PLANNING FOR TUFTS UNIVERSITY

by James Emmor Robinson III
Bachelor of Architecture, Syracuse University, 1956

Submitted in partial fulfillment of the requirements for the degree of Master of City Planning at the Massachusetts Institute of Technology, June, 1960

Signature of author

Department of City and Regional Planning, May 21, 1960

Certified by

Thesis Supervisor

Accepted by

Chairman, Departmental Committee on Graduate Students
ABSTRACT OF THESIS

Title: "Planning for Tufts University"

Author: James Emmor Robinson III

(Submitted to the Department of City and Regional Planning on May 21, 1960, in partial fulfillment of the requirements for the degree of Master of City Planning.)

The thesis proposes a general framework of physical development policies for the whole campus of a university. Within this framework specific planning problems can be considered and related one to another and to the whole web of requirements and conditions which ultimately finds expression in the campus' buildings, spaces, and ways.

Tufts University, the institution studied, has a wide range of program requirements, including provisions for teaching, research, studying, residence, recreation, servicing, internal circulation, and harmony with surrounding land uses and circulation patterns. In many respects, such a program resembles a rather complete community, even a small city.

The thesis makes recommendations for general patterns of land and building use, of circulation, and of density and character of development, with 1980 as the target date for the achievement of the proposals. It is intended as a general framework, not as a specialized or highly refined plan. (Master plans for landscaping or for utilities, for example, would grow out of such a study, but are not part of it. The specific location and size of a new classroom building and the location and character of the faculty club would be significantly influenced by the recommendations, but are not fixed by the plan. A capital budgeting program to implement the proposals would be based on the general study, but is not part of it.)

The thesis includes prefatory notes on existing conditions and problems and on estimated requirements for the 1980 target date. The proposed general plan itself identifies basic goals and criteria for planning, and makes policy recommendations for land and building use, circulation, and for density, supplemented by some design proposals and considerations, and by notes on staging, on post-planning period growth, and on alternative developments. These proposals are based on analyses of history, objectives, and problems; of population trends and projections; of estimated physical plant requirements; and of land area and density considerations. This supporting material is joined by a note on costs and a bibliography to complete the report.

Thesis supervisor: Kevin Andrew Lynch
Title: Associate Professor of City Planning
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PREFATORY NOTES
White portion indicates area of 'base map for succeeding illustrations'.
SUMMARY OF EXISTING CONDITIONS AND PROBLEMS

Tufts University is a privately endowed coeducational institution of higher education with a campus of about 125 net acres in the inner-suburban residential portion of Metropolitan Boston, five miles out from Boston's center. (Tufts Medical and Dental Schools, located in the New England Medical Center in downtown Boston, are not treated in this study.)

The Medford-Somerville campus ("the Hill") serves undergraduates primarily, but there are some graduate students in most departments, and two graduate professional schools; the Fletcher School of Law and Diplomacy and the Crane Theological School. The undergraduate students are included in Jackson College for Women, the College of Arts and Sciences, and the College of Engineering.

In addition to these students, the Tufts campus serves, in the College of Special Studies, undergraduate students from five "Affiliated Schools." These are professional schools which have affiliated with Tufts to offer their students training in the liberal arts, and to make possible for some of them degrees in education from Tufts. Two of the five schools have moved their activities entirely to the Medford-Somerville campus: the Bouve-Boston School (physical therapy and physical education) and the Eliot-Pearson School
(nursery school and kindergarten teacher training). The other three—the Museum School of the Museum of Fine Arts (Boston), the Boston School of Occupational Therapy, and the Forsyth School for Dental Hygienists—are in the City of Boston.

In addition to the students from the Affiliated Schools, the College of Special Studies also provides college-level extension courses, administers the General Electric Apprenticeship Program, and offers special non-credit programs, such as that in Executive Development.

The campus serves about 2900 (full-time-equivalent) students, including graduate, undergraduate, and affiliated school enrollments. The majority, about 2200, are in full time four year degree programs in liberal arts or engineering. There is a teaching staff of about 250 (full-time-equivalent), a ratio of one for every eleven students, and about 550 non-teaching staff members and employees, about one for every five students.

The Tufts campus now has about 370,000 net square feet of non-residential building space, about 450,000 gross square feet in student residences, and about 110,000 gross square feet in campus area staff housing. In addition to this building space, there are about 37 acres in playing fields and parking for about 1000 cars on Tufts own lots and ways. There are 17 buildings, with a total of 150,000 gross sq. ft. which need to be replaced by 1980.
About 60% of the undergraduates live on campus, about 30% with parents or other relatives, and 10% in rented rooms or apartments. Dormitories and fraternity houses accommodate about 1400 residents. Dining facilities for these residents and for commuting students are provided in residence buildings, where almost all the students eat when on campus.

The only graduate housing provided is for 24 men at Crane Theological School and for 40 men and 7 women at the Fletcher School of Law and Diplomacy.

There is no one "Student Center." Curtis Hall has lounges, snack bar, post office, and sorority meeting rooms. The main library has two large lounges which are popular meeting places. The bookstore ("Taberna") has a small snack bar and acts as a gathering place. A small Commuters' House provides study and lounge space and occasional overnight accommodations. The Faculty Club occupies a former residence on Professors' Row, with meeting rooms and some residence space, but no dining room.

Buses and trackless trolleys serve the campus directly on several lines, but many commuting students and faculty members come by car. Students have registered 1400 cars and the staff 220. Currently Tufts has no special parking capacity problem, with 1000 spaces on its own lots and ways and 250 legal spaces on adjacent public streets.

The Tufts athletic program offers physical education, intramural and intercollegiate activity in most sports. There are 37 acres in playing fields, in addition to gymnasium building
sites and the Tufts Yacht Club on Upper Mystic Lake two miles from campus.

The campus is developed at low densities. Tufts "Yard" and building at the top of Walnut Hill has a Floor Area Ratio of .24. The FAR of all Tufts-owned land on the Hill proper (Professors' Row to Boston Avenue and College Avenue to Curtis-Winthrop Street) is .02. The Engineering block (Robinson Hall group), one of the most dense areas, has a FAR of .75. Hodgdon and Bush dormitories on their site have a FAR of .66.

The parts of Medford and Somerville which surround the campus are almost entirely residential, with some industry along the railroad, and with local retail areas dispersed throughout. Most of the housing is in two-family structures built between 1900 and 1920. The neighborhoods were almost completely built-up by 1930. The Tufts property is the only significant open area, and there is almost no vacant land at all. Land coverage is about 35% (net residential block) with a 20% to 45% range.

These neighborhoods in Medford and Somerville are parts of cities of 65,000 and 100,000 population respectively, older suburbs of Boston, mainly residential (46% of Somerville, 33% of Medford), with little industry (9.5% of Somerville, 2% of Medford). Medford is distinguished by the 20% of its area which is in Metropolitan District Commission Middlesex Fells and Mystic River Reservations and by the 10% of its land which is as yet undeveloped.

Medford Square and Davis Square (Somerville) are the important
city shopping areas nearest Tufts. Medford Hillside and Powderhouse Square have groups of neighborhood stores adjacent to the campus which serve some University community needs. There is no significant "collegiate" shopping near, and students and staff probably go to Harvard Square and downtown Boston for clothing and books.

There are a number of community facilities immediately adjacent to the campus: St. Clements Roman Catholic Church, with its parochial elementary and high schools; Sacred Heart Church; Knights of Columbus Hall; Grant Park at Medford Hillside shopping area; Clarendon Hill Presbyterian Church; Medford Hillside elementary school; Dame elementary school (Medford); Cutler elementary school (Somerville); and Powderhouse Park.

Within a few blocks are several more churches, the new Conwell elementary school (Somerville), Tufts Park and Tufts elementary school (Medford), the historic Royall House and Park (Medford), Lincoln elementary and junior high schools (Medford), and Shaw Junior High School (Somerville).

To best serve its present programs and population, the campus needs increased library, general academic, and special facility space, and more residences for staff and for students (including undergraduate, graduate, and married). In addition to known building needs, and the additional space required for any increase in population,
the visual identity and unity of the campus should be strengthened, temporary and obsolete facilities replaced, and improved provision made for pedestrian and vehicular circulation. The campus needs to be guarded against through traffic from the urban area, and its open spaces need to be defended against unnecessary building by the cities and by the University itself. The surrounding neighborhoods need stimulation to combat blight and deterioration and to secure improved services and community facilities from the municipalities.
COMMUNITY
1. Medford Hillside Stores
2. Grant Park
3. Sacred Heart R.C. Church
4. Medford Hillside Elem Sch.
5. Culter Elementary School
6. Clarendon Hill Presby Ch.
7. Shaw Junior High School
8. St. Clements R.C. Church,
   Elementary School and
   High School
9. Tufts Elem Sch and Park
10. Lincoln Elem. & Jr High
11. St. John's Me. Church
12. Hancock Elementary School
13. Royall House and Park
14. Dame Elementary School

TUFTS
a. Administration
b. Chapel
c. Library
d. Crane Theological School
e. Bookstore
f. Bouve-Boston School
g. Fletcher School of
   Law and Diplomacy
h. President's House
i. Infirmary
j. Arena Theatre
k. Women's Gymnasium
l. Auditorium
m. Engineering College Group
n. Elliot-Pearson School
o. Men's Gymnasium
p. Undergraduate Men's Dorm.
q. Undergraduate Women's Dorm
r. Service

EXISTING CONDITIONS
Planning for Tufts University
M. J. P. Thesis M. I. T.
J. E. Robinson May, 1960
1" : 400' North Upward
5" contour
SUMMARY OF ESTIMATED POPULATION FOR 1980

This report predicts that by 1980 the campus will be serving about 50% more full-time-equivalent students, and that this total of 4300 is relatively conservative. Population trends and projections are considered more fully in the section beginning on page 66. Population assumptions for planning are here summarized:

<table>
<thead>
<tr>
<th>Department</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Sciences</td>
<td>1550 undergraduate men</td>
</tr>
<tr>
<td>Jackson College</td>
<td>900 undergraduate women</td>
</tr>
<tr>
<td>Engineering</td>
<td>850 undergraduate men</td>
</tr>
<tr>
<td>College of Special Studies (full time equivalent)</td>
<td>450 undergraduates</td>
</tr>
<tr>
<td>Graduate School of Arts and Sciences</td>
<td>375 graduate students</td>
</tr>
<tr>
<td>Fletcher School of Law and Diplomacy</td>
<td>180 graduate students</td>
</tr>
<tr>
<td>Crane Theological School</td>
<td>40 graduate students</td>
</tr>
<tr>
<td></td>
<td><strong>4345</strong></td>
</tr>
<tr>
<td></td>
<td>say 4300 (3400 resident students</td>
</tr>
<tr>
<td></td>
<td>900 commuting students)</td>
</tr>
</tbody>
</table>

Total enrollments for Affiliated Schools with residences on campus:

<table>
<thead>
<tr>
<th>School</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bouve-Boston School</td>
<td>300</td>
</tr>
<tr>
<td>Eliot-Pearson School</td>
<td>135</td>
</tr>
<tr>
<td>Boston School of Occupational Therapy</td>
<td>110</td>
</tr>
</tbody>
</table>

A prediction is made of a teaching staff of about 430, based on a 10:1 student-faculty ratio. The non-teaching staff and employee total is predicted to be about 750.
SUMMARY OF ESTIMATED BUILDING SPACE NEEDS FOR 1980

These requirements are discussed in the section beginning on page 82, and are summarized here for the various building types. Space needs are correlated with land use districts in the summary on page 15.

<table>
<thead>
<tr>
<th></th>
<th>net sq. ft. per student</th>
<th>net sq. ft.</th>
<th>gross sq. ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>9</td>
<td>38,000</td>
<td>48,000</td>
</tr>
<tr>
<td>Main Library</td>
<td>12</td>
<td>50,000</td>
<td>65,000</td>
</tr>
<tr>
<td>General Academic for Tufts Univ.</td>
<td>120</td>
<td>515,000</td>
<td>645,000</td>
</tr>
<tr>
<td>Affiliated School Academic:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bouve-Boston</td>
<td>100</td>
<td>30,000</td>
<td>37,000</td>
</tr>
<tr>
<td>Eliot-Pearson</td>
<td>45</td>
<td>6,000</td>
<td>8,000</td>
</tr>
<tr>
<td>Special Facilities</td>
<td>20</td>
<td>86,000</td>
<td>110,000</td>
</tr>
<tr>
<td>Indoor Athletics</td>
<td>28</td>
<td>115,000</td>
<td>135,000</td>
</tr>
<tr>
<td>Service</td>
<td>7</td>
<td>29,000</td>
<td>35,000</td>
</tr>
<tr>
<td>Academic total</td>
<td></td>
<td>869,000</td>
<td>1,083,000</td>
</tr>
</tbody>
</table>

Undergraduate mens housing
240 gross sq. ft. per resident
430,000 (1800 residents)

Undergraduate womens housing
240 gross sq. ft. per resident
194,000 (810 Jackson)
29,000 (120 E-Pearson)
65,000 (240 Bouve)
7,000 (30 B. S. O. T.)

Graduate Single
300 gross sq. ft. per resident
60,000 (200 residents)

Married Students
750 gross sq. ft. per unit
150,000 (200 units)

Staff housing
1200 gross sq. ft. per unit
240,000 (200 units)

Residential total
Parking structures
650 cars @ 325 sq. ft. per car
1,175,000 gross sq. ft.
210,000 gross sq. ft.
SUMMARY OF PROPOSED LAND AREAS AND DENSITIES FOR 1980

The amount of land area required for Tufts' activities, and the densities for the development of the various districts are considered in the section beginning on page 107. The amount of building space needed by 1980 is discussed in the section beginning on page 82, and is summarized for the various building types on page 14. A general summary of predictions and recommendations for land area, density, and building space is here presented, organized by land use districts of the proposed plan.

Academic Core and Graduate Complex:

| Land area proposed | 21 net acres |
| Floor area ratio recommended | 1.5 |
| Gross square feet building, predicted need | 785,000 sq. ft. |
| Gross square feet building capacity of site under F.A.R. recommended | 1,386,000 sq. ft. |

Specialized Academic Area:

| Land area proposed | 13.5 net acres |
| Floor area ratio recommended | .75 |
| Gross square feet building, predicted need | 308,000 sq. ft. |
| Gross square feet building capacity of site under F.A.R. recommended | 445,500 sq. ft. |

Women's Indoor Athletics:

| Land area proposed | 1.1 net acres |
| Floor area ratio recommended | 1.0 |
| Gross square feet of building, predicted need | 40,000 sq. ft. |
| Gross square feet building capacity of site under F.A.R. recommended | 50,000 sq. ft. |
Men's Indoor Athletics:

- Land area proposed: 3.0 net acres
- Floor area ratio recommended: 1.0
- Gross square feet of building, predicted need: 90,000 sq. ft.
- Gross square feet building capacity of site under F.A.R. recommended: 132,000 sq. ft.

Undergraduate Women's Residences:

- Land area proposed: 9.0 net acres
- Floor area ratio recommended: .75
- Gross square feet of building, predicted need: 295,000 sq. ft.
- Gross square feet building capacity of site under F.A.R. recommended: 297,000 sq. ft.

Undergraduate Men's Residences:

- Land area proposed: 13.1 net acres
- Floor area ratio recommended: .75
- Gross square feet of building, predicted need: 430,000 sq. ft.
- Gross square feet building capacity of site under F.A.R. recommended: 432,000 sq. ft.

Married Student Housing:

- Land area proposed: 5.5 net acres
- Floor area ratio recommended: .65
- Gross square feet of building, predicted need: 150,000 sq. ft.
- Gross square feet building capacity of site under F.A.R. recommended: 157,300 sq. ft.

(this results in 36 units per net acre, which is average for two and three story apartments)
Staff Housing:

Land area proposed 17 net acres
Floor area ratio recommended .35
Gross square feet of building, predicted need 255,000 sq. ft.
Gross square feet building capacity of land with F.A.R. recommended 261,800 sq. ft.

(this results in the equivalent of 12 units per net acre, which is average for two family detached houses)

Service and Maintenance Area:

Land area proposed 1.6 net acres
Floor area ratio recommended .75
Gross square feet of building, predicted need 37,000
Gross square feet building capacity of site with F.A.R. recommended 52,800

Playing Fields:

Land area proposed 32 net acres

(this results in 327 sq. ft. per student for all students; 375 sq. ft. per undergraduate student)

Parking:

Land area proposed for surface parking 5.2 net acres

(see the section beginning on page for a discussion of parking structures and their land area and density considerations)

Greenbelt:

Land area proposed 29 net acres

TOTAL LAND AREA OF TUFTS CAMPUS PROPOSED FOR 1980: 151 net acres
(about a 25 acre increase over 1960)
SUMMARY OF ESTIMATED COSTS

Costs of achieving the planning proposals are discussed on page 114. A general summary of that discussion is presented here to indicate the general magnitude of development proposed. The costs are expected to be in the area of:

- $28,000,000 for 1,400,000 gross sq. ft. in new building
- 3,000,000 to replace 150,000 gross sq. ft. space to be demolished
- $31,000,000 Total for new building space @ $20.00 per sq. ft. (does not include parking structures)
- $1,260,000 for parking structures for 650 cars (210,000 sq. ft. @ $6.00 sq. ft.)
- $4,000,000 to acquire 200 lots and structures for the expansion of the academic plant, student and staff residences @ $20,000 per lot.

New and relocated streets and ways
Landscaping and paths
Surface parking
Utilities
Renovation of remaining academic and dormitory buildings
Demolitions
Fees

- $40,000,000 a relatively conservative and approximate cost of realizing the planning proposals
"Man is occupied and preoccupied with education for a reason which is simple, bald, and devoid of glamor: in order to live with assurance and freedom and efficiency, it is necessary to know an enormous number of things."

Ortega y Gassett, Mission of the University, p. 68

"To fulfill the function of bringing together students, teachers, books, and research facilities in this era, an institution requires a physical location, shelter, services, personnel ..."

Harvard Students, Institutions Study, Pt. II p. 3

"The more inspiring the environment, the more profound and valuable is the experience ..."

Barbara Price, Technical Colleges, p. 56
INTRODUCTION TO THE PLAN

This planning study is predicated on the conviction that a beautiful and well-organized physical environment is necessary to make most fruitful the efforts of an academic community. Education can take place in miserable surroundings and with inadequate facilities, but in order to attract and hold top-quality faculty and students, and to encourage consistently good results in their efforts, an environment is needed which provides facilities truly adequate for, and stimulating to, teaching, studying, and research. At Tufts, provisions for these fundamental activities are appropriately joined by facilities for residence and for recreation to form a more complete community.

The units of physical environment -- the buildings, spaces, paths, and streets -- need to be arranged in a way that is efficient and easy to use, and pleasant (even exciting) to be in, so that a campus is created which is suitable in every way for the activities of a community of scholars.

To create this campus, Tufts needs to plan with boldness and imagination to enhance its present considerable assets, to overcome the limitations of its present campus environment, and to encourage a rich development in the years to come.

To this end, this planning study seeks:

* to anticipate future changes in the University;
* to choose the best alternatives for physical development;
* to dramatize opportunities for desirable development;

* to propose a development plan for the next twenty years.

A study such as this deals with a university's basic philosophy, and with many of its concerns and policies. At Tufts, much of this is regrettably un-articulated for use in physical planning. Thus, as new decisions are made, changes may be necessary in the Design Proposals of the plan. However, the Recommended Policies (which are the most important part of the plan) are intended as relatively fixed and permanent.

A report at this stage should be reviewed intensively in many meetings with the Trustees, the Administration, the Deans and the Faculty. Where appropriate, it should also be reviewed with the planning staffs of the cities, and perhaps with representatives of alumni, students, and neighboring institutions. It should then be revised, with whatever additional studies needed, and ultimately become one of the official documents of the University.

Just as the present report might be preliminary to a final and official plan, the General Plan which would result from the whole process would be preliminary to the continuous planning process Tufts should maintain. The General Plan would ultimately be used as a working guide:

* by the Trustees and the Administration in programming
physical improvements and maintenance; in budgeting and developing a capital improvements program; in raising funds; in acquiring and selling property; and in developing the University generally;

* by the Deans, the Faculty, and the Administration in planning and allocating space for specific functions and activities;

* by the Department of Buildings and Power in programming maintenance and services;

* by the cities of Medford and Somerville in their comprehensive planning studies;

* by friends of the University, alumni, and students, who may be stimulated to assume increased responsibility in realizing the proposals.

The report is concerned with statements of four types:

1. The basic **Goals** for the physical environment, which remind the University of the fundamental conditions to be satisfied by its campus. (Goals are listed on page 24.)

2. The **Criteria** by which a plan may be judged as well as designed. This list should include qualities and conditions so desirable for Tufts as to be basic to any plan proposed. (Criteria are listed on page 24.)

3. The **Recommended Policies** of the plan itself, the attitudes and actions which are intended as relatively fixed and permanent in directing the development of the campus. These are specific only to the degree necessary to insure certain especially important conditions. They are intended to make possible alternatives in detailed development. (Recommended Policies for Land Use are
listed on page 26, shown in a Functional Diagram on page 28, in a Proposed Land Use Plan on page 29, and discussed in notes beginning on page 30. The Recommended Policies for Circulation are listed on page 37, shown in a Proposed Circulation Plan on page 38, and discussed in notes beginning on page 39.

4. The **Design Proposals** of the plan are details recommended, where necessary, to supplement the Recommended Policies on land use and on Circulation. Recommended Policies for Density are included here, as is a discussion of the character of development. Most of the Design Proposals are shown in the Illustrative Site Plan for 1980, which shows one way in which the campus could develop under the guidance of the Recommended Policies. Many design details can, of course, be changed if necessary, and new proposals made which will still develop the campus in accordance with the Recommended Policies. (Recommended Policies for Density are listed on page 43. A Form Concept Diagram is shown on page 44. Notes on Design Considerations begin on page 45, and the Illustrative Site Plan for 1980 is on page 52.)

Supplementary and supporting material begins on page 60. A complete list of contents is on page 3.
GOALS AND CRITERIA
FOR THE GENERAL PLAN
The Goals for the physical development of Tufts:

* A beautiful and well-organized campus;
* Enough space for existing and probable activities;
* The best location possible for each activity;
* Harmony with surrounding neighborhoods;
* Internal circulation which is easy, direct, and pleasant;
* Good access to the campus from the urban area.

These Goals are to be achieved by a plan which proposes patterns of land use and circulation, and which makes recommendations for density and character in accordance with stated development policies. The Criteria for designing and for judging such a plan include:

* Optimum location and arrangement of academic facilities, the "heart" and most important part of the University;
* Good functional linkages throughout the University; (Activities which are linked in operation, or which it is desirable to link to stimulate interaction, should be located close to each other and well connected.)
* Space and flexibility in some measure for all parts, to allow for post planning period growth and change;
* The basic qualities of the site itself enhanced, its potentials realized;
* The campus easily identifiable in the urban scene;
* A strong sense of unity in the academic precinct;
* An easily serviced and maintained campus, which in fact helps to stimulate high standards of maintenance by design;
* The campus circulation system oriented to the students and faculty as pedestrians;
* A simple, direct pattern of internal vehicular circulation and parking, closely controlled to preserve the amenity of the campus;
* The whole campus area visually handsome as a whole and from within; a delight to see and be in;
* The plan achieved with a minimum dislocation of existing activities and elements.

These statements of Goals and of Criteria are intended as the bases of the twenty-year development plan which follows. A written and graphic presentation of Recommended Policies and of Design Proposals forms the plan for Tufts physical environment.
LAND USE
IN THE GENERAL PLAN
RECOMMENDED UNIVERSITY POLICIES FOR LAND USE:

1. Retain and strengthen the top of Walnut Hill as the academic center of the University by creating there a General Academic Core of heightened activity and of relatively high density.

2. Develop on the western end of the Hilltop a complex for the University's graduate programs.

3. Surround the General Academic Core and the Graduate Complex with a band of permanent open space, developed to a high degree of landscape excellence.

4. Retain and strengthen the area from Latin Way to the men's athletic plant as an area of specialized academic facilities.

5. Retain the present women's playing fields (Powderhouse Fields) as permanent open space, with indoor athletic facilities adjacent.

6. Develop an undergraduate women's residence district adjacent to the women's playing fields, with Hodgdon and Bush Halls as a nucleus.

7. Retain the men's playing fields (Alumni Fields) as permanent open space, with indoor athletic facilities adjacent.

8. Develop an undergraduate men's residence district adjacent to the men's athletic facilities, with Stearns Field (former site of Stearns Village veterans' housing) as the nucleus.
9. Develop housing for married students in the Bellevue-Fairmount-University section, and provide staff housing dispersed in the residential areas adjoining the campus.

10. Work with the planning staffs of the cities of Medford and Somerville in planning the land use and densities of the surrounding areas to insure harmony between the University and surrounding neighborhoods.

Graphic presentation of these Recommended Policies for Land Use follows in the form of a Functional Diagram on page 28, and a Proposed Land Use Map on page 29. Notes on these Recommended Policies begin with page 30.
Married Student Housing

Graduate Housing*

Undergraduate Men:
Playing Fields
Indoor Athletics
Housing

Landscaped Open Space

GRADUATE COMPLEX
Graduate Center
Classrooms
Offices
Fletcher School
Crane School*

ACADEMIC CORE
Main Library
Classrooms
Offices
Administration
Faculty Club
Student Center
Facilities

Landscaped Open Space

Staff Housing

Undergraduate Women:
Housing
Indoor Athletics
Playing Fields

Services*

SPECIAL ACADEMIC
Classrooms
Offices
Engineering
Bouve-Boston
Eliot-Pearson
Theatre
Auditorium

FUNCTIONAL DIAGRAM

* Best location; good use of existing buildings requires partial or whole location elsewhere.
Staff housing in addition to areas shown is to be dispersed in surrounding residential area.

Residential character of surrounding area to continue; neighborhood shopping and light industry to continue with no expansion.
NOTES ON THE RECOMMENDED POLICIES FOR LAND USE

The Academic Core is visualized as a central area of heightened activity common to the whole academic community, the heart, the "there" of the University. It should contain all the general academic facilities of the University: the main library, the commonly used classrooms, laboratories, staff offices, seminar and conference rooms which are the essential part of Tufts physical plant. These would be joined by several especially vital activity centers: the administration offices, faculty-staff club, student center facilities, bookstore, and the chapel. This Core development accomplishes two important things:

1. It sets apart the facilities which are the most important part of the University's physical plant. Tufts can exist without residences, an athletic plant, and specialized facilities of various sorts, but it must have these general classrooms, a library, and offices.

2. The Core helps to dramatize the special feature of the site, the Hill itself, by concentrating building in relatively high density on the crest, leaving the side slopes open.

The General Academic Core is appropriately joined on the Hilltop by one special grouping: a Graduate Complex, including the special facilities for the Graduate School of
Arts and Sciences (which especially uses the general academic facilities extensively), the Fletcher School of Law and Diplomacy, and the residences for single graduate students to utilize existing dormitories.

If the residences in the Tesla Avenue–Edison Avenue section west of Carmichael Hall could be acquired, the University would have the entire crest of the Hill. This additional area is appropriate in size and in location for the Fletcher School of Law and Diplomacy. It would then be apart from the main centers of the University, yet linked to the Core by the facilities of the Graduate School of Arts and Sciences. These two schools would form the Graduate Complex, which should ultimately include the Crane Theological School when it is ready to move and/or outgrows Paige and Crane Halls. As it is, residences for single Crane students, along with those from the other two schools, can be provided in this complex using dormitories now existing. Since graduate students are more likely than undergraduates to be in 'round-the-clock use of academic facilities, and less likely to intensively use the athletic plant, graduate residences adjacent to the Core and apart from the athletic facilities are justified. They still require, of course, indoor and outdoor provision for informal recreation. Married student housing, which is of special importance to graduate programs, is proposed in the Bellevue–University section close to the Graduate Complex.
Together, the General Academic Core and the Graduate Complex would occupy the entire Hilltop. This is to be surrounded by a continuous band of open space which should be developed to an especially high degree of landscape excellence. This space will probably always vary significantly in dimension and in landscape character, but should always provide a definite separation between the Hilltop and the more specialized areas of the campus: a setting for the Hilltop and a transition between it and the specialized academic area, the residences, and the athletic facilities which surround the open belt.

The Engineering College's special laboratories and other facilities are a major part of the Specialized Academic Area. This division is there joined by the Bouve-Boston School (which is proposed to be relocated next to the playing fields which are important to its program in physical education), and the Eliot-Pearson School, also proposed to be relocated in this area. Cohen Auditorium, the University's major assembly facility, is located in this area, and the new theatre is proposed for this location also. This area would also be the locus of a new infirmary, special research facilities, and such future possibilities as specialized religious centers and headquarters for some student activities.

The men's and women's athletic fields seem permanently located, since they are the only level open spaces on the
campus or in the surrounding neighborhoods, and because they are well related to indoor athletic facilities and to existing and proposed dormitory groups. Their locations adjacent to residential areas and to important streets make their role as open space in the urban scene an important one to preserve for the benefit of the cities, as well as for their many benefits to the University.

The newest and largest single portion of existing women's residences is well located adjacent to the women's playing fields. It is proposed to enlarge the Hodgdon-Bush Hall area on Talbot Avenue by expanding the residence district across Talbot Avenue and across and down Packard Avenue, displacing principally University-owned housing and fraternities. Dormitories for the women students of the Affiliated Schools should be in this area, along with those of the Jackson girls. Some shared facilities (dining, recreation, servicing) is then possible, and complete integration of students is easy if the Affiliated Schools become wholly part of Tufts. The association of residences also allows the potential flexibility of use by more than one division.

One of the major relocation proposals which is made is the creation of a new undergraduate men's residence district adjacent to the men's indoor and outdoor athletic plant. This proximity would encourage optimum use of the facilities by the residents, and because of the generous size of the
existing fields would eliminate the need for part of the informal recreation space otherwise needed with the dormitories and fraternities. Moving the undergraduate men's residences from the Hilltop, where most of them are now located, is in accord with the proposal to develop the Hilltop for the General Academic Core and the Graduate Complex. (Existing dormitories on the Hill can well serve the graduate students, and lend themselves for partial conversion into offices and seminar rooms.)

Stearns Field (the old Stearns Village veterans' housing site), which is proposed as the nucleus for this residential complex, can be expanded in several directions by acquiring neighboring residences, and if necessary using a small part of the athletic fields at the Hinsdale Street section. A fraternity complex is proposed as part of this undergraduate men's residence district to replace the present houses, now centered on Professors' Row between Packard and Curtis.

The strong architectural development which the residence group would give this area is desirable visually to strengthen this edge of the campus, where residences and University now meet in vacant land and ragged edges.

Any married student housing which the University would build is proposed to be located in the Bellevue-Fairmount-University
area adjacent to Medford Hillside shopping area, Grant Park, and the Sacred Heart Church. This site is appropriate because of its proximity to the Graduate Complex (the greatest part of the married students are expected to be graduate students), and because it is near shopping, churches, an elementary school, and is on important bus lines. Special attention will be needed in design to insure a clearly recognizable swath of the open landscape belt between this housing and the Hilltop.

Dwelling units for staff, and any additional ones needed for married students, are proposed to be dispersed in the residential areas around the campus. Some of this housing may be in new buildings, but much of it may well be in rem modelled structures.

Tufts is fortunate indeed to be an urban university surrounded by residential areas as healthy as these parts of Medford and Somerville. One of the potential benefits the University can give in helping these neighborhoods to remain healthy is to show by example the possibilities in remodelling, in rebuilding, and in informed and active encouragement of municipal action to improve and safeguard the areas.

Pilot remodelling and rebuilding activity, sponsored by Tufts, guided by imaginative architects, and dispersed in
the area cannot only provide the University with needed housing, but can be a stimulus to the other residents to improve and better maintain their properties. This sort of rehabilitation activity could, of course, be greatly stimulated by having the cities of Medford and Somerville designate the neighborhoods as rehabilitation and conservation areas under Federal Urban Renewal Legislation. The University should make a special study of these possibilities, but if other concerns place such action low in priority for the municipalities, Tufts, and its neighboring churches, can probably stimulate even more significant improvement than is now occurring in self-generating renewal.

The concept of dispersed housing for staff (and perhaps for some married students) permits the University to acquire property in a variety of locations. The residents of such units are benefitted by having any advantages of University-sponsored housing, without isolation in an "academic only" precinct. Easier rentals or sales to non-academic personnel, if this should be necessary or desirable, is possible with dispersed units.

(These notes on the Recommended Policies for Land Use are intended as partial explanations of those Policies, which are listed on page 26, shown in the Functional Diagram on page 28, and in the Proposed Land Use Plan on page 29.)
CIRCULATION
IN THE GENERAL PLAN
RECOMMENDED UNIVERSITY POLICIES FOR CIRCULATION:

1. Develop the campus as a pedestrian oriented world, where foot traffic is easy, direct, and pleasant.

2. Develop a strong system of pedestrian ways linking the Hilltop with the other areas, and linking these specialized areas to each other.

3. Develop a simple internal vehicular circulation system which serves all major buildings and activities, and which is closely controlled to preserve the amenity of the campus.

4. Eliminate vehicular traffic from the Hilltop, except for necessary servicing.

5. Provide parking in a few carefully selected locations, in structures if necessary to accommodate sufficient numbers without destroying the amenity of the campus. Small short-term parking areas primarily for the convenience of visitors should be located at strategic points.

6. Eliminate, wherever possible, all through (non-university) traffic from the campus.

7. Work with the Planning and Engineering staffs of Medford, Somerville, and the Metropolitan District Commission to improve and maintain access to the campus and to route inter and intra-city traffic around and away from the Tufts campus.

Notes on these Recommended Policies for Circulation begin on page 39. The Policies are shown in graphic form in the Proposed Circulation Plan on page 38.
NOTES ON THE RECOMMENDED POLICIES FOR CIRCULATION

The entire campus is visualized as a pedestrian-oriented world, where foot traffic is easy, direct, and pleasant, and where vehicular traffic and parking are closely controlled for safety and amenity. This direction should reach its apogee in the Hilltop's Academic Core and Graduate Complex, with vehicular traffic (except for servicing) eliminated from the main level, and where generous use of wide paths, plazas, and courtyards should help to reinforce the pedestrian orientation.

A strong system of pedestrian ways and spaces is proposed to serve and unite the General Academic Core and the Graduate Complex. This system would be echoed in the rest of the campus by paths and spaces which connect the various specialized facilities. Strong pedestrian ways are proposed to radiate from the Hilltop, crossing the open belt, to connect the residences, special facilities, and athletic plants with the Hilltop Core and Complex. To parallel the Professors' Row -- College Avenue main road, an important walk is proposed which would thus skirt the open belt, connecting staff residences, women's residences, and Specialized Academic Area and continue on to connect these with the men's athletic plant and men's residences.

A system of vehicular ways is proposed which would serve the campus' internal traffic and give access to important buildings
and centers, yet discourage through traffic from the campus. Professors' Row and College Avenue (North) are proposed as the main stem of this internal vehicular system, with the other streets and drives opening off them.

The University's current proposal of extending Latin Way to Powderhouse Boulevard with a new and important entrance there on axis with the Goddard Chapel tower will permit the channeling of University traffic from Powderhouse Square to this road. This will allow the closing of what is now the main approach from Powderhouse Square: College Avenue to Professors' Row. Closing the block of College Avenue from Talbot Avenue to Professors' Row would eliminate the threat of increased city traffic through the campus and eliminate a division in the Specialized Academic Area, yet still leave streets to serve Cohen Auditorium, the proposed theatre, the Engineering College group, and the neighboring residences.

Re-alignment of Dearborn Road will make this part of College Avenue a loop between Powderhouse Square and Boston Avenue, serving the University and the St. Clements residential area, yet discouraging through traffic which can be well served by Boston Avenue and Warner-Harvard Street. College Avenue as it now exists serves residents of the George Street area of Medford in travelling to and from Powderhouse Square and its radiating streets. This neighborhood traffic would not be seriously inconvenienced by using Boston Avenue and Warner-Harvard Street, and such movement would eliminate some potential hazards and unpleasantness from the campus.
Latin Way is proposed to be extended up and across the South Lawn and in front of the administration building to form a loop with Packard Avenue. This drive would give direct access to the chapel, the administration building, and the Yard beyond, and would be of special importance to visitors. Capen Street East and Packard Avenue form a loop serving the General Academic parking area and giving access to the Core and to the Graduate Complex. Parts of Packard Avenue and of Curtis-Winthrop Street are proposed to be depressed below the main level of the Hilltop, and pedestrian overpasses built over them to unite the whole Graduate Complex and the General Academic Core. The topography easily permits these developments.

A loop road is proposed around the men's gymnasium building to serve the undergraduate men's residences and the indoor athletic facilities as well, and to eliminate any need for University traffic in this area to use local residential streets.

Parking for the University is proposed to be provided in four main locations:

1. On the Hill to serve the staff in the Academic Core;
2. Off Curtis-Winthrop Street to serve the Graduate Complex;
3. On the site of the present Cohen Auditorium parking lot, to serve the auditorium, the new theatre, and the Special Academic Area;

4. Between the railroad tracks and the men's athletic plant, to serve commuters, the Special Academic Area, and the men's athletic facilities.

(These notes on the Recommended Policies for Circulation are intended as partial explanations of those Policies, which are listed on page 37, and shown in the Proposed Circulation Plan on page 36.)
DESIGN PROPOSALS

FOR THE GENERAL PLAN
RECOMMENDED UNIVERSITY POLICIES FOR DENSITY:

1. Develop a relatively high density Academic Core and Graduate Complex crowning Walnut Hill, encouraging tall buildings wherever practicable.

2. Develop the Specialized Academic Area at a lower density than the Hilltop, and encourage lower and relatively uniform building heights throughout the area.

3. Develop the undergraduate men's and women's residential areas at a density permitting three and four story buildings with adequate space for landscaping, but not significant informal recreation space. (Most informal as well as organized recreation space is provided for in the generous size of the playing fields adjacent to each of the dormitory groups.)

4. Develop married student housing at a density permitting two and three story apartments with adequate open areas and parking; develop staff housing at a density permitting two family detached houses with adequate open area and parking.

A summary of specific proposals for density in the various land use areas of the campus begins on page 15. More detailed consideration of density and land areas begins on page 107. A Form Concept Diagram is on page 44, and density proposals are included in the discussion of Design Considerations which begins on page 45.
1. Hilltop Academic Core & Graduate Complex
2. Landscaped Open Belt
3. Men's Residences
4. Men's Indoor Athletics
5. Alumni Fields
6. Special Academic Area
7. Women's Indoor Athletics
8. Women's Residences
9. Powderhouse Fields

FORM CONCEPT DIAGRAM
NOTES ON DESIGN CONSIDERATIONS

So complex and varied a development as a university's physical plant should have clear evidence of unity, but this need not require uniformity of density, style, or any other single characteristic. Within a strong general plan such as this report proposes, contrasting treatment of different areas can reflect the basic differences between the various parts. Tufts should avoid the "evenness" of development which characterizes so many colleges and universities: where dormitory and classroom groups are much alike and where there are few significant open spaces in or near activity centers except for the parking lots; where an undifferentiated circulation system treats major and minor streets in the same way, where paths are rarely more than utilitarian and all the same; where the campus fades into the surrounding city in a "gray band" devoid of definition, and where no exploitation of the richness of landscape art is attempted on the scale of the campus as a whole.

Tufts has unique and especially fine opportunities to develop the various portions of the campus within a general framework so that each is functionally appropriate and esthetically exciting in its own fashion. High concentration can be used where needed, broad open spaces preserved and enhanced where they will be most appreciated, and clear variations between the two extremes to suit development needs.
The relatively high density Hilltop, with its sizable existing buildings and proposed taller ones, should be developed about two principal internal spaces: the existing College Green and the uncompleted Reservoir Court. The location of the main library in the Academic Core is appropriate between these two spaces on the highest part of the Hill, closing the Green and the Court alike. This Hilltop Academic Core and Graduate Complex should be the most urban part of the campus, with generous and sensitive use of wide pedestrian ways and plazas, along with carefully developed planting for courtyards and gardens. The whole should have an easy, intimate scale, the apogee of a desirable pedestrian world, where details of paving, planting, and campus "furniture" are as imaginatively handled and controlled as the buildings they complement. In time, with the maturity of the planting and the more complete development of the area, and with the addition of sculpture, shelters, arcades, fountains and the like, this Hilltop of Tufts should become one of those rare places where the observer can spontaneously enjoy every part of the physical environment.

The open landscaped band which is the setting for the Hilltop and its link with the other areas of the campus should be developed to encourage the enjoyment of landscaped open space in all seasons and in all hours of the day. This open belt now contains one symbolic building (the President's House) which may well remain, and two academic buildings
(Sweet ROTC Hall and the present Bouve-Boston building) which should eventually be demolished to open the full sweep of the belt.

The landscaping of this area should emphasize its continuous sweep around the Hilltop. The scale and character of the development should vary significantly from the more intimate courtyards and enclosed greens of the building groups. Planting pattern and material should be used so that the space is a delight to see and pass through in the snows of winter as well as the green of summer, and so that as much attention is given to autumn foliage as to spring flowers. Sensitive and imaginative lighting can make it as lovely at night as during daylight hours.

The circulation ways which cross the belt need to be carefully designed and detailed to be in harmony with the whole landscape pattern. This is as true for the portions of the loop roads and of Curtis-Winthrop Street as for the important paths which radiate from the Hilltop to the other parts of the campus.

The existing, partially completed Class Fence with its punctuating gateways may well be relocated (in part) and extended around this open space to give definition to its outer edge, where it meets the lower density areas of the campus and the surrounding residences.
The Special Academic Area and the dormitory groups should be developed with the same degree of attention given the Hilltop but with difference in character to reinforce their lower density, lesser importance, and different activities. Landscaping and site planning should be organized to enhance local activity and circulation movements. Spaces for informal recreation to supplement the playing fields, places for outdoor discussions and gatherings to supplement building spaces, sheltered spots for relaxation and quiet conversation! these are some of the opportunities for the use and imaginative development of outdoor space. In this area, to contrast with the taller future buildings on the Hilltop, the buildings should be no higher than three or four floors.

The playing fields, lying as they do along important streets, serve as settings for the building groups which they adjoin, as open expanses from which to view the Hill itself, and as delight and relief for the passing citizen as he moves through the often disorderly and congested urban scene. Certainly no buildings should rise along the street frontages of these areas (precisely the portions currently most in danger) and hopefully the University will at all times be able to avoid using any substantial part of these open spaces as building sites. In these playing fields, because of the programmed use of the space, landscaping will necessarily be quite different from other, more passively used areas, but can with skill and imagination be developed to count
positively in their own rights as examples of landscape art.

In the development of the housing areas for married students and for faculty and staff, the University should create models of development excellence, insisting on imaginative planning of building groups, the private open space for each dwelling unit, other open areas, and streets, paths, parking provisions and driveways. This is a rare opportunity for closely controlled design of residential groups incorporating new and existing buildings and related to significant nearby open spaces and important building groups. The University should require development which makes the most of the opportunity.

The various streets and paths should be organized and developed as continuous links between the parts of the campus. They can, where appropriate, be given special and distinctive character. Major streets can be identified by one type of pavement, landscape treatment, signs, etc., and minor streets and drives in the system can vary significantly from these. Important paths should be accented in planting, paving materials, lighting, as well as in relative size. Less important walks should receive no less design consideration, but should have different characters appropriate to the various units of the campus which they serve.

The visual character of each of these vehicular and pedestrian ways must be carefully studied, developed, and respected as
the campus develops through the years. In time, these linear elements should stand as distinctly in the campus as any building or space as they help unite the campus into an efficient and exciting whole.

Gateways, entrances to buildings, bus stops, and the intersections of important paths are all important to develop for beauty, utility, and harmony and as "punctuation marks" in circulation movements. Small landscaped areas are important and necessary in their own right for successful campus development. They must not be regarded in a negative sense as mere space between buildings or along streets, but as places requiring conscious design treatment.

Important parts of the campus which are often neglected, not unified, and of poor design are the signs (so essential for communication), lighting fixtures, benches, waste containers, outdoor bulletin boards and other items of campus "furniture". Tufts needs to carefully study these useful objects which attract so much attention, and should emphasize particularly the development of a well designed, well coordinated, closely controlled system of signs throughout the entire campus.

As the campus develops, and the University changes, it must respect the distinction between mellowing and decay. When purposes and needs change, deliberate steps must be taken accordingly. A successful campus has always been the result
of good basic planning for clearly recognized purposes, and new or old is always vigorous and alive and well cared for.

Total excellence in the campus development is dependent not only upon the basic organization and character such as proposed for Tufts in this report, but on the individual excellence of each particular architectural and landscape design. Tufts should make every effort (possibly by open design competitions, for example) to encourage the best possible solutions for its particular building and landscape problems. It should realize throughout that a good client is as necessary as a good designer in producing final excellence, and should not fail to insist that each and every detailed design must respect and enhance the pedestrian ways, the streets and drives, the individual buildings and building complexes which it would join.

Continuing attention to all aspects of development is necessary in order to actively further the achievement of the beauty, character, and efficiency to be ultimately realized in the University's physical plant.

(These notes on Design Consideration are intended to supplement the Recommended Policies for Land Use, Circulation, and Density by mentioning the desirable character of development to be realized.)
STAGING: 1960-1980
POST PLANNING PERIOD GROWTH
ALTERNATIVE DEVELOPMENTS
STAGING

A precise plan of new construction, of renovation and demolition, of property acquisition and other physical plant additions and alterations necessarily awaits more detailed plans for space use and requirements than is attempted in this general plan. As an indication of the probable steps in the effectuation of the planning proposals, however, a general staging plan is summarized here.

Four specific programs have clear priority first: the necessary Master Plan for Utilities, the Master Plan for Landscaping, a Capital Improvements Program, and an action program of cooperation between the University and the municipalities in realizing the basic goals of improved vehicular circulation in the campus area and of improved residential areas generally.

The University must then satisfy its immediate and pressing needs for a new main library and for improved provision for graduate programs in Arts and Sciences.

When these four necessary programs and the two most pressing immediate needs are satisfied, a probable staging program for the remaining planning proposals would fall into three parts: Stage One for completion in four or five years, Stage Two for a longer, middle period of development, and Stage Three for the final years of effectuation, to be completed by 1980.
STAGE ONE

I. LAND AND BUILDINGS

A. Begin Acquisition of property for expansion of:

1. Western end of Hilltop;
2. Women's residence district;
3. Men's residence district;
4. Married student housing area;
5. Addition to Special Academic Area in connection with Dearborn Road realignment.

B. Begin building program of construction and renovations for:

1. General Academic Facilities, including the relocation of the Eliot-Pearson School and the Citizenship Center;
2. Special Facilities, including student union facilities and graduate center facilities;
3. Undergraduate women's housing;
4. Undergraduate men's housing in the new district;
5. Rehabilitated staff housing;
6. Replacement of inadequate and obsolete facilities to be demolished.

II. CIRCULATION

A. Pedestrian

1. Begin redevelopment of walkways on Hilltop, developing heavy duty sidewalks to be used in servicing;
2. Build radiating paths from Hilltop to men's residences, women's residences, and Special Academic Area;
3. Develop main walkway paralleling Professors' Row and College Avenue (North);
4. Develop walk along the northern edge of Powderhouse Fields.

B. Vehicular

1. Extend Latin Way to new entrance at Powderhouse Boulevard and to Packard Avenue by new South Lawn loop;
2. Remove existing Hill driveway;
3. Close College Avenue between Professors' Row and Talbot Avenue;
4. Lower Packard Avenue through Hilltop in connection with construction of new main library;
5. Build loop road around men's gymnasium complex to serve new men's dormitories;
6. Close block of Packard Avenue at Powderhouse Boulevard in connection with women's dormitory construction;
7. Close the entrance to campus from College Avenue via Talbot Avenue.
(Because the system of pedestrian and vehicular ways is so important in directing the development of the campus as a whole, this system should be essentially complete by the end of the first stage of development.)

C. Parking

1. Construct parking structure to serve the Academic Core on the Hilltop;
2. Relocate and expand surface parking in the new location along the railroad.

STAGE TWO

I. LAND AND BUILDINGS

A. Continue acquisition of property for expansion of:

1. Western end of Hilltop;
2. Women's residence district;
3. Men's residence district;
4. Married student housing area;
5. And begin acquisition for staff housing.

B. Continue building program of construction and renovation for:

1. General Academic Facilities;
2. Special Academic Facilities;
3. Fletcher School building;
4. Undergraduate women's housing including Affiliated Schools;
5. Undergraduate men's housing;
6. Begin construction of new married student housing;
7. Begin conversion of existing dormitories on the Hill for graduate students;
8. Continue rehabilitation and start new construction for staff housing;
9. Complete demolition and replacement of all obsolete and inadequate facilities.

II. CIRCULATION

A. Pedestrian

1. Continue development of walks and spaces in Hilltop;
2. Begin development of walks and spaces in Special Academic Area.

B. Vehicular

1. Lower Curtis-Winthrop Street and
2. Eliminate one block of Tesla Avenue, both in connection with Fletcher School construction;
3. Build new road in married student housing area.
C. Parking: add parking structure to serve Graduate Complex on the Hilltop.

STAGE THREE

I. LAND AND BUILDINGS

A. Complete acquisitions proposed in the plan.

B. Complete the building program: all academic, special facility, and housing structures, including the relocation of the Bouve-Boston School.

II. CIRCULATION

A. Pedestrian: complete development and refinement of pedestrian areas in the Hilltop, Special Academic Area, and dormitory groups, and in connecting walkways throughout the campus.

B. Vehicular: complete development and refinement of roads and drives throughout the campus.

C. Parking: construct parking structure in connection with new theatre.
POST PLANNING PERIOD GROWTH

The planning proposals have tried to incorporate enough space and locational flexibility to meet changes which will undoubt-
edly occur during the 1960 to 1980 period, and also to allow space for expansion of facilities beyond the target date.

The density proposed for the Hilltop would permit about 75% more floor space after 1980 if the entire Hilltop were to be developed at the 1.5 FAR recommended. Most of the present buildings are sited to have space for expansion, and the new ones should be developed with this in mind.

The Special Academic Area has some excess floor space permitted beyond the 1980 estimates under its proposed FAR, and if necessary the density could be increased in the future. A more preferable expansion plan for this part of the campus would acquire and use the areas in residence at Latin Way and Professors' Row, and across College Avenue--Dearborn Road from the theatre and Engineering group. Before density is increased, expansion of special academic facilities should also seriously consider building over the railroad and over the adjacent parking area.

The men's and women's undergraduate residence districts have almost no excess capacity beyond the needs estimated for 1980, and would best be expanded by acquiring the residential properties adjacent to them. The residential areas to the west of the campus offers expansion possibilities for graduate facilities, and for married student and staff housing. The areas proposed
for staff and married student housing for 1980 are in themselves possible expansion areas for the University's academic facilities in the distant future.

The residential properties facing College Avenue between Powderhouse Square and Dearborn Road are potential sites for University or Affiliated School buildings, as is the frontage along Powderhouse Boulevard facing Powderhouse Fields, the frontage on Curtis-Winthrop Street facing the "Old Campus," and the frontage along Wellesley Street facing the Alumni Fields.

In general, this report recommends that as requirements change and additions are necessary, careful investigation of increased density on the Hilltop be made, and that the other areas consider some increased density, but look principally to horizontal expansion for additions. The three principal open spaces -- the Hill's open landscaped belt, the Alumni Fields, and the Powderhouse Fields -- should remain inviolate during any and all expansion. If the University's physical plant increases in size and in complexity beyond the considerations of this report, these three will become more valuable as open space with every passing year.
ALTERNATIVE DEVELOPMENTS

The planning proposals advanced in this report are the carefully considered judgment of its author to be the best possible solution for Tufts' present and probable physical plant problems and requirements within the financial capacity of the University. If, however, they are not accepted in toto, or are not possible of realization because of unusual difficulties in land acquisition, for example, there are a number of alternatives.

One fundamental point affecting consideration of the plan is that Tufts now has, according to common standards, enough land to meet its existing and probable needs. The areas proposed for acquisition are suggested to achieve an optimum situation, but in general the plan proposed can be realized on existing University property.

The men's dormitory group could be constructed on Stearns Field as it now exists, using about the same density as the Harvard Houses, with no additional land needed. The women's residence area can increase its density significantly also, though it would probably have to edge into the Powderhouse Fields if no additional land could be acquired. The Fletcher School of Law and Diplomacy's building could be located on the Hilltop above and behind the Fletcher Hall dormitory and across Reservoir Court from Miller Hall. Housing for married students and for the staff could be significantly higher in density and remain on present University property in the locations proposed or very close to them.
If College Avenue cannot be closed between Talbot Avenue and Professors' Row, the University will have a potentially difficult traffic regulation problem to handle, which might eventually call for the closing of Professors' Row as well as Talbot Avenue. If parking structures are not possible, surface parking should be provided on the same sites as proposed for the structures, and the University limit even more sharply the number of cars permitted to park on campus, or else provide peripheral parking eating into the playing fields. At any rate, the amenity of the central areas of the campus must be preserved from the intrusion of large open parking areas.

There are doubtless satisfactory design and planning alternatives for the University other than the ones proposed in this plan. It is the alternatives of the continuance of present practices and the effectuation of current proposals which is the deepest concern in examining Tufts' physical plant. The alternatives of building on the South Lawn and the playing fields, of continuing significant open parking areas in the centers of campus, of permitting vehicular traffic on the Hilltop and through traffic to use most streets, of scattering academic buildings away from the Hill, and of developing at low and even densities throughout: all these seem objectionable and unnecessary. They should be resisted at every turn if Tufts is to take advantage of its splendid opportunities to secure the beauty and efficiency a fine university requires in its physical plant.
HISTORY, OBJECTIVES, PROBLEMS

Tufts University is the result of efforts of leaders in the Universalist Church in the late 1840's to establish a liberal arts college and a theological school. Sites were considered in the Mohawk and Hudson Valleys in upstate New York, in Vermont, in Western Massachusetts, in the town of Franklin (southwest of Boston), and Walnut Hill in Medford-Somerville.

Charles Tufts' gift of land and money for the Walnut Hill site was accepted and the college chartered in 1852. Although founded by the Universalist Church, it has always been non-sectarian. Ballou Hall, the first building, was finished by 1855, when there were thirty students and four professors. The first degrees were granted in 1857.

The size of the student body and of the teaching staff has increased steadily since then, with the largest increase in enrollment following World War II. To the original programs in Arts and Sciences have been added a number of other schools and departments: Civil Engineering and a Divinity School were formally organized in 1869; Electrical Engineering in 1882; Mechanical Engineering in 1894; Chemical Engineering in 1898; Jackson College for Women in 1910 (the first women had been admitted in 1892); Fletcher School of Law and Diplomacy in 1933; and the College of Special Studies (which now includes the
Affiliated Schools, the extension and special service programs) in 1939. In 1955 Tufts formally recognized its change in character and changed its name from Tufts College to Tufts University. The name "Tufts College" is now applied to the undergraduate men in the Colleges of Arts and Sciences and of Engineering.

Unfortunately, there seems to be no clear statement of objectives for the University. As the faculty-administration authors of the Carnegie Foundation sponsored "Self Study" of the University wrote in 1957, "Not much is said in the official records to define the main objectives for Tufts as a whole or for any of its parts ...(even) the Charter of the Trustees (1852), for example, is singularly barren of basic philosophy."

President Nils Y. Wessell of Tufts, in a talk before the Alumni Council in May, 1958, made a statement regarding Tufts objectives:

"Let me be content with mentioning today only two of the fundamental tenets of our educational philosophy, but those on which all others are based. The first is that our main business is intellectual activity of high quality, the activity of the classroom, the library, and the laboratory. The second is that it is our intention to do a few carefully selected things well and not to try to be all things to all men. Tufts is and should continue to be a small university of high quality."
The "few carefully selected things" are apparently the existing programs in Arts and Sciences, Engineering, Law and Diplomacy, and Theology. Through the Annual Reports of past presidents and department heads, and through the recent "Self-Study" runs the thread that Tufts wants to be "a small university of high quality" and that emphasis shall be on improving the quality of existing programs and development, rather than in expansion in size or in program.

In 1957 the faculty and the administration, under a grant from the Carnegie Foundation, undertook a self-study to examine Tufts resources and opportunities, determine its academic responsibilities and objectives and to define its role in education for the first and second decades of its second century of existence. In this "Self-Study" (as it is called in this report) are listed some of the aspects of the Tufts "image" as the staff suspects it is seen from outside the academic precinct:

- Good pre-medical and pre-dental training;
- The many advantages of being near Boston;
- A homey image: "small, warm, friendly, informal college."

In addition to these favorable aspects are listed some limiting features of the image:

- Limited educational quality and prestige;
- Location in a crowded, unpreposing suburb;
- Large number of commuting students;
Dillution of image by the Affiliated Schools; 
Impressive quality and nearness of a number of 
other institutions of higher learning.

The University has been making significant progress in 
trying to overcome its limitations. For example, it has 
expanded its physical plant since 1945 with 17 new buildings, 
totaling about $15,000,000 of construction, and with a 
number of significant renovations. President Wessell wrote 
in his 1953 Annual Report, "The important point to emphasize 
in connection with this large-scale construction program... 
is that it is intended to improve the quality of the ser-
vices and the opportunities which Tufts...offers and is not 
intended to provide for an expansion in the size of the 
student body."

Tufts current objectives, as voiced by the faculty and the 
administration in the "Self-Study" and in the annual 
President's Reports, are summarized as:

1. It will be a small university of high quality.
2. It will improve present programs in Arts and 
   Sciences, Engineering, Diplomacy, and Theology, 
   and not add new programs.
3. It will continue to provide special educational 
   services:
   a. To qualified professional students in 
      the Affiliated Schools;
   b. To qualified adults in extension programs;
   c. To special groups in non-degree programs 
      from time to time.
4. It will emphasize the importance of a fine faculty, and will make conditions as favorable as possible for it.

5. It will expand and improve the graduate portion of the Arts and Sciences programs, and ally them as closely as possible with undergraduate programs.

6. It will integrate research and teaching programs as closely as possible, in order to benefit the greatest number of students.

In addition to these objectives, it is clear that the University will continue to provide athletic, recreation, and special facilities of various kinds for the students and staff, and also that it would like to establish a residential life on campus for as many students and staff members as possible.

The development of the campus' physical environment will play a large role in the satisfactory achievement of these objectives. In spite of the recent construction programs, considerable expansion of building space is necessary or highly desirable to serve the present population and programs. The University is aware of the need for a new main library, a Humanities Center, a Center for Behavioral Sciences, new facilities for the College of Engineering, a new physical plant for the Fletcher School, student union
facilities, men's gymnasium locker and visiting team rooms, housing for undergraduate, graduate, and married students, and generally improved research facilities in all departments for graduate programs.

In addition to specific, known building needs, the visual identity and unity of the campus needs to be strengthened, temporary and obsolete facilities replaced, and improved provision made for pedestrian and vehicular circulation and for parking.
POPULATION TRENDS AND PROJECTIONS

Aside from meeting the known needs of present enrollment and programs, and assuming no major changes in program or character, all planning for the physical development of Tufts hinges on the question of size. If Tufts accepts more students, it will need a larger staff, more classrooms, laboratories, and offices, and probably more housing, athletic facilities, and parking spaces.

In the nation, expanding population and the requirements and desires for higher education are placing on colleges tremendous pressures to expand. The growing college age population, the increasing demands for trained personnel, and increased leisure time are all bringing pressure on institutions of higher education to accept more students. In this light, retrenchment seems the least likely policy for Tufts. The decision will be to remain the same size, or to expand. If expansion is permitted, decisions will have to be made as to how many students, and of what sort, will be added.

From its very first years, Tufts' enrollment has increased steadily, with a slight drop after World War I, and a considerable rise (followed by a relatively small drop) after World War II. The drop in civilian enrollments during
World War II was compensated for by the School for War Service. Since the 1948 peak of 2930 students, the total dropped to about 2630 in 1951 to 1953 (much less of a drop than had been anticipated), and is now again close to 2900 on the Medford-Somerville campus.

The enrollments in Jackson College for Women have been somewhat indicative of the University as a whole. In 1946, when enrollment in Jackson was at an all-time high of 477, its Dean wrote in her annual report of plans to return to the pre-war enrollment of 350. The most this unit's enrollment dropped, however, was to 380 in 1948, and it has since climbed to 625 in 1960.

The present University total of about 2900 full time equivalent students using the Medford-Somerville campus is a far cry from the 1600 students of 1940, which figure was regarded as ideal by the then-President Carmichael. However, President Carmichael permitted an enrollment of 2900, an 80% increase, in order to accommodate World War II veterans. The spirit on campus was one of temporary service, which probably was the only thing which made the strain on personnel and facilities bearable. In 1949 inflation and the reduction in the number of college-age students were seen as causes of the soon-expected enrollment drop, and President Carmichael wrote in his President's Report for that year "... we are now entering a period in which there will be most active competition for good students. Our
objective in this regard can be stated simply...we must gradually reduce the total number of our students to more nearly our pre-war level. As this is done, we must, if we can, maintain or even improve the quality of our student body."

Five years later, in 1954, the new president, Nils Y. Wessell, saw conditions changing, and wrote in his President's Report: "It is unlikely that Tufts College will be able to resist completely, even if it should elect to do so, the pressures for an increase in enrollment. A more realistic approach to the problem is to attempt to decide how much of an increase is likely and in what particular schools or areas it will occur. Most New England Colleges of our type and with our objectives are predicting an increase of from ten to twenty per cent in total enrollment between now and 1965. Recent studies indicate that during this same period in the State (sic) of Massachusetts alone the numbers of students qualified for admission to college will be increased by over fifty per cent. This, incidentally, is one of the lower percentages among the forty-eight states." In the same report he cautioned that "...any increase (in enrollment) ...cannot be achieved without increases in physical facilities." The following year, 1955, President Wessell made this statement: "After a year of much discussion within the administration of the University we believe that our most realistic prediction for the next ten years is an overall increase of about 15%."
This suggested rate of growth would increase the 1955 enrollment of 2700 to 3100 in 1965, and if continued would result in a total of about 3800 in 1980. Considering Tufts' past growth and the demands to which it will be subjected, this increase seems quite conservative. The writer feels that by 1980 the campus is more likely to be serving at least 50% more students than in 1960, a total of about 4300 full-time-equivalent students in all the graduate and undergraduate programs using the campus.

At the moment, the general enrollment figures sought by the administration for the next few years are:

- **Arts and Sciences**: 1000 (about a 10% reduction)
- **Jackson**: 700 (about an 18% increase)
- **Engineering**: 600 (stabilize)
- **Graduate Arts and Sciences**: 300 (about a 100% increase)

These present enrollment goals reflect an interest in increasing the number of women, a special effort to improve the quality of the undergraduate men (by cutting back slightly in admissions in the face of expected increased numbers of applications) and strong interest in increasing the number of graduate students in Arts and Sciences.

As a private school, Tufts is in control of its enrollment and staff sizes at all times. However, its past history and present programs and objectives indicate that growth beyond
present figures is probable and desirable. The growth predictions made by this report are listed on the following page, and are discussed for each of the divisions in subsequent pages.
LIST OF POPULATION PROJECTIONS  
(all figures rounded)

<table>
<thead>
<tr>
<th></th>
<th>1959</th>
<th>Current Suggest.</th>
<th>Increase Predicted for 1980</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arts and Sciences</td>
<td>1110</td>
<td>1000</td>
<td>1550 (40% incr.)</td>
</tr>
<tr>
<td>Jackson</td>
<td>620</td>
<td>700</td>
<td>900 (50%)</td>
</tr>
<tr>
<td>Engineering</td>
<td>590</td>
<td>600</td>
<td>850 (40%)</td>
</tr>
<tr>
<td>College of Special Studies (FTE)</td>
<td>290</td>
<td>300?</td>
<td>450 (50%)</td>
</tr>
<tr>
<td>Graduate Arts and Sciences (FTE)</td>
<td>150</td>
<td>300</td>
<td>375 (150%)</td>
</tr>
<tr>
<td>Fletcher School</td>
<td>90</td>
<td>100</td>
<td>180 (100%)</td>
</tr>
<tr>
<td>Crane School</td>
<td>20</td>
<td>30?</td>
<td>40 (100%)</td>
</tr>
<tr>
<td></td>
<td>2870</td>
<td>3030</td>
<td>4345 (50%)</td>
</tr>
<tr>
<td>Tufts undergrads.</td>
<td>2320</td>
<td>3300</td>
<td></td>
</tr>
<tr>
<td>College of Special Studies FTE undergrads.</td>
<td>290</td>
<td>450</td>
<td></td>
</tr>
<tr>
<td>All undergraduates</td>
<td>2610</td>
<td>3750</td>
<td></td>
</tr>
<tr>
<td>All Graduates (FTE)</td>
<td>260</td>
<td>600</td>
<td></td>
</tr>
<tr>
<td>All grads. : all undrgrads.</td>
<td>1 : 10</td>
<td>1 : 6</td>
<td></td>
</tr>
<tr>
<td>All grads. : all Tufts undrgrads.</td>
<td>1 : 9</td>
<td>1 : 5.5</td>
<td></td>
</tr>
<tr>
<td>Teachings Staff (FTE)</td>
<td>250</td>
<td>430</td>
<td></td>
</tr>
<tr>
<td>Non-teaching staff and employee total</td>
<td>550</td>
<td>750</td>
<td></td>
</tr>
<tr>
<td>All students : teaching staff</td>
<td>11.6 : 1</td>
<td>10 : 1</td>
<td></td>
</tr>
</tbody>
</table>

Total enrollments of Affiliated Schools with residences on campus:

- Bouve-Boston 200 300 (50%)
- Eliot-Pearson 90 135 (50%)
- B. S. O. T. 70 110 (50%)
POPULATION TRENDS AND PROJECTIONS
Jackson College for Women is currently slated for nearly a 20% expansion. It is one of the strongest of the University's divisions, with a student body of exceptionally high quality. In recent years it has been receiving from 1100 to 1200 applications a year, of which it has accepted from 235 to 275, with a resultant entering class of about 160 each year. The College feels it can accept significantly more applicants without lowering quality, but is restrained because of two factors: limited facilities and a desire to stay "small" in character. Dormitory space is an especially pertinent factor for Jackson, since it houses, and wants to continue to house, 85% of its students. In view of the attractiveness of the College and its reputation, and the pressures to which it will be subjected, a planning estimate for 1980 would be at least 900, a 50% increase, but a figure which would still be classified as "small" in comparing women's colleges. This predicted increase is in line with Jackson's growth pattern since it started in 1910.

The College of Arts and Sciences, the men's counterpart of the liberal arts program offered to the women in Jackson, is scheduled for a reduction in number of admissions in an effort to become more selective and to gain a higher quality student group. In view of probable application pressures, a raising of admissions standards should not be difficult to accomplish, and growth be possible, even encouraged by such improvement in the College. A planning estimate for 1980
is about a 40% increase to 1550 students. This, like the estimate for Jackson College for Women, is in line with past development trends.

The College of Engineering will probably stabilize its enrollment at about 600 for the next few years, but it, too will be subjected to pressures to expand, in part to be stimulated by its improved physical facilities now under construction. Numbers of applications have been rising steadily, with numbers accepted dropping 20% in the past decade, still with a steady entering class of about 200. If the post-World War II peak is discounted, growth in this college has been at a steady 15% per decade since 1925. It is estimated that this enrollment will increase at about the same rate as the Arts and Sciences undergraduate men. Such a 40% increase by 1980 would mean about 850 students.

The College of Special Studies now provides programs in extension work, special sessions like the Executive Development Program, part of General Electric’s Apprenticeship Program, and liberal arts studies for students in the professional curricula of the five Affiliated Schools.

The extension and special non-credit programs make few demands on the physical plant. The classes are in the late afternoons and evenings when they are on the campus, and use facilities already existing. If Tufts ever wanted to develop and emphasize adult education so that special physical
facilities were needed, it would probably consider a special facility closer to urban centers than the suburban Medford-Somerville area. No radical changes are anticipated in these programs, and it can be assumed that they will have little or no effect on the campus.

The Five Affiliated Schools do present planning problems for the campus, however. Analysis of the five individually shows the full time equivalent enrollments holding steady since the immediate post-war rise. Taken as a group, the full time equivalent enrollment using the Tufts facilities has risen from 200 in 1950 to 300 for the past three years.

It seems highly probable that all the affiliations will continue, with the possible exception of the Forsyth program, which is criticized especially by the Tufts faculty for the quality of students. Of the other four, the Bouve-Boston School and the Eliot-Pearson School have moved their activities entirely to the Medford-Somerville campus. The Museum School of the Museum of Fine Arts (Boston) has its quarters in the Museum's buildings on the Fenway in Boston, and some of the classes Tufts offers to Museum School students are taught there. The Boston School of Occupational Therapy has its buildings on Harcourt Street near Copley Square in Boston, but first year students are housed at Tufts and take all their classes on the Hill. If the B. S. O. T. should ever move its professional teaching facilities, it would probably move to a hospital center
rather than to the Tufts campus.

As the demand and desire for trained personnel increases in the nation, these professional schools will be subjected to pressures to expand. Although growth could be great, it is probably not too conservative to estimate a 50% increase in the full-time-equivalent students served by Tufts academic facilities, a total of about 450 in 1980. This is only half the rate of growth during the past decade. The estimated slower rate is justified by the stability expected to result from the relatively recent maturing of the affiliation program and by probable efforts, under Tufts leadership, to improve quality.

Apart from the full-time-equivalent enrollment using the academic facilities, the total enrollments of the three schools now using, and continuing to use, residence facilities are important. The Bouve-Boston School is predicted to have an enrollment of 300 in 1980 (50% increase), the Eliot-Pearson School about 135 students (50% increase), and the Boston School of Occupational Therapy a total of about 110 students, again a 50% increase.

The Graduate School of Arts and Sciences is marked for a 100% expansion in the University's current thinking, to increase the present 150 full-time-equivalent to 300 full-time students. Except for the Fletcher School and (partially) the Crane School, Tufts has been essentially an
undergraduate school, though there has been some graduate work in Arts and Sciences ever since 1892. The University had been reluctant, until after World War II, to encourage any special development of graduate work in Arts and Sciences, partly because of the existence of well-developed graduate programs close by at Harvard and M.I.T. and partly because of the lack of research and graduate facilities. However, the demand for graduate training following World War II increased graduate enrollment in this division from the 1940 figure of 60 to over 200, and demonstrated the contribution of graduate work to the undergraduate programs which the University feels are its main responsibilities and interests. The faculty endorses an increase in graduate programs in Arts and Sciences, and noted in the Self-Study that the change of name from College to University seemed automatically a decision to increase the scope and function of graduate programs.

Tufts expects to remain essentially an undergraduate school, but the graduate program in Arts and Sciences should be increased to benefit the undergraduate programs, the faculty, and to offer graduate training to students interested in individualized work in a small school. The prediction is made that by 1980 the Graduate Arts and Sciences program will have at least 150% more students, a total of 375 full-time-equivalent, if appropriate facilities are provided.
The Fletcher School of Law and Diplomacy, established in 1933 at Tufts, and operating with a cooperative agreement with Harvard is a graduate professional school in international relations. Its enrollment has grown from 50 in 1945 to about 90 now. At present, the enrollment is limited to 50 entering students for the one year basic program, but many stay on for additional studies and thus increase the total.

The School's administration places great emphasis on smallness in size and on a strong sense of community within the School. The present Fletcher School administration feels that many advantages of the program will be lost if enrollment exceeds the 100 students anticipated in current plans.

The Fletcher program is one of the strongest and best known of the University's activities. With the increasing need in the nation and in the world for professionally trained personnel in international relations, it is reasonable to assume that the school will be under increasing pressure to expand. For 1980 an increase of 100% to 180 students may be very conservative, but will be used as an estimate in planning, with the realization that it is high when compared with the thinking of the present administration, and probably very low compared to what it could be.
Crane Theological School, affiliated with Harvard Divinity School, has developed from the old Theological Department of Tufts College, which was founded in 1869. For most of the years that theology has been offered at Tufts, it has been available in both undergraduate and graduate programs. In recent years, however, its emphasis has been in graduate work. The highest enrollment was 56 (35 dually enrolled in Arts and Sciences) in 1941. Since then there has been a slow drop to the present twenty.

Crane is not fully accredited by the American Association of Theological Schools, and until it is, enrollment will probably remain small, even in the face of increasing needs for ministers. Appropriate steps are apparently being taken to complete requirements for accreditation, which will include significant improvement of library facilities and an increase in the number of faculty members. If Tufts is to continue to offer graduate training in Theology (and there has been no mention of dropping the program), it should make every effort to follow accreditation with an increased enrollment. A student body of 40 or 50 is probably necessary to permit the offering of many desirable courses and programs. This report will use an estimate of a 100% increase (40 students) in planning, with the realization that it is a conservative figure.

Teaching Staff on the Hill totals about 250 full-time-equivalent. This includes 197 full-time and 51 part-time
faculty members, plus a FTE of 25 others teaching, including assistants, lecturers, associates, teaching fellows, and student fellows.

This total is the result of steady increases through the years at about 12% per decade. The student-faculty ratio is 11:1. Predicting teaching staff size is as difficult as any task in the planning of a University. Currently there are published theories that a 1:20 ratio of faculty to students is desirable and feasible if efficiently handled. Historically, the lowest possible ratio has been sought by most schools. If Tufts is to significantly increase its graduate programs and also its orientation toward individually-handled undergraduate programs it will need more faculty members relative to the number of students. If the current suggestion of the Self-Study for a program of a "common intellectual experience" for the first two years of the Arts and Sciences program is followed, and if larger classes and more "efficient" use of teaching staff is made, it will need fewer faculty members relative to the number of students.

With all the possibilities of teaching programs and course offerings, it does not seem unreasonable to expect that many of the changes will tend to cancel each other out, and that the over-all student-faculty ratio will not change significantly from the present. The estimate will be made that teaching staff will increase relative to the student body at a rate of about one for every ten, resulting in about 430
teaching staff members in 1980.

Non-teaching Staff and Employees at the University now number about 550. This includes administrators who do not teach, library staffs, research personnel, administrative assistants, secretaries, clerks, technicians, buildings and grounds personnel, dining hall and dormitory staffs, medical staff, and others. This total has been growing at a faster rate than the faculty since World War II, and now has a 1:5 ratio to students. The feeling is that the present staff can probably serve a larger student body, and that the number relative to students will probably drop as enrollments increase. However, more buildings to care for, more students and faculty members to serve, and higher standards for all the University's operations will inevitably mean significant increases in non-teaching staff. A 1:8 ratio for the 1400-student increase would result in 175 new non-teaching staff members. A prediction will be made of a total of about 750 by 1980.
PHYSICAL PLANT REQUIREMENTS

Physical plant requirements are closely related to population served. This is especially true for specific building programs, of course, but it is also true when considering the development of the whole campus. Tufts' existing physical plant (academic and residence buildings, athletic fields, parking spaces, open space) is by definition serving the present students and staff. To the extent that this population is well or poorly served, the standards present are applicable, generous, or deficient for the immediate future expansion or improvement of facilities.

Anticipation of physical plant needs for other than the immediate future is extremely hazardous. Education is far from a static process: population size and characteristics change, teaching methods alter, departments change, and research diminishes or expands. All these change demands on the physical plant in space, equipment, and location.

This report seeks to establish a frame of reference for future specific planning problems. To do this, it is necessary to make some estimate of the size and character of physical plant units for the entire campus. This estimate is considered here as related to number of students served, and the predictions are based on a consideration of the present facilities and their adequacy, and, where possible, on a comparison of Tufts' space-per-student with figures available for certain other schools.
Such predictions are always open to the twin dangers of projecting deficiencies and of specifying too liberally. Although square-foot-per-student standards do not always take into account possible improvements in space use, or new demands on space, they will be used to give an over-all picture of Tufts' long range needs for its estimated population.

Tufts now has about 370,000 net square feet of non-residential building space, 450,000 gross square feet in student residences and about 110,000 gross square feet in campus-area staff housing. In addition to this building space, there are about 37 acres of playing fields, and parking for about 1,000 cars on Tufts lots and ways.

The accompanying tables show detailed breakdowns of building space, and a comparison with figures available for certain other schools. These other schools vary widely in size and in program, but most are urban schools. Comparison indicates that Tufts is very low in library space per student, significantly lower in general academic space, somewhat lower in student facilities, and about average for administration, dormitory space per resident, indoor athletic space, and service space.

(A summary of Estimated Building Space needs for 1980 is on page 14.)
TUFTS EXISTING BUILDING SPACE

(In net square feet except for dormitory-dining space, which is in gross square feet. All figures rounded.)

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Sq. ft. per student</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration</td>
<td>25,000</td>
<td>9</td>
</tr>
<tr>
<td>Main library</td>
<td>11,000</td>
<td>4</td>
</tr>
<tr>
<td>General Academic</td>
<td>183,000</td>
<td>63</td>
</tr>
<tr>
<td>Affiliated Schools General Academic</td>
<td>23,000</td>
<td>100 (Bouve-Boston)</td>
</tr>
<tr>
<td>Special Facilities Indoor Athletic</td>
<td>36,000</td>
<td>12</td>
</tr>
<tr>
<td>Service</td>
<td>20,000</td>
<td>7</td>
</tr>
</tbody>
</table>

371,000 net sq.ft. in non-residential space

Housing:

<table>
<thead>
<tr>
<th>Category</th>
<th>No. of residents</th>
<th>Gross sq.ft. per resident</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate men:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dormitories</td>
<td>165,000</td>
<td>815</td>
</tr>
<tr>
<td>Fraternities</td>
<td>75,000</td>
<td>180</td>
</tr>
<tr>
<td>Undergraduate women:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jackson</td>
<td>132,000</td>
<td>550</td>
</tr>
<tr>
<td>Affil.Schools</td>
<td>65,000</td>
<td>265</td>
</tr>
<tr>
<td>Graduate men</td>
<td>9,000</td>
<td>65</td>
</tr>
<tr>
<td>Graduate women</td>
<td>2,000</td>
<td>7</td>
</tr>
<tr>
<td>Staff</td>
<td>110,000</td>
<td>50 dwelling units</td>
</tr>
</tbody>
</table>

558,000 gross sq. ft. in residential space
*COMPARATIVE FLOOR SPACE

(In net square feet per full-time-equivalent student, except for dormitories, which are in gross sq. ft.
Full time equivalent: full time plus one third part time.)

<table>
<thead>
<tr>
<th>SCHOOL</th>
<th>*Genl. Main</th>
<th></th>
<th>*Stud.</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Tufts (existing)</td>
<td>63</td>
<td>4</td>
<td>9</td>
<td>12</td>
<td>200Md</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>Tufts (proposed)</td>
<td>120</td>
<td>12</td>
<td>9</td>
<td>20</td>
<td>240Md</td>
<td>28</td>
<td>7</td>
</tr>
<tr>
<td>Western Reserve (existing)</td>
<td>88</td>
<td>18</td>
<td>7</td>
<td>15</td>
<td>187M</td>
<td>8</td>
<td>.10</td>
</tr>
<tr>
<td>Western Reserve (proposed)</td>
<td>120</td>
<td>18</td>
<td>7</td>
<td>20</td>
<td>225Md</td>
<td>25</td>
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</tr>
<tr>
<td>Case Institute of Technology</td>
<td>146</td>
<td>2</td>
<td>8</td>
<td>16</td>
<td>157M</td>
<td>45</td>
<td>5</td>
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<tr>
<td>Case (proposed)</td>
<td>180</td>
<td>14</td>
<td>8</td>
<td>25</td>
<td>225Md</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>U. California, Berkeley (proposed)</td>
<td>153</td>
<td>21</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Berkeley (proposed)</td>
<td>144</td>
<td>17</td>
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* See note on following page.
General Academic: classrooms, laboratories, research areas, departmental offices, conference rooms, but not main libraries or research projects separate from teaching.

Student facilities: unions, cafeterias, meeting rooms, theatres, but not athletic space.

M: men; W: women; d: incl. dining;
nd: no dining; ?d: no information on dining.

(Data from University Circle Report, Appendix Table A)
ADMINISTRATION

The University's administration occupies all (23,700 net sq. ft.) of Ballou Hall, and about 1400 sq. ft. of office space above the bookstore in "Taberna." Ballou Hall was completely renovated in 1955, and the facilities are complete and in excellent condition. The life expectancy before any substantial renovation is again necessary should be at least as long as the twenty-year planning study period. The buildings with the administration offices are on the top of the Hill, integrated with the general classroom buildings. There is some crowding in a few offices, but in general, additional space will probably be required only as the University grows. The present 9 sq. ft. per student seems to serve the present student-staff population well, and compares well with other schools. It will be used as a continuing standard in long-range planning.

NEED: None for existing enrollment; 9 sq. ft. per new student.

LIBRARY

The main University library is in the 1908 Eaton Memorial Building, to which was added in 1949 the War Memorial Wing. This 15,000 sq. ft. building has 4000 sq. ft. of unassignable space, and the usable space is for the most part in a series of poorly arranged small rooms. The life expectancy of both parts of the building is long, but it is clearly inadequate in size and obsolete in arrangement for use as a library.
The present 4 sq. ft. per student is far below the space allocations of other schools, where a 12 to 15 sq. ft. range is apparently acceptable, if lower than many schools. The University is aware of serious deficiencies in library space and is studying its long range needs. Except for the Fletcher School Library, branch libraries are not well developed at Tufts, and there is question as to how the library pattern should be organized. A probable division will be:

- Main University Library
- Engineering Library
- Fletcher School Library.

The Crane Library and any other special collections are likely to be included in the Main Library building. Even if branch libraries are further developed, the Main Library will remain the major collection.

Many will argue that the library is the most important building on any campus. Certainly in a small, diversified University the main library should offer the very best possible in facilities and collections. Twelve square feet per student seems the minimum size that the University should have, and this figure will be used in planning for 1980 but with the realization that a higher standard is probably ultimately desirable.

**NEED:** Replace existing 4 sq. ft. per student; add 8 sq. ft. per student for existing enrollment; add 12 sq. ft. per student for enrollment increases.
GENERAL ACADEMIC SPACE

General Academic Space includes classrooms, laboratories, departmental and faculty offices, conference and seminar rooms, and other instructional and closely allied space, but not main libraries, large specialized research projects, theatres, or auditoriums. Of the approximately 183,000 net sq. ft. of space in general academic use at Tufts, 15,000 sq. ft. (Bolles and Goddard) is inadequate for present use, and 27,000 sq. ft. is in obsolete buildings (North Hall, Psychology Annex, stucco Engineering buildings). In the 140,000 sq. ft. remaining, most space has a long life expectancy, though renovation is a frequent need.

The University is apparently making nearly maximum use of its General Academic space. Many departments are overcrowded, with inadequate faculty offices, and with graduate and research programs especially hampered by lack of space. There are general needs also for more small seminar rooms and for large (over 200 capacity) lecture halls.

Departmental overcrowding is not surprising when Tufts 63 sq. ft. per student is compared with the 120 to 180 sq. ft. for many of the schools listed on page . By these standards, Tufts should double General Academic space to serve its present enrollment. The University is aware of needs in this direction, and the buildings now being discussed and planned on campus would serve existing enrollments and,
except for graduate programs, not allow for more than a slight expansion. In addition to the new Engineering Building now under construction, the University wants to add:

- Humanities Center
- Behavioral Sciences Building
- additional chemistry laboratories
- Fletcher School Building
- Theatre and Theatre Arts Program offices and classrooms
- seminar rooms, lecture halls, research and office space generally.

The addition of these known needs for present enrollments would approach a doubling of existing general academic space, giving support to the contention that Tufts probably needs about 120 sq. ft. per student if it is to offer the programs and the quality it wishes. New buildings can presumably be designed for more efficient use of space than older ones were, and careful attention to scheduling can make more efficient use of available space, but the 120 sq. ft. figure is probably not far from a desirable situation, and will be used in planning.

**NEED:** Add 55 sq. ft. per student for present enrollment; add 120 sq. ft. per student for enrollment increases.

**AFFILIATED SCHOOLS GENERAL ACADEMIC**

Of the five Affiliated Schools, only Bouve-Boston and Eliot-Pearson have academic facilities of their own on the Hill.
They are also the only ones likely to have any there: the Museum School and Forsyth are unlikely to move from their present facilities, and if the Boston School of Occupational Therapy ever moved, it would probably relocate at a hospital center rather than on the Tufts campus.

The Bouve-Boston School has 20,000 net sq. ft. (100 per student) and the Eliot-Pearson School has 3000 net sq. ft. (34 per student). The Bouve standard is set by its new building, and is adequate to serve the present enrollment. Additional students would probably require space at the same standard. Eliot-Pearson is somewhat crowded now, but since it requires less space than many programs (due to practice teaching away from campus) 45 sq. ft. would probably be adequate to serve its personnel.

**NEED:** Add 100 sq. ft. per student for additional enrollment at Bouve; add 11 sq. ft. per student for existing enrollment at Eliot-Pearson, and 45 sq. ft. for enrollment increases.

**SPECIAL FACILITIES**

Special facilities include student union facilities, faculty club, chapel, infirmary, auditorium, theatre, bookstore, and other units which supplement academic, athletic, and housing facilities. These spaces at Tufts presently total about 36,000 net square feet.

There is no one student center. Curtis Hall provides
lounges, snack bar, post office, and sorority chapter rooms. The main library has two lounges which are especially popular meeting places. The bookstore ("Taberna") has a snack bar and acts as a gathering place. A former residence on Packard Avenue is used as a commuter center for women, with lounges, study rooms, and rooms for occasional overnight stays. The main University dining facility is the cafeteria in Carmichael Hall, and it is used by men dormitory residents, commuters, students in the Affiliated Schools, and by the faculty, which has a small private dining room there. The Faculty Club occupies a former residence on Professors' Row which has meeting rooms and some residence space, but no dining room. The Goddard Chapel is the campus' one religious building, and houses Protestant worship services. Cohen Auditorium is the University's one large facility of its kind. The Tufts Arena Theatre occupies the building originally the Somerville Golf Club's, then the women's gymnasium. Outside of Fletcher and Crane's academic facilities, there are no special provisions for graduate students. The Infirmary is in a converted residence on Professors' Row.

In general, the condition of the spaces used for these special facilities is good, and the buildings in which they are located have long life expectancies. The planning problem is one of providing more adequate facilities and services and of arranging them for most effective use. A "Student Union" is in demand among the students, probably
because commuting students feel a lack of facilities to use on campus when not in classes. The need for a better and larger theatre is supported not only by its usefulness as a "special facility" but also as academic space for the programs in Theatre Arts. Some special graduate facilities are needed for the presently enrolled students, as well as for the expected increases in graduate enrollment. The Faculty Club does not function as a vital center for the staff because of its location away from the academic center of the campus and because it has no dining room. The infirmary building will need replacement by 1980. There is a general need for departmental lounges and other places where students and staff can gather near the academic activity centers.

Tufts' 12 square feet per student in special facilities (exclusive of the Faculty Club) is below that of most of the schools listed on page . If the University is to serve its faculty and students, both residents and commuters, in an atmosphere which encourages meetings, discussion, and a maximum of time spent in the academic precinct, it needs to provide facilities which will encourage this. Lounges, snack bars, meeting rooms, offices for organizations have a vital role to play. Because the need for these increases as the enrollment increases, and because present needs are not satisfied, Tufts probably will need to plan for about 20 net sq. ft. per student in these special facilities. This should include
not only special commuter facilities, various lounges, meeting rooms, activity offices and the like, but graduate center facilities, faculty club, a theatre, and an improved infirmary.

**NEED:** Add 8 sq. ft. per student for existing enrollments and 20 sq. ft. for increased enrollments.

**INDOOR ATHLETIC SPACE**

Jackson Gymnasium, Cousens Gymnasium, the Hamilton Pool, and the Tufts Oval Field House total about 72,000 sq. ft., about 28 per student, which compares favorably with the schools listed on page , and which is apparently serving the present enrollment well. The Field House is the only one of the buildings which does not have a life expectancy of more than 20 years. Cousens Gymnasium needs more locker and visiting team rooms and if these are provided, the athletic plant would be assumed adequate for present enrollment, with increases needed only to serve additional students. Additions to the athletic program (indoor skating or crew, for example) would probably require space beyond the standard of 28 sq. ft. per student which exists and is proposed to be continued.

**NEED:** Replace field house; add locker rooms; add 28 sq. ft. per student for additional enrollment.
SERVICE SPACE

Existing service facilities include the Maintenance Building, Maintenance Garage, and the new Steam Plant. The Steam Plant is the only one with a life expectancy of greater than 20 years. Tufts nearly 7 sq. ft. per student seems to serve the campus well, and is comparable with the schools listed on page .

NEED: Add 7 sq. ft. per student for enrollment increases; replace maintenance building and garage.

UNDERGRADUATE HOUSING FOR TUFTS

Tufts now houses about 550 women and nearly 1000 men (including about 180 in fraternity houses), leaving 75 Jackson women and about 700 Tufts men in off-campus housing of some sort. Many of these are commuters who either do not wish to live on the Hill or who cannot afford to do so.

The University has apparently never established any policy on the extent to which it wishes to be a residential school. This has been especially true for the men. Jackson College has always housed a large percentage of its enrollment, and recently the figure has risen steadily: 70% in 1953, 80% in 1955, about 85% now. Dormitory space is to some extent a limiting problem in Tufts' admissions work, since its availability often determines whether or not a prospective student can be admitted or will come. Current proposals for
two new dormitories for 230 men and for 110 women are motivated in part by this consideration.

Of the existing undergraduate housing, only 6 fraternities (100 residents) and 3 womens' residences (70 residents) were not built for dormitory use. The vast majority of space is in good condition, with long life expectancies. Dormitory space compares well with the schools listed on page 50. Tufts feels a definite responsibility to provide education for students who must, or who wish to, commute, so it will never be a wholly residential school. It is probable, however, that the University will encourage campus residence as much as possible in the years to come, and that with an increasing percentage of students from outside the metropolitan area, the percentage housed on campus will rise. It is probably not too conservative to estimate that 90% of Jackson, and 75% of Tufts undergraduate men will be housed on campus by 1980.

**NEED:** 240 gross sq. ft. (including dining facilities) per resident student for 90% of Jackson's estimated enrollment, and for 75% of Tufts undergraduate men's estimated enrollment.

**HOUSING FOR AFFILIATED SCHOOLS**

The Museum School now provides no housing for its students, and in the unlikely event that it would, would probably locate such facilities near the Museum School Building in
Boston. The Forsyth School provides housing near its building in Boston and will most probably continue to keep all housing there. The Boston School of Occupational Therapy has provided some housing for freshmen at Tufts, and has made no provision for housing its upperclassmen in Boston. If it ever does provide housing for the upperclassmen, it will probably be near its academic facilities in Boston. The Bouve-Boston School and the Eliot-Pearson School, with all their facilities on the Tufts campus provide residence facilities there now, and will continue to do so.

Bouve-Boston and Eliot-Pearson both require dormitory residence for students who do not live with relatives. Bouve accommodates 160 in its new Ruth Page Sweet Hall and an additional 26 in a converted residence. Eliot-Pearson accommodates about 70 in five converted residences. B. S. O. T. houses 10 freshmen in one converted residence. None of these schools provide dining facilities, and students eat in Carmichael Hall.

As these schools develop and raise their standards, it is quite probable that the percentage of residents will rise. This report estimates that Bouve's 90% figure will continue, that Eliot-Pearson's present 77% will rise to 90%, and that B. S. O. T.'s present 14% will rise to 25% (a little less than the total freshman class).

**NEED:** 240 gross sq. ft. (including dining) for 90% of
Bouve's estimated enrollment, for 90% of Eliot-Pearson's estimated enrollment, and for 25% of B. S. O. T.'s estimated enrollment.

GRADUATE AND MARRIED STUDENT HOUSING

The Fletcher School provides Wilson House for 40 men, and Blakslee House for 7 women; Crane Theological School has Paige Hall, a 20-man dormitory, which is partially used by the Graduate School of Arts and Sciences at the moment. The Arts and Sciences graduate program has never had any special graduate housing. The only married student housing the University ever provided was the Stearns Village veterans' units, now demolished.

The existing graduate housing facilities are in good condition, and the basic problem is to provide more of them. As yet no definite proposals have been made. Fletcher has programmed its needs at housing 100% of its students, single and married. Crane needs women's and married student housing, and the Graduate Arts and Sciences programs need quarters for single men and women and for married students.

The University is interested in providing housing for married undergraduate students as well as married graduate students. The present numbers of married students, which have been the same for the past few years, are:
20 (1%) undergraduates
80 (50%) graduate Arts and Sciences
43 (50%) Fletcher
10 (50%) Crane
153 (6%) of total student body

It is expected that Fletcher and Crane will try to provide housing for as close to 100% of their students as possible. Graduate students in Arts and Sciences are more difficult to plan for, since many graduate students prefer not to live on college campuses. If the University strongly encourages graduate residence, and if attractive facilities are provided, a 50% figure for Tufts small graduate Arts and Sciences program would not be unreasonable to expect.

It seems reasonable to expect a continuance of the 50% married figure in the graduate schools, and of the 1 -- 2% figure among undergraduates. The University will probably want to seriously consider housing all the Fletcher and Crane married students, and half the married students in Arts and Sciences.

**NEED:** 300 sq. ft. per single graduate student for all Fletcher and Crane, and for 50% of Graduate Arts and Sciences estimated enrollments; 750 sq. ft. per married student for all Fletcher and Crane, and for half the married students in Arts and Sciences. (Married student housing developed to meet these requirements should be able to accommodate the few married undergraduates.)
FACULTY AND STAFF HOUSING

In addition to the President's House on the South Lawn, the University owns 31 houses adjacent to the campus which contain 43 dwelling units and are occupied by faculty and administration personnel. There are 6 privately owned faculty-administration houses in this group, making a total of 50 dwelling units in 38 structures. Several of these are traditional residences for various Deans and officers, but most are rented to individual faculty and administration personnel. There are accommodations for 8 bachelors in the Faculty Club.

Problems for the University faculty and administration in living near the campus apparently rest mostly on the type and condition of housing available, the public school systems, and the general character of the neighborhoods. Most of the houses in the area sell for between $12,000 and $20,000 with the $15,000 to $18,000 range common. Many are two-family houses on 5,000 square foot lots and are from 30 to 50 years old. The public school systems of the two cities are criticized by University personnel, especially when considering them for their own children.

If the University is to encourage a close community of scholars, it must find some way to make campus area residence more attractive and possible for its faculty and administration. There has been no poll among this group to indicate
what interest there is in living closer to campus than most of them do, but presumably if attractive housing at a reasonable cost were available, and "better" public schools strongly encouraged, many would be attracted to Medford and Somerville who now turn to Winchester and Arlington. It does not seem unreasonable for a small university to want half its teaching staff and top administration within walking distance of campus. Indeed, it is one of Tufts' strengths that the 50 families who do live there are as close to the students and to campus life as they are.

The teaching staff is expected to number 430 by 1980 and non-teaching staff 750. About 400 of these seem a probable "core" community of "permanent" faculty and administration, of whom 50% may be expected to want to live, or be encouraged or required to live, on or near campus. Housing for this group does not need to be provided by the University necessarily, but the University will at the very least have to take some steps to encourage this movement and may well end up profiting much or all of it. Because it is a planning problem for the University however it is resolved, in this report the total faculty-staff housing need is listed to be provided by the University, with the understanding that hopefully it will not all have to be.

**NEED:** housing for 200 teaching staff and administration families with an average of 1200 gross sq. ft. per dwelling unit.
### BUILDING SPACE INCREASE

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OUTDOOR ATHLETIC SPACE

The University has about 37 acres in current use and in preparation for athletic fields. The land is in two large blocks and one small one: the Alumni Fields near the men's gymnasium, Powderhouse Fields adjacent to the women's gymnasium, and the tennis courts in the "Old Campus" area along Professors' Row. In addition to providing facilities for sports in the teaching programs of Tufts, Jackson, and the Bouve-Boston School, the fields are used for intramural and inter-collegiate games and for informal recreation. Their programmed use as athletic fields is not their only importance, however. They provide settings for buildings and for building groups, and give open areas to lead and delight the eyes of the academic community and the city residents alike. Tufts' athletic fields border important streets in the area, and so are important visually for nearby portions of Medford and Somerville as well as for the University. The setting they provide for the campus' building groups is perhaps as important to the University as their actual use for sports and games.

This open space has been eyed twice in recent years as building sites: once by the City of Somerville as a possible public school location, and once by consultants to the University as locations for future buildings.
The amount of space is large. If the same standard were applied to Tufts as is proposed for Western Reserve University and for Case Institute of Technology (80 sq. ft. per student), Tufts in 1980 would require only eight areas in athletic fields. The University's present programs apparently make good use of the large area, however, and though conceivably the space requirements could be reduced, it is assumed that the University would prefer to preserve the fields for recreation if at all possible. Some support for the area also springs from the relative difficulty of providing appreciable amounts of informal recreation space in the probable locations of dormitories.

**NEED:** Preserve as much as possible of the existing outdoor athletic area.

**PARKING**

Tufts now has the equivalent of one parking space for every 2.3 students, a total of 1280 spaces. If this ratio is continued, the University will need about 1870 spaces in 1980, a net increase of 600 spaces over its present total, and an increase of about 850 spaces over the number available on Tufts' own lots and ways.

There are about 300 spaces available for the 220 cars registered by faculty and staff. The 1400 student cars which are registered can use 730 spaces on Tufts' own lots and ways, and about 250 curbside spaces on public streets,
a total of 980 spaces. There seems to be no special parking capacity problem. Tufts does not permit freshmen who are not living at home with their parents to have cars on campus. If necessary, it can control other classes and groups as well.

In general, parking is needed for faculty and staff; for commuting students; for visitors; for audiences at the auditorium, the theatre, and athletic events; for dormitory residents; and for faculty--staff housing and married student housing. Parking for the last named (staff and married student housing) is probably best provided on the building sites, which should be sized accordingly. All the others, to the extent that the University wishes to provide for them, will probably require attention on a campus-wide parking and circulation plan.

The present faculty-staff-employee ratio per registered car for the same group is 4:1. If the 200 members of this group who are assumed to live within walking distance of the campus in 1980 are eliminated, and the ratio raised to the equivalent of one car for every three commuting members of this group, parking would be required for 330 cars.

There are expected to be 900 commuting students in 1980. Since the campus is well served by mass transportation, and hopefully will be even better served in the future, it is
probably not too conservative to estimate that half the commuters will be driving, and figuring two persons per car, that some 225 spaces would be needed for this group.

The city of Syracuse, New York, requires one parking space for every five men residents on college campuses. If this is applied to Tufts' estimated 1900 single male graduate and undergraduate students, 380 spaces would be required.

These relatively arbitrary but conservative figures for faculty-staff-employees, commuters, and men residents total nearly 1000 spaces, with women residents, visitors, and any additional special audience parking not included. Thus a total of 1200 spaces would be a conservative estimate of parking to be provided on the campus. As mentioned before, if parking is provided at the present ratio of one space for every 2.3 students, about 1870 spaces would be needed.

Hopefully, the increasing residential nature of the campus, for students and for staff, will reduce the ratio, and careful controls by the University as to who may have a car on campus can reduce the ratio still further. This report guesses that a campus-wide ratio, exclusive of staff and married student housing, of one car for every three students, a total of about 1400 spaces, is a reasonable one to use in over-all planning. This is used with the realization that the University can control parking to a significantly lower figure, and that if it uses no controls at all the total demand will be far greater.

**NEED:** Parking spaces for 1400 cars.
NOTES ON LAND AREAS AND DENSITIES

(Recommended Policies for Density are listed on page 43. A Form Concept Diagram is shown on page 44. Proposals for Land Areas and Densities are summarized in the Table beginning on page 15.)

HILLTOP: The total gross square footage expected for this area in 1980, including all proposed building types, is 785,000. This includes general academic facilities for the portion of the student body which uses this area, the main library, administration offices, half the special facility space of the whole campus, the buildings for the Fletcher and Crane Schools, and the residences of single graduate students.

The area proposed for the Hilltop District actually includes, and is determined by, the entire crest of Walnut Hill, totaling about 21 acres. If it is possible to acquire the relatively small portion of the hilltop which the University does not now own or use, the apparent unity, identity, and attractiveness of the campus in the urban scene can be considerably strengthened. Although the additional area is not necessarily needed from a land area requirements standpoint, good use can be made of it as the location of the Fletcher School's new plant.

To accommodate the building space estimated to be required by 1980 on the 21 acre Hilltop, a Floor Area Ratio of .85 would be required. This is a relatively low density for an academic group (Harvard Yard has a Floor Area Ratio of 1.0, and is a model of pleasant spaces and relatively low buildings).
To stimulate compact building, and tall structures to crown the Hill in contrast with the lower, less compact building development proposed for the rest of the campus, and to leave space for additions after 1980, the FAR allowed should be at least 1.0, and is proposed at 1.5, which would allow a total of 1,386,000 gross square feet of building if the whole Hilltop area were developed at this density. However, it is hoped that many existing buildings which are developed (with their immediate site areas) at much lower densities than 1.5 will always remain, and thus the 1.5 allowable FAR for new construction, even if used for all the new buildings, will probably result in an over-all FAR of close to 1.0 for the entire Hilltop.

SPECIAL ACADEMIC AREA: The total gross square footage expected for this area in 1980 is 308,000, including academic facilities and half the special facilities for the whole campus. The portion of land set aside is determined by the existing College of Engineering complex, the existing auditorium and chemistry buildings, and desirable building sites along Professors' Row with their good relationship to the Hilltop Academic Core. This land area totals 13.5 acres and would require only a .52 FAR to accommodate estimated space needs. To allow for a significantly less dense development than the Hilltop and to permit additions after 1980, a FAR of .75 is proposed, which would permit 445,000 gross square feet of building if the entire area were developed at this density.
INDOOR ATHLETICS: The indoor athletic facilities for both men and women are located immediately adjacent to large areas in playing fields. Because of this, and because the dormitory and Special Academic Areas which are also adjacent to the indoor athletic sites are proposed to have relatively low floor area ratios, the indoor athletic buildings can be permitted a higher FAR on their specific sites, and 1.0 is recommended. This permits the accommodation of estimated building space with some small expansion potential for the women's buildings after 1980, and a larger expansion potential for the men's buildings. The site for the women's buildings is determined by the existing auditorium, Talbot Avenue, the proposed site for the Bouve-Boston building (which should be planned for possible use with the women's indoor athletic buildings) and the important pedestrian way proposed along the edge of the playing fields. The site for the men's indoor athletic facilities is determined by the proposed dormitory group, College Avenue, and the proposed parking area (which does offer some expansion space beyond that in the immediate site).

UNDERGRADUATE MEN'S AND WOMEN'S RESIDENCES: A total of 725,000 gross square feet of residence and dining space is estimated to be needed for 1980. The density of such residential developments can vary greatly. Elevator buildings can be used with a high density scheme; the
relatively high density of 2.0 has been used successfully in walkup buildings (the Harvard Houses), though with a relatively high ground coverage and no informal recreation space. If a 25% ground coverage is used for Tufts' dormitories, a FAR of 2.0 would result in eight story buildings on the minimum possible site, a FAR of 1.0 would result in four story buildings, a FAR of .75 would indicate three story buildings, and a FAR of .6 would result in an average of two and a half story buildings. This report recommends that the ground coverage be fixed at 25% to allow for landscaping and a small amount of informal recreation space, and that the FAR be .75, permitting an average of three story buildings. This proposal requires the acquisition of land to provide for both men's and women's developments, with the larger portion needed for the men's dormitories and fraternities. If the University should decide against such acquisition, higher density development can be used on sites now available, and some portions of the playing fields used. The sites proposed are determined by proximity to indoor athletic facilities, playing fields, vacant land, and existing women's dormitories.

MARRIED STUDENT HOUSING: A total of 150,000 gross square feet is estimated to be required in married student housing for 1980. Although several building types can be used to
accommodate these units, the over-all effect should probably permit an average of two and three story apartment buildings. The site proposed is limited by Boston Avenue, the Sacred Heart Church, and the Greenbelt, and would require a FAR of about .65 to accommodate the estimated building space. About 36 units could be provided per net acre, an acceptable average for two and three story apartments. The FAR of .65 is recommended for this development.

**STAFF HOUSING:** A total of 255,000 gross square feet is estimated to be required in staff housing for 1980. This housing is expected to be provided in a variety of forms: large single family houses, efficiency apartments, row houses, two family houses and others, but with the net result probably equalling a uniform development in two-family detached houses. Such residential development requires about one acre for every twelve units, and FAR of about .35. This development of staff housing at these standards echoes the existing development of the residential neighborhoods which surround Tufts, and makes possible a closer integration than might be possible with significantly different standards.

**SERVICE AND MAINTENANCE:** About 37,000 gross square feet of space is estimated to be required for 1980, and some open parking and drive space on the immediate site. The site
proposed is bounded by Boston Avenue, existing engineering buildings, the men's playing fields, and existing light industry. A .75 FAR is proposed for this site, allowing for sufficient open space and the expansion potential of 70% additional building space after 1980.

PLAYING FIELDS: The plan proposes that 32 acres remain in playing fields, divided 17.5 in the Alumni Fields, and 14.5 in the Powderhouse Fields. This area is large for an urban school (327 sq. ft. per FTE student; 375 sq. ft. per FTE undergraduate student), but can be preserved and provided with the land use and density recommendations proposed for all the various parts of the campus. The sites are determined by existing playing fields, the relationships to other parts of the campus, and necessary demands for building sites.

PARKING: About 1400 cars are estimated to require parking on the Tufts campus in 1980. In order to provide parking in desirable high-density locations and to avoid the loss of landscaped open space and the lack of amenity of larger areas of open parking, the plan proposes that about 650 spaces be provided in underground or hillside structures adjacent to the Academic Core, the Graduate Complex, and the Special Academic Area. Some 700 spaces can be accommodated in the 5.2 acres recommended for surface parking between the railroad and the men's athletic facilities. The
remaining 50 spaces can be provided in small groups along the vehicular circulation system to serve visitors at important centers. The structures proposed are to be either completely underground or else built into the sides of the Hill so that their tops form extensions of land areas, and, if very carefully designed, can serve as platforms for buildings, or at least as paved or sodded open areas in the development of the Hilltop and the Special Academic Area. Thus the 210,000 square feet of parking structures are to be below the campus building groups and will not contribute to the FAR of a given area. It is true that extremely careful design, especially of any hillside structures, is necessary to achieve this result, but it is possible, and certainly very desirable.

**GREENBELT:** The open landscaped belt which is recommended to surround the Hilltop Academic Core and Graduate Complex is proposed to total 29 acres. This includes the present 15.5 acres in the South Lawn and the "Old Campus" and the present acreage on the North Hillside, plus land proposed to be acquired at the western end of the Hill to surround the proposed Fletcher School building. The site is determined by existing landscaped areas and by proposed and existing buildings and roads.
NOTE ON COSTS

(A summary of Estimated Costs is on page 158.)

Tufts has spent an average of about $1,333,000 a year (in 1960 dollars) since 1945 on construction, renovation, property acquisition, utilities and landscaping. This represents about $580.00 per student per year for this period. In the 1960 to 1980 period covered by this report, it is estimated that the University will spend about $40,000,000 (1960 dollars) to implement the plan proposed. This represents an average expenditure of $2,000,000 about $555.00 per student per year if population follows the predictions. Thus while the predicted expenditures for physical plant call for a 50% higher rate of spending than the average annual expenditure in the past fifteen years, the spending will be slightly less per student per year than in the past.

The increased expenditures are justified by the fact that Tufts does not even now have all the physical facilities it wants and needs for its present student body. The estimated expenditures reflect the additions for the present population as well as the additions needed for anticipated growth. Also, the report assumes that the University, in its quest for quality in all respect, will no longer tolerate inadequate facilities, "temporary" structures, or a campus environment which is any less efficient and exciting than it can possibly be.
Material is generally available on many of the considerations involved in a university's physical plant, but there is very little available on the comprehensive planning of a campus as examined in this thesis. Listed here is only material which is significantly reflected in the report, either as the source for data and quotations or as the stimulus for approaches to the planning process and the presentation of the report's contents.


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