
George Mason University

Fairfax, Virginia

Master Plan

February 1987

Sasaki Associates, Inc.
Watertown, Massachusetts

Hankins and Anderson, Inc.
Richmond, Virginia

MIRA, Inc.
Minneapolis, Minnesota

George Mason University
Fairfax, Virginia

Master Plan
February 1987

Sasaki Associates, Inc.
Watertown, Massachusetts

Hankins and Anderson, Inc.
Richmond, Virginia

MIRA, Inc.
Minneapolis, Minnesota

PREFACE

A university is more than merely a group of buildings and people who frequently or infrequently occupy the space. It is also more than something to be remembered from a crisp autumn or spring afternoon as a visitor. This is important; however, the university is a culture with roots and paths to the past and, more importantly, byways that lead to the future. It is a real place, a community with the same complexities, elements and problems of any community, and the events that occur help shape the environs of the campus. These events and the interaction of cohorts may have a more lasting affect than the content of the classroom. It is, therefore, a community with a mission or missions.

The missions of a university are (1) acquisition of knowledge through research; (2) dissemination of knowledge through teaching; and (3) public service as a result of the first two. This is the common thread, however fragile, that ties and runs through this community. Dependent on size, this community can be micro in a macro setting or visa versa. It is generally accepted that an enrollment of 30,000 headcount, George Mason's goal, plus faculty, staff, and required services, produces a population of approximately 100,000 in and around the campus. This community must also consider the ongoing number of visitors for conferences, cultural events, short courses, athletic events, and prospective students and families. It is therefore essential to plan and provide the services and facilities which constitute an environment. In so doing, it is imperative that the services and facilities in the immediate environs be considered so that the mutual planning of facilities, common for both communities, can occur.

George Mason University, as a relatively young and emerging university, must consider all these factors or aspects to truthfully be the hub or a pole in the overall development of Northern Virginia, and the metropolitan Washington, D.C. area. This is imperative considering the campus location within Fairfax County. Access from major interstates, both north-south and east-west, is direct via existing or planned arterial routes serving residential, commercial, and governmental developments. The location is also easily accessible, and in reality, is the locus, of the campuses of Northern Virginia

Community College. This provides the interface and leavening agent so important to the development of higher education in Northern Virginia and the Commonwealth at large.

With these factors as a goal, George Mason University, through its Master Planning for both academic and physical growth, has set the task for the development of a Master Plan that will maintain the existing program and provide the adaptability to respond to the needs and change of both the academic and community at large and eliminate any artificial or insular barriers between the two.

ACKNOWLEDGEMENTS

The planning consultants acknowledge the indispensable assistance and critical review provided by University officials and members of the Board of Visitors.

Extensive meetings and interviews were conducted with the University staff, members of the Board, and public officials from Fairfax County and the City of Fairfax. The information obtained and the opinions expressed in these interviews contributed significantly to the final plan.

George Mason University

The Board of Visitors

Randolph W. Church, Jr. (Rector)
Richard A. Barton (Vice Rector)
Robert P. Crouch (Secretary)
C. Douglas Adams
Hector Alcalde
Gayle Perkins Atkins
Carroll A. Baltimore
Brian Butch (Student Representative)
Myron P. Erkiletian
Nancy M. Hirst
Henry O. Lampe
Wal S. McWhorter
Helen Hill Miller
Charles H. Nance
Martha V. Pennizo
Edgar A. Prichard
Elizabeth T. Walker

The Administration

George W. Johnson, President
J. Wade Gilley, Senior Vice President
Maurice W. Scherrens, Executive Vice President
David J. King, Vice President for Academic Affairs
Donald J. Nash, Vice President for Administration
E. V. McKeever, Assistant Vice President for Facilities
Charles R. Wagner, Director of Facilities Planning
John Cresock, Associate Director of Facilities Planning

The Academic Deans

Larry S. Bowen, Dean of the College of Education and Human Services
Rita M. Garty, Dean of the School of Nursing
Robert T. Hawkes, Jr., Dean of the Division of Continuing Education
Henry G. Manne, Dean of the School of Law
Coleman Raphael, Dean of the School of Business Administration
Charles K. Rowley, Dean of the Graduate School
Andrew P. Sage, Dean of the School of Information Technology and Engineering
Rex A. Wade, Dean of the College of Arts and Sciences

Consultants

Sasaki Associates, Inc.
Richard F. Galehouse, Principal
James Doolin, Project Manager
Samuel Coplon, Project Designer
Hankins and Anderson, Inc.
Creed T. Elliott, Principal
MIRA, Incorporated
Thomas Mason, Principal

Table of Contents	Page
I. Introduction	
A. Historical Perspective	1
B. The University Today	1
C. Future Implications for the University	1
D. Purpose of the Master Plan	1
E. The Planning Process	1
F. Master Plan Goals	2
II. Analysis	
A. Community/Campus Context	4
B. Site Analysis	5
C. Land Use/Functional Organization	5
D. Enrollment	8
E. Program Space Demand Analysis	8
F. Circulation and Parking	11
G. Open Space and Environmental Resources	14
H. Utilities	14
III. Master Plan	
A. Program Assumptions	16
B. Land Use/Planning Concepts	16
C. Building Program	16
1. Education and General	
2. Student Services	
3. Student Housing	
4. Athletics and Recreation	
5. Future Development	
6. Building Design Guidelines	
D. Open Space and Environmental Resources	20
E. Circulation and Parking	26
F. Utilities and Lighting	27

List of Tables

Table	Page
1. Existing Land Use	5
2. George Mason University Regular Session Enrollment 1957-1985	8
3. SCHEV/OIA Enrollment Projections 1986-2011	8
4. Existing Space Inventory	10
5. Project FTE Enrollment and Education and General Space (GSF)	10
6. Existing and Projected Student Services Space Demand	11
7. Student Housing Analysis	11
8. Space Demand Summary at 20,000 FTE	16
9. Building Design Guidelines	19
10. Landscape Concept/Environmental Protection	22
11. Circulation Design Guidelines	28

List of Illustrations

Figure	Page
1. Illustrative Plan	3
2. Campus Location	4
3. Land Suitability Analysis	6
4. Site Analysis	7
5. Existing Land and Building Use	9
6. Existing Circulation and Parking	13
7. Land and Building Use Plan	18
8. Landscape/Open Space Plan	23
9. Circulation and Parking Plan	29
10. Heating/Cooling and Water	32
11. Storm Drainage and Sanitary Sewer	33
12. Communication/Telephone and Electric Services	34

I. Introduction

In the spring of 1985, George Mason University authorized Sasaki Associates, Inc. of Watertown, Massachusetts, in association with MIRA, Inc. and Hankins and Anderson, Inc., to prepare a comprehensive update to the Master Plan for the campus. The original comprehensive land plan for the campus was prepared in 1968, followed by a comprehensive update in 1979, and the most recent update completed in 1982 by the Facilities Planning Office.

A. Historical Perspective

George Mason University began in 1957 as a two-year branch college of the University of Virginia to serve Northern Virginia. In 1959, the City of Fairfax purchased approximately 150 acres of land south of the city limits and donated it to the University of Virginia for a permanent branch campus site. The institution was named George Mason College in 1960 for George Mason of Gunston Hall in Fairfax County who was a major figure during the American Revolution and an advocate of guaranteed rights for citizens.

In 1964, George Mason College had 365 students and four buildings (Finley, Krug, West and East) on the current campus site. The school was authorized as a four-year degree granting institution in 1966, and in 1967, enrollment jumped to 1,128 headcount. Graduate classes were added in 1970 and 422 additional acres were acquired for the campus. On April 7, 1972, the institution gained independent university status and added the Law School in 1979. In 1978, enrollment climbed to 10,767 headcount; by 1980, the University had an enrollment of over 13,000 headcount.

B. The University Today

George Mason University is a young and multifaceted institution comprised of the following schools: the College of Arts and Sciences, the College of Education and Human Services, the School of Information Technology and Engineering, the School of Business Administration, the School of Nursing, the Graduate School, the Division of Continuing

Education and the School of Law which is located at the Metro Campus in Arlington, Virginia. For the 1985 Fall semester, the total enrollment was 17,094 headcount representing all regions of the United States and more than 55 countries.

The growth in enrollment at the University over the past 20 years parallels the rapid growth in population and development in Northern Virginia. Today, George Mason University is situated in a region populated by over 1.2 million people. The burgeoning growth of high technology industry in the area is well established with over 800 hi-tech firms. Recognizing the educational demands created by these events, the George Mason Institute was founded in 1981 as an alliance of the School of Information Technology and Engineering with the hi-tech industries of the region.

The 583-acre campus in Fairfax County currently supports over one million square feet of academic and student services space, and provides on-campus housing for approximately 1,500 students. Most students commute from suburban communities in Northern Virginia.

The University continues to rapidly expand its physical facilities in response to enrollment growth and program demands: the \$6 million first phase of the new Humanities complex is under construction, as is the \$10.5 million Science and Technology I Building. Additional projects have been funded and are currently under design: Humanities II and III, Housing IV, Central Heating Plant Expansion, Security and Information Building, and expansion of surface parking lots.

C. Future Implications for the University

The 1980 Board of Visitors Mission Statement established that the University "will provide superior, traditional education enabling students to develop critical and analytical modes of thought and to make rigorous, honorable decisions." The Board further stated that a faculty will be maintained "... which is excellent in teaching, active in pure and applied research and responsible to the needs of the community." In addressing the University's relationship to the community, the Board established that the University "... will strive to be a resource of the Commonwealth serving government and

private enterprise, and to be the intellectual and cultural focus of Northern Virginia."

In response to the mission of the University, the task most fundamental to the Master Plan process is the establishment of strategies that address existing conditions and those future conditions that will influence the growth and development of the University into the next century. At George Mason University, the specific challenges involve the following: 1) accommodating substantial growth in enrollment, 2) attracting quality students and faculty, 3) providing adaptability to meet the changing needs of academic and research programs, 4) enhancing the University's non-institutional relationships with the public and private sectors, 5) maintaining and improving the campus' natural environment, and 6) assessing the role of undeveloped campus property.

D. Purpose of the Master Plan

The purpose of the Master Plan is two-fold: to serve the University as a foundation document for its biennial budget requests to the Commonwealth; and to provide a set of strategies for improvements that will place the University in a favorable position to meet the challenges of the next ten years and into the 21st Century.

The Master Plan is intended to provide direction for the resolution of problems related to the amount and location of academic space, enhancement of the campus environment, and functional improvements to circulation, parking and open space systems. As identified in the 1979 Master Plan, funding for new facilities and other improvements continues to be limited and places increasing importance on the establishment of an appropriate overall physical framework to complement the academic plan and other goals of the University.

E. The Planning Process

The Master Plan has been developed as the result of an interactive process with the University over the last year. Sasaki Associates has undertaken field reconnaissance of the campus and obtained information on building inventories, site and area context, traffic and parking, enrollment and

academic program, and campus infrastructure. Hankins and Anderson has focused on documentation of utility systems. A substantial amount of information collection was coordinated by the University staff on an ongoing basis. An Inventory and Land Use Analysis report was prepared by Sasaki Associates in August of 1985. Development of alternatives as part of the Master Plan process culminated in a Concept Plan Alternatives Report (Sasaki Associates, November 1985). Development of alternative plans was undertaken in direct response to the inventory data and discussions with University staff and the Land Use Committee of the Board of Visitors to test the accommodation of varying levels of enrollment and program, as well as to explore options for site planning.

Five work sessions have been held during the planning process: four at George Mason University and one at Sasaki Associates Watertown Office. These meetings served both as a conduit for information and as a forum for feedback on ideas generated by both the University and Sasaki Associates.

The first work session centered on site reconnaissance, interviews with the administrative and academic sectors, and discussion of formative topics influencing the Master Plan. The second work session focused on the review and presentation of the inventory information by Sasaki Associates, the University staff and Land Use Committee of the Board of Visitors. The third work session introduced the Alternative Concept Plans to be considered by the University and set the stage for formulation of a single Concept Plan. Prior to the formulation of the Concept Plan, an all day work session was held at Sasaki Associates with the University staff to further test the alternatives and refine them into a workable Concept Plan.

The Concept Plan was then prepared and presented at a fifth session in April 1986 to the Land Use Committee of the Board of Visitors for discussion, and the plan was approved in concept for consideration by the full Board of Visitors. The Board of Visitors approved the Master Plan for the University on May 20, 1986. The Master Plan is graphically shown in Figure 1.

F. Master Plan Goals

The Master Plan for the University has been prepared based on a foundation of information that included enrollment, building programs, physical features, basic services and the goals and objectives of the University. To guide the development of the Master Plan, the following physical planning and design goals have been established.

1. Planning and Design

- . Accommodate anticipated growth in enrollment and physical facilities in a manner that is adaptable to allow response to future educational and cultural influences.
- . Maintain and enhance the spatial quality of campus.
- . Organic functional land use sectors on campus for existing and future development.

2. Enrollment

- . Provide for long-term growth in enrollment that supports 20,000 FTE (30,000 headcount) on campus.

3. Education and General Space

- . Provide for the full range of needs for instruction, research and administration in terms of amount of space, type of facilities and quality of design to enhance the character and function of the campus.

4. Student Services

- . Develop additional facilities that address the needs of both commuting students and resident students to enhance the educational and living environment of the campus.

5. Auxiliary Enterprise

- . Recognize and reinforce the role of the University as the educational and cultural hub of northern Virginia by expanding facilities that provide community access to cultural and educational programs.

6. Student Housing

- . Provide housing for 5000 students in a quality living environment that recognizes a variety of needs and lifestyles.

7. Traffic and Parking

- . Continue to maintain adequate vehicular access to campus that does not conflict with the pedestrian core of campus.
- . Improve and reinforce the definition of the pedestrian environment on campus.
- . Provide an adequate number of parking spaces to meet the needs of commuting students, faculty and staff that are suitably located and designed.

8. Open Space

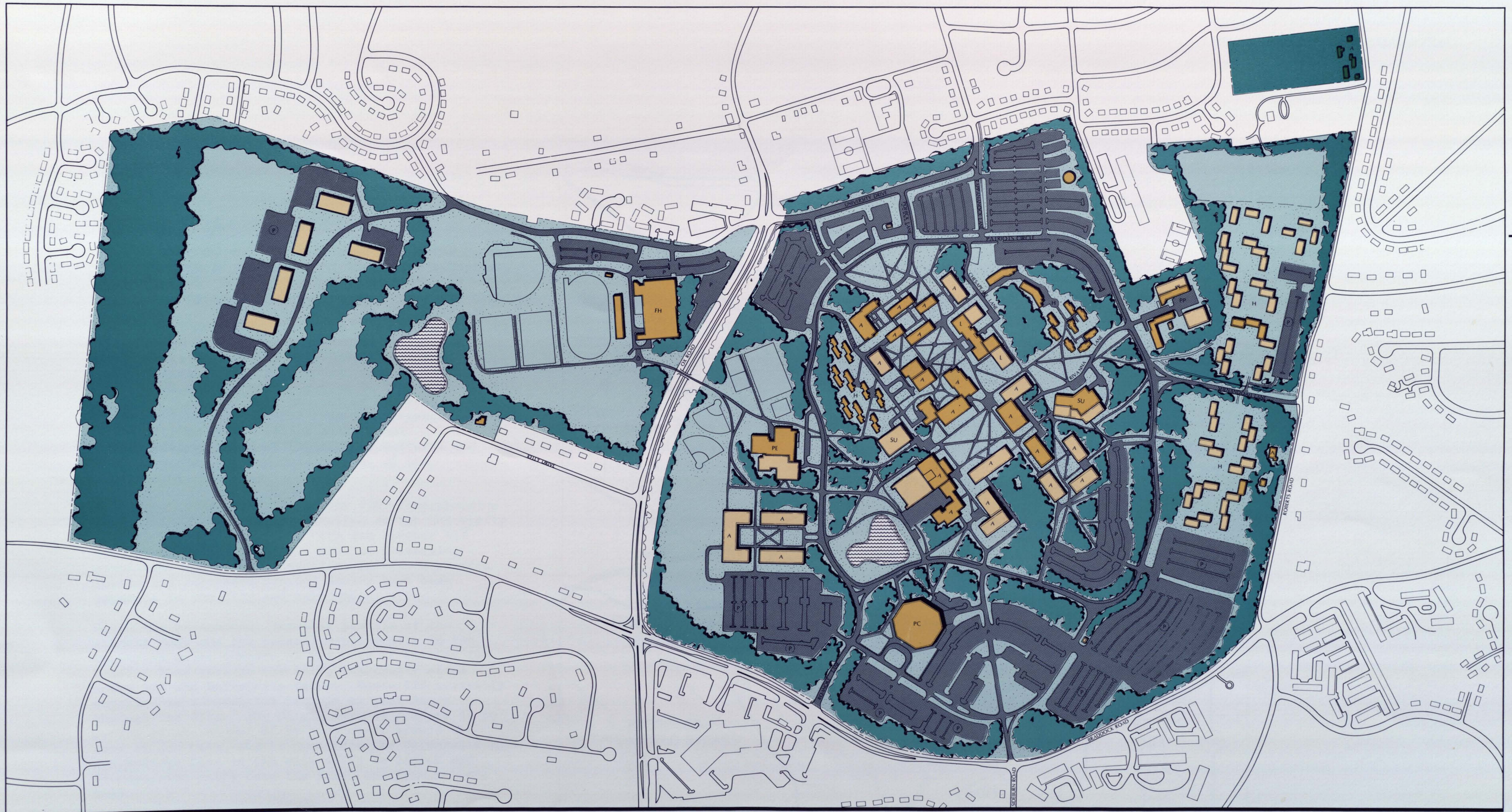
- . Preserve key areas of the natural woodland environment.
- . Enhance the quality of design of open space within the developed portions of campus.

9. Athletics/Recreation

- . Provide for a full range of indoor and outdoor sports activities that meets the needs of instruction, competition, and informal play.

10. Utilities

- . Provide a physical plant and distribution systems that adequately and efficiently support the University's physical facilities at its projected level of growth.



George Mason University
 Master Plan Fairfax, Virginia

Illustrative Plan

- | | | |
|-------------------------|--|---------------------------|
| Existing Buildings | | A Academic/Administrative |
| Proposed Buildings | | FH Fieldhouse |
| Open Space | | SH Student Housing |
| Trees/Shrubs | | L Library |
| Sidewalks (Concrete) | | PC Patriot Center |
| Roads/Parking (Asphalt) | | PE Physical Education |
| | | PP Physical Plant |
| | | SU Student Union |
| | | T Theatre |
| | | P Existing Parking |
| | | Proposed Parking |

Sasaki Associates, Inc.
 64 Pleasant Street Watertown, MA 02172

MIRA, Incorporated
 3112 Hennepin Avenue Minneapolis, MN 55408
 Hankins and Anderson, Inc.
 1604 Santa Rosa Road Richmond, VA 23288

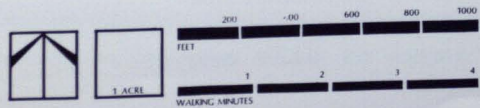


FIGURE 1

II. Analysis

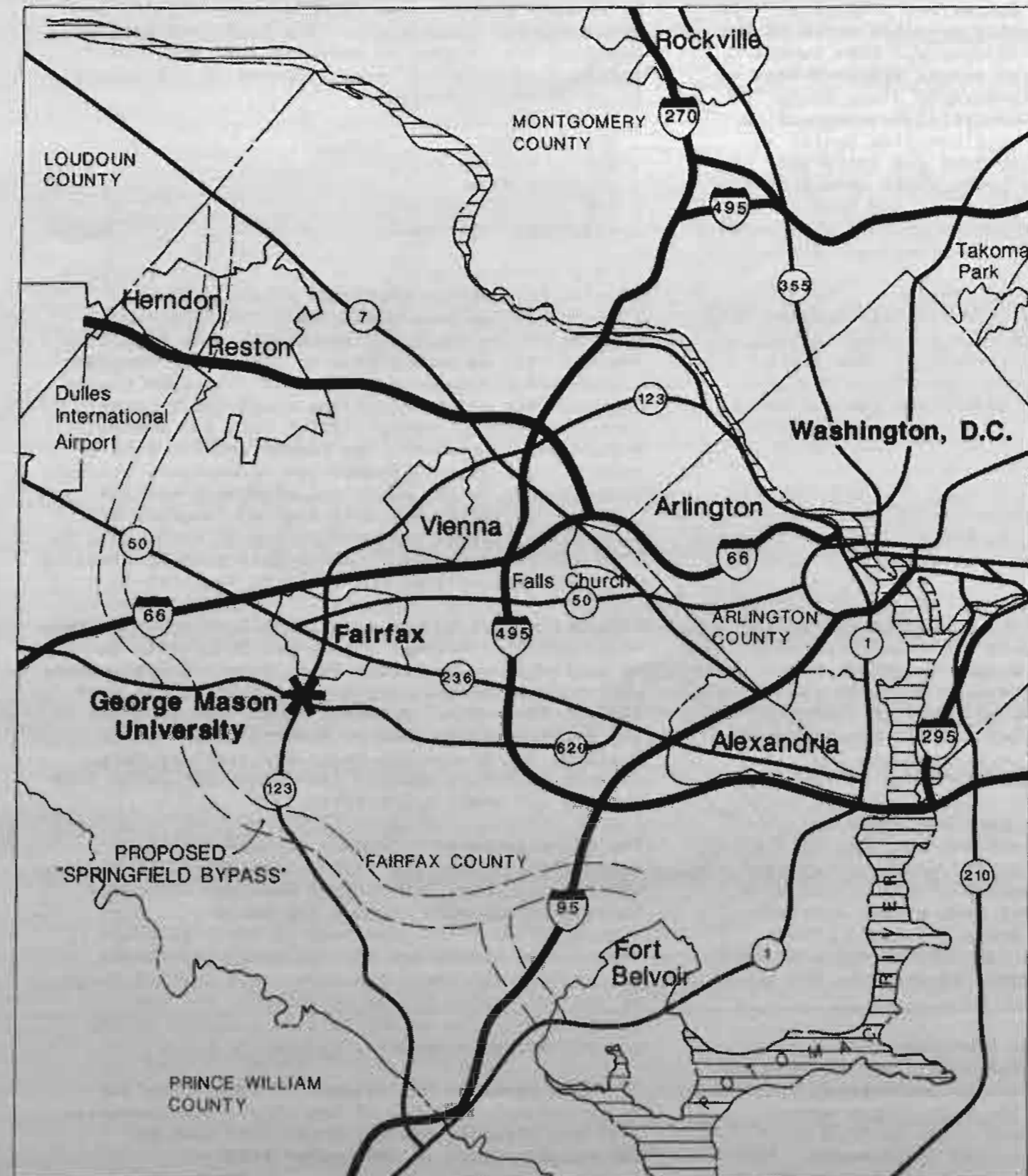
A. Community/Campus Context

George Mason University is located in Fairfax County approximately 20 miles west of the Nation's Capital (see Figure 2, Campus Location Map). Situated within the Washington, D.C. metropolitan area, the University is in close proximity to the center of the Federal government. However, the University has its closest ties to Fairfax County, one of the wealthiest, most highly educated, and fastest growing counties in the country, and the City of Fairfax which borders the campus to the north. Both of these jurisdictions, as well as the rest of Northern Virginia, benefit from the presence of the University by virtue of its educational opportunities, physical facilities, cultural and sports events, and economic support of the surrounding community.

According to the City of Fairfax 1983 Comprehensive Plan, 15% of the students enrolled in the University in 1981 resided within the City and another 41% resided in Fairfax County. With an increasing enrollment and commuter profile, increased traffic levels and increased housing demand have been apparent in the City and surrounding area.

Given the predominant commuter profile of the student body and the overall rapid growth in the County, a major concern of the City of Fairfax is traffic flow through the City, especially along Route 123 and University Drive. Route 123 currently experiences substantial backups at peak hours through the City. The City's current posture is to pursue establishment of by-pass roads around the core of the City, and to encourage the University to use Roanoke Lane as the main entry to campus and de-emphasize entry from the north and from Roberts Road.

Off-campus student housing concerns expressed by the City relate to two issues: the provision of adequate on-site control (maintenance and noise), as well as the quality of housing in terms of amenities and site improvements consistent with the surrounding neighborhood. The City has recently enacted a registration requirement for landowners who wish to lease their property.



Campus Location



FIGURE 2



Land uses surrounding the campus are primarily residential with single family detached units to the north, southwest and east of campus. More recent townhouse developments occur across Braddock Road to the southeast and more sporadically along Route 123 to the north of campus. Commercial development is limited to the University Mall Shopping Center at the intersection of Braddock Road and Route 123. A substantial amount of open space still exists in the vicinity of the campus to the west, and less to the south which is composed primarily of environmentally constrained areas; i.e., poor drainage and steep slopes.

With regard to the University's physical context within the community, there is a generous vegetative buffer around the campus perimeter in most areas. Exceptions occur on the north side of the campus along University Drive and around the fieldhouse at the intersection of Route 123 and University Drive.

B. Site Analysis

Physically, the campus is composed of two distinct sectors: the area east of Route 123 covering 373 acres, and the area west of Route 123 covering 210 acres.

East of Route 123, the northern portion of the campus is relatively flat and essentially forms a plateau where the initial campus buildings were constructed. More steeply sloped areas to the south are within Patriots Circle, adjacent to Braddock Road in the extreme southeast portion of the campus and in the southwest portion along Route 123. Pohick Creek and Rabbitt Run flank the central portion of campus within Patriots Circle and form the major drainage systems and open space corridors. They converge outside Patriots Circle adjacent to Braddock Road in the southwest portion of campus. Another drainageway of significance is located in the south central area within Patriots Circle. Natural woodland areas are found within Patriots Circle, following its circumference as well as the periphery of the campus property to the east, west, and south.

West of Route 123, the area developed for athletics/recreation is relatively flat and provides associated field space. A major drainageway exists in the central portion of the west campus area. Further to the west, the land rises to form a moderately sloped, wooded upland environment. The extreme western portion of campus is characterized

by steeply sloped areas which present significant environmental constraints. The Land Suitability Analysis Map (Figure 3) assesses the amount of constraints relative to development on the campus based on the following:

- . steep slopes
- . poorly drained soils
- . drainage ways
- . key woodland buffers
- . existing development.

In the developed portion of campus within Patriots Circle the woodland character of the natural environment has been maintained. As development expands to the south and southeast, more difficult terrain will be encountered as defined by steeper slopes and drainage corridors. At the same time, opportunities exist to utilize views and improve linkages between remote parking lots and academic buildings. Currently, the campus suffers from a lack of well-defined pedestrian connections between parking lots in the south and southwest and the campus core within Patriots Circle. Another key pedestrian linkage which currently is inadequate is that across Route 123 from the main academic/housing areas to recreational and athletic facilities.

Within the core campus area, conflicts exist between major building service access and pedestrian paths. Of particular concern are those pedestrian movements coming from the existing housing area on the west side to the central academic zone. The location of the service access road to Student Union II and Academic III-A also has major implications with respect to future options for pedestrian paths from parking and housing facilities.

The major gateways to campus along University Avenue/Pohick Lane and Braddock Road/Roanoke Lane and Roberts Road/ Shennandoah Lane are currently lacking in adequate signage and entry monumentation. The hierarchy of these gateways needs to be reinforced through entry treatments compatible with their function. The initial image of the University formed by visitors and the community will be established as a result of the gateway design elements.

The Site Analysis Map (Figure 4) identifies the major natural features of the campus and summarizes physical planning design issues that must be addressed as part of the master plan.

C. Land Use/Functional Organization

1. Existing Land Use - Existing land use acreage within the campus is documented in Table 1 and is displayed in Figure 5, Existing Land and Building Use. As indicated by the table, academic uses, administrative uses, student activities and student housing are located almost exclusively within the perimeter formed by Patriots Circle. However, approximately 60 percent, or 70 acres, of this campus core remains as open space/uncommitted land, along with 87 percent, or 184 acres, of the campus lands west of Route 123. Land uses west of Route 123 are dominated by playfields and sports facilities (outdoor track, fieldhouse).

Parking lots are located primarily outside of Patriots Circle east of Route 123 and exhibit the most land coverage of any single use on campus except open space/uncommitted land. Approximately 70 acres of parking currently are provided east of Route 123, with an additional 2.5 acres located west of Route 123. Two major parking lots are located within Patriots Circle in the northeast and southeast quadrants. However, their locations do not violate the physical integrity of the academic/administrative campus core.

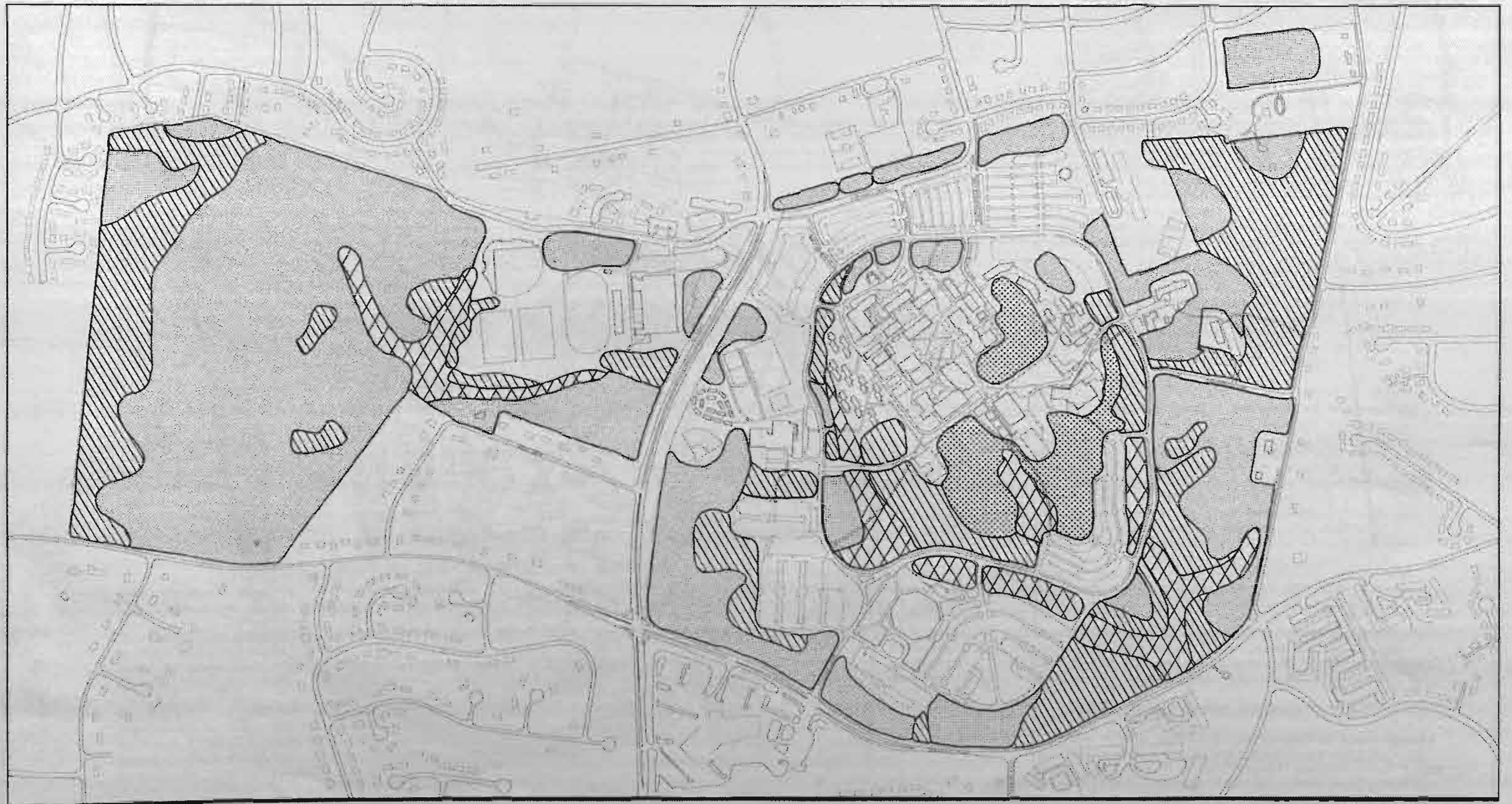
Table 1.
Existing Land Use

Land Use	Acres			
	Total Campus	Main Campus	West Campus	Within Patriots Circle
Education/General ¹	6.3	6.3	-	4.6
Housing ¹	3.0	3.0	-	2.4
Athletics/Recreation ¹	5.1	2.4	2.7	-
Student Services	1.9	1.9	-	1.9
Developed Open Space	35.9	34.1	1.8	26.7
Playfields	25.7	6.7	19.0	-
Parking	73.7	71.2	2.5	13.7
Open Space/Uncommitted	431.7	247.7	184.0	68.7
Land Area Total	583.3	373.3	210.0	118.0
Development Total ²	151.6	125.6	26.0	49.3

¹ Area of building coverage.

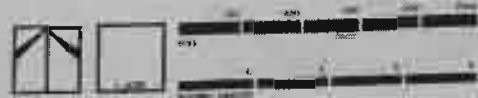
² Acreage totals include buildings, roads, driveways, walks, etc.






2. Functional Organization - The current organizational pattern on campus is easily perceived. Patriots Circle, the major formative element, establishes a loop road within which the central academic/administrative uses are located.



George Mason University
 Master Plan Fairfax, Virginia

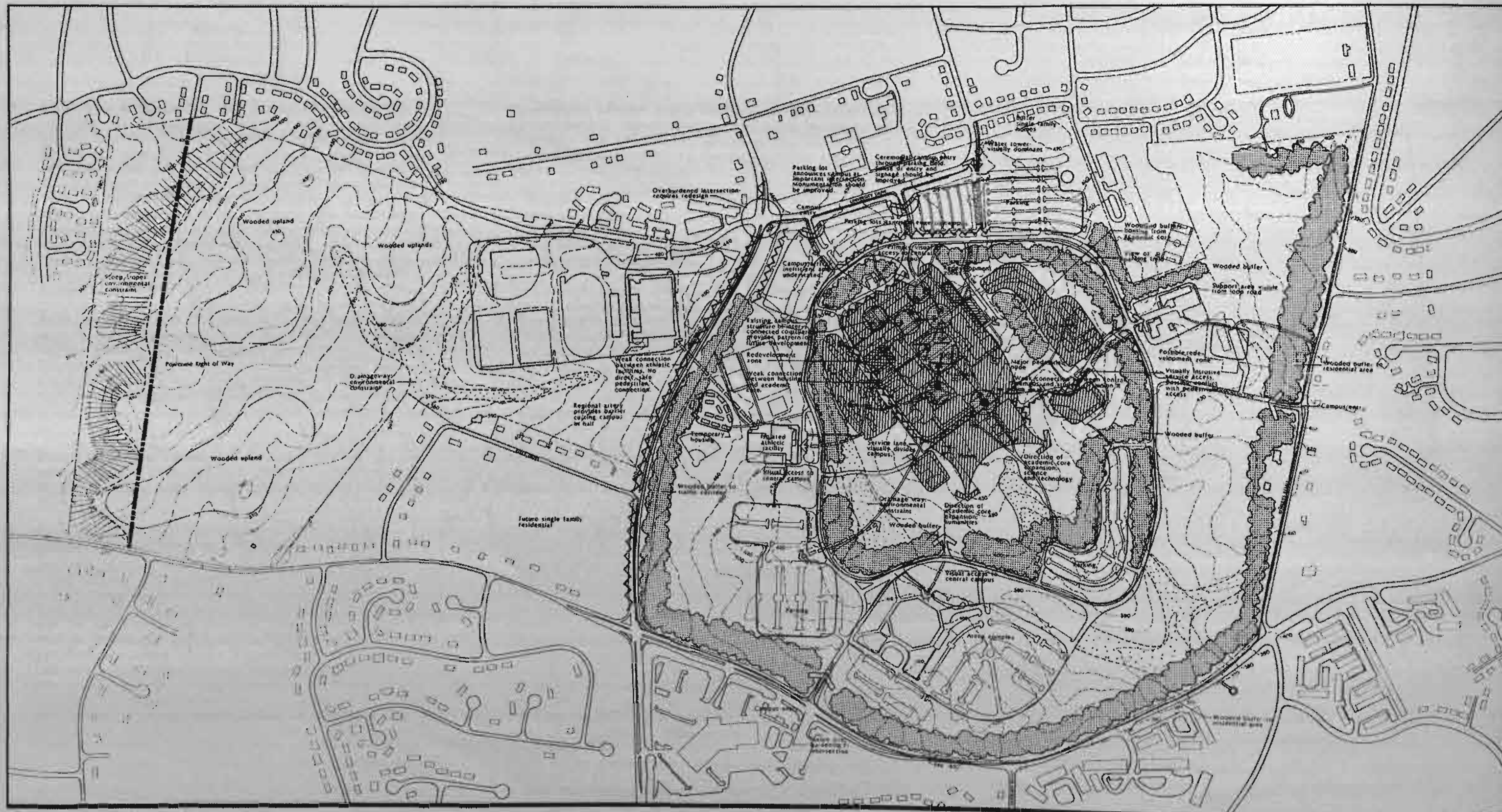
Land Suitability Analysis



- | | |
|--|---|
|  Existing Development |  Secondary Constraint Area |
|  Prime Developable Land |  Major Constraint Area |
|  Other Developable Land | |

Sasaki Associates, Inc.
 84 Pleasant Street Woburn, MA 02172
 MEA, Incorporated
 1112 Hemlock Avenue Wrentham, MA 01908
 Harkin and Anderson, Inc.
 1604 Soma Road Richmond, VA 23286

FIGURE 3



George Mason University
Master Plan Fairfax, Virginia



Site Analysis

- Major Drainageway
- Wooded Buffer
- Courtyard / Mall
- Vehicular Entry

Esaki Associates, Inc.
 64 Pleasant Street Watertown, MA 02172

MPA, Incorporated
 3112 Hennepin Avenue Minneapolis, MN 55408
 Hankins and Anderson, Inc.
 1604 Sova Road Road Richmond, VA 23264

FIGURE 4

Student housing is contained also within Patriots Circle on the periphery of the academic core. In recent years, the central campus has grown to the east and southeast with the addition of academic, student services and housing uses.

The development of the University's campus has proceeded in an orderly fashion since the establishment of the original four buildings (West, Krug, East and Finley). The introduction of 500 beds for student housing in 1977 within Patriots Circle adjacent to the campus academic core established a precedent that has carried the University through its current student housing supply of 1,500 beds. This relationship of housing to the academic core has directed the growth of academic/administrative space to the southeast.

Student Union I is located in the heart of the campus core in proximity to the Library and other academic buildings. Student Union II, when constructed in 1982, diffused the focus of student activities to the southeast on the edge of the existing campus. As the campus facilities continue to expand, Student Union II plays a key role in providing convenient food service and activity space for students.

The location of athletic and recreational facilities bridged the Route 123 corridor in 1982 with the opening of the Fieldhouse. The open space resources of west campus are now used for field space in association with support services for recreation, while the uncommitted land of the central campus within Patriots Circle provides room for expansion of academic/administrative and student services uses.

The location of the new 10,000-seat Patriot Center (opened in 1985) established the Roanoke Lane entrance from the south as a major public entry to campus. This facility, coupled with the Humanities Complex (under construction), which ultimately will contain a performance theatre, will likely shift the public "front door" of the campus to the Roanoke Lane entry area away from Pohick Lane.

D. Enrollment

Having examined the physical context and land use organization of the University, it is essential to

consider projected student enrollment in order to determine the needs for the physical development of the University. George Mason University has grown rapidly in its relatively short history, expanding from an initial student body of 17 in 1957, to a student body of 17,094 headcount in 1985. Table 2 charts enrollment growth of the University since its inception.

With regard to the University's physical context within the community, there is a generous vegetative buffer around the campus perimeter in most areas. Exceptions occur on the north side of the campus along University Drive and around the fieldhouse at the intersection of Route 123 and University Drive.

Table 2.
George Mason University Regular Session Enrollment 1957-1985

Year	Enrollment (Headcount)
1957	17
1964	365
1967	1,128
1978	10,767
1980	13,293
1984	15,548
1985	17,094

The University and the State Council of Higher Education in Virginia (SCHEV) have developed enrollment projections through the academic year 1996-97 which have been approved by the Commonwealth of Virginia. Based upon those approved projections, the University's Office of Institutional Planning and Research has extrapolated enrollment projections to the academic year 2010-11. Table 3 summarizes the SCHEV/OIPR projections.

Table 3.
SCHEV/OIPR Enrollment Projections 1986-2011

Academic Year	Head Count	FTE	FTE % Change
1986-87	16,820	10,702	—
1990-91	19,323	12,353	+13.4
1996-97	21,947	13,837	+10.8
2000-01	23,955	15,110	+8.3
2005-06	26,375	16,635	+9.2
2010-11	28,615	18,040	+7.8

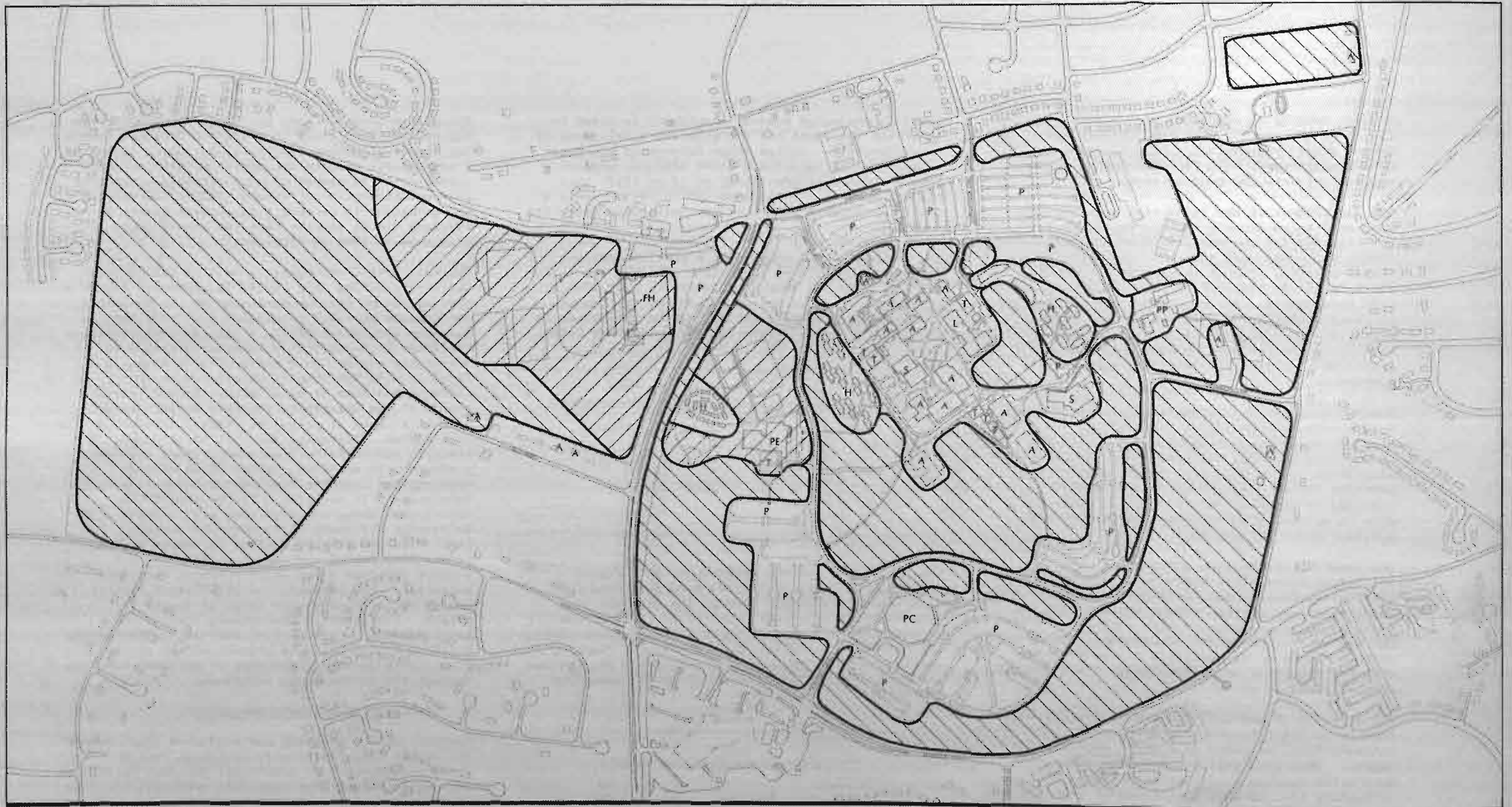
The growth in enrollment projected by OIPR for the University is contrary to projected national trends for higher education enrollment decreases caused by a substantial drop in the number of high school graduates. The number of high school graduates is expected to bottom out around 1993-94, decreasing approximately 16 percent from current levels in Virginia and 28 percent from the number that graduated in 1980 in Virginia.¹

The anticipated enrollment growth at George Mason University during this period is accounted for by a combination of factors dominated by the projected continuance of rapid population growth in the Northern Virginia region. First, as the population continues to dramatically expand, George Mason University as the State University of Northern Virginia will continue to experience an ever increasing demand on enrollment. Second, recent trends at the University indicate an increasing geographic base of potential student interest in the institution, increasing the pool of potential students and contributing to additional enrollment pressure. In addition, review of enrollment applications indicate that George Mason University increasingly is becoming a "first choice" institution among the applicant pool. Third, the University continues to improve the physical facilities and program options on campus with the recent addition of new academic, cultural and student services space which enhances enrollment potential. For example, the 10,000-seat Patriot Center has offered a wide array of events to attend. Programmatic innovations include the establishment of a School of Information Technology and Engineering which is closely allied to the flourishing hi-tech industries of Northern Virginia through the George Mason Institute.

E. Program Space Demand Analysis

Analysis of the existing and projected space demand for George Mason University indicates that a substantial amount of additional physical facilities are required today and that this need will continue




¹High School Graduates: Projections for the Fifty States (1982-2000), Western Interstate Commission on Higher Education, January 1984.



George Mason University
 Master Plan Fairfax, Virginia

Existing Land and Building Use

LAND USE

-  Athletics/Recreation
-  Open Space
-  Parking

BUILDING USE

- A Academic, Administrative
- PC Patriot Center
- FH Field House
- PE Physical Education
- H Student Housing
- L Library
- PP Physical Plant
- S Student Union
- T Temporary Facility

Sasaki Associates, Inc.
 64 Pleasant Street, Watertown, MA 02172

ARL, Incorporated
 3721 Orange Avenue, Alexandria, VA 22308
 Harkin and Anderson, Inc.
 1604 Spring Rise Road, Richmond, VA 23268

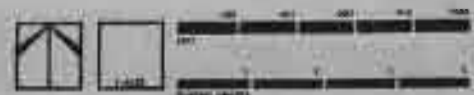


FIGURE 5

to grow. This conclusion is based on two factors: first, the projected growth in enrollment requires new physical facilities of all types; second, an existing shortfall of space exists on campus based on an analysis of existing enrollment and current space inventories compared to the general entitlement criteria established by SCHEV.

Table 4 summarizes the existing space inventory on campus, including those projects under construction.

Table 4.
Existing Space Inventory¹

EDUCATION AND GENERAL			
BUILDING	NASF	GSF	BUILDING USE
Finley Building	10,992	20,496	Administration
Krug Hall	22,923	31,978	Academic
West Building	9,496	18,385	Academic
East Building	8,070	13,110	Academic
Library I, II, III	92,710	140,600	Academic
Lecture Hall	4,910	6,990	Academic
Thompson Hall	43,942	71,957	Academic
Physical Education	45,080	53,787	Academic/Athletics
Robinson Hall	127,270	184,335	Academic
Central Heating & Cooling	5,956	6,814	Physical Plant
Maintenance	10,897	12,002	Physical Plant
Greenhouse	2,143	2,196	Academic
Academic III-A	55,720	83,585	Academic
George's Hall	4,468	6,098	Research
Other ²	25,000	38,517	Administration/Research
SUBTOTAL	469,577	690,850	OGSF
AUXILIARY ENTERPRISE			
EXISTING			
Student Union I	90,820	80,126	Student Services
Housing I	109,000	109,000	Residential
Housing II	63,000	100,000	Residential
Housing III	63,274	100,000	Residential
Student Union II	49,000	72,847	Student Services
Patriot Center	106,607	162,000	Athletics/Events
Fieldhouse	100,508	110,373	Athletics/Academic
SUBTOTAL	542,209	734,346	OGSF
TOTAL EXISTING	1,011,786	1,425,196	OGSF
UNDER CONSTRUCTION			
Humanities I	36,264	50,000	Academic
Science and Technology I	57,540	95,060	Academic
SUBTOTAL	93,804	145,060	OGSF
TOTAL EXISTING AND UNDER CONSTRUCTION	1,105,590	1,570,256	OGSF

¹ Does not include 93,320 GSF in temporary facilities or 131,273 GSF at Metro Campus
² Comprised of houses located on or adjacent to campus plus off-campus warehouse

1. Education and General Space - Including the Metro Campus, the University has an estimated 971,182 GSF (633,250 NASF) of education and general space existing or under construction. An additional 118,300 GSF is currently in the design phase. Based upon SCHEV's general entitlement guideline of 99 NASF/FTE student enrollment and the assumption that GSF = 1.58 NASF, the fall 1985 enrollment of 11,163 FTE would require 1,746,116 GSF (1,105,137 NASF). The current space inventory represents only 56% of the SCHEV guideline with a shortfall of 774,934 GSF (471,887 NASF).

Enrollment growth at the University will further strain the space inventory although the affects of demand will be somewhat alleviated if projects currently in the planning stages are funded and constructed in a timely manner. Table 5 combines enrollment projections and estimates of the growth in education and general space to provide estimates of the shortfall in space that the University may experience in the near future.

According to the OIPR projections, FTE enrollment would approach 15,000 in the year 2000 and would

Table 5.
Projected FTE Enrollment and Education and General Space (GSF)

	Academic Years						
	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94
E&G Space ¹	971,182	974,482	956,982	1,071,482	1,165,582	1,183,982	1,273,982
<u>Proposed Facilities</u>							
Security and Information	3,300						
Volatile Storage		2,500					
Krug Renovation		(20,000)	20,000				
Humanities II			115,000				
Finley Renovation			(20,500)	20,500			
Science & Tech II				92,000			
West Renovation				(18,400)	18,400		
P.E./Pool						40,000	
Library IV						50,000	
Warehouse							25,000
Science & Tech III							100,000
E & G Space	974,482	956,982	1,071,482	1,165,582	1,183,982	1,273,982	1,389,982
Guideline ²	1,742,362	1,803,679	1,866,873	1,932,256	1,970,892	2,002,489	2,026,578
Shortfall	767,880	846,697	795,391	766,674	786,910	728,507	627,596
% Guideline Achieved	56	53	57	60	60	64	69
FTE	11,139	11,531	11,935	12,353	12,600	12,802	12,956

¹ Existing space includes Metro Campus and facilities under construction as of 1/1/87
² GUIDELINE = 99 NASF/FTE X 1.58 GSF/NASF = 156.42 GSF/FTE

require 2,346,000 GSF (1,485,000 NASF) under the SCHEV guideline, or 1,374,818 GSF (851,750 NASF) in addition to the current space inventory. At 20,000 FTE, the space required to meet the SCHEV guideline would be 3,128,400 GSF (1,980,000 NASF), or 2,157,218 GSF (1,346,750 NASF) above the current inventory. In short, the University would need to construct 100,000+ GSF per year between now and the turn of the century to meet the SCHEV guidelines. Afterwards, the demand would decrease to about 50,000 GSF per year to meet the SCHEV guideline for 20,000 FTE approximately in the year 2015.

2. Student Services Space - The current inventory of student services space on campus includes Student Union I and Student Union II which total approximately 153,000 GSF (99,820 NASF). Under criteria utilized by other states, an existing demand for over 185,000 GSF (110,180 NASF) of student services space was established, which is 32,000 GSF (10,360 NASF) greater than that currently available on campus. As enrollment grows, the demand for student services space will grow concurrently. At 15,000 FTE, this translates to a total demand of 248,850 GSF (157,500 NASF), and at 20,000 FTE, 331,800 GSF (210,000 NASF) is required. Table 6 documents that student services space analysis.

Table 6.
Existing and Projected Student Services Space Demand (in gsf)¹

FTE	Total Space Demand**	Existing Space Inventory	Net Space Demand
11,163 (1985-86)	185,194	152,973	32,221
15,000	248,850	152,973	95,877
20,000	331,800	152,973	178,827

¹ Assumes 10.5 NASF/FTE for space planning, from "Facilities Planning Standards and Approval Procedures for New Jersey Public Colleges and Universities", and "State University of New York: Space Projection Criteria For Capital and Long Range Facilities Planning Purposes."

² Assumes 1.58 GSF/1.0 NASF for student services buildings.

3. Student Housing - Prior to fall, 1986, permanent student housing on campus totaled 1,000 beds. Student Housing I, occupied in 1977, provides 500 beds in apartment units in 9

two-story buildings. Residence Hall II, fully occupied in 1982, also provides 500 beds but offers dormitory rooms in 2 five-story buildings. The student housing currently provided on campus establishes a planning module of 200 GSF/bed (1,000 beds/209,000 GSF). Based on academic year 1984-85, the University provided housing for approximately 10 percent of the 9,822 FTE enrollment.

The University recently completed an additional 500 student beds in eight buildings configured in suite style. Based on the most recent enrollment in the fall of 1985 (11,163 FTE), the percentage of FTE students housed on campus is 13.5 percent.

Assuming the ratio of students housed on campus remains constant (13.5 percent of FTE) as enrollment grows, at 15,000 FTE an additional 525 beds would have to be provided. Enrollment growth to 20,000 FTE would likewise cause an additional demand of 1,200 beds over the housing currently provided.

Demand for student housing on campus has grown in recent years as evidenced by the overall application pool. Although George Mason University remains largely a commuter student institution and will continue to be in the near future, provision of increased on-campus housing

Table 7.
Student Housing Analysis

FTE	Housing Provided/FTE		Net Increase Over Existing On-Campus Housing	
	13.5%	25%	13.5%	25%
11,163 (1985-86)	1,500	—	—	—
15,000	2,025	3,750	525	2,250
20,000	2,700	5,000	1,200	3,500

opportunities may become a factor in achieving projected enrollment levels. Table 7 illustrates the resultant demand for student housing at different enrollment levels and ratios of students housed on campus.

F. Circulation and Parking

1. Circulation

a. Existing Conditions - Major arterial streets providing access to the University are Route 123 (Ox Road) on the west side of the main campus, University Drive on the north, Braddock Road on the south, and Roberts Road on the east (See Figure 6). The distribution of campus traffic utilizing these access routes is a function of the location of regional student/faculty/staff population concentrations, campus driveway locations, and peak hour capacity constraint conditions that may encourage more circuitous (but less time-consuming) travel paths.

George Mason University is well situated for regional access via numerous arterial streets connecting at or near the campus in all travel directions. Moreover, for many of these access corridors, particularly in the east-west direction, campus travel demand occurs in a directional pattern opposite to conventional commuter parks, resulting in more efficient utilization of available street network capacity and diffusing potential negative impacts from cumulative flows.

The internal campus circulation system focuses on Patriots Circle which acts as a loop road to intercept and distribute all traffic entering the campus. Essentially, the major uses of the campus, except parking, Patriot Center, the fieldhouse and physical education facilities, are located within Patriots Circle. This system provides good perimeter access and discourages cars in the central academic core. Further, it provides well defined access to major parking facilities on the periphery.

Direct service access is provided to buildings in the central core by several service roads which branch off from Patriots Circle. These service roads have become a major enforcement problem for the University as unauthorized traffic and parked vehicles threaten the safety of pedestrians and clog the routes intended primarily for service, delivery, and emergency vehicles.

b. Campus Circulation Needs - A traffic survey conducted on Thursday, November 5, 1981, prior

to the Patriots Circle completion, by Bellomo-Keller Inc., indicated a slightly greater orientation to the north and west for campus traffic distribution. In that survey, University traffic from these directions on Route 123, University Drive and Roberts Road amounted to 58 percent. Further shifts in this distribution will be affected chiefly by two factors. First, the greatest potential for new residential growth is located in areas to the southeast and southwest of the campus. Enrollment of commuting students will reflect this growth, producing a shift in the components of University access from these southerly directions.

Second, as the City of Fairfax, particularly its downtown, has grown, the conflicting mixed use of downtown area streets for through traffic and local service has overloaded the roadway system. This condition will encourage University traffic to seek alternate routes that avoid Route 123 and University Drive. While numerous proposals have addressed the traffic deficiencies of these roadways, the continued major use of downtown streets for through traffic results in an incompatible function. Thus, any roadway improvements program will need to provide for through traffic to bypass downtown via at-grade streets or highways. One such proposed improvement is the extension of Layton Hall Drive to Main Street and Roberts Road. Should this improvement be completed, Roberts Road will become a more heavily utilized route to the University and will provide primary circulation before and after events at Patriot Center and the proposed 2,000-seat theatre in Humanities III.

The effects of these two factors upon the University travel patterns are already occurring. A comparison of Thursday morning peak hour volumes in November of 1981 and 1984, performed by Kellerco Inc., indicates a significant increase in use of the Roberts Road entrance from 26 to 43 percent, with associated decreased use at other entrances.

Nevertheless, while Braddock Road and Roberts Road may be expected to attract a larger share of campus driveway movements, significantly expanded enrollment will mean a continuation of

substantial traffic magnitudes at the north entrance as well. Thus, roadway system improvements to support the campus should focus on the following areas:

- . Widening of Braddock Road with turn lane provisions and improved signalization at Route 123, Roberts Road and Roanoke Lane. One additional two-way driveway should be constructed connecting between Braddock Road and Patriots Circle.
- . Widening of Roberts Road with turn lane provisions at the University driveway.
- . The intersection of Route 123 and University Drive is currently the key traffic bottleneck and will continue to be even with shifts in campus travel patterns. This intersection and its approaches should be reconstructed to provide better capacity for both through and turning vehicles.

c. Regional Traffic Improvements - Several planned roadway improvements in the region could have significant impacts upon campus accessibility. Immediately adjacent to campus, Braddock Road is scheduled for improvements and widening by the Virginia Department of Transportation. The widening requires the acquisition of additional right-of-way on the north side of Braddock Road on University property. These planned improvements have potential impacts on the campus: the elimination of the buffer zone between parking lots and Braddock Road will be a negative impact, and the opportunity to improve entry conditions to campus from Braddock Road will be positive.

Another major regional improvement proposed is the Springfield Bypass. Conceived as a circumferential roadway extending from Route 7 north of Reston, southeasterly to US Route 1 south of Alexandria, this proposal should greatly improve north-south travel. In relation to campus access, it would provide alternate routing for traffic from the northwest, relieving the burden on Route 123 and University Drive.

The 1983 Comprehensive Plan for the City of Fairfax makes clear the intentions of the City

to promote bypass roadways on both the east and needs of students (resident and commuter), faculty, staff and visitors and the special requirements associated with event parking. Based on general numerical relationships among these user categories, planning studies often designate total parking supply as a percentage of student enrollment (headcount for FTE population). Moreover, a study by the Eno Foundation ("Access, Parking and Cost Criteria for Urban Universities"; 1969), discussed in the 1979 George Mason University Master Plan report, concludes that as University population increases, the parking space ratio decreases. This ratio demonstrates, for example, volumes of 0.3 to 0.4 spaces per student for a total population of under 10,000 students, and decreases to 0.1 to 0.2 spaces per student when population is between 20,000 to 30,000 students. west of the City in lieu of major improvements to internal north/south City streets. The Comprehensive Plan supports objectives to establish the Springfield Bypass, as well as suggests improvements and extension to Shirley Gate Road on the west. On the east, the Plan supports the improvement and extension of Pickett Road.

2. Parking

a. Existing Conditions - Current parking supply on campus is provided in a series of surface parking lots totaling approximately 6,000 parking spaces which are fairly equally distributed between the north and south sides of campus. Most of the lots are located along the outside perimeter of Patriots Circle which provides convenient access to all of the lots.

Additional new surface parking lots and the expansion of existing lots are currently in the design phase and may be under construction by mid-1987. These lots include Lot C (600+ spaces) in the southeast quadrant of the main campus, Lot P (260 spaces) near the Fieldhouse, and the expansion of Lots A (295 spaces) and Lot K (565 spaces) in the south and west portions of the campus, respectively.

b. Parking Needs - Parking at the University is made up of components serving the daily

Previous experience at the University correlates with the findings of the Eno Foundation study. Parking utilization data contained in the 1979 Campus Master Plan indicated a peak parking demand ratio of .34 spaces/student during the 1978-79 academic year when student enrollment was approximately 10,000 headcount. A 1981 study by the University indicated a peak utilization of .27 spaces/student for 13,700 students during the 1981-82 academic year.

Although the University will continue to serve primarily commuting students, the proportion of on-campus housing is expected to increase as a percent of student headcount. As enrollment grows, there will be greater justification for transit service improvements, including route expansions, increased frequency, and more feasible carpool arrangements for student access. All of these characteristics associated with a large campus operation will tend to decrease the parking space per student ratio. Moreover, further adjustments to parking demand will be directly influenced by University policies with regard to controls on available parking supply and use by students, parking fees, and participation in encouraging public transit.

Based on surveyed planning guidelines, continuing commuter nature of the University, empirical data collected at the University, and the absence of any significant changes in University parking policy, a parking ratio of 0.30 spaces per headcount student is recommended. A projected long-term parking justification for 9,000 total spaces at 30,000 headcount students (20,000 FTE) results, adding demand for 3,000 spaces over the current supply.

The peak weekday accumulation analysis does not include special events. Limiting parking to this magnitude is dependent upon the University scheduling special events to avoid coincidence with peak academic periods.

G. Open Space and Environmental Resources

1. Open Space - The open space resources currently found on the campus cover almost 75 percent of the total campus acreage as documented in Table 1 and illustrated on the Existing Land and Building Use map.

The open space system of George Mason University serves to sustain and enhance the campus by performing the following important functions:

a. Environmental Protection - The natural wooded areas that flank the campus core within Patriots Circle identify important drainageways and stream channels such as Pohick Creek and Rabbitt Run. Protection of these woodlands is critical to insure proper management of runoff and erosion control. Protection of natural woodlands on steeply sloping embankments and low lying areas will serve further to limit potential soil erosion and mitigate local runoff and siltation problems.

b. Buffer Zones/University Image - Natural woodlands border the University along its perimeter road system and are adjacent to Patriots Circle. These areas serve to insulate the campus from surrounding land uses and buffer it against the rapid urbanization of Fairfax County. This wooded perimeter assists in reinforcing the dominant image of the University carved out of the woodlands, a characteristic that should be preserved for future generations of students. Additionally, an attractive, generously proportioned and well maintained open space system creates a favorable academic environment for current and prospective students.

c. Campus Organization - The campus open space system, through elements defined below, plays a key role in organizing and unifying the campus structure. A sequence of open spaces helps link different campus zones and uses and provides an identifiable progression for both pedestrians and vehicles. The open space mall in front of the library now functions as the central organizing element on campus. A series of smaller courtyards and green spaces are linked to this central area. The open space system should provide the framework for future University growth, identifying building zones and use areas so that the integrity of the spatial sequence is retained.

d. Recreation - Open space serves to meet recreation demand in both formal, programmed athletic fields and courts and natural and landscaped areas suitable for informal play and passive recreation such as walking and

picnicking. Currently, the main recreational open space areas are found on west campus with limited availability of playfields east of Route 123, where areas for informal play and seating dominate the open space resources.

2. Environmental Resources - A review of existing environmental information presented in the 1968 and 1979 Master Plans indicated the major constraints to development include alluvial soils, seasonally wet soils, stream corridors and associated major drainageways. Less common, but also of concern, are slopes exceeding 10 percent, which present site planning difficulties with respect to pedestrian movement, grading and building orientation.

Stream corridors that trend north/south are located along both the eastern and western perimeters of Patriots Circle. They converge in the extreme southeast portion of the campus. Associated with these corridors are alluvial soils and seasonally wet soils which exhibit constraints to building.

Slopes greater than 10 percent are sporadically located through the campus, but occur frequently in association with the drainageways and in the extreme western portion of the west campus.

The Site Analysis Map, Figure 2, illustrates the environmental resources described above.

H. Utilities

Mapped information illustrating the existing conditions of the utility systems described below are included on each of the utility plan maps located in Section III (Master Plan) of this report.

1. Water Distribution - Water service for fire and domestic use to the main campus is provided by the City of Fairfax via a 12-inch main which enters the campus along Rappahannock Lane. This main is connected to a 4-million gallon storage tank located on the northeast corner of the campus. The tank floats on the University system and assists in pressurizing the system and providing the needed capacity. Campus buildings are individually metered.

An Engineering Report on Water Distribution for the University, written in 1973, proposed a

12-inch loop system that would basically follow Patriots Circle. The outer 12-inch loop would be interconnected with a network of 8-inch lines as needed to serve the expansion within the loop.

In 1977, two independent segments of the 12-inch loop were constructed. The northeast segment is tied directly to the 12-inch city supply line and storage tank. The main continues along Patriots Circle to the intersection of Rivanna Lane. Near this intersection an 8-inch connection is made to the city main in Roberts Road. Both ends of this 12-inch segment are connected by 8-inch lines to the inner campus network.

The southwest segment which was constructed in 1977 begins at Patriot Center and follows Patriots Circle to the northern end of Student Housing II. This segment is linked at its midpoint by a 12-inch main and at its northern end by an 8-inch main to the inner campus network.

No work has been done since 1977 to strengthen the 12-inch loop system which is vital to provide adequate fire protection for future growth.

2. Heating and Cooling Distribution - A central plant provides the heating and cooling requirements for most of the main campus buildings. This facility is located in the northeast section of campus just outside Patriots Circle. As the campus began to grow, the central plant concept with an underground distribution system was adopted as a cost-effective way of providing heating and cooling to the new buildings. The framework for this system is established by 8-12 inch heating/cooling lines. Although some of the older buildings have been connected to the campus distribution system for chilled water, most are still heated by individual boilers.

The central plant is at its capacity and will not be able to accommodate any further expansion of the campus until additional heating and cooling capacity are added. Since the plant heating expansion design is currently under contract, the plant heating and cooling capacity will be expanded further to meet campus needs. However, any facilities planned west of Route 123 should not be part of the existing central chiller/boiler system, similar to the existing fieldhouse which has its own heating/cooling plant.

3. Sanitary Sewer - The campus sanitary sewer system follows the natural drainage swales that divide the east and west halves of the campus. The two 10-inch mains that follow these swales come together near Braddock Road, pass through a metering device, and cross the road in a 16-inch ductile iron main. Both mains have existing reserve capacity based on current development demands.

The extreme northeast sector of campus, like west campus across Route 123, is in a different natural drainage basin than the main campus core. Should this area require sanitary sewer service based on the campus plan, a choice would have to be made to either pump back to the main system or allow gravity flow through the existing subdivision across Roberts Road.

A 12-inch main currently serves the west campus fieldhouse facilities and has ample capacity for additional sewage flows.

4. Storm Drainage - The campus storm water system empties into two drainage swales that follow closely the east, west and southern portions of Patriots Circle. These two swales converge near Braddock Road and pass beneath the road and through a 72-inch pipe culvert. Dividing the drainage from the campus into east and west areas, the swales provide adequate drainage relief for the campus. A minimum amount of piping is required.

As campus development continues, the need for more storm water retention facilities will have to be addressed. Considering the differences of imperviousness and flow characteristics of the soils within a wooded area versus the pavement of a parking lot, the amount of rainfall runoff from an improved area will increase approximately 400 percent. This increase must be retained on site and released at a rate that does not exceed the runoff from the pre-improved condition. An alternative to retention is to make downstream channel improvements to assure that the channel is adequate to handle the increased flows without flooding adjacent properties.

5. Electric Service - A 34.5 KV underground distribution loop has been recently completed. This loop is routed along Patriots Circle and has

a capacity of 35.85 MVA. The loop is owned and maintained by Virginia Power.

Based on the present 500 KVA per year load growth of the University, the total demand at the end of a 20-year period would be 10 MVA which is 27.9 percent of the electrical service capacity, leaving a large residual service capacity.

6. Communications - The George Mason University campus facility and student communication system comprises a broad band Local Area Network system (LAN) which is distributed underground through the campus by a coaxial cable network. This cable network system provides voice, video and data media. The main equipment is located in Thompson Hall which is dedicated as the main computer center for the University. The closed circuit television studio is located in the Academic III Building.

7. Telephone System - The existing telephone service for the University is provided by a 3,600 pair cable from Braddock Road. The present remaining telephone circuit capacity is approximately 50 percent. The remaining capacity is estimated to be sufficient to handle the existing University building telephone requirements for another 5 to 10 years.

8. Energy Management System - The University currently has an HVAC Analog Energy Monitoring System which provides status, temperature readings, and ON/OFF Control of HVAC equipment on campus.

III. Master Plan

A. Program Assumptions

Consistent with the goals established for the Master Plan the program accommodated by the plan is based on an enrollment of 20,000 FTE (30,000 headcount). This enrollment level is clearly a long-term projection, envisioned to be reached well beyond the year 2000. The implementation of the Master Plan program will be incremental in nature and will include new construction, reprogramming existing facilities, renovations and displacements (demolition). The program elements which follow will satisfy the basic program needs, commit undeveloped land resources and establish the overall parameters for development based on the 20,000 FTE enrollment level.

Comparison of the existing campus development to total space demand and the resultant demand for net additional space at 20,000 FTE reveals that the University faces extraordinary demands for new facilities in the future. In part, this demand is caused by a significant existing shortfall of educational and general space on campus.

Table 8.
Space Demand Summary at 20,000 FTE (GSF)

Buildings	Existing (1987)	Total Demand	Net Additional
Education and General	971,200	3,128,400	2,157,200
Student Services	153,000	331,800	178,800
Student Housing*	300,000	1,000,000	700,000
	(1,500 beds)	(5,000 beds)	(3,500 beds)
Building Total	1,424,200	4,460,200	3,035,200

Parking

Parking Spaces**	2,400,000 (6,000 spaces)	3,600,000 (9,000 spaces)	1,200,000 (3,000 spaces)
------------------	-----------------------------	-----------------------------	-----------------------------

* Assumes 200 GSF/bed
** Assumes 400 GSF/space

B. Land Use/Planning Concepts

The Master Plan is founded on the concept that the existing overall land use pattern is appropriate and valid for the University. That is, the academic/administrative/student services core will

be located within Patriots Circle; student housing, parking and recreation will be located along the perimeter of the campus; and significant amounts of open space will be maintained throughout the developed portions of campus. Patriots Circle will continue as the major organizing element for the overall campus development by functioning as the primary circulation loop and reinforcing the demarcation of land use zones.

The Master Plan establishes well defined land use sectors (see Figure 7). This is achieved by maintaining the integrity of existing land uses and creating new areas of development that exhibit the critical mass necessary for establishment of an easily perceived organization pattern. The plan recognizes that while the University currently has a substantial undeveloped land resource, new development should occur in an efficient pattern that maximizes the functional relationships to existing campus facilities and maintains options for long-term expansion. To that end, future academic/administrative development is recommended to occur in a slightly more intensive manner by using larger building modules than currently exhibited by buildings in the academic/administrative campus core. This is achieved by establishing a building prototype that has 4-5 floors above grade, a programmable basement level and a typical footprint of 20,000 GSF. In addition, the plan recommends the re-development of selective sites within the existing core development that are currently underutilized.

The plan locates academic, administrative and student housing functions east of Route 123. The area west of Route 123 is planned for expansion of athletic/recreational space and an area for future development. The area within Patriots Circle will remain the academic core of campus. A future academic node between Patriots Circle and Route 123 will provide a functional "bridge" to the west campus uses. Housing and parking uses will be located on the periphery of the academic/administrative core within Patriots Circle. In this way, the integrity of a quality pedestrian precinct can be maintained while still allowing convenient pedestrian access to housing and parking.

The Master Plan recognizes that the Roanoke Lane entry to campus will become increasingly dominant as the public entry to campus. In part, this is a

result of the 10,000 seat Patriot Center and the performance theatre that will be contained within the Humanities Complex. However, the plan recommends that the Pohick Lane entry from the north be physically improved and remain as the symbolic campus entry to the original four buildings of campus (Krug, Finley, West and East).

C. Building Program

The building program for the Master Plan is categorized into four major types of facilities: Education and General, Student Services, Student Housing and Athletics and Recreation.

1. Education and General - The Master Plan accommodates a total of 3,128,400 GSF (1,980,000 NASF) of education and general space on campus; 2,157,200 GSF (1,346,750 NASF) of that amount is additional space above that currently provided on campus.

New buildings which house education and general functions will be located as extensions to the existing academic/administrative development within Patriots Circle. This will consolidate the academic and administrative centers on campus and maximize the functional relationships between uses. Two quads will be formed extending to the southeast from the Humanities Complex and Science and Technology I. To provide for long-term academic needs, a new academic quad will be located just outside Patriots Circle in the southwest sector of campus. This will provide for general educational needs or perhaps, given its peripheral location, these facilities will provide for additional specialized or professional school needs.

Additional educational and general space will be provided through the following actions:

- Construction of substantial additions to the Library, Academic III and the Physical Education Building.
- Redevelopment of the Lecture Hall building site to accommodate more intensive academic development.
- Reprogramming of Student Union I into academic uses.
- Replacement of temporary trailer facilities southwest of the West Building with a permanent academic building.

The new buildings housing education and general space have been strategically located to form logical extensions to the existing courtyards and pedestrian walkway system. In this way, the organizational pattern of the basic instructional facilities will continue to be easily understood and well defined.

2. Student Services - Student services space currently provided by Student Union I and Student Union II, 153,000 GSF (99,820 NASF) falls short of the space planning guideline for this type of space by almost 33,000 GSF (17,400 NASF). With projected enrollment increases to 20,000 FTE, the net additional space demand increases to almost 179,000 GSF (110,200 NASF). The Master Plan provides for this space need by substantially expanding the Student Union II facilities and proposing a new Student Union building. Under this scenario, portions of Student Union I will be reprogrammed into academic space and Student Union II will act as the main contract food service facility on campus due to its close proximity to existing and proposed student housing.

The new Student Union building included in the Master Plan is located between the Humanities Complex and Student Housing I. In this location, student services will be geographically balanced on campus. The role of the new Student Union would focus on overall student services as well as including the bookstore, conferences and meeting facilities and specialized food service. In conjunction with the Humanities, which will ultimately contain a theatre for public performances, and the Patriot Center, the new Student Union building will reinforce the southwest quadrant of campus as an area of public activity and community services offered by the University. To that end, the new Student Union building also offers an opportunity for distinctive architectural treatment.

3. Student Housing - The provision of an additional 3,500 beds on campus is accommodated by the Master Plan east of Patriots Circle, both north and south of Shenandoah Lane. This will bring the permanent on-campus student housing total to 5,000 beds.

In this location, the new student housing will be advantageously sited on relatively level terrain. This allows recreational open space for informal

play and programmed outdoor recreational spaces (courts, fields) to be easily located within and around the housing development. This location will also place new student housing within reasonable walking distance of the academic core of campus and it will be convenient to student services (including expanded food service) provided by Student Union II.

The student housing development on campus will provide for a variety of lifestyles (single students, married students, graduate students, etc.). This will be accomplished by establishing sectors within the overall housing area for varying types of housing. The proposed housing will be in three- to four-story modules which will accommodate both suite and apartment style housing.

4. Athletics and Recreation - Increases in enrollment and the increasing percentage of students housed on campus in the future will create additional demand for areas for informal play and active recreation. The Master Plan expands the existing field space resources on west campus to provide for practice by intercollegiate team sports, instruction, intramural sports and informal play. East of Route 123, the Master Plan maintains the existing improved field space and courts and greatly expands outdoor green areas for informal play and intramurals. A portion of the field expansion will be located to the north of the student housing also on Roberts Road. Field space and courts should increasingly be provided with lighting and durable surfaces to increase the use, duration and intensity of such facilities.

The Physical Education Building will be expanded and include a pool complex as a substantial addition to the south side of the existing building. This will provide for improved instructional space as well as indoor recreation and swimming competition. The Patriot Center will continue to provide a venue for major spectator events (volleyball, basketball) and varsity practice.

5. Future Development - The Master Plan has focused on the goal of providing physical facilities for an enrollment of 20,000 FTE. If growth beyond that goal is desired, the University will have several options for the expansion of its physical facilities. One option would be to develop the area west of Route 123. The Master Plan map indicates a "land bank" for future

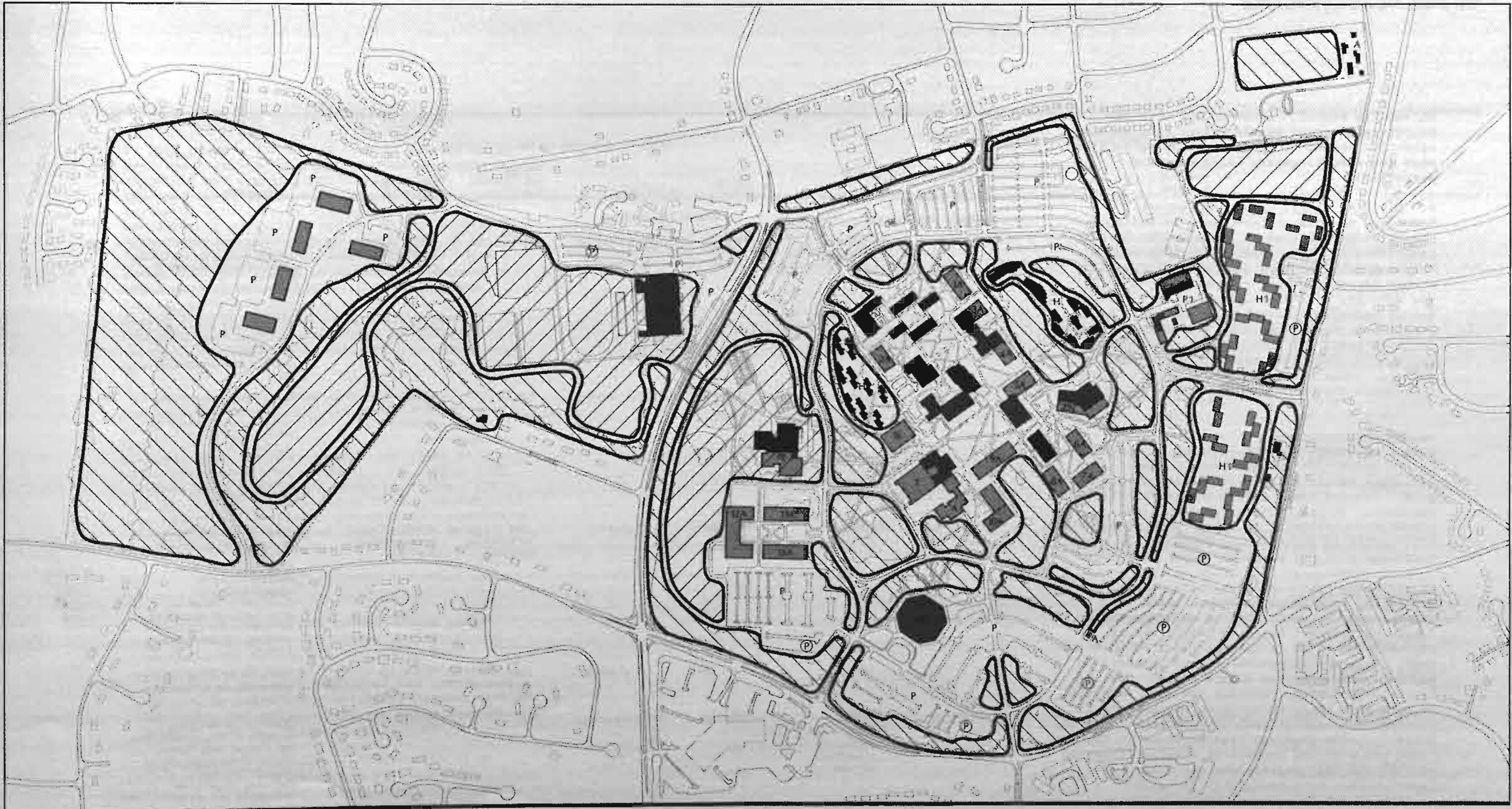
development west of the existing ballfields and track. The area shown on the map would accommodate 500,000 GSF with additional expansion possible. An access road connecting University Drive with Braddock Road would serve such development. Other options that would be available to the University include:

- . Demolition of old, low density structures and replacement with new, high density structures.
- . Decking of surface parking lots for the provision of new parking and/or buildings over existing parking lots.
- . Development of off-campus land owned by the University or to be purchased in the future.
- . Consideration of a satellite campus located elsewhere in Northern Virginia.

6. Building Design Guidelines

a. Unity Between Old and New - Central to the idea of achieving a unified design for the campus is the need to develop clear ties between new and existing buildings. These ties should be visual and functional. Visual ties involve building form defined in six fundamental aspects: size, shape, color, texture, directionality and location. Buildings which possess similar aspects of form will be perceived as a unified group. The more aspects that bear similarity, the greater the sense of unity there will be. The basic goal of new architecture on the campus should be to enhance the visual unity of the campus. No one aspect of form is responsible for visual unity; rather, a combination of factors unique to each situation will result in a compatible composition. For example, the original four buildings on campus, Finley, West, East and Krug, form a unified image based on a consistency of all six design features. The main library quadrangle is an example where the aspects of shared building location and alignment around the quadrangle space exert a unifying influence in spite of considerable differences in size texture and building shape.

These examples suggest that while the aspects of building form are interactive, some play a more important role than others on the



George Mason University
 Master Plan Fairfax, Virginia

Land and Building Use Plan

- BUILDING USE**
- A Academic/Administrative
 - PC Patriots Center
 - FH Field House
 - H Student Housing
 - PE Physical Education
 - L Library
 - P Physical Plant
 - T Theatre
 - S Student Union

- LAND USE**
- Existing Buildings
 - Proposed Buildings
 - Athletics/Recreation

- Undeveloped Open Space
- Existing Parking
- Proposed Parking

NOTE: NUMBERS (101-154, 155-200, 101 AND 102) INDICATE BUILDING CODE FOR BUILDING DESIGN GUIDELINES, TABLE 4

Sasaki Associates, Inc.
 64 Pleasant Street Watertown, MA 02172

ASRA, Incorporated
 3112 Hennepin Avenue Minneapolis, MN 55408

Harris and Anderson, Inc.
 1604 Santa Rosa Road Richmond, VA 23268

FIGURE 7



University campus. Accordingly, with new buildings proposed by the Master Plan primary attention should be given to building location, size and directionality (alignment and proportion).

b. Building Shape, Color and Texture -

Secondary aspects of form, such as building shape, color and texture, should also be made compatible with the traditional standards of University buildings. General building shape should be rectangular or square.

The majority of the existing campus buildings are of relatively recent construction. An overall vocabulary has been established which includes brick and pre-cast concrete exterior (with brick dominant) materials with anodized windows. This vocabulary has been maintained throughout the campus except in Student Union II.

c. Facade Proportion - Directional aspects of campus buildings include building alignment and facade proportion and expression. New buildings should align with the pedestrian grid. New buildings should be essentially horizontal in proportion, and the facade expression horizontal as well. This feature will assist in successfully blending the new buildings with the original campus buildings.

d. Building Size - Building size should be controlled to maintain a common scale relationship between existing and proposed campus buildings. Building height should typically be three to five stories, or 40 to 60 feet. Only special architectural elements in key landmark locations should exceed this limit. The Library provides the most important example of a landmark building where vertical elements are appropriate. Of the new buildings, the proposed Student Union or the final phase of the Humanities Complex (theatre) present the most appropriate and best opportunities to successfully integrate vertical focal elements in building design.

TABLE 9. BUILDING DESIGN GUIDELINES

Building	Use	Approx. ² GSF	Height	Approx. 1st Floor Elevation	Building Material	Comments
Academic and General						
1A	Academic, administration, lecture facility	100,000	3-4 stories	450	Brick, white architectural concrete	<ul style="list-style-type: none"> Building will be part of campus entrance. Quality architectural statement desired. Compatibility to adjacent original building complex. Compatibility in scale and building materials. Possible use of arcade. Service off Chesapeake Lane.
2A	Academic, classroom, administration	100,000	3-4 stories	430	Brick, white architectural concrete	<ul style="list-style-type: none"> Building should relate to both original building complex and Thompson Hall. Frame edge to new academic quad. Principle entrance from new academic quad, secondary entrance from Aquia Lane. Service off Aquia Lane.
3A	Library addition	50,000	3 stories	same elevation as existing building	Brick, white architectural concrete	<ul style="list-style-type: none"> Match scale and material of existing (original) library building. Allow entrance from Chesapeake Lane (dormitory) side. Relation in material, architectural detailing to new building #1A. Service off Chesapeake Lane.
4A	Library	100,000	5 stories	Same elevation as existing building	Red brick	<ul style="list-style-type: none"> Match to existing tower additions to original library.
5A	Academic, science and technology classrooms, offices	110,000	3-4 stories	440	Brick	<ul style="list-style-type: none"> Addition to existing science building, modulate new facade into larger bays, create interest on pedestrian level. Building to provide enclosure and screening for existing service area. Grade change across building: 3 floors uphill side, 4 floors downhill side. Pedestrian entrance uphill, service adjacent to service entrance for Academic IIIA.

The following table (Building Design Guidelines, Table 9) is keyed to the Land and Building Use Plan Map (Figure 7). The table identifies the buildings proposed by the Master Plan and describes the overall architectural intent and design features recommended for each of the proposed buildings.

D. Open Space and Environmental Resources

1. Open Space - The Master Plan is founded on an open space system that will provide the essential structure and organization to the campus. While the open space system will provide visual and aesthetic benefits, it will also support recreational activities and act as the conduit for pedestrian movement through campus and, in certain cases, emergency/service vehicle access. Open space will also afford an appropriate measure of environmental protection for natural systems. Finally, the open space system provided by the Master Plan will respond to the basic need of improving the spatial quality of the University by establishing distinctive and inviting campus open space areas.

The major feature of the open space component of the Master Plan is the establishment of an open space quadrangle adjacent to the northeast of the Humanities Complex. This mall will be framed by both existing and new academic buildings in a major pedestrian crossroads area of campus. Of generous proportion, this space in conjunction with the existing library quad will form the major open space amenity within the developed portion of campus and will provide an area that is both memorable and functional.

The open space strategy includes two other major features, as follows:

- . maintain a substantial woodland/open space buffer zone around the campus periphery, and
- . maintain key woodland sites within the developed portions of campus to enhance the existing woodland character of the campus and to provide appropriate screening between buildings and between land use types (example - parking lots and academic buildings).

2. Environmental Resources - Maintenance of a natural woodland buffer system will provide assistance in campus stormwater management and protect existing natural stream systems. The Master Plan will protect the existing drainage systems of Pohick Creek and Rabbitt Run within Patriots Circle and the major natural drainage corridors west of Route 123. Two retention ponds will be included to assist in stormwater management as well as providing opportunities to create water feature amenities on campus. Most

TABLE 9. BUILDING DESIGN GUIDELINES

Building	Use	Approx. ² GSF	Height	Approx. 1st Floor Elevation	Building Material	Comments
Academic and General						
6A 7A 8A	Academic, science and technology	100,000 each	3-4 stories	6A - 430 7A - 420 8A - 420	Predominately red brick, some architectural concrete to modulate facades	<ul style="list-style-type: none"> . Development of new science and technology quadrangle. . Entrance to buildings off quadrangle, service corridor taken off existing "B" lot. . Retain woodland setting - minimal clearing. . Buildings sited to relate to changes in grade, minimize grading.
9A	Academic, classrooms, offices	200,000	4 stories	440	Brick and white architectural concrete	<ul style="list-style-type: none"> . Major new academic building forming strong edge to new academic quad. . Minimum clearing around wooded southern edge. . Significant architectural statement. Articulated facade for visual interest. . Inviting pedestrian level.
10A	Academic, classrooms, office	200,000	4 stories	425/415	Brick, white architectural concrete	<ul style="list-style-type: none"> . Building should address edge of campus, relationship to arena and entrance to campus from arena area. . Building should step to accommodate grade change. . Pedestrian entrance from new courtyard between Humanities building, service from down hill side. . Minimal clearing around wooded southern and eastern edges.
11A 12A 13A	Academic	200,000 300,000 200,000	4 stories	430 435 430	Red brick, white architectural concrete	<ul style="list-style-type: none"> . Major new buildings to frame new academic quadrangle. . Buildings should have similar architectural vocabulary and be compatible with other campus academic buildings. . Classical assemblage of buildings should be reflected in building architecture. Use elements such as porticos, arcades, etc. . Service area off revised K lot. . Quadrangle should align with retention/amenity pond across Patriots Circle.

prominent will be a pond in front of the Humanities Complex public entry, the other will be on the west side of Route 123.

New buildings proposed by the Master Plan have been sited in such a manner that they avoid disruption of natural drainage patterns, steep slopes and known archaeological sites.

3. Landscape Concept/Open Space Plan - The Landscape Concept/Open Space Plan (Figure 8) identifies three basic categories of open space resources on campus which follow.

a. Landscape Buffer - These areas will include existing woodland buffers. They will play crucial roles in environmental protection by insulating natural drainage corridors and controlling storm water runoff. Additionally, wooded buffers help maintain the woodland campus image and provide screening for the campus from surrounding land uses. Within the campus, buffers screen undesirable visual elements or assist in delineating different campus land use zones.

b. Informal and Recreational Open Space - These areas are defined by open lawn, large landscaped areas and general field space. They provide space for programmed and informal active or passive recreation, serve as transition zones between both the buffer areas at the campus perimeter and the formal landscaped areas at the campus core. Slopes in these spaces generally should not exceed 8% with proper grading. Plant materials should be used to frame vistas and visual corridors and defined larger, usable spaces.

c. Formal Landscaped Open Space - These are the most intimate, sheltered and well defined spaces on campus. They serve as courtyards, entrance points, both as final gateways to campus and arrival of areas at buildings and campus facilities. They function essentially as "outdoor rooms", accommodating pedestrian circulation and gatherings and providing opportunities for outdoor displays of artwork. Site design features such as outdoor furniture, paving patterns, ornamental plantings and lighting are of particular importance to the success of this space.

TABLE 9. BUILDING DESIGN GUIDELINES

Building	Use	Approx. ² GSF	Height	Approx. 1st Floor Elevation	Building Material	Comments
<u>Academic and General</u>						
<u>Student Services</u>						
1S	Student Union	100-120,000	3-4 stories	430	Red brick, white architectural concrete	<ul style="list-style-type: none"> Building design should acknowledge grade change by stepping down slope. Uphill edge should be 3 stories with main entrance off new plaza formed by Student Union, Robinson and Humanities building. Major pedestrian walkway adjacent to southern edge of building. Secondary entrances along this edge. Facade should have visual interest at pedestrian level.
2S	Student Union	45,000	3 stories	(existing)	Red brick and concrete (existing is concrete and tan concrete block)	<ul style="list-style-type: none"> Building expansion to existing S.U. II. Attempt to establish design vocabulary consistent with other campus buildings.
<u>Housing</u>						
H1	Residential Complexes	700,000	3-4 stories	Varies	Concrete and red brick with wood trim	<ul style="list-style-type: none"> Various building unit sizes for suites and apartments. Larger buildings to be congregates of smaller units. Units to contain approximately 70 beds each. Courtyards within each complex. Areas on perimeter of complexes to remain as natural woodland.
<u>Physical Plant</u>						
P1 P2	Physical plant warehouse and chiller/boiler expansion	40-50,000	1 story	420	Dark metal panel	<ul style="list-style-type: none"> Keep in same building vocabulary as existing physical plant. Screen from proposed adjacent residential uses and Patriots Circle.

¹ Note: Building codes are keyed to Figure 7., Land and Building Use Plan.

² Note: In general the GSF space estimate assumes a programmable basement level.

The following table (Landscape Concept/ Environmental Protection, Table 10) is keyed to the Landscape Concept/Open Space Plan Map (Figure 8). It identifies the categories of open space and locates discrete areas on campus that are components of the plan. Finally, the table describes the function, design intent and recommended action for each of the identified locations.

A Recommended Planting List by landscape zone type is contained in the Appendix.

4. Landscape Design Guidelines - The open spaces that define the campus are comprised of more detailed landscape elements. These elements - plantings grading, site finishes, signage, and lighting - often are determining factors in the attractiveness and usefulness of a particular open space. The following guidelines are intended to provide a framework for future detailed design decisions undertaken at the project level.

a. Plantings - Plant materials play a key role in the information and liveability of outdoor spaces. In general, plants may be used to create vistas and reinforce visual axis, reinforce spatial organization, screen undesirable uses, control erosion and provide environmental protection. The following identifies the overall use of plant materials in each of the open space categories. The appendix that follows provides a list, by category, of plant species that may be considered for use at the University.

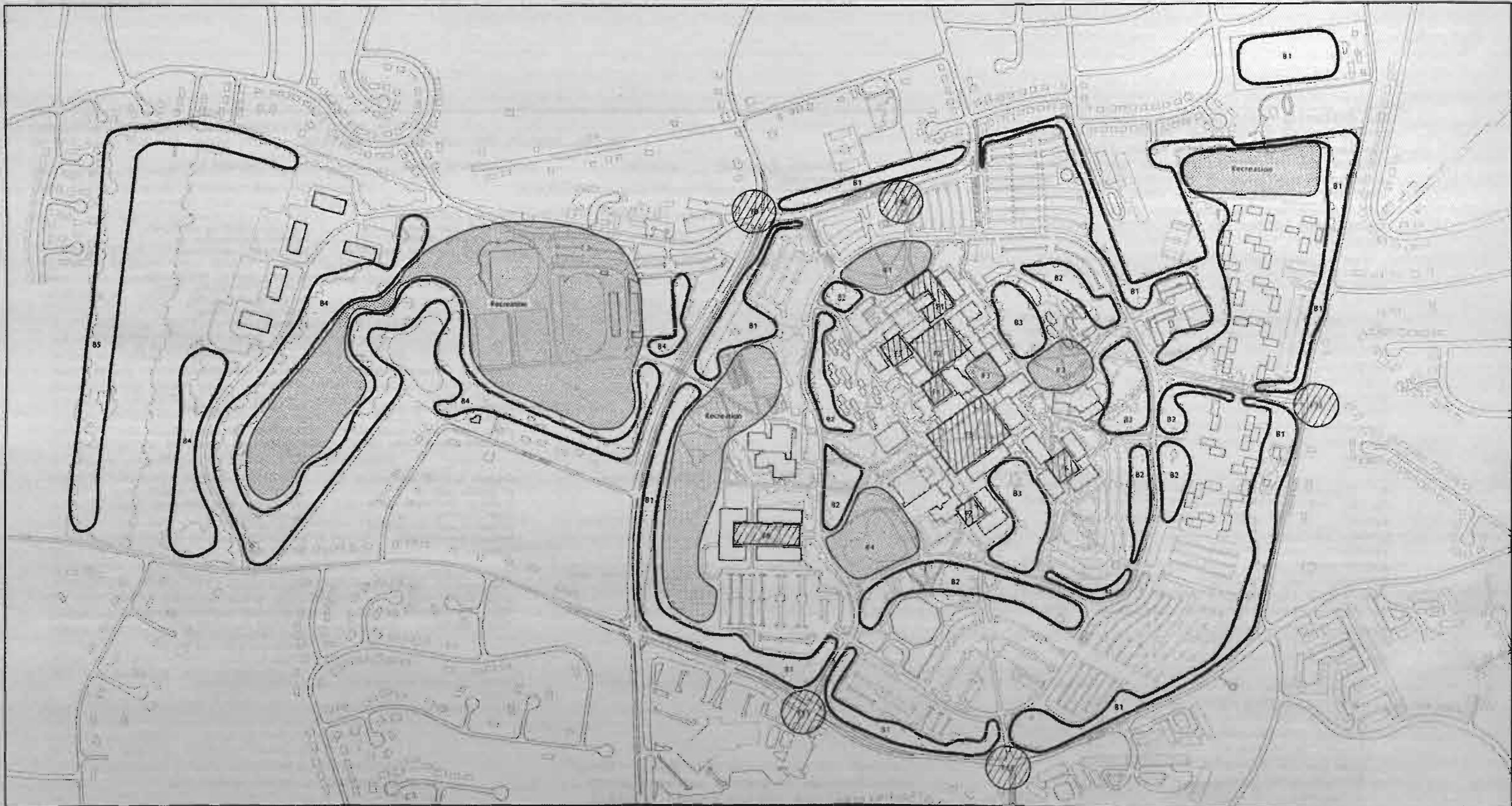
• Buffer Zones - Screen plantings should be used to augment existing screening of parking lot areas, particularly those by Pohick and Roanoke Lanes. New lots should retain an ample wooded buffer between the parking lot and adjacent land uses. Screening of other visually intrusive elements, such as service corridors, maintenance areas and the power plant should be given consideration in a master campus planting plan. Additionally, proper attention should be given to preserving existing woodlots with proper arboreal care and supplementary plantings to ensure the continuance of a natural wooded buffer.

TABLE 10. LANDSCAPE CONCEPT/ENVIRONMENTAL PROTECTION			
Landscape Space Type	Location	Function/Design Intent	Recommended Action
Landscape Buffer			
B1	Campus perimeter	<ul style="list-style-type: none"> Insulate campus from adjacent land uses. Identifiable wooded perimeter - campus image. 	<ul style="list-style-type: none"> Maintain existing woodlands. Reinforce screening at parking lot by Occoquan Lane. Maintain strong wooded edge along all perimeter roads. Screen plantings for parking lots along University Drive. New screen plantings with evergreen plant material, minimum of 8' in height
B2	Patriots Circle	<ul style="list-style-type: none"> Important drainage corridor, runoff control. Erosion control. Screen peripheral uses, (parking lots, physical plant from campus core). Insulate campus core. 	<ul style="list-style-type: none"> Maintain all existing woodlands New construction to limit intrusion into wooded buffers. Reinforce screening of all parking lots inside and abutting Patriots Circle.
B3	Within campus core	<ul style="list-style-type: none"> Augment spatial definition of campus use. Drainage corridor, slope stabilization. Screen visual connection between housing and library. 	<ul style="list-style-type: none"> Maintain as existing - prohibit intrusion of future campus facilities into remaining wooded areas. Areas of woodland within campus to be preserved.
B4	West campus buffer zone	<ul style="list-style-type: none"> Buffer athletic complex from adjacent residential areas and Ox Road. Major drainage corridor, runoff control. 	<ul style="list-style-type: none"> Maintain existing woodlands. Keep a buffer along residential edges. Limit clearing of woodlands in areas of future development to zones within the immediate vicinity of the project.
B5	West campus buffer	<ul style="list-style-type: none"> Buffer adjacent residential areas. Steep slopes/erosion control 	<ul style="list-style-type: none"> Maintain woodlands.

Informal and Recreation Open Space - These areas function as general entrance points and transitions between various activity zones. The selected species should have a definitive landscape presence such as large canopy and ornamental trees, and large shrub masses. These plantings should be arranged to give spatial destination of large, open lawn areas and form vistas to direct

attention to an object (such as a building) or a direction (a major pedestrian pathway).

Consideration should be given to developing a master landscape planting plan to allow planned open space definition to be coordinated with facility development.



George Mason University
 Master Plan Fairfax, Virginia

Landscape Concept/Open Space Plan

- Buffer Areas
- Recreation and informal Open Space
- Formal Landscaped Open Space

Note:
 NUMBERS B1-B5, B1-F1-F10
 INDICATE LANDSCAPE SPACE TYPE FOR
 LANDSCAPE CONCEPT/ ENVIRONMENTAL
 PROTECTION, TABLE 3B



Soaki Associates, Inc.
 14 Pleasant Street Watertown, MA 02172
 A/E/C, Incorporated
 113 Gervais Avenue Minneapolis, MN 55408
 Soakin and Anderson, Inc.
 1624 Soria Road Reston, VA 22091

FIGURE 8

Formal Landscaped Open Space - These areas are formal arrival points on campus. Included in this zone are the proposed and existing quadrangles, the courtyards where major pedestrian pathways intersect, the residential courtyards between dormitories, and the major entrance points to campus. The form, texture and characteristics of the species selected should reinforce the more confined or ordered nature of these spaces. The plantings should acknowledge the use of the space and reinforce the intended activity. Small trees and shrub plantings should reinforce edges and pathways, while more ornamental trees should be located at prime viewing points. Trees planted along paths should be branched higher than 7' and shrub plantings should acknowledge pedestrian desire lines.

b. Grading - Grading of lawn areas and the zones around buildings plays an important role in the quality and perception of open space. The following criteria should serve as a guide for grading and earthwork associated with future University projects:

- . Maintain a smooth transition between disturbed and undisturbed areas. Avoid abrupt changes in grade.
- . Minimize and balance cut and fill requirements.
- . Buildings should retain an even (2% slope away from facade) relationship with grade. Avoid depressions or moundings around buildings to allow "at grade" entrance and service areas.
- . Grading and planting concepts should be complimentary.
- . Maximum slopes for lawn areas should not exceed 3:1; slopes greater than 3:1 should be planted with bank stabilizing plant material.

c. Site Finishes - Site finishes refers to the furnishings and amenities that contribute to the "liveability" of the campus. The type and condition of these materials plays a role in the perception and use of campus open spaces.

TABLE 10. LANDSCAPE CONCEPT/ENVIRONMENTAL PROTECTION

Landscape Space Type ¹	Location	Function/Design Intent	Recommended Action
<u>Informal Landscaped Open Space</u>			
IF1	Informal open space at Patriots Circle and Pohick Lane	<ul style="list-style-type: none"> . Entrance area. . Ceremonial vehicular entrance and drop off area . Informal and passive recreation. 	<ul style="list-style-type: none"> . Revised vehicular circulation (removal of parking, simplify automobile circulation) - creation of ceremonial arrival at central campus. . Revised pathways to acknowledge desired pedestrian travel routes. . Plantings to improve vista to central campus, embrace entrance area, direct pedestrian traffic. . Lawn area to allow informal and passive recreation.
IF2	Informal open space between Student Union II, and new residential complex	<ul style="list-style-type: none"> . Pedestrian circulation. . S.U. II drop off. . Landscape connection between academic and residential districts. . Informal and passive recreation. 	<ul style="list-style-type: none"> . New pathways to acknowledge pedestrian desire lines. . Ceremonial drop off and temporary parking for S.U. II. . Lawn areas for informal play. . Screening of service area for science and technology buildings.
IF3	Informal open space adjacent to library.	<ul style="list-style-type: none"> . Transition between formal academic quadrangles. . Landscape screen for larger library towers. . Pedestrian circulation. 	<ul style="list-style-type: none"> . Maintain wood character. . Supplement existing woodland species with similar species as required. . New construction to limit intrusion into existing woodlands.
IF4	Informal open space by new retention pond	<ul style="list-style-type: none"> . Visual focus on campus pond as major landscape feature. . Informal and passive recreation. . Pedestrian circulation. . Ceremonial vehicular entrance and drop off area. . Stormwater management . Public entry 	<ul style="list-style-type: none"> . Lawn area with specimen and ornamental plantings. . Water tolerant species near pond edge. Ornamental species to highlight entrance area to humanities building, path intersections. . Specimen plantings to frame space, mark perimeter.

Trash receptacles, benches, bicycle racks, bollards, landscape walls, fencing and paving materials are some items included in this broad category. The following criteria should be addressed in future campus growth and facility expansion:

- . Site finishes should retain a consistent

vocabulary throughout campus. One type of bench, trash receptacle, bollard, etc. should be selected and installed in future projects, and replace existing nonconforming items as they deteriorate. Initial cost, appearance, durability and maintenance should be primary considerations.

. Bollards may be used to control circulation and protect items from vehicular damage. Removable bollards may be used to control automobile traffic, but allow emergency or service vehicles. Bollards may be constructed of wood, metal or concrete, but a consistent vocabulary should be selected for use throughout campus.

. Bicycle racks should be placed at key destination points, out of the main stream of pedestrian traffic.

. Paving Materials - Bituminous concrete is an acceptable material for walkways and driveways. Special areas such as plazas, building courtyards and entrance areas should receive special paving treatment. Cast in place concrete has been used in the past for major pedestrian walkways and plazas. In the future, use of red brick pavers should be considered alone or in combination with cast in place concrete.

. Fencing and Site Walls - Fencing (ornamental and security) and site walls make very strong statements about the use and accessibility of space. Use of these items should be carefully considered, and installed with discretion. Seating walls should be located where students congregate such as in the main quads and along main pedestrian avenues and should be sited so to not block pedestrian traffic, views or open space use. Seatwalls may be used to take up changes in grade, and plantings behind the seating area can provide screening or an ornamental focus. Fencing should be used to delineate private or secure areas, and should not diminish the concept of an open accessible campus.

d. Signage - Campus signage serves several important roles from announcing campus facilities to directing vehicular and pedestrian traffic on campus. A complete clear and uniformly designed campus signage system will greatly enhance the appearance of the University and assist in the day to day functioning of the campus. The University has initiated a signage program that will need to

TABLE 10. LANDSCAPE CONCEPT/ENVIRONMENTAL PROTECTION

Landscape Space Type	Location	Function/Design Intent	Recommended Action
<u>Formal Landscaped Open Space</u>			
F1	Open space near East Building	<ul style="list-style-type: none"> . Pedestrian circulation. . Entrance area/gateway into academic core. . Fire maintenance access. 	<ul style="list-style-type: none"> . Ornamental plantings to accent pedestrian flow academic core. . New seating areas associated with new buildings. . Outdoor art display.
F2	Existing library quad	<ul style="list-style-type: none"> . Major campus quad and focal point. . Pedestrian circulation and gathering . Fire/maintenance access. 	<ul style="list-style-type: none"> . Maintain as open lawn with specimen and ornamental plantings at perimeter and key focal points. . Keep seating areas and gathering points at building edges. . Shrub masses at perimeter. . Accent entrance areas to buildings with ornamental plantings.
F3	New academic quad between new academic building and Krug Hall	<ul style="list-style-type: none"> . Pedestrian circulation. . Gateway to main quad. . Building entrance area. 	<ul style="list-style-type: none"> . Ornamental plantings at quad and building entrance. . Outdoor art display. . Shade tree planting throughout quad for uniform canopy effect.
F4	Existing quad framed by Robinson Hall I and II	<ul style="list-style-type: none"> . Pedestrian circulation. . Secluded, "quiet" area. 	<ul style="list-style-type: none"> . Maintain existing heavily wooded character. . Improve pedestrian entrance from Aquia Lane by regrading and additional ornamental plantings.
F5	New quad between Robinson Hall II and new academic building	<ul style="list-style-type: none"> . Major new academic quad to extend core campus. . Pedestrian circulation. . Fire and maintenance access. . Associated plaza between Humanities and new Student Union and between Robinson and Academic III. . Passive recreation. . Building entrance areas. . Memorable space. 	<ul style="list-style-type: none"> . Quad should have open lawn area with dense, high tree canopy. . Where possible, retain clusters of naturally occurring trees. . Courtyards, as pedestrian gathering and distribution points should be paved and act as a foil to soft green space of quad. . Adequate perimeter seating areas of courtyards - ornamental plantings at edges. . Outdoor art display.
F6	New Science and Technology quad	<ul style="list-style-type: none"> . Pedestrian circulation. . Building entrances. . Maintenance and fire access. 	<ul style="list-style-type: none"> . Maintain existing vegetation where possible. . Accent building entrances with ornamental plantings, seating areas. . Outdoor art display.

be expanded and improved as the school grows. In developing a unified campus signage system, the following hierarchy of signs should be instituted:

- . Monumentation signage at major campus entrances (University Drive and Ox Road, Roanoke Lane and Braddock Road).
- . Secondary gateway entrance signage (University Drive and Pohick Lane, Shenandoah Lane and Roberts Road, Sideburn Lane and Braddock Road).
- . Campus Directory Signage (Pohick Lane, Shenandoah Lane, Roanoke Lane and key points along Patriots Circle).
- . Directorial and Regulatory Signage (throughout campus) along major pedestrian routes.
- . Building and Facility Identification Signage.
- . Temporary signage for campus events.

In developing a signage system that is attractive, legible and identifiable, the following criteria should apply for all campus signs:

- . Consistent use of similar type styles and faces.
- . Vary size of lettering, boldness of letters and sign heights to acknowledge heirarchical order of signs.
- . Utilize consistent color scheme and lettering method.
- . Utilize consistent mounting styles, poles and or bracing.
- . Use of logo may be incorporated into major signs.

A campus map and informative legend should be placed at the major campus visitor entry points - Pohick Lane and Roanoke Lane.

TABLE 10. LANDSCAPE CONCEPT/ENVIRONMENTAL PROTECTION

Landscape Space Type ¹	Location	Function/Design Intent	Recommended Action
<u>Formal Landscaped Open Space</u>			
F7	Courtyard between Humanities Complex and new academic building.	. Southern pedestrian gateway to campus. . Pedestrian circulation. . Building entrance area. . fire and maintenance access.	. Paved area for pedestrian gatherings and distribution. . Outdoor art display. . Ample seating areas with ornamental plantings at entrances to courtyards and buildings. . Canopy vegetation bordering courtyard and pathways.
F8	New quad south of P.E. Building	. Classical formal design. . Pedestrian circulation. . Building entrance areas . Fire, maintenance access.	. Formal plantings - allees of canopy trees bordering central lawn area. . Ornamental plantings and seatings at building entrances.
F9	Entrance onto University Drive from Ox Road	. Entry monumentation.	. Major campus signage. . Ornamental plantings to accent signage.
F10	University Drive and Pohick Lane	. Major campus gateways.	. Gateways with formal architectural, graphic and landscape designation.
F11	Braddock Road and Roanoke Lane	. Major campus gateways.	. Formal ornamental plantings. . Architectural gates. . Entry and directional signage.
F12	Sideburn Road and Braddock Road	. Secondary campus entry	. Ornamental landscape plantings.
F13	Shenandoah Lane and Roberts Road	. Secondary campus entry	. Secondary entry and directional signage.

¹ Note: Landscape/Open Space codes are keyed to Figure 8., Landscape/Open Space Plan.

E. Circulation and Parking

1. Vehicular Circulation - The Master Plan continues the basic circulation system presently in place at the University with Patriots Circle acting as the major traffic distribution loop on campus. This system will emphasize the separation of vehicular and pedestrian movements and reinforces the area within Patriots Circle as a

pedestrian precinct. The Circulation and Parking Plan is shown in Figure 9.

Shifts in regional traffic patterns to campus are anticipated to increasingly emphasize daily travel to campus along Braddock Road and Roberts Road. This trend, in conjunction with projected enrollment increases, causes the need to establish a second campus entry drive from Braddock Road in

addition to the Roanoke Lane entry. Due to road geometry and concerns for traffic safety, it is recommended that the new entrance be located opposite Sideburn Road. The existing traffic signal should be augmented to provide full signalization in all directions.

Current entrance characteristics from University Drive will be improved by four major adjustments:

- a. Shift visitor parking/information station to outside of Patriots Circle.
- b. Widen Pohick Lane entry to include a queueing lane from visitor information and parking.
- c. Allow only right hand turn entry and exit along Occoquan Lane at University Drive and maintain Rappahannock Lane as an exit only.
- d. Redesign the entry loop in front of the Finley Building to align with Pohick Lane and Occoquan Lane.

The campus entry at Shenandoah Lane at Roberts Road will be improved to include turn lane provision along Roberts Road.

The circulation component of the Master Plan will also improve the roadway geometry at the Roanoke Lane/Patriots Circle intersection and the Shenandoah Lane/Patriots Circle intersection. At Roanoke Lane the existing traffic islands will be reconfigured to better define turning movements and through lanes. At Shenandoah Lane, right hand turn lanes will be added with traffic control islands.

Service access will be adjusted to emphasize separation of service vehicles from pedestrian paths whenever feasible. While service access to existing buildings will remain essentially the same in location, new buildings will generally access directly off Patriots Circle along exclusive service drives.

To maintain adaptability in the long-term campus development, a vehicular roadway easement has been maintained just to the south of the Physical Education building which could provide location for vehicular access across Route 123. However, current traffic analysis does not demonstrate this

need to definitively include such a connection in the foreseeable future.

2. Pedestrian Circulation - The Master Plan establishes the area within Patriots Circle as a pedestrian dominated precinct. This is accomplished in several ways:

- . No through traffic.
- . Minimize service and pedestrian conflicts through location and design treatments which prioritize the pedestrian (signage, paving, lighting, etc.).
- . Establish a hierarchy of pedestrian courtyards and open spaces connected by well defined walkways.
- . Improve pedestrian walkway connections from parking lots to the central academic core (signage, paving, lighting).

The master plan will also establish a pedestrian bridge across Route 123 to recreational facilities on west campus. This improvement is considered essential for pedestrian safety as the on-campus resident student population increases and crossings of Route 123 increase, especially at night.

3. Parking - The parking strategy established by the Master Plan is founded on the existing parking system which places parking lots along the outside perimeter of Patriots Circle. This will continue to provide convenient parking to the core campus. The plan calls for the construction of new parking lots in the southeast quadrant of campus and the redesign/expansion of Lot K and Lot A. Parking will also be provided in association with the proposed housing development along Roberts Road. A total of 9,000 parking spaces is accommodated by the plan which is an increase of some 3,000 spaces over the current inventory. This provides .3 spaces per headcount student consistent with project student enrollment levels and recognizes that transit improvements in the vicinity of campus are likely in the future and on-campus student housing will increase as a percentage of total enrollment. University policies will also be influential in the parking program in relation to car pooling and operation decisions. Beyond 20,000 FTE, the University would likely have to include parking decks within the campus or provide remote parking sites.

4. Design Guidelines- The circulation system of George Mason University can be divided into four distinct levels for design guideline purposes: 1) Access road, 2) Service Lanes, 3) Pedestrian Pathways and 4) Parking Lots. The intention of these design guidelines is to keep these levels as distinct as possible, minimizing conflicts between uses and providing safe and efficient systems.

The majority of users, the commuting students and faculty experience these levels of circulation through three points of arrival. The first point of arrival is the initial vehicular entrance to the campus zone, turning off the peripheral road system onto University Drive, Roanoke Lane, Pohick Lane or Shenandoah Lane. The second point of arrival, after parking, is the pedestrian entrance to the campus core through the informal landscape zones, punctuated by more formal gateways. The third level of arrival is through the formal landscaped open space or plaza. A properly designed and organized circulation system should clearly identify these distinct levels of arrivals. Proper use of plantings, signage, special site or architectural detailing such as gateways and pavement designs may be employed in identifying these zones. The pedestrian system that draws traffic from the parking lot and distributes it to central campus destinations needs to be clearly defined with a minimal number of conflicts between automobile and service traffic. The following are the Master Plan design guidelines for future development affecting these four levels of circulation.

F. Utilities

1. Water Distribution - Accommodation of the building expansion contained in the plan for water service will essentially be provided by completing the 12-inch main loop system which generally follows Patriots Circle. High priority will be given to closing the existing gap in this system in the northwest quadrant of Patriots Circle. As building sequence dictates, the southeast quadrant of the loop system will be completed. Reinforcement of this campus system should be made by connecting to the City of Fairfax water main along Route 123. Within the 12-inch loop system, 8-inch mains will tie the outer loop with the

inner network which will serve new buildings and strengthen the existing system.

Water service to the 3,500 bed housing sector outside Patriots Circle along Roberts Road will be provided by extending a 12-inch main from the Patriots Circle loop system. Reinforcement of this line may be provided by connecting to water mains along Roberts Road.

Expansion of west campus building facilities will be served by extending the existing 12-inch water main along University Drive to eventually connect with an existing 10-inch water main in the extreme western portion of campus.

With these planned additions, the water distribution system would adequately serve the planned growth of the University. However, water pressure for planned development may not be sufficient to provide for adequate fire protection. It is recommended that the University enter into discussions with the City of Fairfax to resolve this potential problem.

Features of the proposed water distribution system are shown in Figure 10, Heating/Cooling and Water.

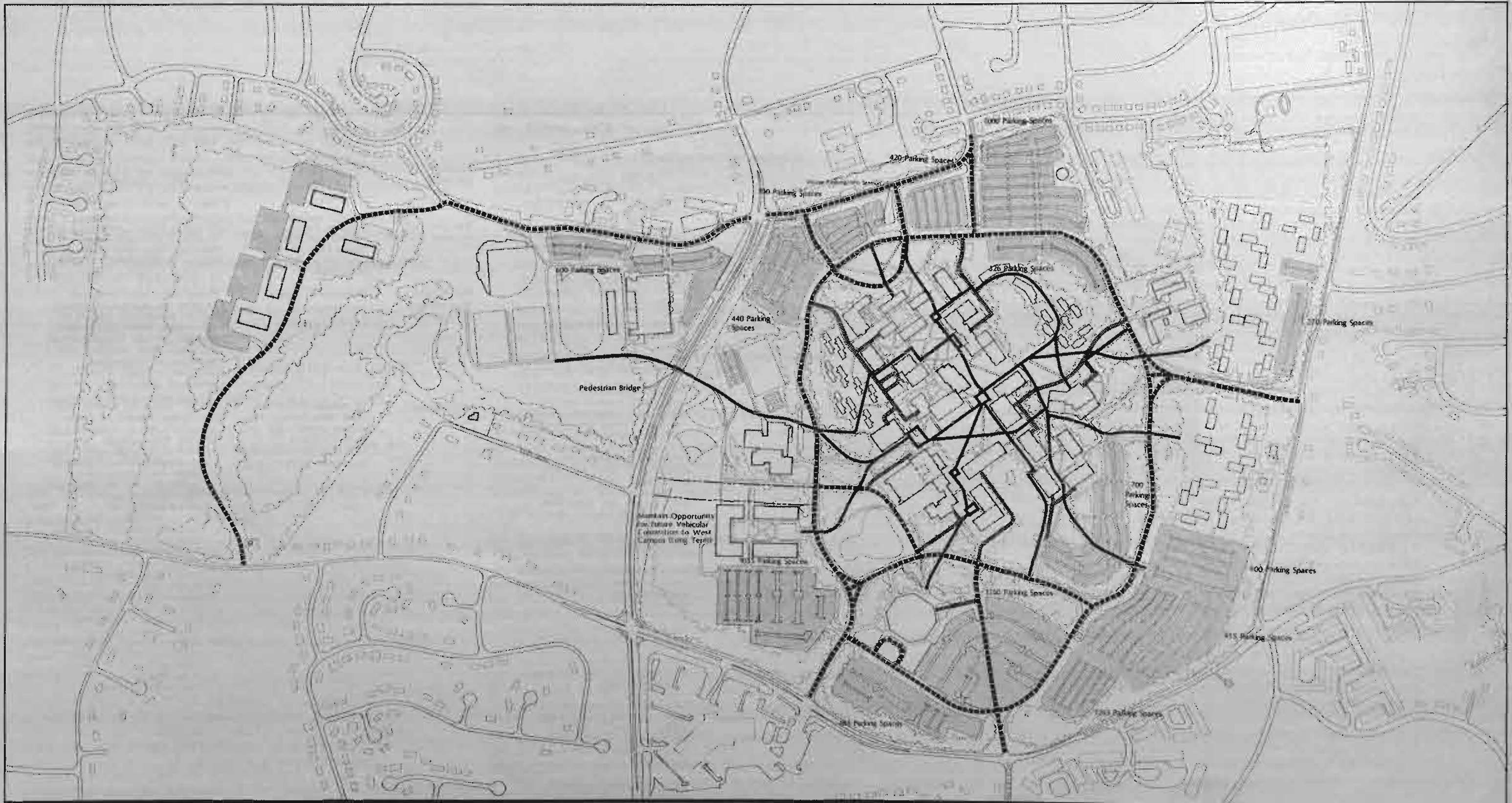
2. Heating and Cooling Distribution - The central chiller/boiler plant is currently operating at capacity and will require substantial expansion in capacity to meet the needs of the Master Plan. Design of the plant expansion is presently under contact and should provide for future campus needs. Thus, with a substantially upgraded plant capacity, heating and cooling systems proposed by the Master Plan as shown in Figure 10, Heating/Cooling and Water, are assumed to be adequately supplied.

Previous master plan concepts excluded the Physical Education building (west of Patriots Circle) from service by the central plant because it was in a relatively isolated location. However, the Master Plan academic building expansion proposed west of Patriots Circle presents a feasible basis upon which to include the Physical Education building among those that are planned to be served by the central plant.

As the academic building expansion proceeds within the southern half of the Patriots Circle loop, the heating and cooling distribution system will be

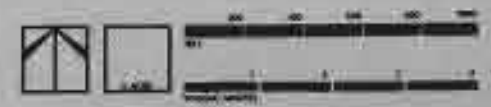
TABLE 11.
Circulation Design Guidelines





Access Category	Location	Design Guidelines	Access Category	Location	Design Guidelines
<u>Access Road</u>	Pohick Lane, Roanoke Lane, Shenandoah Lane, Proposed entry across Sideburn Rd. and Patriots Circle	<ul style="list-style-type: none"> Formal entrance experience along access roads. Ornamental plantings, signage, direction to parking areas. Patriots Circle-Retain woodland and character, open vistas to central campus from key points. Screen parking lots from entrance drives. 	<u>Service Lanes</u>	Rivanna Lane, Chesapeake Lane, Aquia Lane Service corridors to new buildings	<ul style="list-style-type: none"> Keep as short as possible. Mitigate visual intrusion by screen plantings, limit curbing, keep road section as narrow as possible - Max. 22'.
<u>Pedestrian Pathways</u>	Throughout Campus	<ul style="list-style-type: none"> Vary width 4-12' feet depending on level of use. Paths should follow topography - avoid abrupt changes in elevation. Use of vertical curves and generous radii in designing paths. Material: Bituminous concrete or cast in place concrete. Unit pavers for important areas and/or feature strips Materials should be used consistently. Acknowledge pedestrian desire lines. Locate pathways along preferred pedestrian traffic routes. Minimize crossings of service lanes. Where crossings of service lanes are necessary, pedestrian traffic should be directed away from service activity areas. Pedestrian walkways should avoid closely paralleling service lanes. Where unavoidable, provide adequate screen plantings and grade separation. Identify clear, generous crosswalks from parking lots to entrance points to central campus. 	University Maintenance, fire access	Throughout Campus	<ul style="list-style-type: none"> These lanes also serve as primary pedestrian pathways. Design vocabulary should be consistent with pedestrian pathway system Width - 12 to 15' avg., Max. gradient 10%. Pavement - Bituminous concrete or cast in place concrete.
			<u>Parking Lots</u>	At Campus Perimeter, draw cars from access roads into lots without allowing penetration of campus core.	<ul style="list-style-type: none"> Design intent is to minimize the visual impact of large amount of required parking. Parking lots should: <ol style="list-style-type: none"> 1) Work with topography - if on sloping sites, parking lanes should run with contours, and be separated into terrace levels if necessary. 2) Where possible, curve parking lanes to break up mass of lot. 3) Retain perimeter woodlots for screening, augment with additional screen plantings. 4) Landscape islands and medians in parking lots - plant with canopy shade trees to increase attractiveness of lot and provide shade for cars. Create bays of not more than 50 cars separated by landscape islands.



George Mason University
 Master Plan Fairfax, Virginia

Circulation and Parking Plan



-  Vehicular Circulation
-  Major Service Access
-  Major Pedestrian Access & Plazas
-  Parking Lots

Sasaki Associates, Inc.
 84 Pleasant Street - Watertown, MA 02172
 ARPA, Incorporated
 1121 Monaghan Avenue - Minneapolis, MN 55408
 Hunkeler and Anderson, Inc.
 1604 Santa Rosa Road - Richmond, VA 23288

FIGURE 9

expanded with the intention of forming a loop system as shown in Figure 10. Being in close proximity to the central plant, the proposed 3,500 bed housing unit complex near Roberts Road will be conveniently served by the plant.

As the satellite plants within the older buildings become too old and costly to maintain, these buildings should be incorporated into the central plant system. A loop system through the north campus area will service these buildings as needed and help to reinforce the piping to the northwest housing units and proposed future buildings. This is also shown in Figure 10.

West campus expansion is too remote from the main campus central plant to be able to use the facility economically. Depending on the rate and sequence of expansion in this area, each building may provide for its own heating and cooling, or all local central plants may best serve these buildings. If a central plant is envisioned, a basic scheme for the entire development should be planned, along with the total future demands to be placed on the plant. With only one or two buildings being built initially, the initial cost of a central plant may be too high to be justified.

3. Sanitary Sewer - The existing 10-inch main which is located along the western half of the main campus will be adequate to handle the development proposed by the Master Plan with new connections as shown in Figure 11. Academic buildings generally do not place a heavy load on the sanitary system.

Development on the eastern side of the main campus includes housing for an additional 3,500 beds. This translates into roughly 1,200 gallons per minute at peak flow, which alone would require a 10-inch sewer. The total proposed development indicated by the Master Plan, in addition to the existing development, would overload the existing 10-inch main during peak demand periods. To handle this overload another 10-inch sewer could be installed, parallel to the existing one. The existing meter and 16-inch main located at Braddock Road is adequate for the entire flow from all proposed development on the campus.

The need for the additional 10-inch main on the eastern portion of campus depends on sewage being pumped from the 2,250 bed portion of housing

complex, as shown in Figure 11, back into the campus system. Without this section of housing on the campus system, the existing system will be adequate to handle all other proposed development.

2,250 beds of the housing unit complex are located in a separate drainage area, meaning that the sewage will have to be pumped into the campus system, or flow by gravity through the subdivision system across Roberts Road. Several issues need to be considered in choosing a route which should be selected before any of the 3500 bedhousing units are constructed.

a. The adequacy of the capacity of the subdivision system to handle the loads imposed by the proposed campus housing.

b. Sewer rates through the subdivision route would be higher since the sewage would not be metered, but based on water usage.

c. The cost of pumping and the maintenance of the system.

d. Additional piping is required on campus to handle the increased loads.

West campus development can be adequately served by extensions to the existing 12-inch main that presently serves the field house complex.

4. Storm Drainage - The runoff from the northern portion of campus east of Route 123 will be retained by two basins, one on the east side near the housing units and another on the west side, just north of the Patriots Center as shown in Figure 11. The southern portion of the campus, with its large areas of proposed parking, will require retention to prevent downstream flooding. The northeastern part of the campus, proposed site of 2,250 beds of housing, is in a different watershed. Drainage in this area crosses Roberts Road and follows a swale through the adjacent subdivision. A retention basin should be provided near Roberts Road to control runoff from this area.

Expansion of athletic facilities across Route 123 as proposed on the Master Plan lies within the area drained by the ditch line which receives flow from a 72-inch culvert. According to the need to conserve space, this ditch may be enclosed in a culvert or left open as an improved channel. If

grassed fields are to be the major use of this area, retention may not be required, but the need will have to be assessed as development occurs. However, the Master Plan includes a retention basin to serve this area in the long term as shown in Figure 11.

Any future building development would sit upon a ridge line with most building and parking runoff, draining to the west. This runoff should be retained before leaving the site. As a result, a small retention basin will be included in this area as well.

5. Electric Service - Based on the present load growth of George Mason University of 500 KVA per year, the total demand at the end of a 20-year period would be 10 MVA which is 27.9% of the existing electrical service capacity.

As a comparison, using an estimate 5 watt per square foot figure for electrical usage, the estimated load growth the gross square footage expansion of academic and general space proposed by the Master Plan would calculate to a load demand of approximately 12 MVA. This load would only be 33.5% of the electrical service capacity.

In summary, the electrical primary service can support further campus expansion. The new and proposed buildings will be served radially within and surrounding Patriots Circle via tap switches along the cable route as shown in Figure 12.

Future development on west campus will be served by extensions to the existing primary overhead distribution circuits along Route 123.

Depending upon the University's policies, the new student housing to the east of Patriots Circle, can be served by either the loop system if master primary metering is desired, or by an existing radial overhead distribution circuit along Roberts Road if individual metering is desired.

6. Communications - Based on future 20,000 FTE enrollment levels and additional gross square footage for academic/general, housing, and student services, the Local Area Network System can satisfy future information service needs within and surrounding Patriots Circle. This is based on

the fact that of the present 2000 active device capacity of the LAN system, only 300 active devices are presently being utilized.

Faculty and student information services will be available to west campus only when the pedestrian bridge is constructed. The bridge will provide a direct means of cabling across Ox Road. Overhead distribution of the LAN system would be vulnerable to damage, and leased telephone lines would prove to be expensive in the long run to distribute voice, video and data information.

7. Telephone System - In order to satisfy the long-term future telephone requirements of the academic/general, housing and student service, two new 3,600 pair cables will be required. One 3,600 pair cable will be routed around the southwestern and southeastern portions of Patriots Circle from Braddock Road. This cable will service the new academic buildings, student union and expanded Library. The second cable will run parallel to Roberts Road to provide individual telephone service to the new student housing. These proposed improvements are shown in Figure 12.

The local telephone company's capacity to handle the future growth of the University is questionable due to the capacity limitations of their facilities and present equipment. University Information Services personnel are actively involved in planning with the telephone company for future service requirements.

The future development on west campus area could be handled by extensions to existing telephone lines in the area.

8. Energy Management System - Although the present HVAC monitoring system has the sufficient capacity to handle future campus expansion, this system is limited in the respect that it cannot automatically adjust set points to compensate for climate changes. The existing system cannot be readily converted to a digital system. If this system were digital, it could be compatible with the LAN system which would virtually eliminate additional cabling for the HVAC monitoring system by using the LAN cable network.

9. Lighting - Lighting is an important element in providing appropriate levels of campus safety and organization. Lighting will give clear order to the nighttime perception of the campus in addition to providing security. Buildings which are heavily used at night (Library, Student Union, etc.) should be highlighted to act as lanterns within the academic core. Lighting should also be used to augment areas of special interest, such as plans, art work and signage; examples of this include the public gateway area associated with the Humanities Complex where special lighting will enhance the arrival sequence.

As the resident student population grows, the importance of lighting becomes increasingly evident to provide a desirable environment for extended use of the campus on nights and weekends.

To institute a level of design quality and consistency on campus, light standards and fixtures should be of a similar design vocabulary. Presently there are over ten different light fixtures and combinations of standards and campus. As the University continues to grow, one light type should be selected for each lighting need and, over time, inconsistent fixtures and poles should be replaced.

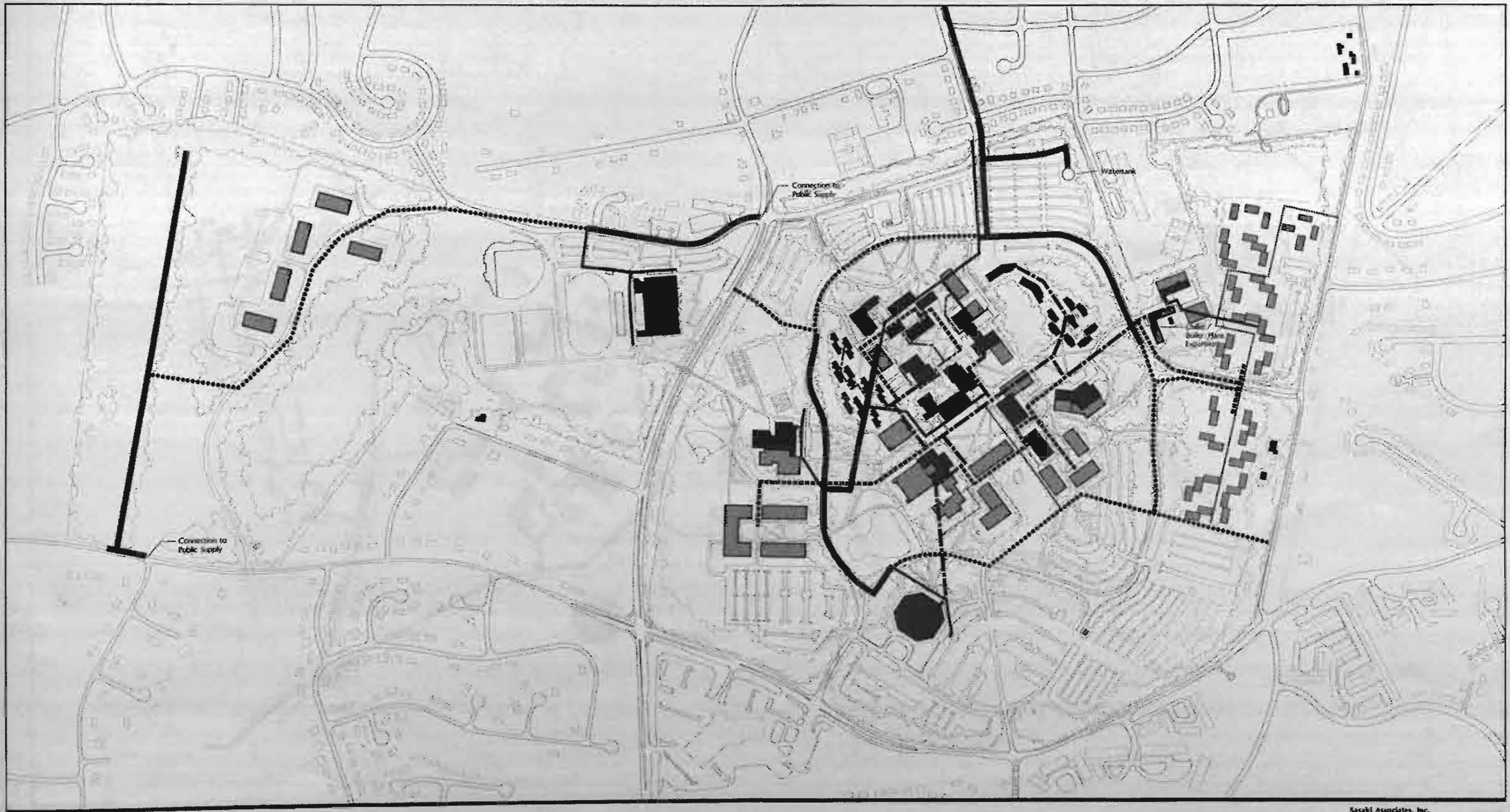
The hierarchy of lighting types to be used on campus are described below:

a. Access Roadway Lighting - Lighting in these areas should have a relatively high level of illumination and spread for entrance announcement and safety. Roadway lighting should be 25-35' high and spread along one side of the road to accentuate roadway alignment.

b. Parking Lot Lighting - Parking lot lights should be 25-40' in height and have a "cut off" or concealed light source to limit light spread to specific targeted parking areas.

c. Pedestrian Walkway Lighting - Major pedestrian routes should receive a higher level of lighting than minor routes either through double pedestrian standards or a higher standard with greater light spread. Pedestrian lights should be 12-15' high and have a warm light.

d. Accent and Feature Lighting - Lighting of landscape areas, plazas, art work, nighttime building entrances, etc., may be lit through a variety of concealed or low level landscape lights. Use of accent lighting will help identify special nighttime destinations (Student Union, Library, Theatre, etc.), special plazas and courtyards and important objects (art work, signage).



George Mason University
 Master Plan Fairfax, Virginia

Heating/Cooling and Water

- | | | | |
|--|---------------------|--|----------------------|
| | Existing Buildings | | Proposed 10"-12" W |
| | Proposed Buildings | | Proposed 6"-8" W |
| | Existing 8"-12" H/C | | Proposed H/C |
| | Existing 4"-6" H/C | | Reroute Existing H/C |
| | Existing 10"-12" W | | |
| | Existing 6"-8" W | | |

Sasaki Associates, Inc.
 64 Pleasant Street Watertown, MA 02172
 A/E/C Incorporated
 3112 Hennepin Avenue Minneapolis, MN 55408
 Harkins and Anderson, Inc.
 1604 Santa Rosa Road Richmond, VA 23288

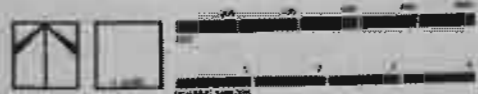
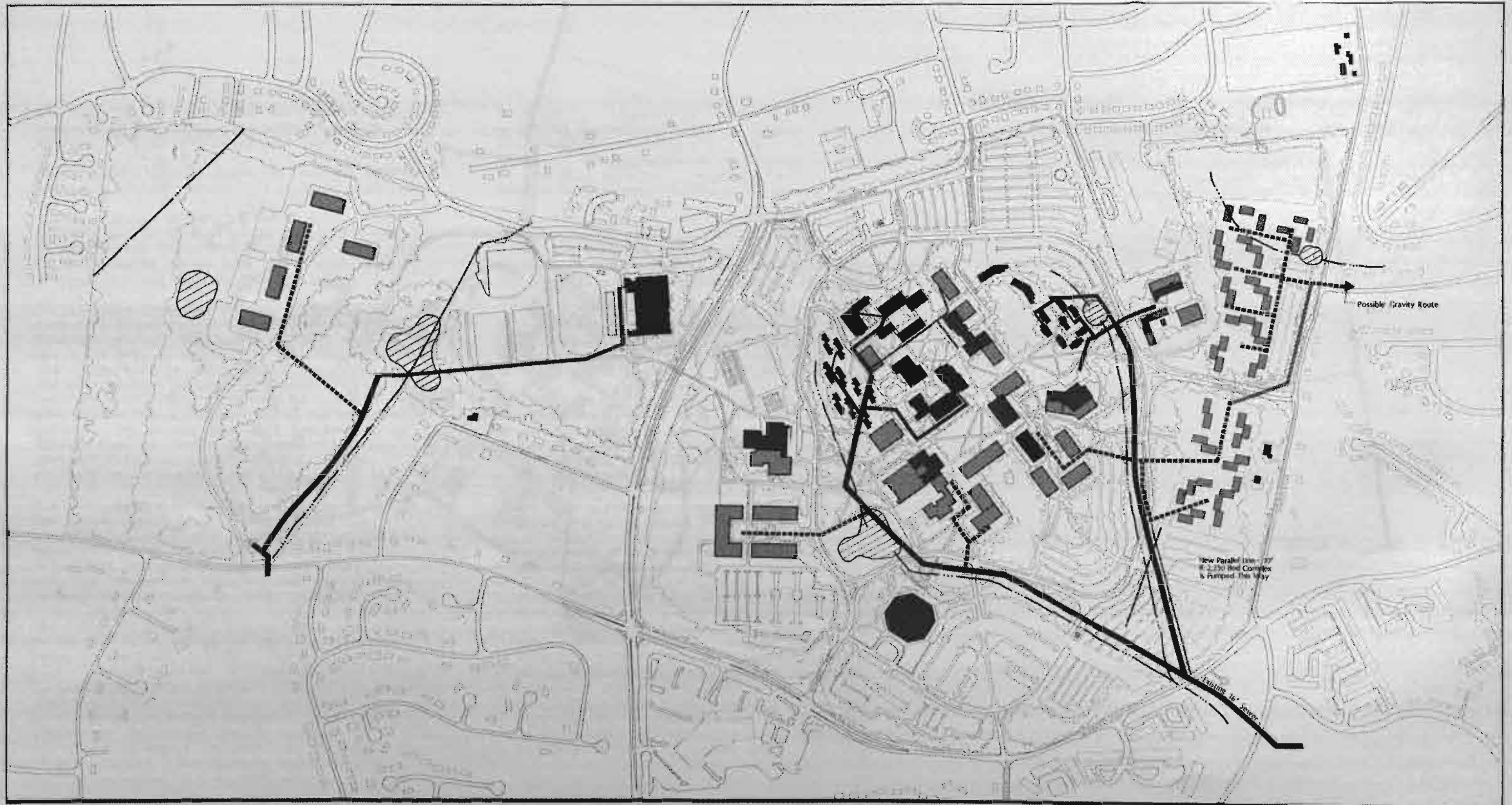


FIGURE 10



George Mason University
 Master Plan Fairfax, Virginia

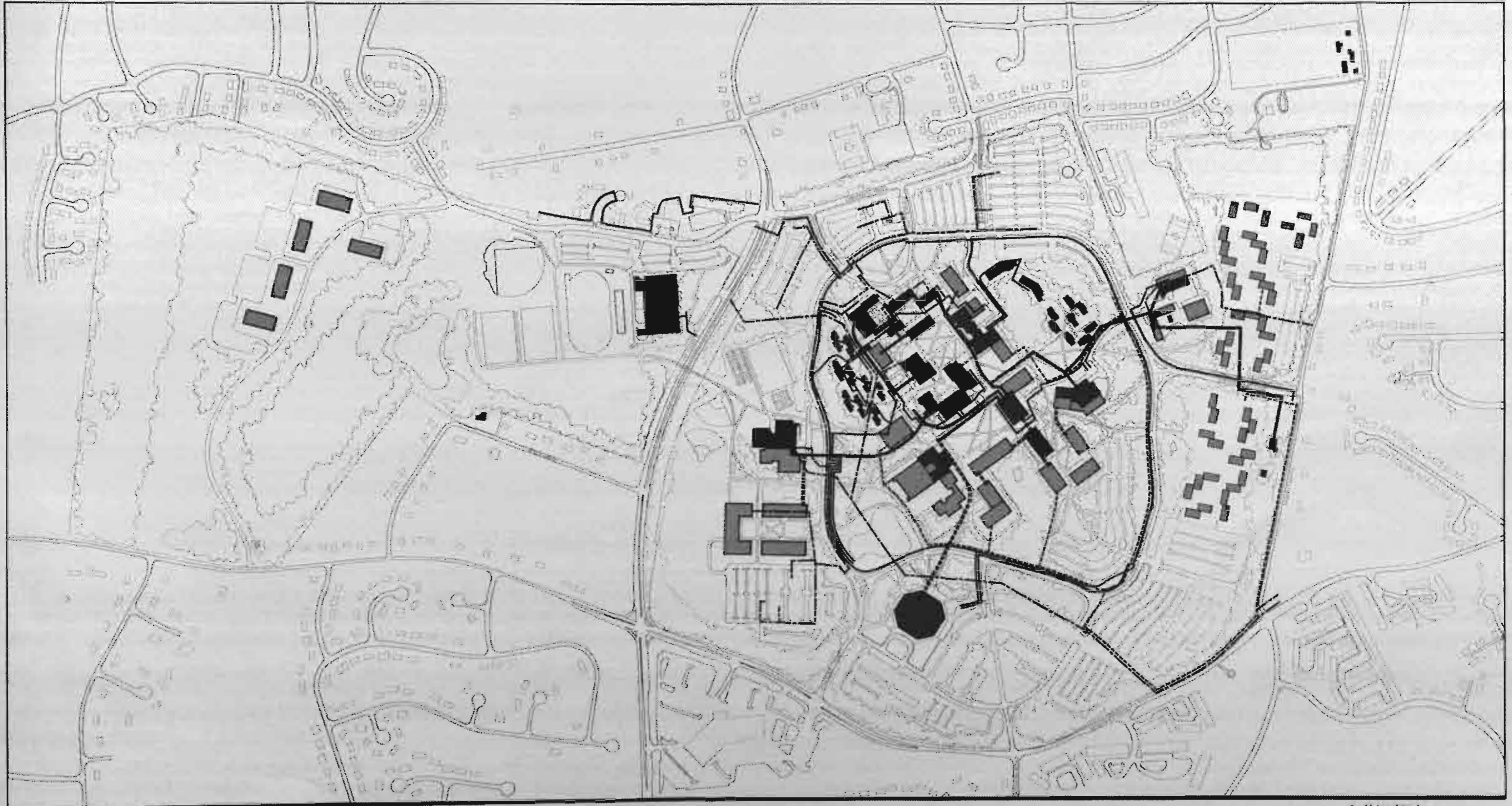
Storm Drainage and Sanitary Sewer



- | | |
|--------------------------|--------------------------|
| Existing Buildings | Existing Swale |
| Proposed Buildings | Proposed Sewer |
| Existing 10" Sewer | Pumped Sewer |
| Existing 8" Sewer | Alternate Sewer |
| Existing 6" Sewer | Proposed Storm Drain |
| Existing 72" Storm Drain | Proposed Retention Basin |








Sasaki Associates, Inc.
 64 Pleasant Street, Watertown, MA 02172
 HRA, Incorporated
 3032 Prosperity Avenue, Chesapeake, MD 20840
 Haskins and Sells, Inc.
 1008 Sams Run Road, Richmond, VA 23100

FIGURE 11



George Mason University
 Master Plan Fairfax, Virginia

Communication / Telephone and Electric Services

-  Existing Buildings
-  Proposed Buildings
-  Existing Telephone
-  Proposed Telephone
-  Existing Electric
-  Proposed Electric
-  Existing Communications
-  Proposed Communications

Sasabi Associates, Inc.
 64 Pleasant Street Watertown, MA 02172
 MRA, Incorporated
 3112 Hennepin Avenue Minneapolis, MN 55408
 Hanks and Anderson, Inc.
 1604 Santa Rosa Road Richmond, VA 23280

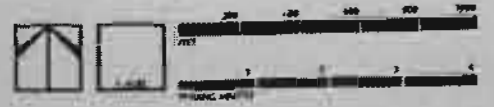


FIGURE 12