

MASTER PLAN

GEORGE MASON UNIVERSITY
FAIRFAX, VIRGINIA

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THIS DOCUMENT

This document is a narrative and graphic description of the George Mason University Master Plan. All of the rationale and analysis by the planning consultants has been presented to the appropriate staff authorities of the University and the members of the Board of Visitors. Special presentations leading to the preparation of this document have included the Office of Facilities Planning, the Academic Deans, the Vice Presidents, the President and Rectors, the Land Use and Physical Facilities Committee of the Board, the Executive Committee of the Board, and the Board of Visitors. The Plan was approved by the Board of Visitors on November 15, 1978, with the provision that, in accordance with the Code of Virginia, this master plan shall be a generalized guide to the future development of the campus, and neither the specific features, schematics, locations or configuration of buildings (except those already designed) nor use of future buildings whose siting is suggested by the plan shall be committed by the Board's approval of the general plan.

PURPOSE OF MASTER PLAN REVISION

The present master plan of George Mason University was prepared in 1967-68 when the institution was a college of the University of Virginia. Since that time, the institution has become a regional university serving northern Virginia. Its perception of self and its mission in serving the region have changed considerably.

The master plan serves to guide the physical growth of the University and forms the basis of capital outlay for facilities. Currency of the master plan is necessary to assure that physical form properly complements the academic plan.

The 1968 master plan made certain assumptions about the young college that are no longer valid. Primary among those assumptions, which were derived from the academic plan of the Board of Visitors of the University of Virginia, was the division of the Institution into six colleges of limited enrollment and equal size offering a liberal arts education. The result of this assumption was a plan to arrange the colleges in clusters which could, to a large extent,

be self-contained. The plan required the duplication of several facilities within each of the colleges and implied the multiple location of certain academic programs. With the change in mission of the University, the master plan requires revision.

The purpose of this revision is to make such changes as are indicated by the current academic plan and the University's current objectives.

FISCAL CONSTRAINTS

It is assumed that capital outlay requests by the University will continue to be rigorously scrutinized by the state and that funds appropriated for physical facilities will be limited. Such limitation will permit only the highest priority projects to be constructed at any one time. Because of the demands of all departments of the University, only projects of limited scope will be accomplished. The implications of this process upon the campus plan are that the plan will serve as pattern which is filled in with structures as funds are appropriated. This "checkerboarding" process tends to limit the alternatives available to the planner. By not being able to complete large scale projects at one time, under one design control, bold, thematic plans are not feasible. The practical alternative, is a concentration on the framework of the plan and the location of specific facilities which best complement the academic plan and the objectives of the University. It is toward this end that this master plan has been developed.

LAND USE

The existing land use plan is valid and should be maintained with only slight modification.

CIRCULATION

Patriots Circle should be extended to completion and built with a four lane cross section. Existing portions of Patriots Circle should be expanded approximately to a four lane cross section.

Additional access to the campus will be needed in the future to handle increased traffic. Construct one additional access road from Braddock Road to Patriots Circle and two additional roads from Roberts Road to Patriots Circle. Access roads should be built with a four lane cross section.

The extension of University Drive along the north edge of the west campus should be continued to the extreme west campus and become the major through street providing access to facilities that will be developed in the future.

It is vital to create a major linkage to unite the main and west campuses. A roadway carrying vehicular, bicycle, and pedestrian traffic should extend from the main campus to the west campus without having to mingle with traffic on Ox Road. This roadway should have a grade separation at Ox Road with land reserved for a future interchange if the need arises.

Primary parking for the main campus should continue to be located between Patriots Circle and the peripheral off-campus roadway system. As the west campus develops, primary parking should be located between the extension of University Drive and the facilities served or off the peripheral roads.

The provision of on-campus housing will tend to decrease the need for parking.

The parking required for an enrollment of 15,000 FTE students can be provided on the main campus.

The University should strive to reduce the

ratio of parking spaces per person by about fifteen percent below the current trend.

Transit usage by the University population should be encouraged and action should be taken that will achieve the maximum utilization possible.

Cross circulation of vehicles and pedestrians should be minimized.

SITE IMPROVEMENTS

The campus should be divided into primary and secondary areas for landscaping. Primary areas should be intensively landscaped to complement architecture and emphasized elements. Secondary areas should provide visual enrichment and screening of undesirable sights.

A planting plan should be developed that will give direction and consistency to future construction projects and result in an orderly and elegantly landscaped campus.

Unity in the landscape will be improved by the establishment of standards and specifications for such site improvements as pavements, site furnishings, site lighting, and signage.

FACILITIES

The University is currently operating with about one-half of the space which is normal among institutions of higher education in the United States.

The academic plan indicates that the size of facilities needed in the future will probably be less than that for universities with large enrollments in engineering and physical sciences.

The University will need about 3,000,000 square feet of non-residential space for an enrollment of 15,000 FTE students.

It is feasible to construct all of the needed non-residential space on the main campus, if necessary. It is also feasible for the facilities to be supported by the necessary parking.

The University should provide on-campus housing for at least 4,000 students and faculty members. The required residential space would total about 1,345,000 square feet.

VISUAL FORMS

Provide a visual link with the community by creating two campus landmarks. The first would consist of a major open space in the heart of the main campus with a vista extending southward to a pond at Braddock Road. The second would be the construction of a community related facility near the intersection of Ox Road and Braddock Road that would establish the presence of the University.

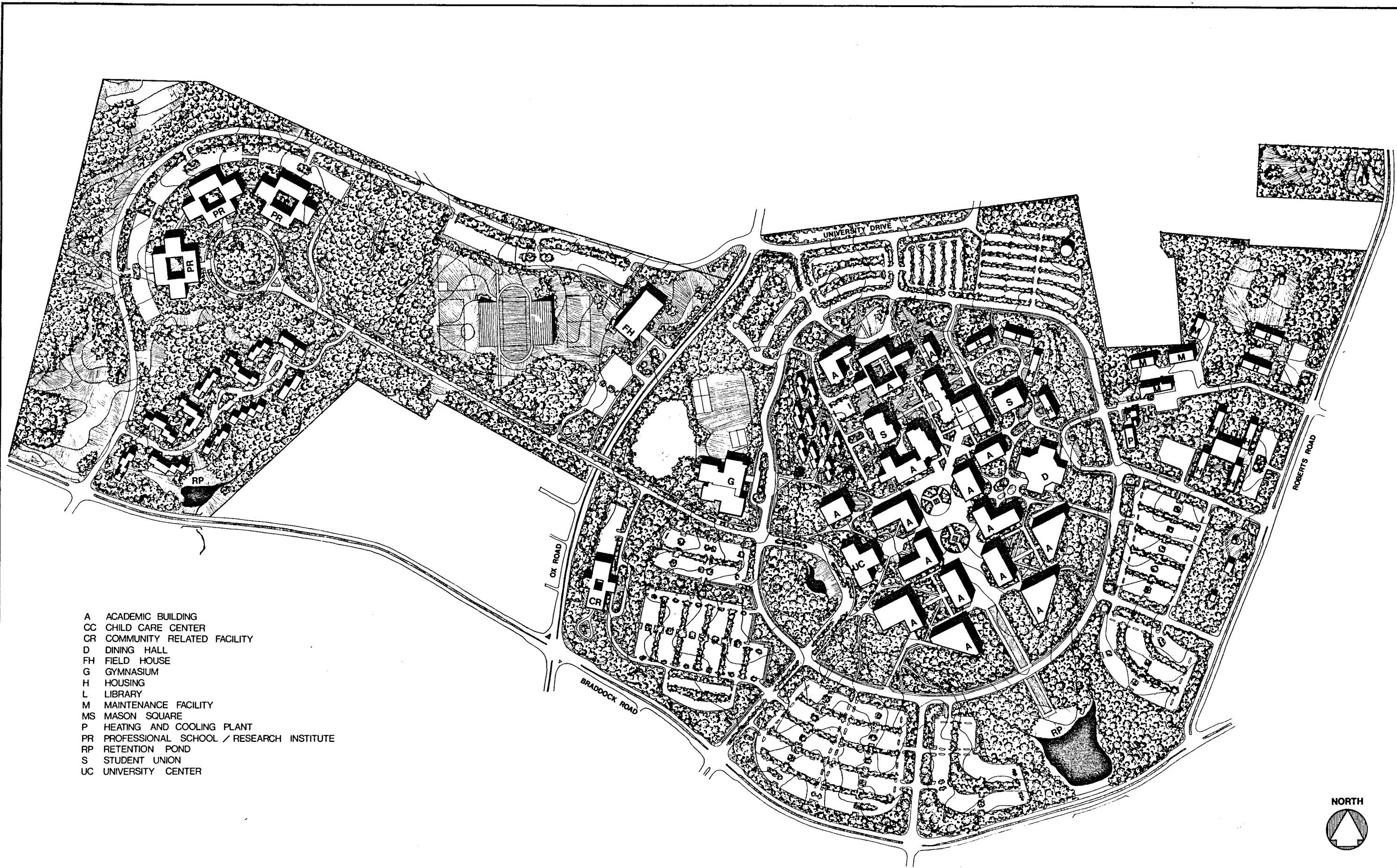
Bring visual unity to the campus by establishing developmental guidelines for the landscape and architecture.

Size and site new buildings not only to suite the required space program, but also to conserve the natural assets and ecological values of the existing land.

Introduce sculpture, fountains, and similar cultural accouterments where appropriate.

EXPANSION CAPABILITY

The plan is flexible and open-ended. Building sizes, locations, and occupancies are suggested as a guide, but are flexible and interchangeable. Parcels of land are reserved for future expansion.

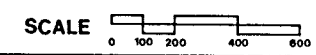


- A ACADEMIC BUILDING
- CC CHILD CARE CENTER
- CR COMMUNITY RELATED FACILITY
- D DINING HALL
- FH FIELD HOUSE
- G GYMNASIUM
- H HOUSING
- L LIBRARY
- M MAINTENANCE FACILITY
- MS MASON SQUARE
- P HEATING AND COOLING PLANT
- PR PROFESSIONAL SCHOOL / RESEARCH INSTITUTE
- RP RETENTION POND
- S STUDENT UNION
- UC UNIVERSITY CENTER



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TOPOGRAPHY

The property east of Ox Road is trisected by two tributaries to Rabbit Branch which is in turn a tributary to Phick Creek. The land lies in the upper reaches of the Pohick Creek watershed. The property along the east side of Ox Road forms a ridge line within which are the highest elevations on the campus. The northern portion of the property borders the City of Fairfax and is relatively flat forming a plateau upon which the initial campus was constructed. In the north-south direction the land varies in elevation by approximately 90 feet, the low point being the confluence of the two streams at the passage under Braddock Road on the south property line. The land varies approximately 90 feet in the west to east direction along the south property line bordering Braddock Road.

The property west of Ox Road is bisected by the East Fork of Popes Head Creek which at its passage under Braddock Road on the south property line is the low point of the property. Approximately 60 acres of relatively open land lies between the road and the ravine of the creek. Beyond the ravine to the west there lies approximately 160 acres of land which slopes toward ravines on the east and west. The land varies in elevation by approximately 80 feet in the east-west direction and 70 feet in the north-south direction. The land lies in the upper reaches of the Popes Head Creek watershed.

VEGETATION

The undeveloped area of the property east of Ox Road is covered by a dense growth forest which develops naturally and consists of hickory, maple, oak and pine with scattered understory vegetation such as laurel and holly. This forest has been disturbed in limited areas to provide sanitary sewers and roadways.

The property west of Ox Road consists of an approximately 16 acres of open meadow along Ox Road, some 20 acres of open field on the western perimeter, and a large forest in between which contains the major local vegetation types. There are patches of oak-hickory and beech-maple forests with pines in the fringe areas. There is also scattered understory

vegetation such as holly and ironwood in the upland.

SOILS

The soils on the property are composed of deeply weathered and fine grained mica schist. Cuts of 25 to 30 feet can be made without encountering hard rock material.

East of Ox Road, the high ground between the two streams is composed of soils in the Glenelog Silt Loam and Fairfax Silt Loam classifications which are rated good for supporting large buildings.

The flood plain areas along the stream beds are mixed alluvial soils which are not considered suitable for building sites.

Bordering the flood plain areas are areas of Worsham Silt Loam and Glenville Silt Loam. These areas have a high water table during wet seasons and will probably require more extensive foundation and under-drain systems for the below grade spaces of buildings constructed therein.



- 450 - 470
 - 430 - 450
 - 410 - 430
 - 390 - 410
 - 370 - 390
 - 350 - 370
- Contour Interval 10 Feet

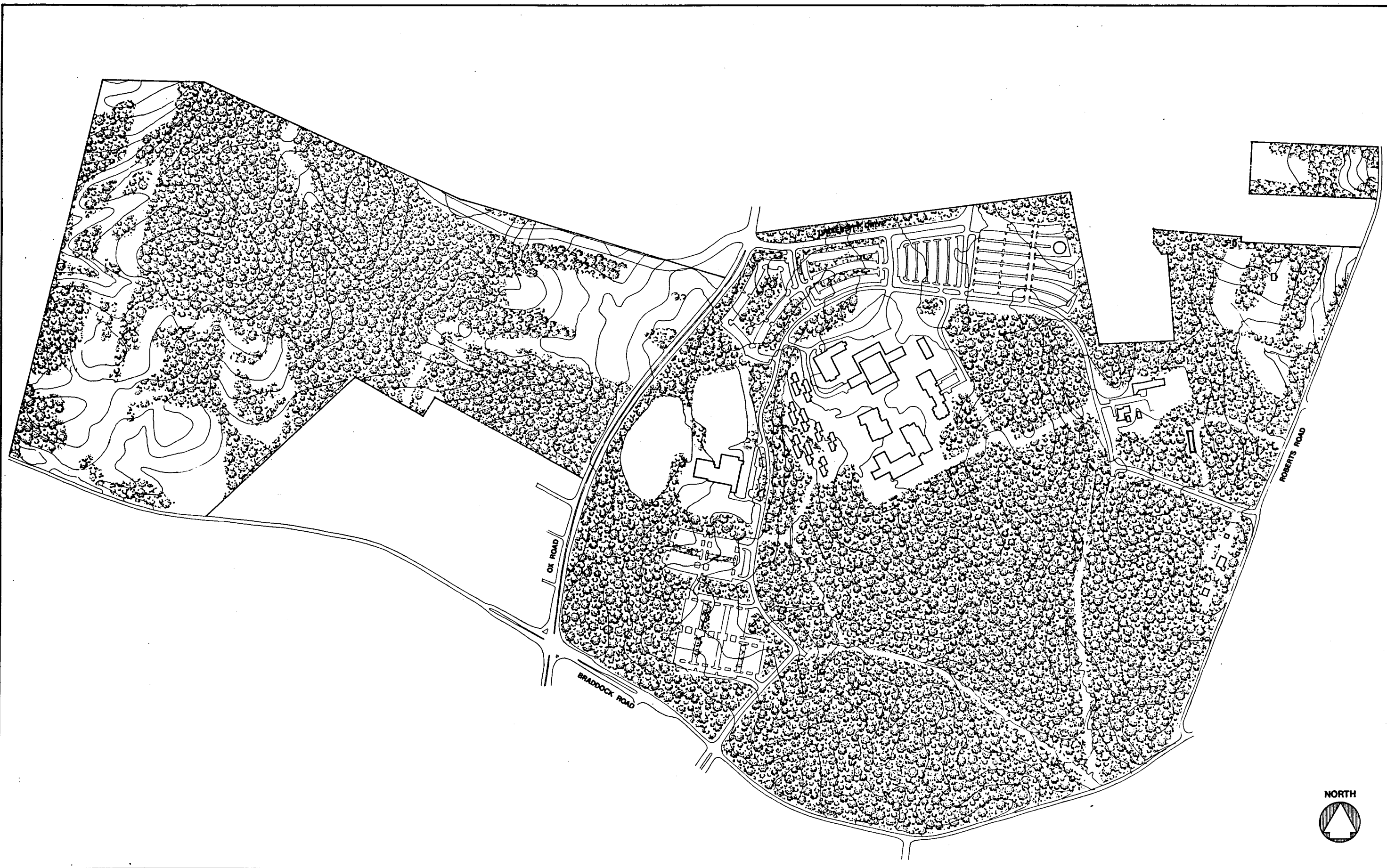
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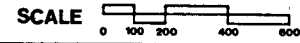
EXISTING TOPOGRAPHY

PLATE
2



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EXISTING CONDITIONS

PLATE
3



The University currently has available for use approximately 565 acres of land of which 355 acres lies east of Ox Road and 210 acres lies west of Ox Road. Not included in the plan is the property known as North Campus which is located within the City of Fairfax.

Generally, the revised master plan maintains the land uses designated in the 1968 plan. This results from the establishment of the intra-campus circulation system, the development of Patriot's Circle and the access roads to off-site traffic arteries, the development of service and utilities facilities, and construction of new parking areas.

NEIGHBORING PROPERTIES

Land uses of properties abutting or opposite that of George Mason University will remain primarily residential. Because of recent land development actions by the Fairfax County, it appears that abutting residential land uses will remain so and that several current vacant parcels will be developed as residential. One major commercial project has been developed south of Braddock Road and a portion of that commercial use remains to be developed. An exception to this assumption may occur at the northwest quadrant of the intersection of Ox Road and Braddock Road. The County planning staff reports that there are intense pressures to have the quadrant designated for commercial development.

CENTRAL ACADEMIC AREA

This area which lies within Patriot's Circle will continue to be the primary location of academic facilities. A central core of highly flexible instructional facilities is created primarily to serve lower level instruction. Immediately surrounding the central core is a zone of special centers. This zone contains specialized instructional facilities such as laboratories and research buildings, the library, and student centers. To the extent possible, the central core and special center zone would be located within the walking distance area which may be traversed during the normal class change period. Beyond the special center zone is a residence and natural preserve zone which extends to the ring

road, Patriot's Circle. To the extent possible, this zone contains only student housing and natural vegetation. The small streams in this zone are enhanced where appropriate by additional landscaping.

PERIMETER APPROACHES AND PARKING

At the perimeter of the main campus property, multiple approaches will be developed. These approaches will be attractively landscaped utilizing natural vegetation and will be engineered to efficiently handle vehicular traffic between the campus and the peripheral circulation system. The roadways will be linked to the major perimeter parking areas which lie between Patriot's Circle and the property boundaries and almost completely surround the central academic area.

SERVICE AREA

The area in the northeast corner of the property will continue to be the location of service facilities such as the heating and cooling plant, maintenance shops, warehouses, receiving and shipping, and printing. The area is located near a major roadway and may be easily screened to hide service activities.

ATHLETIC AND RECREATIONAL AREA

That area between Patriot's Circle and Ox Road on the western perimeter of the central campus has been developed for use as physical education facilities. Additional athletic facilities are currently being planned west of Ox Road. The plan provides for the extension of athletic facilities on west campus from Ox Road to the stream ravine.

HOUSING

In addition to the housing located within the central academic area, it is proposed that housing be provided in the area north of Shenandoah Lane and

west of Roberts Road. It is assumed that the church property adjacent to Roberts Road and Shenandoah Lane will be acquired. This area, containing about 8.5 acres of land, has been designated as a site for additional housing. When the need arises and adequate roadways can be provided, the area on the west slope of the stream ravine on the west campus may be developed for housing.

is designated as a reserve. This area provides expansion capability for the University and will remain undeveloped until the demand for facilities requires its use.

WEST ACADEMIC AREA

The area comprising the higher elevations of the property between the stream ravines on the west campus is designated for the development of professional schools and research institutes which will occur as a result of the growth of the University.

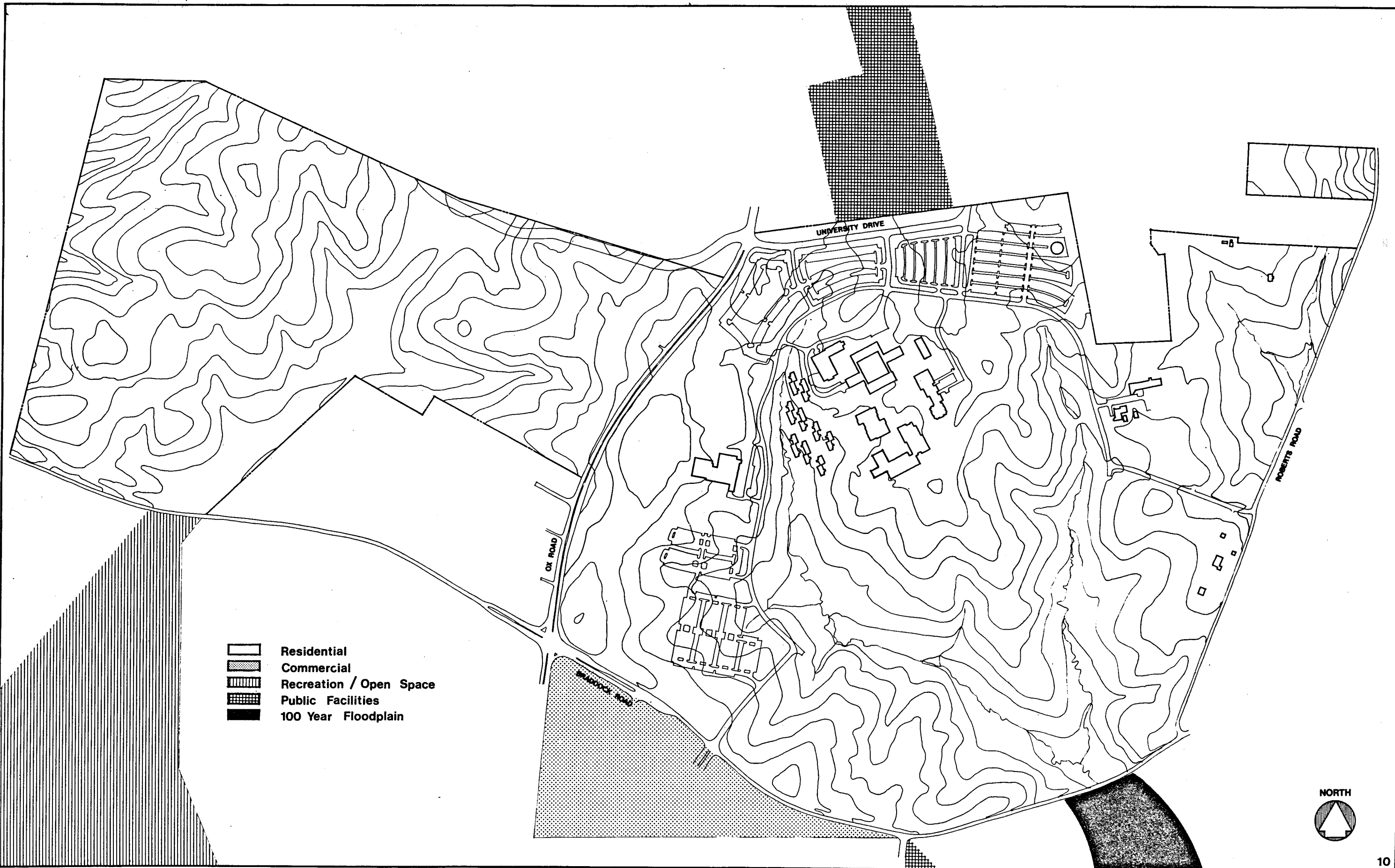
NATURAL PRESERVE






The natural setting of gentle rolling land with well developed vegetation and a wide range of habitats is a visual asset and an important teaching resource for courses that the University offers. It is an asset to the community. Therefore, the Plan is designed to maintain natural preserves to the maximum extent possible outside the proposed development area.

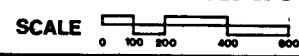
There are two major natural preserve areas. The first is on the main campus and includes the ravines of the upper tributaries to Rabbit Branch and extends from Braddock Road to the upper extremities of the tributaries bordering Patriots Circle. This preserve creates a wooded buffer that almost completely surrounds the central academic area. The second preserve is on the west campus and includes the ravine of the East Fork of Popes Head Creek and portions of the slopes leading thereto. This preserve maintains existing forest and habitats for teaching purposes, biological and ecological studies.

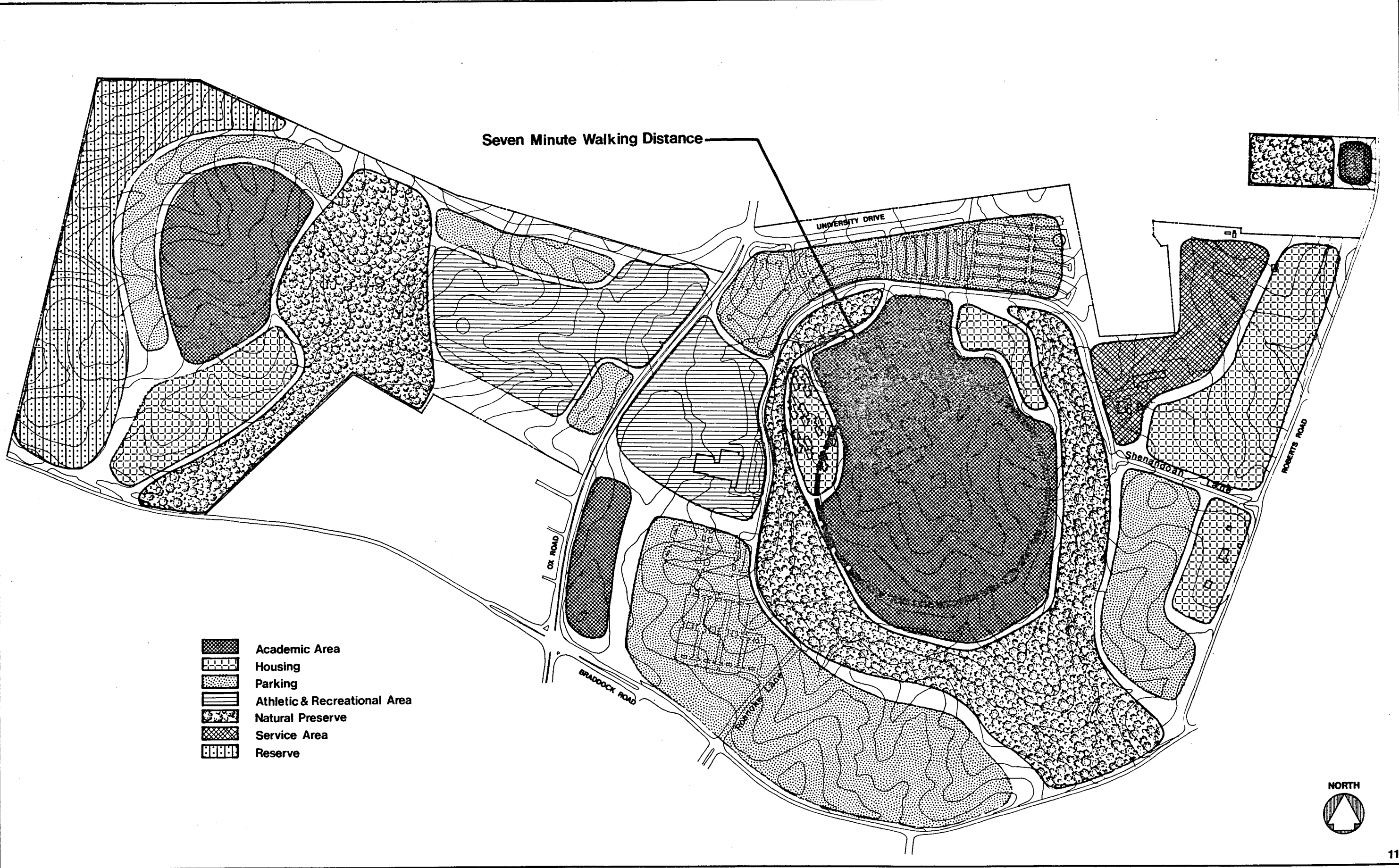
RESERVE

The extreme western portion of the campus



-  Residential
-  Commercial
-  Recreation / Open Space
-  Public Facilities
-  100 Year Floodplain





Seven Minute Walking Distance

-  Academic Area
-  Housing
-  Parking
-  Athletic & Recreational Area
-  Natural Preserve
-  Service Area
-  Reserve



OFF-CAMPUS ROADWAY SYSTEM

Primary north-south campus access is provided by Ox Road (Virginia Route 123) which bisects the campus. Adjacent to the campus, Ox Road is presently being widened to a four-lane divided roadway with separate left turn lanes at major intersections. The four-lane cross section extends from the Fairfax City Line immediately north of the campus to the Courthouse Country Club approximately one-half mile south of Braddock Road. At the termini of this widening, Ox Road narrows to a two-lane roadway.

Primary east-west campus access is provided by Braddock Road (Virginia Route 620) which borders the campus on the south. Braddock Road is primarily a two-lane roadway in the vicinity of the campus although it widens to a four-lane divided cross section from the Roanoke Lane campus entrance westward through the Ox Road intersection. Separate left turn lanes are provided at the major intersections along the widened section in the immediate vicinity of the campus.

Direct campus access is provided from Ox Road via University Drive on the north side of the campus. University Drive is a four-lane undivided roadway which swings northward from the campus into Fairfax City providing alternate access from the north.

Bordering the campus on the east is Roberts Road, a two-lane roadway that extends north from Braddock Road to Main Street (Virginia Route 236) in Fairfax City. Roberts Road provides alternate access to the campus from both Braddock Road and Main Street.

PROPOSED OFF-CAMPUS ROADWAY IMPROVEMENTS

There are several proposed roadway improvements which could have significant impact upon campus accessibility and traffic circulation. The improvements reflect recent decisions by the Fairfax City Council not to widen roadways through the City and to discourage vehicular travel through the City.

Ox Road is presently under construction from the Fairfax City Line to the Courthouse Country Club. This improvement consists of the widening of the roadway to a four-lane divided cross section with separate left turn lanes at intersections and the installation of a traffic signal at the intersection

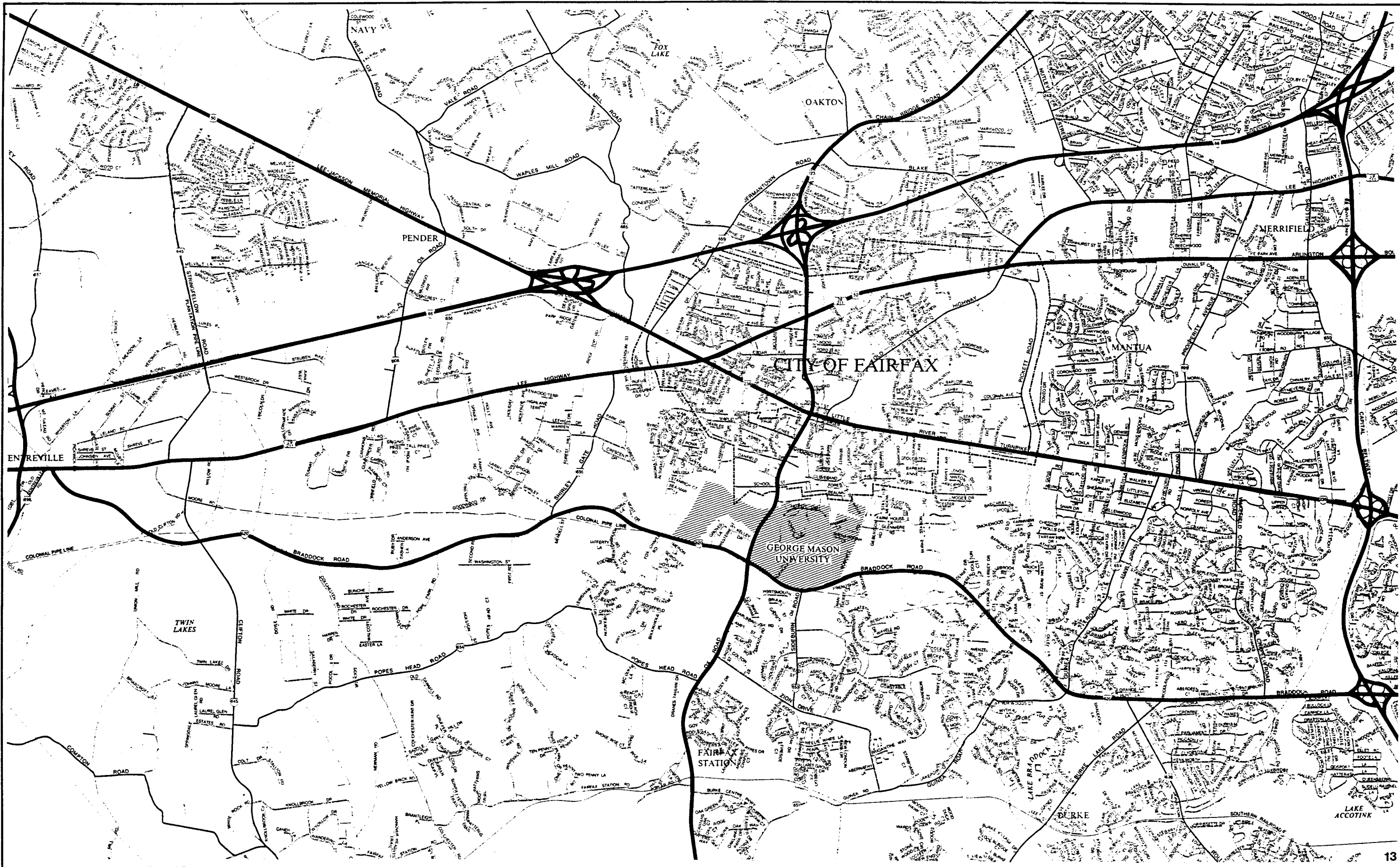
with University Drive. The improvement is scheduled for completion in early 1979 and will improve access to the campus and traffic flow in the area.

The widening of Ox Road is to be continued in two sections. The first section from the Courthouse Country Club to Burke Lake Road is scheduled for completion in 1985. The second section from Burke Lake Road to the Prince William County Line is scheduled for completion in 1990. This improvement will ultimately improve traffic flow in the north-south direction as well as access to the Burke Lake community.

Braddock Road is to be widened to a four-lane divided roadway consistent with the cross section adjacent to and east of the campus. The section from Guinea Road to Sideburn Road is scheduled for completion in 1985 and will significantly improve travel conditions to the east. The section from Ox Road westward to Centreville Road is scheduled for completion in 1995.

A regional improvement of major significance is the proposed Springfield Bypass. This facility will provide a circumferential roadway extending from Virginia Route 7 north of Reston in a southeasterly direction to U.S. Route 1 south of Alexandria. This improvement will greatly enhance north-south travel capacity in the western Fairfax County area and will alleviate demand on Ox Road and Braddock Road. In relation to access to the campus, it will provide an alternate routing for traffic from the northwest so as to avoid Fairfax City.

Another proposed improvement of major consequence is the proposed widening and realignment of Shirley Gate Road (Virginia Route 655). This improvement is not programmed by the state of Virginia but is included in the Fairfax County Master Plan as part of a planned system of roadways to bypass traffic around the City of Fairfax. This improvement will provide a direct connection between U.S. Route 50 and Braddock Road for campus traffic from the U.S. Route 50 corridor.



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OFF-CAMPUS ROADWAY SYSTEM

PLATE
6

TABLE 1 EXISTING CONDITION OF OFF-CAMPUS PERIPHERAL ROADWAYS

Road/Street	Route No.	Average Daily Traffic, Vehicles (1)	Design Standard Needed (2)	Existing Conditions
BRADDOCK ROAD				
Roberts Rd. to Sideburn Rd.	620	13,785	Category VI (Four lane, divided)	Two lane, hard surface, non-standard
Sideburn Rd. to Ox Rd.	"	12,825	"	" " " " "
Ox Rd. to Graves Lane	"	7,108	"	" " " " "
Graves Lane to Prestwick Dr.	"	6,951	"	" " " " "
Prestwick Dr. to Belmont Dr.	"	5,543	"	" " " " "
OX ROAD				
School St. to University Dr.	123	13,715	Category VI	Two lane, hard surface, non-standard
University Dr. to Kelley Dr.	"	(3)	"	Divided four lane, standard
Kelley Dr. to Braddock Rd.	"	(3)	"	" " " " "
ROBERTS ROAD				
Braddock Rd. to Glenmere Rd.	653	5,561	Category VI	Two lane, hard surface, non-standard
Glenmere Rd. to Forest Ave.	"	3,156	Category V (Two lane)	" " " " "
UNIVERSITY DRIVE				
Forest Ave. to Rappahannock Lane	383	7,475	Category VI	Four lane, hard surface, undivided
Rappahannock Lane to Pohick Lane	"	(3)	"	" " " " "
Pohick Lane to Occoquan Lane	"	(3)	"	" " " " "
Occoquan Lane to Ox Rd.	"	5,644	Category VI	" " " " "

Notes: (1) Vehicle Count for Braddock Road, Ox Road, and Roberts Road made in 1977 by the Virginia Department of Highways and Transportation. The count for Ox Road extends from the Fairfax City limits to Fairfax Station Road. Vehicle count for University Drive made in June 1977 by Fairfax City.

(2) In accordance with the Fairfax County Public Facilities Manual, Volume 2, Construction Standards, Street Design (approved by the Va. Dept. of Highways & Transportation).

(3) Not available.

TABLE 2 PROPOSED OFF-CAMPUS ROADWAY IMPROVEMENTS (1)

Roadway	Termini	Improvement	Completion Date
1. Ox Road (Va. 123)	Fairfax City Line - Courthouse Country Club	Widen to 4-lane arterial	1979
2. Ox Road (Va. 123)	Courthouse Country Club - Burke Lake Road	Widen to 4-lane arterial	1985
3. Ox Road (Va. 123)	Burke Lake Rd.-Pr. Wm. Co. Line	Widen to 4-lane arterial	1990
4. Braddock Road (Va. 620)	Guinea Rd - Sideburn Rd.	Widen to 4-lane arterial	1985
5. Braddock Road (Va. 620)	Ox Rd. - Centreville Rd.	Widen to 4-lane arterial	1995
6. Springfield Bypass	Va. 7 - U.S. 1	Construct/reconstruct 4-lane arterial	1985
7. Shirley Gate Rd. (Va. 655)	U.S. 29-211 - Braddock Rd.	Widen and realign 4-lane arterial	(2)

Notes: (1) Source: Virginia Department of Highways and Transportation

(2) Improvement shown in Fairfax County Master Plan but not programmed by the Virginia Department of Highways and Transportation.

ON-CAMPUS VEHICULAR CIRCULATION

Internal campus circulation is provided on the main campus via Patriots Circle, a two-lane ring road which circles the central academic area. Access to the internal ring road is currently provided via three roadway connections to University Drive, one to Roberts Road and one to Braddock Road. Access to individual buildings is provided by internal service roadways via the internal ring road. No internal campus circulation exists on the campus west of Ox Road.

Most of the campus parking areas are located outside of the internal ring road with access provided either directly from Patriots Circle or via one of the roadways connecting Patriots Circle to the external roadway system. This limits vehicular travel within the main campus (inside Patriots

Circle) and protects the integrity of the pedestrian oriented central academic area.

The Master Plan continues to emphasize separation of vehicular and pedestrian movements on the main campus. Future primary parking is located peripherally to Patriots Circle with sidewalk connections to the central academic area. An additional external entrance point is provided on Braddock Road and two additional entrances are provided on Roberts Road, one of which is a service road. Access to all primary parking areas will be provided directly from the external access roadways. The intent of this design is to maintain the separation of vehicular and pedestrian movements by providing multiple access points to and from the external roadway system with direct access to parking areas thereby minimizing vehicular travel along Patriots Circle.

The addition of entrances along Braddock Road

and Roberts Road will create a greater dispersal of campus traffic to the roadway system. The additional access will complement proposed modifications to the external roadway system. Programmed improvements are designed to discourage travel through the City of Fairfax and to improve north-south capacity. The resultant change in travel patterns for campus generated traffic will be to encourage access via Braddock Road and Roberts Road.

To ensure adequate capacity and minimize congestion, all access roadways to the external roadway system should be designed with a four-lane (44-48 feet) cross section. This will provide two lanes for both inbound and outbound movements as well as the ability to utilize the second lane as a bypass lane around turning vehicles that may queue in one lane. Turning queues will occur upon exiting the campus onto the external roadway system and upon entering the peripheral parking facilities. The design of the access roadways may be either as divided or undivided roadways. Operationally, there is little difference; however, aesthetics and environmental considerations may indicate the desirability of a median separation. Roanoke Lane is expected to be a divided roadway because of its service as the prime campus access.

Patriots Circle will be completed as part of the plan to encircle the central academic area. Access to parking facilities as well as internal service roadways will be provided from this roadway. In addition, this roadway will provide the pick up and drop off capability for staff and students who "kiss-and-ride", and internal circulation for any transit service. Considering the multiple vehicular uses on this roadway and the need for this roadway to provide the major internal circulation capability, it is planned to have a four-lane (44-48 feet) cross section.

Analysis of internal circulation requirements reveal that during peak hours, sections of Patriots Circle may be required to accommodate 600 vehicles in both directions. This is based upon two-thirds of all campus traffic being served by access to the parking areas from the access roadways. It also is based upon the peaking characteristics of University traffic. Therefore, considering the multiple uses of the internal circulation roadway, that is,

numerous turning and stopping vehicles, a four-lane cross section provides the optimum flexibility to accommodate all the vehicular movements and volumes required while minimizing congestion.

Primary access to the west campus is to be provided by an extension of University Drive westward to a terminus at Braddock Road. This roadway will provide direct access to all land uses on the west campus as well as most parking areas. Considering the primary service function of this roadway it should be designed with a four-lane (44-48 feet) cross section.

In addition to the extension of University Drive, the west campus is to be served by an internal circulation roadway that extends westward from Patriots Circle across Ox Road to a cul-de-sac in the west academic area. This roadway is intended to serve exclusively as an internal circulation roadway for traffic between the main campus and west campus. As such, it is recommended that it be constructed with a two-lane (24 feet) cross section with pedestrian walkway and bicycle path. To facilitate the internal connection and to maintain the unity of the campus atmosphere, a grade separation should be provided at Ox Road. To discourage usage by other than intra-campus vehicular travel, no direct connections to University Drive are provided from this roadway. However, to serve the necessary intra-campus function, connections to the parking areas and residential units are provided.

The grade separation not only provides a unifying feature between the central and west campuses, but also provides the University with flexibility in planning long range access requirements. Should it become necessary in the future to provide access to Ox Road from the cross-campus roadway, an interchange could be provided at the grade separation by the addition of ramps. Right-of-way area is provided adjacent to the grade separation.

Traffic control on the internal circulation roadways should be provided by stop signs. Signalization of the internal roadways should be avoided as it inhibits traffic flow and causes undue delay. As such, signalization should be restricted to access connections to the external roadway system and only where absolutely warranted. Based upon forecast traffic volumes, signals will most likely be required along Braddock Road at Roberts Road, Roanoke Lane, and University Drive (west campus entrance).

PARKING

The campus parking supply is a key planning element for the long range University growth. This is due to the large amount of land required to accommodate parking areas and the large capital investment for construction, lighting and maintenance of these facilities. Insufficient supply causes congestion on campus and could affect enrollment, while surplus parking utilizes funds that may be necessary for other University expenses.

The existing campus supply of parking totals 3391 spaces. This total does not include curb parking along University Drive or parking in the vicinity of the power plant.

Parking spaces are classified by the University as student, faculty or staff, handicapped person, and visitor. For the purposes of the Master Plan, parking spaces are also classified as primary and secondary. Primary spaces are those located within the large designated parking lots. Secondary spaces are those located within the academic areas off service roads and other incidental spaces in the immediate vicinity of certain facilities.

Discussions with University officials revealed that past parking demand is directly related to the headcount enrollment. Experience has shown that peak parking demand is equal to 0.4 spaces per student (headcount). Surveys conducted by the campus security department revealed that the peak demand occurs during the fall semester and during the school day between the hours of 10:00 a.m. to 1:00 p.m. These surveys revealed that in September 1978, all campus parking areas were virtually 100 percent utilized between the hours of 11:00 a.m. - 1:00 p.m. except for Lot K which achieved a maximum utilization of 80 percent. Considering that Lot K is the most remote from the present campus buildings, its lower utilization is predictable.

Based upon the peak parking factor of 0.4 spaces per student, the present supply should total approximately 4,000 spaces for the student enrollment of slightly over 10,000 headcount. Considering the extensive usage of University Drive for parking due to its immediate

proximity to the central academic area, the present supply is estimated at approximately 3600 spaces. Thus, the 0.4 space factor probably provides a surplus of parking to actual demand.

In determining long range parking requirements, an analysis is necessary of travel characteristics associated with the University as well as a comparison with other universities. Travel characteristics of a university's population are based on several factors: university parking policy, availability of alternative transportation modes, university housing policies, group-riding characteristics, and parking fees.

The university parking policy will directly relate to vehicle usage. A university which provides abundant parking space for all segments of the population will experience a substantially higher demand for parking than one which imposes parking controls on all or some segments of its population.

A university which is served by highly efficient and frequent transit service will experience a high level of transit usage by its population. However, universities which are poorly served by transit must depend upon automobile usage. As a result, these universities experience a high demand for parking.

Another factor affecting parking demand, particularly that of students, is university housing policies. The number of students commuting daily to a university is a function of the percentage of the total student population living on campus. In addition, housing regulations in areas adjacent to the campus will also influence the parking demand by students.

Group-riding characteristics of commuters affect the vehicle volumes entering the campus. An increase in auto occupancy ratios will reduce the number of vehicles entering the campus and correspondingly reduce the required parking supply. Typically, student occupancy ratios are significantly higher than those for either faculty or staff.

Finally, parking demands are related to parking fees. The imposition of parking fees has a direct impact on vehicle usage by students due to the economic situation of most students. On the other hand, faculty and staff are not influenced significantly by a fee structure.

TABLE 3 INVENTORY OF EXISTING AUTHORIZED PARKING SPACES

Location	Class Of Parking Spaces					Total	Remarks
	Student	Faculty or Staff	Handicapped	Visitor	Assigned		
Lot A	360					360	
Lot B		340				340	
Lot C	413					413	
Lot D	496					496	
Lot E	348					348	
Lot F	170					170	
Lot G				135*		135*	150 possible, special events
Lot H						0	60 possible, lot closed
Lot I			6*	49*		55*	
Lot K	922	60	15			997	
Finley Circle			11*	20*	1*	32*	
Student Union					1*	1*	
Robinson Hall			10*			10*	temporarily closed
Fenwick Library		18*				18*	
P.E. Building		6*	3*	7*		16*	
Subtotal, Primary	2,709	400	15			3,124	
Subtotal, Secondary		24	30	211	2	267	
Total		424	45	211	2	3,391	
Percent of Total	80	13	1	6	0	100	

Notes: * indicates secondary parking spaces

To a large degree, George Mason University possesses the conditions which induce automobile usage. It is located in a suburban community that is not conveniently served or accessible by public transportation. Present on campus housing serves less than eight percent of the full time equivalent student enrollment. The University has a high percentage of part time and evening students. By legal requirements, it is unable to implement parking fees other than to cover administrative costs. As a result, the University is presently commuter oriented and is dependent upon automobile usage for its existence.

A study of 53 urban universities in North America determined parking space ratios for each of five campus population groups. In comparison

Table 4 PARKING SUPPLY FOR EACH OF FIVE CAMPUS POPULATION GROUPS (1)

University Population	Spaces per Person
Under 10,000	0.3 to 0.4
10,000 - 15,000	0.2 to 0.35
15,000 - 20,000	0.15 to 0.25
20,000 - 30,000	0.1 to 0.2
30,000 - 40,000	0.07 to 0.2

(1) V. Setly Pendakur, "Access, Parking and Cost Criteria for Urban Universities", Traffic Quarterly, Eno Foundation, July 1968.

with this study the present University ratio of 0.4 spaces per student is in line but on the high side of the range. This is due to high auto dependency the degree of which is unknown for the universities comprising the study. However, the study indicates that as university enrollments increase, the parking supply ratio decreases. This results from substantial increases in on-campus housing and the availability of services within or adjacent to the University which diminish the need for automobile usage. Most universities over 20,000 students are self-sufficient and mainly pedestrian oriented.

The Master Plan forecasts an increase in enrollment to 15,000 full time equivalent students (23,000 headcount). In addition, the on-campus housing will increase to 4,000 students or approximately 27 percent of the full time equivalent

enrollment. This would tend to support a reduction in the parking space ratio necessary to accommodate future demand.

Based upon the existing ratio of 0.4 spaces per student, 9200 spaces will be necessary to accommodate 23,000 headcount enrollment (15,000 FTE). If the ratio were reduced to 0.35, only 8050 spaces would be required. The Plan provides 8,000 primary parking spaces on the main campus and 1,500 primary spaces on the west campus. It is estimated that additional secondary parking in the amount of three percent of the total primary parking will be created when the campus is fully developed. That would add approximately 240 spaces to the main campus and about 45 to the west campus. Therefore, nearly the entire parking requirement is provided on the main campus. This appears not only adequate but possibly excessive.

Professional schools and research facilities will be provided on the west campus as well as housing and athletic and recreational facilities. Therefore, a portion of the required parking supply must be provided on the west campus to satisfy the demands of these facilities. That will reduce the parking requirement for the main campus since the parking supply is based on the University as a whole.

Except when sporting events are scheduled, which is usually in the evening or on weekends, athletic and recreational area parking lots are virtually unused. As a result, these parking areas may be used as remote surplus parking or a portion may be used to supply the total University requirement.

Primary parking areas are designed with large medians between parking bays and with areas of natural vegetation surrounding the parking areas. If the medians, which are used to preserve natural vegetation and to provide space for new plantings, were eliminated, it would be possible to create 500 additional primary parking spaces on the main campus making a total of 8,500 spaces.

The standard used for planning parking spaces is 9 feet by 20 feet and the bay widths are 64 feet. The current trend in automobile manufacture is toward smaller, more energy efficient vehicles. If the standard size of a parking space were reduced, or if compact car spaces were used with regular car spaces, the parking capacity could be increased. The parking areas have an expansion potential of up to

TABLE 5 EXISTING PUBLIC TRANSIT ROUTES

Type	Route No.	Terminations	Major Stops	Routing Times		Service Area
				Arrive GMU	Leave GMU	
Bus	5K	George Mason Univ., & Farraquut Square, D.C.	Tysons Corner McLean	7:08 a.m.	6:14 a.m.	Northern Fairfax Co. Northern Arlington Co. Falls Church
				7:42	6:53	
				8:10	7:29	
				9:12	7:50	
				10:12	8:43	
				11:16	9:43	
				12:16 p.m.	10:43	
				1:16	11:43	
				2:20	12:43 p.m.	
				3:20	1:43	
				4:20	2:43	
				5:24	3:42	
				6:34	4:41	
				7:04	5:39	
				7:28	6:42	
				8:15	7:42	
9:09	8:42					
10:09	9:32					
Bus	29K	George Mason Univ., & Alexandria, VA	Annandale Landmark, Alexandria	5 minutes before the hour from 6:55 a.m. to 9:55 p.m.	On the hour from 6:00 a.m. to 10:00 p.m.	Alexandria Southern Arlington Co. Southern Fairfax Co.

20 percent by simply restriping the pavement to accommodate smaller cars.

A goal of the University should be to reduce the present parking requirement from 0.4 spaces per student to 0.35 or lower. The increase in on-campus housing and student facilities will assist in this effort. It is suggested that the University institute a more comprehensive system of data collection and record keeping of automobile and parking usage. The information generated by such a system will enable the University to determine how well it is achieving its goal and to more exactly determine its future parking needs.

Since all vehicles entering the campus must have permits to park on campus, it will be necessary to provide a visitor's information and control center operated by the security staff. This facility must be readily accessible and well identified but

not be so conspicuous as to be a distraction from the campus ambiance. Although not detailed on the Plan, a suitable location for such a facility would be west of the intersection of Patriots Circle and Roanoke Lane. This location is at the primary approach to the University and therefore is immediately accessible. It is adjacent to a primary parking area where short term parking can be provided and it can be landscaped within the wooded buffer area that surrounds the parking.

TRANSIT

The campus is served directly by two Metrobus routes throughout the day. The University is a termination point of each of the routes. Both routes enter the campus via University Drive from

the north and exit via Ox Road proceeding north through the City of Fairfax. The present bus stop is located on the north side of University Drive opposite Pohick Lane.

Observations of the bus stop revealed limited use of transit by both students and staff. A major reason for this is that these routes serve a limited number of suburban areas and are oriented toward the east. Areas such as Reston, Vienna, Springfield and Burke are accessible only through a series of transfers. Therefore, the present bus routes only serve those portions of the campus population who are located along these routes or who are transportation disadvantaged (auto less).

With the completion of the Metrorail line to Vienna in the mid 1980's, bus service will be reorganized to provide a feeder service for the rail line. This will result in expanded service throughout western Fairfax County. The increased availability of service will greatly enhance access to the University by transit. However, even considering the proposed increase in service, usage by the University population will tend to remain limited.

Transit usage by the University population should be encouraged and action should be taken that will achieve the maximum utilization possible. University officials should request Metrobus routes to enter the campus and arrange strategic bus stop locations. Protected shelters should be provided at the bus stops as well as curb cut-outs to eliminate on-street congestion.

Although the use of transit is limited due to the suburban location of the campus, efforts to maximize usage will result in a reduction of parking requirements. The proposed actions to encourage transit usage are not capital intensive and can be implemented in conjunction with the development of the campus. The uncertainty of future economic and energy conditions may also contribute to greater demand for transit service.

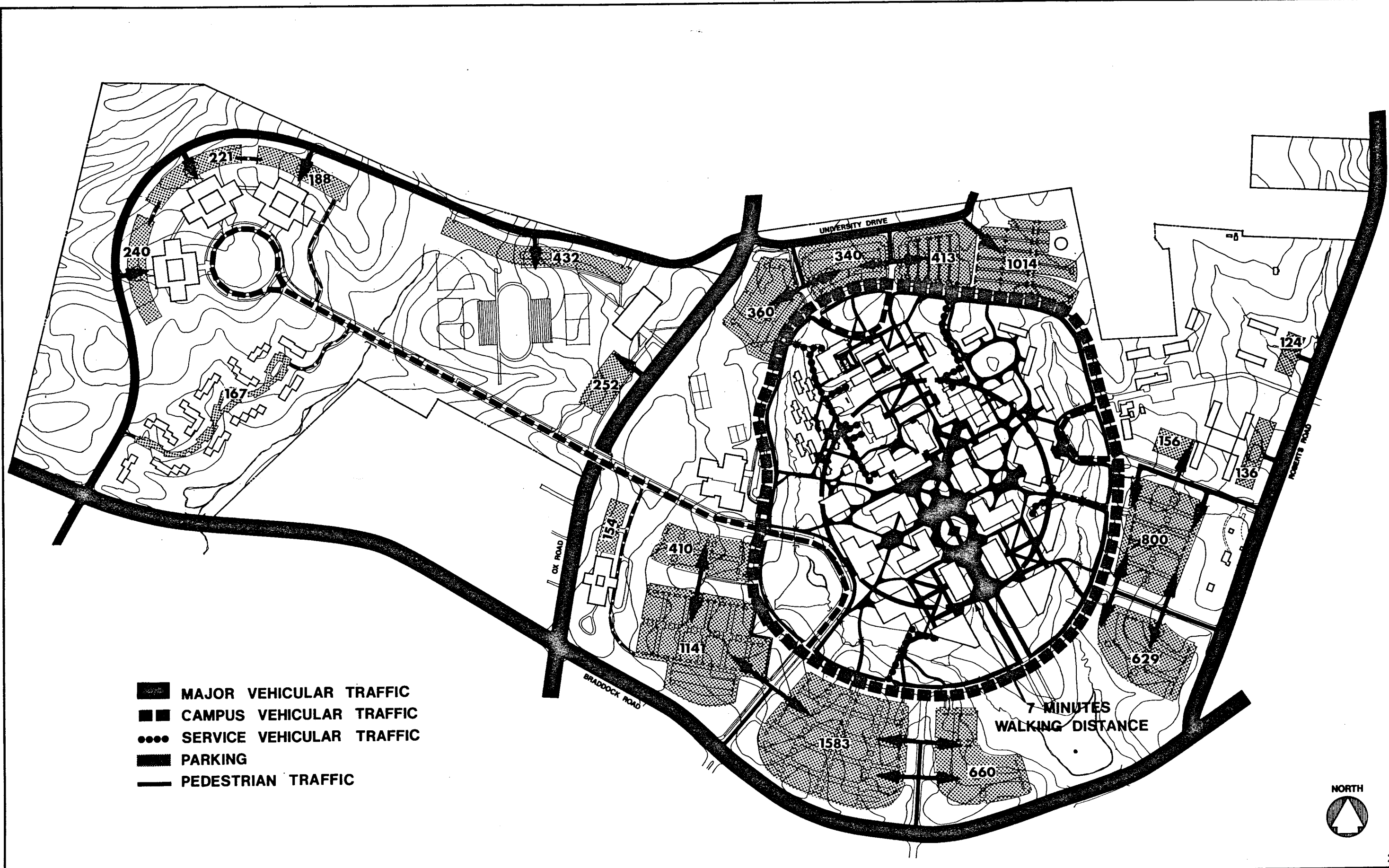
ON-CAMPUS PEDESTRIAN CIRCULATION

As stated previously, the Plan attempts to minimize the crossing of vehicular and pedestrian

circulation. The academic area is free of vehicular traffic to permit fast and efficient travel of persons between facilities. These attributes of the circular system are accomplished by creating pedestrian precincts of the central and west academic areas. The major internal roadways circumscribe these precincts to provide easy access by vehicle. Many walkways and paths conduct pedestrians from the roadways to all parts of the academic areas. Only minor cross circulation of vehicles and pedestrians occurs at the service roads within the academic areas.

The greatest concentration of pedestrian circulation will occur within the central academic area because of the clustering of the intensively used academic facilities at the center. It is intended that most of the intensively used lower level instructional facilities be located within a diameter of 1,600 feet. This is the distance which a person may travel in seven minutes. By allowing one and one-half minutes for vertical travel at each terminus, students have the capability of changing classes within the allotted ten minutes.

The grade separation at Ox Road provides linkage between the main campus and the west campus. The inter-campus roadway is paralleled by a pedestrian walkway and is separated therefrom by a wide landscaped median. Pedestrians as well as vehicles and bicycles pass along the tree lined walkway and roadway without conflict of circulation patterns.



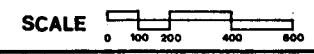
- MAJOR VEHICULAR TRAFFIC
- CAMPUS VEHICULAR TRAFFIC
- SERVICE VEHICULAR TRAFFIC
- PARKING
- PEDESTRIAN TRAFFIC

7 MINUTES
WALKING DISTANCE



SAUNDERS, CHENG & APPLETON
ARCHITECTS, ENGINEERS & PLANNERS
ALEXANDRIA, VIRGINIA

GEORGE MASON UNIVERSITY MASTER PLAN
FAIRFAX, VIRGINIA



CIRCULATION AND PARKING

PLATE
7

LANDSCAPING

The landscaping of the campus is to enhance the physical environment by providing the most pleasing aesthetic effect possible. The landscape plan accentuates the Master Plan concept of having a Central Academic Area with strong axis mall and fringe development and preserve the beautiful natural setting to the maximum extent. The campus landscape is divided into primary and secondary areas.

The landscape in primary areas will be relatively intensive and will complement the architecture or the emphasized elements. These areas will contain the highest quality plants. Trees should be large and of specimen quality. Garden spaces and courtyards will be highly refined and contain some distinctive furnishings. The primary landscaped areas are:

- . Most of the central academic area
- . The mall between Mason Square and the retention pond
- . Major entry approaches and entry roads
- . The President's house and grounds
- . The arboretum
- . Front yard of the field house
- . Community Related Facility and grounds
- . Housing areas
- . The west academic area

The landscape in secondary areas will provide visual enrichment as well as screening of undesirable sights. Earth berms and plants will be introduced to provide physical delineation of spaces, continuous shade and windbreak over walkways and fields. The secondary landscaped areas are:

- . All the minor entry roadways
- . Patriots Circle
- . All the parking lots
- . The power plant area

- . The athletic fields and recreation areas

PLANTING

Planting is a means by which the campus is developed to achieve the following objectives:

- . Humanizing buildings and surroundings
- . Defining functional areas
- . Defining traffic flow
- . Screening
- . Controlling noise and dust
- . Controlling soil erosion
- . Providing shade & windbreak
- . Purification of the air and directing air movement

The landscape planting should be executed using the following guide lines:

- . Size the planting in scale with adjacent buildings and surroundings.
- . Use formal planting and composition for Mason Square, the mall, and major entries to the campus.
- . Use symmetrical planting for symmetrical building and symmetrical approaches to the building.
- . Use informal planting for gardens, courtyards, ponds and the periphery of developed areas to add interest and to blend developed areas with areas of natural vegetation.
- . Select one large deciduous tree such as red oak (*Quercus Borealis*), green ash (*Fraxinus Pennsylvanica Lanceolata*) or American linden (*Tilia Americana*) as the primary species for Mason Square, the mall, and the central academic area.
- . Incorporate an arboretum into the campus by setting aside an area for planting a large number of variant plant species. The Tallwood (isolated property northeast of the main campus)

area is suggested as a location for the arboretum because it will not limit development of the main campus and it is adjacent to the garden in the neighboring property south of Tallwood.

- . Use plant material that meets the requirements of the American National Standard for Nursery Stock (ANSI Z60.1) sponsored by American Association of Nurserymen.
- . Develop a planting plan which will give direction and consistency to future construction projects and result in an orderly and elegantly landscaped campus.

GRADING

Grading is an important part of site development. The change of ground elevations makes the site suitable for its intended use while ensuring that movement from one place to another is easy and surface drainage is adequate. Grading is a part of the design concept and should be performed in accordance with the following guidelines:

- . Keep new grades as close as possible to the existing grades to avoid drastic cut and fill.
- . Balance cut and fill closely to avoid high construction expense.
- . Make grade changes smooth and natural, blending slopes into level areas so as to avoid sharp transitions.
- . Grade paved areas as follows:
 - . Minimum gradients for all paved areas:
 - . Absolutely minimum: 0.5%
 - . Desirable minimum: 1%
 - . Maximum gradients for all paved areas:
 - . Roadways: Absolutely maximum: 17%
Desirable maximum: 12%
 - . Parking: Absolute maximum: 10%
Desirable maximum: 5%

. Walking: Desirable maximum: 6%

- . When walking gradient is over 6%, design a non-slip surfaced ramp not in excess of 12%.
- . Grades over 3% in paved areas are noticeable.
- . Grade planting areas as follows:
 - . Minimum gradient required to provide satisfactory drainage is 2%.
 - . A grade of 2% to 6% is recommended for general activities.
 - . Grades approaching 10% are distinct slopes.
 - . Maximum gradient for lawn area is 3:1. Slope steeper than this is difficult to mow.
 - . Slopes in excess of 2:1 should have special treatment such as retaining wall to prevent erosion.

PAVING

All roadways, parking lots, walks and most of Mason Square should be paved. Paving materials should be durable, attractive, and require little maintenance. Paving material should be consistent throughout the whole campus for the same functional areas. The recommended paving materials are portland cement concrete, bituminous concrete, and brick with grouted joints. Standard details and specifications should be developed for this work.

The major entry roads, Patriot's Circle, and the cross-campus road should be paved with bituminous concrete with portland cement concrete curb and gutter. All other roadways and parking lots should be paved with bituminous concrete with portland cement concrete curb.

Walks in building areas should be portland cement concrete with joint and scoring pattern. Walks in open field and natural areas should be bituminous concrete.

Gardens, courtyards and Mason Square should be paved with brick using concrete as a supplementary material.

SITE FURNISHINGS

To result in a unified development, selection and use of site furnishings must be coordinated with the architectural design of buildings and be appropriate to site conditions. Emphasis should be placed on good appearance, simple details, low maintenance, and quality of workmanship.

Benches should be provided within selected locations in Mason Square, gardens, courtyards, bus stops, and along walks. Benches should be wood with a clear finish, have back but no arms, and be limited to two types. Each bench should be 18 inches in height from ground surface. The seat width should be 15 inches minimum, and the length should be a minimum of 6 feet.

Trash receptacles should be provided in all pedestrian circulation areas at reasonable intervals. Trash receptacles should be wood with a clear finish and not taller than 36 inches.

Screen fence should be used only to hide unattractive elements such as large trash containers and large utility facilities. Material and color of screen fence should be consistent with architectural treatment. Chain link fence should be used with discretion and should be limited to site boundary and athletic areas.

SITE LIGHTING

Site lighting is to provide adequate outdoor light during dark to insure safety and permit movement about the campus. It is also the most important element of the site furnishings. The types and styles of lighting fixtures and standards used for different functional areas should be coordinated. Similar functional areas should use the same type to create a consistent and unified appearance throughout the campus.

Lighting for vehicular areas should be of the same type using similar fixtures and standards. Roadway lighting should be the minimum adequate to light roadways and adjacent walks. Parking lot lighting should provide enough illumination to

discourage vandalism and facilitate security procedures.

Lighting for pedestrian areas should also be of the same type using similar fixtures and standards. Walk lighting should assure an overlap of illumination without dark spots. Lights should be placed on one side in rectilinear layout, but it can be staggered from side to side for curvilinear walks. Lighting for gardens and courtyards should provide enough illumination to accommodate intended usage. Mason Square and the mall area should be highly illuminated for ceremonial and large outdoor activities to be held after dark.

It is recommended that the University establish standards for all campus site lighting.

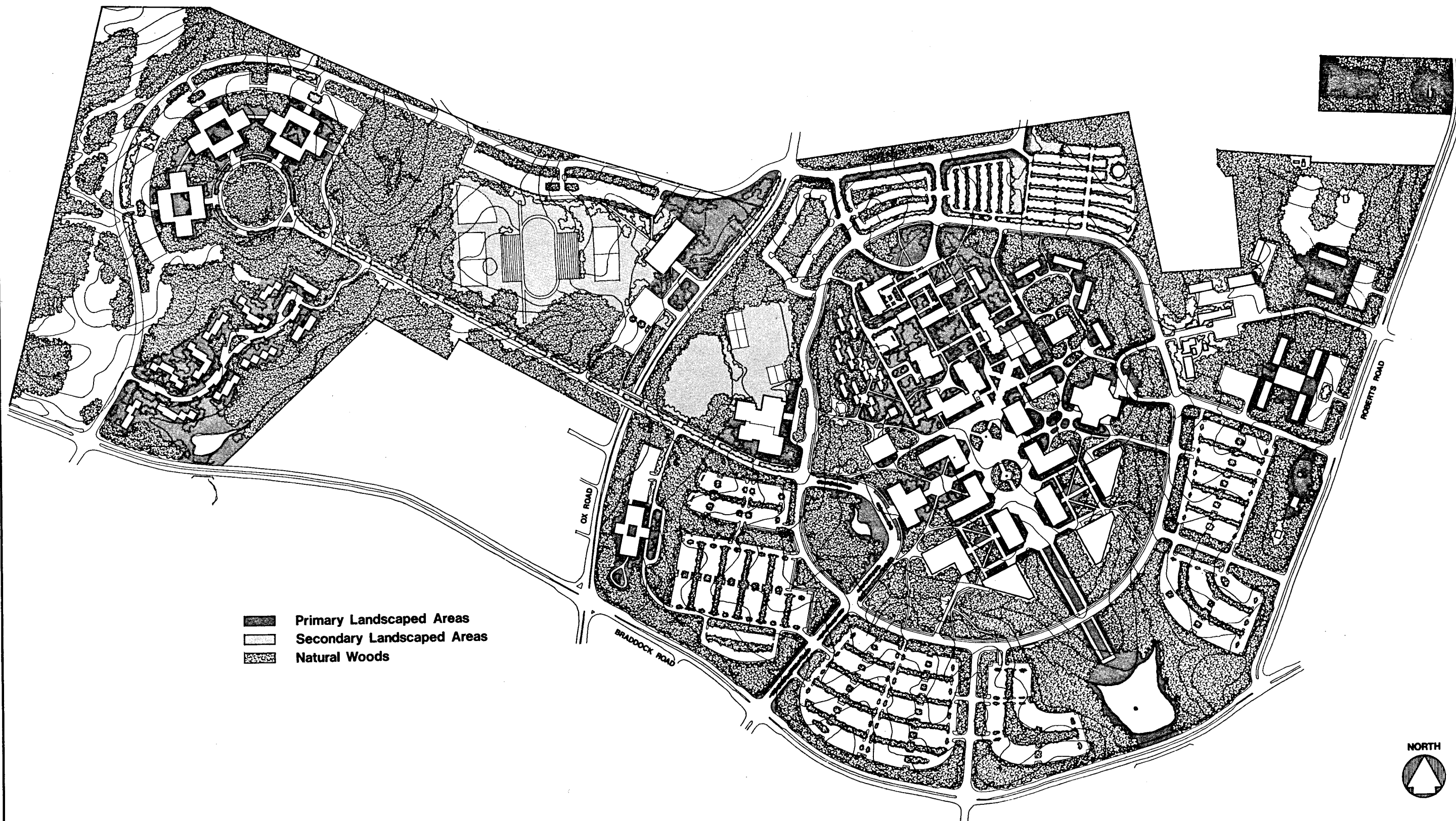
SIGNAGE

Most successful projects are the result of the visual impression they leave. Among those visual elements, signage is the first and the most noticeable. The signage system should be consistent and coordinated by using the same type of lettering and graphics in limited subsystems to create a unified image throughout the entire campus.

The campus signage system can be divided into the following subsystems:

- . Entry Signage. One type of entry sign should be used on all major entry roads and selected critical points.
- . Circulation Signage System. This system gives directional information to both vehicular and foot traffic and will include directional signs and parking signs.
- . Location Information System. This system gives information about locality which will include: campus map and directory boards, building identification, and place identification such as gardens, courtyards, plazas, and other significant points of interest.

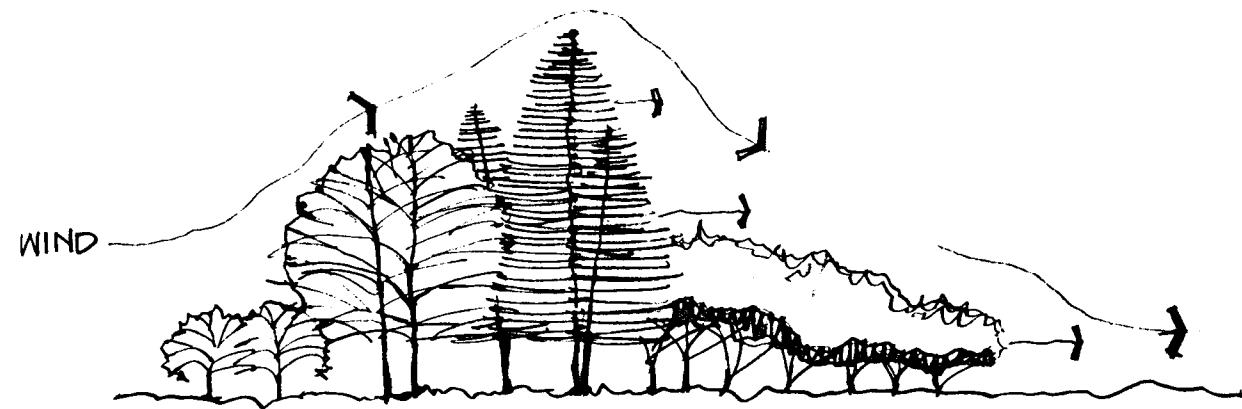
It is recommended that the University establish standards for all campus signage.



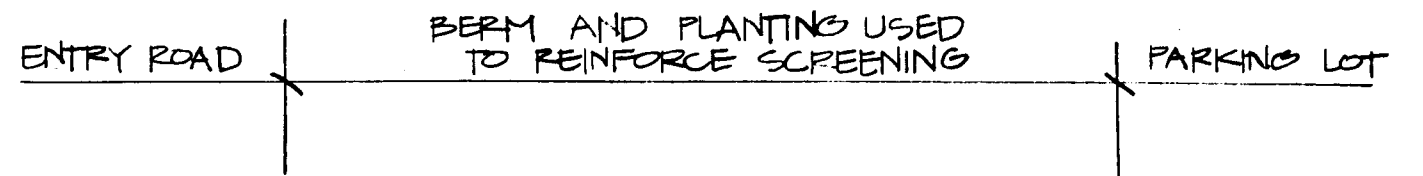
- Primary Landscaped Areas
- Secondary Landscaped Areas
- Natural Woods



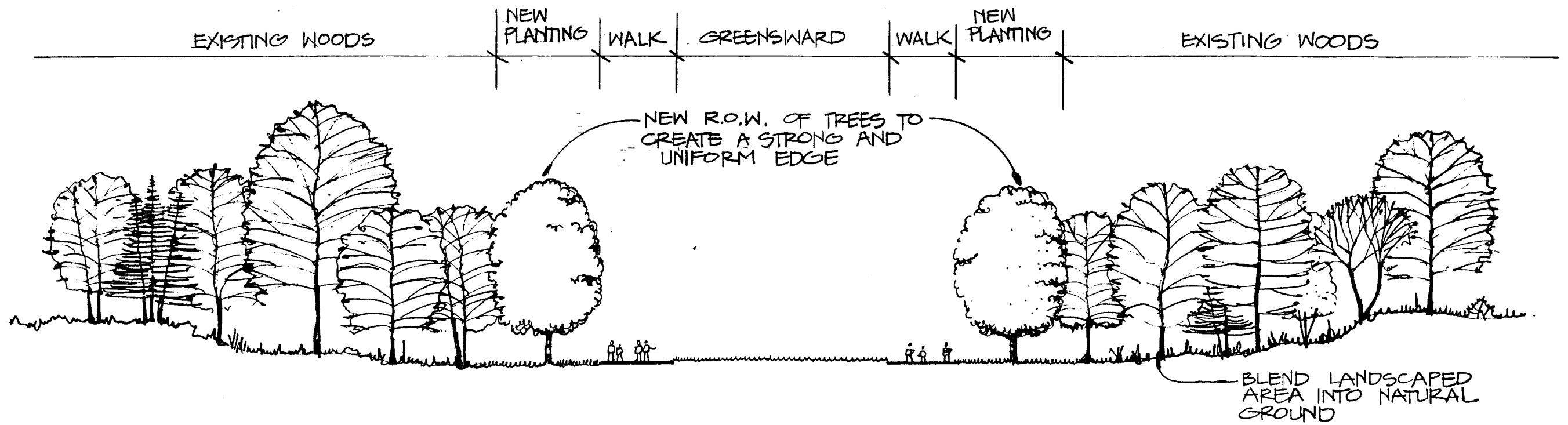
PLANTING CAN TEMPER CLIMATE BY PROVIDING SHADE IN SUMMER AND WINDBREAK IN WINTER



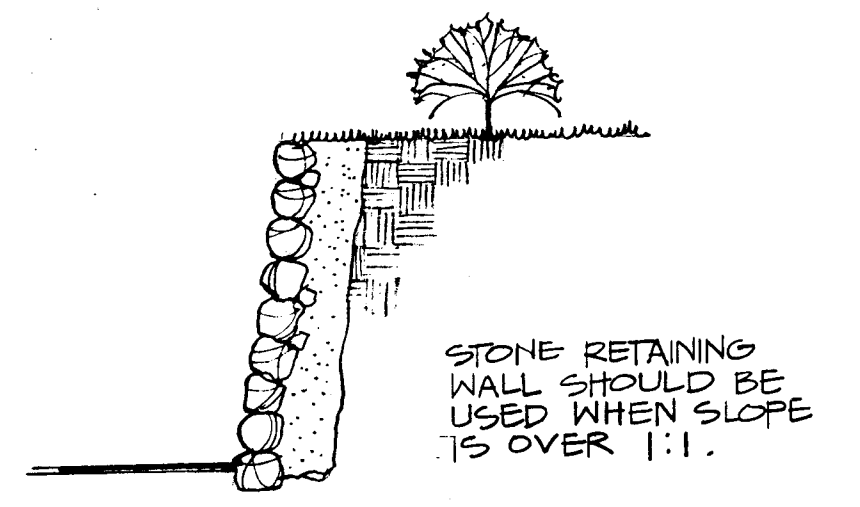
Diagrammatical Use of Planting



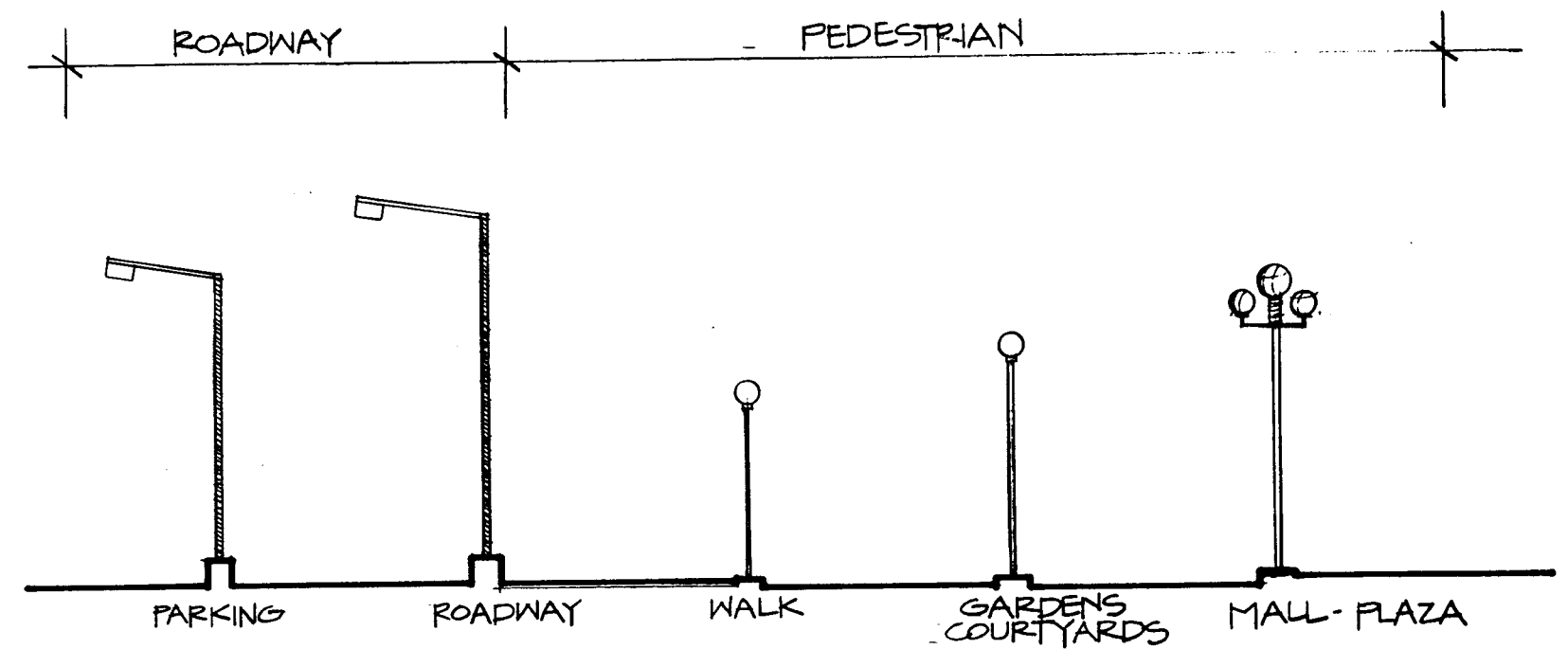
Parking Lot Screening



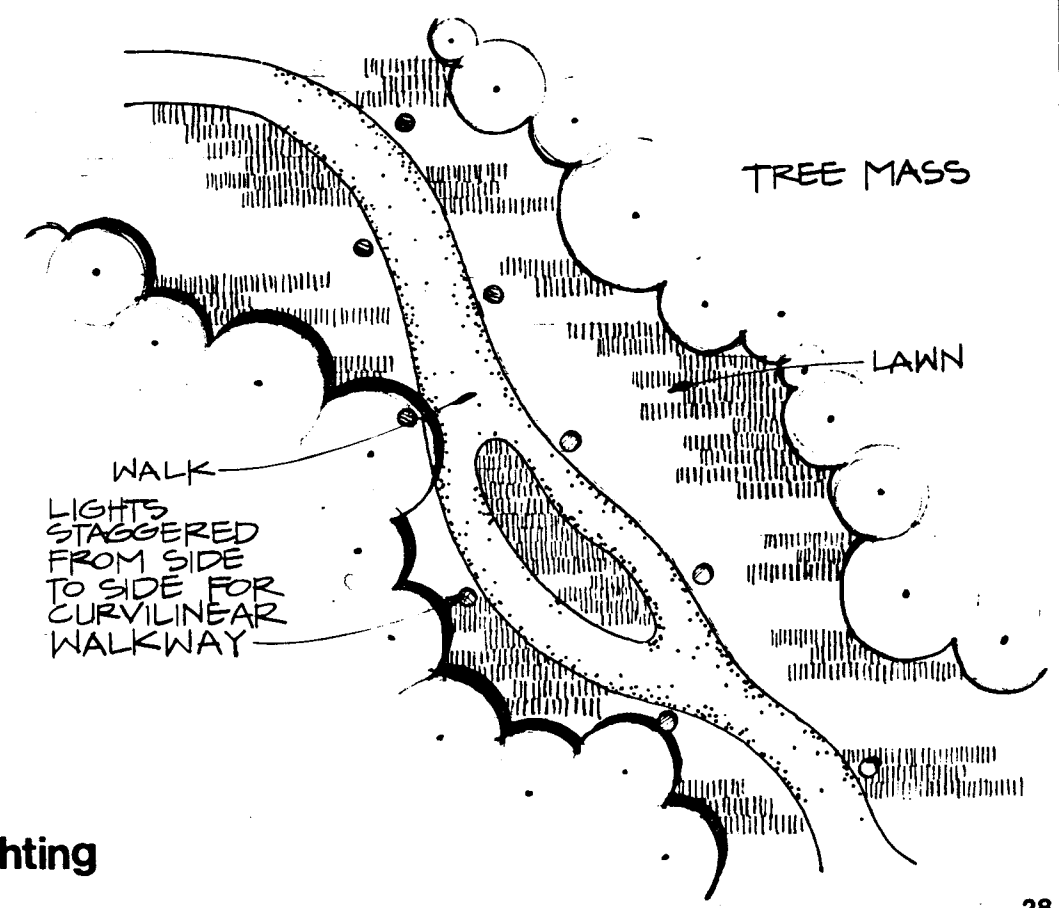
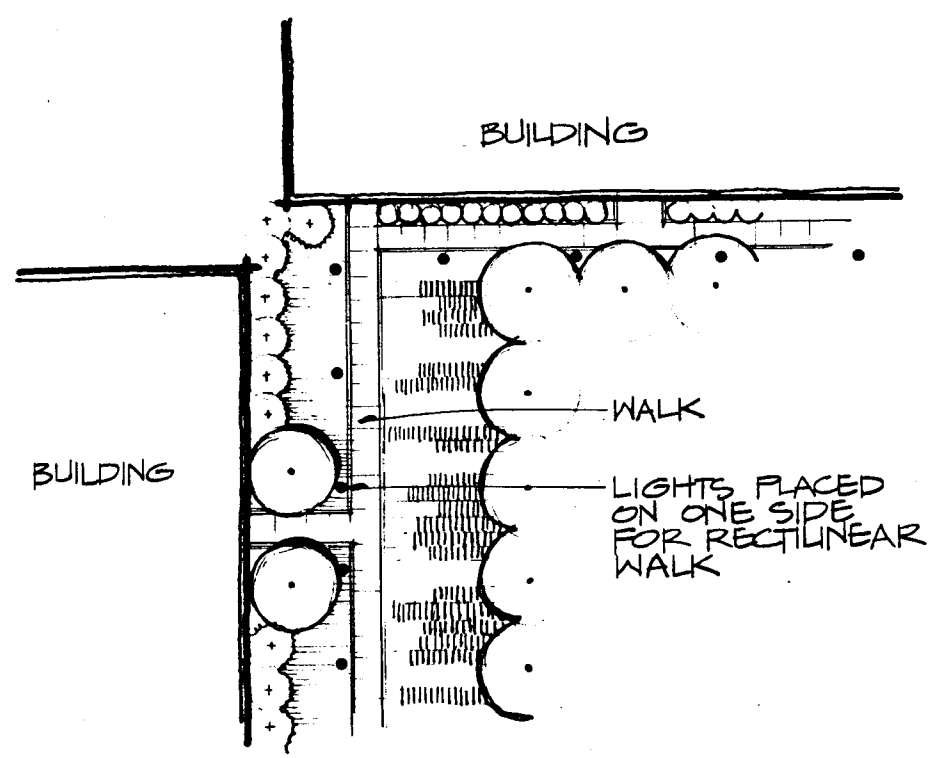
Transverse Section Through the Mall



Grading & Ground Treatment



Coordinated Site Lighting



Location of Walk Lighting

ENROLLMENT

This plan is designed to show the development of a campus for 15,000 full time equivalent students. Current projections indicate a FTE enrollment of 9,400 by the year 1990.

ACADEMIC PLAN

A major influence upon the physical plant is the academic plan of the University. Such a plan was published in October 1978 and it indicates that the University will continue to emphasize the liberal arts and sciences with many additional offerings in business and public administration. The major implication of the academic plan is that the physical size and bulk of facilities will probably be less than that for an institution with large enrollments in engineering and the physical sciences. The requirements for space in those disciplines are much greater than the programs planned by the University.

PLANNING CRITERIA

To project the future requirements for facilities, residential and non-residential facilities are investigated separately. Considerable variation exists among institutions of higher education in the amount of housing provided for students and faculty. The ratio of residential area to the total area of the institution varies widely but the ratios of other types of assignable area to the total are more consistent and predictable.

A study was made using national norms to arrive at suitable criteria for calculating the space requirements at George Mason University. A norm of approximately 120 to 135 square feet of assignable non-residential space per FTE student exists in the inventory of such institutions of higher education. If this net area is converted to gross area by adding in the unassignable area (dividing by the average ratio of net to gross among university facilities), it would appear that a gross area of 200 square feet per FTE student is a reasonable criterion for non-residential space requirements.

Projections for residential facilities have been made based upon interviews with University officials and the information contained in a 1974 study of the University's non-academic needs. The amount of gross area required for housing is determined using national norms for each type of housing unit to be provided.

NON-RESIDENTIAL AREA

Using the planning criterion of 200 gross square feet per full time equivalent student, a total FTE enrollment of 15,000 will generate a space requirement of 3,000,000 gross square feet of nonresidential area. If George Mason University develops according to national norms, the distribution of this total gross area will approximate that shown in the Tables accompanying this text. Deviation from these norms will probably occur due to conditions peculiar to the state of Virginia and the unique characteristics of George Mason University. However, the deviation may only be plus or minus two or three percentage points.

The University currently has an inventory of about 780,000 square feet of non-residential gross floor area including the north campus. Excluding the north campus, the total is approximately 640,000 gross square feet. The area of the addition to Robinson Hall now under construction is included in these totals. Virtually all of the existing space, exclusive of the north campus, is located on the main campus. The ground coverage on the main campus occupied by these existing facilities totals approximately 280,000 square feet.

To provide the additional 2,360,000 gross square feet of non-residential area needed for the 15,000 FTE enrollment, the Plan indicates the construction of new facilities mostly in the central academic area on the main campus and in the west academic area on the west campus. The ground area occupied by new facilities is about 940,000 square feet of which 670,000 is located on the main campus and 270,000 is on the west campus.

It is feasible to construct all of the needed 3,000,000 square feet of space on the main campus within the configuration indicated in the Plan. It is also feasible for the facilities to be supported by the necessary parking as stated elsewhere in this report. It is likely that the provision of facilities

TABLE 6 COMPARISON OF ASSIGNABLE SQUARE FEET OF NONRESIDENTIAL AREA PER FTE STUDENT (1)

Room Use Category (2)	HEGIS Code	VCHE Function Code (3)	Inventory norms (4)				GMU-OFP/VCHE (7)		
			In All Public Universities, United States		In All Institutions, Southeastern States	In All Institutions, United States	In All Institutions, Virginia	Fall, 1978	198x Projection
			Median (5)	90% (6)					
Classroom	100	1	10	13	16.7	13.9	13.5	9.1	9.4
Laboratory	200	1,3	28	46	25.1	25.2	20.7	12.4	57.6
Office	300	1,4	29	41	24.0	22.6	23.8	12.4	16.6
Study	400	2	11	17	12.4	11.8	12.0	8.7	9.5
Special Use	500	1,5	16	29	17.2	15.4	19.1	7.5	8.2
General Use	600	1,4	20	30	23.0	20.8	22.3	11.5	4.1
Supporting	700	7	11	22	11.3	11.2	10.7	5.4	9.9
Health Care	800		1	11	2.9	2.3	.7	.0	.0
Total	-	-	132	187	132.6	123.2	122.8	67.0	115.3

(1) The statistics presented in this table are not totally comparable because of variations between the classification systems used by the federal government and the state of Virginia in the collection of data. For example, the Virginia Council of Higher Education does not include in its inventory those facilities such as student unions and food service which are not funded by the state; these facilities are included in the Department of Health, Education and Welfare inventory.

(2) Room Use Category is that of HEW.

(3) Since Virginia uses a function code for categorizing areas, those categories which are most comparable to the HEW-HEGIS categories have been grouped for comparison of GMU statistics.

(4) Inventory relates to Inventory of Physical Facilities in Institutions of Higher Education, Fall 1974 published by the National Center for Educational Statistics.

(5) This is the median size public university in the category of 10,000 to 24,999 FTE enrollment.

(6) This is the average of public universities in the 90 percentile in the category of 10,000 to 24,999 enrollment.

(7) Statistics are taken from space analyses prepared by the Office of Facilities Planning, GMU.

TABLE 7 DISTRIBUTION OF ASSIGNABLE NON-RESIDENTIAL AREA BY ROOM USE CATEGORY (1)

Room Use Category		Range of Inventory Norms - % of Total Assignable Area	GMU Estimate	
Code	Room Use		%	Sq. Ft.
100	Classroom	6 - 13	10.0	300,000
200	Laboratory	17 - 22	20.0	600,000
300	Office	18 - 23	20.0	600,000
400	Study	8 - 10	10.0	300,000
500	Special Use	13 - 16	15.0	450,000
600	General Use	14 - 18	15.0	450,000
700	Supporting	8 - 11	9.5	285,000
800	Health Care	1 - 5	0.5	15,000
Total			100	3,000,000

Notes:

(1) The room use category classification and inventory norms are taken from Facilities Inventory and Classification Manual, 1973 and Inventory of Physical Facilities in Institutions of Higher Education, Fall 1974, publications of the United States Department of Health, Education and Welfare.

TABLE 8 DISTRIBUTION OF ASSIGNABLE NON-RESIDENTIAL AREA BY PROGRAM CLASSIFICATION (1)

Program Classification		Inventory Norms - %		GMU Estimate	
Code	Program	In All Institutions	In All Public Institutions	%	Sq. Ft.
1.0	Instructional Program	45	46	46	1,380,000
2.0	Organized Research	8	7	7	210,000
3.0	Public Service	1	2	2	60,000
4.0	Academic Support	15	14	14	420,000
5.0	Student Services	18	18	18	540,000
6.0	Institutional Support	12	11	11	330,000
7.0	Independent Operations	2	2	2	60,000
8.0	Unassigned	0	0	0	
Total		100	100	100	3,000,000

Notes:

(1) The program classification and inventory norms are taken from Facilities Inventory and Classification Manual, 1973 and Inventory of Physical Facilities in Institutions of Higher Education, Fall 1974, publications of the United States Department of Health, Education and Welfare.

will occur on both the main and west campuses as the needs develop. This is evidenced by the current plans to construct a field house on the west side of Ox Road to complement the athletic facilities.

The bulk of the existing and proposed buildings is estimated to total 45,000,000 cubic feet. This volume is probably a minimum. It will increase as the requirement increases for large volume facilities such as auditoria and indoor athletics. Generally, the volume of facilities will be apportioned equally between the main and west campuses.

RESIDENTIAL AREA

Currently, there are about 500 single students houses in apartment units. Within the next few years, another 500 single students will be housed in dormitory units now in the design stage. The plan does not differentiate between types of housing units. It is considered feasible for units of varying types to be located within the same structures.

It is recommended that the University provide on-campus housing for 4,000 students and faculty. Of the 4,000 University-related persons to be housed, 3,000 are assumed to be single students and 1,000 are assumed to be married students or faculty members.

Using national norms for existing campus housing, space requirements for the recommended housing would total approximately 1,345,000 gross square feet. The bulk of the residential buildings is estimated to total 16,000,000 cubic feet.

TABLE 9 CALCULATION OF RESIDENTIAL SPACE REQUIREMENTS

Type of Housing Unit	No. of Units	Gross Square Feet per Unit (1)	Gross Square Feet per Type
Undergraduate Housing			
Single male students	1200	215	258,000
Single female students	1200	250	300,000
Married students	400	520	208,000
Graduate Housing			
Single male students	300	215	64,500
Single female students	300	250	75,000
Married students	100	675	67,500
Faculty Housing			
Married with children	400	760	304,000
Married without children	100	680	68,000
Total			1,345,000

Notes: (1) Dober, Campus Planning.

ENERGY UTILITIES

Electricity. The University is served by a Virginia Electric & Power Company loop system. This system is fed, at any one time, by seven power generating stations. The utility has indicated that they have the ability to meet any increase in electric power requirements resulting from the further development of the University. On-campus distribution will be by a loop bus at 13,200 volts for an estimated demand of 15,000 to 20,000 KVA.

Gas. Natural gas service is not provided to the campus and no service lines of sufficient capacity are located in the vicinity. Washington Gas Light Company is the local utility which provides natural gas service. Gas which may be required for certain facilities such as laboratories will be supplied by self-contained propane bottled gas systems.

Hot and Chilled Water. Heating and cooling of facilities on the central campus will continue to be served by an extension of the existing hot and chilled water distribution system. The heating and cooling plant located in the northeast service area of the main campus will continue to use No. 2 oil as the fuel. Development of facilities on the west campus will be initiated by using self-contained systems. Large scale development may necessitate an additional central plant on the west campus.

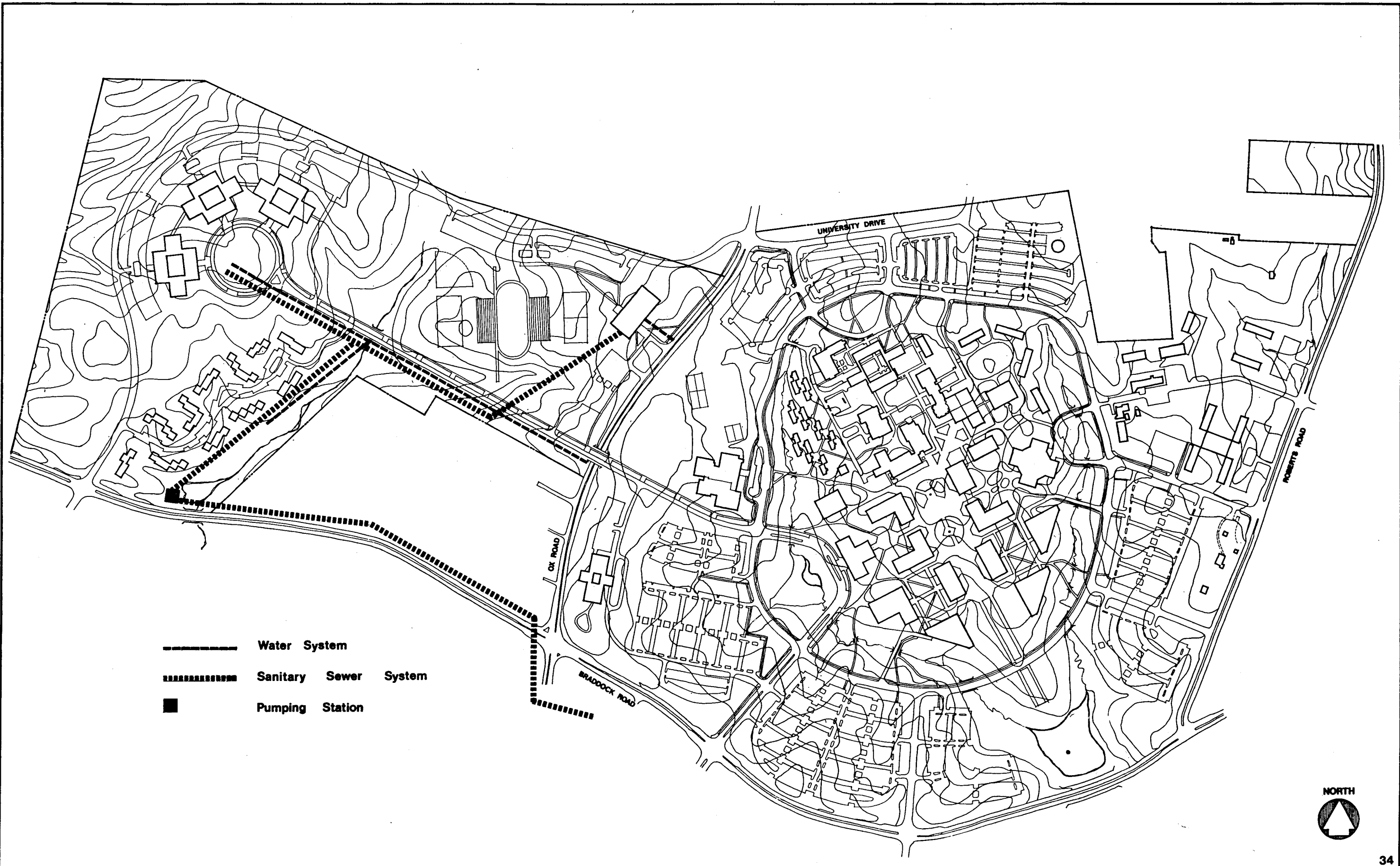
SERVICE UTILITIES

Water. Water service to the campus is provided by Fairfax City. A four million gallon water storage tank exists in the northeast corner of the central campus to assist in pressurizing the system and to provide adequate capacity. Water for development of the main campus will be an extension of the existing system. Water for development of the west campus is expected to be extended from a new water main which parallels Ox Road. It is also possible to extend water service from the main campus or from the existing Fairfax City system north of the west campus.

Sanitary Sewers. The University's property is split between two sanitary sewerage districts. The main campus property lies within the sewer service

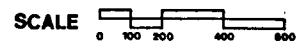
area of the City of Fairfax and the outfall goes into the Pohick Creek watershed and treatment area. The west campus property lies within the sewer service area of the County of Fairfax and within the Popes Head Creek watershed. The Popes Head Creek watershed has no treatment facility. Recently, a trunk sewer line was constructed from south of Braddock Road to connect to the main campus sewer lines eliminating the need to pump sewage back through a force main into the City of Fairfax. The basic sanitary sewer system on the main campus has been constructed to a point of connection with the system in the treatment area. Development of the west campus property will be facilitated by construction of a trunk line which will parallel the stream bed of the East Fork of Popes Head Creek. A pumping station will be located in the vicinity of Braddock Road and the water retention pond. From this station, sewage will be pumped through a force main to a basin near the intersection of Ox Road and Braddock Road from which it will flow by gravity in a sewer line parallel to Ox Road to an existing man-hole which is connected to trunk lines in the Pohick Creek treatment area.

Storm Sewers. Storm water run-off from buildings, pavements, and ground surfaces will continue to be conducted to the two stream beds on the main campus and to the single stream bed on the west campus. Such development will necessitate the construction of an on-campus water retention system to prevent flooding downstream from the campus. The Plan indicates the provision of water retention ponds and their development as an aesthetic enhancement to the campus ambiance. It will be necessary to modify the existing sanitary sewage system where it lies within the area proposed for the ponds. In order to keep the retention ponds free of refuse and trash that enters the storm sewer system, it is recommended that small detention ponds be constructed on the tributaries to screen out the undesirable material.



SAUNDERS, CHENG & APPLETON
 ARCHITECTS, ENGINEERS & PLANNERS
 ALEXANDRIA, VIRGINIA

GEORGE MASON UNIVERSITY MASTER PLAN
 FAIRFAX, VIRGINIA



WATER & SANITARY SEWER
WEST CAMPUS

PLATE
11

ELEMENTS OF FORM

Those elements of the physical setting which give form to the campus include paths, edges, nodes, districts, and landmarks. These elements are a part of the human experience and it is the blend of these elements that forms the ambiance of place and one's good or bad perception of it.

LANDMARKS

The present campus is devoid of landmarks. It is the intent of the Plan to create definite landmarks to give the campus greater identity and distinct character. A prominent feature of the Plan is the creation of water retention ponds at the locations where the streams pass under Braddock Road. These ponds are necessary to prevent flooding downstream when the campus is fully developed. It is intended that they be designed to provide an esthetic enhancement to the campus as well as satisfy an engineering need. These two ponds will become definite landmarks because of their presence next to the heavily traveled Braddock Road.

A major open space will be created in connection with the pond on Rabbit Branch. Extending from the pond into the heart of the central campus will be a linear opening 100 feet wide and approximately 800 feet long. This lawn area will terminate at another major open space located at the highest elevation of the central campus. This open space is designated as Mason Square. Within the space are two circular groves of natural vegetation that will be landscaped and enhanced by additional plantings. Within the grove at the higher elevation will be a statue or other representation of George Mason. Special features are made of the pedestrian circulation spaces within Mason Square. Mason Square will be a space for public activities as well as personal enjoyment and reflection upon the achievements of the University's namesake. The intent of this landmark is to open the campus to the community by way of an attractive vista that serves as a visual link between the community and the University that serves that community.

Another prominent feature to the plain is the development of the community related facility on the high land near the intersection of Ox Road and

Braddock Road. This location will give high visibility to the University due to the thousands of vehicles that must stop at this intersection. The community related facility will not, however, impose upon the attractive natural setting, but will rise above the tree line as a symbol of the University's presence. It is extremely important that this building be well designed with the symbolic image in mind.

AESTHETIC CONSIDERATIONS

Within the total setting, the details of place make up the final perception of the physical environment. Those aspects of the environment include buildings, landscape, site improvements and their interrelation by scale, juxtaposition, color, texture, pattern, and configuration. The use of these elements of design have a meaning all their own on a campus.

Uniformity of appearance is greatly enhanced by consistency in the landscaping and building construction. Such consistency can be achieved in the landscape by the establishment of guidelines and standards for site improvements. Consistency in building construction is less readily achieved because of the varying requirements for buildings and the attitudes of designers towards their design solutions. Even if a specific style of architecture were adopted, it would be difficult to achieve total consistency in the appearance of buildings. The imposition of style, usually historical style, inevitably leads to conflicts between the appearance requirements and the functional requirements of the facilities being designed. Therefore, the adoption of style should be avoided.

It is possible, however, to achieve a unity of appearance by the establishment of architectural guidelines that stipulate the manner of expression in architecture but do not dictate the final form. The major contributing factors to architectural character are mass, form, scale, materials, texture, color, and details. Mass and form are mainly functions of the program of building requirements. Scale, materials, texture, and color are elements which may be regulated from project to project without compromising the functional requirements of the structure. Harmony among buildings is most readily achieved by the use of materials, color, and texture. It is therefore recommended that the University consider the

establishment of architectural guidelines which control the use of materials, colors, and their textural composition. It is further suggested that the use of exterior materials be limited to one color and pattern of brick with cast-in-place or precast concrete of one color and finish. The transparent openings in the building enclosures should be non-obtrusive, subdued framing materials. Slate or copper is recommended for roof coverings and facings of roof structures. The use of white or black in facing materials should be avoided.

Landscape and architecture can and should be complemented by forms which represent our culture. Cultural accouterments represent the achievements of man and their presence in the environment are spiritually uplifting. At selected points, the introduction of sculpture, gardens, and fountains will add interest to the campus. Specifically, it is suggested that a major sculpture be placed in Mason Square and that a fountain be constructed within the pond on the main campus. The sculpture would be a representation of the University's namesake. The fountain would be a dramatic and eye-catching water spire. Each of these elements would serve as focal points in the campus landmark and make a lasting impression on all who view them.

Measures should be taken to ameliorate the detrimental effect of the large parking lots at the north approach to the campus from University Drive. Except at this approach, the campus is entirely screened from the peripheral road system. Enough natural vegetation has been maintained at all other parking areas to mitigate the large expanse of barren pavement. The effect of having to view the central campus from across a sea of pavement and curbs is deadening. The Plan provides for the improvement of the north approach to the campus from University Drive. The vehicular access to University Drive from the large parking areas is deemphasized and rerouted to discourage through traffic. Broad areas for the addition of earth berms and plantings are created to mitigate the effect of large expanses of barren pavement and regular pattern.

It is important that future development of the campus be executed in a manner that respects the existing environmental conditions. The size and siting of new facilities should be planned to agree with the Master Plan and have the least environmental impact. To the extent possible, the natural grade should remain in tact. The adjustment of

grades to suit building or structure form should be kept to a minimum. Where necessary, a building's form should be controlled to reflect these constraints. By following these developmental guidelines, it will be possible to save much of the existing vegetation and leave the existing soils undisturbed. The University's inherent assets are thereby maintained.

EXPANSION CAPABILITY

There are several means by which the University may expand beyond the 15,000 full time equivalent student enrollment represented by this Master Plan. Expansion may occur by using the reserve area on the west campus, by increasing the density of the central academic area, by increasing the density of the west academic area, and by reducing the area used for parking so as to provide other facilities.

Use of the reserve land on the west campus is the most practical means of campus expansion. If the facilities proposed are compatible with the location, then this land is easily developed.

Expansion may be accommodated by increasing the density of the academic areas. This may be done by two methods. First, the new facilities provided in the academic areas may be increased in size over that contemplated in this Plan. Second, the existing facilities in the central academic area may be added to or eventually razed to make way for newer structures. If the buildings are increased in size, they will either be taller or they will be wider and longer. Taller buildings will mean longer flights of stairs or the installation of elevators. Wider buildings require more ground coverage and reduce open space. Elevators for people movement should be avoided in the intensely used buildings for lower level instruction but escalators may be used. Elevator buildings may be used for graduate level research facilities that house persons that seldom need to move between facilities. Accommodating the projected educational needs and considering the ecological values of the land, the Plan places no limit on the height of buildings but does indicate the desirable open space and natural area between facilities.

The University may be expanded by providing more area for facilities. Expansion may be accommodated by reducing the land used for parking. If structured parking were used in lieu of surface parking, many acres of land would be available for other facilities. On the main campus, it is feasible to construct multiple deck parking structures at strategic locations adjacent to the peripheral off-campus road system with pedestrian links to the academic area. The remaining area between Patriots Circle and the periphery of the campus would contain clusters of facilities that become satellites of the central academic area.

Strong pedestrian links would radiate from the central academic area to these satellites. As the value of land increases in future years, this alternative will become economically practical.

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The Image of the City, Kevin Lynch, 1960

Undergraduate Catalog 1978-79, George Mason University

INFORMATIVE SOURCES

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

Extensive interviews were conducted with the University staff and members of the Board, with public officials of the City of Fairfax, The County of Fairfax, the state of Virginia, and regional cooperative bodies. The information obtained and the opinions expressed in these interviews contributed significantly to the final design.

The consultants are impressed by the widespread support for the University in the northern Virginia area as expressed by the many persons contacted during the performance of the planning study.

SAUNDERS, CHENG & APPLETON Architects Engineers Planners

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Donald L. Bosserman, Architect / Planner

JHK & ASSOCIATES Consulting Traffic Engineers

Morris J. Rothenberg, Vice President
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EDAW, INC. Consulting Landscape Architects

Joseph E. Brown, Principal
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GEORGE MASON UNIVERSITY

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C. Hunton Tiffany, Vice Rector
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Donald J. Mash, Vice President for Student Affairs
Joseph I. Gurfein, Director of Facilities Planning
Elmer V. McKeever, Director of Buildings and Grounds

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Leon E. Boothe, Dean of the College of Arts and Sciences
Larry S. Bowen, Dean of the College of Professional Studies
Lloyd M. DeBoer, Dean of the School of Business Administration
William C. Johnston, Dean of the Summer Session
Thomas R. Williams, Dean of the Graduate School

**** PROJECTED STUDENT ENROLLMENT SCHEM FORM L-1 ****
 ***** RUN DATE: OCTOBER 25, 1978 *****

LEVEL	1977-78			1978-79			1979-80			1980-81		
	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG
BACH. LOWER LEVEL	2962	2090	258	3752	2548	314	3955	2666	329	4028	2680	331
UPPER LEVEL	3548	2255	397	3449	2233	394	3798	2443	430	4264	2714	478
GRAD FIRST YEAR	1124	192	263	1308	213	293	1455	236	324	1607	259	356
ADVANCED	0	0	0	0	0	0	0	0	0	32	4	8
UNCLASSIFIED HC	1514	0	0	1529	0	0	1604	0	0	1667	0	0
LOWER UG FTE	0	53	71	0	71	97	0	67	92	0	61	84
UPPER UG FTE	0	59	80	0	65	88	0	64	88	0	64	88
GRAD FIRST FTE	0	124	171	0	105	144	0	117	161	0	127	175
*** TOTAL *****	9148	4773	1240	10038	5235	1330	10812	5593	1424	11598	5909	1520

LEVEL	1981-82			1982-83			1983-84			1984-85		
	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG
BACH. LOWER LEVEL	4207	2798	345	4410	2857	353	4594	2895	357	4784	2950	364
UPPER LEVEL	4620	2933	517	4915	3037	535	5165	3109	548	5428	3193	563
GRAD FIRST YEAR	1789	289	397	2006	324	447	2292	371	512	2545	412	567
ADVANCED	40	5	10	64	8	16	113	15	29	158	20	40
UNCLASSIFIED HC	1726	0	0	1762	0	0	1776	0	0	1801	0	0
LOWER UG FTE	0	58	79	0	54	74	0	50	69	0	47	64
UPPER UG FTE	0	63	86	0	60	82	0	56	77	0	53	72
GRAD FIRST FTE	0	139	191	0	149	204	0	157	215	0	165	227
*** TOTAL *****	12382	6285	1625	13157	6489	1711	13940	6653	1807	14716	6840	1897

LEVEL	1985-86			1986-87			1987-88			1988-89		
	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG
BACH. LOWER LEVEL	4968	2992	369	4973	2993	369	4977	2994	370	4982	2998	370
UPPER LEVEL	5672	3262	575	5712	3286	579	5753	3308	583	5794	3331	587
GRAD FIRST YEAR	2835	458	631	3036	491	678	3226	520	718	3416	551	760
ADVANCED	215	28	55	248	32	63	271	34	69	294	37	75
UNCLASSIFIED HC	1820	0	0	1791	0	0	1763	0	0	1735	0	0
LOWER UG FTE	0	44	59	0	41	56	0	39	52	0	36	49
UPPER UG FTE	0	49	67	0	47	63	0	44	60	0	42	56
GRAD FIRST FTE	0	173	238	0	173	238	0	173	238	0	173	238
*** TOTAL *****	15510	7006	1994	15760	7063	2046	15990	7112	2090	16221	7168	2135

LEVEL	1989-90		
	FALL HEAD- COUNT	REG SESS DAY	FTE EVNG
BACH. LOWER LEVEL	4985	3000	370
UPPER LEVEL	5835	3355	592
GRAD FIRST YEAR	3606	583	803
ADVANCED	317	40	81
UNCLASSIFIED HC	1707	0	0
LOWER UG FTE	0	34	46
UPPER UG FTE	0	39	53
GRAD FIRST FTE	0	173	238
*** TOTAL *****	16450	7224	2183

ENVIRONMENTAL IMPACT STATEMENT

GEORGE MASON UNIVERSITY MASTER PLAN

2nd REVISION November 1978

I. PROJECT IDENTIFICATION

Identification of Action: MASTER PLAN

Sponsor of Action: George Mason University, Fairfax, Virginia 22030.

Joseph I. Gurfein, Director of Facilities Planning,
703-323-2129, Fairfax County, just south of Fairfax City,
and north of Braddock Road, west of Roberts Road. (See
attached plan)

2nd Revision: This revision supercedes the July 1974 EIS.

II. PROJECT DESCRIPTION

Nature of Action: The Master Plan revised in 1978 is now being implemented by construction of facilities along a fifteen year schedule.

Reason for Action: The purpose of this report is to provide one overall impact statement for the entire university to which all future construction can be referenced.

Scope of Action: Of the 46 buildings in the Master Plan on the east side of Highway 123, 21 have been completed, two are under construction, the remainder are planned. There are 15 more scheduled for the west side.

There are 567 acres of which 120 contains the active university building areas. The remainder due in a great part to lack of sewerage is undeveloped. The total footage to be developed is:

Buildings	3,000,000 sq. ft. (gross area)
	1,000,000 sq. ft. (ground area)
Roads	21,750 linear ft.
Walks	10,800 linear ft.
Parking	153 acres (outside building areas)

There will be a total of 61 buildings when completed, though sometimes two may be considered as one building (e.g. Phase I and Phase II of the Student Union.) The Master Plan envisions about 10,000 FTE students and 1300 faculty, administrators, etc. by 1985 with future expansion unknown at this time. In addition, if housing is built on campus it might include wives and children as well as students.

Time Frame: The original Master Plan scheduled completion of construction east of Highway 123 by September 1985. This is now extended at least ten more years. All buildings are of a permanent type and should have a minimum useful life of thirty years but practically stretching to fifty.

III. SIGNIFICANT EFFECTS ON THE ENVIRONMENT

Wildlife:

There are rabbits, squirrels, opossum, skunk, mice, moles, deer, racoon in the wooded area of the campus. In addition fish, frogs, toads, lizards and snakes have been seen. Normal insect and bird life for this part of Virginia is present. As the campus expands, this wildlife will be forced southward and possibly westward into the undeveloped areas or else killed since these latter areas already presumably are occupied. Although corses of trees will be left scattered through the campus, and many new plantings made as part of the landscaping plan, the wildlife will be reduced considerably by the expansion.

Historical Sites:

There are no historical sites on campus although some Civil War emplacements exist. In the City of Fairfax some Revolutionary War buildings are preserved as relics. Although these cause traffic problems by limiting road widths, there is no plan to destroy them despite the increased traffic problems foreseen. Property adjacent to the campus includes a building of Civil War repute.

Effect on Community:

The City of Fairfax donated the original land for GMU campus, and is helping GMU grow. In fact, the planners of the City cite with pride the growth of traffic business and residents caused by GMU. There are at least two studies on this. GMU believes it can enhance the value of the City and make it into a university town such as Cambridge for Harvard.

Fairfax County is restricting growth by freezing sewerage permits. Hence, though GMU may grow, its students and faculty find it extremely hard to obtain housing nearby.

The community is feeling the impact of an expanding university in requests by developers for rezoning, sewerage permits, shopping centers, etc. Land prices have skyrocketed nearby.

There is also a neighboring black community which is between GMU and Fairfax City. Some persons have feared that the blacks might move into a new development, others fear they won't. The relations with the university have been cordial but official. A consultant study of the effects on this community and recommend solutions was made in 1975 (Arms' Study).

Critical Environmental Areas:

The land west of Highway 123 is undeveloped in general. There are plans for installing sewerage there and athletic facilities. Fairfax County has decided to expand southeast from GMU rather than westward. These areas will be affected by our construction before 1990.

Highway Patterns:

Numerous studies made by Fairfax City, Fairfax County, GMU, etc. show the present and expected traffic patterns. Recommendations to relieve the expected traffic problems range from widening Roberts Road, Braddock Road, etc., to building overpasses or circumferentials. Planning has been done by the City and County. Highway 123 is being widened to four lanes in the County area. Meanwhile GMU has an exit to the east onto Roberts Road, an exit to the south onto Braddock Road, one west onto Highway 123, and one north into University Drive. The students, faculty and staff come to GMU by auto. The center of gravity of a plot of their Zip Codes lies about six miles east of GMU. We expect this to slowly move westward. As the university grows, the traffic will increase and problems will mount.

Parking:

A recent parking survey conducted at GMU's two campuses - the Main Campus and the North Campus - indicated the following:

(1) There are a total of 3150 parking spaces at the Main Campus. As indicated below, the peak hour for parking is 11:00 a.m., with a total 2950 filled spaces and 200 vacant spaces. The survey, which was conducted from 8:00 a.m. to 4:00 p.m. provided the following data:

<u>Hours</u>	<u>Filled</u>	<u>Vacant</u>	<u>Total</u>
8:00 a.m.	350	2800	3150
9:00 a.m.	2400	750	"
10:00 a.m.	2550	600	"
11:00 a.m.	2950	200	"
12:00 noon	2900	250	"
1:00 p.m.	2500	650	"
2:00 p.m.	2400	750	"
3:00 p.m.	1500	1650	"
4:00 p.m.	1000	2150	"

(2) There are a total of 745 parking spaces at the North Campus. Traffic enters and exits the university grounds at 10675 Lee Highway (Route 50), Fairfax, Va. As indicated below, the peak hour for parking is also 11:00 a.m., with all spaces filled at that time. The survey, which was also conducted from 8:00 a.m. to 4:00 p.m., provided the following data:

<u>Hours</u>	<u>Filled</u>	<u>Vacant</u>	<u>Total</u>
8:00 a.m.	125	620	745
9:00 a.m.	520	225	"
10:00 a.m.	647	98	"
11:00 a.m.	745	0	"
12:00 noon	700	45	"
1:00 p.m.	652	93	"
2:00 p.m.	600	145	"
3:00 p.m.	310	435	"
4:00 p.m.	198	547	"

The possible solutions have been enumerated in the studies. Only positive action by the City and State can help now.

There is a minor problem in trailbikes going cross-country and disturbing vegetation and surface soils.

Encroachment on State Bottoms or Wetlands:

None.

Discharge of Substances Into Surface or Ground Waters:

There are at present on campus half a dozen homes discharging sewage into septic tanks and thence into ground water. Most of these houses will be demolished over the next years as the campus expands thus alleviating that problem. Rain runoff and building drains discharge into surface or ground water. The CHCP discharges a minor amount of heat into the campus soil when operating since the HTHW system carries 350° water under 250 p.s.i. in the underground loops to the campus buildings. Although well insulated, the pipes lose some heat to the surrounding soil and hence water. There is no measurable effect on water, wildlife, flora nor air. Air conditioners do discharge some heat into the atmosphere, as do other small heating plants.

Clearing:

All of the 120 acres to be occupied by the campus buildings is or was recently covered by trees. The plan calls for leaving as many trees up as possible during construction and then replanting cleared areas under landscape control. However, of the estimated 13,000 trees 5" or over in diameter now standing on these 120 acres, well over half will be cleared off. If we replace 150 trees per building, we shall regain 6,000 trees. Open burning is not permitted on campus. Trees are either carried away or shredded and distributed as mulch into our wooded areas.

Excavating and Filling:

The Master Plan envisions the campus laid out on both sides of a ridge line. Many buildings will have entrances at two levels. Most buildings and roads will require excavation to care for this. The excavated soil is disposed of off campus three to five miles away depending on site availability. Top soil is stockpiled and re-used. A rough estimate of soil to be excavated and moved is 176,000 cubic yards. No major fill operations are planned west for two small earth dams for silt control. Individual buildings will require some. Construction contractors are required by their contracts to control erosion. Generally bales of hay are placed at storm sewer inlets during construction to control sedimentation. A/Es are required to design for good control.

Electric Power:

Distribution will be a loop bus around the campus at 13,200 volts for an estimated demand of 15-20,000 KVA. Present demand is proportionally smaller.

(1) Present power consumption - *12,309,726 KWH Annually
Peak Month (October)

* Includes power consumption of outlying buildings, i.e. Tallwood, President's house, etc.

(2) Location of generating station supplying the university.

The university is served by a Virginia Electric & Power Company loop system. This system is fed, at any one time, by seven power generator stations. Liaison with the Power Co. indicated that they have the capacity to meet any increase power requirements resulting from the university building program.

(3) Future requirements are:

1982 - 21,000,000 KWH
1990 - 38,000,000 KWH

Water Resources:

On campus water resources are negligible - two small, all weather streams and ground water in a reasonably impervious soil. Water for consumption of all types is brought in from Fairfax City and is running about 35 gallons per FTE per day. On campus housing uses 25,000 g.p.d. of the 350,000 gallons per day, which is available.

Rainfall averages 42 inches per year. Because of imperviousness of the soil, almost all runs off leaving about 5% for evaporation.

The water resources problem is pressure for fire in high level buildings and overall quantity. A 4,000,000 gallon water reservoir (tank) has recently been completed by the City.

Emission of Air Pollutants:

The fuels used on campus are numbers 2 and 5 oil. The pollutants from these are measurable (47 points of SO₂ per hour) mostly from the CHCP. Presently the Chemistry labs vent their stacks into the atmosphere. The volume is small and consists of volatile gases which vary from day to day.

Open burning of slash is not permitted.

Heating:

<u>Location</u>	<u>No. of Boilers</u>	<u>Rated Capacity</u>	<u>Type of Fuel</u>
P.E. Building	2	6294 MBH Each	#5
Thompson Hall	2	4184 MBH Each	#5
Library	1	3259 MBH	#5
Student Union	1	3770 MBH	#2
CHCP	2	10,000 MBH	#2
		20,000 MBH	#2
North Campus	2	5360 MBH Each	#5

1 MBH = 1000 BTUs/Hr.

Sulfur content of #5 oil is 85% by weight; #2 oil 24% by weight.

There is no emission control equipment installed. Normal preventative maintenance is carried out in order to keep equipment in optimum operation.

Sewage and Solid Waste Disposal:

100 cubic yards per day of solid trash is carried off campus by County trucks and disposed of in County dumps. In the future this may rise to 300 cubic yards a day. Construction trash is carried away by contractors and disposed of in the Fairfax County dump or private Woodbridge dump. Sewage for permanent buildings is fed into Fairfax City sewerage and handled through its treatment plant. Old existing houses on campus discharge sewage through leaching fields.

There are no plans for incineration for the foreseeable future.

Emission of Radiation:

None. Radioactive material used in labs are covered and controlled internally. In the future negligible radioactive materials may be disposed of through sewage system.

Noise:

Minor noise sources are heating plants, air conditioners, construction machinery, and music classes. There are no constant noise sources of any frequency. The decibel count is very low (50 dbL.). Traffic is far enough away from the campus to be excluded. Occasional fire trucks or ambulances are heard.

Toxic or Hazardous Materials:

Negligible amounts in laboratories.

Pesticides and Herbicides:

Small amounts used by grounds people under control of Director of Buildings and Grounds. No great increase is foreseen.

Recreational Areas:

Our Master Plan does lay out tennis courts, track and ball fields outdoors as well as large indoor facilities for basketball, swimming, badminton, fencing, wrestling, etc. In addition we are working with the surrounding community on a Little League Park, bicycle paths, and even a possible golf course. We have many small open areas amongst our planned buildings. The students use these for touch football, frisbee, etc. Hopefully, we can put tennis and basketball courts near each housing area.

IV. MEASURES PROPOSED TO MINIMIZE ADVERSE EFFECTS

Water and Sewage Supply:

A \$10,000 study on water supply and sewage usage problems prepared November 1973 shows that facilities are adequate if planned construction is carried out. A conference was held at GMU in Spring 1974 to discuss water supply and sewerage. Our plans are to tie into the County system in 1979.

Solid Waste Disposal:

No problem yet. Future removal by City of Fairfax may be charged to GMU.

Power Source for Heating and Cooling:

Oil is used at present. Electricity would be too expensive for foreseeable future. The finished campus will require 2,400,000 gal. of #2 oil per year against 20% of that now.

Means of Access:

The bus system of Fairfax City is helpful. Meanwhile State pressure on County and City officials to act on road proposals is indicated at this time.

Erosion:

All future construction contracts will contain a clause stating that effective erosion control and storm management is a responsibility of the contractor.

Control:

The Environmental Impact Control Point is in the Facilities Planning Office. Programs must be evolved for recycling paper, cans, other waste, and for preserving general environmental resources.

V. ALTERNATIVES

Alternatives to sewage disposal, trash removal, air pollution, etc. are only duplicates of existing systems run by the State instead of the City. The cost of duplication is not justified since no improvement in environment would result.

There appears to be no logical alternative to the students driving since students are too spread out for busing. The Metro will not come close for many years.

The use of high-rise buildings is not financially acceptable. The alternative of not building is to reduce the number of students. This is not contemplated.

The use of rainwater runoff from parking areas to feed green areas is possible.

VI. ECOLOGICAL COMPATIBILITY AND RESOURCES

The long range ecological effect of construction of George Mason University is that:

- a. Wildlife will be pushed south and west. There will be fewer plants resulting in loss of oxygen production, lower humidity and higher temperatures. Negligible effect.
- b. A small amount of heating oil combustion pollutants will be in the air. Increased traffic will increase exhaust pollution.
- c. The traffic flow will be severely hampered if no remedial action is taken immediately.
- d. About 170,000 cubic yards of earth will have been removed and 61 new permanent structures will have been built. There will also be an increased soil nutrient runoff from construction cut areas.