries encourages high speed driving when it is desirable to maintain a 20-25 mph speed limit on campus. The length of the text shown on the variable message sign just before the Information Booth on Bartle Drive presents a distraction to drivers. A speed counter placed on the West Drive by West Gym alerts motorists of the speed adjustment necessary before approaching the main areas of the campus loop, which illustrates a known problem of slowing traffic down. There are approximately 25 pedestrian crosswalks on campus. Yield signs are posted at crosswalks, but traffic signals are not present.

While recent trends have seen an increase in off-campus carpooling, public transit, walking and cycling, the number of students who register vehicles with the campus and purchase parking permits has continued to rise. A national commercial rental company has instituted a car share program available on campus to rent hybrid vehicles by the hour from the reserved parking area across from the Lecture Hall, a convenient location within the central core.










From the 2009 study, *Binghamton University Employees' Journey-to-Work: Prospects for Change*, nearly 90 percent of respondents travel by car as their most frequent mode of transportation to work. After personal auto, 4 percent most frequently carpool, 3 percent use bus, 1.5 percent walk and 1.4 percent bicycle to work. Of faculty and staff respondents primarily using personal automobiles, their alternate commute modes used in next frequency are 44 percent carpooling, 36 percent bus travel, 14 percent biking and 6 percent walking. A further incentive to carpooling is a program devised with University Parking Services to provide reserved preferred parking spaces for multi-passenger vehicles.

Vehicular circulation uses a two-way traffic loop road, known as West and East Drive, but in plan view forming the shape of the Brain. The original master plan organized the campus functions within the Brain. However, as the University has developed and

outgrown the confines of the Brain, various uses have been placed over the years outside of the loop road.

The current organization places residential communities, athletics, recreation and campus service buildings outside the loop road and masses the academic buildings, senior administration and most student services within the Brain. While this has allowed a coherent strategy of organizing campus precincts as the University grows, conflict points along the loop road are increasingly visible. Critical pedestrian areas exist where the residential population crosses the loop road to reach the key buildings within the academic core: Lecture Hall Center, Bartle Library and University Union.

VEHICULAR MAP KEY

-  Vehicular circulation
-  Minor route
-  Major Site Access
-  Route Direction
-  Pedestrian conflict
-  Vehicular conflict
-  Building Entrance
-  Campus Boundary
-  Car-Share Program Location



Information Booth and Variable Message Sign

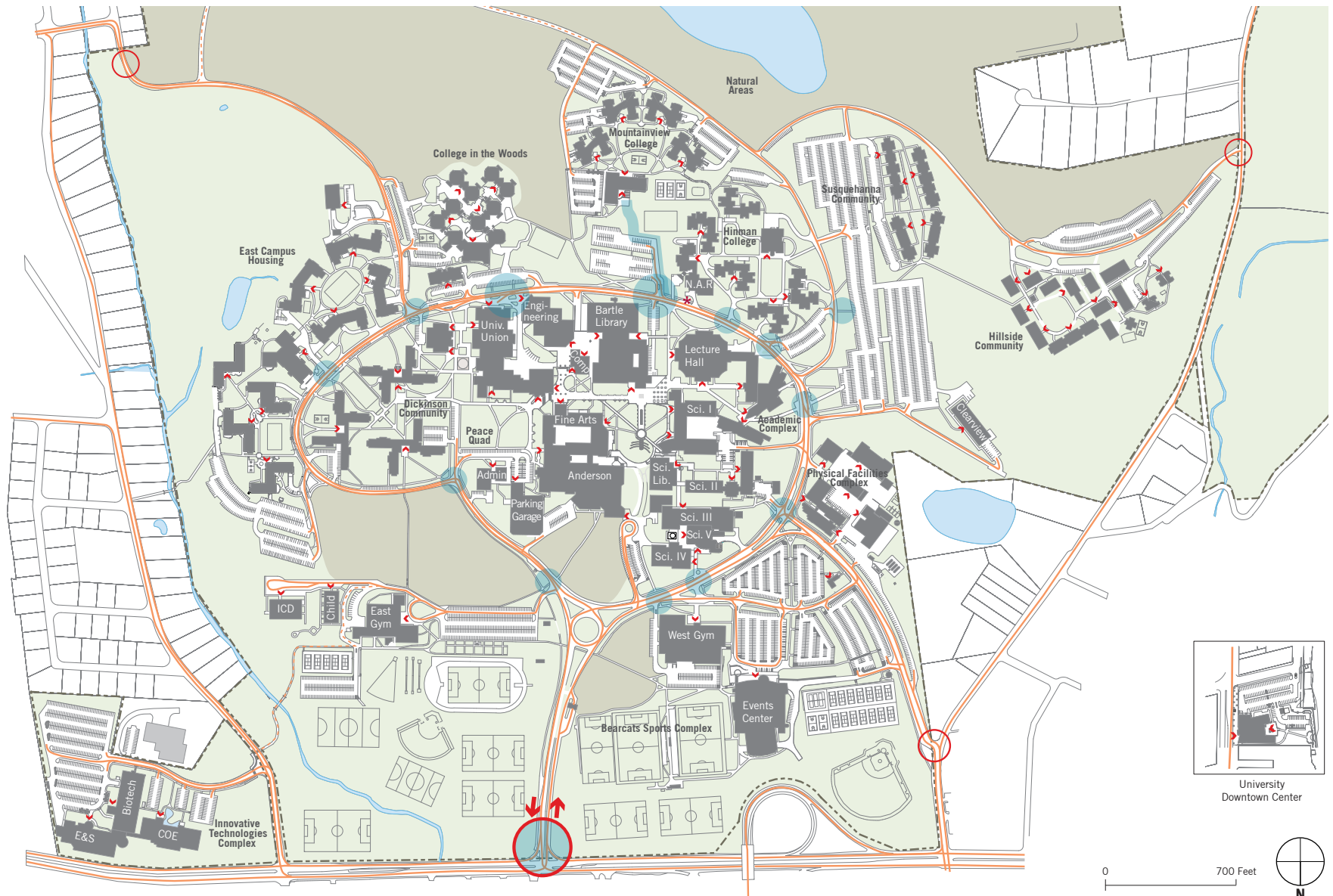


FIGURE 2.2.5A Circulation Map: Existing Vehicular

2.2.6 PARKING

Department of Public Safety manages the operation of Parking Services and coordinates use of parking facilities on campus with policy guidance from the Vice President for Administration. Revenues from the self-supporting parking program fund staffing, office operations, lot maintenance, lot lighting, construction, safety measures and other parking support services.

In addition to term and day parking permits for the majority of lots, there are also paid lots, a paid parking garage, metered parking spaces, and personal in-car meters. Several nascent programs encourage alternatives to traditional car usage, including an HOV carpooling program, and planned installation of additional motorcycle spaces near the Dickinson Community. Other motorcycle spaces are located on the southwest of University Union, near loading docks at the Engineering Building, Couper Administration building, at the West Gym and near Science I.

Twenty-nine designated snow lots enable clearing of snow during the winter months, operating from November 15 through March 30.

University Downtown Center campus has restricted use parking and is officially designated as a commuter and snow lot. Designated sections are provided for students, staff, service, disabled, and visitors.

Blue light phones are the emergency telephone system connected to University Police Department that facilitates emergency assistance from the parking lots. UPD will provide 24-hour on-campus escort from parking areas on request. Security issues are discussed in further detail in Section 2.5.

STUDENT, FACULTY AND COMMUTER PARKING

Commuter lots are reserved for commuter parking weekdays from 6 am to 5 pm, with no overnight parking allowed. In addition to vehicle registration fee, commuters pay a permit fee for one of many available permit types: annual 24-hour, annual evening, semester, semester evening only, summer, service, calendar month. Permit fees may be paid online or through mail-order. Most commuter lot areas are also designated snow lots.

PARKING MAP KEY			
	Parking Lot		Overnight Parking
	Paid, Hangtag Req'd		Scoters
	Commuter & Snow Lot		Building Entrance
	Snow Lot		Campus Boundary

Lot	Regular	Service	Reserve	Handicap	Total
A	10	9	-	15	34
B	39	-	-	-	39
C	65	1	-	4	70
D	32	3	-	7	42
E	325	-	-	2	327
E1	126	-	4	-	130
F	261	-	-	4	265
F1	240	-	-	3	243
F2	142	-	9	1	153
F3	157	-	-	-	157
G	129	-	-	3	137
H	252	-	-	-	252
I	56	24	4	2	86
J	588	-	6	8	602
Sci. Load. Dock	-	5	2	16	23
L	65	5	3	32	105
M0	457	-	-	-	457
M1	482	-	-	-	482
M2	237	-	-	-	237
ZZ S/N	337	-	-	-	337
M4	33	2	-	-	35
M5	21	-	-	-	21
N	43	-	-	-	43
O1	58	-	-	2	60
O2	63	-	4	5	72
O3	22	-	-	-	22
O4	15	-	-	-	15

Lot	Regular	Service	Reserve	Handicap	Total
P	74	-	-	2	76
Q1	51	-	-	7	58
Q2	8	7	2	8	25
R	31	1	6	1	39
S3	114	-	-	-	114
S4	115	-	-	-	115
S5	132	-	-	-	132
T	44	-	-	-	44
T1	70	-	2	3	75
U	20	-	-	-	20
V	9	5	3	0	17
X	97	-	3	2	102
Y1	106	1	2	3	112
Y2	109	2	5	1	117
Y3	53	1	1	2	57
Y4	156	-	-	1	157
Y5	109	-	-	0	109
Z	22	1	-	2	25
ZZN	127	-	-	-	127
ZZS	286	-	-	-	286
Garage	322	-	-	-	322
Paid Lot	293	-	-	2	295
AD Circle	56	-	-	2	58
UDC	110	-	8	4	132
Lecture Hall	-	3	-	3	6
Dorm/Dock	-	-	4	53	57
Total	6,779	76	68	200	7,123

FIGURE 2.2.6A Parking Distribution

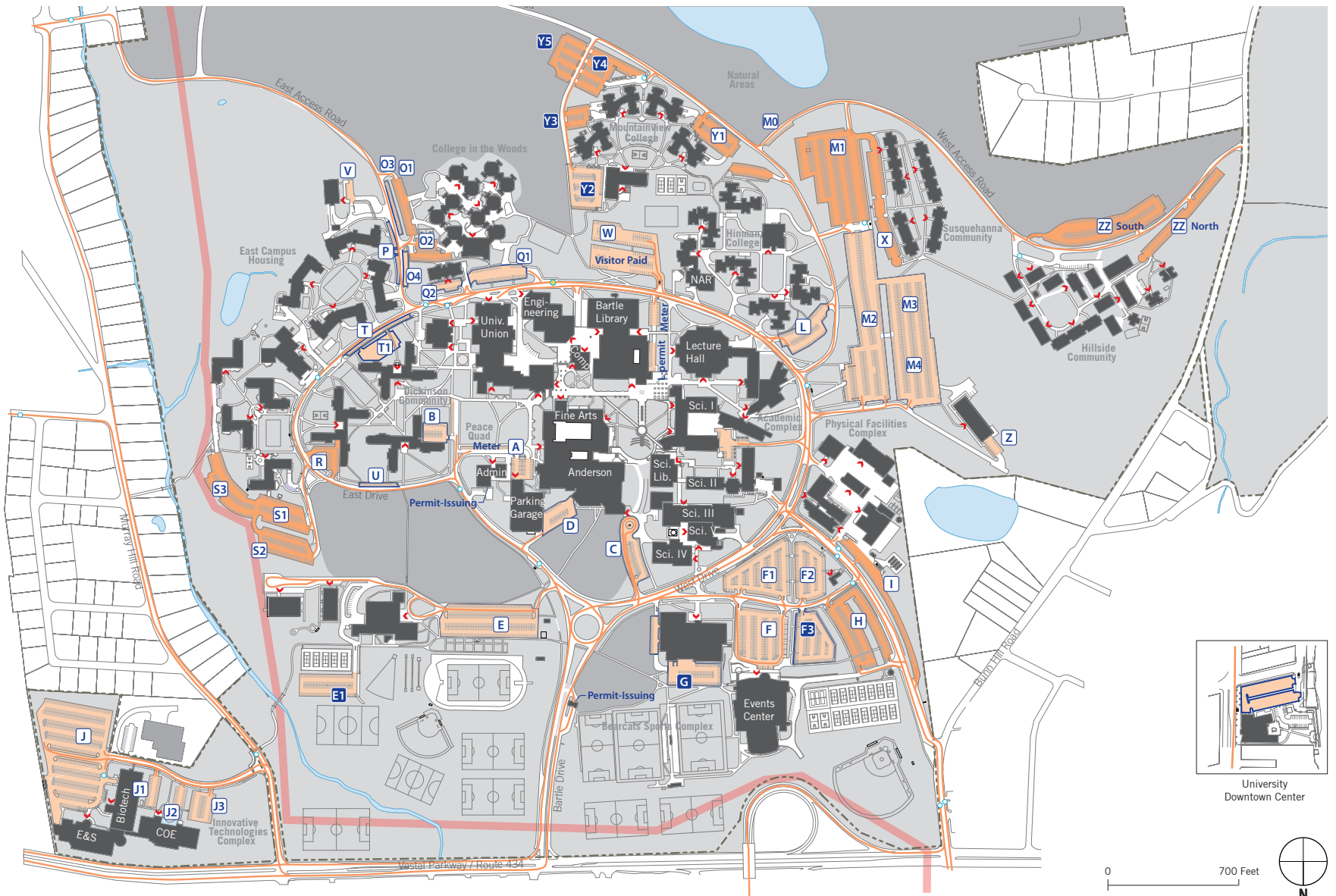


FIGURE 2.2.6B Circulation Map: Existing Parking

VISITOR AND PAID PARKING

Visitor parking areas are well-distributed throughout all main campus areas. Hourly parking is available at the Parking Garage and in the Visitor's Paid lot, which is currently under-utilized. Pay-by-space, solar powered meters, are available at \$0.50 per hour in lots L and M5. Personal parking or in-car meters can be used in any open lot or metered area on campus. Visitors may also purchase a daily parking permit from the Information Booth, Parking Services or University Police.

Parking for the Events Center is facilitated primarily in Lots F, F1, F2, and F3. These lots have been reported to be poorly designed, causing traffic back-up after major events. Other adjacent lots may be used for event parking on an as-needed basis, including Lots G and H.

OVERNIGHT PARKING

Overnight parking is mostly situated near residential communities with the exception of H and I, near Physical Facilities and the Events Center. Freshman are not permitted to keep cars, and rely on the OCCT campus shuttle.

DISABLED PARKING

Disabled parking spaces are coordinated with the office of Services for Disabled Students (SSD). Not every lot contains accessible parking, yet spaces are carefully distributed with concentration within the central campus and a two-tiered system of disability parking. Further analysis including graphic representation of disabled parking locations is included in Section 2.7, Accessibility.

CONSOLIDATED AND DISTRIBUTED LOTS

On entering Bartle Drive, the drive-up Information Booth can direct visitors to appropriate parking areas for visitors. Continuing on the loop road past the first glimpse of the academic core of buildings, motorists encounter an expansive set of consolidated parking lots (F-F3). Another consolidated lot area of greater capacity exists at lots M1-M4, which are also higher on a slope and therefore more visible from the loop road and campus core. These large, consolidated parking areas project an unappealing initial experience and image of the campus.

Although the number of parking spots available is currently adequate, usage patterns result in uneven availability at peak times in certain areas. At present, parking spaces are less utilized at peak times in lots H, I, ZZ North and ZZ South, and the Visitor's Paid lot. Parking Garage spaces provide an overflow rate during peak day hours. According to a recent BU Pipedream article and from discussions with campus personnel, a lack of parking spaces is perceived by students, yet spaces remain available in reality. The discrepancy arises because open spaces exist in areas located far from the central Brain or key buildings on campus, which requires a longer walking distance or use of the campus shuttle buses.

A parking strategy should be developed that analyzes all campus parking in a holistic manner, balancing suitable distribution of parking with preservation of open space, athletic fields and improving the aesthetic image of the campus.



Visitor Paid Parking, W and Y lots: aerial

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2.2.7 SERVICE

Service vehicles move from the Physical Facilities Plant near the West Drive and West Drive Access Road, using the loop road around campus. One of the core services of Physical Facilities at BU is Central Receiving, a combination warehouse and delivery service. The central receiving dock is located behind the Physical Facilities building.

The Physical Plant Complex and the Library underground loading dock serve as principal delivery points. Operations staff have realized efficiencies by handing off small packages to Campus Mail Services for delivery in smaller units. Such coordination efforts should be increased to reduce large vehicle traffic on the loop drive. Still, a significant volume of activity is generated from this hub as packages from Central Receiving are typically expedited to campus locations within 24 to 48 hours.

Companies with representatives serving offices or equipment on campus are issued special parking permits from Parking Services, allowing service vehicles to use reserved “State/Service” spaces in lots and near loading docks.

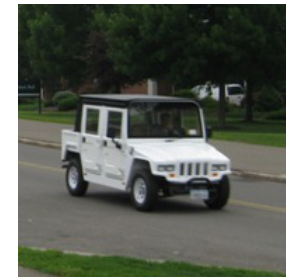
While many purpose-specific vehicles are used for waste and recycling hauling, the campus has also invested in a fleet of low-speed electric vehicles, which are being increasingly used by Facilities personnel for their easy negotiation of both paved roads and pedestrian pathways. Conventional service trucks have wider wheel-bases than the walkways and typically cause damage to adjacent turf. As of 2009, 22 gasoline vehicles have been removed from service and replaced with EVs. Electric cart charging and pooling hubs have been identified throughout campus, as shown on the Service map on the following page. A more formal system of signage and service standards for charging stations does not currently exist.

Due to the high number of dumpster locations, there are several important points of conflict between service traffic and other types of circulation, particularly pedestrian and bus transit. Primary points of conflict occur near the Library Service and Receiving area and at the University Union. Conflicts also occur at Fine Arts, the Science Library, and the Science I and II loading areas. Conflict occurs due to the lack of crossing signals and lighting, combined with heavy pedestrian flow across the loop road from residential halls.

In general, BU has a high quantity of dumpsters that are often in visible locations, especially at the residence halls. These detract from the overall aesthetic quality of campus, meriting further study of campus dumpster placement.



Service dock under Engineering Quad



Electric vehicles



FIGURE 2.2.7A Circulation Map: Existing Service

2.2.8 EMERGENCY ACCESS

The map on the opposing page (Fig. 2.2.7A) illustrates the evacuation routes and emergency access points for the Vestal campus. The campus falls within the fire district served by the Town of Vestal volunteer fire department. Emergency access routes and the evacuation map are defined by the University Police Department, which is in charge of the BU Emergency Response Plan.

Emergency service vehicles most easily approach the central campus loop road via the Bunn Hill Road access and Bartle Drive route. The Bunn Hill Road route is a wide road that can accommodate the arrival of various service vehicles. Entering at Bartle Drive is segregated, single direction and offers minimal impact on traffic flow until reaching two-way traffic on the loop road. Emergency access to the Central Campus Quad area will be from the north driveway using a mountable curb at the terminus of the eastern-most sidewalk, designed at 8 feet wide with an additional 4 feet of structural soil strips at either side. Grade along this walkway does not exceed 10 percent, as required for fire truck access. Seasonal roads in natural areas are closed for several months out of the year, limiting emergency vehicle response to some peripheral gate locations.

At the University Downtown Center, emergency calls go into the Broome County dispatch to the City of Binghamton fire department. The fire department dictates how they approach the building.

For additional examination of emergency issues, also refer to these related sections: Section 2.5 Security and Section 2.6 Life Safety.

EVACUEE LOADING POINTS

Potential evacuee loading points are designated at University Union West (Bus Stop), Events Center, East Gym, Lot ZZ South, Lot S1/S2.

TRAFFIC PATTERNS

University Police control traffic patterns during emergencies and in the event of evacuation from the campus. Roads may be converted to one-way traffic to expedite the flow away from campus. Beyond the campus boundary, traffic routes will generally be directed in a northern, eastern or western direction.

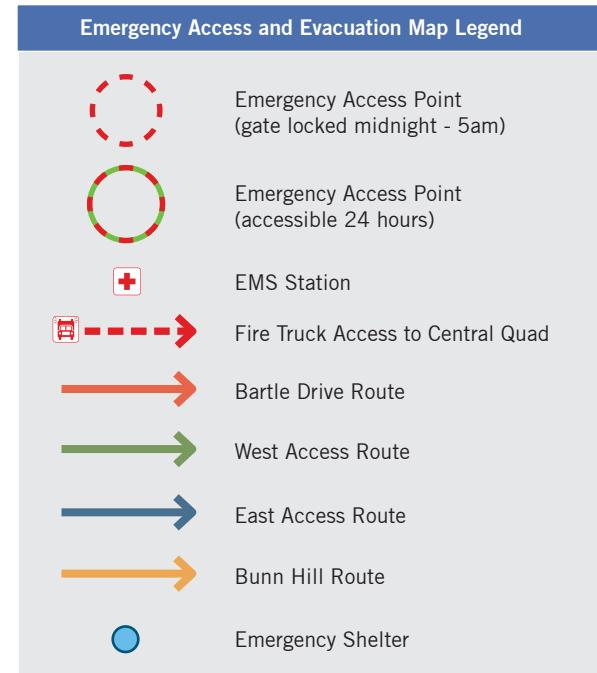
EMERGENCY RESPONDERS / SERVICES

Review of the Town of Vestal fire department's alarm log, which is available on their website (www.vestalfire.com), indicates that BU generated 38 percent of all alarm events in 2009. The closest station house is Vestal Company 4 located on Vestal Parkway East at Earl Road. The campus is served by its own student volunteer EMS service, Harpur's Ferry Ambulance. Town of Vestal also uses the Vestal Ambulance service. As all gates are closed to traffic from midnight to 5 a.m. except at the main entrance, Bartle Drive remains the only accessible entry point to campus, unless otherwise coordinated with University Police.

The nearest hospitals include Wilson Regional Hospital in Johnson City, Binghamton General in City of Binghamton, and Our Lady of Lourdes Hospital also in City of Binghamton.

EMERGENCY SHELTER

In June of 2006, record rainfall hit the Southern Tier counties and caused massive flooding, forcing thousands of Binghamton area residents to evacuate to higher ground. A request from the Red Cross to shelter evacuees was directed by Broome County Emergency Services, who contacted the campus. The campus emergency response team, activated in accordance with the campus' Emergency Response Plan, converted the Events Center building into an emergency shelter. With at least 1,800 evacuees registered with the Red Cross, the Events Center was converted into an emergency shelter. The University food services vendor, Sodexo, supplied meals during this period. The student volunteer ambulance service, Harpur's Ferry, worked with University Police and the Environmental Health and Safety staff to provide medical care. As this was the first event to utilize the Events Center in this way, it is conceivable that the Events Center will become a designated emergency shelter, given the elevation of campus beyond the reach of flooding and the success with which the emergency was attended by the campus community.



Student-operated Harpur's Ferry EMS

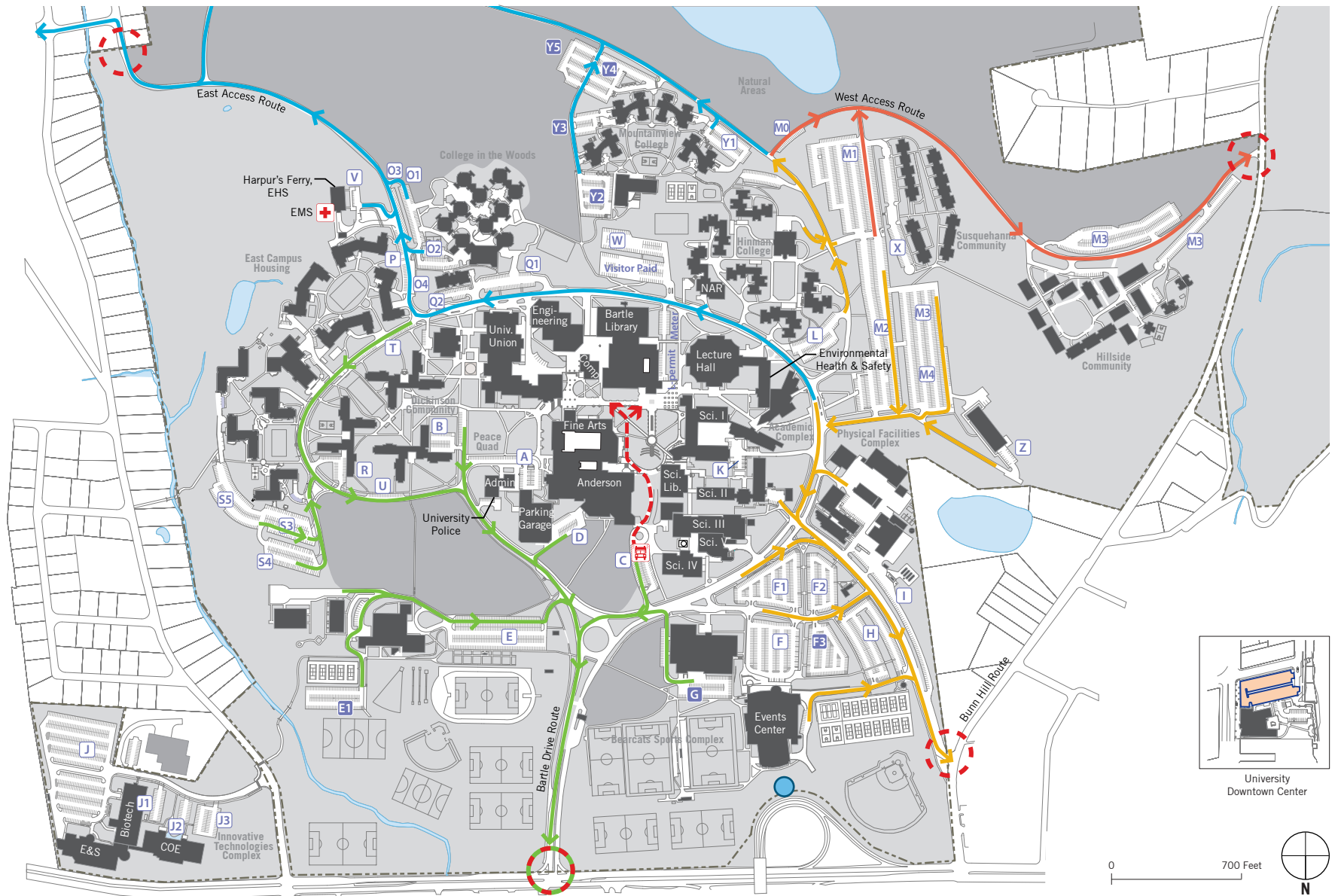


FIGURE 2.2.8A Circulation Map: Existing Emergency Routes

2.3 Landscape

2.3.1 VEGETATION

Types of Vegetation

- + **Buffer:** Often evergreen trees these formal plant arrangements buffer views and winds, while separating and defining spaces.
- + **Edge:** The edge condition describes a situation in which the development of previously forested areas creates ideal conditions for colonizing and/or invasive species. These edges have a scrubby appearance and a predominance of invasive species.
- + **Formal Landscapes:** Malls, groves, or bosques configured in straight, evenly spaced lines or grids, these plants (both mature and developing) rigidly articulate formal spaces.
- + **Open Lawn:** Large areas of open lawn are ideal for both unstructured passive recreation as well as athletics.
- + **Mature Informal Landscape:** Older portions of the campus host mature landscape plants arranged informally.
- + **Immature Informal Landscape:** Newer portions of the campus host developing landscape plants arranged informally.
- + **Wooded:** These areas are predominantly populated with mature deciduous trees, fewer understory trees and shrubs (evergreen and deciduous), and woodland perennials.
- + **Natural Areas:** These areas consist of unmaintained plant populations comprised largely of perennials species, some shrubs, and few small trees.

Campus Vegetation by Zone

Campus Core. The campus core contains the most diverse types of vegetation at the university. One finds mature formal landscapes in the form of bosques and allees and open lawns along with mature informal and buffer or screening plantings. Also represented are less mature or more recently installed

designed landscapes. These vegetative types typically occur as newer building additions and construction projects are completed. The campus core also exhibits parcels wooded land. Generally the plant types range from introduced ornamentals to native species with little or no conspicuous ecologically functioning communities outside of the preserved forest.

College in the Woods. Nestled along the edge of old growth forest, College in the Woods has a largely cohesive vegetative palette. Aside from the old growth forest that encompasses the college, the interior courtyards are populated with a mostly native plant population of birches, viburnum, and cherry trees.

(Original) Dickinson Community. As the only college within the confines of the Brain, the Dickinson Community has the most mature landscape plants of the residential colleges. Large trees pervade with an understory of lawn. This simple palette is a throwback to a more traditional approach to campus landscaping; one in which the focus is to provide shade and canopy. The relative lack of smaller plantings especially around the buildings leaves the community with an open if not bare feeling in spite of its large trees.

Hillside Community. The Hillside Community is one of two colleges that have a noticeable dearth of landscape plants. The plants that are present are mature and are mostly evergreen trees. Many of these were planted quite close to the residence halls and now in maturity show signs of this stress. Most of the community is carpeted in lawn though the outskirts are populated with naturalized herbaceous perennials.

Hinman College. Hinman College's landscape is characterized by lawn and mature trees. Its planting design is similar to that of Dickinson Community though it is a clearly younger landscape.

Mountainview College. As the youngest of the current campuses, Mountainview has the newest plantings of the residential colleges. Most of these are small native trees and ornamental grasses. There are also some shrubs and perennials planted along the foundations of the residence halls.

(Original) Newing College. The existing portions of Newing College are consistent with the planting of the other older colleges. Large shade trees and lawn predominate, though unlike the other colleges Newing is bordered by old growth

forest and has several fragmented patches of old growth throughout the campus. Also unique to this campus is the existence of a riparian corridor.

Susquehanna Community. Similar to the Hillside community the Susquehanna Community has mature evergreen trees and a few ornamental trees, but is largely without a designed landscape. The community's more compact layout and situation on a terraced slope makes it feel less open and sparse than Hillside. Some shrubs are located along the embankment that separates the lower buildings from those higher upon the slope as well as adjacent to the individual building seating areas. The embankment is also populated with what appears to be naturalized herbaceous perennials.

Natural Areas. University Recreation Services utilizes the natural areas on campus for student recreation purposes. The Outdoor Pursuits program uses trails for show shoeing and advanced cross-country skiing. The program also uses natural areas off-campus such as Greenwood Creek State Forest, Chenango Valley State Park, Onondaga County Park, and Highland Forest. Use of surrounding facilities helps BU students to connect with the surrounding community and its recreational opportunities.

Tree Canopy

The campus tree canopy as it exists within the campus core and populated areas is discontinuous and fragmented. One of the unique features of Binghamton University's campus is its prevalence of contiguous wooded area at its periphery. Several large pockets of this same contiguous wooded area also exist within the campus core. These are emblematic elements of the campus and can act as the seeds for developing a more cohesive ecology of canopy throughout the campus where desired.

The true ecological benefit and health of these existing systems require a more in depth review to determine tactical best management practices for maintenance, restoration, and proliferation. Though a contiguous tree canopy throughout the campus may not be desirable, efforts should be undertaken to interweave threads of continuity through the campus fabric.



FIGURE 2.3.1A Landscape Map: Existing Vegetation

2.3.2 CAMPUS OPEN SPACE

TYPES OF OPEN SPACE

- + **Open field:** Open and maintained unprogrammed space.
- + **Recreation Field:** Present at each college, these fields provide a setting for impromptu and informal recreation as well as college intramural games and events.
- + **Athletic Facility:** Tennis and basketball courts, soccer, lacrosse, baseball, and softball fields along with the track and field events comprise the outdoor athletic facilities.
- + **Academic Quad:** Typically smaller in scale these quads are closely associated with an academic field, serving outdoor classroom and circulation needs.
- + **College Commons:** These spaces are specific to the individual residential college experience and contribute the unique character of each college. Most contain some incidence of plaza space.
- + **University Commons:** These large scale open spaces serve the needs of the university and community at the macro scale.
- + **Plaza:** Here plazas are independent paved areas of varying scale often providing formal entrances to buildings.
- + **Courtyard:** These mostly outdoor spaces are delineated by the buildings that contain them.

CAMPUS OPEN SPACE BY ZONE

Campus Core. The campus open spaces are varied in scale, function, and use. Like most campus spaces they are successful due to the fact that they are highly utilized by the student body. With the exception of the athletic fields, the single largest open space is also the most central to the campus. The University Commons, defined for the purposes of this assessment as the area between the University Union, Science I, Bartle Library, and the Fine Arts Center, is the figurative heart of the university where students daily cross paths to and from classes, the library and the union. This space also hosts the annual Spring Fling, and other campus-wide activities. Academic quads, plazas, and courtyards contribute to the full compliment of open space

within the Brain. This space will be named for BU's retiring Lois B. DeFleur.

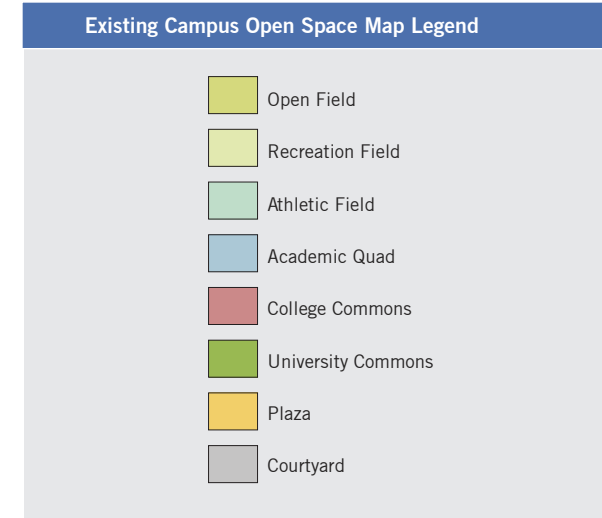
(Original) Dickinson Community. As "the Original Community" at Binghamton University, Dickinson is the only residential college that exists within the Brain. Its open space more closely resembles traditional college quadrangles with open lawn areas and mature planting. Situated throughout these quads are sitting areas, "the object" a large sculpture, and spaces for various recreational activities including; a basketball and beach volleyball court and a multipurpose field. To the south and west of the Dickinson Dining Hall is a plaza space that is noticeably more urban in character than the rest of the community.

Hinman College. Hinman College's open space is similar in character to the Dickinson Community with open lawn areas and mature planting. A centrally located quad sits in front of the Dining Hall. Plaza spaces join the Collegiate Center and the Nelson A. Rockefeller building leading down to the Brain. Basketball, tennis, and beach volleyball courts are located to the east of the college along with a multi-purpose field. As currently configured, a heavily utilized pedestrian route leading from commuter Lot M to the Brain cuts through the Hinman College open space. This results in a high volume of students that are not a part of the residential community moving through the space, creating a barren, dirt path.

College in the Woods. The open spaces in this residential college consist of a series of interconnected paved courtyards framed by four-story dormitories. They are relatively intimate in scale and are imbued a sense of separation from the rest of the university due to scale of the dormitories which limits sightlines in and out of the courtyards. The largest of these spaces is anchored by the Iroquois Commons which houses the college's dining hall and mail room. This courtyard is a vital community meeting place that also hosts college events. Additionally there is a multipurpose recreation field to the west of the Tuscarora Office Building where informal pick-up games and play takes place.

Hillside Community. Comprised of two neighborhoods of apartment communities, Hillside is the most independent and remote of the residential communities. The most prominent open space is the large centrally located field. This flexible space is primed for pick-up games or events. Further west near the commons are a basketball and beach volleyball court.

Susquehanna Community. With perhaps the smallest open space of the colleges the Susquehanna community's main open



space is primarily dominated by an unusable slope. Adjacent to each building is a small patio / sitting area. As this community historically catered to graduate students, some with families, all four buildings share a common playground. The community is not mostly undergraduate.

Mountainview College. The open space at Mountainview College is one of the most centralized of the other residential colleges. The main quad area is bounded by the residence halls and the new Appalachian Collegiate center. The quad features a multipurpose field, basketball court, and seating areas with additional courts nearby.

(Original) Newing College. Newing College, being set back as it is from the Brain, has a good portion of its open space as a front yard between the residences and the Brain. Internally the college's open space is loosely organized around an open lawn populated with picnic tables and a basketball court. This space is divided by an asphalt service drive. A beach volleyball court is also nearby. The proposed portion of the college is organized around a central green containing a multi purpose field and adjacent plaza spaces.

The recreation fields within the residential colleges are highly used natural turf fields, and as such they are well worn. High levels of traffic cause soil compaction which then hinders the growth of turf. With continued use, natural turf can be difficult to maintain.

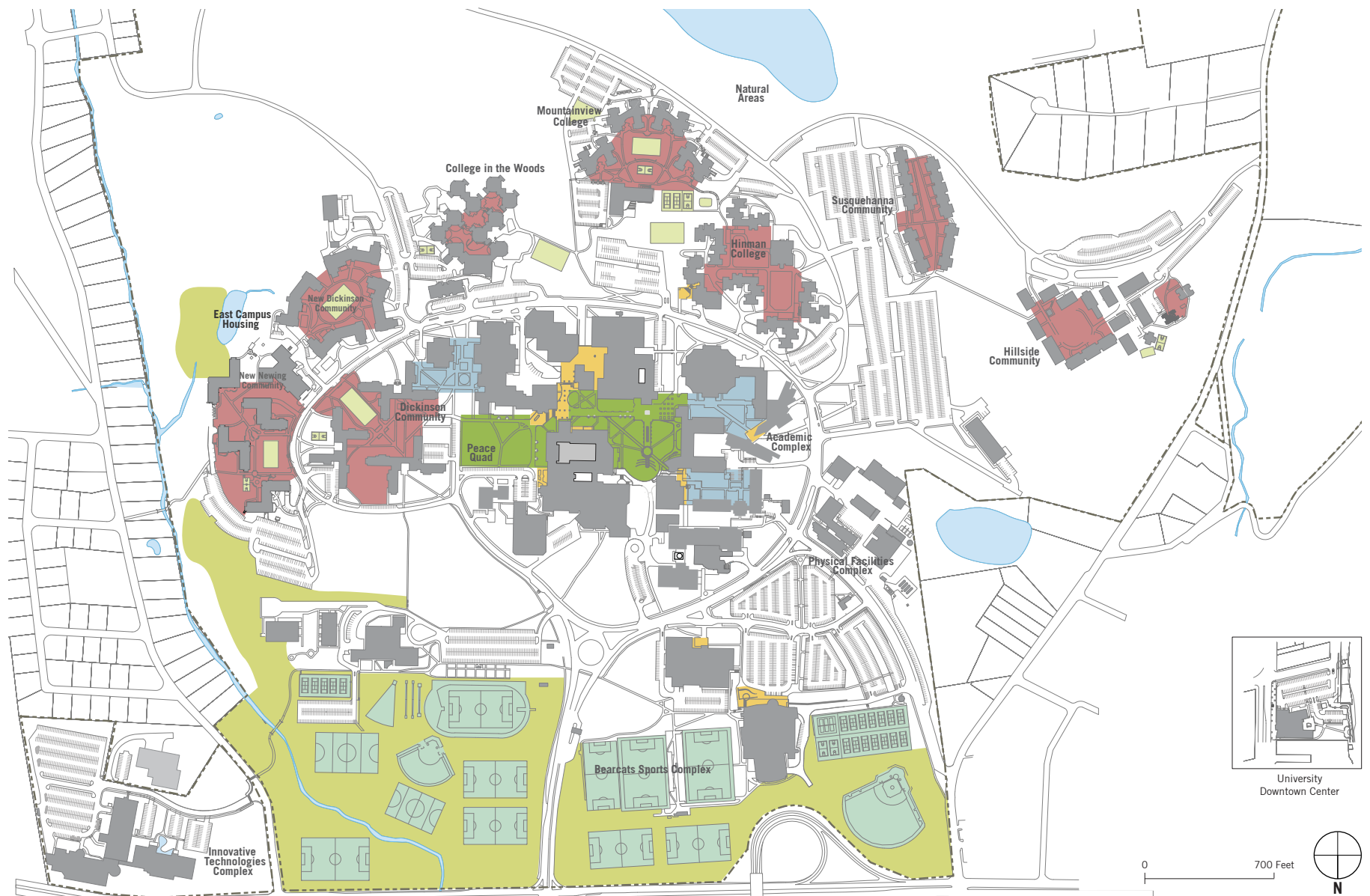


FIGURE 2.3.2A Landscape Map: Existing Campus Open Space

2.3.3 HARDSCAPES

CAMPUS HARDSCAPES BY ZONE

Campus Core. The campus hardscapes are largely a mix of asphalt, concrete, and precast concrete pavers. Generally the condition of these pavements is good. The asphalt in particular shows signs of wear likely due to winter snow plowing, salting, and the freeze thaw process and due to its perceived age. Large portions of the concrete pavement and precast concrete pavers are newer as they relate to more recent additions to the campus facilities, and therefore show fewer signs of wear and degradation. Broken or otherwise poor pavements are localized and not prevalent.

Asphalt pavement is the least expensive commonly used pavement and also has the shortest life expectancy. Concrete is more costly than asphalt but is considerably more durable and long lasting. Unit pavers are the most expensive of the three paving systems but given an adequate base can outlast either of the other two materials. Its modular system also makes repairs and reuse seamless.

College in the Woods. The pavements within the College in the Woods courtyards are precast concrete pavers. This pavement is in fine condition, though the condition of the asphalt pavements at the periphery of the college courtyards is mixed. Few of the asphalt paths are new while others are uneven and cracking.

(Original) Dickinson Community. The predominant pavement in the Dickinson Community is asphalt, though the entrances to the residences are marked by pavers. Adjacent to the dining hall sits a concrete plaza, portions of which are broken, crumbling, or patched with asphalt. The asphalt walkways are generally in good condition, though some cracks, crumbling edges and patches are evident.

Hillside Community. The walkways and roads within the Hillside Community are paved exclusively with asphalt; the condition of which is relatively poor. Though these walkways are in no way impassable, large portions of the existing pavement are broken and crumbling.

Hinman College. The walkways within Hinman College again are predominantly asphalt. Though these pavements are aged and have been patched over time, they have been well

maintained and are in good condition.

Mountainview College. Mountainview College displays the greatest diversity in pavement type when compared to the other colleges, all of which are new. The walkways are composed of concrete, precast concrete pavers, and colored and stamped concrete.

(Original) Newing College. The existing Newing College is paved in asphalt, and is in good condition. Though it is clearly not a new pavement, it shows few signs of deterioration.

The proposed pavements for the new portion of the college are a mix of concrete and pavers.

Susquehanna Community. Like the other older communities, the Susquehanna Community is paved predominantly with asphalt that is showing signs of its age. Also present are several seating areas paved in concrete. Both pavements are in good condition though isolated areas of asphalt are broken and crumbling.



Asphalt

Pavers



Concrete

Mixed

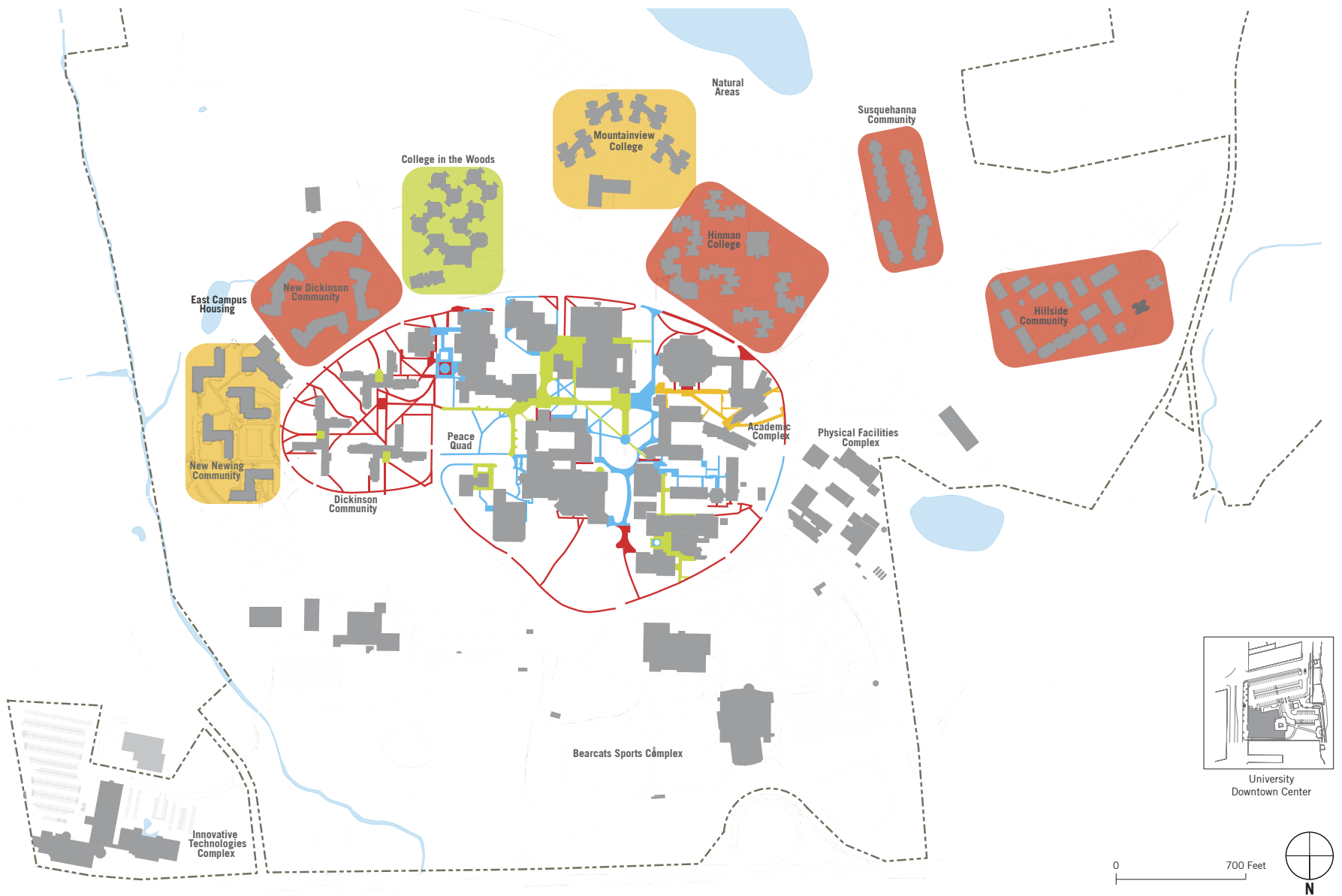


FIGURE 2.3.3A Landscape Map: Existing Hardscapes

2.3.4 SITE FURNISHINGS

Like many places that have grown organically and evolved over time, one finds a wide variety of site furnishings throughout the campus. Several of the colleges have consistent families of furniture but most house a combination of new and old, representing several styles. Certain portions of the campus, like the University Commons, exhibit cohesive clusters of furniture. Some of this furniture also appears in the residential colleges as well. The following is a catalog of some of the existing site furnishings. For a complete set of examples, please see Appendix A.2.1 Landscape.

The campus streetscape is a mélange of materials and treatments. The main entry drive with its consistently spaced monoculture of shade trees along the boulevard's central median has the beginnings of a unified streetscape. As one progresses to the loop road the unity devolves and this strong cohesive idea deteriorates. Varieties of light fixtures, bus shelters and other furnishings, sporadic planting, and a range of surface materials all detract from a regularized impression of the street as a place. A consistent streetscape should be considered and adopted by the university for phased implementation. Elements such as materials, furnishings, plantings, bicycle circulation, and dimensional relationships should be formalized and utilized to visually connect the campus's streets. These elements supply the needed framework, sense of identity and place, subtle directional and arrival cues that people identify with a given environment and use to navigate through it.

SCULPTURE / PLANTING	LOCATION
Pegasus	Anderson Hall
Large Sundial	Outside Lecture Hall
Wooden Sculpture	University Commons
Wooden Sculpture	Adacent to NAR
Stainless Steel Sculpture	Front of Events Center
Other Sculpture	Dickinson Community
Concrete Sculpture	Between Union & Dickinson DH
Memorial Planting	At Physical Facilities Building
Memorial Courtyard	Fine Arts Building
Collard Memorial Gazebo	At Western Tennis Courts

Site Furnishings - Benches



Site Furnishings - Site Lighting



Site Furnishings - Signage



Site Furnishings - Seating



FIGURE 2.3.4A Sculpture & Memorial Plantings

Site Furnishings - Bicycle Racks



Site Furnishings - Sculpture



Site Furnishings - Miscellaneous Furnishings



Site Furnishings - Shelters



2.4 Geography

2.4.1 CLIMATE AND GEOGRAPHY

Located on the edge of New York State's "snow belt" region, snow cover is relatively consistent during the operating months of restricted parking "snow" lots between November and March. The Campus experiences a high percentage of cloudy days annually at 58 percent, but taking the average during 9 months of a typical academic year, the average cloudiness rises to 63 percent. This limits the potential for solar-technology installations. The Town of Vestal is included in USDA plant hardiness Zone 5A. The 100-year flood plain does not extend to the northern boundary of the main campus, and the University Downtown Center in Binghamton lies close to the banks of the Chenango and Susquehanna rivers, yet is still beyond the extent of the 100-year flood plain.

Vestal is located in earthquake seismic zone "B". A moderate level of seismicity and seismic hazard exists in most regions of New York State. US Geological Survey historical data indicates that within 100 miles of the campus 14 events have occurred from 1974 to present, of which 13 can be characterized as minor (generally not felt) and 1 was light (noticeable shaking, damage unlikely). Although infrequent, seismic activity has the potential to cause extensive damage to non-reinforced masonry buildings.

Temperature

Annual Average High/Low	54/38 degrees F
January Average High/Low	28/15 degrees F
July Average High/Low	78/59 degrees F

Precipitation

Annual Total	38.7 inches
Monthly Average	3.2 inches
Precip. Highest Month (Jun)	3.2 inches
Annual Snowfall	54.8 inches
Snowfall Highest Month (Feb)	13.6 inches

Energy

Heating Degree Days (Normal)	6760
Cloudy Days Annually	58 percent
Sunny Days Annually	42 percent

2.4.2 SIGNIFICANT SLOPES

The existing terrain contains hilly slopes in the southern region of campus. With peak elevations above 1,600 feet, areas with steep slopes lead to the Harpur Wetland Complex and further downhill toward populated campus areas. The eastern slopes proceed toward Fuller Hollow Creek on the campus' eastern border and toward Bunn Hill Road on the western end of campus, and Bunn Hill Creek beyond.

2.4.3 DRAINAGE

The drainage strategy for the University is a traditional system of swales and catch basins which convey stormwater to local waterways. There is one constructed wetland stormwater system near the main entrance and one retention system behind the (Original) Newing Campus. Both the wetland and retention system are small relative to the size of the campus' built space. There are localized areas of the campus where bedrock and other subsurface conditions prevent effective stormwater percolation.

2.4.4 PREVAILING WINDS

As the campus proper is located at the lower base of surrounding slopes, wind directions can vary significantly with winter winds predominantly blowing from the northwest and summer winds from the southwest. In Figure 2.4.2A, the wind rose diagram plots the annual wind data for 1992 recorded by National Weather Service station #04725, Binghamton / Edwin A. Link Field, and displays wind speed direction (blowing from). Average wind speed is 4.45 m/s with calm winds of 1.53 percent.

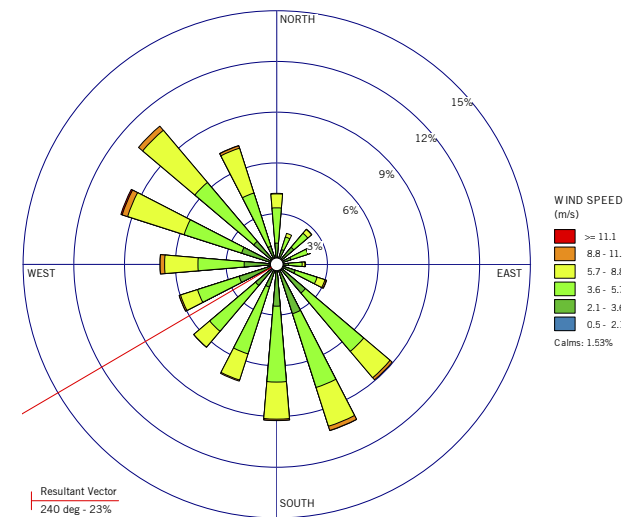
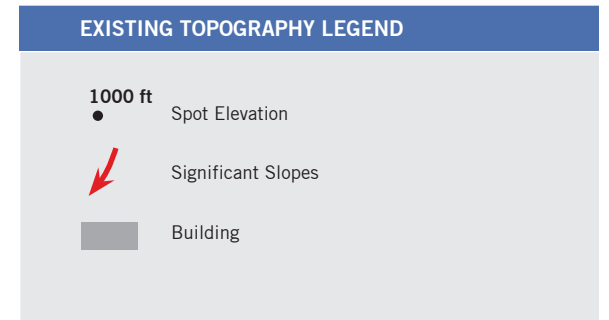


FIGURE 2.4.4A Wind Rose Plot

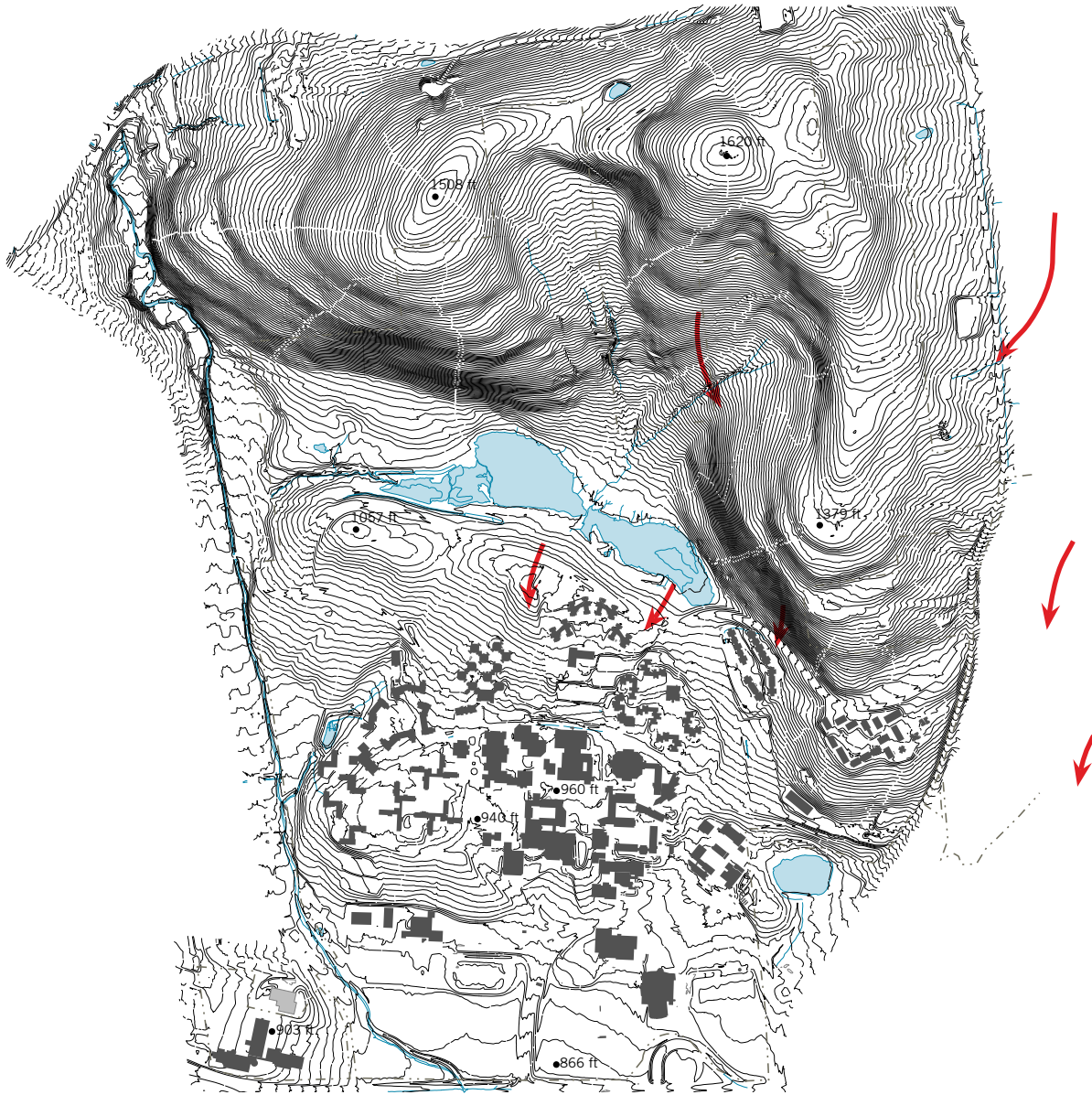


FIGURE 2.4.4B Existing Site Topography

2.5 Security

Binghamton University has a number of security systems to ensure safety of students, faculty, staff, and visitors. Major components of campus security include: the University Police Department, site security, building and facilities security systems, communication and notification systems, and emergency response and evacuation plans.

2.5.1 UNIVERSITY POLICE

The University strives to provide a safe environment for the students, visitors, faculty and staff. To that end, the University Police department operates 24 hours a day, seven days a week, from a central station in the Couper Administration Building (room G-35). The law-enforcement unit consists of 34 sworn personnel: the Chief of University Police, two Assistant Chiefs of University Police, one Deputy Chief, 23 Patrol Officers, five University Police Lieutenants, and two University Police Investigators. The University Police officers have full arrest powers and are responsible for enforcing all state, federal and local laws, as well as the rules and regulations of the University.

Sworn officers of the University Police receive their law enforcement authority from the New York Criminal Procedure Law. Officers receive their training at the Zone 6 Municipal Police Training Academy.

The University has up to three uniformed building guards that provide physical security by patrolling campus grounds from 7 p.m. to 7 a.m. each night. The building guards stay in radio contact with University Police and are responsible for reporting emergencies, fire safety violations, and violations of law and campus rules and regulations. Guards patrol both residence halls and academic buildings. In addition to mobile and foot patrols, the University Police officers patrol the campus on police-equipped mountain bicycles, weather permitting.

The University Police department provides a number of other services, including, but not limited to, medical emergency assistance, crisis intervention, crime prevention, locating missing/wanted persons, and providing speakers on topics related to law enforcement. The department also coordinates the campus escort service and the emergency and blue-light phone systems.

The University also operates a safety escort service and Safe Ride van program to provide added measures of safety for students traveling at night. On-campus student escorts are available to walk with members of the University community each night during the academic year. University Police officers staff the escort program at all other times. Each escort receives special training and carries a radio to communicate with the University Police. The Safe Ride van provides transportation via a predetermined route on campus. To use this service, students simply wait along the Safe Ride route for the blue van with a yellow light on top.

The University Police department maintains a close working relationship with neighboring law enforcement agencies as required by law. These agencies include the Vestal, Binghamton, Johnson City and Endicott police departments, the Broome County Sheriff's Department and the New York State Police Department.

To help members of the campus community to learn more about campus safety and gain knowledge about their surroundings, the University Police and offices within the Division of Student Affairs hold more than 100 educational programs each year on a variety of topics.

The personal safety advisory committee is composed of faculty, staff and students. This group reviews campus personal safety issues and recommends ways to enhance personal safety, especially through campus educational and student-life programs. The committee sends a written report to the president every year.

2.5.2 SITE SECURITY

Site security consists of access to campus, the site closed circuit television (CCTV) system, the emergency call ("Blue Light") system, and campus lighting.

Access to Campus. There are four entrances to the campus: the main entrance at Glenn B. Bartle Drive and three access roads. From midnight to 5 a.m., ingress and egress at the access roads are closed to traffic using a manual gate. Ingress at Bartle Drive is limited by a security check point. All vehicles

requiring admission to the campus during this time must display a current University parking decal. If the required decal is not displayed on the vehicle, at least one occupant of the vehicle must be a member of the University community, proven by presenting a valid University ID card. Egress at Bartle Drive is not monitored or closed.

Closed Circuit Television System. BU currently employs analog CCTV cameras to monitor locations around campus, with data transmitted over the fiber network. The campus has a mixture of standard fixed type and Pan-Tilt-Zoom (PTZ) type CCTV cameras. The PTZ cameras are equipped with a 32x optical lens.

Cameras are connected to the CCTV system via a coax cable that is brought to a central location in the building that it is installed. This location is usually a data closet in the building. It is at this junction, that the cameras are connected to a Digital Video Recorder (DVR). The DVR is then connected to a closed loop fiber network which brings the views back to the viewing stations in the University Police Department. All campus DVR can be monitored at the location over the Binghamton University network as well as centrally at the police station. The downtown campus is monitored in two locations: downtown and at Vestal campus. The new ITC building can be monitored at the building as well as main police station.

The University is making a conversion over to an IP, hybrid DVR CCTV system with high megapixel cameras.

The University has identified a desire to implement a coordinated camera system to monitor large-scale events at the Events Center.

Emergency Call ("Blue Light") System. Emergency call locations, also known as the "Blue Lights," are located near campus roadways, sidewalks, parking lots and residence halls. A blue light atop the pole makes each phone easy to recognize. These emergency phones are wired directly to the University Police. Emergency phones are used generally on walking paths, in parking facilities and building entrances throughout the campus.

Upon a person lifting the receiver, the University Police know the location of the emergency phone and will dispatch a patrol car for assistance.

Telecommunications manages the blue light system. The telecommunications group designs each phone project and make provisions for the conduit routing. The campus Facilities Department provides the cabling and the installation for the device as well as making the final connections. Blue light signals are carried over the campus (copper) phone system.

Campus Lighting. The University Police provide lighting assessments on a yearly basis. This assessment helps to determine the campus needs and to plan for the future expansion of the outdoor lighting. The use of exterior lighting in parking lots, along pedestrian walkways and in areas around buildings helps to promote campus safety. The light poles are numbered to facilitate the reporting of any problems to University Police. A lighting upgrade along Murray Hill Road has been discussed.

Independent Security Systems. As a policy, the University Police does not allow departments to install their own independent security systems. The Art Museum in Fine Arts is the only space protected within a building, with its own separate alarm and fire system monitored by campus police.

Some engineering labs have simplistic door alarm systems. Ideally specific science departments would upgrade to higher security systems. Banks have their own monitors and recording systems in addition to the campus system. Sodexo also has some independent monitors and a recording system. These locations are also monitored with campus cameras.

The women's locker rooms in the West Gym are equipped with panic buttons. The panic buttons are incorporated into the fire alarm system for transmission of an alarm. These panics communicate an alarm directly to the building staff for immediate response upon activation.

2.5.3 BUILDINGS & FACILITIES SECURITY

The security systems used at buildings and facilities consist of access control at academic facilities and residence halls, CCTV, and independent security systems.

Members of the campus community, as well as guests and visitors, have access to most campus buildings and facilities during business hours Monday through Friday, at times when the University is normally in operation. Limited hours may be

designated for weekends. Exterior doors on campus buildings are secured manually each evening by the University Police. Any door or security problems are reported on a daily basis.

Access Control System. Access cards are issued by the Registrar's office. The access card is of the proximity type and contains a magnetic stripe that is used for cashless vending on campus, to check out Library collections, and for free rides on the Binghamton city buses. This card is also used to access the dormitories and also the gym facilities.

The campus access control system operates independently of other systems on the campus as of the present time. The system operates on its own dedicated fiber strands and connects to the head end equipment in the Couper Administration Building (room G-35). At present, the information being transmitted over the campus network is minimal and is limited to data and telephone activity.

The telecommunications group pulls the required cable infrastructure for the access control system. The access control system is not deployed throughout the entire campus at this time, but it is going to be the standard moving forward and for all future projects.

The University prefers the LENEL system, intruder alarm detection, propped door alarms, each building requires a controller that can hold up to 64 door panels and each panel can support one reader and one alarm point.

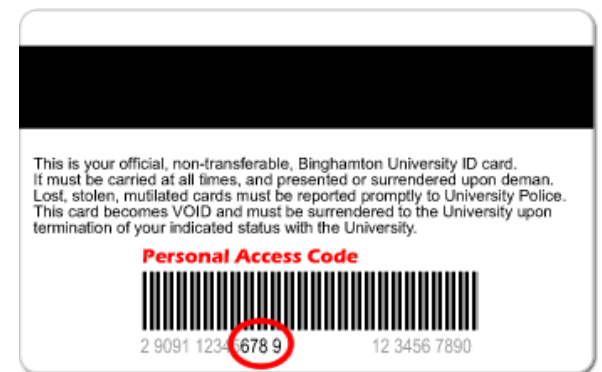
Access Control at Residence Halls. All of the residence halls are locked on a 24-hour basis and use a card access system that ensures doors remain locked at all times. If the door remains open longer than approximately 10 seconds, the Lenel system will activate an audible sounder to alert students in the building that there is a door propped open. The valid and invalid card access log attempts are reported to the University Police Lenel head end workstation. Going forward, all new residence halls are to be outfitted with required cabling for access control locations and for IP CCTV cameras in the building. IP will be monitored under CCTV.

University residence apartments are equipped with key locks on exterior entrance and interior bedroom doors. Within the apartment, the bedrooms are keyed separately. Residents of the campus are responsible for all keys issued to them and are asked to report lost or stolen keys to the University Police. The re-keying of doors is required when keys are lost or stolen.

CCTV at Campus Facilities. Designated portions of the buildings, offices, laboratories, and computer rooms are equipped with CCTV monitoring. Presently, there are no cameras in the dormitories.

In keeping with the conversion to an IP CCTV system, new buildings are outfitted with pathways and cabling so cameras may be installed in the future at doors and key points.

There is no integration between the access control and CCTV systems.



2.5.4 COMMUNICATION & NOTIFICATION

The campus employs a variety of communication and notification systems including analog, hard-wired systems as well as systems that utilize wireless communication technology.

Emergency Phone System. Emergency phones (Red Phones), clearly marked with the word “Emergency” either on or near the phone, have been placed in convenient internal locations, such as elevators, hallways and other public areas, to provide easy accessibility. Red phones are used in the interior space of the lab/sciences building as well as a caller who reports an emergency using one of the University’s emergency telephones will reach a dispatcher at the University Police, who will request specific information while an officer is sent to assist the caller.

Security Access Telephones. The University has installed security access telephones outside the main entrance of each residence hall. Guests, visitors, or delivery persons may call students to let them know they are waiting outside in the hall. Residents are responsible for meeting such callers and escorting them while they are in the building.

Wireless Technology and Alternative Systems. Systems that rely on radio or cellular communication depend on signal access. Campus officials have noted dead-spots on campus. The campus does not have a policy on digital transparency to eliminate these dead spots, however the University Police has been pushing for service in all spaces. Specific areas of concern include Academic A&B and the basement of the library. The campus was told service depends on (1) location and (2) building construction.

New construction on campus, including dormitories, makes use of VOIP phone technology. In some buildings the campus is testing out the use of soft phones, which allow students to make calls over the internet using a computer and commercially dedicated software (Skype), in lieu of dedicated hardware. These measures provide potential alternative communication methods should phone infrastructure or power be interrupted.

Mass Notification. The mass notification system used at BU combines various methods to alert students and faculty to an event that is unfolding. In keeping with best practices, the University has multiple systems of varying technologies, including:

- + *Text and electronic messaging (RAVE/SUNY NY Alert).*

Text messaging allows emergency messages to be sent directly to a student’s mobile device. Student on-file contact numbers are automatically registered to receive this service. Students may log on to manage their accounts and add additional phone numbers. The RAVE system is carried over the campus’ own network. The alert system used throughout the campus is primarily through the cell phone service. Telecommunications put the system in place in conjunction with University police.

- + *BU alert line.* The alert line at 777-7700 provides a recorded message with updated information regarding any emergency incidents and weather-related information for the campus.
- + *Campus voice mail.* Recorded messages containing emergency information can be distributed to all University owned hard-wired phones.
- + *B-Line e-mail list.* The University B-Line is used during emergency situations to provide updates and critical information via a student e-mail list.
- + *University web page.* The University’s web page is used to communicate important information regarding any critical incident.
- + *Internet browser redirect.* During critical incidents, the University can redirect any computer that attempts to access an off-campus web site to an emergency notification page containing important information.
- + *Electronic message boards/TVs.* Emergency messages can be displayed on electronic message boards and TV screens located throughout campus.
- + *University cable channel 42.* Students may tune to cable channel 42 to receive important emergency information.
- + *Campus and local media.* The University works closely with local media to distribute information regarding emergency events and weather cancellations.
- + *Outdoor siren.* The University operates an outdoor siren audible from all outdoor areas on the Vestal campus. Students are expected to follow any voice instructions that accompany this alert tone. If no

instructions are given, students should take shelter in the nearest building and seek further information. The siren is carried over the data network.

- + *Vehicle-mounted public address systems.* Emergency vehicles on campus are equipped with public address systems that can be used to convey emergency messages.

2.5.5 EMERGENCY RESPONSE & EVACUATION

The Emergency Response Plan details the policies and procedures the University will take when preparing for, responding to, and recovering from emergency incidents or other unplanned events.

Emergency Response. Upon notification of an emergency incident, Binghamton University first responders and emergency operation center staff shall follow the National Incident Management System (NIMS) for the response and management of all emergency incidents.

At the Vestal campus, the Town of Vestal responds to emergency calls. Emergency vehicle approach routes are coordinated by the University Police. At the downtown campus, the City of Binghamton responds to emergency calls. The city dictates how they approach the building. For further details regarding emergency access routes refer to section 2.2.7 Emergency Access.



Evacuation Procedures. Binghamton University conducts evacuation drills in every campus building (academic and residential) a minimum of two (2x) times per academic year. These drills are conducted by the office of Environmental Health and Safety. The office of Environmental Health and Safety works with all departments on campus to develop and enhance evacuation plans.

2.5.6 AREAS OF CONCERN & UPGRADES

SPECIFIC LOCATIONS OF SECURITY CONCERN

Campus security officials have identified a number of specific locations with heightened security concern. A number of these locations currently undergo increased security monitoring. All site should be considered closely for security with future campus development.

- + *Outdoor public spaces.* The University Commons, specifically the fountain in front of Bartle Library, is the common area for public demonstration. Fewer gatherings and demonstrations occur in the Peace Quad in front of Couper Administration, however it should be considered.
- + *Campus water tower.* Currently the facility is monitored with a camera. There is desire to upgrade the system to include an alarm.
- + *Propane tank area.* Currently the facility is monitored with a camera. There is desire to upgrade the system to include an alarm.
- + *Events Center.* Security is a concern in and around the Events Center during events due to the high population in-flux to campus.
- + *Anderson Center.* Security is a concern in and around the Anderson Center during events due to the high population in-flux to campus. Ideally coverage at Anderson Center would include the outdoor performance areas and the drive up the hill from the north.
- + *Animal facilities in the Science Complex.* In the design phase for Science V access control to the

animal facility was considered.

- + *Institute for Child Development.* The IDC is a research facility for child development. They have a teaching/research facility on the campus including a building and outdoor playground. The facility requires the high degree of security applicable to childcare.
- + *ITC Complex.* Research units are candidates for heightened security in and around the ITC. The use of a Sally Port at certain locations in the building was considered.
- + *Potential future corridor between the Brain and ITC.* Should the corridor between the main academic campus within the Brain and the ITC Complex be developed it would be a candidate for heightened security. The corridor covers a sizable distance of less developed space, and passes in close adjacency to the Institute for Child Development. There are currently no cameras along the drive route but there have been upgrades to lighting.

SECURITY SYSTEM INTEGRATION

Currently the campus access control and CCTV systems operate independently of each other, creating a situation where data gathered from each must be reviewed separately. This configuration does not reflect industry best-practice, which calls for integration of the two systems so they can be reviewed at a single workstation. The integrated system is not building specific but will be for the entire security system. This allows for review of alarms on the access control system in conjunction with a readily available video clip for verification of what transpired or the transaction. Depending on the head end software and/or add on packages offered, some other systems may also be integrated such as fire alarm systems, HR databases, mobile mustering devices, intrusion detection and IP intercom systems. The campus is already looking to integrate CCTV and access card system. An IP system allows for greater integration.

SECURITY UPGRADES

The University Police patrols regularly test the emergency phones and "Blue Light" locations that are connected directly to the University Police call center. Upon testing of the equipment, if the device is deemed to not perform properly the University Police will submit work orders for repairs to the

system. The University Police also recommend the trimming of shrubbery for safety reasons and to keep the CCTV views unobstructed.

The University Police also conduct periodic lighting surveys. Officers report the need for replacement of lights and any other physical hazards they notice. Periodic crime-prevention surveys are conducted when a crime trend occurs, or upon physical changes of office space and equipment, when requested by an administrator.

A project is underway for twenty-one elevators to be refurbished throughout the campus. In the process of rehab, provisions will be made to have additional cable in the elevator traveling cable dedicated for CCTV and access control use. This will provide the necessary infrastructure for the elevators in the event that the school uses these buildings for a mixed use environment.

SUCF Life Safety Project 07A25 identifies a number of buildings that require security upgrades. The buildings require upgrades and the respective number of exterior doors are summarized in the chart below. Security components recommended for upgrade include door hardware, card readers, conduit, wiring, door props, card access system.

2.6 Life Safety

2.6.1 LIFE SAFETY SYSTEMS

Life safety systems at Binghamton University, including fire alarms, emergency power, and sprinklers, are in varying condition or state of completeness. The Life Safety Map, (Fig. 2.6.1A) indicates the distribution of fire hydrant locations on campus and presence of sprinkler systems in buildings. SUCF Project 07A25 Life Safety Upgrades is underway that will abate asbestos, upgrade fire alarms, emergency generators, and lighting in areas of select buildings. Improvements planned as of 2010 are noted in individual building conditions assessments.

EMERGENCY POWER

Binghamton University has emergency generator-provided back-up power for Life Safety and some critical loads in most academic buildings and dining halls. Evaluation of emergency power capacity and a list of existing emergency generators is shown in Section 2.10 Infrastructure. Many of the buildings have only enough back-up power to provide safe exiting from the buildings. It is not a “support-in-place” system.

Support systems, such as ventilation and air conditioning, should be covered by generators to protect computer equipment or lab processes that should not be interrupted. The Life Safety Study will identify where increased generator capacity is required and will consider a central generator plant that would back-up utility distribution.

FIRE ALARM

All fire alarm systems are stand-alone systems. Fire alarm panels are Pytronics and can be controlled from University Police. Some buildings have first generation Pytronics addressable voice communication systems that were installed in the early 1990’s. Voice panels cannot be controlled centrally rather can only be used locally on the panel. Most of these systems are still active today, and should be replaced with building renovations or a dedicated Life Safety project. The University Police is pushing for a full voice system within the fire alarm systems, preferably that can be operated centrally.

By fall 2010, all residence halls will have up-to-date, addressable fire alarm systems.

SPRINKLER SYSTEMS

The water distribution on campus has adequate capacity and pressure to sprinkler all existing buildings. Towers on campus must either be connected to the water main (230 PSIG) between the pump house and tanks (or a dedicated return main, when installed) or a fire pump will be required to provide standpipe pressure in the tower stairwells. New fire services will be required for sprinklers in buildings that have none. The newer dorms have sprinkler systems, the older ones do not. Several buildings have partial sprinkler coverage. Binghamton University’s policy is to provide sprinklers in any new buildings or major renovation. The Life Safety projects scopes do not provide for installation of new sprinkler systems.

DEFIBRILLATORS

Automated external defibrillators (AEDs) are used to treat victims experiencing sudden cardiac arrest (SCA). AEDs are located in public areas of buildings on campus that have been wired to an alarm which will notify the University Police Department (UPD) when the AED is removed from storage. UPD will then dispatch response. UPD also manages the Public Access Defibrillation (PAD) program allowing trained laymen to defibrillate in emergency. Through the SUNY Lifesaver program, the emergency management program offers CPR/AED classes, which are free to all BU students, staff and faculty.

In an effort to maintain consistency in training and response, the University’s standard for AED equipment is the Cardiac Science PowerHeart G3 fully automatic AED. All subsequent installations of AEDs on campus will be of this manufacturer and comparable model. Every state building on campus has an AED installed. Through a five year implementation plan completed in 2009, more than 130 AEDs have been installed throughout campus buildings.



BUILDINGS REQUIRING NEW EMERGENCY GENERATORS	BUILDINGS REQUIRING FIRM ALARM UPGRADES
Bartle Library	Couper Administration
Computer Center	Lecture hall
Couper Administration	Science I, II, III, IV
Fine Arts	
Lecture Hall	
Science I, II	
University Union	
West Gym	

FIGURE 2.6.1A Emergency Generators and Fire Alarm Upgrades

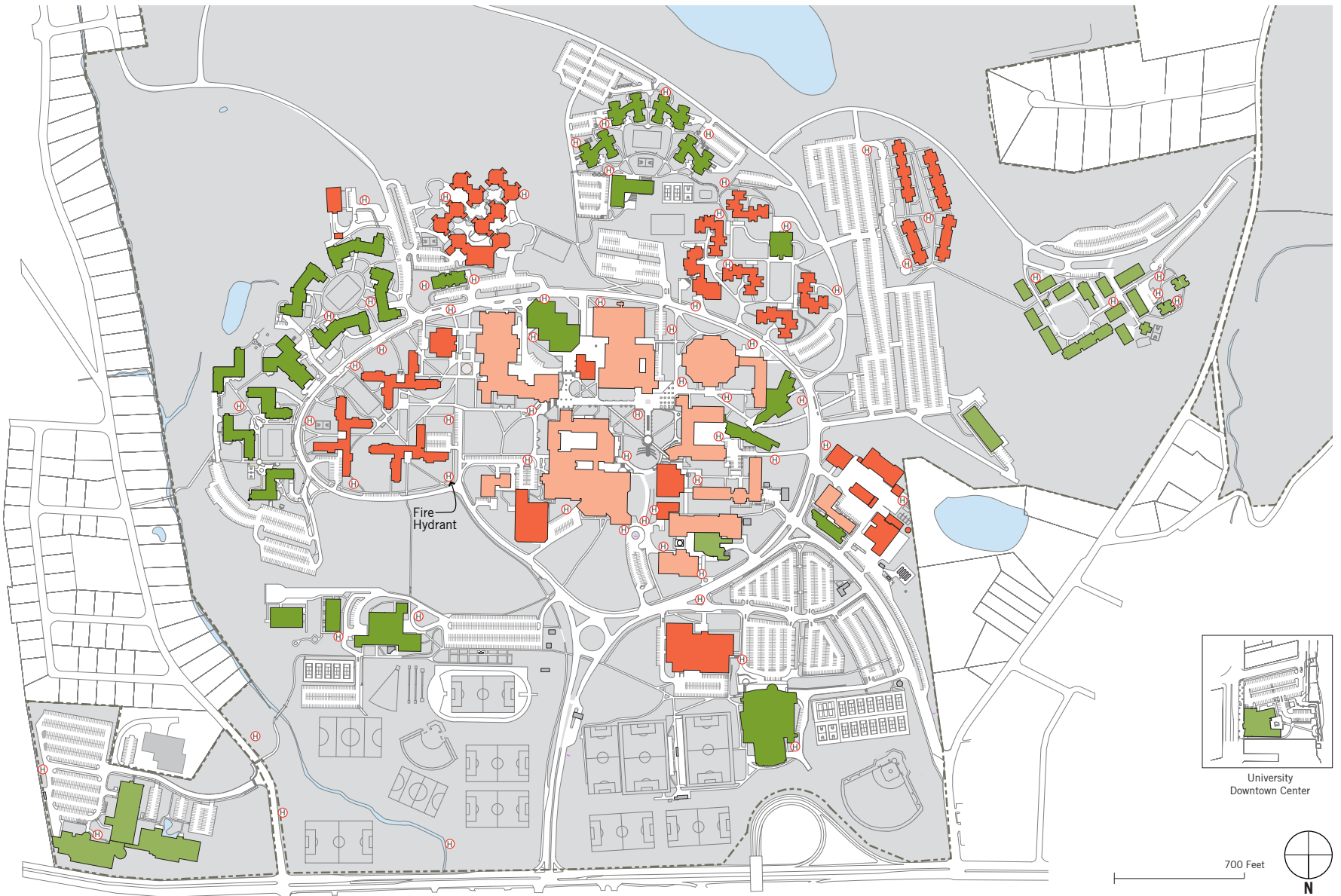


FIGURE 2.6.1B Existing Life Safety Map

2.7 Accessibility

2.7.1 ACCESS AND CIRCULATION CONDITIONS

Although a comprehensive report of ADA deficiencies has not been commissioned, the campus has been addressing accessibility issues in facilities for some time. The University issued a philosophy statement in response to US Rehabilitation Act of 1973 (which predated the Americans with Disabilities Act of 1990). Most recently, in 2003 the Disability Access and Inclusion Team was formed to establish a campus-wide mechanism for planning, implementing, maintaining and enhancing access for people with disabilities. As a preamble to that effort the campus adopted the following vision statement:

Binghamton University is committed to equal access and inclusion for all qualified individuals, regardless of disability. Disability access and inclusion shall always be characterized by dignity, independence, safety, integration and self-determination or personal choice.

In terms of building access, all primary entrances have automatic door-openers installed. However, users often experience inactive actuators when units are not manually re-powered following periods of a building's closure.

Bathrooms in many older campus buildings are marginally accessible. Although spaces may have been fitted with grab bars, the plumbing fixtures and layouts are often non-compliant. Furthermore, remote or non-central location of bathrooms within larger buildings, as in the Lecture Hall, is a concern. The campus in-house design group has a project ongoing to renovate all non-compliant bathrooms in state buildings. Areas of refuge do not exist uniformly across buildings.

There are a number of space types that present particular barriers to equal access, such as science-specific areas. As laboratories are renovated, accessible stations may be introduced, but a large portion of lab spaces are existing and do not currently provide accommodation or wheelchair accessible stations. The second floor of Science I is not easily accessible as the passenger elevator is not large enough. A project is currently underway to modernize the elevators in the science buildings to improve accessibility.

The grand staircase of the University Union is a clear obstacle

as there is no obvious way to negotiate between entry and program on various levels. Developing a clear public way to navigate from University Union to University Union West is a critical issue. The existing method of navigating across this area of campus requires one to navigate around, instead of through, the building. The Phase II renovation of University Union will address these accessibility issues.

Campus circulation is of particular concern, as the roadways lack pedestrian crossing lights and tactile indicators. The Campus is committed to replacing asphalt paths with concrete pavers, which are not the ideal surface for people with some disabilities. Paving and walking surfaces should be studied to develop a set of campus standards for tactile experience to enhance navigating by people with visual impairment. Lack of wayfinding and signage inside buildings and outdoors is an ongoing difficulty for students of all abilities. Audible signage should be considered, as not all vision impaired students are braille literate. The campus does not currently have a campus signage and wayfinding master plan.

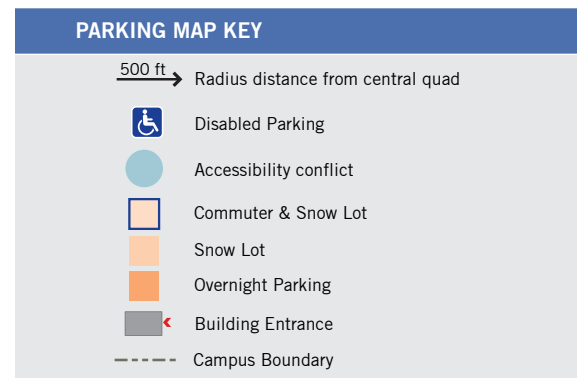
2.7.2 ACCESSIBLE PARKING

Figure 2.7.2B illustrates distances measured from the central quad in the academic core of campus. The disability permit system is regulated in two tiers of access, with the most limited tier of parking spaces located inside the 500 ft radius on the map. All drivers must also properly register vehicles with Parking Services.

Regular Disability Parking requires that vehicles display a NYS disability parking hangtag or disability parking license plate issued to the driver or passenger. Campus-specific permission from office of Services for Students with Disabilities (SSD) not required.

L-Permit Parking is reserved for drivers with limited mobility for whom regular disability parking is too far to building destinations. In addition to display of NYS parking hangtag or license plate, L-Permit requires physician-completed application with photocopy of the hangtag or vehicle registration to SSD for authorization, which expires annually.

Wheelchair-Only Parking provides wider transfer aisles for easy loading and unloading of wheelchairs or scooters.



DISABILITY PERMIT TYPE	QUANTITY SPACES
Regular Disability Parking	141
L-Permit Parking	50
Wheelchair-Only Parking	6

LOT	SPACES	LOT	SPACES
A	15	Q2	8
C	4	R	7
D	7	T1	3
E	2	X	2
F	4	Y1	3
F1	3	Y2	1
F2	1	Y3	2
G	3	Y4	1
I	2	Z	2
J	8	Paid Lot	2
K	16	AD Circle	2
L	32	UDC	4
O1	2	Dorm/Docks	53
O2	5	Lecture Hall	3
P	2	Total	200

FIGURE 2.7.2A Disability Parking Distribution

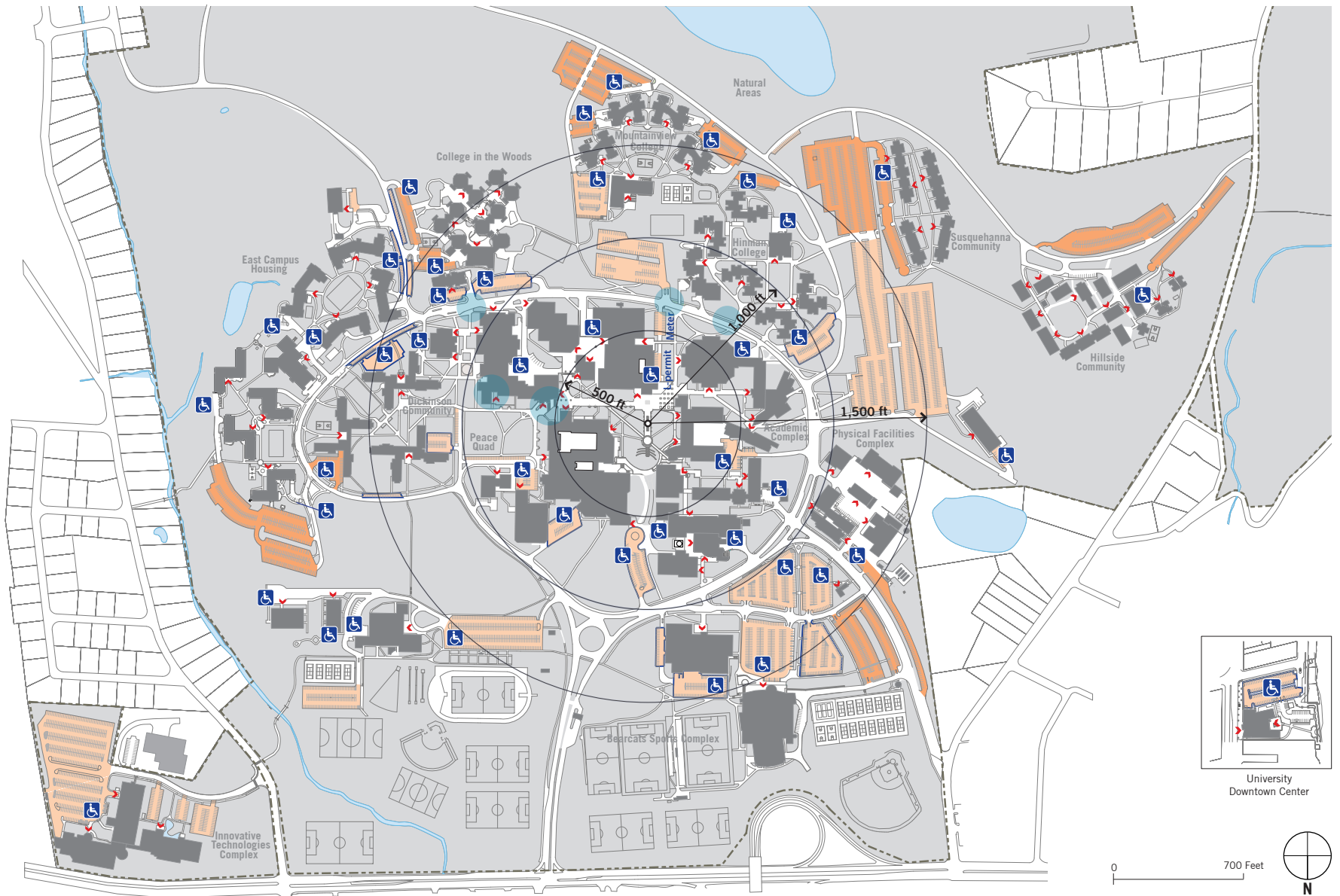


FIGURE 2.7.2B Existing Accessibility Map

2.7.3 ACCESSIBLE TRANSIT

Several transit options exist for people with disabilities travelling to and around campus. Off-Campus College Transport (OCCT) operates two wheelchair lift-equipped vehicles. The Director of SSD determines eligibility to use the “Lift Buses” and forwards authorization to the Lift Coordinator at OCCT. The lift service provides access for individuals are unable to either drive or use regular bus services and operate weekdays from 7 am to 11 pm during the semester. The lift service represents a transportation enhancement that exceeds requirements mandated by federal or state laws.

The Broome County Department of Public Transportation operates fixed-route service to the campus, providing either collapsible staircase or a ramp on all buses. BCT drivers will lower ramps and kneelers upon request and service animals are permitted. Additionally, BCT offers the BC Lift, which is a dial-a-ride, curb-to-curb service available to eligible persons living in Broome County urban areas. BC Lift service is largely supplanted by the OCCT Lift service, which is dedicated to the University community.

2.7.4 UNIVERSITY ACCOMMODATION

The office of Services for Students with Disabilities (SSD) promotes and facilitates on behalf of students at Binghamton, also advocating for the incorporation of universal design. In providing academic accommodation, individual needs assessments are made to determine appropriate accommodations for each student. SSD coordinates disability-based accommodations in academic courses, beginning with preliminary application and needs assessment.

Providing an accessible campus is not limited to a single disability, but requires a broader consideration for a range of limitations in vision, mobility and hearing. While new facilities are designed for accessible compliance, a campus providing equal access allows ultimately for disabled students’ independence. While SSD services are appropriately tailored to the individual, a broader coordinated policy and design guidelines for facilities on campus are not currently in place.

2.7.5 ADAPTIVE TECHNOLOGY

As part of standard campus policy, rooms seating 50 persons or more are outfitted with assisted listening devices. Phonic Ear portable units are available for seminar and smaller rooms, which allow the professor’s voice to be amplified through the use of a lapel microphone, transmitter, and receiver. While disabled students are allowed to audio-record classes, note takers assist students when recording is not permitted.

Within Bartle Library, located on the third floor, the Adaptive Technology Room (ATR) is maintained by the library and Services for Students with Disabilities (SSD), which authorizes key access to the room. ATR computers support a wide variety of assistive software programs. Other locations marked “Priority Access for Persons with Disabilities” provide some of these assistive programs, including selected computers in the PODS area of Bartle Library, Science Library, Academic A Building, and the University Downtown Center library.

Infrared assistive listening systems in the Concert Theater and Chamber Hall allow patrons with hearing impairments to experience performances and ushers are available to assist with disability seating arrangements.



Accessible Transit: OCCT Lift Bus



Residential Life: Mohawk Hall accessible housing, parking



Accessible Parking: L-permit lot near Library



Circulation: Inaccessible level changes at UU / Peace Quad

2.8 Environmental

2.8.1 POLICIES AND PRACTICES

In 2004, on Earth Day, the University adopted an Environmental Policy for the campus that includes the institution's impact on the earth and its interaction with the community. In 2007, the University reinforced its commitment to a long-term goal of reducing the University's impact on the environment, by endorsing the American College and University Presidents Climate Commitment. The Campus Climate Commitment Task Force was formed to help achieve this. The University's *Climate Action Plan* was released in 2009 and compiles current strategies being employed to reduce the greenhouse gas emissions associated with BU's campus activities. Sustainable practices and initiatives are evident across the campus and can be categorized in the following environmental categories.

SITE SUSTAINABILITY

Several areas on campus serve as educational resources for the sciences, including the Geology and Biology departments. The Outdoor Biological Research building is located within the forested area near the campus' water storage tanks. Several of the trails in this area are seasonal, including the Snowshoe and Cross country trails which are not maintained outside of the winter months. Five trailheads are located at the edge of the residential communities on campus, providing direct access for the student population. Outdoor Pursuits programs do not make extensive use of the natural areas, instead organizing group pursuits off-campus that require transportation arrangement. Good opportunities exist to expand the University community's engagement of this broad environment, encompassing more than 180 acres of forest, woodland, meadow, pond and 20-acre wetland.

Within the campus core, an initiative known as "Operation Green Space" has been implemented over several years, replacing more than 85,000 square feet or nearly two acres of former pavement with planted green space. While the University recognizes the value of maximizing open space, such efforts could be coordinated with development of parking organization strategies. For additional site analysis, refer to Section 2.3 Landscape and Section 2.4 Geography.

Stormwater quality and quantity control remains problematic for the campus as capacity has been reached some areas.

However, some small-scale experiments have been implemented for evaluation. A test case for porous paving has been installed near new Bingham dormitory. Grasspave, a porous paving assembly, has been installed over a student pedestrian path that also supports service traffic. A previous installation at College in the Woods residential community has been in place for two years. The Central Quad Project will incorporate structured soil into the design. For further discussion of site drainage, refer to Section 2.10 Infrastructure: Stormwater.

The ITC will include a green roof on the Center for Excellence and stormwater harvesting from the roofs and parking lots for use in the cooling tower, toilets, and for irrigation.

In contemporary practice, there is a focus on holistic and ecologically designed landscapes that function as reproductions and in support of natural systems and also engage cultural, spatial, and aesthetic demands. Utilizing natural system models provides a number of benefits when one asks questions of sustainability. Water and maintenance can often be reduced or eliminated by using native plant materials, natural systems can support wildlife populations and increase biodiversity of flora and fauna, stormwater can be intercepted and detained if not infiltrated on site in localized systems, all the while providing evident and demonstrable lessons in biology, ecology, and human interaction with each. Universities are afforded a special opportunity to build living, learning landscapes that function ecologically and educationally.

WATER EFFICIENCY

Several strategies are being implemented with respect to water efficiency. Water saving, low-flow faucets and toilet fixtures are installed in new buildings and renovation projects. Also, water meters have been installed to monitor water usage throughout campus. Although water harvesting and re-use has not been utilized in campus projects to date, it is under consideration for the ITC complex. Installation of artificial turf in the Bearcats Sports Complex has reduced some irrigation needs.

ENERGY & ATMOSPHERE

From the 2009 *Annual Physical Facilities Retreat Annual Report*, energy conservation projects have achieved reduction in total electricity consumption. The 2008-2009 annual

savings is more than \$1.6 million. Since 2005, roughly 5,800 incandescent lights have been replaced with fluorescent lights. Occupancy sensors have been installed in many buildings on campus. The BU campus utilizes an energy management system (EMS) from Siemens that monitors energy use, providing efficiency and controls for mechanical, lighting and other building systems. The University has adopted an energy-efficient appliance purchasing policy, requiring ENERGY STAR-certified products for qualifying equipment. An ongoing study is examining use of bio-mass in the Central Heating Plant operation. Exit signs in buildings have been replaced with LED technology that consumes a fraction of the energy used in incandescent or fluorescent signs. Building temperatures across campus buildings are closely monitored and Physical Facilities has moved to maintain 70 degree building temperatures during the heating season and 74 degrees during the cooling season.

Several projects are incorporating on-site generation of energy. A geothermal field over the Innovative Technologies Complex will be a test case. Susquehanna Community's Brandywine residence has recently had 4 solar thermal panels installed on its roof in a pilot project that is monitored through the campus EMS.

The ITC Center for Excellence will include photo voltaic panels on half its roof. ITC Engineering Science will include 2,250 square feet of photo voltaic film on south-facing windows.

One of University's sustainable goals is to minimize the burning of coal. Current plans are to increase the mix of wood chips (biomass) with the coal which significantly reduces the emissions of HCL from the plant. This reduction will allow increased heat production from the plant while staying under the NYS DEC emissions cap. The high temperature hot water (HTHW) distribution can then serve more of the campus including the East Campus Housing and the Commissary. The local availability of wood chips will be the limiting factor.

Cogeneration options have previously been evaluated and the best fit for the University has been determined to be to use natural gas, which will be locally available soon from Marcellus Shale development, in an engine driven generation plant. The size of the plant should be limited to 3 megawatt which is the minimum electric load required at the University during winter recess. The heat recovered from the exhaust system will help

maintain the temperature in the campus HTHW system. To make the system is feasible a matching summer heating load must be found. A new absorption cooling plant that would serve the Science Complex is the best solution as it has a year round occupancy 24/7 and the absorption chillers would run continuously during the cooling season. Absorption chillers operate better without cycling on and off. Areas of the campus with a varying cooling load should continue to be served by electric chillers. The recent electric chiller specifications for the university are for “frictionless” chillers with electromagnetic bearings. These chillers can produce chilled water at an energy consumption as low as .3 kw / ton as compared to conventional efficient chillers at .5 to .7 kw / ton.

MATERIALS & RESOURCES

BU has pledged that all new building or major renovation projects will be built to achieve LEED Silver standards or the equivalent. LEED, or Leadership in Energy and Environmental Design, is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts. Mountainview Community's Windham and Cascade halls earned LEED certification. Several buildings under construction are actively pursuing certification. The ongoing benefit to the University is multi-fold, including responsible construction waste management, use of regional and recycled materials as well as energy savings that are measurable with campus EMS monitoring. The following table summarizes projects that have achieved LEED certification and projects registered in pursuit of certification:

The University has a comprehensive recycling program, which is visible in the hallway recycling receptacles and dock recycling collections at all buildings. The Office of Recycling and Resource Management organizes recycling efforts during the annual student Move-Out week. From 2008-2009, 408 tons of material have been recycled. Recycling/resource management has achieved a 308-ton reduction in landfill haul in 2009.

A compost collection program has been very successful. The University composts pre-consumer and post-consumer scraps. In cooperation with Sodexo, the campus food service vendor, food scraps and trimmings are collected and brought to a composting farm in Warren, Pennsylvania and then returned

to the University as compost to be used by the grounds department. Although the campus has composted materials on-site, the off-site compost operation allows for greater capacity. Dining hall waste management was expanded to all dining areas in 2008 and has resulted in the removal of all waste receptacles from dining halls. From the 2009 *Annual Physical Facilities Retreat Annual Report*, from 2008-2009 the University composted 184 tons.

Beyond facility operations, BU is a regular participant in RecycleMania, a competition among US colleges and universities. In 2009, Binghamton became the grand champion in Recyclemania recycling 5.53 lbs/person and composting 2.3 lbs/person. There is also a student-run Compost Organic Garden Demonstration Project, funded in part through a National Wildlife Federation Fellowship and Physical Facilities.

INDOOR ENVIRONMENTAL QUALITY

Air filters on campus have been replaced to improve air quality and reduce electricity consumption. Other efforts to address indoor air quality include upgrades in the print shop. New labs on campus utilize 100 percent outside air units with energy recovery ventilation to provide clean air and reduced energy usage.

Information Technology Services (ITS) has implemented a campus wide computer equipment recycling program. Since starting the program in May 2008, ITS has recycled over 138 skids, or 72 cubic feet, of equipment. A significant change for the University in 2010 has been the outsourcing of campus e-mail to Goggle Apps Education Edition. In further entering the computing “cloud”, ITS has virtualized over 50 Intel servers, removing them from the network, decreasing air conditioning requirements and overall power consumption. This also frees up usable square footage in existing buildings for repurposing. ITS has also worked with Facilities to introduce cooler outside air into machine rooms for cooling and implementing environmental monitoring in the machine room.

Maintenance staff at BU have switched to nontoxic, biodegradable cleaners.

Binghamton University received the “2009 Green Rating Honor Roll” recognition by The Princeton Review in its first-ever “Green Rating” of colleges, the only SUNY institution to be included in this 11 college selection.

LEED Certified Project	Certification Level
East Campus Housing	LEED NC Silver
University Downtown Center	LEED NC 2.2 Silver
Mountainview (Cascade Hall & Windham Hall)	LEED NC 2.1 Certified

LEED Registered Project	System Version
Center of Excellence	LEED NC 2009
Science V	LEED NC 2.2
Engineering & Science Building	LEED NC 2.2
Physical Facilities	LEED EB O&M
Rehabilitation of the East Gymnasium	LEED NC 2.2

FIGURE 2.8.1A Campus LEED Projects

2.8.2 VISTAS AND VIEWS

Situated on a large hill facing the Susquehanna River, Binghamton University is endowed with far reaching vistas to the surrounding towns, hills, and rivers. Opening at a variety of points throughout the campus, these vistas are a surprising resource that visually connects the university to its regional geography. Several notable vistas are identified in the accompanying graphic.



From Bingham to Johnson City



From Susquehanna Community to Johnson City



From Mountainview to Johnson City



From Susquehanna Community to Downtown Binghamton

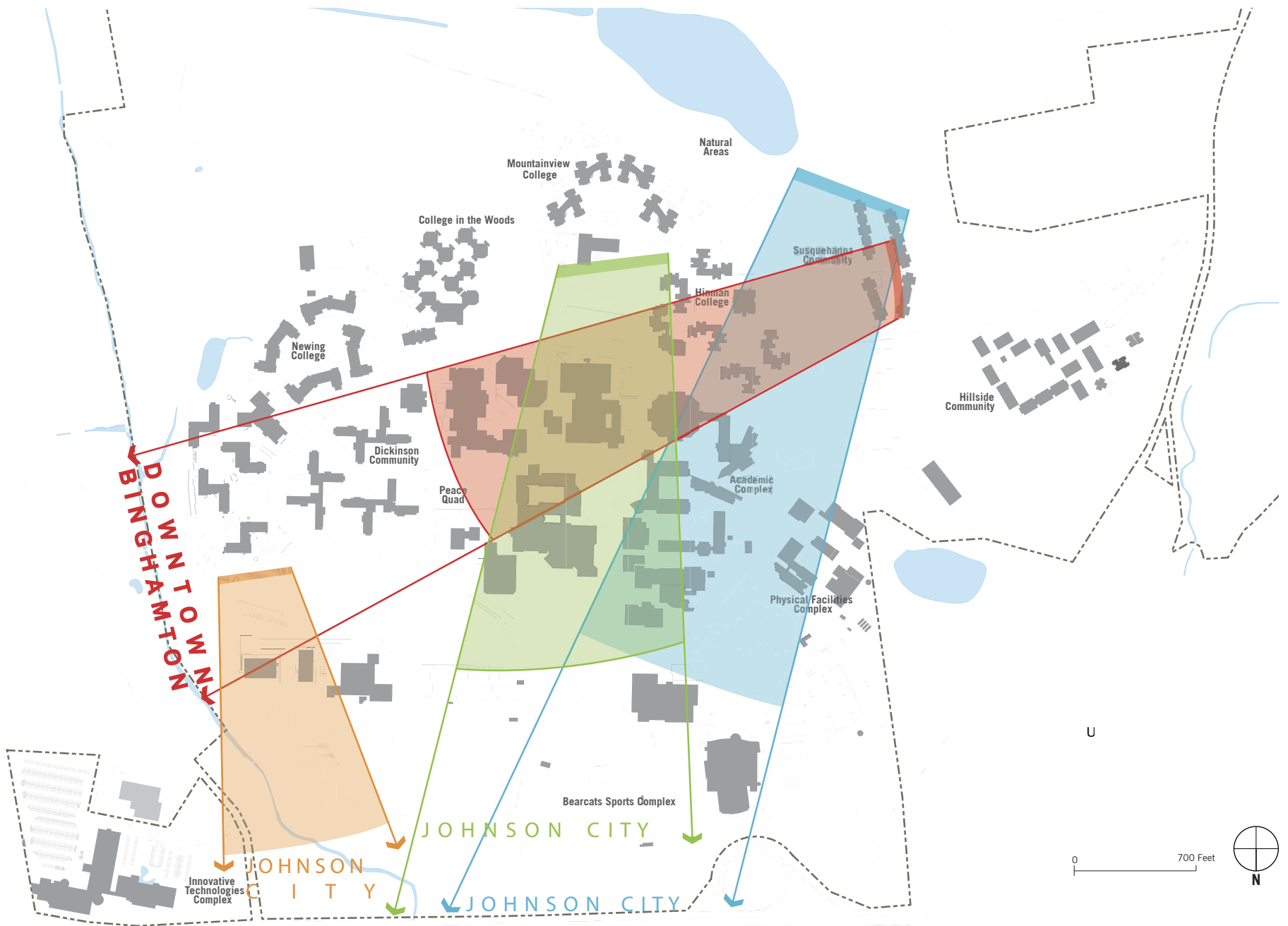


FIGURE 2.8.2A Existing Vistas Map

2.9 Technology

Observations listed in this section are based on discussions with the Binghamton University Information Technology Services (ITS) group and the former Telecommunications group which was merged with ITS around 2005.

2.9.1 TECHNOLOGY ADMINISTRATION

The campus has a documentarian on staff to document the data network. Major backbone fiber optic runs are documented on a Campus Fiber Duct system plan. At the time of the writing of this report, the campus stated that the information on this plan is approximately six to eight months behind current conditions. Refer to Figure 2.9.1A on following page.

There is no accompanying plan for coaxial and copper cable in existence, however, ITS has all the information in a database and can run various tracking reports as needed.

ITS utilizes Pinnacle as their cable management database program. This software coordinates the system and all service calls received. ITS has the ability to view schematics of the actual installed equipment in most spaces to help with troubleshooting. They also have implemented some network monitoring packages.

ITS has produced a set of "Telecom Design Standards" so that all new construction projects are designed within consistent parameters.

The campus also has a dedicated Audio Visual support staff in place to assist and maintain the audio visual classroom systems. The group has extensive documentation of the specific systems and contents of classrooms and lecture halls posted on their website, known as the 'Educational Communications Center'.

The website is designed as a 'self-help' tool to enable end-users to reserve and identify the required audio visual components of various rooms on the campus. The interface is intuitive and arranged in the form of a FAQ, with the ability to search for a specific room. Additionally, there are extensive system wiring diagrams and images of the installed systems within each room description. This comprehensive approach facilitates self-help for scheduling rooms based on the type of technology

required for a specific presentation, and eases the demand on the IT staff for day-to-day operational support. There is also a section within the room equipment lists that shows the date of last renovation for that particular room, which could play an important role in the selection of a room for a specific type of presentation or course.

2.9.2 CAMPUS DATA SYSTEM

INCOMING SERVICE

Telephone and data incoming service demarcations (demarcs) are located in University Union Telecom Switchgear Room (Room B49).

Data service is a one-gigabit Ethernet connection delivered by Time Warner Telecom, via two separate physical pathways:

1. Route 1 originates in Manhole #2 (near Vestal Parkway East) on the north side of campus and runs through the existing signal duct bank system to University Union.
2. Route 2 is delivered from a telephone pole on the west side of campus and runs aurally to Clearview Hall then transitions down to the existing signal duct bank system, through Academic A, and back to University Union.

Both data connections are active and are load balanced by Time Warner Telecom. An alternate feed for Internet commodity service (backup service) terminates in Academic A via Route 2 above.

The University leases a dark fiber connection (currently from Fibertech) to connect between the University Union and the Downtown Center.

A 50 Mbps Internet 2 connection from the University Union to Syracuse University is provided by NYSERNet (New York State Education and Research Network), and utilizes Route 1 above.

Voice service is a DS3 connection comprised of 10 PRIs and three T1s. This service is in the process of being removed

due to reduced voice traffic on campus. There are also point-to-point connections between University Union and ITC, Downtown Center, Cahill Building in downtown Binghamton, and the Bus Garage.

CAMPUS DATA SYSTEM

The campus Data Center is located in the basement of the Computing Center. This data facility handles the University's core business functions including finance, payroll and human resources along with applications such as student systems, admissions, financial aid, billing, and registration for both courses and housing. In addition to business systems, ITS is responsible for all academic support functions, such as communications among students and professors, student grade databases, and classroom applications/learning management systems (i.e. Blackboard).

Despite its basement location, the Data Center has encountered only one flooding incident, which occurred approximately three years ago due to a faulty storm drain in the adjacent "wire alley room." Outside of this event, the room has remained dry for most of its existence.

Backbone network speeds are typically 1 Gbps (Gigabit per second) Ethernet running over fiber optic cable between core routers. Some connections are being upgraded to 10 Gbps during the summer of 2010. 1 Gbps speeds are deployed between core routers and each Campus Distribution Frame (CDF), which are currently being upgraded to 10 Gbps as well. All new intra-building backbones are 10 Gbps, with existing buildings running 1 Gbps. Desktop network connections can run up to 1 Gbps but typically share bandwidth with other users.

Recent system upgrades, along with virtualization, have freed-up a large amount of space within the room. The existing robotic backup system is planned to be relocated to the new Science and Engineering building when it is fully constructed. There is ample space in the room for equipment expansion as necessary, with the limitation being the available cooling and power capacity. Virtualization and consolidation has provided the opportunity to run only (3) AC units in lieu of the (5) that had previously supported the room. Some areas of the room

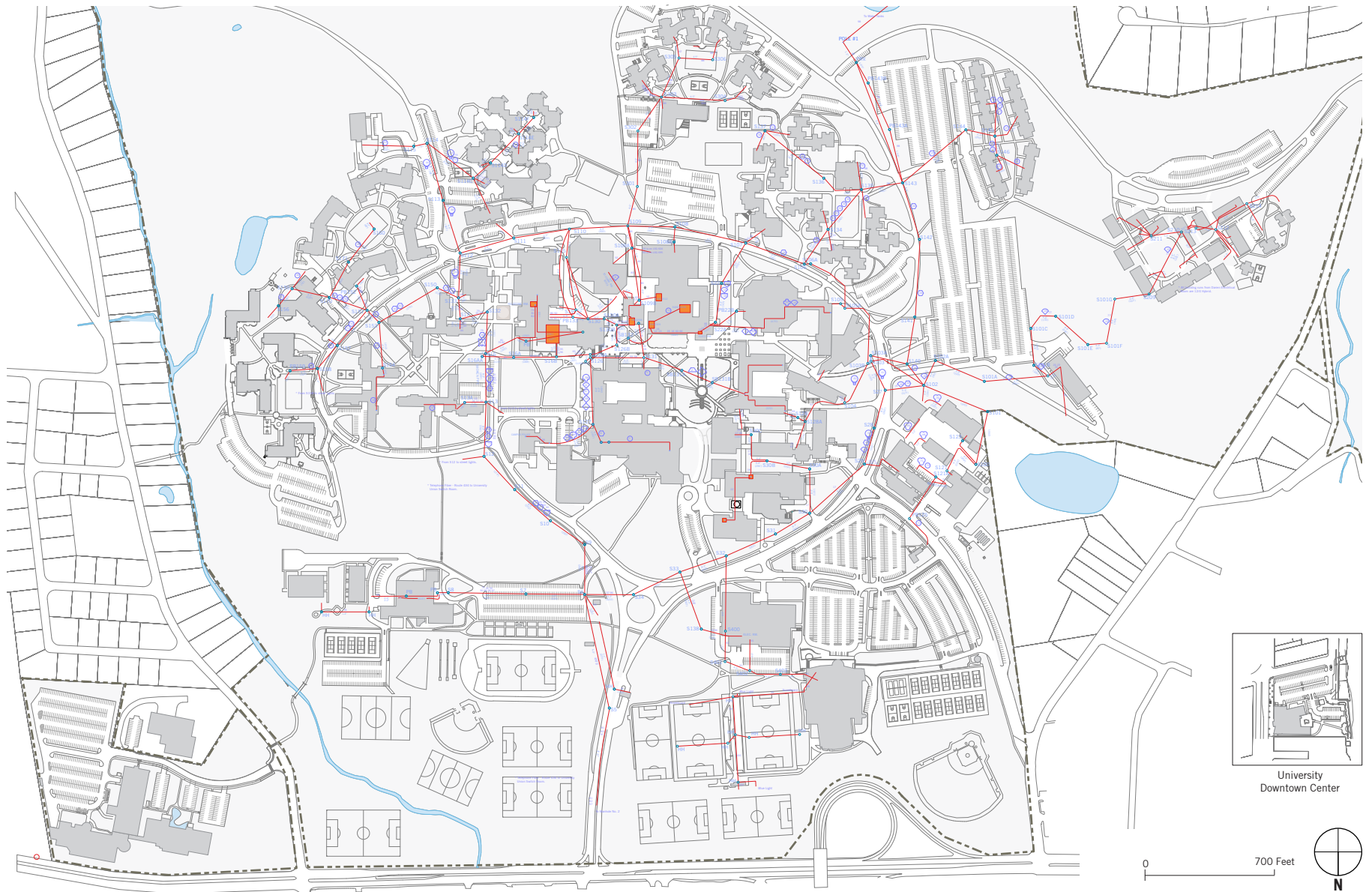


FIGURE 2.9.2A Network Logic Diagram

have “hot-spots” which ITS has been addressing by various means such as re-configuring return air duct work, installing portable fans, and the use of blanking panels in most cabinets to prevent hot air recirculation. They are also investigating the possibility of installing air curtains for a cold-aisle-containment system, and brushed grommets (a.k.a. KoldLok) for all notched raised floor tiles.

The Innovation Technology Complex (ITC) contains its own research Data Center, which is networked to the main Data Center. The long-term intent is to have the ITC act as a satellite Data Center but there may not be enough power and other infrastructure to support it. A disaster recovery room is located within the ITC such that if the main Data Center were damaged or destroyed, a backup provision exists. This room has not yet been built out. When it is constructed, it will need power and cooling as well.

There has been a push to centralize departmental research servers into the Data Center to eliminate each researcher having to support and maintain their servers themselves, along with being able to provide a secure and environmentally controlled environment for this equipment. Most faculty are fairly receptive to installing their equipment in the Data Center as there is no service charge to do this. However, faculty are not allowed access to the Data Center, and any maintenance must be performed remotely. On an as-needed basis there is the possibility for faculty to have dedicated space in the Data Center but there has not been a study to determine what the space capacity is to fully support such a policy. At present, there are only ten (10) research servers in the Data Center. Unix servers are mirrored to both Academic A and University Union for disaster recovery purposes. Windows servers are virtualized and mirrored to BOCES in Binghamton via direct fiber optic connections.

CAMPUS PATHWAYS AND SPACES

The University maintains three separate cable infrastructure backbone networks: (1) coaxial cable for cable television service, (2) copper cable for the telephone network, and (3) fiber optic cable for the data network. All three cabling systems are run in the signal duct bank system.

Regarding the data network, the campus has a fairly adequate amount of multimode and singlemode fiber optic backbone cabling arranged in a star wiring topology. All network

backbone cabling originates in the Computer Center which acts as a Campus Distribution Frame (CDF). More recently, ITS has constructed two alternative CDFs; one in Academic A and the other in the University Union switchgear room. ITS has put network switches in each of these locations and have been cross-connecting them with fiber to create the beginnings of a campus loop. At this time there are still some missing components to this path. Redundancy is limited to the existing signal duct bank pathways. Due to the cost of installing fiber in the ground, ITS has implemented a plan to use wireless technology to bridge some of those gaps. The primary gap in the loop is from Academic A to the East Gym on the east side of campus. There's not a good alternative pathway through the signal ductbanks. On the outlying areas of campus, the dorm complexes connect via a star topology into a central building that in turn connects back to the network. In case of a fiber optic cable break, a portable WiFi bridge can be deployed to restore service until the cable can be repaired.

The campus Physical Facilities group maintains and updates the Campus Fiber Duct system plan. There is no accompanying plan for coaxial and copper cable in existence, however, ITS has all the information in a database and can run various tracking reports as needed. ITS has stated there is capacity in the ductbanks to pull additional copper cable, but the exact amount is unknown because the surveys to determine capacity were never completed. The copper cable information has been deemed less critical by ITS with the current transition to VoIP technology.

CAMPUS CABLING SYSTEM

ITS has produced a set of “Telecom Design Standards” so that all new construction projects are designed within consistent parameters. There are also labeling standards for consistent documentation.

Campus backbone cabling for voice service is traditional multi-pair copper cable. Data cabling is a mixture of multimode, singlemode, and hybrid fiber optic cables, depending on origin/destination points and use.

For all new building and renovation projects, ITS furnishes and installs all cable, jacks, faceplates, patch panels, distribution hardware, security cameras, blue light phones, data switches, and door access control hardware. The capital project provides all raceways, cable trays, conduit and backboxes, along with the funding for all ITS furnished equipment.



Nortel TDM Telephone Switch and Data Center Server Cabinets (Partial View)



Corrugated Ceiling of Switchgear Room and Emergency Generator (serving Telecom Switchgear Rm)

Desktop cabling for new installations is Category 6 rated, with existing installations being a minimum of Category 5e.

The campus is moving away from providing an abundance of wired desktop connections within residence halls. The current standard is to provide (1) Category 6 cable to each shared room, where previous projects installed (1) cable to each bed, or (2) per shared room. Most students favor the use of the wireless network which is ubiquitous in each building. The exception is students involved with gaming applications, where a wired connection provides a more stable connection. Also, students are relying on their cellular telephones in lieu of traditional land line telephone service, which eliminates the need for this extra jack in each room. ITS does not want to totally eliminate all cabling in dorms in case future applications such as IP Video/distance learning require this type of connection.

WIRELESS SYSTEM

ITS rents space to cellular service providers for three (3) cell-site antennas which are located on Bartle Tower. Campus IT and telecom officials report that the campus has two installations of distributed antenna systems (DASs):

- + University Union basement
- + Library basement

This equipment was bought by the campus and is maintained by the campus: it is a single system that only provides cellular regeneration for the AT&T network. There are no plans to expand the DAS system. There is no established policy on DASs and there is currently no policy that all buildings on campus are to be digitally transparent. It is likely, however, that ITS would try to procure and maintain DAS equipment if it were to be implemented in every building.

The adequacy of cellular telephone coverage on campus has yet to be determined through student interviews, however, ITS states that cellular coverage on campus is fairly complete for the large carriers such as AT&T, T-Mobile, Sprint, and Verizon.

Wireless LAN coverage is deemed fairly complete by the University. Even the soccer fields are adequately covered. Most network traffic has transitioned from the wired network infrastructure to the wireless network. ITS stated that the wired network appears largely unused except for carrying the wireless network.

The campus does not mandate students purchase laptops as part of their educational experience, although a lot of students have purchased them regardless. PODs (public computing areas) are provided by ITS for all students, and they have remained a popular choice for student computing even with the evolution of wireless computing technology.

During the time of wireless network installations throughout campus, considerable electric upgrades were also carried out to support WLAN access points and desktop power. For example, when the Library was renovated additional power receptacles were installed to support laptop power receptacles. However, until recently, no capital projects had added laptop power receptacles to spaces in which students are casually accessing the campus network wirelessly via laptops. More recently, SUCF Project 07A27 Campus Center Quad Improvements will provide outlets in the seating walls of the quad. Discussions regarding an outdoor mesh WLAN network have taken place but it has not been implemented yet.

A wireless link has been installed between the Events Center and the ITC which serves as a backup connection for the School of Engineering's research purposes.

TECHNOLOGY SYSTEM CAPACITY

The existing technology infrastructure has sufficient physical capacity to support all existing and near-term requirements for the campus. As additional buildings are constructed, new underground pathways must be installed and new fiber optic backbone cable must be pulled in order to connect each to the existing signal duct banks and network.

The process of upgrading all existing backbone connections to 10 Gbps should continue, in order to accommodate all current and future deployments of high-speed network applications.

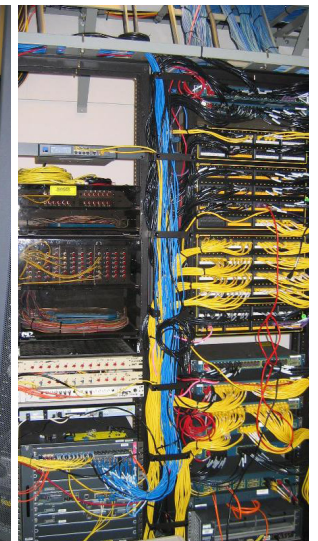
The only observed deficiency is the physical redundancy of fiber optic backbone connections which can be improved in certain areas of the campus. Redundancy is not critical to the functionality or speed of the network, but can have a major impact on functionality if an existing backbone link is damaged. Potential network failures are always a possibility without full network redundancy in place.



Time Warner Telecom Incoming Service Cabinet and incoming Copper Service Demarc. (Telecom Switchgear Rm)



Mirrored Servers within Academic A



Campus Distribution Frame within Academic A

2.9.3 CAMPUS VOICE SYSTEM

The campus has a TDM-based Nortel telephone switch (PBX) located in the University Union Telecom Switchgear Room (Room B49) right below the kitchen. This equipment has been upgraded over time, and currently supports approximately 8,000 phone lines. There is a stack of IP equipment that handles the Hillside complex and there are several small-sized TDM peripheral remotes (one in Chenango and two in the ITC / Biotechnology Building).

The Switchgear Room is also home to the campus CATV headend and DVRs for the University Union's CCTV system. Since this room is located directly below the kitchen, a corrugated fiberglass ceiling was installed to prevent water leaks into the room.

A couple of years ago the campus started deploying Voice-over-IP (VoIP) technology for new construction projects. This rollout was of some concern but it looks like it has been successful. Within all new buildings VoIP technology for telephone service is the standard. The new Engineering Science and Science V buildings will have VoIP telephone service.

Upgrading older buildings presents significant challenges to deployment. The biggest obstacle in transitioning to VoIP in older buildings is identifying a real reason to spend the money when the campus has a solid voice network that experiences few problems. It could be a multi-million dollar effort to furnish and install Power-over-Ethernet (POE) data switches, and provide cooling and emergency power feeds to all existing Telecom Rooms. When an existing building is renovated, power and cooling requirements to support VoIP are planned for each Telecom Room, even if the technology is not deployed Day-1.

The plan is that future residential (dormitory) construction will not include traditional digital phones. If there is a need for phone service, it will be delivered through VoIP. The campus has recently installed software to make their VoIP system SIP compliant, but they are not seeing a great amount of student interest in the use of Wi-Fi phones. Students mostly rely on their cellular telephones for service.

TECHNOLOGY TO SUPPORT SECURITY SYSTEMS

Campus security is also largely independent of the main network backbone, using separate strands of fiber optic cable.

There are some locations in which campus security travels over the data network as well, however. Conversion to IP CCTV cameras is currently underway in newer installations.

ITS manages the blue light emergency telephone system; they will install and terminate copper cabling for each phone (through conduits provided by each design project). Each phone is supported by the existing TDM telephone switch.

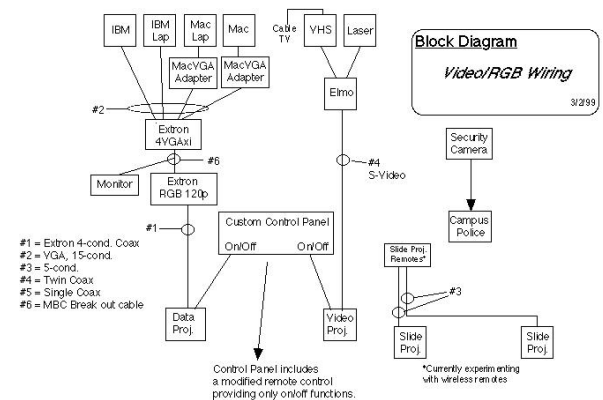
The RAVE emergency alert system is carried over the campus network. ITS installed the system in conjunction with University Police. The alert system is activated primarily through cellular phone service. The siren function is carried over the data network.

2.9.4 AUDIO VISUAL SYSTEMS

Observations listed in this section are based on information gathered from the SUNY Binghamton Information Technology Services (ITS) and the Audio Visual services support sub-group, as well as from their support web site.

The classroom audio visual systems are compartmentalized within each room; the systems that are utilized within the room are generally located within a "Multimedia Podium" that is used to house the associated equipment, and as a surface for the instructor to place materials or equipment on during a lecture.

The school has taken a "tiered" approach to the audio visual systems installed in the classrooms. The tiered approach consists of various levels of installed systems within the classrooms, depending on the room location, room type, and ability to upgrade room technology. This allows for more complex rooms available for larger and more content-rich presentations or lectures when necessary. This approach also tends to slowly transition the staff and students to leverage the installed systems as part of their learning and interacting environment. The basic tiers are as follows. The campus standard is the Laptop Ready Classroom. Classrooms below that standard have factors that prevent them from upgrade, such as asbestos in the walls.



Typical block system diagram (from website)



Basic Technology Classroom (LN 2402) vs. Laptop Ready Classroom (S2 140)

Basic Technology Classroom

- + Projection screen
- + Overhead projector
- + VHS Playback (with video monitor or projector, determined by room size)
- + Black Chalkboard

Laptop Ready Classroom

- + Basic Technology equipment plus:
- + Network connection at teaching station
- + Computer display for PC & Mac laptop computers
- + Campus cable television
- + Telephone (restricted to on-campus calls only)
- + Lighting controls
- + Sound system (determined by classroom size)
- + Window treatment
- + Shelf and wiring (power and remote control) for Slide Projector
- + Projected image and chalkboard can be used simultaneously
- + Document Camera/Visual Presenter (e.g. Elmo)

Multimedia Classroom

- + Laptop Ready equipment plus:
- + PC & Mac installed
- + DVD player
- + Slide Projector
- + Cassette deck (audio)

User instructions. Instructions for use of the audio visual systems are clearly defined within a set of 'how-to' videos on the campus web site. The instructions are easy to follow for untrained users; the systems are designed to be consistent so that a user can use any room without needing specific instructions or training. There is some disparity in the age of equipment within some of the campus areas, as a technical

refresh appears to be due to bring the systems up-to-date. Generally, the age of the systems does not seem to affect the operational requirements of the older rooms- but the reliability is adversely affected. Replacement of failed equipment can also present an operational issue, since there is no assurance of backward compatibility with new replacement equipment.

Overhead projectors. The overhead projectors currently installed throughout the campus are either SVGA (800x600) or XGA (1024x768) resolution. The units appear to meet the current display requirements and user needs adequately. The ongoing maintenance costs and the supply of spares for the existing projectors will make it desirable to perform an equipment upgrade within a year.

DVD and VHS players. The playback source units, such as the currently-installed DVD and VHS players are somewhat dated and will soon need to be upgraded. The requirement for obsolete technology like VHS format content continues to persist due to the lack of copyrighted instructional content on DVD. As the transition is made to digital media, the need for VHS will diminish.

Portable overhead projectors. Portable overhead projectors remain a viable method for displaying handwritten notes, marked-up documents, and images that are not digitized. They can be essential for annotation in real-time for printed documents, and continue to be a mainstay for many instructors. The equipment itself will eventually be phased out of the environment by digital capture devices, but the transition will likely not occur for a few years. The equipment available on-campus appears to be a bit dated but serviceable.

Audio cassette players. The audio cassette players are quite obsolete, and should be transitioned into the digital domain as soon as possible. The degradation of quality from playback and the probability that there will eventually be a complete loss of recorded data via tape failure are important considerations. Digital media storage is inexpensive, just as easy to use, and much simpler to transport. If portable audio recording devices are required they should be digital and hard-memory based.

Distance learning systems. There are a few instances on campus where distance learning systems are implemented. The transition to distance learning on the whole depends on numerous factors. The campus network must be designed with the increased demands that a large distance learning infrastructure would require. There would need to be more

extensive training and support for the faculty and staff to use the systems effectively. There would also need to be a significant investment in network video storage and retrieval of recorded events and seminars. Similar investments must also be made at the "far end", to fully utilize the systems. There are already systems in place and efforts underway to further the above goals on the campus. No timetable has been given regarding milestones or requirements.

CABLE TELEVISION (CATV) SYSTEM

Roadrunner CATV service is only used in a couple of locations. The campus is the major CATV service provider, supplying service to the dorms.

2.9.5 BACKUP POWER FOR TECHNOLOGY

The Data Center is supported by a UPS and emergency generator power feed. The UPS has capacity for about 45 minutes of power after which the emergency generator can carry the load indefinitely. The Data Center HVAC system is fed by the same emergency power generator.

An older generation halon system provides fire suppression for this room only (not the adjacent computer science room). ITS investigated replacement of the halon system with a safer and more environment-friendly FM100 system, however it was



Multimedia Classroom (EB N25)

deemed cost-prohibitive to accomplish. Instead the halon control panel and alarm system were upgraded in the past year for better system reliability.

The telecom switchgear room has its own emergency generator. In addition, the PBX is supported by a DC battery backup system.

Telecom Rooms typically have small UPSs that are good for 10-15 minutes during switch-over to generator emergency power. Beyond that there is no redundancy in the power generation.

Stand-alone provision for emergency power is installed for all new buildings (there is no central campus emergency generators or network). There is also no campus standard for the length of time the systems have to be up and running in an emergency situation.

In the Engineering Building (where there is no provision for the data/telecom HVAC to have emergency power) the system is designed to go into a controlled shutdown in the event of power loss.

It is undetermined if the cell-phone antennas on campus are provided with emergency power (either generator or battery backup).

There are no campus standards for the provisioning of UPSs (centralized building unit versus local units within each Telecom Room).

2.9.6 VISION AND CAPACITY

Binghamton University ITS has established a Long-range Plan, outlining future technology-related initiatives. Ongoing initiatives and progress to-date includes:

Maintaining a stable, dependable environment for those using IT services and those resources already in place, and creating an effective training and help environment to allow them to be used efficiently. Initiatives include:

- + Recently converted the campus "Mirapoint" e-mail system to Google's Gmail; planning to convert "Exchange" users.
- + Established new response and callback metrics for helpdesk calls to ensure good response on user

questions and problems.

- + Upgrading multiple software packages to ensure modern, stable software is available to users.
- + Upgrading Pod and classroom equipment to ensure modern, working equipment is available for students.
- + Conduct a user satisfaction survey each semester to ensure that ITS is meeting the needs of faculty, students and staff.

Applying IT that improves and extends the utility of classrooms and the University's concept of effective learning environments, supporting established modes of teaching, and promoting reasonable innovations in teaching and learning. Initiatives include:

- + Provide the Google Applications for Education to all University faculty, students and staff.
- + Upgrade approximately 15 general purpose classrooms each year to ensure the latest technology for faculty and students in the classrooms.
- + Install the ECHO360 system in 12 classrooms to support distance education.
- + Continue to refine the offerings associated with Blackboard.
- + Set up a formal service and conference rooms which can be used for video conferencing on short notice.
- + Seek a site license on a top-tier web-conference tool.

Supporting research IT infrastructure improvements for faculty and students that are capable of supporting multiple research initiatives across disciplines. Initiatives include:

- + Provide common software and research databases for use by faculty.
- + Set up a "condominium" service whereby researchers can reserve and buy disk managed by ITS for research use.
- + Provide access to high-performance computing both through local campus equipment and via the National TeraGrid.
- + Upgrade Internet 2 capacity from 50 to 200 Mb/s.

Maintaining a scalable, modern, high-speed, and secure campus and externally-connected communications infrastructure sufficient to handle the University's growth, and enhancing seamless collaboration among people and machines for academic, research, University business, outreach, and social purposes. Initiatives include:

- + Upgrade the core and first-level switches to increase inter-building network speeds from 1 to 10 Gb/s.
- + Upgrade campus wireless AP's to 802.3/N to allow faster wireless speeds and more bandwidth.
- + Increase commodity Internet bandwidth to keep pace with demand.

Strengthening the University's business support systems with focus on ways to improve services, reduce costs, and adapt effectively to changing needs. Initiatives include:

- + Help implement an effective imaging system in Graduate Admissions and other offices which process large quantities of paper.
- + Push to adapt existing software so it is compatible with new, mobile computing devices.
- + Assist rollout of the new campus portal.
- + Upgrade the Oracle business systems, the Banner Student System, Hyperion, Blackboard and a host of other software to keep pace with new developments.

Employing approaches and good practices within ITS that foster enhanced productivity in projects, more clarity in setting priorities, and more accountability in measuring and achieving positive outcomes to goals. Initiatives include:

- + Implement effective project management by completing the installation and use of @Task, and by aligning PM methods with the software.
- + Rollout the "Green IT" project to help the campus understand potential energy savings associated with information technology.

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2.10 Physical Conditions

Binghamton University's existing campus consists of a rich network of built infrastructure and building resources that support the institution's community.

This section presents physical condition data for infrastructure, 2.10.1 and buildings, 2.10.2. Detailed conditions assessment by building are presented in Appendix A: Buildings Manual.

2.10.1 INFRASTRUCTURE

Existing systems have been evaluated using existing site infrastructure studies, historical surveys, and recent project documentation received from the University. Available information has been supplemented by site observation visits and interviews with campus personnel.

The following sections examine the following major campus infrastructure components:

- + Central Heating Plant
- + High Temperature Hot Water
- + Air Conditioning
- + Domestic Water
- + Sanitary Sewer
- + Storm Drain
- + Gas
- + Electrical
- + Emergency Power



Main Campus and University Downtown Center

Central Heating Plant

The Central Heating Plant at Binghamton University's Campus is a high temperature hot water (HTHW) facility built in 1965. In general, the facility is in good repair, functional, and reliable. The plant received extensive renovations in the late 1980's and early 1990's.

CRITICAL MAINTENANCE ITEMS

The University has identified several critical maintenance issues associated with the Central Heating Plant which are being addressed to maintain plant reliability, efficiency, and safety. Work is currently planned on the coal and ash material handling systems, HTHW generators, select mechanical auxiliary equipment, plant control system, and several of the facility's building systems.

BIOMASS USE

The Central Heating Plant combustion equipment consists of three 100,000 MBH boilers and one 50,000 MBH boiler. The equipment was originally configured to burn coal as the primary fuel and gas as a back-up fuel. In 2007, the facility initiated a program to burn biomass in the form of wood chips in the HTHW generators. The program was successful, and in 2008, wood combustion constituted approximately 13 percent of the HTHW generators' total BTU consumption.

The University is now considering options for increasing the plant's biomass consumption, including upgrading the existing equipment and replacing the existing equipment.

A challenge to increased use of biomass is obtaining sufficient fuel to support the effort. The Regional Greenhouse Gas Initiative (RGGI) is a ten-state agreement to reduce greenhouse gas emissions from power plants, using a cap and trade system. As a result, many power plants have been burning biomass to offset costs. Further competition has come from supplying the wood pellet market.

COGENERATION OPTIONS

At this time no cogeneration system is in place at Binghamton's campus. All of the Central Heating Plant's electric power is purchased from New York State Electric and Gas (NYSEG).

In 2005, a report was prepared evaluating the feasibility of cogeneration, using gas engine technology to simultaneously generate heat and electricity for the campus. The report also evaluates the feasibility of cogeneration using solid fuel technology.

Obstacles identified to implementing cogeneration for the University have included the fuel price risk associated with a natural gas technology-based cogeneration plant, and the high capital cost and staffing requirements associated with a solid fuel type cogeneration plant.

Recent increased interest in gas drilling within Broome County, which is situated above the Marcellus Shale formation extending northeast from the Appalachian mountain range, has led the County in 2010 to establish a Natural Gas Development Team as development of natural gas resources are investigated. Movement toward natural gas drilling has the potential to change fuel pricing and availability outlook of a natural gas based cogeneration system. In connection with the Central Heating Plant Upgrade project (#07A26), the campus is currently studying the feasibility of the cost and payback of a gas-engine based cogeneration plant. The study focused on a plant sized to match the minimum campus power demand of 3.5 - 4.0 megawatts. The report preliminary indication is the solution is not a clearly feasible project.

TITLE V AIR PERMIT RENEWAL

The Central Heating Plant is a Title V Facility that is permitted by the New York State Department of Environmental Conservation (DEC). The current Title V permit will expire in December of 2011.

Rehabilitation of existing HTHW generators, increased biomass and combined heat and power could potentially have an impact on the permit renewal. Additionally, many of the residential facilities and ITC are not currently connected to the HTHW system because of concern that the added load might affect the Title V emissions permit renewal.

By burning an increased percentage of wood chips with the coal, the HCL portion of the emission will be reduced (HCL is the emission closest to the DEC cap) which will then allow greater heating production from the central plant serving more buildings.



Central Heating Plant

High Temperature Hot Water

SYSTEM OVERVIEW

The original HTHW distribution system was installed when the Central Heating Plant was commissioned in 1965. The system supplied HTHW to all of the campus buildings for heating, domestic hot water, absorption air conditioning and kitchen use. Since its installation, most of the absorption chillers have been replaced and the remaining ones are due for replacement.

All buildings on campus are served by the HTHW system with the exception of: Clearview, the Commissary, Health Services, University Union, the Warehouse, and the original Newing residence halls and all other residential communities. Many stairwells in Science III and IV are not heated.

Parts of the HTHW system were abandoned in place in the late 1990's when the campus installed gas-fired boilers in many of the buildings furthest from the Central Heating Plant. The decentralized boilers include both steam and hydronic units, and are located in Dickinson, Susquehanna Community, Newing College, C.I.W., Mountainview College, Hinman College, and the University Union.

Bartle Library had gas-fired boilers installed as well, but was later connected back to the HTHW loop. The gas-fired boilers now serve as a back-up in the event of failure or maintenance to the HTHW loop. Fine Arts, the Library, Science III, and Science IV also have steam generators. The generator at the East Gym will be eliminated.

Manholes are located throughout the campus for the piping take-offs to the various buildings. The manholes contain isolation valves to allow sections of the system to be removed from service. The distribution runs from building to building and through buildings. It is not a main line supply and return with branches into each building.

University Downtown Center is an independent site using gas-fired boilers to produce HTHW.

MAINTENANCE AND PLANNED PROJECTS

The HTHW distribution system is in excellent condition following site utility upgrade projects between 2007-2008. However, overall system capacity to expand is an issue due

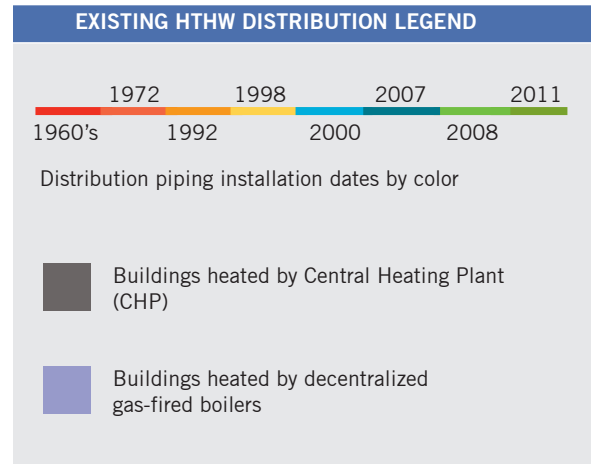
to current permit limits on particulate output from the Central Heating Plant.

The HTHW loop currently ends at manhole MH09A at the campus' east side. With projects at Bingham Hall and the Collegiate Center, the HTHW line has recently been extended to the Dining Hall Heating Plant, where heating hot water and domestic hot water will be generated as needed. When construction associated with this project is complete, the three remaining buildings in Newing College will have been demolished along with their gas-fired boilers. The replacement building that will take their place will be fed from the new Dining Hall Heating Plant.

HTHW PIPING

The HTHW piping is run through several buildings on campus, typically located in the crawl space area of the buildings and is inaccessible to both the students and faculty. The pipe is schedule 40, carbon steel.

There is one section of HTHW piping between Science II and Science III buildings that is partially exposed outdoors. The exposed section of HTHW line will be rerouted under SUCF Project 07A48 Upgrade HTHW, Interconnection Zones One and Two.



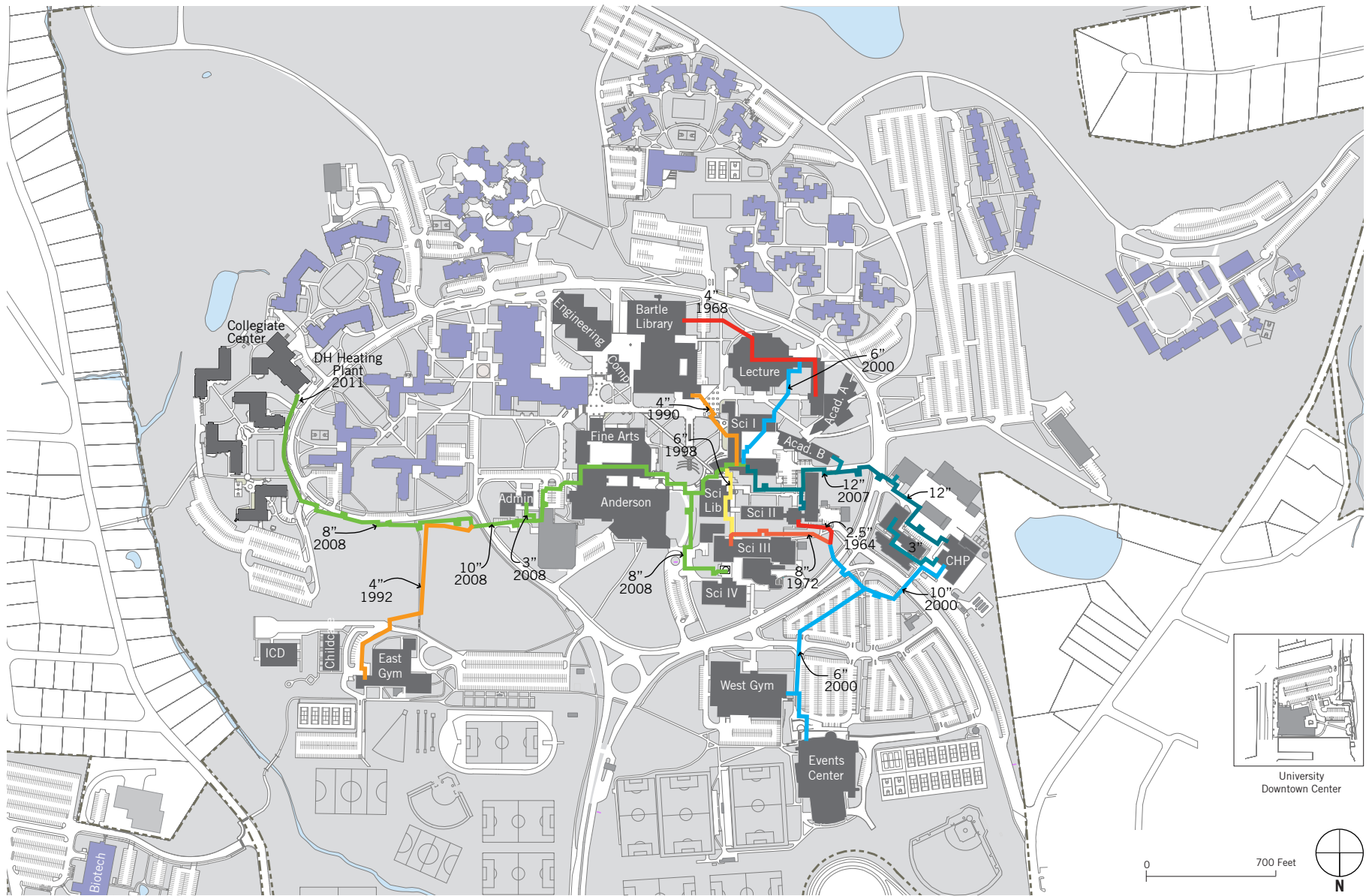


FIGURE 2.10.1A Existing HTHW Distribution

Chilled Water and Air Conditioning

SYSTEM OVERVIEW

Buildings at Binghamton University are cooled with decentralized chilled water systems. Most buildings and residential communities are equipped with dedicated chillers, although some are shared with adjacent buildings. The Science III and IV share chillers, as do Bartle Library, Engineering, and the Computer Center. The only instance of a distant pairing is the Events Center, which shares the Science III / IV chiller. This relationship has worked because the Events Center's heavy occupancy times are off-peak relative to the science classes.

Large portions of some buildings are currently not served by central chilled water. Some use window air conditioners, including the Library Tower, Science II Tower, and Science I. Window units are difficult to service, visually unattractive, and inefficient. Additionally, many spaces on campus served by air conditioning experience inconsistent cooling.

Some areas are served by dedicated air cooled chillers in addition to the building's central system. Areas with dedicated air cooled chillers include the Computer Center and the rare books area of the Library Tower, which is cooled by a dedicated chiller on the roof. There is also a small water cooled chiller in the Library penthouse with glycol distribution to the Computer Center for winter cooling. Additionally, there are numerous small split Dx systems for cooling data rooms.

University Downtown Center is an independent site using roof top chillers and chilled water pumps with localized Dx cooling for special spaces, such as computer servers.

MAINTENANCE AND PLANNED PROJECTS

The campus was initially served by absorption chillers. In the 2005 utility study by Schuyler Engineering (SUCF #07832), six absorbers were listed. Since that study, two of the absorption chillers were replaced by three rotary (screw) chillers and two were replaced by three centrifugal chillers. An additional new chiller is included in the 2010-2011 renovation plan for the East Gym, and a similar chiller is being selected for the Fine Arts Building. Both of these chillers will use the frictionless electromagnetic bearing technology that uses between 0.3 to 0.4 kw / ton of electricity to operate compared to 0.7 to 0.9 kw / ton required for the conventional centrifugal chillers.

The Innovative Technologies Complex will be an independent system, with the chillers in the Biotechnology building and the Engineering & Science building ganged to also serve the Center of Excellence building. The new Collegiate Center, part of the East Campus Housing project, will contain two 550-ton centrifugal chillers and an additional 550-ton absorption or centrifugal chiller.

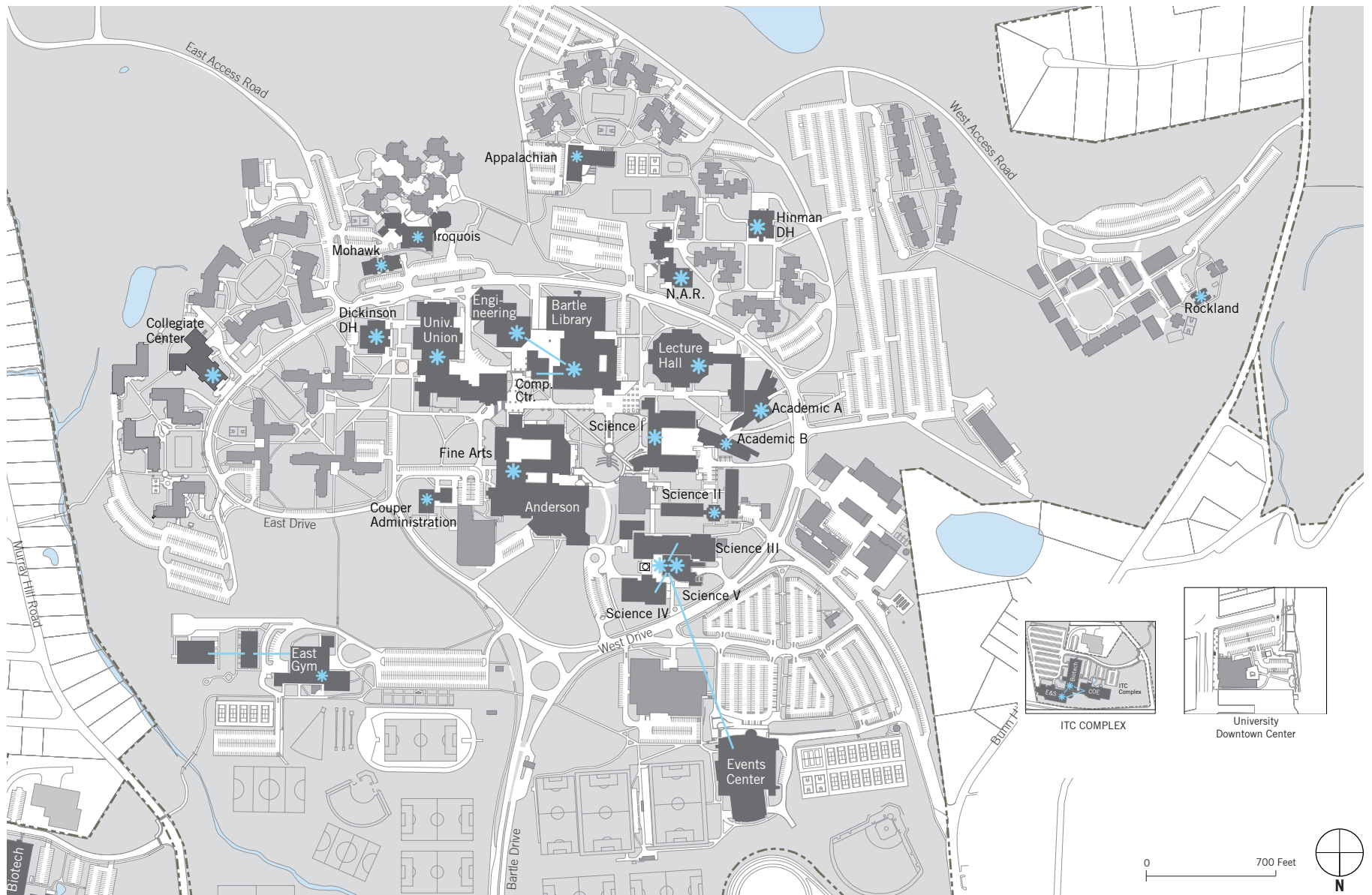


FIGURE 2.10.1C Existing Main Chiller Locations

Domestic Water

SYSTEM OVERVIEW

Binghamton University receives its domestic water from the Town of Vestal through two intake locations: at the Bunn Hill Road metering pit and at the Murray Hill Road metering pit, located along Vestal Parkway near Murray Hill Road. The majority of the water supply is fed from the Bunn Hill Road pit due to higher supply pressure.

A 12" main carries this water to a new pump house at the intersection of Bartle, East, and West Drives. From here, the water is pumped to three one million gallon tanks on the hill south of the main campus. This feed pipe to the tanks also serves as the main feed to the campus. The feed pipe's double function is one of the weaknesses of the system.

The existing water distribution system was evaluated under SUCF #07832 in the 2005 Campus Site Utility Study by Schuyler Engineering. This report noted that the campus is separated into five pressure zones. One of these is the high pressure main, or riser main, that delivers water from the pump house to the three water storage tanks. The pressure in the riser main ranges from approximately 230 psi at the pump house to 15 psi at the base of the water storage tanks.

The other four pressure zones are defined by four PRV stations connected to the main. The PRVs reduce the available pressure from 230 pounds to 110 PSIG for distribution to the four branch mains. All four PRV stations are located in manholes. Replacement PRV stations are being designed into three new underground vaults to allow access for servicing. PRV Zone 1 will be located near the pump house, PRV Zone 2 south of Bartle Library, and PRV Zones 3 and 4 in Parking Lot M1.

University Downtown Center is an independent site supplied with domestic water from City of Binghamton.

MAINTENANCE AND PLANNED PROJECTS

Much of Binghamton University's water infrastructure is the original 1960's installation and nearing the end of useful life. Portions of the campus have experienced watermain breaks, while maintenance and upkeep of watermain is ongoing.

SUCF Project #07A37 Domestic Water Rehabilitation is in

design and includes the replacement of approximately 3,000 linear feet of 12 inch watermain, in addition to various valves, backflow preventers, water tank improvements, and the installation of water meters along with other building features. The portion of the main thru the quad will be constructed as part of the quad project which will begin construction in Summer 2011 with completion in winter 2012. The project also includes the addition of 20 isolation valves to allow for partial shutdowns for main repair and replacement. The project is planned to start construction in mid-summer of 2010, with completion in the winter of 2012. Future projects will be required to replace the remaining original piping and to add piping to create redundant loops within the distribution.

New RPZ backflow devices will be installed in ten locations on domestic water services and in five locations on fire services. Fire services will be required to be added to several buildings on campus when sprinkler services are added.

The existing water tanks have ample capacity and are noted to be in good condition. Minor repair work to the tank lining and level controls has been identified in Project #07A37 Domestic Water Rehabilitation.

WATER SOFTENERS

The existing water softeners located in the East Gym have been replaced with a new system located next to the pump house. The central softening system partially reduces the water hardness. Individual buildings have additional softeners to further reduce water hardness where hot water or steam is being produced.

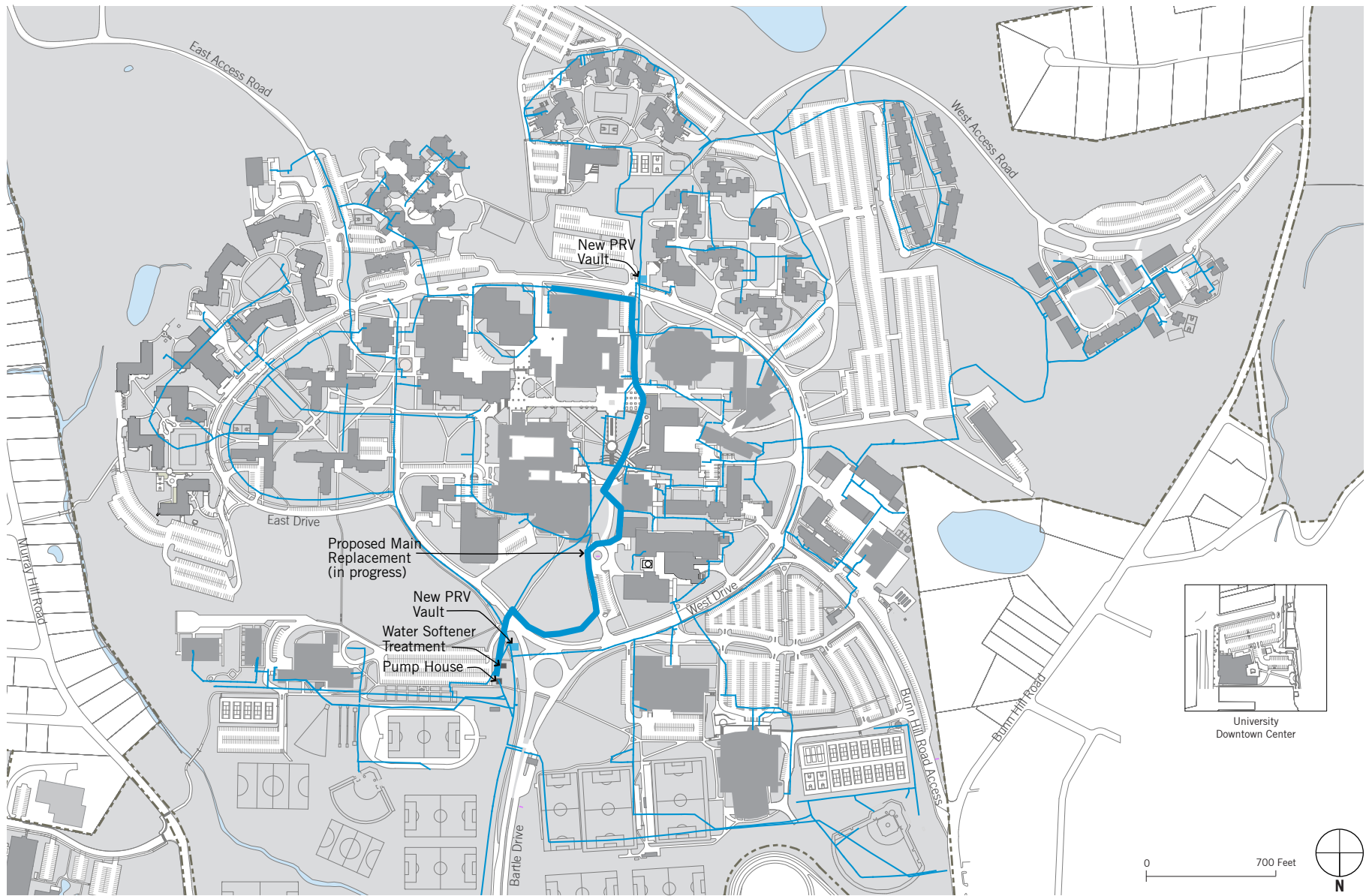


FIGURE 2.10.1E Existing Domestic Water Distribution

Sanitary Sewer

The documentation of the existing sanitary sewer system is incomplete. The original 1965 drawings (not available in AutoCAD) were reported by Physical Facilities to be the most recent accurate drawings of the system. No underground piping is included. A complete mapping and condition analysis is recommended.

The campus has a 12" and a 15" sewer line exiting the campus on the North, that are connected to the Binghamton/Johnson City Joint Sewage Treatment Plant, located nearby on the bank of the Susquehanna River across Vestal Parkway and Vestal Road. The campus does meter the sewage outflow. They have noted an increase in sewer outflow when it is raining. Any system survey should try to identify if there is roof water connected to the sanitary sewer or major breaks at manholes allowing infiltration of ground water.

The Facilities staff has noted issues with excessive food grease and oils from dining halls in parts of the system. Any system survey should include an evaluation of the kitchens on campus and the cooking procedures to determine if food wastes are not run through grease traps, or if grease waste is improperly being discarded.

Clay pipes that have been used in the sewer system have asbestos-containing material. Many of these pipes have been abandoned and replaced, but the pipes have not been removed from the ground.

In the absence of adequate documentation of the underground components of the sanitary and storm sewer systems, the planning team would recommend the following investigations:

1. Robot-controlled video survey of lines from the points of connection to the municipal systems back to the branch points at residential quads leading to a conditions assessment report.
2. Flow-rate modeling to track input and outflows across the network leading to a capacity assessment report.
3. Manholes should be visually inspected for obstructions or failing masonry collar extensions.
4. Storm catch basins should be reviewed in field for intended operation and grading conditions.

Fiscal Year 2007/2008				
Campus	Water / Sewage Gallons per AAFTE	Water / Sewage Gallons per OGSF	Avg. Cost per AAFTE	Avg. Cost per SF
Empire State	0.00	0.00	\$0.00	\$0.00
System Adm.	0.00	20.02	\$0.00	\$0.09
Morrisville	42.66	0.07	\$0.37	\$0.00
Alfred Ceramics	4,143	6.24	\$24.58	\$0.04
Utica/Rome	4,729	13.59	\$39.26	\$0.11
Fredonia	5,490	14.32	\$90.71	\$0.24
Oswego	6,385	13.71	\$19.85	\$0.04
New Paltz	6,391	18.99	\$35.15	\$0.10
Farmingdale	7,806	24.89	\$14.66	\$0.05
Canton	8,044	24.16	\$93.40	\$0.28
Potsdam	8,477	16.86	\$83.69	\$0.17
Cortland	8,832	23.58	\$58.81	\$0.16
Old Westbury	10,039	24.39	\$25.92	\$0.06
Oneonta	10,965	27.06	\$67.16	\$0.17
Plattsburgh	10,985	30.34	\$60.30	\$0.17
Binghamton	12,053	32.17	\$73.08	\$0.20
Brockport	12,156	32.26	\$50.48	\$0.13
Geneseo	12,567	28.63	\$52.97	\$0.12
Cobleskill	12,850	26.75	\$61.81	\$0.13
Optometry	13,113	13.13	\$91.66	\$0.09
Buffalo	13,590	33.38	\$59.64	\$0.15
Forestry	14,339	24.22	\$68.83	\$0.12
Buffalo	14,442	44.77	\$50.53	\$0.16
Maritime	16,705	30.01	\$57.40	\$0.10
Purchase	18,795	32.38	\$124.54	\$0.21
Delhi	21,036	50.41	\$177.20	\$0.42
Albany	21,473	54.19	\$256.79	\$0.65
Alfred	21,552	41.63	\$125.31	\$0.24
Stony Brook	26,409	53.13	\$99.10	\$0.20
Cornell/Geneva	35,600	32.35	\$357.01	\$0.32
Syracuse HSC	114,692	57.98	\$554.60	\$0.28
Brooklyn HSC	121,718	92.11	\$805.79	\$0.61

FIGURE 2.10.1F Water/Sewage Usage Rates per AAFTE

Storm Drain

The documentation of the existing storm system is incomplete. Binghamton University Physical Facilities staff has found substantial inaccuracies and missing information. The condition of the overall system is not known, except in areas where repairs or modifications have been required. A complete system mapping, capacity analysis, and condition assessment is recommended.

The problems identified include sections of the system that are operating at over 100 percent capacity. The deck between the Engineering Library and the Computer Center floods during hard storms. Lake Lieberman, on the west side of campus, can not accommodate the volume of stormwater it receives. The ECH project will include some modifications to include a settling pond upstream of the lake.

No piping is included. There is limited stormwater piping included in recent dorm and Quad upgrade projects, but no overall system maps.

In the absence of adequate documentation of the underground components of the sanitary and storm sewer systems, the planning team would recommend the following investigations:

1. Robot-controlled video survey of lines from the points of connection to the municipal systems back to the branch points at residential quads leading to a conditions assessment report.
2. Flow-rate modeling to track input and outflows across the network leading to a capacity assessment report.
3. Manholes should be visually inspected for obstructions or failing masonry collar extensions.
4. Storm catch basins should be reviewed in field for intended operation and grading conditions. A storm water management plan must then be prepared identifying projects to correct problems or repair obsolete piping and manholes. The plan must address planned treatment of new storm water demands from future projects.



Electrical

The Binghamton University Campus is provided with electric service from New York State Electric and Gas (NYSEG) with two 34.5 kV supply feeders from different directions on Bunn Hill Road.

There is a main distribution (substation) yard behind the boiler plant, where power is transformed down to 4,800 Volts for the old circuits; and to 12,470 Volts and 13,200 Volts for the newer circuits. The main distribution supports all of the Vestal campus except the ITC complex.

The University is midway through a long-term project to replace all of the old 4,800 Volt system, and to increase the system's overall capacity. The existing five transformers provide 24,000 kVA capacity. At the project's completion, the final build out will provide 40,000 kVA capacity (SUCF project #07A12, Electrical Upgrade Phasing Analysis). Upgrades to the substation will also include automatic switching between the two NYSEG feeders after NYSEG has upgraded the back-up feeder to handle the full campus load.

The duct bank's distribution from the substation has recently been upgraded through four recent projects northwest along East Drive and West Drive to the East Campus Housing Complex. A new duct bank system with more conduits and segregated manholes has been built so that primary circuits can be run parallel to each other but remain isolated in manholes. This will ensure that a fault in a manhole won't also knock out the back-up circuit.

Future projects are planned for a similar upgrade to the duct bank on the south side of the loop road. New 15 kV feeders are being installed that will be switched over to the new 12,470 Volt system as it progresses. Any new transformers, like the one in the East Gym renovations, are being supplied with dual windings at 4,800 Volts and 12,470 Volts for initial operation at the old 4.8 kV voltage and future operation at new 12,470 Volts. The eventual build out should have all transformers running at 12,470 Volts. There are numerous existing building transformers that will require replacement to convert to the new voltage.

Under SUCF #07A42, the new high voltage substation is being located behind the Commissary building and across from Admissions parking area. Appropriate screening, planted or constructed, is recommended.

Future projects will be required to replace existing building 4.8

kV transformers as the switchover to high voltage progresses. The circuits in the new duct bank are scheduled to be switched over in 2013. The long range plan for the south side of the campus transition extends out through 2020. Once switchover is completed, a project will be required to remove the old substation equipment and abandoned cabling.

Emergency Power

The Binghamton University campus is served by forty fixed emergency generators dedicated to individual buildings or shared by adjacent buildings. Eleven of these units are sized greater than 75kW (maroon shading) and are capable of handling some equipment load along with emergency lighting and alarms. The remaining units are smaller (light blue shading) expected to serve life safety purposes only and do not have the capacity to serve large HVAC equipment loads in the buildings.

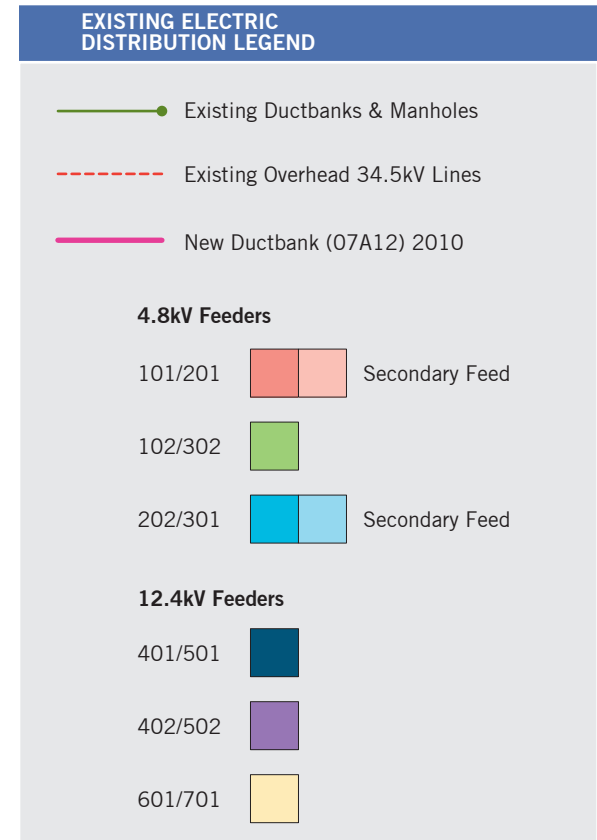
Twenty-two of these emergency generators are fueled by natural gas (yellow shading) and eighteen are fueled by diesel (green shading). The reliability of the natural gas supply is limited by as Binghamton University purchases natural gas under an "interruptible" rate plan. The gas generators operate poorly on the propane/air mix that is put into the gas piping during a utility gas interruption.

The five largest units serve the Central Heating Plant Complex (1MW); Event Center (450kW); ITC (350kW & 250kW); and Science III/IV Buildings, Science Library and Greenhouse (250kW). These units provide power to operate sensitive equipment and HVAC along with lighting.

Per campus staff, a temporary 400kVA generator was recently installed to serve the Computer Center and the Health Care generator is expected to be replaced under a current Life Safety Upgrades project (#07A25).

The tan column lists the current loading for each generator and the dark blue column indicates the maximum load capacity. The existing generators are capable of handling more load such as data room equipment, dataroom cooling, or more lighting.

The existing emergency power system is not designed to keep the campus operating during a prolonged outage. It provides power for safe evacuation of buildings and to maintain the central heating plants. A cogen plant addition of 3.5 megawatts would allow the campus to remain in operation at a reduced load.



YEAR	CAMPUS PEAK ELECTRICAL DEMAND (KW)
2005	11,918
2006	10,681
2007	11,335
2008	10,676
2009	10,465

FIGURE 2.10.1J Campus Peak Electrical Demand

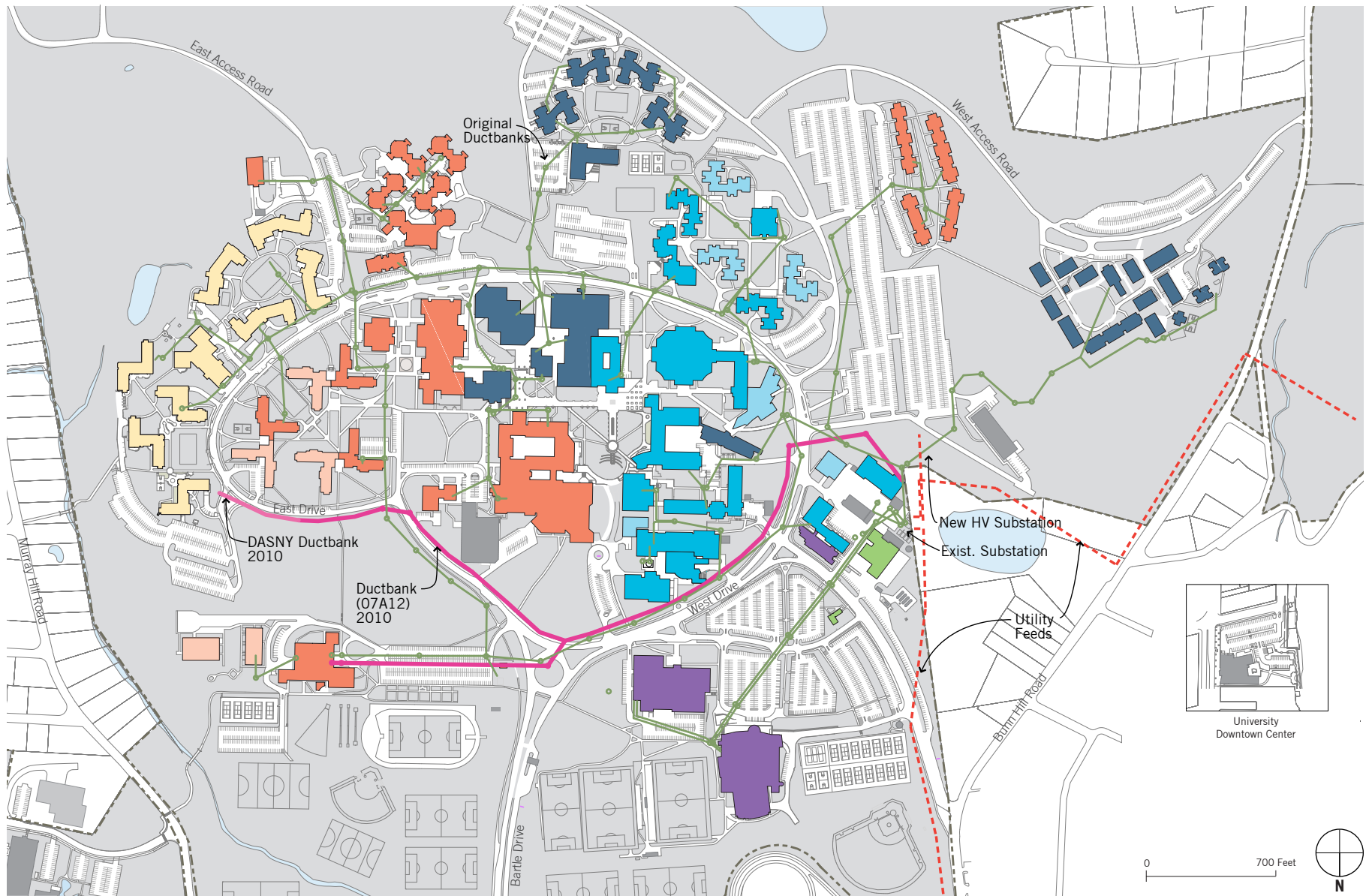


FIGURE 2.10.1K Existing Electric Distribution

Gas

Natural gas is distributed around much of the campus, with the exception of the East Drive or East Gym area. Natural gas is provided by NYSEG from Bunn Hill Road, and enters the campus through the gas house adjacent to the Central Plant. Two lines serve the campus, with one supplying the heating plant and the other supplying the rest of campus.

The major gas loads on campus are the distributed boilers in the University Union, the Library, and the residential complexes. Natural gas is supplied throughout the Science Complex as well. The library does not normally use natural gas to heat the building. The gas boilers in this facility are standby units and are run infrequently with the exception of boiler inspection purposes.

The Innovative Technologies Complex receives separate gas service, not connected to the campus grid.

The air propane plant is used as a backup system to the Central Heating Plant, as an alternate fuel source to the wood/coal/natural gas supply, but not as a backup to the natural gas grid.

Binghamton University currently acquires its gas at an "interruptible rate", meaning at times of peak demand for the utility (NYSEG) supply can be turned off to the Campus. The campus is currently converting their gas-fired emergency generators to diesel power to account for the interruptible nature of the gas supply.

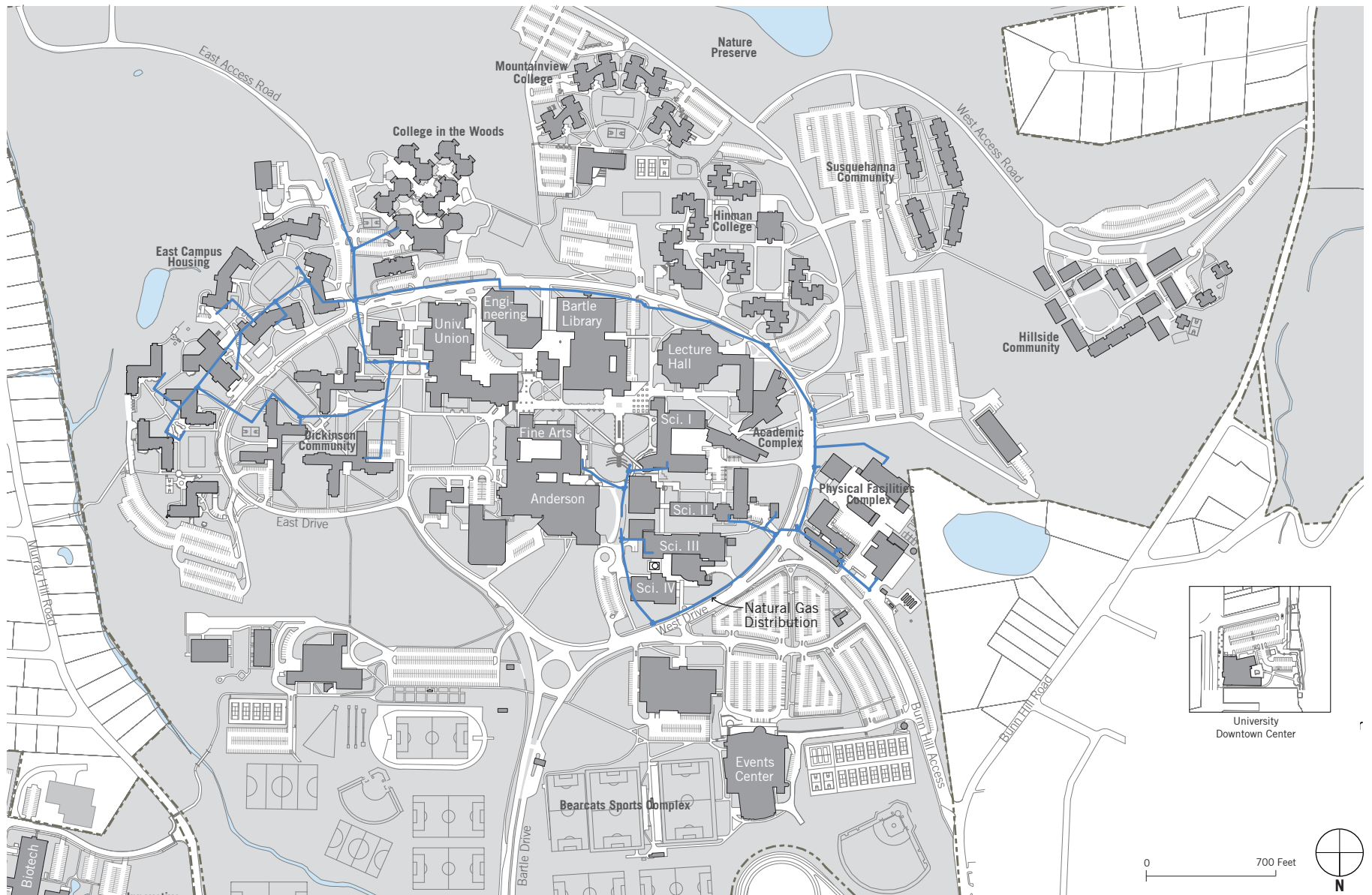


FIGURE 2.10.11 Existing Gas Distribution

2.10.2 BUILDING CONDITION ASSESSMENT

SUCF and Binghamton University jointly conducted a campus-wide Building Conditions Assessment Survey (BCAS) in 2007. The Assessment evaluates the condition of state-owned facilities based on four major categories: Building Exterior, Building Interior, Mechanical and Plumbing, and Building Electrical. Components of each major category are evaluated for condition on a four-point scale of poor, fair, good, and excellent.

The FMP conducted a confirmation and update to the conditions data reported in the BCAS. Updates are informed by field observations, capital projects, and interviews conducted with facilities management and operations personnel. The figure at the right presents a summary of conditions assessment findings. A composite conditions score of either satisfactory or unsatisfactory is presented for each building based on a weighted averaging of component scores.

The conditions assessment indicates a significant need for renovation at Binghamton University's legacy facilities. Approximately half of today's campus was in existence by 1969. Legacy buildings are characterized by heavy concrete and masonry facades, double-loaded corridors, large lecture halls, and narrow classroom depths. Many remain in operation today, and while they have been well-maintained and are in sound condition, structurally, they require extensive mechanical upgrades and reprogramming to meet contemporary pedagogy needs.

Buildings of primary concern are the Bartle Library, the Computer Center, the Fine Arts Building, and Sciences Complex. Buildings that were constructed or have undergone major renovation more recently are in satisfactory condition.

Appendix A: Buildings Manual

Detailed conditions assessment by building are presented in Appendix A: Buildings Manual. Binghamton University is composed of a disproportionate number of buildings that are more than 40 years old with 80 percent of the campus' academic/research stock at least 30 years old. The age of the various buildings on campus is graphically represented by Fig. 2.10.3B.

Buildings are grouped into the following categories:

- B.1 Academic / Research Buildings
- B.2 Libraries
- B.3 Student Service Buildings
- B.4 Athletic / Recreation Buildings
- B.5 Service Buildings
- B.6 Food Service Buildings
- B.7 Residential Communities



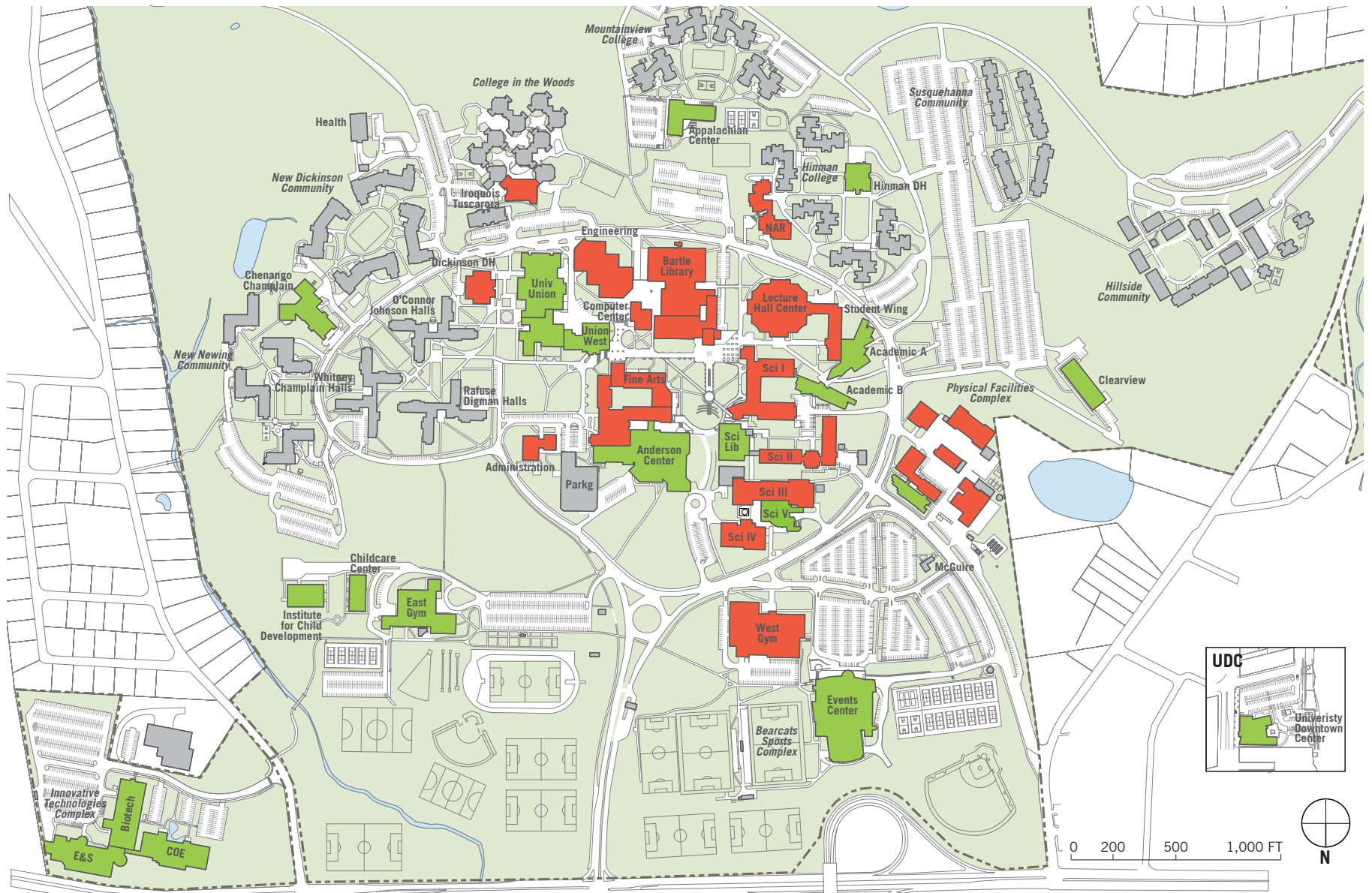


FIGURE 2.10.2A Campus Map: Buildings by Major Use

Building Age

At the time the college officially moved to Vestal, the campus consisted of 16 buildings totaling 1,445,115 GSF. These buildings included the six Dickinson Community residence buildings, Science I, the East Gym, and the Library.

Approximately half of today's campus was in existence by 1969. These buildings have been exceptionally well-maintained and remain in operation today. Buildings constructed during the 1950s and 1960s are characterized by double-loaded corridors, large lecture halls, and narrow classroom depths.

By this time, interstate highways I-88 and I-81 made the site more accessible and more desirable.

Steady building growth continued through the early 1970s. Construction initiatives during this time included Science Buildings III and IV and a number of residential facilities. These buildings are characterized by concrete frames with block infill.

In the mid 1970s, building growth halted due to economic conditions in New York state. Conditions continued through the 1980s and 1990s, during which time facilities grew very little on campus. While growth of the campus' physical facilities slowed during this period, the 1980s and 1990s saw the construction of two residential communities, the Academic A/B complex, and the Science Library Addition.

In 1990, the State University Construction Fund commissioned a campus master plan. Among the plan's recommendations were the infill of areas between existing buildings, the removal of parking from the campus' core, and the establishment of the University Union as the dominant center of campus life.

Another facilities capital plan was completed in 2000. Following this plan, a number of new projects began construction.

The University's physical facilities continue to grow. Recent capital projects include the construction of the University Union West in 2002, the Events Center in 2004, and the University Downtown Center in 2007.

RENOVATIONS AND RECENT PROJECTS

In 1985, the campus central heating plant underwent a full renovation following a 1985 feasibility study.

Recent building projects reflect the University's commitment to its mission as a doctoral research institution. The recent renovation of the Innovative Technologies Complex (ITC) Biotechnology Building, the construction of the Science V building and the ITC Engineering and Science Building, and renovation of new facilities in the Engineering Building are projects focused on the creation of cutting edge research space.








The University has also focused on upgrading its residential facilities in recent years, with the most recent new buildings constructed in the Newing Residential Community. The University has also started construction for the East Campus Housing Project, a three-phase construction program to replace the old Newing College buildings with new dorm facilities and a new dining hall.

Current capital projects in progress include the Science V and the ITC Engineering and Science Building, which will provide state of the art lab space for the Watson School of Engineering & Applied Sciences. The University is also planning construction for the Center of Excellence Building at the ITC and renovations to the East Gym.

CAMPUS EXPANSION

The recent creation of the University Downtown Center (UDC) marked a significant achievement for the campus. While the University has engaged the city of Binghamton in a variety of ways over the years, the UDC was the first University facility to be built in downtown Binghamton. The University foresees the city of Binghamton as an area rich with opportunity for future campus expansion and community engagement.

BUILDINGS BY AGE COLOR LEGEND

-  Original Campus
-  1960s Expansion
-  1970s Expansion
-  1980s - Early 90s Expansion
-  Late 90s - Present Expansion
-  Major Renovation Late 90s - Present
-  Residential Bldg (Not Considered)

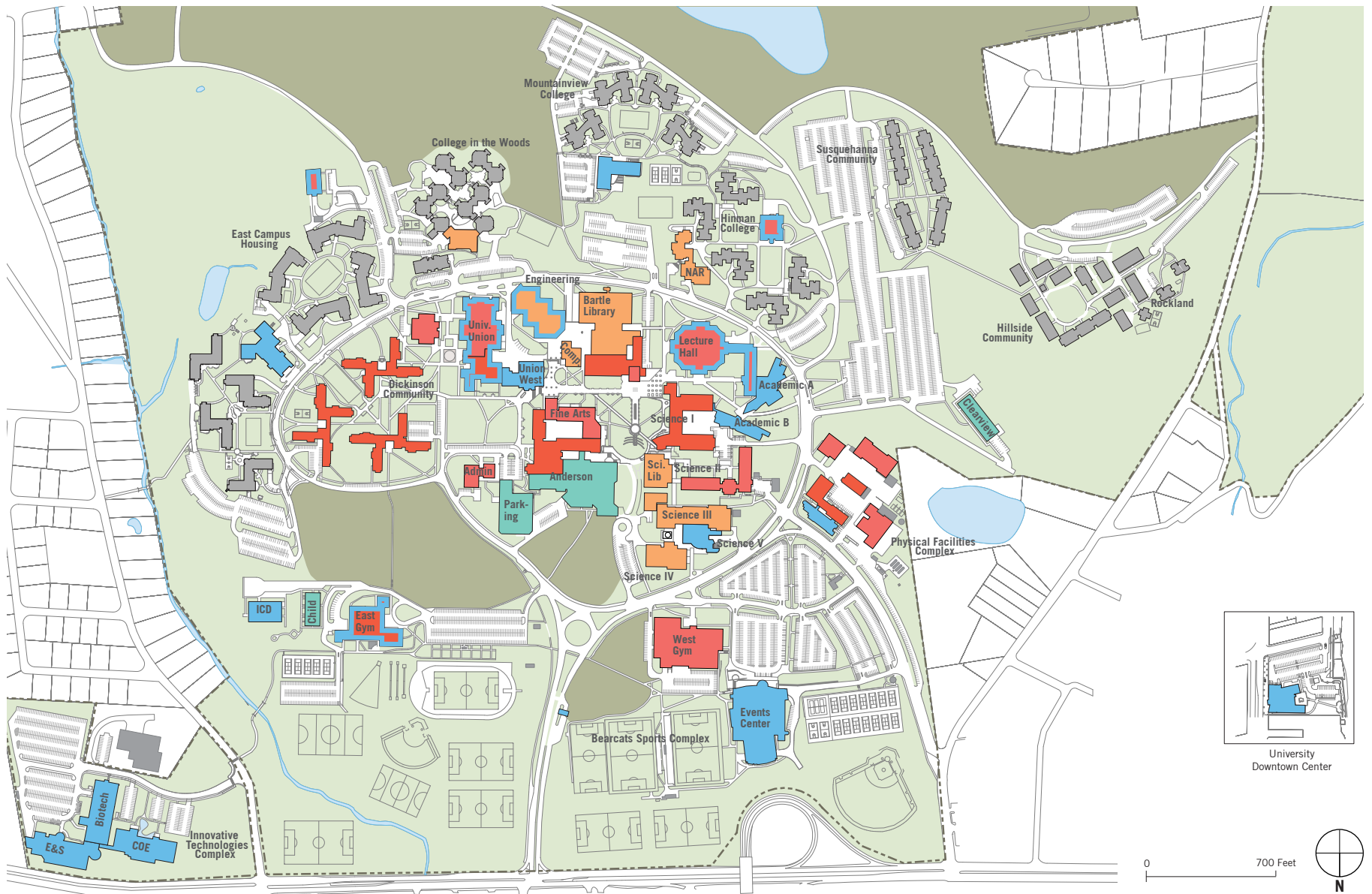


FIGURE 2.10.2B Campus Map: Buildings by Age

2.11 Suitability

2.11.1 OVERVIEW

The primary factor impacting suitability of facilities at Binghamton University's main campus relates to the age of facilities. The campus experienced the majority of its development in the 1960s and 1970s, and as a result is characterized by a disproportionate number of buildings over 40 years in age. While these buildings have received regular maintenance and periodic upgrades, many now require more extensive upgrades to key building systems. Facilities also require comprehensive renovation to support contemporary programming and pedagogy, which has undergone dramatic shift since the construction of legacy buildings. It is important for the University to plan for the capital burden implicit in the quantity of facilities that will require major renovation in the coming years.

The issue of facilities suitability due to age and condition is compounded by an overall space deficit and lack of vacant swing space. As a result, the University will be required to press facilities that are below desired suitability levels into use to facilitate major renovations across campus. This situation is evidenced by upcoming renovations of O'Connor and Johnson Halls, legacy residence halls in the Original Dickinson Community, for administrative and academic uses. However, it is important that the University is not penalized for its adaptive repurposing of these facilities. While the Master Plan will make the most of all existing facilities in the near-term, it will pursue a campus in which an appropriate size and configuration of building areas are available for each of the University's programs in the long-term.

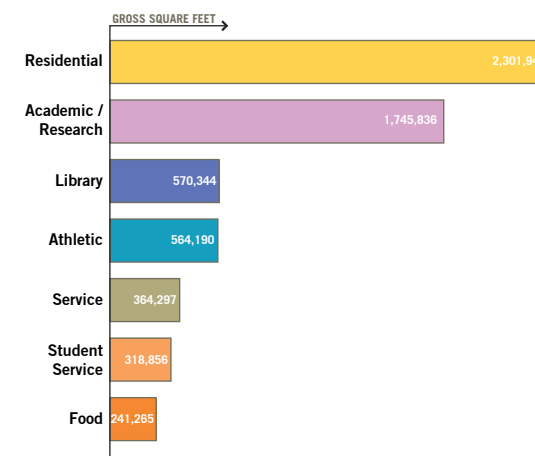
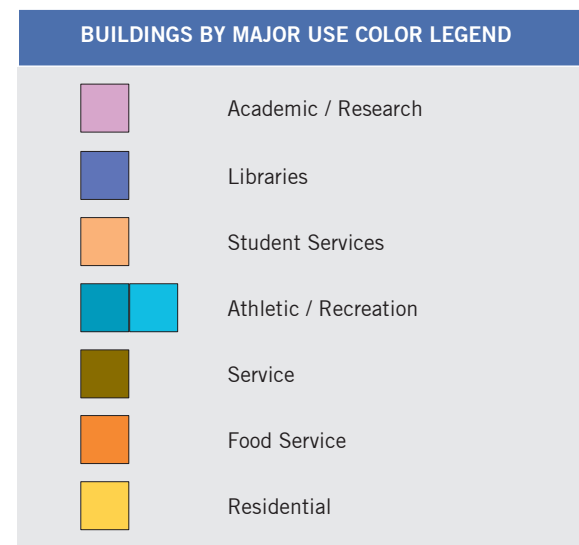


FIGURE 2.11.1A Campus GSF by Building Type

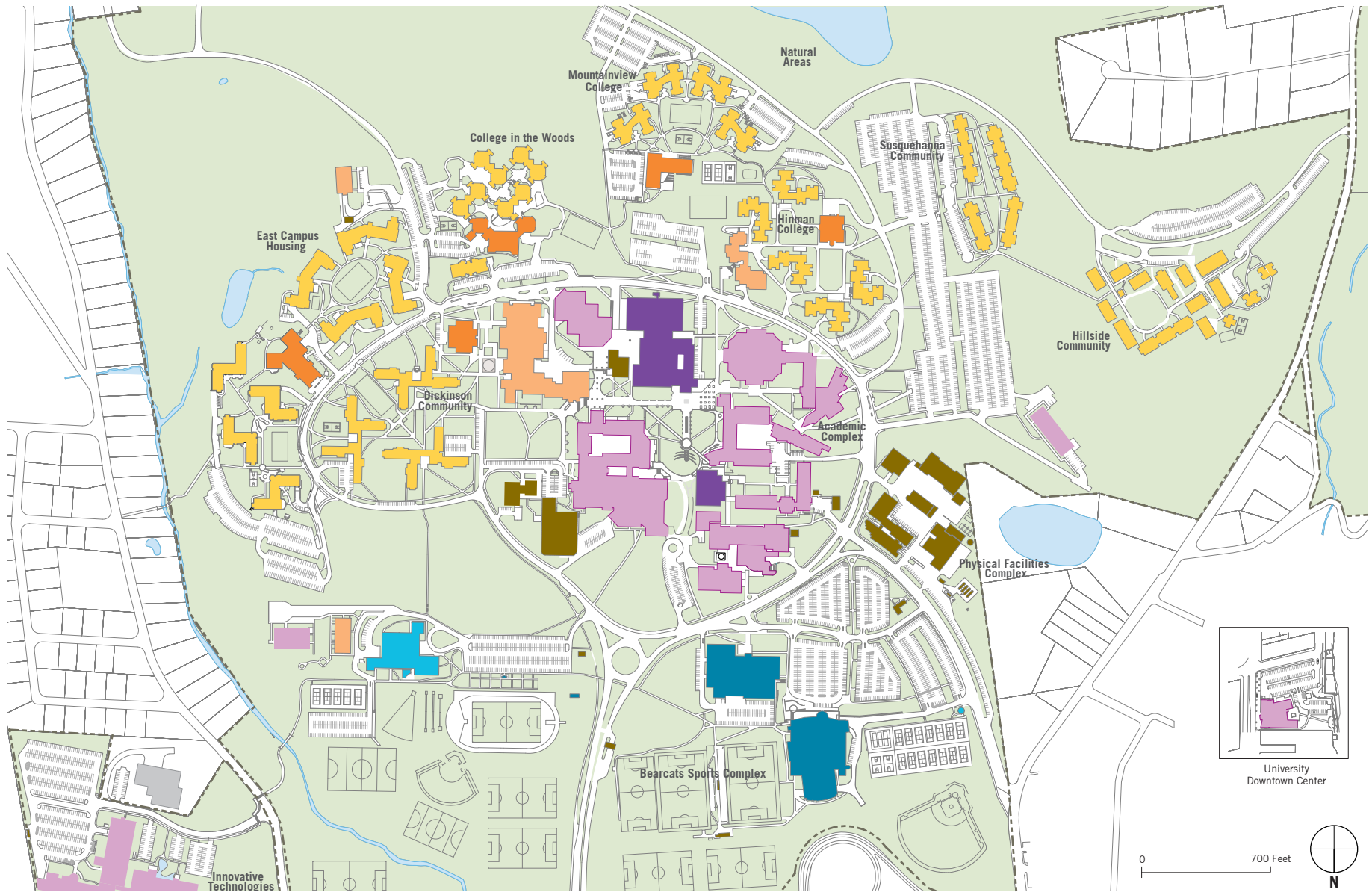


FIGURE 2.11.1B Buildings by Major Use

2.11.2 SUITABILITY RECOMMENDATIONS

The conditions assessment analysis presented in the preceding sections of this report and the Buildings Manual provides indication of each building's current condition as well as potential and upgrades required for continued use. This section on suitability synthesizes the detailed analysis and outlines recommendations for building investment and reallocation. The adjacent diagram presents recommendations for each non-residential building on campus. Buildings are organized into one of five categories: not considered, existing to remain, minor rehabilitation and reprogramming, major rehabilitation and reprogramming, and no new investment. Categories are defined in the adjacent legend.

NOT CONSIDERED

This Facilities Master Planning effort is primarily concerned with identifying capital need related to State-operated properties in fulfillment of academic mission. Therefore, non-State-operated facilities are not considered for the purposes of suitability, with the exception of the residence halls in the Original Dickinson Community within the Brain that may be repurposed for academic use.

EXISTING TO REMAIN

This category includes buildings that significantly fulfill their purpose with no further modification necessary. Recently constructed buildings and spaces that have undergone recent rehabilitation are generally considered to be adequate for their program and usage. Upon further development of the Facilities Master Plan, buildings in this category may experience small-scale instances of re-configuration due to associated programmatic moves. Capital improvements associated with regular cycles of maintenance will continue in these facilities. Existing buildings to remain include the following:

- + Academic A
- + Academic B
- + Anderson Center
- + Childcare Center
- + East Gym

CATEGORY	DESCRIPTION
Minor to Moderate Renovation & Reprogramming	Buildings that require full or partial minor to moderate upgrades including relocation of interior partitions, upgrade of finishes, exterior facade work, etc. but whose internal systems are still viable. Similarly, buildings that will be reconfigured to house new functions but will only require minor architectural upgrades.
Major Renovation & Reprogramming	Buildings that are structurally sound but require significant overhaul of building systems and architectural modifications to conform with current life safety and accessibility standards. Given the extent of such building renovations, these are considered candidates for wholesale reprogramming.
Not Considered	Residential hall-related projects not considered in the scope of the FMP.
Existing To Remain	Buildings of recent construction or renovation that significantly fulfill their purpose.
No New Investment	Buildings that are structurally deficient, would require excessive capital investment to meet anticipated campus needs, or where further capital investment exceeds building value.

FIGURE 2.11.1A Facilities Investment Summary

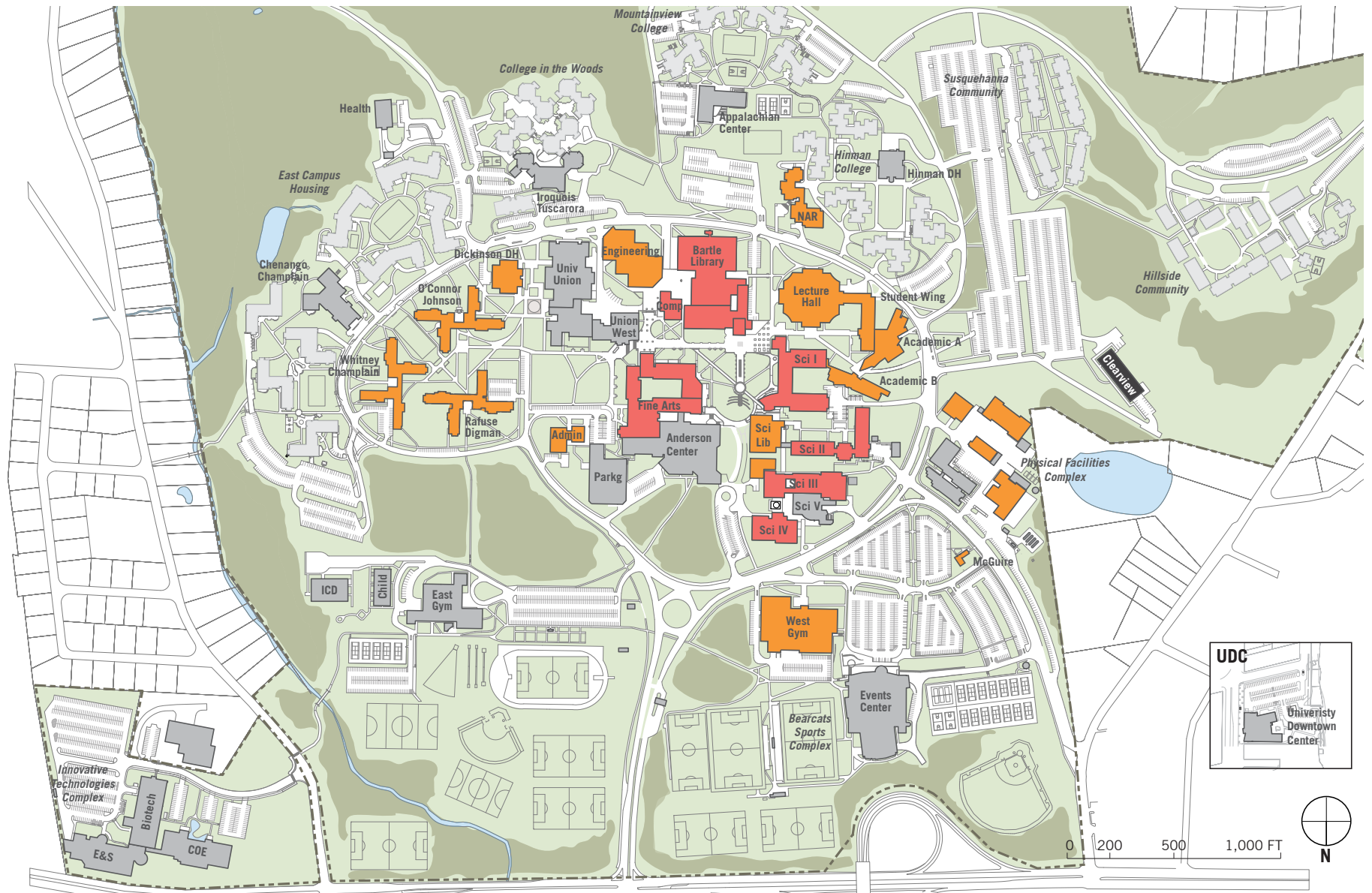


FIGURE 2.11.1B Facilities Investment Summary

- + Events Center
- + ITC Biotechnology, ITC Center of Excellence, ITC Engineering & Sciences
- + Institute for Child Development
- + Physical Facilities & Physical Facilities North
- + University Union

MINOR TO MODERATE REHABILITATION AND REPROGRAMMING

This category includes buildings that require a degree of upgrade to interior finishes and exterior work but whose internal systems are largely viable. These facilities have often received recent work to address aspects of life safety, building systems, technological upgrades, and interior renovation, however additional work is anticipated to be necessary. Additionally, buildings that have been identified as potential candidates for significant reconfiguration to house new functions are indicated in this category. Buildings indicated for minor to moderate reprogramming and rehabilitation include the following:

Couper Administration Building. Couper Administration exterior reflects the brick, vertical glass and metal panel language of similar high-rise towers on campus. The tower is a strong, orienting landmark set across Peace Quad and the University Union. Although various internal renovations have taken place, deficiencies remain in major building systems, building envelope and ADA facility compliance. The exterior requires critical attention to its aging curtain wall system and roof overhang. The building should be evaluated for its capacity to support the current configuration of offices.

Dickinson Dining Hall. The brick exterior of Dickinson Dining Hall is similar to other early campus structures and the glazed openings from the dining areas provide attractive communication with the surrounding plaza and landscape. As a new dining hall complex is currently under construction, the building can be considered for adaptive reuse. The building should be considered for program that requires open space with more generous floor to floor height, such as for gathering.

Engineering Building. Current projects underway at the Engineering Building address critical maintenance issues chiefly related to the building envelope. As program has been steadily decanted from this building, there exists an opportunity for wholesale reprogramming to determine its best employment.

Lecture Hall Center and Student Wing. The Lecture Hall Center has been updated in a series of phased projects. The older Student Wing should be a candidate for rehabilitation and reconfiguration. Its capacity to accommodate classrooms of suitable sizes should be evaluated and additional programming options explored. A project to rehabilitate the Student Wing has been identified and is currently being defined. Classrooms at the existing student wing will be constrained in size due to the ceiling height of the building and the limited depth of the floor plate.

McGuire Building. The portion of land that McGuire Building occupies can support a greater capacity of program than its present building offers. The wood frame building is not of significant construction and merits only extremely modest further investment. In the near-term, the facility should support administrative functions, however in the long-term it is a candidate for demolition to better utilize this area of land and to co-locate program contained therein with related administrative functions.

Nelson A. Rockefeller Collegiate Center. Nelson A. Rockefeller Collegiate Center (NAR) lies at the edge of Hinman residential community. Some interior spaces have been recently renovated. Like the NAR building, Iroquois Commons/Tuscarora Office Building is a multi-function building adjacent to a residential community, but its primary usage is residential dining. These buildings contain disparate functions and their programming should be evaluated.

Original Dickinson Residence Halls. The Original Dickinson Community dates from the oldest period of construction on campus and is located within the academic core. Consistent with current land use goals, areas within the Brain should contain academic program and should be developed at densities to support “right sizing” the campus relative to its system peers. In the short term, the buildings may be rehabilitated and reprogrammed for temporary surge space needed to facilitate critical maintenance and rehabilitation projects. In the longer term, the structural dimensions of all Dickinson Community buildings limit the adaptive reuse of these dormitories for other purposes. Possible uses are for departmental or administrative office use. The buildings will not support significant gathering, with the exception of the existing community rooms at the first level. These buildings should be long-term candidates for demolition and a higher functional use for the centrally located land they occupy should be considered.

Physical Facilities Complex: Central Plant, Commissary, Garage, Warehouse. The Physical Facilities Complex contains



Engineering Building



a number of legacy facilities that support a wide array of campus service functions. Facilities have been adapted over the years to meet evolving needs, but have not undergone major upgrades. More significant renovations of legacy buildings at the Complex should be considered to maximize existing facilities and upgrade for contemporary service delivery.

Science Library. Science Library was built in two periods. The earlier, library portion corresponds to the reinforced concrete, CMU infill and glass vocabulary of other Science Complex buildings and suffers from some of the same deficiencies, such as poorly insulated exposed slabs. While the reading areas have been recently renovated, areas of the library appear to be underutilized or without program. Such areas should be evaluated as libraries increase use of group study and electronic information.

West Gym. West Gym contains facilities that support both the University's athletic, recreation, and health and wellness studies program. As the East Gym renovation will relieve some dependence on West Gym for recreational uses, there remain interior spaces that should receive updating and reconfiguration. The building also presents opportunities to improve the utilization of spaces by rightsizing them based on contemporary physical activity requirements.

MAJOR REHABILITATION

This group of buildings is structurally sound but require overhaul of building systems and architectural modifications to conform with current accessibility / life safety standards. The extent of such renovations indicates wholesale reprogramming candidates. Candidates for major rehabilitation include the following:

Bartle Library. Bartle Library is a building that was constructed in three segments and has undergone piecemeal renovations. Removal as opposed to encapsulation of remaining asbestos materials in the building will impact adjacent spaces. A complete overhaul is necessary as is an examination of program content, along with asbestos abatement. Renovation should also clarify the program organization within the building and the organization of circulation patterns.

Computer Center. The current square footage of the Computer Center building is relatively modest, but it contains operations that are essential to the technological life of the University. Deficiencies and life safety hazards in the Computer Center cannot be adequately addressed with the data center in place.

Finding a new home for that function will allow for more efficient operations and provide the opportunity to repurpose this strategically located building for higher and better use. The building is centrally located at a prime location within the Brain of the main campus, and should be considered for program that is desired for high visibility and accessibility.

Fine Arts Building. The Fine Arts Building and the Anderson Center form a multi-faceted arts complex that also contains some general purpose classrooms within which it may be possible to carry out some programmatic fine-tuning. However, due to the specificity of the facilities associated with these programs there will likely be a quantity of space types for which new construction is the most appropriate action.

Sciences I-IV. The infrastructure and systems of Science I-IV are unlikely to support expanded and advancing technological needs of the science programs. At completion, Science V will offer surge space to facilitate overhaul of other Science buildings. Major systems replacement in these buildings will also permit a comprehensive reprogramming effort. Due to the age of facilities, the buildings will struggle to support some aspects of contemporary science instruction and research. Specific constraints include modest floor to floor heights, limited core facilities, and the scale of floor plates.

NO NEW INVESTMENT

This category includes buildings that are not recommended for further investment and may be candidates for future demolition upon program replacement. Buildings include temporary facilities as well as structures that are not likely to accommodate upgrades for modern systems without unreasonable cost. Buildings recommended for no new investment include the following:

Clearview Hall. Clearview Hall is adequately operational, but was built as a temporary structure and would not merit additional investment to increase its efficiency. Clearview does not offer expansion capacity for its current role, housing Psychology department elements and the Psychology Clinic. Its building systems are dated and exceeded their useful lives.

Temporary Trailers. Due to facilities demands, temporary trailers house SUCF site representatives at the Physical Facilities Complex and administrative offices at the Institute for Child Development. The plan should seek to relocate such program to permanent facilities, co-located with related functions and remove all temporary trailers.



Science II



Dickinson Community