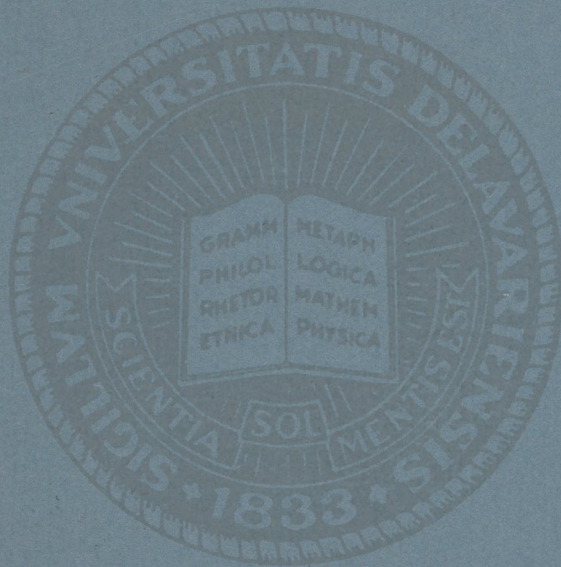


John A. Murray
University Extension

LONG RANGE DEVELOPMENT GUIDE
UNIVERSITY OF DELAWARE



OCTOBER 1968

LONG RANGE DEVELOPMENT GUIDE
UNIVERSITY OF DELAWARE

SUMMARY REPORT

OCTOBER 1968

PREPARED IN COOPERATION WITH THE UNIVERSITY OF DELAWARE BY
SASAKI, DAWSON, DeMAY ASSOCIATES INC. WATERTOWN, MASSACHUSETTS

UNIVERSITY OF DELAWARE
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October 1, 1968

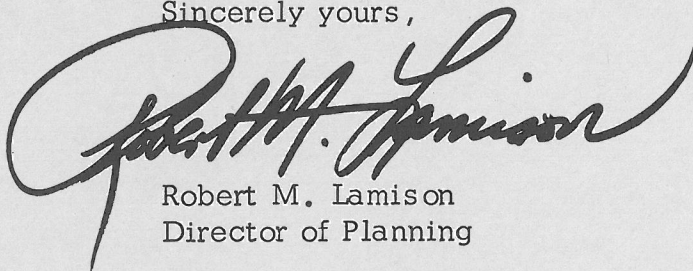
President Edward Arthur Trabant
University of Delaware
44 Kent Way
Newark, Delaware 19711

Dear President Trabant:

It is my pleasure to submit to you the Summary Report for the University of Delaware Development Guide. Our goal in preparing this guide has been to establish the basic design structure for land use, pedestrian and vehicular circulation, and open space about which a viable campus community can flourish.

The Development Guide is intended to be a dynamic document which contains the flexibility to accommodate changes which surely will take place over time. It is our sincere hope that this Development Guide will serve the University as successfully as did its counterpart since 1917.

Sincerely yours,

A large, stylized handwritten signature in dark ink, reading "Robert M. Lamison". The signature is fluid and cursive, with a large initial "R" and "L".

Robert M. Lamison
Director of Planning

RML:jmp

TABLE OF CONTENTS

THE CHALLENGE OF GROWTH

SECTION ONE

THE UNIVERSITY TODAY

PARAMETERS OF UNIVERSITY GROWTH

SECTION TWO

LONG RANGE DEVELOPMENT GUIDE

THE CONCEPT OF LAND USE DEVELOPMENT

THE ACADEMIC CORE

OPEN SPACE CONCEPT

NON-ACADEMIC FACILITIES

CIRCULATION AND PARKING

CONCLUSION

SECTION THREE

APPENDIX



VIEW OF THE GREEN LOOKING SOUTH TO MEMORIAL LIBRARY EMPHASIZES THE UNITY OF THE ORIGINAL CAMPUS DESIGN.

THE CHALLENGE OF GROWTH

Universities today are faced with a double challenge. They must take on ever greater responsibilities of leadership in a rapidly changing world, and they must accommodate a growth rate which is already putting extraordinary pressure on their physical facilities.

The University of Delaware must begin now to formulate specific planning procedures if it is to keep pace with both expanded enrollments and the changing demands of higher education. Proper planning can ensure that the physical environment will continue to express both the traditions and the on-going spirit of the University.

It is the purpose of this report to evaluate the assets and liabilities of the campus from the viewpoint of function and design, and to determine the logical direction of future university development in terms of land acquisition, building location, circulation pattern, landscape and architectural de-

sign. Our goal is to provide a program which can provide for all the contingencies of accelerated expansion without destroying the dignified and human scale which the campus now possesses.

Section One begins with a brief history of the University and discusses the campus environment as it has evolved from earliest planning stages to present day. University landholdings are described with recommendations for further acquisitions, and the pattern of existing land use is analyzed by function. The section also defines the parameters of University growth as established by population trends and enrollment projections, and estimates the building space required to accommodate growth.

Section Two discusses the purpose and objectives of the Long Range Development Guide. It defines the concept of land use development, and formulates specific land use proposals and design objectives for the University of Delaware.

SECTION ONE

THE UNIVERSITY TODAY

HISTORY OF THE UNIVERSITY

Education had its beginning as the major industry in Newark in 1767 when the Newark Academy was located in the town. Though it was forced to close during the years of the Revolution, the Academy was a famous school of its time. In 1835, under a new charter, the Academy became an academic department of Delaware College, which endured until 1859, when financial difficulties closed its doors. Under the Morrill Land Grant Act in 1870, the College was reorganized and reopened as Delaware College. In 1914 a coordinate Women's College, with the same Board of Trustees, was opened, and in 1921 the University of Delaware was formed by a merger of the two institutions.

within the larger context of campus design if the University is to continue to develop as a strong and positive physical entity.

Day and Klauder, Philadelphia architects who were retained by many of the leading universities in the country for planning and architectural services, worked with the University in the early part of the century to develop the design structure and concept for the development of the existing campus. This 1917 Plan, and subsequent revisions, has served as a guide for development over the past fifty years. Its simplicity has withstood the test of time, and its flexibility has assimilated academic changes of considerable import, as when, for example, Delaware College and The Women's College merged to form the University of Delaware.

Although in recent years the University has been supplanted as one of the town's principal employers by regional industries, it remains, nevertheless, the cultural and economic focus of the community.

CAMPUS ENVIRONMENT

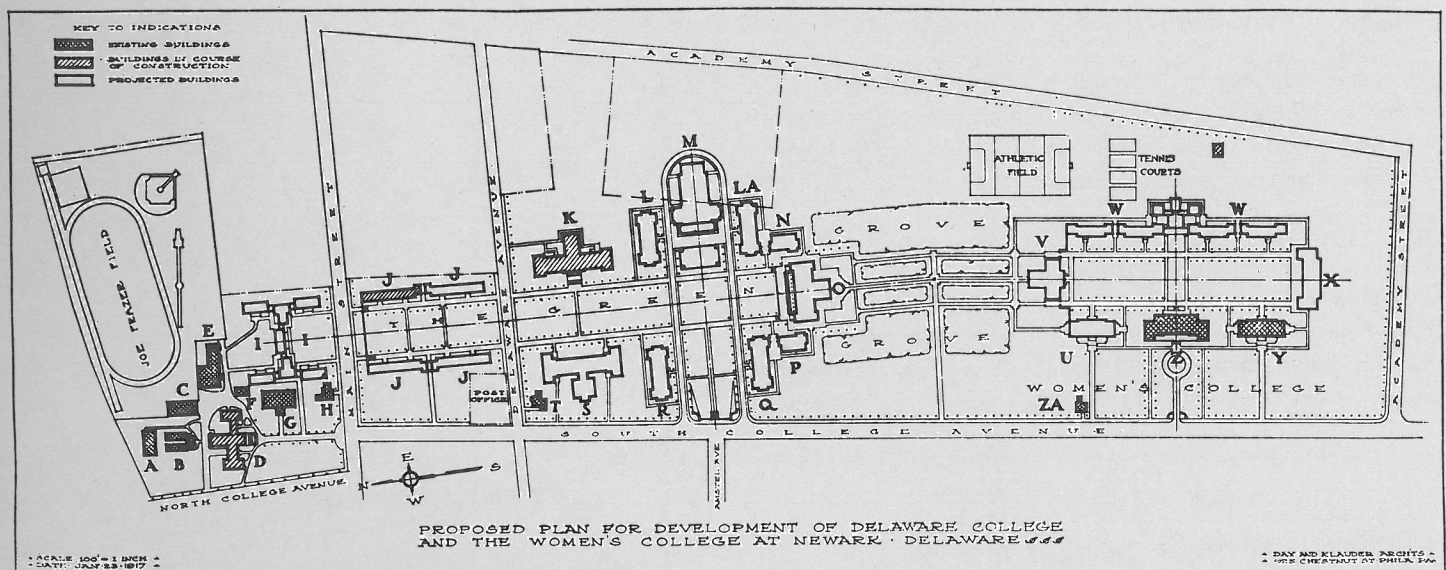
One cannot help but be impressed by the campus environment at the University of Delaware, especially the Green. The quiet dignity and restraint of the architecture, the scale and proportion of the buildings, and the nature of the landscaping, all serve to reinforce the grand design of the axial form.

The Campus today, notwithstanding minor deficiencies, substantially follows the order of the original design structure and reflects the planners' sensitivity to both landscape and architectural details. It shows the recognition on the part of administrators that physical facilities not only provide space but also set the tone and influence the atmosphere of the institution by expressing and symbolizing its values. In subtle but unmistakable ways, the plan of the campus lends credence to what the institution stands for, and compels the role of the student to further participation in that definition.

Architecture and landscape execution remain the key to achieving a handsome, unified, campus environment. The design of individual buildings and spaces must always be judged

The original plan has essentially been fulfilled. Its design concept has served to guide campus structure and development for the past half century, setting a high standard of excellence. The challenge now is to create a Development Guide which will provide for future growth and yet be sympathetic in spirit to the tradition of the University.

1917 PLAN; DAY AND KLAUDER ARCHITECTS



THE UNIVERSITY IN THE NEWARK REGION

As physical entities, the University of Delaware and the Newark region are thoroughly woven together. The Central Campus is enclosed by the residential development of the City of Newark. Newark's central business district, northeast of the campus along east Main Street, is the commercial center for the University as much as for the town. The land surrounding outlying University parcels such as the Farm, Manor, and White Clay Creek properties, is rapidly being filled by new residential and industrial development. It is apparent that the institution and the region are both growing entities, and that their futures are inextricably tied together.

This relationship between University and Region makes it doubly important that plans are made with particular attention to mutual needs. University growth will affect and be affected by the surrounding community, so land uses in each case must be compatible. Not the least of the mutual concerns will be the solution of regional circulation problems.

The General Comprehensive Plan for Newark and the New Castle County Development Plan, issued respectively in 1965 and 1966, recommended several major highway improvements which serve not only to reduce congestion in the heart of the region, but also to improve access to and from the region. This would be accomplished by implementation of three circulation proposals in the County Plan:

- a north-south expressway east of the city of Newark
- an outer loop road around Newark
- an inner loop road in Newark

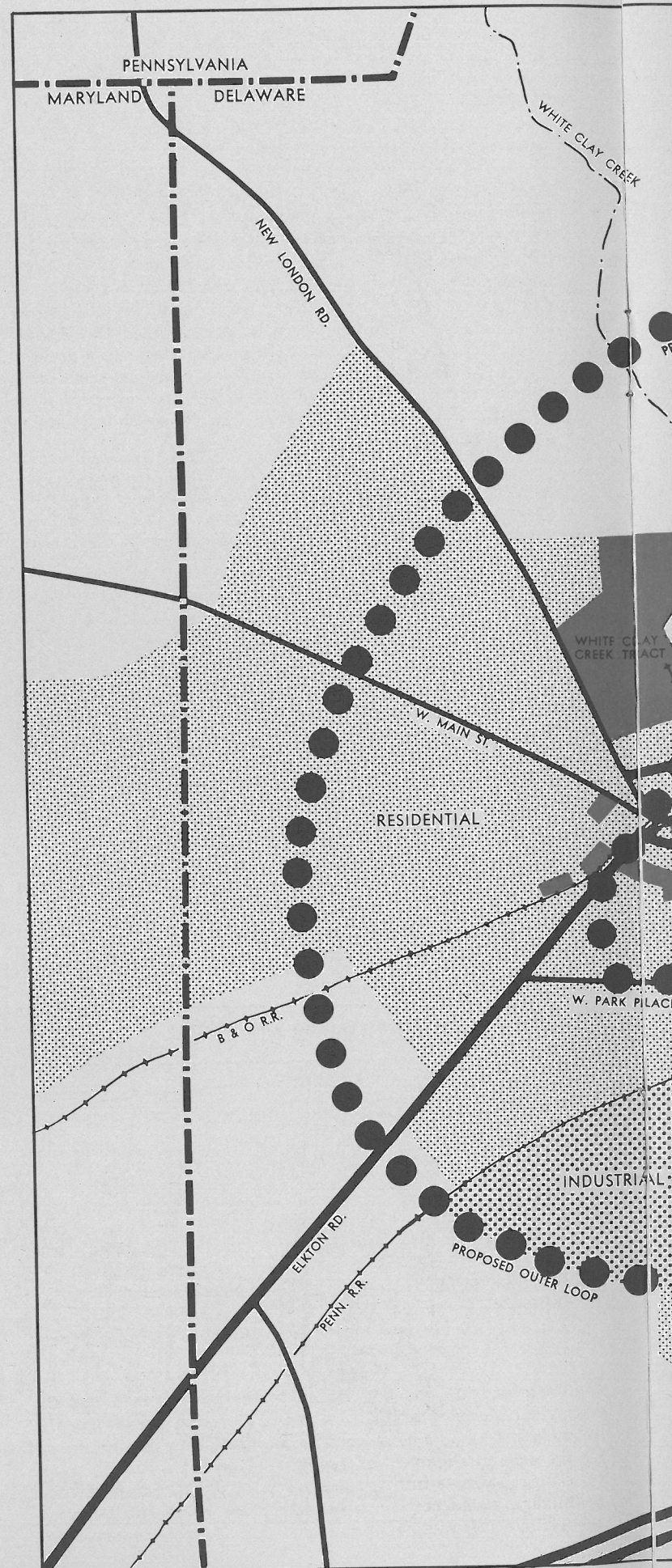
As will be indicated further in this report, such a concept is worthy of encouragement by the University, and should be reviewed jointly with public agencies with respect to details of alignment and implementation. Indeed, all planning issues of mutual concern between the University and the region should be reviewed as part of an ongoing process.

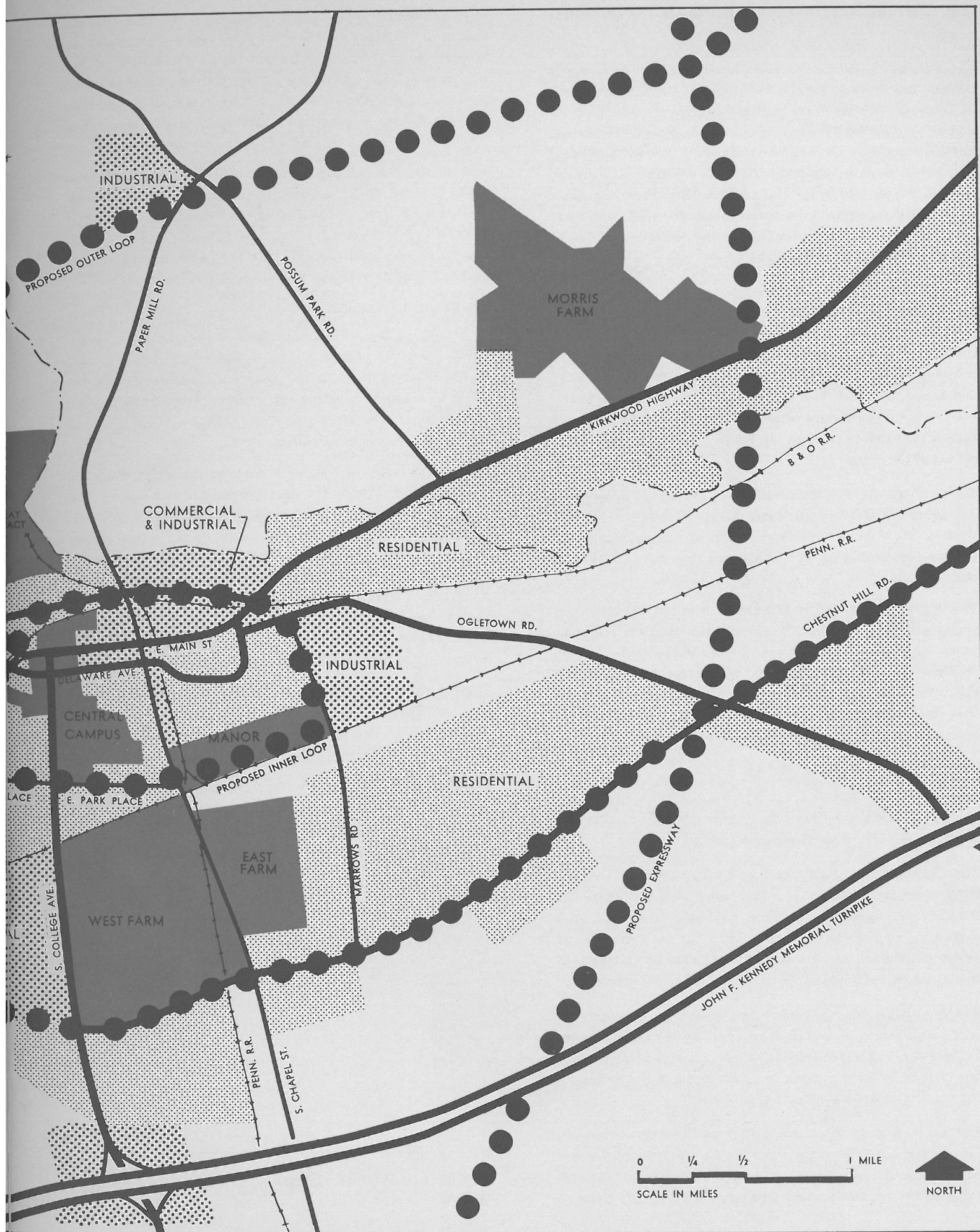
UNIVERSITY LANDHOLDINGS

The pattern of property ownership is, of course, critically important to the formulation of any future planning guide, since ownership, by its nature, is the basis on which all decisions concerning campus expansion must be made.

OUTLYING PROPERTY

University of Delaware landholdings outside the existing central campus area can be classified into two broad categories. The first includes relatively large blocks of property somewhat removed from the main campus area, while the second con-





sists of the smaller parcels and houses adjacent to the central campus.

Aside from the Georgetown facilities for the College of Agricultural Sciences and the Marine Laboratory at Cape Henlopen in Lewis, the Morris Farm in Mill Creek Hundred is the most distant of the University's major landholdings. Located 2 miles east of Newark and north of the Kirkwood Highway, this parcel contains approximately 400-500 acres. According to a report prepared by the United States Department of Agriculture Soil Conservation Service, most of the property presents moderate to severe limitations for development, due to steep slopes, rock outcroppings, high water table, stream flooding, and soil texture.

The Manor property, the White Clay Creek Tract, and the East and West Farms are all approximately equidistant from the central campus area. In round figures, the Manor property contains 100 acres, the White Clay Creek Tract potentially 200 acres; the East Farm, 200 acres; and the West Farm, 500 acres. All parcels are within one-half mile of the academic core of the existing campus, the White Clay Creek Tract being closest of the sites.

The southern parcels (Manor and East and West Farms) consist primarily of level crop land. Although there are no distinctive site features, neither are there any known major development problems—except distance from the central campus.

The White Clay Creek Tract has many areas of steeper slopes and is generally covered with second growth plant material, except in ravines and steeper slopes, where more mature vegetation exists. Although the area presents topographic difficulties, its potential for an exciting environment suggests that this Tract should have a high priority for the development of facilities compatible with steeper slopes.

PROPERTY IN THE CENTRAL AREA

The major undeveloped or underdeveloped University landholdings in and around the central area lying west of College Avenue, and offer a great potential for development.

The University's property east of College Avenue is essentially committed. There are areas behind Wolf Hall, near the Bio-Chemistry Research Building (Franklin Institute), and south of Memorial Hall, however, which are very suitable for new construction. The areas north and east of Old College could also be redeveloped.

For some time the University has been in the process of acquiring property in the block bordered by Elkton Rd., Main, College and Delaware Avenues. There are individual parcels, however, which have not yet been obtained and are necessary for the proper development of this block.

The Knoll property (bounded by Orchard Road and Delaware, College and Amstel Avenues) and the parade grounds (bounded on three sides by Elkton and Orchard Roads and Amstel Avenue), are linked by smaller parcels owned by the Univer-

sity. Additional land should be obtained, if possible, between the large parcels, so that the University link could be strengthened. The University also owns about 50% of the land area and two of the five parcels between the President's Residence and College Avenue. The acquisition of the remaining parcels would consolidate University landholdings and yield a parcel large enough for effective development.

Present University landholdings west of College Avenue total about 20 acres. With the acquisitions (proposed above) to consolidate land area, the total would increase to approximately 24 acres. This property, since it is adjacent to the present academic area, must accommodate the physical expansion of academic facilities for the next ten to fifteen years.

EXISTING LAND USE

Existing land use - the breakdown and distribution of existing property by function - is another major determinant of the direction in which the University will develop. Areas of future campus development must be established in such manner as to strengthen and clarify the functional relationships between present facilities.

At the University of Delaware, most of the major academic facilities are located on the main campus and constitute a well defined "core area" bounded by Alison Hall, Morris Library, Sharp Laboratory and Wolf Hall. Currently the only academic building south of this core is Robinson Hall. There are a number of academic buildings on the North Campus above Main Street. The completion of the new Education Building and the planned Arts and Sciences Building will expand the main academic core to the northwest and will increase the importance of the north campus as a major instructional area.

Student residence facilities are located immediately to the north of Delaware Avenue and to the southeast of the central campus Green. The most recent University dormitories are located west of Elkton Road.

The athletic fields used for teaching stations lie north of Carpenter Sports Center and south of the academic core area next to the Women's Gymnasium. The inter-collegiate athletic facilities are located on the West Farm, south of the College of Agriculture.

EXISTING UNIVERSITY LANDHOLDINGS AND LAND USE



PARAMETERS OF UNIVERSITY GROWTH

POPULATION TRENDS AND THE DEMAND FOR HIGHER EDUCATION

Population growth, especially within age cordons and income groups for Delaware and the Atlantic seaboard region, indicates that the demand for higher public education will increase at an explosive rate over the next two decades. As outlined below, these factors will contribute to major growth at the University of Delaware, with the full time enrollment jumping from the 1967-68 level of 7,000 to approximately 15,000 in ten years. Enrollment by 1987-88 has been projected at 20,000 students.

The 1917 Master Plan for the physical development of the campus served as a guide for fifty years. In the next decade the University will have to accommodate an additional 8,000 students thus doubling the current enrollment. Essentially, the University is faced with constructing another campus equal in size to the present physical facilities, and this must be done, not in fifty years, but in ten.

STATE AND REGIONAL TRENDS

Delaware is one of the nation's fastest growing states, its growth rate exceeding that of the United States as a whole. The state lies in the southern half of the populous Atlantic urban region. Consistent with the growth characteristics of this larger region, Delaware's population will increase from 446,000 in 1960 to a projected 590,000 by 1970 and 835,000 in 1980, or almost twice the 1960 figure.

Meanwhile, the college age population will continue to increase at an above-average rate. In 1960 the college age group comprised 6% of the population, while in 1980, it will total 8%. Concurrently, due to the greater degree of academic training required to compete in today's job market, an increasing

proportion of the college age population is pursuing some form of higher education. Furthermore, the per capita income increase in the state and region contributes substantially to the pursuit of higher education. Thus, the projected increase in Delaware's college enrollment is expected to parallel that of the nation as a whole.

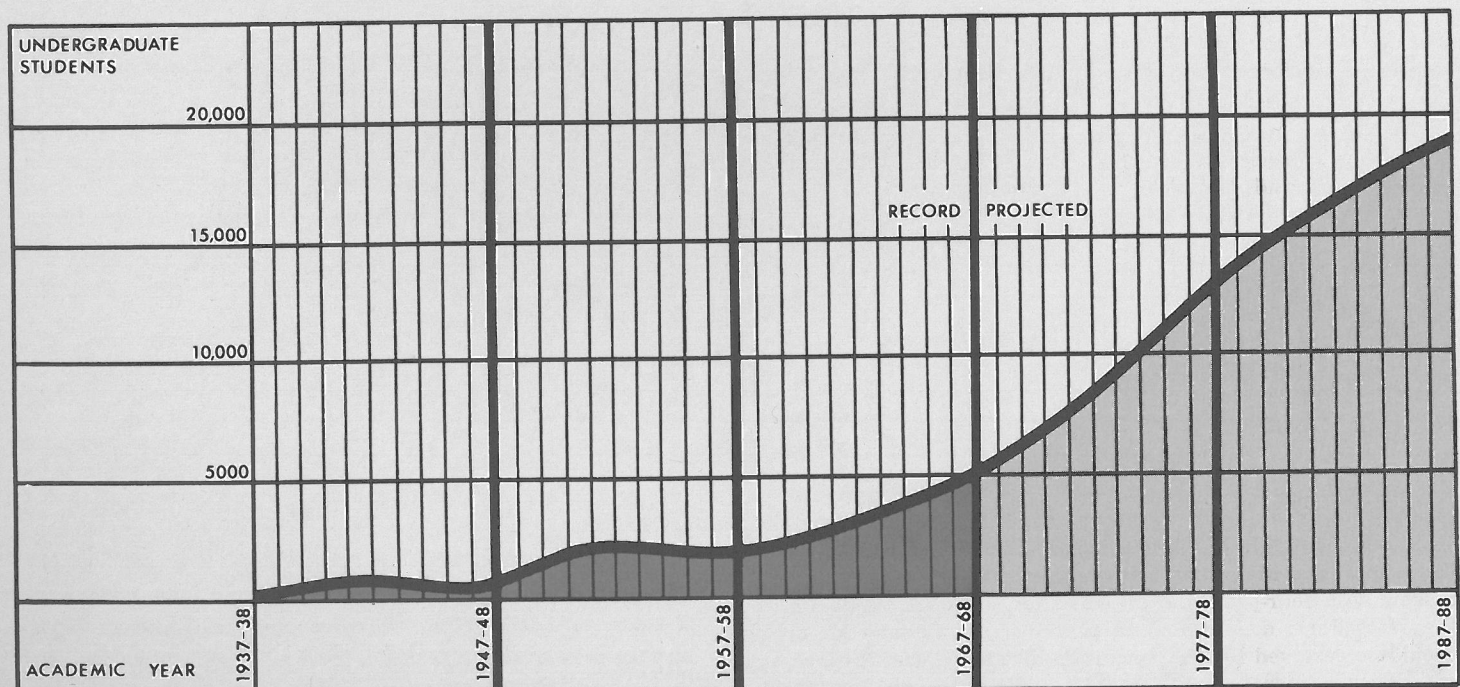
ENROLLMENT PROJECTIONS

According to figures published in *A Fifteen-Year Forecast of Students, Staff and Facilities Ending 1982*, May 1968, the full-time enrollment is predicted at 10,385 for academic year 1972-73 and 15,357 for 1977-78. A projection of these trends would indicate an approximate enrollment of 20,000 students by 1987-88. Based on these projections, two planning levels were envisioned for the University: a 10,000 enrollment level in slightly less than five years, and a 15,000 student level in approximately ten years. Plans for the physical accommodation of this growth were developed for a particular enrollment level rather than for a particular academic year.

The above figures do not include the University Extension Division, "special" undergraduates, or the "part-time" graduate students. According to the projections reported by the University's fifteen year forecast, these categories will total about 6,500 by 1972-73 and about 8,000 by 1977-78.

It is generally expected that the Extension Division's academic program can be accommodated in the same space as the day-time enrollment. Although some additional administrative space, faculty offices, and classroom types might be required, the total amount of space for the Extension Division would be very small relative to the University's full-time day enrollment needs.

UNDERGRADUATE ENROLLMENT



BUILDING SPACE NECESSARY TO ACCOMMODATE GROWTH

The future growth in enrollment, the expansion of existing academic programs and the institution of new programs at the University of Delaware will require additional building space. For planning purposes, these space requirements have been estimated for enrollment levels of approximately 10,000 and 15,000 full-time students (expected to occur in five and ten years respectively). The Development Guide must allocate the required space in such a manner that the campus environment will continue to be visually pleasing as well as functional.

RESIDENTIAL SPACE

Projections from *A Fifteen Year Forecast of Students, Staff, and Facilities Ending in 1982*, published May 1968, indicate that approximately 60% of the total full-time undergraduate and graduate enrollment should be housed in University-owned residential units. In the Fall of 1968, with the opening of the final units of the west dormitory complex, the University will house 4,600 students. In order to house 60% of the student body, the bed count must be raised to 9,000 units by the time the 15,000 enrollment level is reached.

NON-RESIDENTIAL SPACE

Based on the existing standards at the University of Delaware and other comparable universities, and considering future flexibility, 250 gross square feet per student is considered a reasonable basis for planning non-residential building space. At the 10,000 student planning level, approximately 2,500,000 g.s.f. (gross square feet) would be required — 750,000 g.s.f. more than the existing inventory. For each additional 5,000 students, approximately 1,250,000 additional g.s.f. would be required.

Future planning must consider both total space and the relationship between building space serving different uses. This has been developed in The Development Guide Report No. 1. Non-residential building space can be expressed in three major categories, each embodying certain locational requirements. These categories are: Academic and Related Uses, General Uses and Auxiliary Uses.

- Academic and Related Uses

For planning purposes, this category has been estimated as comprising 85% of the total non-residential building space — 50% allocated to classrooms, teaching laboratories, faculty and department offices, and 35% to library, physical education and research. This space has been allocated to specific departments or disciplines according to teaching responsibilities, space requirements, scheduling limitations, and projected changes in student enrollment.

- General Uses

This category, which includes physical plant, auditoria, administration and faculty offices, constitutes 10% of the non-residential building space.

- Auxiliary Uses

The remaining 5% of non-residential space would be occupied by the student center and health services.

Based on this breakdown, the total non-residential space requirements at each planning level have been estimated as follows:

	Existing Inventory	10,000 Students	15,000 Students
Academic & Related Uses	1,400,000 gsf	2,125,000 gsf	3,187,500 gsf
General Uses	113,000	250,000	375,000
Auxiliary Uses	134,000	125,000	187,500
Total Non- Residential Uses	1,647,000 gfs	2,500,000 gsf	3,750,000 gsf

OTHER FACILITIES

On any university campus there are certain facilities which do not relate directly to the teaching responsibilities of the institution as measured by enrollment. Such facilities would include auditoria, museums, art galleries, sports facilities, related institutions or agencies, sponsored research, and possible major program additions, such as Law, Medical and Dental Schools. Whether such facilities are required is contingent upon broad-based policy decisions by the University.

The Long-Range Development Guide can accommodate a number of additional programs without imposing important alterations in the plan, although in the case of a major demand such as a medical complex, some provisions must be made in the plan.

PARKING PROGRAM

On-campus parking demands have increased at a rate equal to or exceeding the expansion in enrollment. Often, this demand has been met by a series of makeshift lots distributed throughout the campus. Generally, these lots lack well-defined entrances and are situated so as to complicate the major campus circulation patterns. Furthermore, the location of these lots often coincides with prime building sites for future campus development.

Parking is a major land use in terms of total area. About 300-350 gross square feet of space is required to store an automobile (plus additional area for access roads). This is in comparison to the approximately 250 gross square feet required to house a single student in a dormitory room and provide a common facility for dining, and the roughly 250 gross square feet per student required for instructional and related facilities.

The Development Guide Report No. II describes the principles used in determining the long-range parking needs of the University, as well as the results of that investigation. The following is a summary of the estimated demand for parking at the two planning levels:

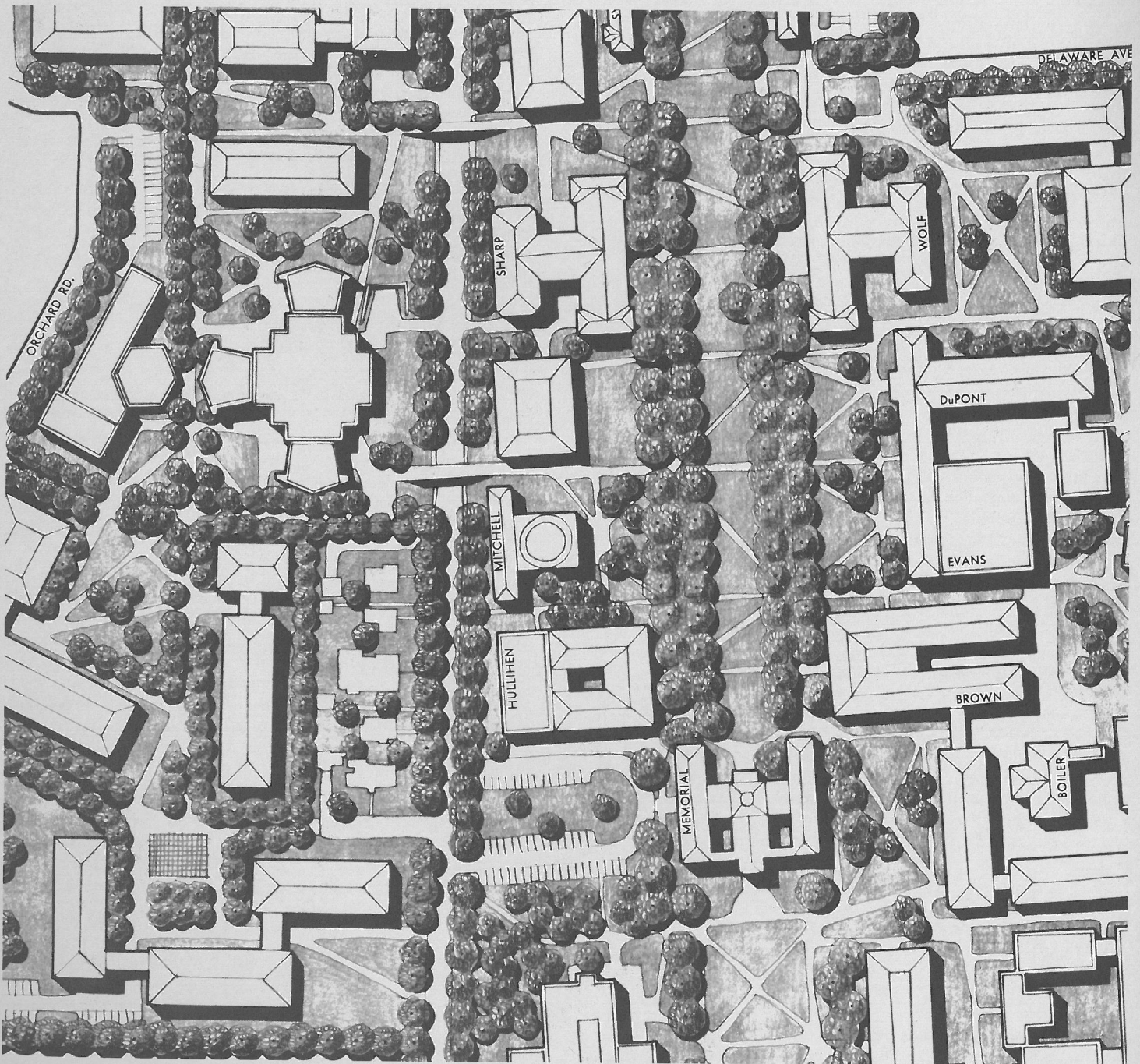
	10,000 Students	15,000 Students
Total Eligible Parkers	6,500 Persons	9,700 Persons
Estimated Peak Hour Demand	3,700 Spaces	5,550 Spaces
Average Percentage	60%	60%

SECTION TWO

LONG RANGE DEVELOPMENT GUIDE

The Long Range Development Guide is the University's plan of action. It must take into account the parameters of growth established by enrollment expansions and landholdings as well as the amount of building space necessary to accommodate projected growth. It must establish a sequence of buildings and open spaces appropriate to both the topography of the land and the functional relationships between facilities. Finally, it must formulate design objectives for architecture and landscape which will create a visual environment reflecting both the traditions and the on-going spirit of the University.

The first section of this report discussed enrollment projections, University landholdings, existing land use and building space necessary to accommodate growth. These are the technical factors which must be incorporated into the Long Range Development Guide. This section discusses the basic principles of land use development, with particular emphasis on the delineation of an "academic core". These principles are the basis of the specific land use proposals and design objectives recommended for the University of Delaware.



THE CONCEPT OF LAND USE DEVELOPMENT

The term "land use development" refers to the grouping of land uses in a way which reflects not only similarity between functions but also wider relationships which exist between different functions. In campus planning, therefore, land use patterns should reflect the functional relationships which exist between University facilities. Housing, instructional facilities and recreational areas should be arranged not only for their own efficient operation, but also for the convenience of students and faculty.

In the past, the operational organization and functional requirements of universities in America resulted in a spatial arrangement of facilities which was remarkably similar from campus to campus, in spite of variations due to topography, landholdings, roads and other external physical elements. In recent years, however, increases in enrollment and the resulting physical expansion have occurred at a rate that was totally unanticipated, with the result that many campuses grew without a clear reference to the basic functional relationships between facilities which are necessary for the convenience of both students and faculty. These original functional relationships and land use patterns, whether they were achieved implicitly or explicitly, represent a desirable planning goal, and in cases where they have been obscured by disorderly growth, planners must often work to re-establish them as principles for development.

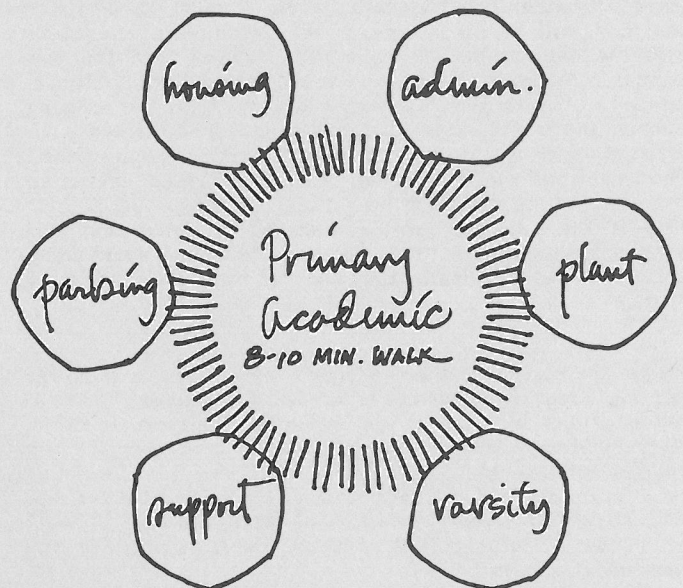
Due primarily to long range plans adopted in the early part of the century, the University of Delaware has always maintained a growth pattern which reflects the basic functional requirements necessary for convenient operation. Studies have shown that the University could continue to develop according to the principles outlined below, without major land acquisition, at least until daytime enrollments reach the 15,000 student level.

One of the central elements in the concept of land use development is the delineation of an academic core area which is sufficiently compact to permit convenient pedestrian passage between the primary instructional facilities, faculty and administrative offices, and academic services such as the library. The general location of this academic core should be established according to its ability to satisfy, at least through the next generation of development, the following principal objectives:

- Maximum use of available land.
- Incorporation of the existing campus academic areas.
- Maximum flexibility to cope with the many "unknowns" in the University's development over the course of the next ten to fifteen years.

The size, disposition and desirable functional limit of the core is normally determined by the walking distance which can be comfortably covered during the interval between classes. As with most institutions in this country, the University of Dela-

ware has adopted a ten-minute class change. Five minutes is insufficient time to accommodate the final statement of the professor, gathering books and notes, donning coats, traveling between buildings, and repeating the reverse procedure in the subsequent class. Fifteen minutes, on the other hand, either reduces the amount of classroom contact from 50 to 45 minutes, or reduces the number of class periods that can be accommodated during the day. The traditional ten-minute interval is a reasonable medium, of which three to four minutes are available for egress and ingress of buildings, leaving six to seven minutes for walking between classroom buildings. Based on a six to seven-minute walk between buildings, the maximum comfortable distance that a student can be expected to cover is 1500 to 1800 feet. Consequently, the ideal maximum academic core would be contained within the area circumscribed by a circle with a diameter of 1800 feet, enclosing about 55 acres. It should be noted that the student would rarely be forced to walk the maximum distance—especially where departments and schools were organized in groups.



The other facilities necessary for the operation of the University would be located outside, but adjacent to the academic core area wherever practical. These other land uses include housing, parking, research facilities, varsity athletics, general administration, support facilities such as warehousing and physical plant, and other facilities which do not operate on a class period basis.

The location requirements for these non-academic uses vary. For example, housing should be within a reasonable walk from the edge of the academic core, while physical plant facilities can be more distant.

Although no "pure" concept can cover all development decisions, a clear understanding of the principles of land use development will ensure that each facility, whether it be academic, residential, recreational or support, will be developed within a system of clearly articulated functional relationships.

THE ACADEMIC CORE

On the basis of this land use concept, alternative locations for the further development of the academic area were investigated. The core area delineated here is the alternative which most fully satisfies the concept criteria. All major buildings presently used for instructional purposes, including the new Education Building, are situated within this area, except Robinson Hall and the Biology-Chemistry Building.

Despite a number of constraints imposed by non-University development, there is within the core area a substantial amount of land available for long-range expansion. At present, approximately 1,200,000 square feet of University land is either undeveloped or underutilized and therefore suitable for redevelopment. There is approximately 600,000 square feet of land in parcels within the expanded academic core, which is not owned by the University. Approximately one third of this total should be purchased by the University in order to consolidate its existing land holdings and permit an integrated campus development.

Estimates of University building, playfield, and parking requirements were used in land accommodation studies to determine whether the University could develop on available land and still retain a density of development compatible with the old campus. These studies showed that the new campus area west of College Avenue would have to be developed at an appreciably higher density than the existing campus and would serve to create a new concentrated environment which would complement the openness of the Green. The new areas would be developed with buildings averaging from four to six stories in height and covering some 25% to 35% of the available land. (It should be noted that this average height of four to six floors would include some buildings as low as two floors and others of possibly ten or more floors.)

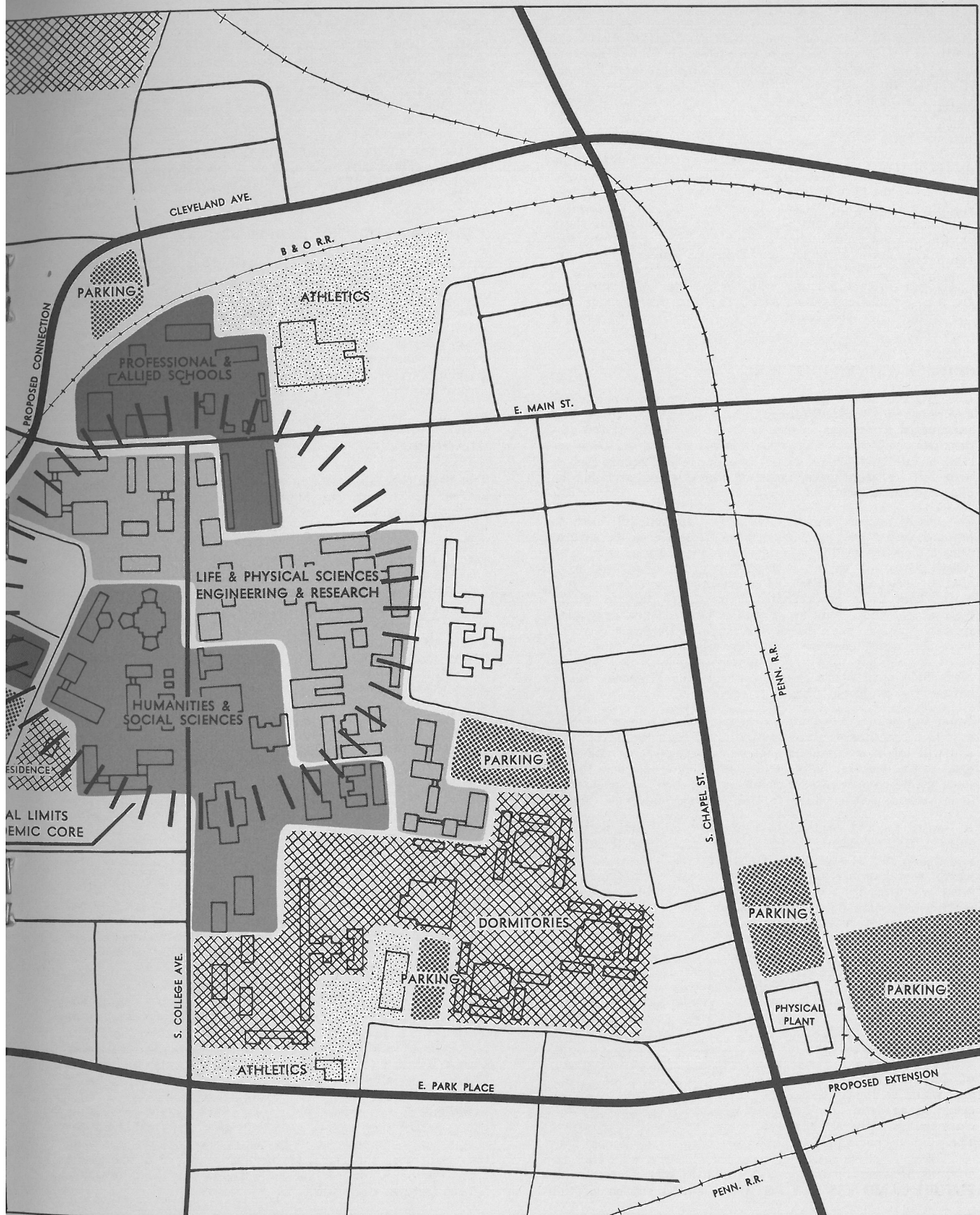
Within the portion of the academic core on either side of the existing Green, development of academic buildings would not represent any increase in the apparent density since three-story buildings could be retained in this area. Several new building sites could be obtained through street removal and reuse of spaces underutilized at the present time. These new sites should be developed north and south of Sharp Laboratory, west of Hullihen Hall, south of Brown Laboratory, and west of Alison Hall.

The housing group comprised of Brown, Harter, Sypherd and Sharp Halls occupies an important location along Green within the academic core. Pressures for academic space beyond the 15,000 level might necessitate the reuse and/or reconstruction of these facilities for academic uses. In the meantime, since these dormitories provide a pleasant scale and introduce student activity in the area, there is no reason for them to be phased out.

The portion of the Old Campus south of the Morris Library is technically outside of the academic core. New building sites shown in this vicinity could be designated for either academic or residential use according to future need. The area is presently a residential enclave (with the exception of Robinson Hall), therefore, long range residential expansion would be most reasonable. However, should major growth occur in academic facilities not directly dependent on the class change interval, this area would provide an appropriate site.

FUTURE LAND USE — CENTRAL CAMPUS





HUMANITIES AND SOCIAL SCIENCE

Humanities and social science should continue to occupy the eastern half of the academic core area, since they must be easily accessible to Morris Library. Although some Humanities and Social Science facilities might be placed east and west of Morris Library, the majority of new facilities should be developed west of College Avenue and south of the Arts and Science Building.

With the acquisition of several scattered parcels and the closure of Amstel Avenue and Kent Way, some eight to ten acres would become available for development as a new academic quadrangle for the Humanities and Social Sciences. This area lies in the logical direction of expansion for these lines, and its development would fill out and strengthen the linkage between Old Campus Mall and University development west of South College Street. Furthermore, a major quadrangle in this location could become the southern anchor of a new pedestrian spine paralleling the existing mall and connecting with the North Campus and Proposed Science Complex.

SCIENCE AND ENGINEERING

Chemistry, Physics, and Physical Sciences and Engineering and other facilities require an unusually large amount of building space. The projected growth of science facilities up to the 15,000 student level will require 675,000 square feet of specialized instructional areas. This does not include 500,000 square feet of unused research space, much of which would probably be devoted to the sciences.

In the initial phases of new science construction will have to be completed within the next few years. While there are several alternatives that could readily accommodate this early growth, long-range plans call for the development of an integrated complex of science facilities. The sciences, therefore, should shift their focus of activity from Wolf Hall to Sharp Auditorium, thus creating a major new science expansion west of South College Street and north of Delaware Avenue. This site, which contains approximately 10 acres, would fill the academic core in the northwest sector and provide suitable outlets for growth even if the sciences expand beyond the projected planning levels.

From the design viewpoint, a large, highly integrated Science Complex involves the possibility of high rise structures which will introduce building masses on a scale that does not exist in the academic core at present. Such a complex, therefore, should receive careful attention to ensure sensitive scale and material relationships to the existing buildings.

A limited amount of land east of Wolf Hall and north of Sharp Auditorium, presently occupied by a much-needed parking lot, should be regarded as a reserve for future facilities which would relate directly to chemical engineering and related activities in that area. The parking problem could be solved at some future time, either by construction of a new parking garage or relocation to other sites on the fringe of the academic core.

PERFORMING ARTS

It is proposed that the area south of Amstel Avenue between Kent and Orchard Roads be reserved for a complex of fine arts and performing arts facilities. The large auditorium proposed for construction within the next two or three years would be the initial element of this complex and will form the nucleus of a major new land use on the parade grounds. As the complex evolves, the Conover Hall housing facilities could be located to one of the larger residential areas.

The proposed location has good proximity to the Humanities and Social Sciences area and would constitute a solid University link between the academic core and the West Dormitories. The location of the site is in the ten-minute walking circle of the

academic core, thus allowing for the inclusion of instructional space for the arts. At the same time, the site is directly accessible from Elkton Road so that public access to events in the complex can be readily accommodated. Public parking facilities can more easily be provided on this fringe site and could be used for faculty and staff parking as well. The galleries, exhibition, spaces, and performing arts functions will constitute a lively and significant element of public contact for the University. This, with the relative physical detachment of the complex from the academic core, provides a unique opportunity to consider a more assertive and sculptural architecture than would be appropriate within the core itself.

PROFESSIONAL AND ALLIED SCHOOLS

Professional and allied schools which do not fit exactly into the traditional class schedule, yet require a good access to other institutional facilities, should be located on the North Campus. Over the past fifty years the North Campus has been relegated to a secondary position as the University center of activity grew to the south. These professional and allied schools, combined with the recently completed Education Building, present an excellent opportunity to consolidate and strengthen this area as a lively element of the University.

OTHER FACILITIES ADJACENT TO THE ACADEMIC CORE

The North Campus would also be a good location for a second student union. Such an addition would serve as a complement to the existing student center near the East Dormitory complex and would be directly astride the path of student movement which will be generated by the development of the White Clay Creek Tract.

Other facilities which require proximity to the mainstream of student and faculty movement, but do not depend upon the class change interval, should be located at the edge of the academic core. Such facilities would include the Library, Gymnasium, Parking and administrative facilities, as well as the community-oriented functions of the Fine Arts Center. These facilities tend to function as contact points between the University and the "outside" world and should therefore be readily accessible via regional circulation. This arrangement currently exists at Delaware, although the physical relationship of elements such as the Student Union and Gymnasium to the main campus area is not as strong as it could be. The Development Plan would reinforce the linkage between these elements and the proposed academic core by eliminating or bridging the pedestrian-vehicle conflicts which occur at present.

DESIGN OBJECTIVES FOR THE CORE AREA

The University's principal environmental asset is the original Green with its graceful scale and consistency of texture and material. The architecture and landscape of the Green create a cohesive, humanly-scaled environment and should continue to provide the basic inspiration for future design.

Although consistent landscape treatment and the use of appropriate building material will ensure a sense of overall unity for the campus, each new enclave should nonetheless be developed in a character consistent with its own particular scale and use. The Science Complex, for example, will consist of large specialized structures in close physical relationship to one another. A highly integrated arrangement of this sort would call for an urban type plaza as its central organizing space, rather than a soft "natural" area. This could be developed as a complement to the more verdant open space of the Green with the visual tie between the two areas established by the details of landscape design and the expression of architectural materials.

OPEN SPACE CONCEPT

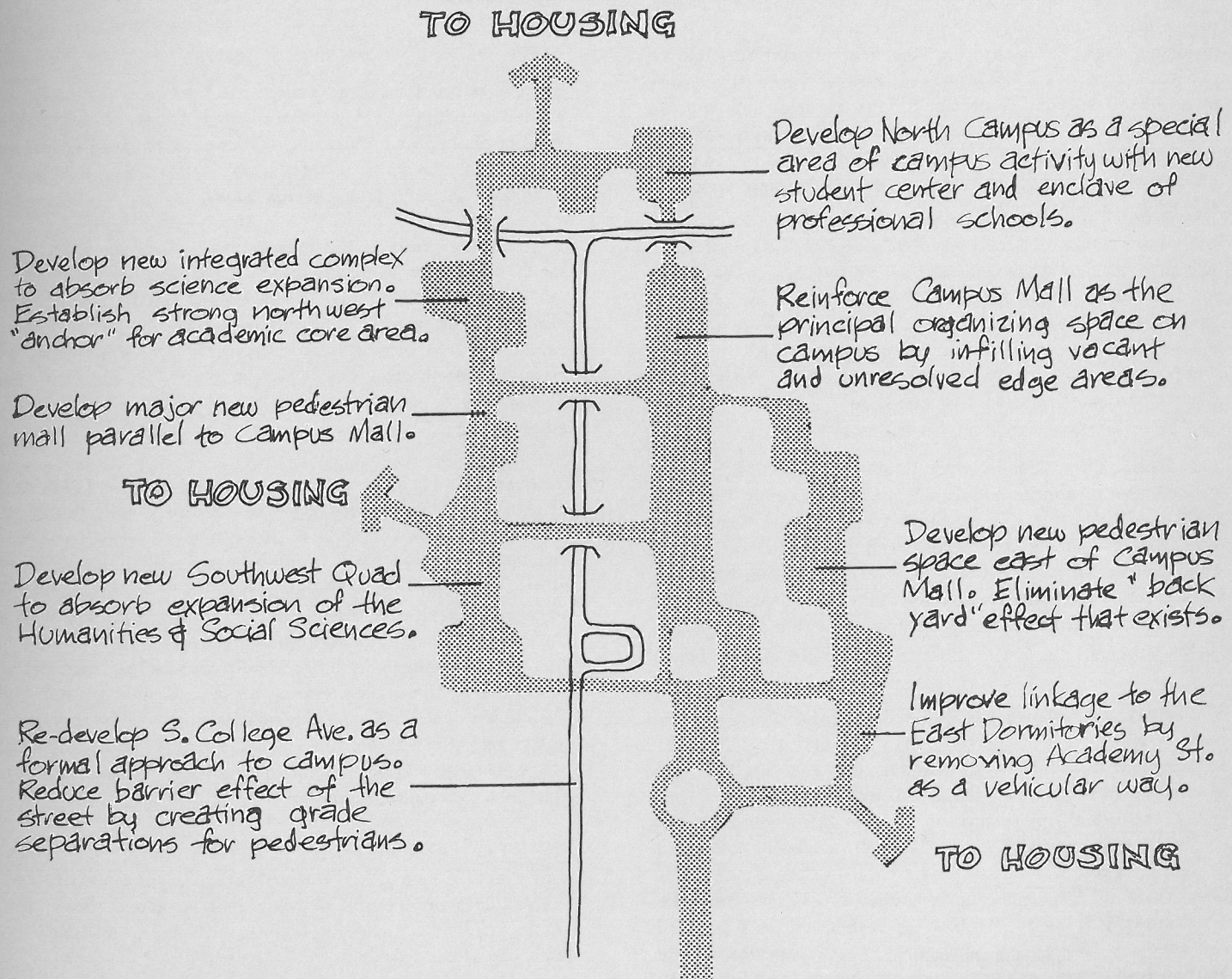
The establishment of an appropriate and orderly sequence of open spaces and edges is one of the keys to a pleasing and coherent campus environment.

The Green has always been the traditional focal area of the campus. It should, therefore, be reinforced as the principal organizing space by in-filling vacant and unresolved edge areas.

Many of the areas abutting the Green have become "backyard" areas, dominated by parking and service. Future development should reclaim these peripheral spaces visually, through the introduction of planting and the reduction of large paved surfaces. These reclaimed areas could then be

developed as new pedestrian spaces, which would help to integrate the edges of the campus with the Green.

In the case of those buildings which abut South College Avenue, it will be particularly important to screen and modify this "backyard" appearance, since these and other roads abutting the Green should be treated as important visual edges to the campus. There is potentially a fine panorama of the University from College Avenue, but with the increase in number and type of overhead utilities, street parking, and other visual conflicts, one's sense of the campus is disrupted. This major approach to the University should be exploited for its dramatic and aesthetic possibilities.



NON-ACADEMIC FACILITIES

HOUSING

Theoretically, the trip between housing and the academic core is limited only by the distance that a student can reasonably be expected to walk two or four times a day, given such factors as climate and topography. The desire of the University to achieve a sense of community, however, is probably the best determinant of this relationship. There is of course, no simple or ideal solution. Too much dispersal increases the difficulty of integrating residential facilities with the intellectual and social fabric of the University, thus eroding the sense of campus identity and community. On the other hand, concentration of residential elements enhances the opportunities for student involvement in the full spectrum of campus life, but is likely to pre-empt space that should be allocated to facilities more dependent upon academic interrelationships.

The present disposition of residential facilities at the University offers good proximity to the academic core without pre-empting space that should be used or reserved for academic uses. The linkage of the West Dormitories to the academic core could be improved, however, and the design plan makes specific recommendations toward this end. In time, the growth of instructional space may require that the residential uses on the Green north of Delaware Avenue (Brown, Harter, etc.) be transferred to a housing area outside of the academic core.

The projected development of the White Clay Creek Tract for residential purposes will allow for major housing expansion to the 15,000 level, while simultaneously opening up a new direction of University housing growth. This will counterbalance the current concentration of residential facilities to the south and east of the core.

The White Clay Creek Tract is a handsome, abundantly wooded area of approximately 200 acres, containing the most variegated topography of any land owned by the University. The character of the site lends itself mainly to residential development. The residential scale and texture can be easily worked into the rolling landscape, while related playfield and parking uses can be accommodated on available flat portions of the site.

The connection between the White Clay Creek Tract and the campus will have to be made direct and attractive in order to integrate this part of the campus into the total University. Since it is detached from the central area of the University by a half-mile segment of non-University uses, including the Baltimore & Ohio Railroad, a clearly-delineated pedestrian connection should be developed to the North Campus, including, if possible, grade separation at the railroad. Whether or not the non-University residential uses between are ever acquired by the University, this connection should be conceived to strengthen the relationship of the White Clay Creek Tract to the rest of the University.

Housing beyond the 15,000 student level will necessarily develop in areas outside the core where there is sufficient room for dormitory parking and informal play space. Whether this takes place on areas such as the Farm property or acquired land nearer the core depends upon the density at which the University wishes to develop. Approximately 75 acres in the northern portion of West Farm could be considered as a potential site for future residential expansion, particularly if for any reason the White Clay Creek Tract is not developed to its projected capacity, or if dorms in the central area are pre-empted by other facilities. Although the one-half mile to the academic core is a moderate walking distance, future pedestrian connections to the campus should be grade separated at the railroad and attractively designed. As a supplement to the residential development, the strip of land parallel to the Penn-Central main line should be reserved for the long range needs of intramural play.

ATHLETICS

PHYSICAL EDUCATION

Playfields require large amounts of land and should be assigned sparingly in the central area either as dormitory-related play space or teaching stations for physical education. Meanwhile, the bulk of intramural and varsity field space should be developed in outlying areas.

A study conducted by the consultants in 1968 shows that the men's physical education program is not likely to be seriously deficient in outdoor playfield space until the 15,000 or 20,000 student levels. The facilities of the Carpenter Sports Building should be adequate at these future levels. Meanwhile, we strongly recommend that the playfields presently in use around the Carpenter Building be retained and, where possible, expanded.

The women's program will have a crucial need for additional space for outdoor activities in the relatively near future. In addition to more intensive utilization of existing space (which can only be considered a short-range solution), other alternatives for future playfields will have to be considered. It is imperative that the plans for the new gym serve both the short and long range indoor needs of the program. The existing women's gym is ideally situated in many ways. It is close to the academic area, a major dormitory area and the student union. The latter relationship is only important if the recreational facilities in the student center are used for physical education instruction and both buildings are considered a "recreation complex."

The major disadvantage of this location is the limit on outdoor playfield space. The women's program as currently conducted, does not depend a great deal on the outdoor area, particularly in comparison to other universities. Additional land east of the existing gym between Park Place and Courtney Street might be obtained to supplement the outdoor areas as required.

The flat northeast portion of the White Clay Creek Tract adjacent to the stream bed should be reserved for playfields. The relationship of the site to projected dormitory areas and its distance from the core suggests its use for recreational or intramural sports rather than physical education. Informal play areas should be developed adjacent to each dormitory complex.

VARSITY ATHLETICS

The University athletic plant is located on the West Farm site and has excellent vehicular access to the main campus, Kennedy Turnpike (via South College Avenue) and the Newark region in general (via the proposed inner loop). This, plus the fact that there is ample room for parking, makes it ideal for varsity events which draw large numbers of outside spectators. The present site is not convenient for the athletes or for student spectators, however, since the residential and academic areas are more than a mile and a half distant. Nevertheless, alternate locations are not available, and, even if they were, the present investment in sports facilities precludes any serious consideration of relocation.

Any program of varsity athletics calls for practice fields as well as spectator and parking facilities. With an area of 500 acres, the West Farm site constitutes the University's largest single parcel of land and has sufficient uncommitted space (which should be reserved) to accommodate additional practice field and other facilities, should enrollment or University policy call for expansion of the program.

RESEARCH AND SPECIAL INSTITUTIONS

Facilities not serving functions which operate on a class period basis nor housing persons extensively involved in classroom activities, should be located outside the academic core area. This would permit the limited amounts of land in the core area to be used for those facilities with the more critical location requirements.

It is suggested that portions of the Manor property be developed along the lines of an industrial-research park. The area proposed for the Park has good vehicular access, is about a 15-minute walk ($\frac{3}{4}$ mile) away from the edge of the academic core and has good potential for rail service.

In addition to science research sponsored by the University, private firms, and special government institutions, the University physical plant facilities, including equipment storage, warehousing and repair shops, could also be located on this property.

OTHER FACILITIES

FUTURE MEDICAL SCHOOL

It is recommended that the 200-acre East Farm property be reserved for the future development of a Medical School. This is the only University parcel of sufficient size and configuration to contain the full complement of facilities attendant to a four-year medical education program. Although the West Farm does contain a parcel of equivalent size, it should be reserved for the expansion of athletic facilities, as mentioned earlier.

A reserve of 200 acres would allow not only for the medical instruction facilities, but also for a teaching-hospital, adequate parking, residential quarters and other para-medical programs.

At present, a 15 acre triangle of land in the southwest corner is separated from the main parcel by South Chapel Road. The proposed realignment of South Chapel Road to the west side of the Penn-Central tracks would consolidate the property. As the East Farm is developed, suitable grade-separated connections to the site can be provided from the realigned Chapel Road. The University should give high priority to the purchase of a 100 foot right-of-way from the northeast corner of East Farm to Marrows Road for future vehicular access.

The Public Health Service, in its publication *Medical Education Facilities*, 1964, recommends a minimum site of 50 acres, and 75 to 150 acres where it is feasible. It also suggests that provisions be made for nearby space for married and single student housing. Should the University determine that a Medical School be built, the reserve of 200 acres would be more than adequate to allow for adequate surface parking facilities and to provide for greater flexibility in the number and type of programs which could be established.

CONTINUING EDUCATION CENTER

The University has proposed that a Continuing Education Center be constructed on the west side of White Clay Creek along New London Road. This use would provide an excellent complement to the residential development mentioned earlier, since it would generate activity and population that housing alone could not provide. Furthermore, since the center serves the outside community, placing it in this relatively peripheral area will reduce traffic conflicts in the core.

COLLEGES

If the University adopts a policy of creating autonomous "colleges" to provide for growth after the 15,000 enrollment level, the White Clay Creek Tract would be a prime site, since the proposed dormitories and Continuing Education Center would provide a strong base. Other possible sites would be the West Farm as part of a new housing complex and the Morris Farm tracts.

AGRICULTURAL SCIENCE

The College of Agricultural Science is presently located on the West Farm. Although future building expansion could easily occur adjacent to present facilities, it is suggested that the College consider shifting some of its lower, or possibly upper division course work to the academic core area. Such a move would certainly be more convenient for students, and the present facilities could, in time, be devoted exclusively to graduate level work and research.

CIRCULATION AND PARKING

VEHICULAR CIRCULATION

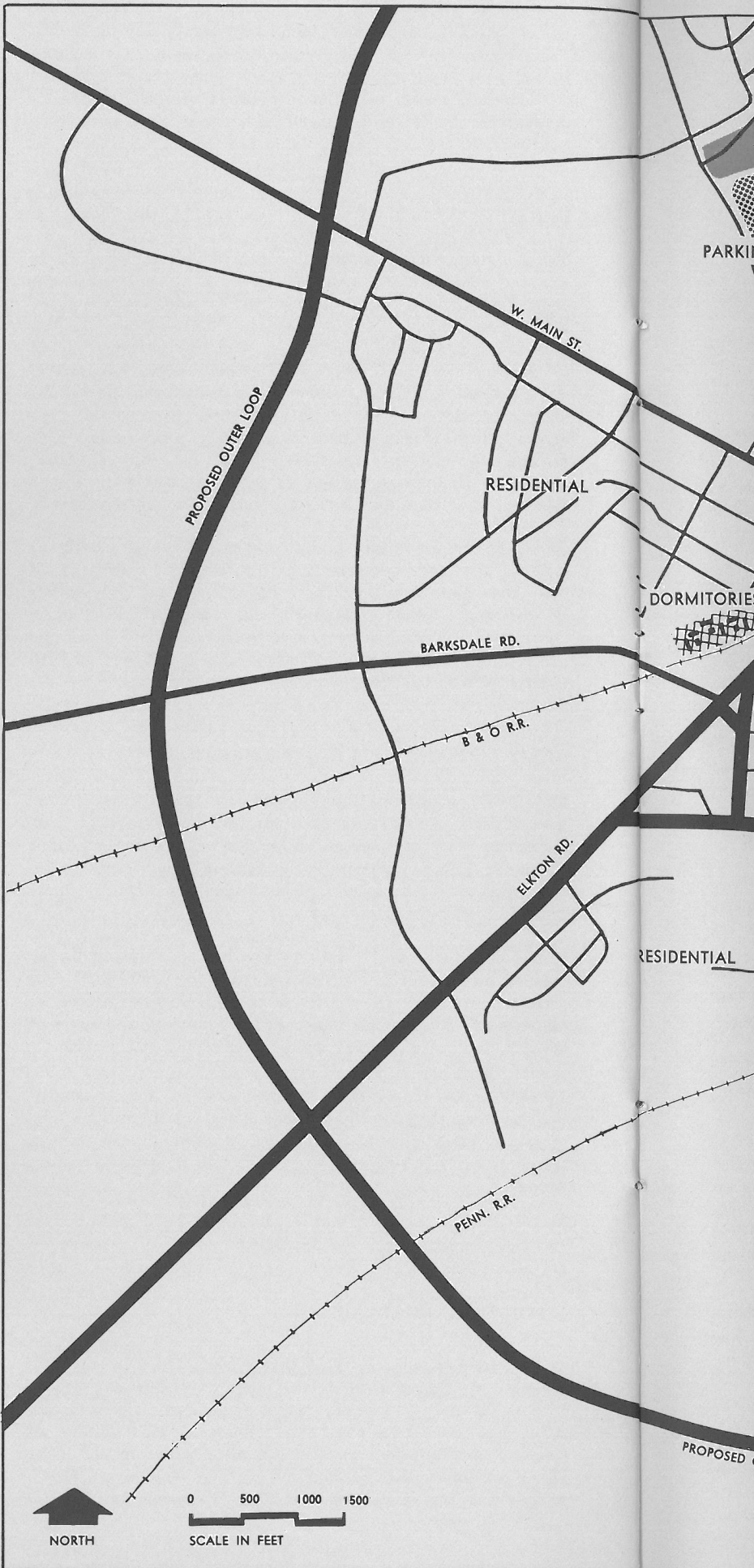
One of the principal land owners and employers in the city of Newark, the University maintains a vested interest in vehicular circulation, not only on the campus, but throughout the community as a whole. In approximately ten years, the University will generate 15,000 to 25,000 person-trips per day. The road system therefore must be adequately developed to serve this volume of traffic. At the same time, the University's ability to achieve a sense of overall unity and coherence will depend to a large degree on the convenience and variety of pedestrian linkages between various portions of the campus. Vehicular traffic capacity and the pedestrian flow capacity are inversely proportional to one another. Generally speaking, if the traffic-carrying capacity of a road is increased, the capacity for the cross movement of pedestrians is decreased, and vice versa.

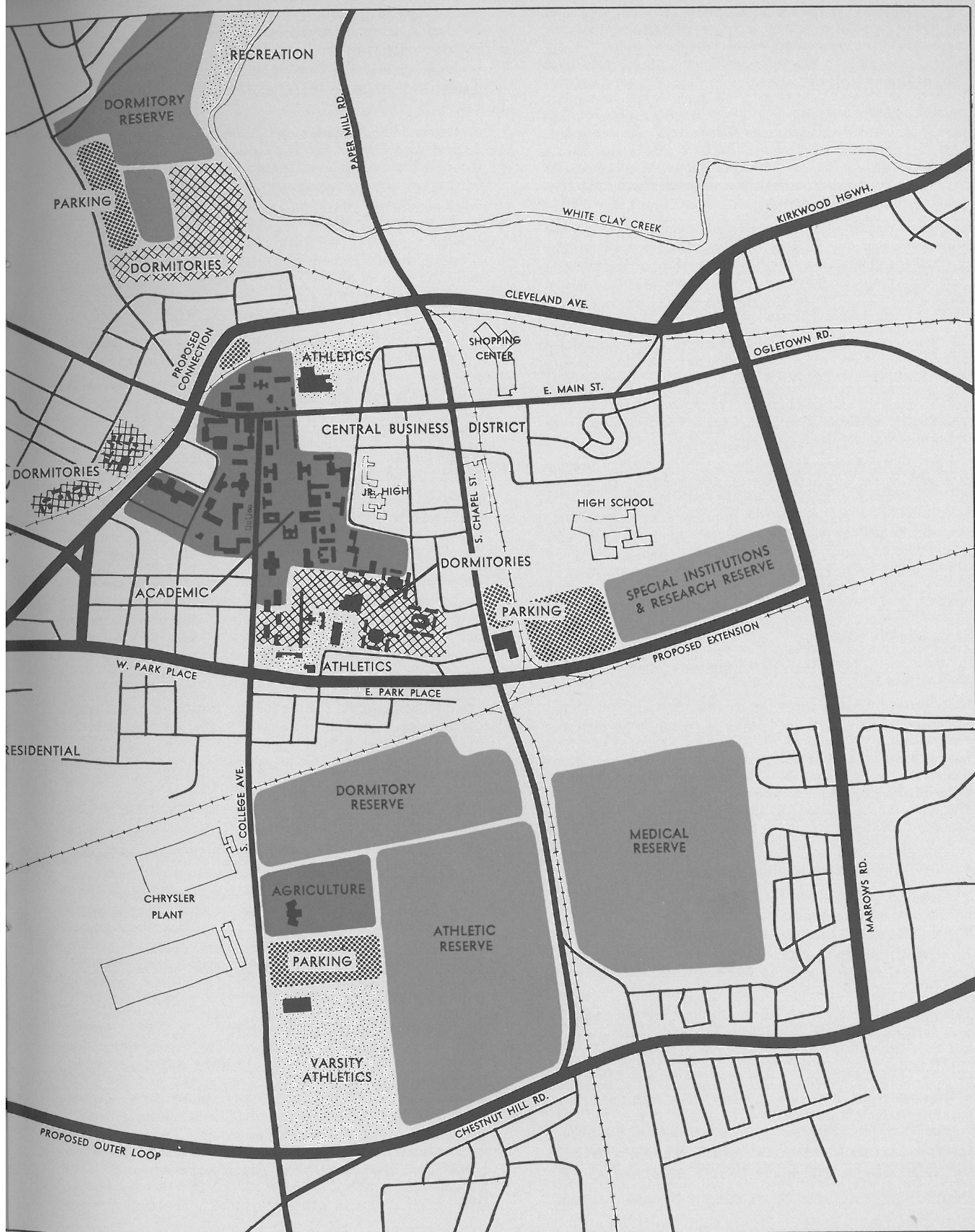
At the present time, the sense of integration between the University campus and Newark's Central Business District is challenged by the more than 25,000 vehicles per day which travel on the Main Street-Delaware Avenue one-way pair. It is obvious that neither the campus nor the business district can generate this amount of traffic; thus the vast majority of these vehicles represent through-traffic between opposite ends of the city, or between sectors of the city and outlying areas. At present, this traffic has no alternate route. The spatial arrangement of roads within the city literally funnels traffic into this single centrally located one-way pair. The streets are presently operating at a practical maximum.

In the future, the pedestrian traffic in the Central Business District and on campus will increase, thereby creating a higher level of conflict between auto and pedestrian traffic. As the capacity of the road system is reduced by the increased pedestrian movement, the automobile and truck traffic will continue to generate more and more demand for roads which have a greater traffic-carrying capacity.

The New Castle County Development Plan of August 1966 and the General Comprehensive Plan for Newark of February 1967 suggest a number of new roads and improvements to existing routes which would provide alternatives to the Main Street-Delaware Avenue-College Avenue bottleneck. The County plans consist of three major improvements: a north-south expressway (located one to two miles east of city limits); an outer ring road; and an inner ring road.

UNIVERSITY LAND USE AND VEHICULAR CIRCULATION





The expressway would serve the whole western portion of the state, permitting convenient and swift north-south movement. The outer ring road would provide a means for bypassing the more congested central area of Newark when driving from a suburban neighborhood to another neighborhood or to work. The inner ring road would serve two functions: first, it would permit the central area to be bypassed entirely if the driver's destination is not downtown; second, the auto driver whose destination is in the central area, but on the opposite side of an approach, could use the inner loop to circulate around the congested area, and then penetrate to his final destination.

The basic concept is a sound one and would serve both the University and the City in a most adequate manner. The particular rights-of-way, their size and order of implementation, and their implications for the development program of the City and University, must be studied in cooperation with city and county officials.

The following modifications to the existing street system are proposed in order to reduce pedestrian-vehicular conflicts and restructure the campus as a network of pedestrian precincts:

- Retention of South College Avenue with Pedestrian Grade Separations at Strategic points.

South College Avenue serves several non-University properties and is an important access and service link to the main campus area. Since these needs will not diminish, it is proposed that South College be retained as a formal vehicular approach to the University. Grade-separated pedestrian crossings would be developed north of Mitchell Hall and north of Sharp Laboratory. These crossings would accommodate two of the major pedestrian routes described elsewhere in this chapter. New street trees, lighting and proper screening of service areas would establish the street as a formal element of the campus landscape.

- Retention of Main Street with Pedestrian Grade Separation at Strategic Points.

Main Street will continue to be an important element of the local circulation system, and there is no practical basis for recommending its removal or diversion around University land. Indeed, the University's current proposal to control pedestrian traffic across it recognizes the long-term importance of the road. As the University develops, a grade separation could be established over or under Main Street to link the Education Building to the new pedestrian spine west of College Avenue.

- Elimination of North College Avenue.

The removal of this street would consolidate the North Campus as a pedestrian precinct and create new sites for future buildings. Based on available traffic situation, this road is not an integral nor major part of the City's circulation system but serves University parking areas and provides on street parking.

The general alignment of North College Avenue would be developed as a pedestrian route between the academic core and the White Clay Creek Tract, with future underpass at the B&O Railroad.

- Elimination of Delaware Avenue as a Vehicular Way Between Orchard Road and Wolf Hall.

Removal of this section would leave the Green between Memorial Hall and Main Street unobstructed as a pedestrian space. The Green would therefore be strengthened as the principal space in the academic core. Elimination of traffic

conflicts would make the academic core more efficient by decreasing the time it would take students to cross this portion of the campus.

Removal of the road would also create a new building space north of Sharp Laboratory for future academic expansion.

- Support the Extension of Elkton Avenue to Cleveland Avenue as a Part of the Bypass around University and the Newark Central Business District.

This is a regional circulation improvement of most direct advantage to the central area of the University and the City. Traffic congestion in the central area would be reduced and through-traffic could move more readily to its destination. The diversion would eliminate any possible objection to the University's removal of portions of North College Avenue, and in connection with the extension of Park Place would make the elimination of Delaware Avenue possible.

- Cooperate with the City to Extend Park Place to Marrows Road and Marrows Road to the Kirkwood Highway.

Park Place and Marrows Road extensions would provide an alternate route of sufficient capacity to draw traffic off those central streets which disrupt the connection between the campus and the central business district.

- Elimination of Academy Street in front of the Student Union.

A major safety problem exists at this pedestrian-vehicular conflict point. Auto traffic is light enough that pedestrians become casual to the dangers involved, while the auto drivers' speed is uninhibited by other vehicular traffic.

University personnel would be the major group inconvenienced by the closure since access to the University parking would require a slightly longer drive. However, it is felt that the increased pedestrian safety provides sufficient justification to inconvenience the University auto driver.

PARKING

The optimum parking scheme for any institution is one where parking areas are located as close to the destination of the commuting students, faculty, staff and visitors as possible. Since parking is a major consumer of land, it inevitably conflicts with the critical land requirements of the academic core. If priority is given to academic and related space, close-in parking must be minimal or else in structures, while bulk parking should be confined to relatively remote areas. The ultimate compromise depends on the economic and land-use policy accepted by the University.

The projection of a 5,500 parking space requirement at the 15,000 student level represents an increase of 3,000 spaces necessary not only to accommodate expansion of enrollment but also to compensate for spaces pre-empted by building projects. Of the total 5,500 spaces, approximately 2,500 will be required by faculty, staff and visitors, while commuting students will require the remaining 3,000 spaces.

As previously mentioned it is desirable to locate faculty, staff and visitor parking convenient to the facilities. The land-use and its circulation design show 2,000 spaces distributed throughout the central campus and includes a 200 car area north of the B & O Railroad at North College Avenue on land that would have to be acquired immediately. In addition, some lesser acquisitions will be necessary in order to develop a few of the proposed central lots. These acquisitions would be necessary in any case, to consolidate central area land for the 15,000 student enrollment planning level.

To accommodate staff parking for activity centers outside of the central area, 250 spaces would be provided north of the General Services Building and another 250 would be distributed among existing or proposed developments at the White Clay Creek Tract, Southwest Dorms, Agriculture School and Field House.

It is proposed that a 3,000 car lot be developed on the west edge of the Manor property to serve commuting students. This underdeveloped and relatively flat site lies within ½ mile of the academic core. The proposed extension of Park Place parallel to the Penn-Central Railroad tracks would provide excellent regional access to the commuter parking area by intercepting the traffic from all directions and diverting it to the Manor property parking area without requiring the drivers to go into the central business or campus area. The large lots north of the Field House would be reserved for special events either at the Field House or in the Central Campus area.

The option exists to construct parking ramps in the central area either to consolidate parking or to accommodate post 15,000 growth if necessary. Three large parking areas are especially suited for parking structures. These are located south of the Fine Arts Complex, northeast of the Bio-Chemistry Building and north of the B&O Railroad.

Major facilities in each of these locations would be well related to the proposed inner loop system so that most of the garage traffic would be confined to the periphery of the business and campus areas. Smaller structures could be built as part of building programs for the Science Complex and the expansion area east of Wolf Hall. It should be noted, however, that even with ramps it would continue to be desirable to maintain a network of small surface lots for convenience throughout the central area.

PEDESTRIAN CIRCULATION

A large and diverse University is most effectively organized and comprehended through a clearly defined circulation system for both vehicles and pedestrians. Ideally, there should be complete separation between vehicles and pedestrians in order to insure safety, avoid congestion, and maximize circulation capacity through continuous flow.

The pedestrian system should be defined by a strong network of open spaces. These spaces should be shaped by plantings and buildings in such a way that each quadrangle, plaza, and pathway is related to the others in a clearly visible sequence. The Green should continue to be the principal organizing space for the University.

A new mall, parallel to the existing mall, is recommended for the main area of future academic development. The function of the new mall will be exactly the same as that of the older mall — spatial organization, pedestrian circulation, visual cohesiveness and creation of environment. The new mall would run from the Education Building south, bisecting the proposed Business and Economics Building, and Art and Science Building, and terminating in a plaza west of the President's Residence.

The new mall would be linked to the present mall and the main residential areas by a series of pedestrian paths. The main path would commence at the West Dormitories, follow the general alignment of Amstel Avenue and penetrate across College Avenue into the present mall. Additional pedestrian linkage would occur between the malls along the Delaware Avenue alignment and north of the Morris Library. It is

interesting to note the campus development plan prepared in 1917 suggests a major cross axis on the Green at Amstel Road. Pedestrian ways to the proposed North Campus dormitory groupings and the Manor Property commuter parking areas have also been designed.

Building placement in the new campus core areas and the Green can be coordinated in such a manner as to essentially eliminate all pedestrian traffic across College Avenue except at the designated points. In the future, overpasses or underpasses could be developed to separate the vehicular from the pedestrian traffic.

All secondary campus spaces should have a clearly defined relationship either to the Green or to the principal pedestrian ways which lead into the mall. A specific system of such spaces and paths and the meshing of this system with vehicular circulation is suggested under Design Objectives for the Core Area.

The growth of the University to the 15,000 student level will alter the cohesive scale of the existing campus. In order to preserve and improve the sense of unity as the campus evolves into its new scale, it will be necessary to eliminate those conditions, street conflicts in particular, which would have a divisive effect on the central area.

Penetration of the main areas of the campus by automobiles should be confined to significant points of arrival, with the vehicular circulation system peripheral to the areas of heavy student movement. In a campus currently as dispersed as Delaware is and will continue to be, it would be impractical to terminate all of the roads that penetrate campus areas. It would be desirable, however, to eliminate those roads which are not essential for general traffic or University purposes. The remaining roads, which would necessarily carry appreciable volumes of traffic, should eventually be grade-separated from the major pedestrian routes between campus areas. Specific proposals are outlined under "Vehicular Circulation".



CONCLUSION

A long tradition of responsible and sensitive planning at the University of Delaware has resulted in a campus which is dignified and gracious. Its classic design and human scale reflect the intellectual and social values of a close-knit academic community. The changing demands of higher education, however, coupled with the need to double its size in the next ten years, have placed the University at a new turning point. The wider range of intellectual and cultural styles and diversity of interests which go along with larger size present new opportunities for a rich and stimulating environment.

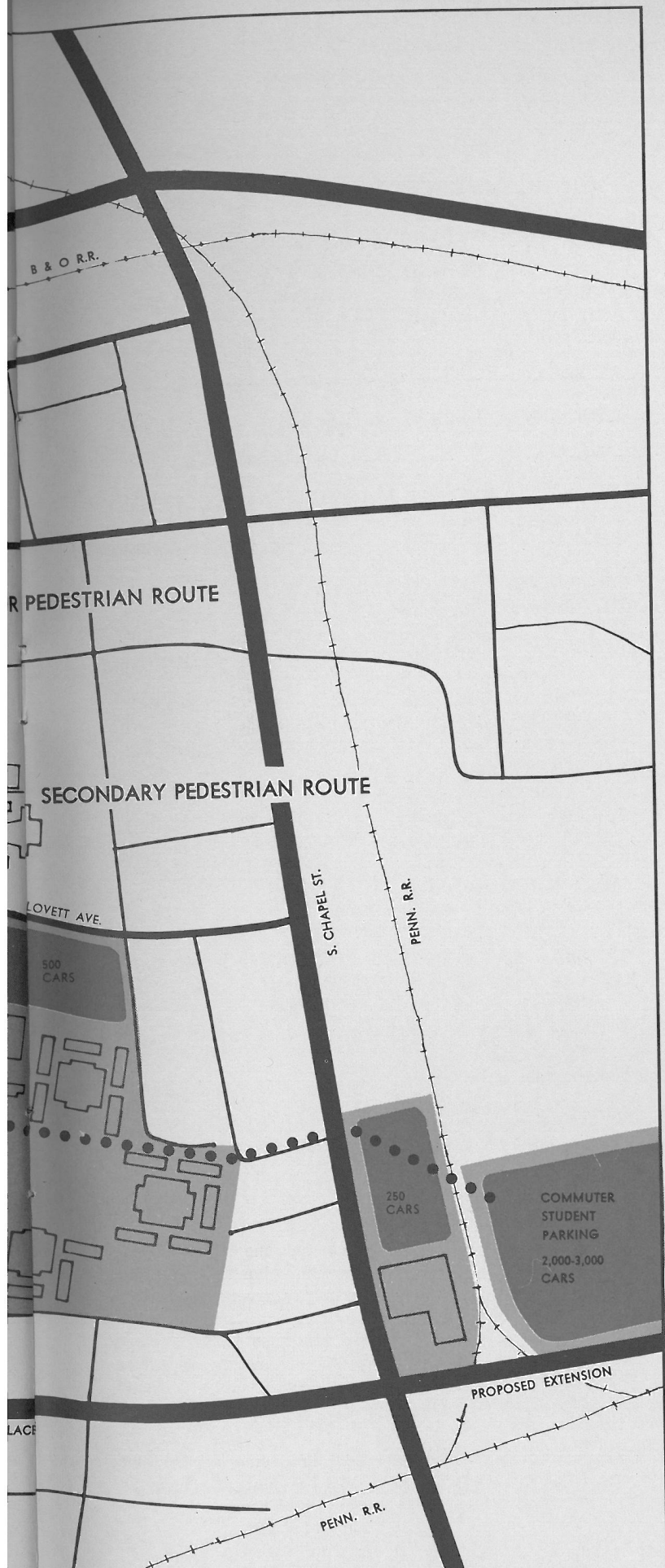
The Long Range Development Guide incorporates, therefore, both the tradition and the progressive outlook of the University. Its recommendations for land use and design are intended to set a pattern of dynamic and imaginative growth, while retaining the dignity and human scale so appropriate to a close-knit academic community.

In keeping with the principles of land use development, future university facilities are grouped according to their functional relationships with one another. Thus the academic core will be both the focal area and set the design motif of the campus, with housing, recreation and community-oriented facilities located around this core and readily accessible to it. A clearly articulated system of open spaces and edges will give a sense of order and coherence to the expanding campus and ensure that the University will remain a strongly identifiable entity. Future buildings for example should be placed so as to contain and strengthen the organization of campus spaces. For example, buildings of general use, would become the "background" structures on the edges of the malls and pathways. Such buildings would be subdued in design, creating a relatively uniform spatial wall. Buildings which house major focal activities and have symbolic importance to the University, should be more monumental or sculptural in design. For visual emphasis these buildings would be located at the ends of spatial axes or in the centers of large open areas.

Efforts have also been made to create a close and fruitful relationship with the wider community by reducing the physical barriers of traffic which presently separate the campus from the central business district of Newark. Circulation, both pedestrian and vehicular is designed to give efficient access to all parts of the campus, yet protect it from the disruptions of heavy traffic.

Our principal aim throughout this study has been to preserve and enhance those qualities of the University which have made it a gracious place of learning, and yet provide for exciting opportunities presented by the prospects of accelerated growth and enriched programs.

FUTURE CIRCULATION AND PARKING IN THE CENTRAL CAMPUS



SECTION THREE

APPENDIX

NON-RESIDENTIAL BUILDING SPACE REQUIREMENTS

Figures Based on 250 G.S.F. Per Student

	P L A N N I N G L E V E L			
	Existing Inventory (1967)	6,5000 Students	10,000 Students	15,000 Students
Total G.S.F.	1,737,000	1,625,00	2,500,000	3,750,000
ACADEMIC & RELATED USES	1,490,000	1,381,000	2,125,000	3,187,500
Sciences	313,000 ¹	317,000	437,000	675,000
Humanities & Social Studies	294,000	252,000	412,000	637,000
Business & Economics	30,000	57,000	88,000	169,000
Engineering	197,000 ¹	97,000	150,000	169,000
Agriculture	77,000	32,000	63,000	94,000
Home Economics, Education & Nursing	141,000 ²	57,000	100,000	131,000
Library System	148,000	162,500	250,000	375,000
Physical Education ³	290,000	162,500	250,000	375,000
Research	—	244,000	375,000	562,500
GENERAL USES	113,000	163,000	250,000	375,000
Physical Plant	28,000	49,000	75,000	112,500
Auditoria	—	49,000	75,000	112,500
Administration	85,000	65,000	100,000	150,000
AUXILIARY USES	134,000	81,000	125,000	187,500
Student Center	125,000	65,000	100,000	150,000
Health	9,000	16,000	25,000	37,500

¹ These inventory figures include space used for research, especially in the engineering category.

² The inventory includes the new Education Building which provides for future expansion and is currently shared with other disciplines. The future space requirements are based on the assumption that existing programs will continue. Expansion of a program which requires facilities not currently provided will necessitate provisions for additional space.

³ Inventory includes all field houses, gymnasiums, swimming pools, enclosed areas of the stadium, spectator seating, ROTC facilities, etc.

General Note: For methodology, refer to Development Guide Report No. I, prepared by Sasaki, Dawson, DeMay Associates, Inc.

UNIVERSITY PARKING DEMAND

PARKING SPACE BY USER CATEGORY	P L A N N I N G L E V E L	
	10,000 Students	15,000 Students
OFF-CAMPUS STUDENTS	4,000 Persons	6,000 Persons
Assume:		
75% on-campus simultaneously	3,000 Persons	4,500 Persons
Spaces required at 1.5 Persons/Car*	2,000 Spaces	3,000 Spaces
FACULTY AND PROFESSIONAL STAFF	1,000 Persons	1,500 Persons
Assume:		
85% on-campus simultaneously	850 Persons	1,250 Persons
Spaces required at 1.25 Persons/Car*	700 Spaces	1,000 Spaces
GENERAL ADMINISTRATIVE STAFF	550 Persons	850 Persons
Assume:		
100% on-campus simultaneously	550 Persons	850 Persons
Spaces required at 1.5 Persons/Car*	350 Spaces	550 Spaces
OTHER EMPLOYMENT	850 Persons	1,250 Persons
Assume:		
100% on-campus simultaneously	850 Persons	1,250 Persons
Spaces required at 1.5 Persons/Car*	550 Spaces	850 Spaces
VISITORS		
Estimate @ 1% of Enrollment	100 Spaces	150 Spaces

SPECIAL EVENTS — To be determined as facilities are sited and programmed.

*Includes those who actually car pool as well as those who walk or are dropped off at the campus.

SUMMARY OF LONG RANGE PARKING ESTIMATES

DAYTIME PEAK HOUR DEMAND BY GROUP	P L A N N I N G L E V E L	
	10,000 Students	15,000 Students
STUDENTS	2,000 Spaces	3,000 Spaces
Space as % of population	50%	50%
FACULTY AND PROFESSIONAL STAFF	700 Spaces	1,000 Spaces
Space as % of population	70%	70%
GENERAL ADMINISTRATIVE STAFF	350 Spaces	550 Spaces
Space as % of population	65%	65%
OTHER EMPLOYMENT	550 Spaces	850 Spaces
Space as % of population	65%	65%
VISITORS	100 Spaces	150 Spaces
SPECIAL EVENTS	To Be Determined	
TOTAL	3,700 Spaces	5,550 Spaces

RESIDENTIAL SPACE REQUIREMENTS

Projections for residential space requirements are taken from the statistics reported in *The University of Delaware Looks Ahead*, 1963. These figures indicated that approximately 60% of the total daytime enrollment (or 63% of the undergraduate enrollment) should be housed in units owned by the University. In keeping with the proposals of the current Capital Budget, 54% of the daytime enrollment would be accommodated by 1971-72. This would necessitate the construction of 4,400 units prior to the 15,000 student planning level in order to raise the total bed count to 9,000 (60% of 15,000 students). For the projected 20,000 enrollment level, an additional 3,000 units will be required to raise the count to 12,000 beds.

Projected Requirements for Dormitory Space

Approximate Date	1976-77	1986-87
Planning Level	15,000 Students	20,000 Students
60% Planning Level	9,000 Students	12,000 Students
No. Existing Units	4,600 Beds ¹	9,000 Beds ²
Additional Units Required	4,400 Beds	3,000 Beds

¹In 1968-69, the University will have approximately 4,600 Beds Available:

North Complex (Brown, Sypherd, etc.)	450 Beds
South Complex (Kent, Cannon, etc.)	700 Beds
E. Complex (Thompson, Gilbert, etc.)	2,000 Beds
West Complex	1,500 Beds

²Assumes 1976-77 unit requirements to have been achieved.

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UNIVERSITY ADMINISTRATION

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George M. Worrilow, Vice President for University Relations.

John E. Hocutt, Vice President for Student Affairs

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