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TRANSPORTATION TO AND FROM THE CAMPUS: A REPORT TO THE PRESIDENT AND EXECUTIVE PLANNING COMMITTEE ON THE PHYSICAL PLANT.

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A study dealing with the means of transportation required and used by students, faculty, staff, and other employees of the University of Pennsylvania in their travel to and from campus. Areas of destination and modes of travel are discussed. The major emphasis is on the use of the automobile and the parking demand that is thus created. Current parking demands are analyzed in terms of requirements by faculty, employees, students, and visitors. The relationship between parking supply and demand is discussed. Projected parking needs through 1970 are studied with an estimate of the capital costs involved. Appendices include a sample traffic survey form, plus maps, and a list of transportation policy considerations. (NI)



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A PROJECTION

is an educated guess

of what may happen

A PLAN

is a specific program of action

to make as sure as possible

that the right thing

does happen

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TRANSPORTATION TO AND FROM THE CAMPUS

A REPORT TO THE PRESIDENT AND THE EXECUTIVE PLANNING COMMITTEE ON THE PHYSICAL PLANT

A Study and Policy Document
Prepared as
An Element of the Continuing Planning Program
by the
University Planning Office

UNIVERSITY OF PENNSYLVANIA • MARCH 1964

EXECUTIVE PLANNING COMMITTEE ON THE PHYSICAL PLANT
OF THE
UNIVERSITY OF PENNSYLVANIA

1963-64

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FOREWORD

This study deals with the means of transportation used and required by the students, faculty, staff and other employees of the University in their travel to and from the Campus. Its purpose is to provide the basis for further policy deliberations and capital improvement planning, as part of the University's continuing planning process.

"One of the most perplexing problems confronting governments and private transportation enterprises is how to provide the means of transporting people and goods" in a manner that is efficient, economic and yet "consistent with the predominant desires of the users."¹ The transportation problem on the University's level of concern is no less perplexing.

Initiating and completing a transportation study is very much like engaging the horns of a charging bull and attempting to hold him still long enough to permit the conformation of his muscles and the possible projection of his energies to be measured. Among the professional hazards in such an enterprise are the length of time it requires, the distractions introduced by other pressing assignments, and changing office personnel. Fortunately, the University's

1. Transportation: Lubricant or Friction to Our Region's Progress, Charles H. Frazier, Penjerdel, November, 1962.

development is being carried out within the predetermined context of an approved integrated plan for Campus expansion; and this has meant that the data collected by the 1960-61 Transportation Survey has not been subject to the usual attrition of time and changing conditions.

This survey and analysis is the product of a collective effort over several years. Unfortunately, it is possible at this writing to recall and acknowledge our indebtedness to only a few of the many to whom an expression of appreciation is long overdue.

Harry Schwartz, former Planning Analyst in the University Planning Office, was responsible for preparing the original Proposed Off-Street Parking Plan, which was issued in February of 1961. He also developed the 1960-61 transportation questionnaire, supervised the sample and complete surveys, and supervised the program for computer machine processing which has provided the basic information for this report. Mr. Schwartz was assisted by Richard Tavss and Stephen A. Sheller, who at the time were, respectively, students at the Wharton School and Law School.

The organization and analysis of the survey material was made by Arthur Schwartz, who also wrote this report in collaboration with the undersigned. Mr. Schwartz is the former Land Use and Population Analyst for the Pittsburgh Area Transportation Study.

The following are among the many persons associated with the University who gave freely of their sympathetic assistance, experience and counsel:

Mr. George H. Barcus, Captain of the University of Pennsylvania Guards.

Mrs. Carolyn Ganschow, IBM Programmer, Wharton School of Finance and Commerce, IBM Office.

Dr. Charles S. Goodman, Professor of Marketing, Wharton School of Finance and Commerce; and the former Chairman of the University Parking Committee.

Mr. John J. Keyes, Business Manager of the University.

Miss Elizabeth B. Moffett, Administrative Assistant, Hospital of the University of Pennsylvania.

Dr. Franklin R. Root, Associate Professor of Marketing and Foreign Commerce, Wharton School of Finance and Commerce.

Mr. Evert Stringfellow, University Parking Administrator.

John E. Murphy and John L. Walters, Jr., Delineator-Draftsmen in the University Planning Office, prepared the illustrations. Mrs. Lorene Denney and Miss Peggy Weikel, Secretaries in the University Planning Office, typed the manuscript and duplimats. Mrs. Denney coordinated the various stages of material preparation and reproduction.

While the past sixty years have shown that there is nothing more vulnerable than man's best made plans to reach an accommodation with the automobile, the off-street parking program presented on the following pages is offered in a spirit of realistic optimism. Optimistic, because the University has the means by which to hold the need for off-street parking space within reasonable bounds. Realistic, because (as the report suggests) the conclusions of this analysis must be read and pondered in terms of a rational transportation system for the Philadelphia-Camden Metropolitan Region.

HAROLD TAUBIN, Director
University Planning Office

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INTRODUCTION

INTRODUCTION

During 1960-61, sixty-two percent of the full time students resided in the University area. (See Figure 1) Among full time faculty members, close to 12 percent lived in the area. Among Hospital employees, 16 percent lived in the area; and among other University employees, 12 percent lived in the area. Among the total University population, slightly more than one-fourth walked to and from the Campus. Obviously, the means by which the remaining three-fourths of the University population traveled to and from the Campus is of profound significance to the future development of the University and its neighborhood.

The present off-street parking element of the University Development Plan is derived from an earlier transportation study.¹ The University Development Plan² provides for the general location of parking facilities, the principles to be followed in their development, and the estimated number of spaces to be provided at each location.

1. Proposed Off-Street Parking Plan, An Element of the UoffP Development Plan, February, 1961. This report deals with (a) transportation facilities serving the University area, (b) the existing off-street, on-street and commercial parking supply, (c) current and future parking needs, (d) special event visitor parking, and (e) the proposed University parking system.
2. University of Pennsylvania Development Plan, third printing, August, 1961. This was approved by the Trustees on May 19, 1961; and was reviewed and approved by the City Planning Commission for incorporation within the redevelopment plan for University City on November 3, 1961.

The University planning program views the automobile as one of several transportation components which needs to be understood in developing a balanced timetable for meeting the University's requirements. Figure 2, "Philadelphia-Camden Metropolitan Transportation Facilities," illustrates the excellent manner in which the University is connected to all parts of the Philadelphia metropolitan area by commuter railroads, public transit and expressways. Figure 3, "University Area Transportation Facilities," tells the same story in terms of the University neighborhood. Figure 4 shows the University supply of curb and off-street parking during 1963-64.¹

If the University area is so well served by commuter railroad and public transit facilities, why the dominant and evergrowing demand for automobile accommodation? The first transportation study concluded that a railroad and public transit schedule that provides its most efficient service during peak travel hours does not effectively satisfy the need for commuting flexibility which many members of the University population, with irregular work hours, have. A second and more realistic explanation might be that, all logic aside, the public service system simply cannot compete with the favor in which the private automobile is held at the present time. The following analysis of the 1960-61 Transportation Survey shows that, if the automobile's ravenous appetite for land and capital is to be effectively contained, there needs to be:

1. An accelerated program for student and faculty housing in the University area.
2. Motor vehicle registration and control.²

1. During 1960-61, the University was able to provide a total of 1,920 off-street parking spaces. As Figure 4 shows, this number had been increased to 2,091, as of the time of this publication, through property acquisition, clearance and increased efficiency in the arrangement of surface spaces. For the purpose of this analysis, 1960-61 is used as the base year.

2. See page 15 and Appendix 3 for information on initial University measures.

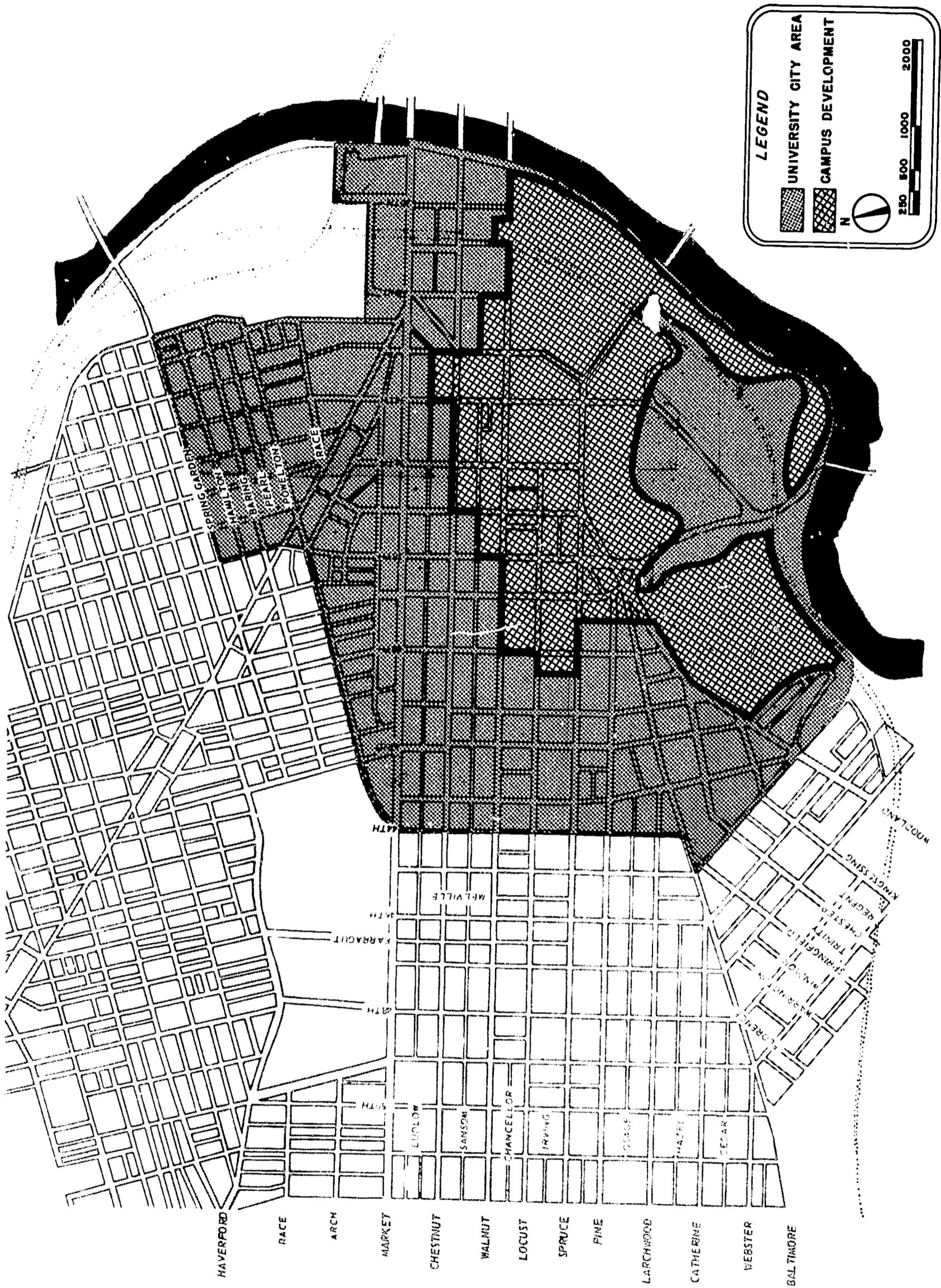


Figure 1. University City Area
 (As defined for the purpose of Transportation Study)

3. Support for the City's effort to strengthen the metropolitan rapid transit system.
4. Collaboration between the University and other private and public interest within University City for the construction, wherever feasible, of joint use facilities. (Such collaboration should seek to obtain the support of the City's off-street parking program, and can be accomplished with the assistance of The West Philadelphia Corporation.)

Comparison of Two Studies

The first transportation study had to be carried out and completed with great speed to provide the off-street parking element subsequently incorporated in the University Development Plan. The first study was based upon information which was the most readily available.¹ It was recognized at the time that a comprehensive survey would need to be undertaken at the earliest possible date to verify and, where necessary, correct or expand the judgements made in the first study. For this reason, the comprehensive transportation survey was initiated while work upon the first study was still continuing.

The 1960-61 transportation survey distributed more than 24,000 questionnaires. More than half of these were returned properly completed. It is interesting to compare the findings of the two studies.

1. For example, the first study analyzed the residential distribution of faculty, employees and students holding permits to use University off-street parking spaces.

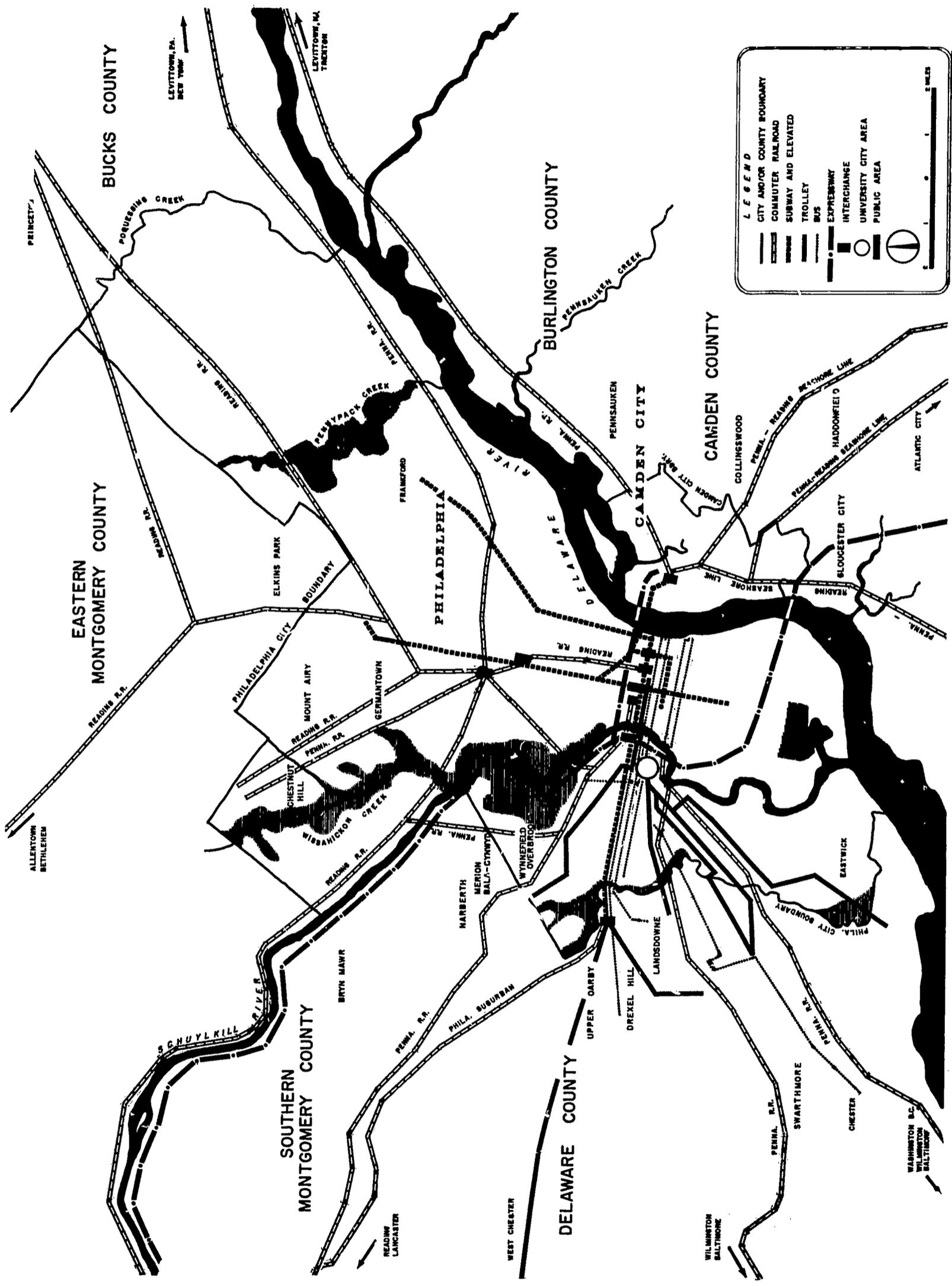


Figure 2. Philadelphia-Camden Metropolitan Transportation Facilities

1. The first study¹ estimated that the University was short 480 spaces during the 1960-61 academic year. By comparison the exhaustive analysis provided in this report finds that during the period of survey, there were 1,265² more members of the University population bringing automobiles to the Campus area than there were spaces.
2. The first study projected a total need of 3,300 off-street parking spaces by 1970; the following analysis projects the need as being 4,250.
3. The first study estimated that \$8,700,000 would need to be expended during the present decade to provide the off-street spaces required by 1970. The following analysis estimates a required expenditure of \$11,099,000 in terms of 1963-64 construction costs.

Student Operated Automobiles

The 1960-61 survey found that, in addition to the cars driven by commuting students, the students residing in the Campus area maintained a total of 2,618 automobiles: 379 of which were owned by students residing in University dormitories and 485 of which were owned by students residing in fraternities. Based upon the first complete registration of vehicles owned or operated by full

1. Proposed Off-Street Parking Plan, An Element of the Uof P Development Plan, February, 1961; page 53.
2. See Table 7.

time undergraduate students, this now appears to have been a conservative estimate for the entire resident student body at that time.¹

The following analysis has drawn the conclusion that the University will be obliged to prohibit resident undergraduate students from bringing automobiles to the Campus.

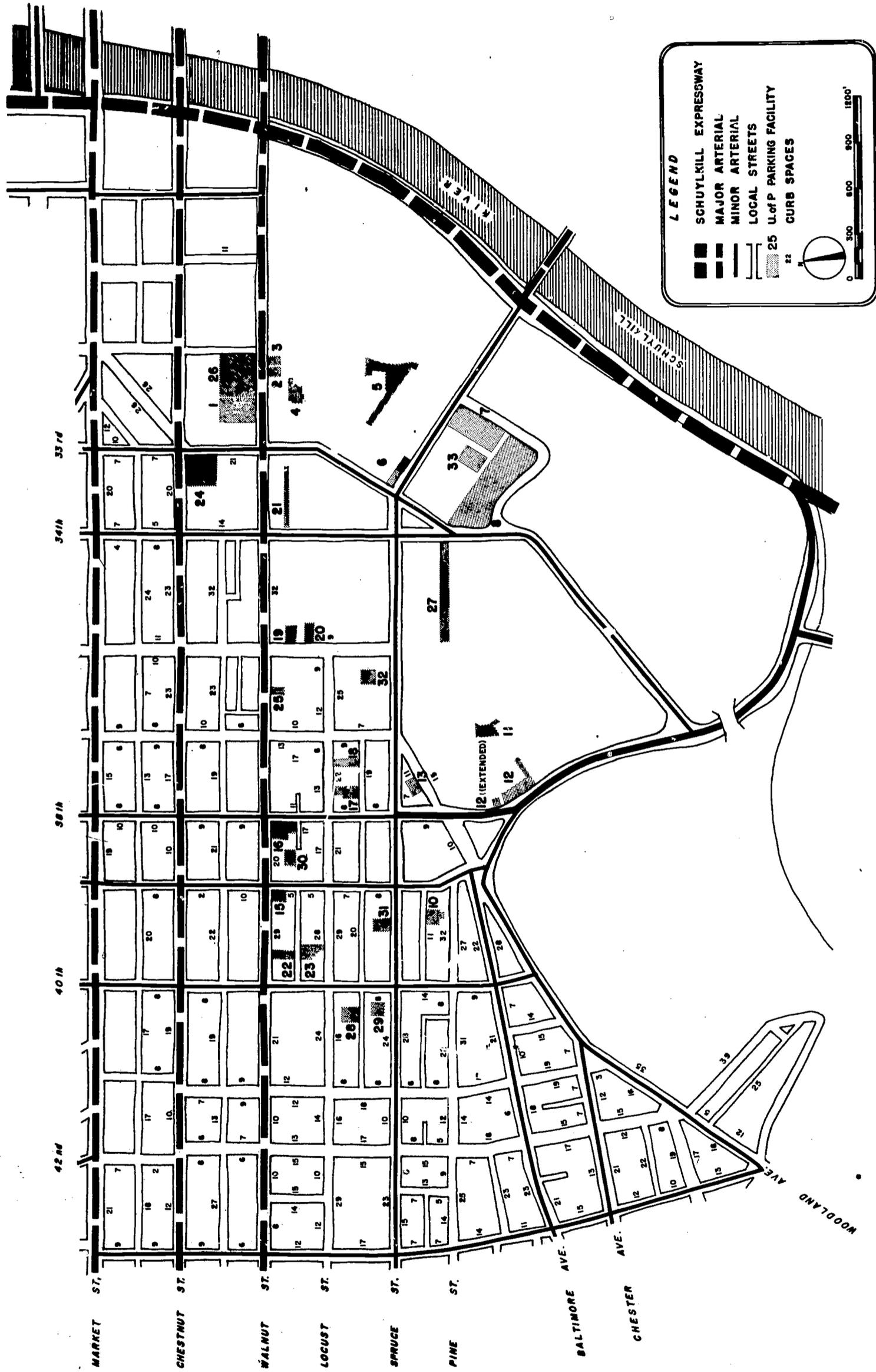
In accordance with the University's housing program, a minimum of 1,240² full time graduate students will be living in University accommodations by 1970. Of this number, an estimated 43 percent (or 535) may be expected to have cars for which the University will be obliged to provide off-street parking space -- unless it takes appropriate action to avoid this necessity. The total number of 4,250 spaces projected by the following analysis for 1970 includes the 535 spaces to be required by resident graduate students.

Policy, Planning and Development Questions

The completion of the 1960-61 Transportation Survey and the following analysis brings into sharp focus several major policy, planning and development questions which require attention; and provides an opportunity to review University accomplishments since the first transportation study was issued.

The first question is concerned with the impact which University development has upon its neighborhood. The University has recognized the importance of maintaining a viable community. It knows

1. The fall 1962 registration of motor vehicles owned or operated by full time undergraduate students was 2,054. The figure at midyear, 1962-63, was 2,164. See also Appendix 3 for 1963-64 figure which has resulted from prohibition on use of motor vehicles by freshmen.
2. University of Pennsylvania Integrated Development Plan, 1962. (Table 9, page 52, presents the number of full time students and place of residence as projected by the Integrated Development Plan.)



KEY (showing lot number, location, and number of spaces):

NO.	LOCATION	SPACES	NO.	LOCATION	SPACES
*1	Walnut Street between 32nd and 33rd Streets	120	*18	Dietrich Lot (east), south side of Locust Street, between 37th and 38th Streets	18
*2	Chancellor Street Lot, east of Decatur Hall (enter from 33rd Street entrance to Palestra Lot)	14	*19	Blanchard Lot, east side of 36th Street, 209 South 36th Street,	18

*2	Chancellor Street Lot, east of Decatur Hall (enter from 33rd Street entrance to Palestra Lot)	14	*19	38th Streets	18
*3	Decatur Lot, east of Decatur Hall (enter from 33rd Street entrance to Palestra Lot)	10	*20	Blanchard Lot, east side of 36th Street, 209 South 36th Street, between Walnut and Locust Streets	30
*4	Physics Lot, east of 32nd Street (enter from 33rd Street entrance to Palestra Lot)	21	*21	221-223 South 36th Street (east side of 36th Street between Locust and Walnut Streets)	20
*5	Palestra Lot, east of Squash Courts and along Franklin Field Arcade	150	*22	Chancellor Street Lot (enter from 34th Street)	34
*6	Weightman Lot, NE corner of 33rd and South Streets	26	*23	Illman Lot, 3944 Walnut Street (enter from 3941 Chancellor Street)	27
*7	Museum Lot, SW corner of South Street and Convention Avenue	182	*24	Illman Annex Lot, 3935 Locust Street (enter from Chancellor Street)	43
*8	Convention Lot, Convention Avenue and 33rd Street (south of University Museum)	353	*25	SW corner 33rd and Chestnut Streets	90
(9)	(Eliminated)	—	*26	Annenberg Courtyard — 3608-12 Walnut Street	18
*10	School of Allied Medical Professions, 3901 Pine Street (enter from Delancey Street)	13	*27	University Garage, NW corner 32nd Street and Walnut Streets	358
*11	School of Medicine Courtyard (enter from 36th and Spruce Streets)	15	28	Hamilton Walk (at rear of Hospital of the University of Pennsylvania)	125
*12	Zoology Lot (enter from 36th and Spruce Streets)	72	29	Dental School (enter from Irving Street)	21
*12 Ext.	Zoology Lot (enter from University Avenue)	12	30	Dental School Courtyard (enter from 40th Street)	15
*13	NE corner of 38th Street and Woodland Avenue (Eliminated)	35		Fels Institute of Local and State Government, east side of 39th Street between Walnut and Locust Streets (enter from 39th Street)	12
(14)		—	31	Army ROTC, 3905 Spruce Street (enter from Spruce Street)	15
*15	Fels Lot, SW corner of 39th and Walnut Streets (enter from 39th Street)	25	32	Wistar Institute, north side of Spruce Street between 36th and 37th Streets (enter from Spruce Street)	15
*16	Eisenlohr Lot, SW corner of 38th and Walnut Streets (enter from 38th Street)	41	33	University Museum parking area (enter from South Street)	90
*17	Dietrich Lot (west), south side of Locust Street, between 37th and 38th Streets	66	TOTAL		2,091

*Parking lots administered by University Parking Administrator

Figure 4. University Parking Supply and Unrestricted Curb Parking, 1963-64

from experience that traffic congestion and excessive competition for available curb parking space contribute toward the deterioration of a neighborhood. Given the continued increase in the number of private vehicles being brought to the University and the closing of many streets for incorporation within the Campus, the situation is moving toward an intolerable climax unless the University maintains the momentum of the parking facility construction program upon which it is already embarked. This includes the development of parking terminals at major entrance points to the Campus.

The second question is concerned with the ownership and use of automobiles by resident students. The subsidy of housing (to the extent that available funds permit) for both undergraduate and graduate students is generally accepted at this University. Whether such subsidies can or should be extended to student owned automobiles is a matter which warrants careful deliberation. The Philadelphia City Planning Commission has already informed the University that off-street parking spaces will need to be provided in new student housing projects, if a University control policy is not instituted. The Commission has also informed the University that curb spaces along frontage not controlled by the University may not be counted as usable spaces in its parking program.

One solution has already been suggested for undergraduate students. It would prohibit the resident undergraduate student from owning or operating an automobile within the University area. The resident graduate student, as the following analysis and plan suggests, would be required to make adequate provision for off-street parking in either a University or private commercial facility.

(A subsidiary but related question is the result which Campus expansion and neighborhood rehabilitation is expected to have upon

the Area's supply of inexpensive private housing for graduate students. Unless measures not now contemplated are taken, the present number of graduate students residing in the University area can be expected to decrease as the supply of private housing declines.¹ In order to reverse this trend, and thus improve both the academic environment and the parking condition, it will be necessary to acquire and/or construct more than the 800 graduate student units currently provided in the University's integrated planning program.)

The third question is related to the University's stated objective to encourage at least 50 percent of its faculty and staff to reside within University City by 1970. Given the growth that has taken place since the objective was first announced, we may now wish to ask whether this objective is not too modest.

The fourth question requires the University to consider appropriate means by which it can obtain maximum utility from the fine commuter and public transit facilities which serve the Campus; and whether it is feasible to spread the cost of parking facilities by erecting structures that can serve the needs of several institutions and private groups in the University area. In order to accomplish the latter, The West Philadelphia Corporation could serve as the agent for bringing together its member institutions, the Tri-Institutional medical center, the Trade and Convention Center, and other appropriate interests to form a special purpose corporation which would provide and manage the off-street parking facilities and jitney bus service required by each of the participants.²

-
1. The 1960-61 Transportation Survey found 1,954 graduate students residing in non-University Housing within the University area. The Integrated Development Plan estimates that 2,250 graduate students will need to reside in such housing within the University Area by 1970.
 2. As this report was being prepared for publication, the West Philadelphia Corporation had commenced negotiations with the City of Philadelphia for the establishment of a parking program for University City.

Accomplishments

Much has been accomplished since the first transportation study was released in February, 1961.

1. The central administration of off-street parking facilities by the Parking Administrator's office has been strengthened and parking spaces continue to be allocated primarily on the basis of need.
2. All motor vehicles maintained and/or operated by undergraduate students in the University area (as defined in Appendix 3) are required to be registered with the University; beginning with the 1963-64 academic year, first year resident students are not permitted to bring motor vehicles to the Campus; beginning with the 1964-65 academic year the same prohibition will be extended to resident sophomores; and, beginning with the 1964-65 academic year, resident juniors and seniors will only be permitted to maintain a motor vehicle in the University area (as defined in Appendix 3) if they can make adequate arrangements for private off-street parking.
3. The construction budget of each new project identifies the number of parking spaces required for the project and the funds required to provide such spaces.

4. The rate of faculty and staff movement into University City suggests that, with a well conceived program, the University's 50 per cent goal can be accomplished much earlier than 1970.
5. The Trustees, on January 17, 1964, approved an increase in the number of undergraduates to be accommodated in the University House System by 1970. (See footnote to Table 9, page 52.)

Conclusion

The following analysis deals with the transportation preferences and habits of the University population as these were expressed in the 1960-61 survey. The analysis (after careful study) makes a judgement between essential and non-essential use of automobile travel to and from the University, and stresses the important role which the commuter railroad and public transit must continue to play in serving the transportation needs of the University population.

If the University population should continue to be caught up in the residential movement to the suburbs, the parking requirements projected in Table 10 for 1970 may prove to be too low.

It should be possible, however, to actually reduce the number of parking spaces required by 1970 -- if the University is prepared to build upon its recent accomplishments. For this reason, a number of policies are suggested for consideration in Appendix 5 of this report.

PART I

THE TRAVEL CHARACTERISTICS OF THE UNIVERSITY POPULATION

CURRENT PARKING DEMAND

PROJECTED PARKING NEED

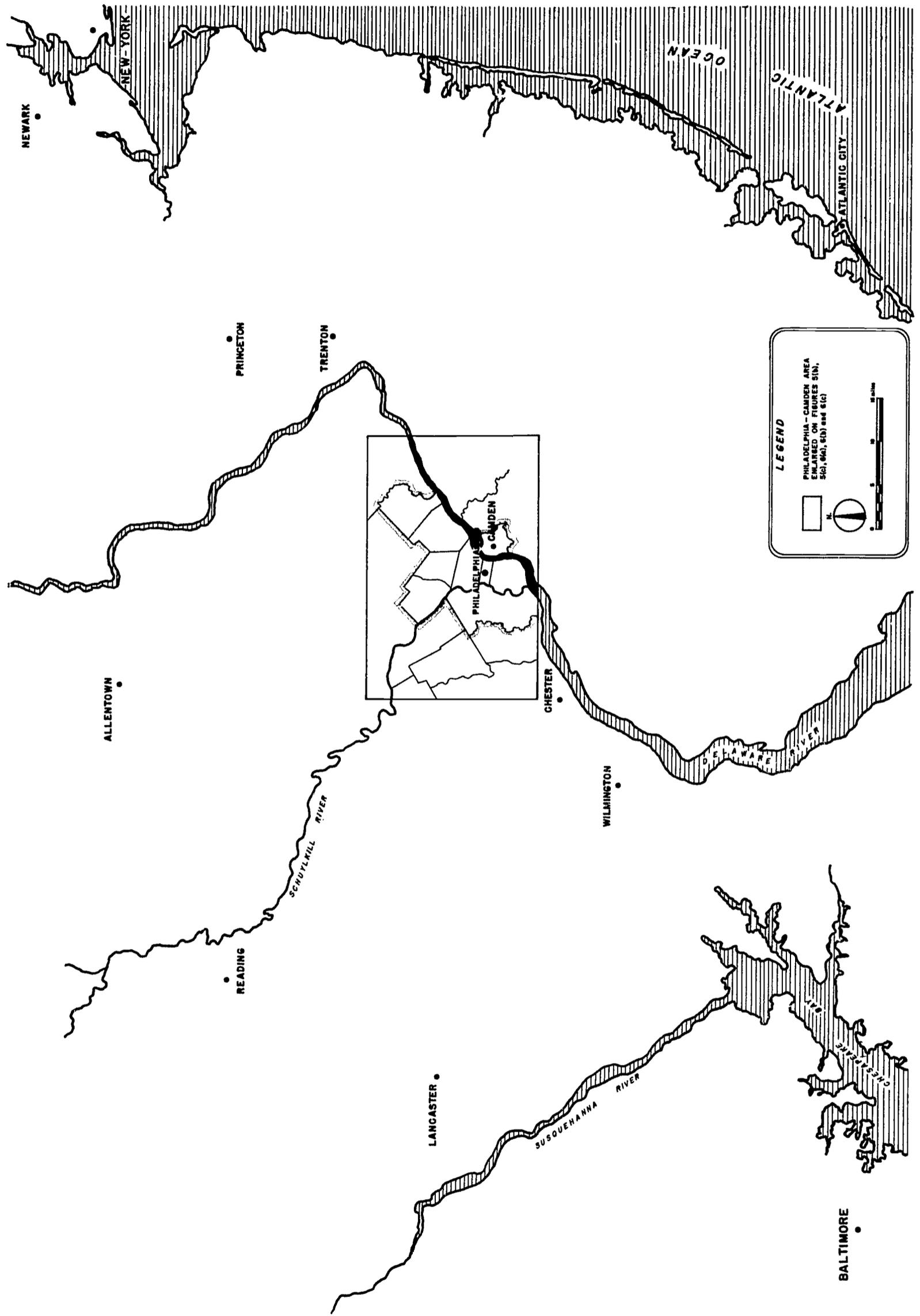


Figure 5(a). Philadelphia-New York-Wilmington-Baltimore Area

THE TRAVEL CHARACTERISTICS OF THE UNIVERSITY POPULATION

The term "University population" includes all persons studying and working at the University's facilities in West Philadelphia during the 1960-61 academic year. At that time the University population was approximately 24,300 persons. This population came from as far north as New York City and as far south as Baltimore, with the predominant origin and destination area being the one shown on Figure 5(a) and the following maps in the Figures 5 and 6 series.

AREA OF DESTINATION¹

The Transportation Survey found that the University area, although not dominant, is important as a place of residence for the University population.² Tables 1(a), (b) and (c) provide a profile of that portion of the population residing in the area at the time of the 1960-61 survey: almost 30 percent of the total University population, 62 percent of all full time students, 16 percent of University Hospital employees, slightly more than 12 percent of other University employees, slightly less than 12 percent of the full time faculty and staff, slightly more than 10 percent of the part time students, and more than 7 percent of the part time faculty and staff.

-
1. See Appendix 4 for explanation of terms used in this report.
 2. See Figures 5(b) and 5(c).

TABLE 1(a). DESTINATION OF TRIPS ORIGINATING
AT THE UNIVERSITY CAMPUS
1960-61

DESTI- NATION AREA	STUDENTS		FACULTY		EMPLOYEES		TOTAL
	FULL TIME	PART TIME	FULL TIME	PART TIME	HOSPITAL	OTHER	
A	5,554	818	233	112	240	293	7,250
B	650	865	150	141	552	548	2,906
C	226	308	83	220	36	67	940
D	173	389	25	67	200	205	1,059
E	352	483	29	58	40	209	1,171
F	471	590	179	91	53	145	1,529
G	358	1,052	112	91	18	85	1,716
H	292	583	445	250	22	138	1,730
I	299	684	299	91	165	311	1,849
J	106	529	183	58	31	74	981
K	153	489	33	50	22	74	821
L	133	610	41	50	4	39	877
Not Re- ported	206	543	174	229	111	219	1,482
TOTAL	8,973	7,943	1,986	1,508	1,494	2,407	24,311

Source: University of Pennsylvania Transportation Survey, 1960-61.

Full time students were distributed throughout the metropolitan area. That portion of West Philadelphia which lies outside the University area (B on Figure 5(b)) had the largest percentage of commuting full time students, 7.3.

Of the 3,419 commuting full time students, 19 percent lived in West Philadelphia, but outside the University area, at the time of the survey. Three other areas each housed more than 10 percent of the full time student commuters. These were Oak Lane-Logan-Near Northeast Philadelphia, with 15 percent; Germantown-Mt. Airy-Chestnut Hill, with 11 percent; and Far Northeast Philadelphia-Bucks and Northern Montgomery Counties, each with 11 percent. Each of the remaining areas had less than 10 percent, with the far west and southwest suburbs providing the smallest number of commuting full time students.

Part time students were also widely distributed throughout the metropolitan area. The largest proportion, more than 13 percent, lived in the northern suburbs and Far Northeast Philadelphia. The fact that this large area is distant from the University did not seem to be as much of a deterrent to part time students as to other University population groups. The sections providing the next largest number of part time students were West Philadelphia (outside the University area), with almost 11 percent, and the immediate University area, with slightly more than 10 percent.¹ Every other area contributed less than 9 percent of the part time students; including the entire area south of Allegheny Avenue (C and D on Figure 5(b)), which contributed 8.8 percent.

1. Forty-one percent of the part time students living in the University area at the time of the survey were enrolled in a graduate school of the University.

TABLE 1(b). PERCENT OF UNIVERSITY POPULATION AND TRIPMAKER CATEGORY TRAVELING TO DESTINATION AREAS 1960-61

DESTI-NATION AREA	STUDENTS				FACULTY				EMPLOYEES				UofP POPULATION	
	FULL TIME	PER-CENT	PART TIME	PER-CENT	FULL TIME	PER-CENT	PART TIME	PER-CENT	HOS-PITAL	PER-CENT	OTHER	PER-CENT	TOTAL	PER-CENT
A	5,554	61.9	818	10.3	233	11.7	112	7.4	240	16.1	293	12.2	7,250	29.8
B	650	7.3	865	10.9	150	7.5	141	9.4	552	36.9	548	22.8	2,906	11.9
C	226	2.5	308	3.9	83	4.2	220	14.6	36	2.4	67	2.8	940	3.8
D	173	1.9	389	4.9	25	1.3	67	4.4	200	13.4	205	8.5	1,059	4.4
E	352	3.9	483	6.1	29	1.4	58	3.9	40	2.7	209	8.7	1,171	4.9
F	471	5.3	590	7.4	179	9.0	91	6.0	53	3.5	145	6.0	1,529	6.3
G	358	3.9	1,052	13.2	112	5.6	91	6.0	18	1.2	85	3.5	1,716	7.1
H	292	3.3	583	7.3	445	22.4	250	16.6	22	1.5	138	5.7	1,730	7.1
I	299	3.3	684	8.6	299	15.1	91	6.0	165	11.0	311	12.9	1,849	7.6
J	106	1.2	529	6.7	183	9.2	58	3.9	31	2.1	74	3.1	981	4.0
K	153	1.7	489	6.2	33	1.7	50	3.3	22	1.5	74	3.1	821	3.4
L	133	1.5	610	7.7	41	2.1	50	3.3	4	0.3	39	1.6	877	3.6
Not Re-ported	206	2.3	543	6.8	174	8.8	229	15.2	111	7.4	219	9.1	1,482	6.1
TOTAL	8,973	100.0	7,943	100.0	1,986	100.0	1,508	100.0	1,494	100.0	2,407	100.0	24,311	100.0

Source: University of Pennsylvania Transportation Survey, 1960-61.

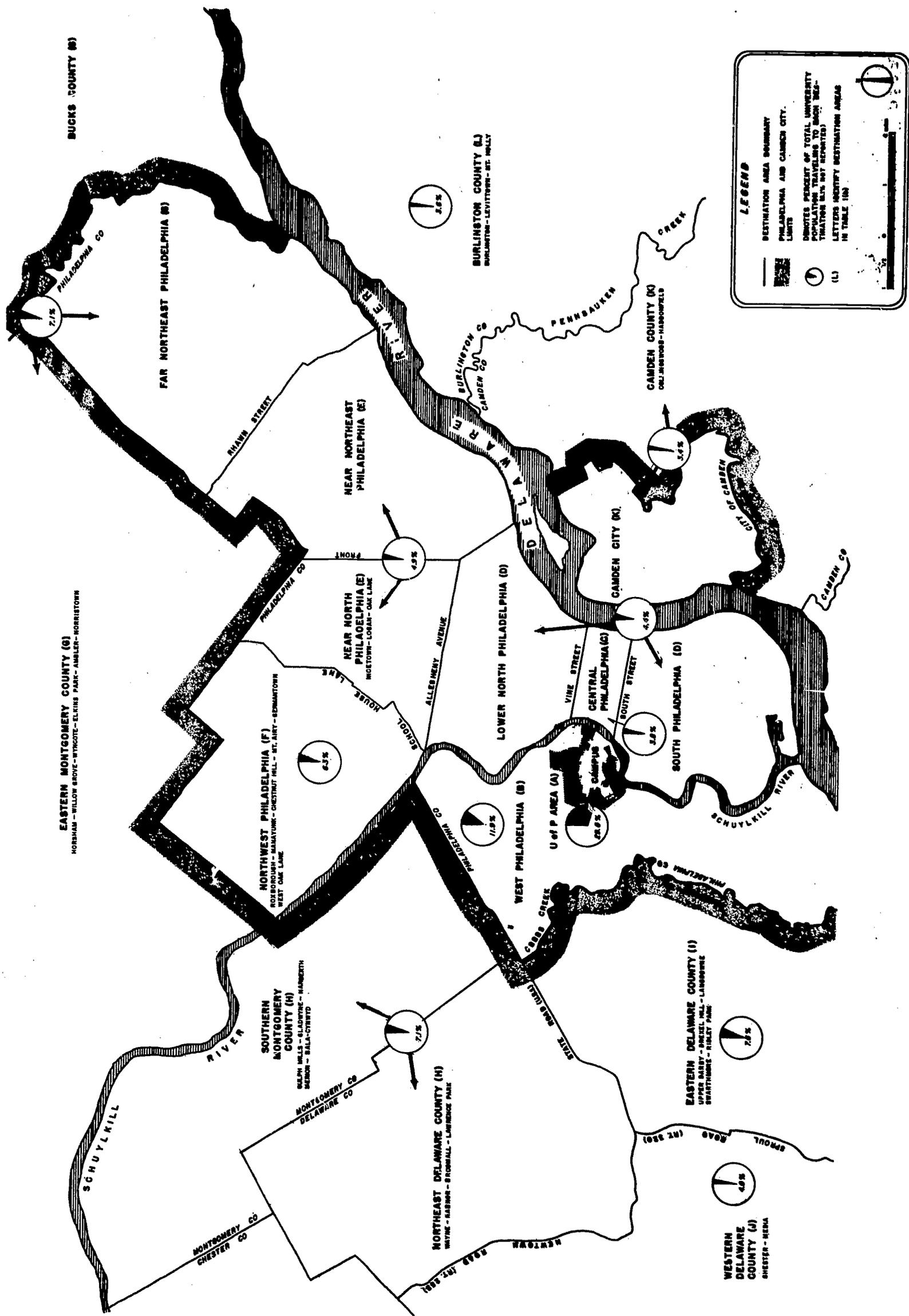
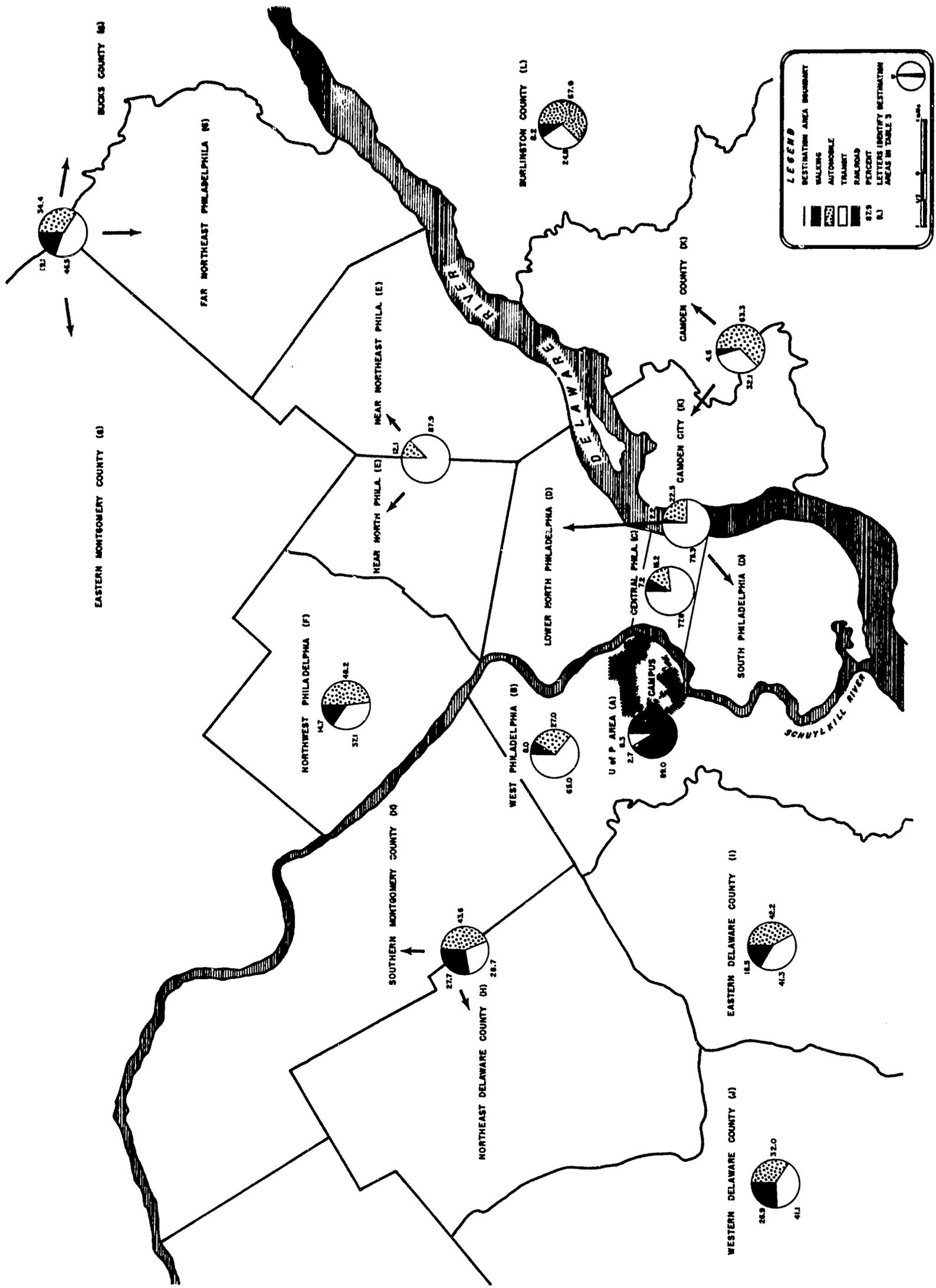


Figure 5(b). Percent of Total University Population Traveling to Each Destination Area

TABLE 1(c). PERCENT OF TOTAL TRIPS TO EACH DESTINATION AREA
BY TRIPMAKER CATEGORY
1960-61

DESTI- NATION AREA	STUDENTS				FACULTY				EMPLOYEES				UoFP POPULATION	
	FULL TIME	PER- CENT	PART TIME	PER- CENT	FULL TIME	PER- CENT	PART TIME	PER- CENT	HOS- PITAL	PER- CENT	OTHER	PER- CENT	TOTAL	PER- CENT
A	5,554	76.6	818	11.3	233	3.2	112	1.6	240	3.3	293	4.0	7,250	100.0
B	650	22.4	865	29.7	150	5.2	141	4.9	552	18.9	548	18.9	2,906	100.0
C	226	24.0	308	32.8	83	8.8	220	23.4	36	3.8	67	7.2	940	100.0
D	173	16.3	389	36.7	25	2.4	67	6.3	200	18.9	205	19.4	1,059	100.0
E	352	30.1	483	41.2	29	2.5	58	4.9	40	3.5	209	17.8	1,171	100.0
F	471	30.8	590	38.6	179	11.7	91	5.9	53	3.5	145	9.5	1,529	100.0
G	358	20.9	1,052	61.3	112	6.6	91	5.3	18	1.0	85	4.9	1,716	100.0
H	292	16.9	583	33.7	445	25.7	250	14.5	22	1.3	138	7.9	1,730	100.0
I	299	16.2	684	36.9	299	16.2	91	4.9	165	8.9	311	16.9	1,849	100.0
J	106	10.9	529	53.9	183	18.7	58	5.9	31	3.1	74	7.5	981	100.0
K	153	18.6	489	59.6	33	4.0	50	6.1	22	2.7	74	9.0	821	100.0
L	133	15.2	610	69.6	41	4.7	50	5.7	4	0.4	39	4.4	877	100.0
Not Re- ported	206	13.9	543	36.6	174	11.7	229	15.5	111	7.5	219	14.8	1,482	100.0

Source: University of Pennsylvania Transportation Survey, 1960-61.



(See Figure 5(b) for destination area boundary names.)

Figure 5(c) Percent of Total Trips to Each Destination Area by Tripmaker Category

The full time faculty of the University had a much more concentrated pattern of destination. More than two-fifths of the full time faculty traveled to the western suburbs; with 22 percent commuting to the Main Line-Northern Delaware County area, 15 percent to Eastern Delaware County, and 9 percent to Western Delaware County, Chester County and the Wilmington area. Slightly less than 12 percent of the full time faculty resided in the immediate University area. Nine percent resided in the Germantown-Chestnut Hill area. In addition, a surprisingly low percent of the full time faculty members resided in the northern (5.6) and center (4.2) sections of Philadelphia; and less than 4 percent resided in New Jersey.

The part time faculty was more widely distributed. Again, the Main Line area was the most popular, with more than 26 percent of the part time faculty reporting it to be their destination. The next most popular area among the part time faculty was Center City, which accounted for more than 14 percent of all destinations. Only 7 percent of the part time faculty lived within walking distance of the Campus.

With the travel destination profile of University employees (excluding, for the moment, Hospital employees) we begin to see a significant relationship between residence and place of employment. More than one-third of such employees reported their destination as West Philadelphia, including the University area. Next in importance was Eastern Delaware County with nearly 13 percent; with the Philadelphia area south of Allegheny Avenue, between the Delaware and Schuylkill Rivers, close behind (11.3 percent). Sixty percent of this group's trips to and from the Campus were, therefore, carried out within West Philadelphia and the areas to its immediate east and west -- all well served by public transit.

The destinations of Hospital employees were among the most concentrated of all University population groups. The highest proportion of such trips, 37 percent, were made to West Philadelphia, outside the University area. The second most popular residential section among Hospital employees was the immediate Campus, where 16 percent lived. The third in numbers, with nearly 16 percent, was the section of Philadelphia, described previously, south of Allegheny Avenue. The fourth significant area was Eastern Delaware County, with 11 percent. With 53 percent of all Hospital employees residing in West Philadelphia (including the University area), there was obviously a significant relationship between place of residence and place of employment -- and public transit provided the essential transportation link where the home was beyond walking distance.

MODE OF TRAVEL

A description of the mode of travel of the University population is readily generalized (see Table 2). As would be expected, walking was only the predominant mode of travel for resident full time students. The automobile was the preferred mode of travel among the commuting students, both full and part time, and the University faculty. Public transit was the most common mode of travel for all University employees.

Several interesting variations can be seen in this general travel pattern. Part time faculty members seemed to be most firmly attached to their automobiles. This is not surprising, as the survey revealed that many of them were on the medical faculty and would normally have to travel to several widely separated places during the day. The full time faculty was the only group making extensive use of railroad service. As we have seen, its members were concentrated in the areas which are best connected to the University by railroad. Among the interesting footnotes on our affluent society provided by the survey

TABLE 2. PERCENT OF TRIPS BY CLASSIFICATION OF
TRIPMAKER AND TRAVEL MODE
1960-61

TRIPMAKER	TRAVEL MODE					TOTAL
	WALK	AUTOMOBILE	TRANSIT	RAILROAD		
<u>Students</u>						
<u>Full time</u>	68.6	14.6	13.8	3.0		100.0
Undergraduate	57.0	27.5	10.0	5.5		100.0
Graduate						
Part time	10.1	54.8	28.6	6.5		100.0
Undergraduate	11.8	64.6	16.3	7.3		100.0
Graduate						
<u>Faculty</u>						
Full time	12.3	61.3	9.6	16.8		100.0
Part time	8.7	79.6	7.6	4.1		100.0
<u>Employees</u>						
University	12.6	34.0	47.4	6.0		100.0
Hospital	20.0	26.0	53.0	1.0		100.0
ALL TRIPMAKERS	25.6	44.9	23.2	6.3		100.0

Source: University of Pennsylvania Transportation Survey, 1960-61.

was the fact that a majority of commuting students (excluding full time undergraduates) traveled by automobile. Full time commuting undergraduates were not far behind, with 46.5 percent of their number using automobile transportation.

The relation between geographic distribution and mode of travel is examined in Table 3 and illustrated by Figures 6(a), (b) and (c). As expected, walking was most important in the immediate Campus area. However, some persons also walked from Center City and sections of West Philadelphia that are outside the University area. Railroad travel tended to be significant for trips to the Germantown-Chestnut Hill area, the northern and western suburbs and to the more distant points in New Jersey (e.g. Trenton and Princeton), as well as New York and Baltimore. Among students, the railroad (after the automobile) was the preferred means of travel to the Southern Montgomery, Northeast Delaware and Western Delaware sections in Pennsylvania; and to Burlington County in New Jersey. Employees (including Hospital employees) residing in every destination area used public transit in preference to the railroad.

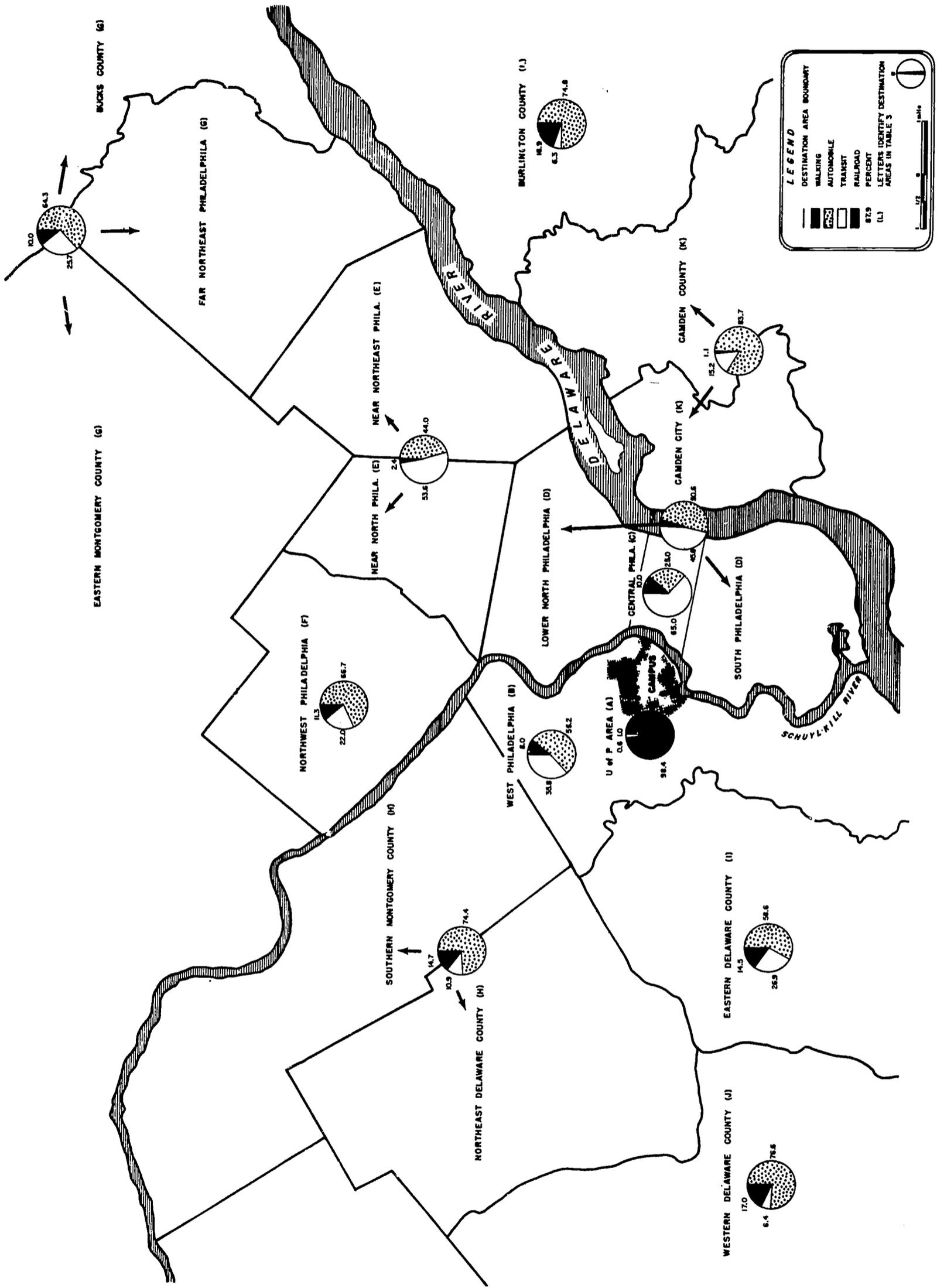
Automobile usage by geographic area was remarkably constant among the different tripmakers. It can also be described as being excessively high among those whose destination areas were convenient to the University and well served by railroad and/or transit facilities. This is evident in the proportion of automobile commuters to and from West Philadelphia, the area south of Allegheny Avenue (including Central Philadelphia) between the Delaware and Schuylkill Rivers, Northwest Philadelphia, and Eastern Delaware County.

In only three areas (including the University area) did less than half the student commuters from the area travel by automobile. In six of the twelve geographic areas, including Northwest Philadelphia, more than 65 percent of the student trips were regularly

TABLE 3. PERCENT OF TRIPS TO EACH DESTINATION AREA
BY TRAVEL MODE AND TRIPMAKER CATEGORY
1960-61

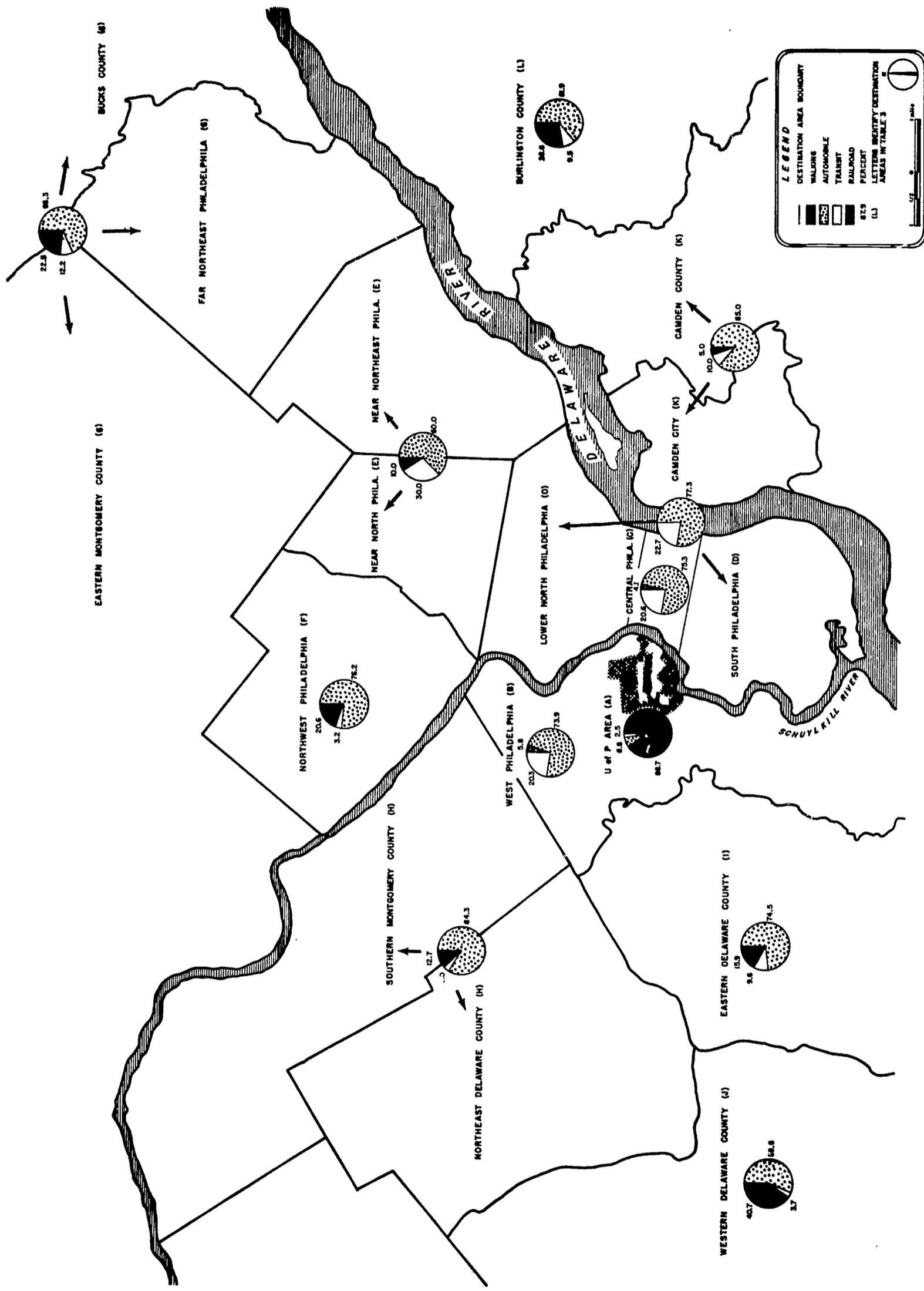
DESTI- NATION AREA	STUDENTS					FACULTY					EMPLOYEES (including Hospital)				
	WALK	AUTO	TRANSIT	RAIL- ROAD	TOTAL	WALK	AUTO	TRANSIT	RAIL- ROAD	TOTAL	WALK	AUTO	TRANSIT	RAIL- ROAD	TOTAL
A	98.4	0.6	1.0	-----	100.0	88.7	8.8	2.5	-----	100.0	89.0	2.7	8.3	-----	100.0
B	8.0	56.2	35.8	-----	100.0	5.8	73.9	20.3	-----	100.0	8.0	27.0	65.0	-----	100.0
C	10.0	25.0	65.0	-----	100.0	4.1	75.3	20.6	-----	100.0	7.2	15.2	77.6	-----	100.0
D	3.8	50.6	45.6	-----	100.0	0.0	77.3	22.7	-----	100.0	2.2	22.5	75.3	-----	100.0
E	-----	44.0	53.6	2.4	100.0	-----	60.0	30.0	10.0	100.0	-----	12.1	87.9	0.0	100.0
F	-----	66.7	22.0	11.3	100.0	-----	76.2	3.2	20.6	100.0	-----	48.2	37.1	14.7	100.0
G	-----	64.3	25.7	10.0	100.0	-----	65.3	12.2	22.5	100.0	-----	34.4	46.5	19.1	100.0
H	-----	74.4	10.9	14.7	100.0	-----	84.3	3.0	12.7	100.0	-----	43.6	28.7	27.7	100.0
I	-----	58.6	26.9	14.5	100.0	-----	74.5	9.6	15.9	100.0	-----	42.2	41.3	16.5	100.0
J	-----	76.6	6.4	17.0	100.0	-----	55.6	3.7	40.7	100.0	-----	32.0	41.1	26.9	100.0
K	-----	83.7	15.2	1.1	100.0	-----	85.0	10.0	5.0	100.0	-----	63.3	32.1	4.6	100.0
L	-----	74.8	6.3	18.9	100.0	-----	61.9	9.5	28.6	100.0	-----	67.0	24.8	8.2	100.0

Source: University of Pennsylvania Transportation Survey, 1960-61.



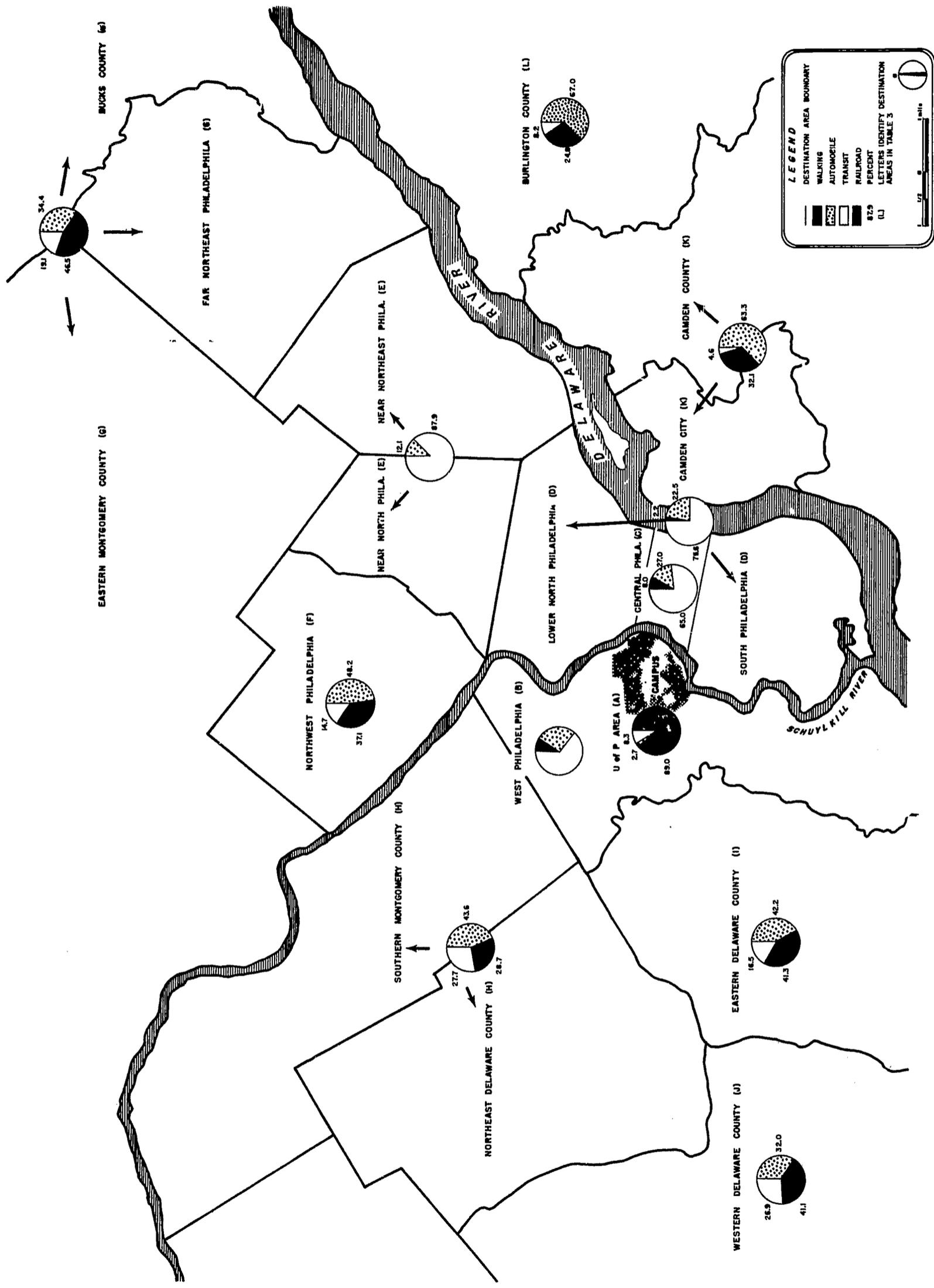
(See Figure 5(b) for destination area boundary names)

Figure 6(a). Percent of Student Trips to Each Destination Area by Travel Mode



(See Figure 5(b) for destination area boundary names.)

Figure 6(b). Percent of Faculty Trips to Each Destination Area by Travel Mode



(See Figure 5(b) for destination area boundary names.)

Figure 6(c). Percent of Employee Trips to Each Destination Area by Travel Mode

made by automobile. In the New Jersey area, in West and Northeast Delaware County, and in Southern Montgomery County 75 percent or more of the student trips were by automobile. Some part of the extremely high rate of automobile use in certain areas (particularly in Far Northeast Philadelphia and in the more remote suburbs) can be explained by the higher proportion of part time students residing in the area and the absence of both adequate transit and railroad service to the Campus. This, however, does not explain the high percent of students who resided in West Philadelphia and traveled to the Campus by automobile.

Members of the faculty also utilized automobiles for a very large proportion of their trips to and from most of the residential areas. In ten of the statistical areas (including West and Central Philadelphia) three-fifths or more commuted by automobile. Nevertheless, wherever adequate railroad and/or transit service was available, a sizable number of faculty members in areas with the highest proportion of automobile users also patronized such facilities. Obviously, the proportion of automobile users among faculty members would have been considerably higher in many areas if adequate railroad and transit service had not been available.

Automobile usage by all employees, including Hospital employees, provided three sectional patterns. The first pattern (with less than 30 percent usage) prevailed among four connected statistical areas within Philadelphia (B, C, D and E), three of which adjoined the University Campus. The second pattern was dominant in the remaining portions of the City and the Pennsylvania portion of the suburbs. There, between one-third and one-half of all employees commuted by automobile. The third area consisted of the New Jersey suburbs, from which approximately two-thirds of the University employees commuted by automobile.

CURRENT PARKING DEMAND¹

DEMAND FOR PARKING IN THE UNIVERSITY AREA

Fortunately, it is not necessary to provide parking spaces at any one time for the more than 9,600 automobiles which are brought to the Campus during the average school week (see Table 4). Among the several reasons for this are:

1. Some members of the University population do do not travel directly to and from the main Campus.
2. Not all automobile commuters are at the University at the same time. Many faculty members devote a portion of their work hours to non-University activities.
3. The necessity for operating the University physical plant on a twenty-four hour basis means that certain employees do not have regular 9 A.M. to 5 P.M. working hours.

1. As in all sections of this report, the figures cited here are derived from the 1960-61 Transportation Survey. The present tense is used, however, where it will facilitate discussion, analysis and the presentation of material.

4. A large portion of student enrollment is composed of evening students; and most of these attend classes only one or two days per week.
5. The operation of car pools.
6. The spread of Hospital visiting hours during the weekday and weekends.
7. The schedule of varied University activities throughout the day, evening and weekend hours.

The various University population groups have different travel characteristics and their demand for parking follows different patterns. Each of these demand patterns is examined separately on the following pages.

FACULTY PARKING DEMAND

Faculty commuting by automobile is a major source of parking demand at the University. A total of 2,128 automobiles is brought to the Campus by faculty members during the average five day week. Wednesday and Thursday mornings are the times during which the largest number of faculty members report being on Campus. On Wednesday morning, among faculty members who commute by automobile, 85 percent of full time and 30 percent of part time faculty members are on the Campus. On Thursday morning, among the same group, 84 percent of full time and 34 percent of part time faculty members are on Campus. If we apply carloading factors¹ of 1.14 for full

1. For derivation of carloading factors see Appendix 1.

TABLE 4. TOTAL PARKING DEMAND
1960-61

(Monday through Friday)

CATEGORY	TOTAL NUMBER AUTOMOBILES BROUGHT TO UNIVERSITY ^a	DAYTIME PEAK DEMAND ^b	EVENING PEAK DEMAND ^b
Commuters			
Students:			
Undergraduate	2,468	512	759
Graduate	2,906	663	867
Faculty:			
Full Time	1,021	858	226
Part Time	1,107	376	44
Employees:			
University	570	519	70
Hospital	201	157	21
Total	8,273	3,085	1,987
Visitors to University	500	500	(c)
Students Residing in University			
Housing			
Undergraduate	671	671	671
Graduate	193	193	193
Total	864	864	864
TOTAL	9,637	4,449	2,851

a. Total number of automobiles brought by each category to the University Campus during the week.

b. These columns show the portion of the total number of automobiles brought to the Campus (by each category) which "demand" parking during the peak hours. Derived from first column as described in text.

c. Not available.

time faculty and 1.03 for part time faculty, this means that a total of 1,331 faculty members arrive in 1,200 cars during the peak Wednesday morning period, and 1,364 faculty members arrive in 1,234 cars during the peak Thursday morning period. For the purpose of recording peak existing parking space demand, the Thursday morning peak of 1,234 (858 + 376) is used in column 2 of Table 4.

EMPLOYEE PARKING DEMAND

A total of 570 automobiles is brought to the Campus by University employees (other than Hospital employees). Given a carloading factor of 1.37, a total of 781 University employees commute by car. The greatest parking demand created by this population group occurs on Monday, Wednesday, and Friday mornings. On Wednesday morning, the peak period, 91 percent of the group commuting by car is on Campus. As shown in Table 4, the parking spaces required at such time total 519.

Hospital employees also provide a relatively stable demand for parking spaces. The 201 automobiles which they bring to the Campus carry 302 commuters. The carloading factor for Hospital employees is 1.5. On Thursday and Friday mornings, the peak periods, 78 percent of this commuting group is on the Campus and requires 157 parking spaces.

STUDENT PARKING DEMAND

During 1960-61, 1,725 full time students and 4,638 part time students commuted to the University by automobile.¹ It is

1. Derived from Tables 1 and 3.

necessary to make several assumptions regarding the frequency or time of day when these students were at the University.

1. It is assumed that daytime demand (i.e., morning and early afternoon) is composed entirely of full time students and is equal to 90 percent of the full time commuting students, since no University population group has substantially more than 90 percent of its members on Campus at any one time.
2. It is assumed that the evening demand is composed entirely of part time students. Since a majority of evening classes meet once per week, and most part time students take more than two courses per term, it is assumed that at least 40 percent of the part time students commuting by automobile are on Campus during any given evening.
3. It is assumed that the part time students on Campus during the day (i.e., morning and early afternoon) and the number of full time commuting students on Campus during the evening is negligible and can safely be ignored.

The above implies a daytime demand consisting of 1,553 automobile passengers and an evening demand consisting of 1,855 automobile passengers. This, in turn, means that 1,175 daytime and 1,626 evening parking spaces are required; given carloading factors of 1.41 for all full time undergraduates, 1.25 for full time graduate students, 1.13 for part time undergraduates, and 1.15 for part time graduate students.

Two other sources of student parking demand in the University area must be considered. One of these is the space used by resident students. Table 5 shows that almost 40 percent of the students residing in the Campus area have automobiles. It is probable that nearly all such automobiles occupy space in the University area during a typical weekday: 379 cars are owned by full time students residing in University dormitories, 485 cars are owned by students living in fraternities. While the fraternities are not all on University owned property, they do form a part of the immediate Campus neighborhood. A total 864 curb and off-street parking spaces are, therefore, used by the residents of University owned or controlled housing.

UNIVERSITY VISITOR PARKING DEMAND¹

It has been estimated that about 500 visitor parking spaces are required on an average weekday.² As the 1960-61 Transportation Survey was not designed to provide information about this type of demand, the estimated need for 500 visitor parking spaces is used for the purpose of this analysis.

TOTAL CURRENT PARKING DEMAND

The daytime and evening demand for parking by persons commuting to the University is summarized in Table 6. Evening parking demand for faculty and staff was derived by a method similar to that used for daytime parking.

1. Special event visitor parking is discussed in Appendix 2.
2. Proposed Off-Street Parking Plan, February 1961.

TABLE 5. AUTOMOBILE OWNERSHIP BY STUDENTS
RESIDING IN UNIVERSITY AREA
1960-61

STUDENT RESIDENT GROUP	NUMBER		PERCENT OWNING CARS
	STUDENTS	STUDENTS OWNING CARS	
<u>Full Time Students</u>			
<u>Undergraduate:</u>			
Dormitory Residents	1,706	279	16.4
Fraternity-Sorority Residents	896	392	43.8
Apartment and Rooming House Residents	<u>1,161</u>	<u>610</u>	52.5
Subtotal and Group Percent	3,763	1,281	34.0
<u>Graduate:</u>			
Dormitory Residents	312	100	32.1
Fraternity-Sorority Residents	173	93	53.8
Apartment and Rooming House Residents	<u>1,499</u>	<u>796</u>	53.1
Subtotal and Group Percent	1,984	989	49.8
<u>Part Time Students</u>			
<u>Undergraduate</u>			
Graduate	395	134	33.9
	455	214	47.0
Subtotal and Group Percent	<u>850</u>	<u>348</u>	40.9
TOTAL	6,597	2,618	--
PERCENT OF RESIDENT STUDENTS			39.7

Source: University of Pennsylvania Transportation Survey, 1960-61.

TABLE 6. COMMUTER PARKING DEMAND
1960-61

TYPE OF COMMUTER	PARKING DEMAND	
	DAYTIME PEAK	EVENING PEAK
<u>Students</u>		
Undergraduate	512	759
Graduate	663	867
<u>Faculty</u>		
Full Time	858	226
Part Time	376	44
<u>Employees</u>		
University	519	70
Hospital	157	21
TOTAL	3,085	1,987

Source: University of Pennsylvania
Transportation Survey, 1960-61

The total daily demand for parking associated with the University is approximately 4,449 spaces (see Table 4). Of this number 3,085 spaces, or 69 percent, are required by faculty, employee and student commuters, 864 spaces are required by student residents of University owned or controlled housing, and 500 are required by visitors (see Tables 4, 5 and 6).

RELATIONSHIP BETWEEN SUPPLY AND DEMAND

During 1960-61 the University's off-street parking facilities were fully occupied. With few exceptions, every qualified person associated with the University as a faculty member, student, and employee was able to obtain a parking permit upon application. The extent of actual satisfaction of demand is another matter, since many automobile commuters considered the location of parking lots in which they might obtain space too distant from their place of employment or classes on Campus. For this reason, many automobile commuters (given a choice) may have preferred on-street parking. It is also recognized that such a favorable showing may actually result from a parking permit application and review process which reflects and is controlled by the number of University off-street parking spaces that are available.

The annual and daily charge is another factor affecting the use of University parking facilities. As described below, the prevailing annual and daily rates are at a level that is generally acceptable to the full time faculty member. Nevertheless, many students and part time employees undoubtedly find it worth their while to use metered and restricted curb spaces.

Table 7 presents the relationship between the supply and demand for University commuter parking spaces. It shows that the University during 1960-61 was satisfying 59 percent of the peak daytime parking demand. However, this percentage varies from 80 percent for University employees to 16 percent for Hospital employees.

TABLE 7. COMMUTER PARKING DEMAND SATISFIED BY
UNIVERSITY OFF-STREET PARKING SUPPLY
1960-61

COMMUTER CATEGORY	NUMBER		DEFICIENCY	PERCENT SATISFIED
	DEMAND ^a	SUPPLY		
Students	1,175	480	705	41
Faculty	1,234	910	324	73
Employees: University Hospital	519 157	415 25	104 132	80 16
TOTAL AND PERCENT	<u>3,085</u>	<u>1,830</u>	<u>1,265</u>	<u>59</u>

Sources: University of Pennsylvania Parking Administration's
Office, 1960-61
University of Pennsylvania Transportation Survey,
1960-61

a. Daytime Peak Demand as shown for commuters in Table 4.

University employees have the highest proportion of their demand satisfied by University off-street parking facilities, because their regular hours and days of work make the annual \$50 fee for parking most attractive. With a five-day week, fifty-week year, the average cost of parking is twenty cents per day. Also, during the regular 9 A.M. to 5 P.M. work day, most on-street parking space in the University area, which is either metered or has peak hour restrictions, is unavailable to this group.

The University faculty has the next highest proportion of its demand, 73 percent, satisfied by University off-street parking space. It is this group which probably finds the annual parking charge most acceptable. Since the members of this group have the greatest demands made on their time, they are least inclined (nor should it be necessary for them) to spend time searching for a curb parking space. This group consists of both full and part time faculty members and its total demand for parking spaces does not, therefore, need to be accommodated at one time.

Part time faculty members may find the annual rate much less attractive, since their use of University parking facilities is less frequent. The peak demand of part time faculty for parking represents only 34 percent of the total of such persons commuting by automobile.¹ This suggests that the average part time faculty member comes to the Campus about one and one-half days per week. For such a schedule the alternatives include: (a) renting a University parking space at the daily rate of seventy-five cents² and (b) metered and restricted curb spaces, which (though limited) may be more readily available to part time faculty members or employees.

1. See Table 4.

2. During 1961-62 approximately 180 permanently assigned, and an average of 225 unused, permit spaces were available for this type of parker.

Students commuting by automobile have only 41 percent of their daytime parking demand satisfied by University off-street facilities. However, the commuting student has incentives and alternatives which include: (a) restricted or metered on-street spaces and (b) free curb space west of the Campus. The restriction of student parking to one lot at the northeast corner of the Campus (33rd and Walnut) makes University parking unattractive to the person bound for the western section of the Campus, where on-street space may be most plentiful if he comes early and is prepared to engage in a daily patient cruise.

PROJECTED PARKING NEED

This section first attempts to forecast the demand for parking in the University area, from the present up to a target year of 1970, then differentiates between demand and what is expected to be actual need. For this purpose, various assumptions are examined as to future conditions and the most likely conditions are used to estimate and differentiate between both the future demand and the future need for parking space.

Table 8 presents the projected 1970 demand for parking, given the information provided in the 1960-61 Transportation Survey and existing University policies. After examining the expressed demand and making certain assumptions regarding a necessary evolution in University policies, Table 10 shows the projected number of spaces that are expected to be actually required by 1970. The intermediate forecast of needed spaces by 1965 has been derived from Table 10, and is presented in Table 11.

As in the previous section's examination of 1960-61 demand, the various components of projected parking demand are first examined separately and then combined to obtain the total forecast. Estimates of future size of faculty, employment, and student enrollment are based upon information provided by the colleges and schools of the University (during 1961-62)

TABLE 3. PARKING DEMAND
1960-61 and 1970

CLASSIFICATION	1960-61 DEMAND ^a	1970 DEMAND ^b	
		CONTINUATION OF EXISTING CONDITIONS	ASSUMED CONDITIONS
<u>Commuters</u>			
<u>Students (full time)</u>			
Undergraduate	512	650	740
Graduate	663	1,425	1,425
Faculty			
Full time	858	1,050	595
Part time	376	385	385
Employees			
University	519	630	760
Hospital	<u>157</u>	<u>250</u>	<u>250</u>
Total	3,085	4,390	4,155
Total	500	800	450
<u>Visitors</u>			
<u>Students Residing in</u>			
<u>University Area</u>			
Undergraduate (full time)	1,281	1,885	150
Graduate (full time)	989	1,745	1,745
Undergraduate and Graduate (part time)	<u>348</u>	<u>120</u>	<u>120</u>
Total	2,618	3,750	2,015
Total	<u>6,203</u>	<u>8,940</u>	<u>6,620</u>
TOTAL			

NOTE: This table is based upon the analysis and projection of Transportation Questionnaire data, as described in the text. The Trustee action of January 17, 1964, reduces the number of full time undergraduate commuters anticipated in 1970 from 2,250 to 1,750 (see Table 9). In accordance with the 1960-61 experience and the conditions assumed in the text, this action will serve to reduce to 575 the number of spaces required for full time undergraduate commuters. The figure of 740 (column 3 above) is, however, retained as the base figure for this analysis.

- a. Daytime peak.
- b. Numbers rounded to nearest five.

to the Operations Committee of the University's Integrated Development Committees.¹

FACULTY AND ADMINISTRATIVE STAFF

By 1970 the number of faculty and administrative staff members is expected to grow by approximately 400 fully affiliated members, with the number of partially affiliated faculty members to remain the same as at present. If the present conditions of automobile use and residential location remain constant, 1,050 parking spaces would be required for full-time faculty and administrative staff members. However, it is the policy of the University to encourage faculty and staff members to live within walking distance of the Campus, in the area indicated on Figure 1. It is the goal of this policy to have 50 percent of the fully affiliated faculty and staff members residing within or on the periphery of this area by 1970. If this occurs, the number of parking spaces required for full time faculty would be reduced to 595.² If this goal is not attained, additional parking will, of course, be needed. For example, if only 35 percent of full time faculty and staff should reside in the University area, an additional 180 parking spaces would be needed for a total of 775.

Partially affiliated faculty members will require 385 parking spaces, approximately the same number as at present. It is assumed that very few of the latter will choose to move into the University area; that their non-University employment will remain the determining factor in the choice of residential location.

-
1. University of Pennsylvania Integrated Development Plan, 1962.
 2. This number would, of course, be further reduced as the number of faculty families taking up residence in the University area goes beyond the present 50 percent goal.

EMPLOYEES

Employees of the University are expected to increase in number by approximately 462, to a total of 2,870. If the present parking demand structure remains the same, this employee total will require a minimum of 630 parking spaces. However, it is likely that increased automobile ownership and some continued movement to the suburbs will affect the demand for automobile parking space. It seems safe to assume, therefore, that the proportion of University employees traveling by automobile will increase from the current 34 percent¹ to 40 percent by 1970. If this takes place, the required number of parking spaces will increase to 760.

According to survey data, Hospital employees at present make 26 percent of their work trips by automobile.¹ Although a large increase in the number of employees of the University Hospital is expected, it is assumed that parking demand will not increase substantially. The reasons for this assumption are:

1. Current information apparently overstates actual automobile usage and the demand for parking facilities.
2. The present dominant residential location pattern of Hospital employees (i.e., within walking distance of the Hospital and/or public transit facilities serving the Hospital) is expected to be maintained.

It is estimated that by 1970 Hospital employment will total 2,300. Based on the existing rate of automobile usage among Hospital

1. See Table 2.

employees, 250 parking spaces will be required to meet Hospital employee needs.

STUDENTS

The projected 1970 full time student enrollment is 7,800 undergraduates and 6,500 graduates. It is anticipated that, of these numbers, an estimated 2,250 full time undergraduates and more than 3,000 graduate students will be commuting from residences outside the University area. These total rounded figures are broken down in Table 9.

It is also estimated that by 1970 the University will have enrolled some 3,500¹ part time undergraduate students and 4,000 part time graduate students.²

If the current percentage of commuting students traveling by automobile remains the same, at 40.7 percent for undergraduates and 59.1 percent for graduate students, then a total of 2,075 student parking spaces will be required. These will accommodate 650 undergraduates and 1,425 graduate student automobiles.³

However, it is possible that increased suburbanization of the population of the Philadelphia area will make public transit unattractive to a higher proportion of commuting students, and that this effect will be most pronounced in the case of undergraduate students. Thus the proportion of undergraduate students commuting by automobile may increase to slightly more than 46 percent. Based on this assumption, 1,043 undergraduates will be

1. Includes "degree," "certificate," and "special" students.

2. Source: University of Pennsylvania Integrated Development Plan, 1962. See pages 66, 67, 68 and 69.

3. See Table 8, "Continuation of Existing Conditions."

TABLE 9. NUMBER OF FULL TIME STUDENTS AND PLACE OF RESIDENCE 1970

PLACE OF RESIDENCE	UNDERGRADUATE ^a			TOTAL GRADUATE	TOTAL STUDENTS
	MEN	WOMEN	TOTAL		
<u>University Area</u>					
University House System	2,900 ^d	1,300 ^d	4,200 ^d	--	4,200 ^d
Fraternities	950	150	1,100	175 ^b	1,275
Graduate Residences	--	--	--	1,066 ^c	1,066
Non-University Housing	250	--	250	2,250 ^c	2,500
Total	4,100 ^d	1,450 ^d	5,550 ^d	3,491	9,041 ^d
<u>Outside University Area</u>					
Commuters	1,300 ^d	950 ^d	2,250 ^d	3,009	5,259 ^d
TOTAL	5,400	2,400	7,800	6,500	14,300

Source: University of Pennsylvania Integrated Development Plan, 1962. See pages 66, 67, 68, 69, and 70 of the Integrated Development Plan.

- a. For degree students only. The number of full time undergraduate "certificate" and "special" students is expected to be negligible.
- b. Breakdown: Existing Law School dormitory 166
Mayer Graduate residence 100
Proposed Graduate students units 800
Total 1,066
- c. Full time 1961-62 graduate and professional student enrollment: 4,500. Approximately half (or 2,250) resided in non-University housing within the University area. It is assumed that the same number will be accommodated in this manner in 1970.
- d. On January 17, 1964, as this report was being prepared for reproduction, the Trustees approved the following changes in the undergraduate residence and commuter goals for 1970:

	Men	Women	Total
University House System	3,200	1,500	4,700
Commuters	1,000	750	1,750

These changes did not affect the total goals for full time undergraduate students.

commuting by automobile in 1970, and a total of 2,165 student parking spaces will be required at that time. These projections are reflected in the assumed demand for parking space presented in Table 8.

Resident students in 1970 will need to have a considerably different pattern of automobile ownership and use than they do at present, if the parking problem is to be kept within reasonable bounds. The above analysis, therefore, assumes that undergraduate students in University owned or controlled housing (dormitories and fraternities) will not be permitted to own or operate automobiles in the University area.¹

It is estimated that slightly more than 43 percent² of the 1,241 full time resident graduate students to be housed in University owned or controlled residences (dormitories and fraternities) will have cars, for a total of 535 automobiles. It is assumed that these spaces will either be provided in on-site off-street parking or within the University's system of terminal parking structures. In addition, it is assumed that graduate students living in housing that is owned or controlled by the University (dormitories or fraternities) will only be permitted to maintain an automobile within the University area when it can be shown that the student has made adequate off-street parking arrangements in either a University or private facility.³

1. See Suggested Policy Considerations, Appendix 5.
2. Nearly 40 percent of the graduate students residing in University owned or controlled housing during 1960-61 had automobiles. See Table 5.
3. See Suggested Policy Considerations, Appendix 5. The above policy anticipates a period when the number of resident graduate student cars may exceed the number of off-street parking spaces available for graduate students residing in University housing.

DAILY VISITORS

The demand for parking by visitors to the University is separable into two parts, constant or daily demand, and special event demand. The first of these, daily demand, is considered in this section. Special event visitor parking needs are discussed in Appendix 2.

A previous study¹ has indicated that the 500 spaces needed by daily visitors at present will increase to 800 by 1970. However, this analysis assumes that it will be possible to accommodate an increase in the number of visitors with less than 500 spaces. Peak commuter demand occurs in the morning, while peak visitor demand occurs during Hospital visiting hours in the afternoon. It is likely that visitors during the morning hours would not require more than half the number of spaces required in the afternoon. The drop in commuter requirements between morning and afternoon should be sufficient to offset the increase in visitor requirements. The figure of 450, as shown in Table 8, has been derived on this basis. Except for special occasions (e.g. convocations, commencement, individually scheduled events), the number of other visitors to the Campus during the regular school day can be accommodated as part of the short-term turnover of spaces in a parking system that has been expanded to take care of the University population's daily needs.

ASSUMPTIONS FOR DETERMINING 1970 PARKING NEED

A differentiation has to be made between parking need, as opposed to demand, before the extent of University responsibility for providing parking facilities can be properly determined.

1. Proposed Off-Street Parking Plan, February 1961.

TABLE 10. PARKING NEED AND ESTIMATED SUPPLY REQUIREMENTS
1970

CLASSIFICATION	ESTIMATED NEEDS ^a	REQUIRED SUPPLY ^a	
		OFF-STREET	OTHER
<u>Commuters</u>			
<u>Students (full time)</u>			
Undergraduate	740	555	185
Graduate	1,425	1,070	355
Faculty	595 ^b	595 ^b	--
Full Time	385	385	--
Part Time			
Employees	760	760	--
University	250	125	125
Hospital			
Total	4,155	3,490	665
Visitors	450	225	225
<u>Students Residing in</u>			
<u>University Housing</u>	535	535	--
Graduate			
TOTAL	5,140	4,250	890

NOTE: This table is based upon the analysis and projection of Transportation Questionnaire data, as described in the text.

- a. Numbers rounded to nearest five.
- b. The projected decrease in full time faculty and administrative staff requirements for off-street parking (compare with Tables 8 and 11) is based upon an assumed increase in the number of residents in the University area. See page 49 and Appendix 5 for discussion of University policy and objectives.

On the basis of previously stated assumptions regarding the automobiles of undergraduate and graduate students, we can begin by making the following deductions from the total 1970 demand shown in Table 8:

Total 1970 demand (Table 8)-----	6,620
Less automobiles in the University area of:	
<u>Residents in University Housing:</u>	
Undergraduates-----	150
Graduates-----	---
<u>Residents in non-University Housing:</u>	
Graduates and Undergraduates-----	<u>1,330</u> ¹ <u>1,480</u>
Remaining estimated need-----	5,140

The remaining estimated need of 5,140, as broken down in Table 10, must now be examined further in light of the most probable degree of University parking facility use -- based upon present experience and assuming the continuation of the present (or a higher) parking fee. On this basis, it is likely that not all commuters will desire to use University facilities. For the purpose of evaluation it is assumed that all of the faculty and employees (other than Hospital employees) will use University facilities, that 75 percent of students will use University facilities, and that 50 percent of Hospital employees and visitors will use University facilities. While these percentages are higher than current experience, they have been selected to reflect several probable changes. Among these are a substantial reduction in on-street parking due to street closings, additional restrictions on the use of the remaining street space, and the increasing acceptance of paid parking.²

1. This figure is derived as follows from Table 8, "Assumed Conditions":

1,865 (1,745 + 120) equals total cars of graduate full and all part time students.
 1,865 less 535 (the cars of graduate students residing in University owned or controlled housing in University area) equals 1,330 (the cars of residents in non-University housing).

2. See Table 7, for comparison with current experience.

The University will, therefore, need to provide 4,250 spaces in its off-street parking program by 1970.¹ In addition, the University population and visitors will make use of 890 other spaces. For these users, 500 on-street spaces are expected to be available adjacent to the University. It is also reasonable to expect that by 1970 a parking program will have been organized for University City in accordance with the suggestion in Appendix 5; and that this will provide accommodations for the overflow demand which will occur during periods of peak activity. In accordance with an injunction of the Philadelphia City Planning Commission, the mention of curb spaces in this analysis does not assume that such spaces are part of the University parking program.²

1965 PARKING NEED

The need for off-street parking spaces in 1965 has been interpolated from the projection for 1970. (See previous analysis and Tables 10 and 11.)

It is likely that by 1965, considering current construction programs, the University will have approximately 2,400 off-street parking spaces available. This will be 600 short of the 3,000 spaces called for in the Development Plan³ and 1,000 short of the estimated requirement at that time. Some of this expected shortage can be handled by use of on-street space. However, it is considered undesirable to rely on curb parking space. If construction that is currently programmed for completion after 1965 can be pushed ahead, 870 spaces would be added to the parking supply and the remaining load could more easily be handled by curb spaces.

1. See Table 10.

2. Letter from Philadelphia City Planning Commission, dated November 3, 1961.

3. Proposed Off-Street Parking Plan, February 1961; "Off-Street Parking Areas — Stage I," page 109.

TABLE 11. PARKING NEED AND ESTIMATED SUPPLY REQUIREMENTS
1965

CLASSIFICATION	ESTIMATED NEED ^a	REQUIRED SUPPLY ^a	
		OFF-STREET	OTHER
<u>Commuters</u>			
<u>Students (full time)</u>	625	470	155
Undergraduate	1,045	785	260
Graduate			
Faculty	725	725	--
Full Time	380	380	--
Part Time			
Employees	640	640	--
University	200	100	100
Hospital			
Total	<u>3,615</u>	<u>3,100</u>	<u>515</u>
<u>Visitors</u>	300	150	150
<u>Students Residing in</u>			
<u>University Housing</u>	150	150	--
Graduate			
TOTAL	<u>4,065</u>	<u>3,400</u>	<u>665</u>

NOTE: This table is based upon the analysis and projection to 1970 of Transportation Questionnaire data, as described in the text.

a. Numbers rounded to nearest five.

PART II

THE UNIVERSITY PARKING SYSTEM

THE UNIVERSITY PARKING SYSTEM

This section reviews the parking system element of the University Development Plan, and suggests modifications and additions based upon the foregoing analysis.

The following assumptions and space and distance standards underlie the University's existing plan for off-street parking and the suggestions presented in this review.

1. The Need for Parking Spaces.

The projected need for parking space in 1965 and 1970, as discussed in Part I, is used as the controlling factor in determining the total number of parking spaces that will have to be provided. This need was estimated for each group of the University population and is presented in previous sections of this report (see Tables 10 and 11 for the detailed breakdown); thus, the suggested parking system is designed to provide 4,250 off-street spaces by 1970 and shows a need for 3,400 spaces by 1965.

2. Distance Standards for Parking Facilities.

All University activities and facilities requiring off-street parking are to be served by a parking structure that is no more than 1,200 feet (5-minute walking time) distant. Facilities with

consistently high off-street parking needs, such as the University Hospital, are to be served by a parking structure that is no more than 800 feet (3-minute walking time) distant.

3. Parking for Spectator Events.

Facilities generating only variable peak visitor parking requirements, such as Franklin Field and the Palestra, are to be within 1,800 feet (7-minute walking time) of a parking structure.

4. Passenger Loading and Unloading.

Passenger loading and unloading facilities are to be provided at such high visitor generators as the University Hospital.

5. Location Considerations for Parking Structures.

Since the limited supply of land accessible and available to the University must be developed intensively and compactly for academic, housing and service programs, and since it would require approximately 28 acres of surface parking to provide for the 4,250 cars that will have to be accommodated by 1970, the majority of the University's off-street parking should be provided in parking structures. The major parking structures are located on the Campus periphery in order to minimize the amount of vehicular traffic within the central Campus area. Wherever possible, parking facilities are placed close to the activities which they directly serve.

6. Surface Parking.

To increase user convenience and to lessen traffic congestion at the central parking terminals, a series of local surface parking facilities are also suggested for development.

7. Peak Visitor Parking.

In order to provide for peak visitor parking demands, the University's supply of required off-street parking spaces must be distributed in relation to a number of generators with varying demand schedules for commuter and visitor parking.

8. Parking Facility Entrances and Exits.

The location, capacity, orientation and placement of the entrances and exits of each parking facility is necessarily related to and limited by the predominant routes and directions of travel used by motorists coming to or leaving the University; and to the direction of traffic movement and the traffic capacities on the bounding streets.

9. Parking as an Entrance to the University.

The importance of the parking structures as entrances to the University precinct and as vital components of the total circulation system is recognized.

10. Parking Facility Description.

Each parking facility in the suggested system is described in terms of type, general location and approximate capacity.

THE PARKING SYSTEM IN 1965

By 1965 it is likely that the University will still fall short, by a considerable amount, of meeting its parking requirements. At present, there are about 1,920 spaces¹ available in the University's off-street parking system. Current construction programs provide for about 490 additional spaces to be added in three locations. (The Thirty-second Street Garage, the Veterinary School and the Social Sciences Center.) In addition, advance property acquisition and building demolition is expected to make about 260 more spaces available in the Social Sciences and Administration areas. Off-setting this, about 300 spaces will be lost, primarily in the 32nd/Walnut/33rd/Sansom Streets block, as a result of construction. Thus a net gain of only 450 spaces can be expected by 1965, for a total of 2,400 spaces. If the 32nd Street Garage is completed by 1965 to its ultimate size, an additional 250 spaces will be made available. With a requirement of 3,400 spaces in 1965, a deficiency of from 750 to 1,000 spaces will continue to exist. However, the completion before 1970 of the Physical Education Facility block (bounded by 37/Walnut/38/Sansom Streets) with its 400 spaces would ease the situation considerably.

THE PARKING SYSTEM IN 1970²

By 1970 the University's parking supply should be capable of meeting the demand for 4,250 off-street spaces. To accomplish this, four major parking terminals and 16 smaller local parking areas will need to be completed between 1965 and 1970.

Only 530 currently existing surface spaces will be available for use in 1970. In addition, 525 existing surface spaces will be

1. This was the number as of the base year 1960-61. As of the time of this publication 1963-64, this number had been increased to 2,091 (see Figure 4).
2. The following description is summarized in Table 12; where, in addition, the suggested 1970 system is compared with the present parking plan (dated February 1961).

absorbed by the multiple level structures that will occupy their sites. By 1970, four major terminals, containing 2,565 parking spaces, and seven local parking areas, containing 989 spaces will have to be acquired or constructed. Three other existing parking facilities will have to be enlarged, to gain an additional 215 spaces.

The seven-level structure to be built at the northwest corner of 32nd and Walnut Streets, will be the University's first major terminal. It will be constructed in two stages and will replace, with increased capacity, the surface parking lot which formerly occupied the block bounded by 32nd, Walnut, 33rd and Sansom Streets. A large part of this terminal may need to be devoted to student parking. In addition, it should be capable of providing for a sizeable portion of faculty and employee requirements in the northeast section of the Campus. The two-level 400-unit structure on the block between 37th and 38th Streets, Walnut to Sansom Streets, will serve a similar role for the northwest portion of the Campus. This structure will provide a partial platform for the physical education facilities to be built on the same block.

The location of the third major terminal is at Curie and Convention Avenues, south of the University Museum. This structure should contain 1,060 spaces for University use. In addition, its capacity may need to be expanded to provide parking facilities for Children's Hospital and other elements of the proposed Tri-Institutional medical center which are to be located within the present Philadelphia General Hospital compound. Most of the 1,060 parking spaces to be provided in this facility will be required by the University Hospital, for both staff and visitor parking.

The fourth major parking terminal is the five-level 500-unit structure in the southwest portion of the Campus, between the

TABLE 12. SUGGESTED 1970 PARKING SYSTEM
(AS COMPARED WITH 2/61 PARKING PLAN)

Approximate Size and Type of Facility

FACILITY NUMBER	GENERAL LOCATION	NUMBER OF SPACES	
		SUGGESTED BY THIS ANALYSIS	2/61 PARKING PLAN
1	North side of Walnut, 37th to 38th -- structure under Physical Education Facilities	400	400
2	Northwest corner 32nd and Walnut -- 7 level structure	605	600
3	South side of Locust, West of 40th -- Dental School under rear half of addition	120	120
4	East side of 39th, south of Walnut -- Fels Institute parking lot	20	10
5	South side of Walnut, between 37th and 38th -- under Social Sciences Center courtyards	180	140
6	South side of Walnut, between Annenberg School and Faculty Club	40	40
7	East side of 36th, between Walnut and Locust Streets (eliminated)	20 ^a	80
8	North side of Spruce, between 37th and 38th Streets -- under Social Sciences expansion courtyards	230	120
9	East of Squash Courts and along Franklin Field Arcade	75	70
10	South side of Delancey, west of 39th -- Allied Medical Professions courtyard	15	15
11	East side of 39th, south of Spruce -- Veterinary School expansion courtyard	50	40
12	East side of University Avenue south of Hamilton Walk -- 5 level structure	500	350

13	36th, south of Spruce -- Medical School courtyard	15	15
14	Hamilton Walk, west of 34th -- Hospital parking lot	110	110
15	Southwest corner of South Street and Convention Avenue	180	180
16	Convention Avenue and 34th -- structure behind University Museum (additional spaces may be needed for elements of the Tri-Institutional medical center)	1,060	500
17	West side of 38th, north of Spruce -- graduate student housing	150	b
18	North side of Walnut, east and/or west of 36th	80	350
19	North side of Spruce, east of 36th -- under Hare Building replacement (eliminated)	--	60
20	West side of 33rd, north of Spruce -- under courtyard between replacement for present Fine Arts Building and new Chemistry Laboratory	100	100
21	Additional parking for other graduate student housing	300 ^c	b
	TOTAL	4,250 ^d	3,300 ^d

Source: Proposed Off-Street Parking Plan, February 1961, Table XXVI, P. 119.

- a. Future University development will require that these surface parking spaces be eliminated.
- b. Footnote in Proposed Off-Street Parking Plan, February 1961, Table XXVI, p. 119: "The quantity of spaces required (by the Graduate Housing Center) will depend on the number of housing units built and the standard followed by the University in providing this type of parking."
- c. See explanation on page 70.
- d. The parking lot serving the University Museum with 90 spaces is not included in this figure.

Botanical Garden and University Avenue. This structure, largely cut into the hillside, may serve as a platform for the location of facilities serving the University's medical affairs activities. The parking spaces in this terminal will serve the portion of the Campus that includes the Medical Schools, Biological Sciences, Veterinary School, Allied Medical Professions, Dental School, Social Sciences, and Graduate Student Residences.

The seven new local parking areas will serve various functions, as do existing local parking areas. Some will be designed to serve specific facilities on the Campus, while others will be for the purpose of providing parking in the central Campus area where a major terminal is impractical. The first new local parking area is the surface lot located between the Faculty Club and the Annenberg School of Communications, which is serving these two facilities. This lot currently has a rated capacity of 20 spaces. It is assumed that a more efficient use of the existing space may double this capacity. The Social Sciences Center, because of the availability of several large courtyards, will provide a considerable amount of space in the western end of the future central Campus super block.¹ The Center's first stage provides for 80 spaces underneath the northeast courtyard at 37th and Walnut Streets. It is to be hoped that either the 100 spaces planned under the northwest courtyard (38th and Walnut Streets) or the 250 spaces shown for the south portion of the Center (between Spruce and Locust Streets) can be made available in the not too distant future.

Fifty spaces will be provided in the courtyard between the present Veterinary School and its new wing. This area will be for the use

1. The Social Science Center area is bounded by 37th, Spruce, 38th and Walnut Streets. The future central Campus superblock will be bounded by 34th, Spruce, 38th and Walnut Streets, with all existing streets within this area converted to walkways.

of the School. The new Administration and General Services Center will also require parking for its own use. It is expected that 20 surface spaces will be provided as part of this Center's first stage. An additional 60 spaces should be provided during later construction to serve this area of the Campus.

At the time the building currently occupied by the School of Fine Arts is replaced, 100 spaces should be provided under the open area between the new building and the Chemistry Laboratories. The entrance to these spaces should be from 33rd Street.

Several of the present local parking areas which will be affected by University development are as follows: First, it may be possible to double the capacity of the lot behind the Fels Institute of Local and State Government by a more efficient use of existing space. One of the two existing lots on 36th Street, south of Walnut, will be eliminated as part of the Graduate Library project. This will result in a loss of 20 existing spaces. The second 36th Street lot contains 20 spaces and will continue to be used for the central Campus area. Future University development may, however, require that this parking lot also be eliminated. Parking for the Graduate Student Residence Center should be expanded to meet the ultimate needs of that area. Its design and exact location will depend on the size and design of the housing area to be located on the block bounded by 38th, Spruce, 39th and Locust Streets. Finally, the parking facilities for the Dental School should be increased from the present 35 spaces to 120 spaces as part of the School's expansion program.

A small amount of parking will also need to be provided for visitors and some resident faculty members, within the sites for undergraduate housing.

Graduate and professional fraternities should be required to provide off-street parking for the automobiles owned by their residents.

Based upon a conservative projection of current automobile ownership among graduate students and the University's program for graduate housing, an estimated 525 parking spaces will need to be provided for resident graduate students by 1970. Of this total, 150 have been located in the Graduate Student Residence Center and 75 have been distributed among other terminals and surface parking areas in accordance with the standards identified at the beginning of this chapter. The remaining 300 spaces cannot easily be added to the large terminals or fitted in elsewhere on Campus without further study, because of the high densities and parking capacities made necessary by other University activities. For this reason, the parking system suggested by this analysis assumes (1) that the additional 300 spaces will be provided by the University in other parking facilities still to be designated on the Campus Plan, (2) that these spaces will be provided through the University City parking program,¹ or (3) that the additional 300 spaces will be provided by some combination of the two.

Considering the cost of providing off-street spaces, the University may finally choose to prohibit all resident graduate students from bringing automobiles to the Campus area unless they can make adequate arrangements for off-street parking.² As with other elements of the parking program, the University's obligation and ability to provide the necessary number of spaces for graduate student automobiles should be reviewed periodically, in terms of University control policies, the most up-to-date

1. See Appendix 5.

2. See suggested policy in Appendix 5.

figures on anticipated need, and the coordinated development program for the Campus and its environs.

ESTIMATED CAPITAL COSTS

This section presents the estimated capital cost of providing the off-street parking facilities required by 1970. Table 13 identifies each suggested facility and its estimated capital cost.

Of the 4,250 off-street spaces required by 1970, 475 are located in existing (1961-62) parking lots and 3,775 will be either located in large parking structures or provided in local parking areas associated with new construction.

The estimated capital costs do not include the cost of land acquisition. This exclusion is considered to be valid for two reasons:

1. Three of the sites (#2, #12 and #16 on Figure 7) upon which major parking structures are proposed, are already owned by the University.
2. The remaining proposed parking structure (#1 on Figure 7) will serve as a platform for buildings housing other University activities.

Although land costs are not calculated as part of the ultimate cost of any University parking facility, the parking program will be involved in the land acquisition process.

It is assumed (for the purpose of calculation) that the average cost of providing an off-street parking space in a structure

at the present time is \$3,000.¹ On this basis, to meet the University's total essential off-street parking needs (large structures and local parking areas) an estimated capital expenditure of \$11,099,000 will be required by 1970.²

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1. In two areas, where only paving is required, a cost of \$200 per space is assumed.
 2. In terms of 1963-64 construction costs.

TABLE 13. SUGGESTED 1970 PARKING SYSTEM
ESTIMATED CAPITAL COSTS

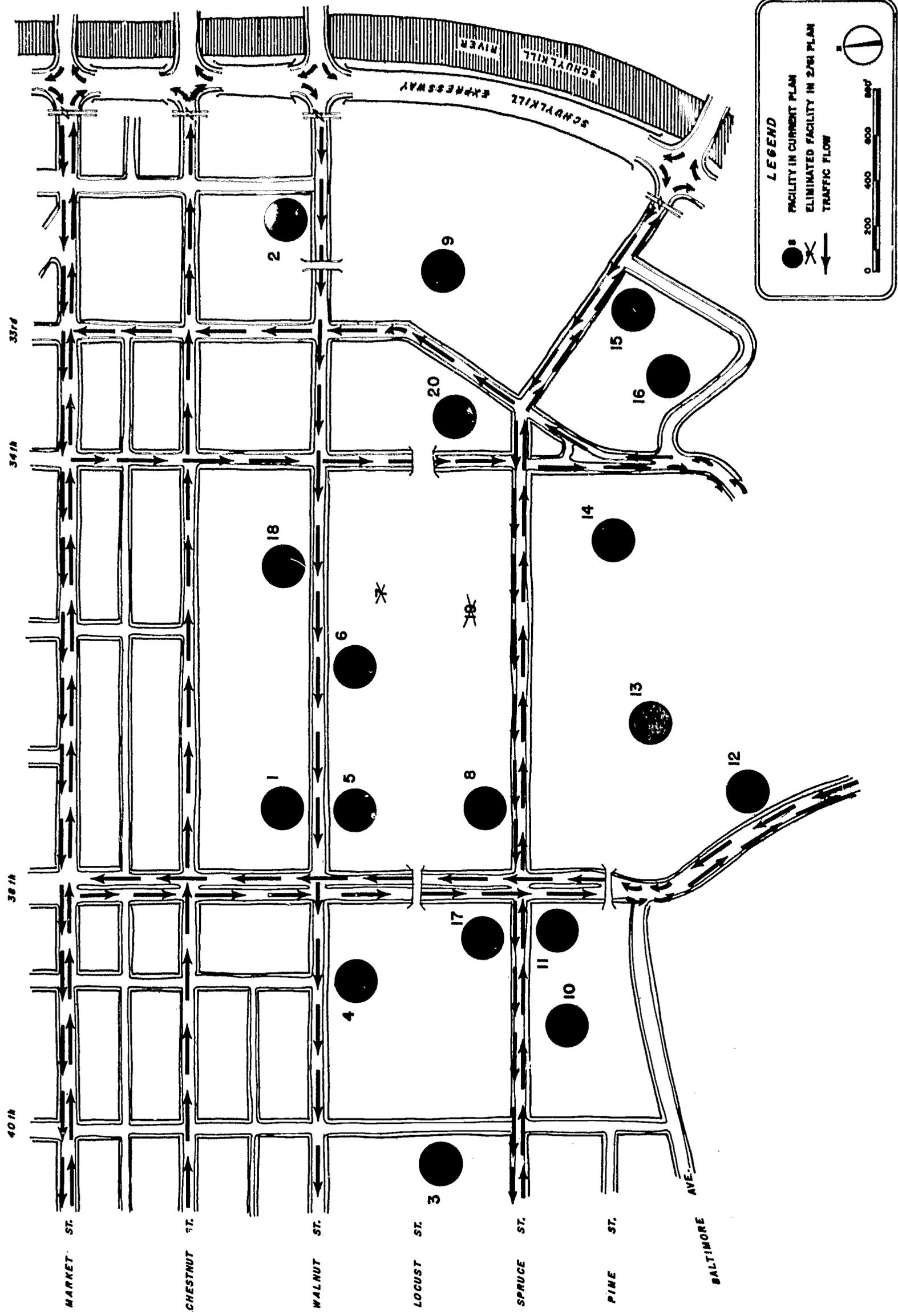
(As Compared with 2/61 Parking Plan)

FACILITY NUMBER	EXISTING SPACES	ADDITIONAL OR RECONSTRUCTED SPACES	ESTIMATED CAPITAL COST	
			SPACES SUGGESTED BY THIS ANALYSIS FOR 1970 ^b	2/61 PARKING PLAN
1	--	400	\$ 1,200,000	\$ 1,200,000
2	--	605	1,815,000	1,800,000
3	--	120	360,000	360,000
4	10	10	--	--
5	--	180	540,000	420,000
6	20	20 ^a	4,000	120,000
7	20	--	--	240,000
8	--	230	690,000	360,000
9	75	--	--	--
10	15	--	--	--
11	--	50 ^a	10,000	120,000
12	--	500	1,500,000	1,050,000
13	15	--	--	--
14	110	--	--	--
15	180	--	--	--
16	--	1,060	3,180,000	1,500,000
17	30	120	360,000	--
18	--	80	240,000	1,050,000
19	--	--	--	180,000
20	--	100	300,000	300,000
21	--	300	900,000	--
TOTAL	475	3,775	\$11,099,000	\$ 8,700,000

Source: Proposed Off-Street Parking Plan, February 1961, Appendix D, Table IV, p. 25.

a. Surface paving.

b. Estimated 1963-64 construction cost.



("Current Plan" refers to existing parking elements of Development Plan recommended for retention as described in text.)

Figure 7. Location of University Off-Street Parking Areas, 1970

APPENDICES

- 1 SOURCES OF INFORMATION AND ANALYTIC
METHODS USED IN THE DETERMINATION OF
PARKING REQUIREMENTS
- 2 SPECIAL EVENT VISITORS
- 3 MOTOR VEHICLE REGISTRATION AND CONTROL
- 4 EXPLANATION OF TERMS USED
- 5 SUGGESTED POLICY CONSIDERATIONS

APPENDIX 1

Sources of Information and Analytic Methods Used in the Determination of Parking Requirements

The basic source of information used in the preparation of this analysis was the transportation survey conducted by the University Planning Office. This survey consisted of questionnaires that were distributed to all students, faculty and employees of the University during the 1960-61 academic year.¹ The reply rate was very high for this type of survey, being approximately 51 percent. From the questionnaires returned, a sample was drawn which was stratified by classification of respondent. For all population groups taken together, the sample rate was approximately 18 percent. Varying sample rates were used for different segments of the University population, the exact rate depending on the size of the group and the amount of stratification within it. Response and sample rates for the four population groups used are shown in Table 14.

While most of the analytic procedures used in the preparation of this report are self-evident, certain procedural judgements were

1. See Figures 8(a) through 8(f).

UNIVERSITY OF PENNSYLVANIA
University Planning Office
3025 Walnut Street
Philadelphia 4, Pennsylvania

TO: ALL FACULTY AND STAFF MEMBERS

The University is assembling information about the transportation and parking needs of its faculty and staff, as part of the continuing planning and development programs.

For this reason, your cooperation in answering the attached questionnaire will be most appreciated.

Please return the completed questionnaire to the University Planning Office, as promptly as possible, in the enclosed, self-addressed envelope.

HAROLD TAUBIN
Director

HT:ld

Encl.

(A similar letter was transmitted to University employees, and, by the Director of University Hospital, Elizabeth C. Berrang, to Hospital Employees.)

Figure 8(a). Questionnaire Letter of Transmittal to Faculty and Staff Members

STUDENT TRANSPORTATION QUESTIONNAIRE

UNIVERSITY OF PENNSYLVANIA

1960-61 ACADEMIC YEAR

The present shortage of parking spaces at the University of Pennsylvania affects the entire University community. Adequate provision for parking facilities in the University's development program will require accurate information about the parking and transportation needs of students, faculty, and staff. The University Planning Office appreciates your cooperation in answering the relevant questions below.

1. Student Status

All students: Please answer either A or B

A. Full-time Students (check one)

- (1) Undergraduate - Degree or Associate Degree
- (2) Undergraduate - Certificate (e.g., Oral Hygiene)
- (3) Undergraduate - Special
- (4) Professional (Dental, Grad. Medical, Law, Medical, Veterinary)
- (5) Graduate (Allied Med. Profs, Arts & Sci, Comm, Education, Fine Arts, Engineering, Social Work, Wharton)

B. Part-time Students (check one)

- (6) Undergraduate - Degree or Associate Degree
- (7) Undergraduate - Certificate (e.g., Vocational Education)
- (8) Undergraduate - Special
- (9) Professional (Dental, Grad. Medical, Law, Medical, Veterinary)
- (10) Graduate (Arts & Sci, Comm, Educa, Eng, Fine Arts, Social Work, Wharton)

2. During the 1960-61 school year will you be living within walking distance of the Campus? (check one)

- (1) Yes (IF "Yes" please do not answer Question #4)
- (2) No (IF "No" please do not answer Question #3)

3. Students living within walking distance of the Campus during the 1960-61 school year, please answer both A and B.

A. Type of accommodation in which you live (or expect to live) during the 1960-61 school year (check one).

- (1) University Dormitory
- (2) Fraternity or Sorority
- (3) Rooming House, Apartment or Private House

B. Will you have regular use of an automobile during the 1960-61 school year?

- (1) Yes
- (2) No

4. Students living beyond walking distance of the Campus during the 1960-61 school year, please answer A, B and C.

A. What is your most usual means of transportation to the University? (check one)

- (1) Commuter Railroad
- (2) Mass Transit (subway, bus, trolley)
- (3) Automobile

B. Do you ever come to the University by any other means? If so, what means and how often?

C. If you come by automobile, does anyone else usually come to the University in this car? (check one)

- (1) Yes
- (2) No.

(OVER)

Figure 8(c). Student Transportation Questionnaire

5. All Students: Please answer both A and B

A. Do you usually come to the University from (check one):

- (1) Residence
 (2) Place of work
 (3) Other (Please explain) _____

B. When you leave the University do you usually go to (check one):

- (1) Residence
 (2) Place of work
 (3) Other (Please explain) _____

6. All Students: Please check on the list below the location of the place from which you usually come directly to the University, and the location of the place to which you usually go directly from the University. (The map attached to this questionnaire is provided for your convenient reference).

<u>COME FROM:</u> (Place located in)	<u>University Area</u>	<u>GO TO:</u> (Place located in)
_____	1. Within walking distance of the Campus.	1. _____
	<u>Other Areas Within Philadelphia</u>	
_____	2. West Philadelphia - north of Market St.	2. _____
_____	3. West Philadelphia - south of Market St.	3. _____
_____	4. South Philadelphia - below South St.	4. _____
_____	5. Center City - between South & Vine Sts.	5. _____
_____	6. Lower North Philadelphia - between Vine St. and Allegheny Ave.	6. _____
_____	7. Upper North Philadelphia - Nicetown, Logan, Oak Lane	7. _____
_____	8. Roxborough-Manayunk - between Fairmount Park and the Schuylkill River	8. _____
_____	9. Northwest Philadelphia - Chestnut Hill, Mt. Airy, Germantown, West Oak Lane	9. _____
_____	10. Near Northeast - between Allegheny Ave., Front St. & Rhawn St.	10. _____
_____	11. Far Northeast - between Rhawn St. & northern limits of Philadelphia	11. _____
	<u>Suburbs - Northern</u>	
_____	12. Bucks County	12. _____
_____	13. Eastern Montgomery County - e.g., Horsham, Willow Grove, Wyncote, Elkins Park, Ambler, Norristown	13. _____
_____	14. Upper Montgomery County - e.g., North Wales, Lansdale, Colledgeville	14. _____
	<u>Suburbs - Western</u>	
_____	15. Southern Montgomery County (Upper & Lower Merion Townships) - e.g., Gulph Mills, Gladwyne, Narberth, Merion, Bala-Cynwyd	15. _____
_____	16. Northeast Delaware County - e.g., Wayne, Radnor, Broomall, Lawrence Park	16. _____
_____	17. Eastern Delaware County - e.g., Upper Darby, Drexel Hill, Lansdowne, Swarthmore, Ridley Park	17. _____
_____	18. Western Delaware County - e.g., Chester, Media	18. _____
_____	19. Chester County	19. _____
	<u>Suburbs - Delaware</u>	
_____	20. Delaware - e.g., Wilmington	20. _____
	<u>Suburbs - New Jersey</u>	
_____	21. Camden City	21. _____
_____	22. Rest of Camden County	22. _____
_____	23. Burlington County	23. _____
_____	24. Gloucester County	24. _____
_____	25. Remainder of New Jersey	25. _____
	<u>Other Areas</u>	
_____	26. Maryland	26. _____
_____	27. New York	27. _____

Figure 8(c). (Continued)

FACULTY AND STAFF TRANSPORTATION QUESTIONNAIRE
UNIVERSITY OF PENNSYLVANIA, 1960-61 ACADEMIC YEAR

1. University Rank (Please answer either A or B)

A. Full-time at University (Check one)

- (1) Emeritus Professor
- (2) Full Professor, Associate Professor, Assistant Professor
- (3) Associate, Instructor, Assistant Instructor
- (4) Other Academic Staff (Lecturer, Fellow, Research Investigator)
- (5) Senior Administrative Officer, Administrative Staff
- (6) Professional Staff (e.g. Coach, Curator, Librarian)

B. Part-time at University (check one)

- (1) Emeritus Professor
- (2) Full Professor, Associate Professor, Assistant Professor
- (3) Associate, Instructor, Assistant Instructor
- (4) Other Academic Staff (Lecturer, Fellow, Research Investigator)
- (5) Senior Administrative Officer, Administrative Staff
- (6) Professional Staff (e.g. Coach, Curator, Librarian)

2. Are you presently living within walking distance of the Campus?

- (1) Yes (If "Yes" please omit question #3)
- (2) No

FACULTY AND STAFF PRESENTLY LIVING BEYOND WALKING DISTANCE OF THE CAMPUS, please answer question #3.

3. A. What is your most usual means of transportation to the University? (Check one)

- (1) Commuter railroad
- (2) Mass transit (subway, bus, trolley)
- (3) Automobile

B. If you come by automobile, does anyone else usually come to the University in this car?

- (1) Yes
- (2) No

C. Do you ever come to the University by any other means than checked in question #3A? If so, what means and how often?

ALL FACULTY AND STAFF

4. Please check in the table below the periods during which you are usually at the University.

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Morning							
Early afternoon							
Late afternoon							
Evening							

5. In what building is your principal University Office? _____

6. Do you usually come to the Campus from (check one):

- (1) Residence
- (2) Place of work (other than Campus)
- (3) Other (Please explain) _____

7. When you leave the Campus do you usually go to (check one):

- (1) Residence
- (2) Place of work (other than Campus)
- (3) Other (please explain) _____

(OVER)

Figure 8(d). Faculty and Staff Transportation Questionnaire

8. Please check on the list below the location of the place from which you usually come directly to the Campus, and the location of the place to which you usually go directly when you leave the Campus. (The map attached to this questionnaire is provided for your convenient reference.)

<u>USUALLY COME FROM</u> (Place located in)	<u>University Area</u>	<u>USUALLY GO TO</u> (Place located in)
<input type="checkbox"/> 1. Within walking distance of the Campus		1. <input type="checkbox"/>
<u>Other Areas Within Philadelphia</u>		
<input type="checkbox"/> 2. West Philadelphia - north of Market St.		2. <input type="checkbox"/>
<input type="checkbox"/> 3. West Philadelphia - south of Market St.		3. <input type="checkbox"/>
<input type="checkbox"/> 4. South Philadelphia - below South St.		4. <input type="checkbox"/>
<input type="checkbox"/> 5. Center City - between South & Vine Sts.		5. <input type="checkbox"/>
<input type="checkbox"/> 6. Lower North Philadelphia - between Vine St. and Allegheny Ave.		6. <input type="checkbox"/>
<input type="checkbox"/> 7. Upper North Philadelphia - Nicetown, Logan, Oak Lane		7. <input type="checkbox"/>
<input type="checkbox"/> 8. Roxborough-Manayunk - between Fairmount Park and the Schuylkill River		8. <input type="checkbox"/>
<input type="checkbox"/> 9. Northwest Philadelphia - Chestnut Hill, Mr. Airy, Germantown, West Oak Lane		9. <input type="checkbox"/>
<input type="checkbox"/> 10. Near Northeast - between Allegheny Ave., Front Street & Rhawn Street		10. <input type="checkbox"/>
<input type="checkbox"/> 11. Far Northeast - between Rhawn St. & northern limits of Philadelphia		11. <input type="checkbox"/>
<u>Suburbs - Northern</u>		
<input type="checkbox"/> 12. Bucks County		12. <input type="checkbox"/>
<input type="checkbox"/> 13. Eastern Montgomery County - e.g., Horsham, Willow Grove, Wyncote, Elkins Park, Ambler, Norristown		13. <input type="checkbox"/>
<input type="checkbox"/> 14. Upper Montgomery County - e.g., North Wales, Lansdale, Collegeville		14. <input type="checkbox"/>
<u>Suburbs - Western</u>		
<input type="checkbox"/> 15. Southern Montgomery County (Upper & Lower Merion Townships) - e.g., Gulph Mills, Gladwyne, Narberth, Merion, Bala-Cynwyd		15. <input type="checkbox"/>
<input type="checkbox"/> 16. Northeast Delaware County - e.g., Wayne, Radnor, Broomall, Lawrence Park		16. <input type="checkbox"/>
<input type="checkbox"/> 17. Eastern Delaware County - e.g., Upper Darby, Drexel Hill, Lansdowne, Swarthmore, Ridley Park		17. <input type="checkbox"/>
<input type="checkbox"/> 18. Western Delaware County - e.g., Chester, Media		18. <input type="checkbox"/>
<input type="checkbox"/> 19. Chester County		19. <input type="checkbox"/>
<u>Suburbs - Delaware</u>		
<input type="checkbox"/> 20. Delaware - e.g., Wilmington		20. <input type="checkbox"/>
<u>Suburbs - New Jersey</u>		
<input type="checkbox"/> 21. Camden City		21. <input type="checkbox"/>
<input type="checkbox"/> 22. Rest of Camden County		22. <input type="checkbox"/>
<input type="checkbox"/> 23. Burlington County		23. <input type="checkbox"/>
<input type="checkbox"/> 24. Gloucester County		24. <input type="checkbox"/>
<input type="checkbox"/> 25. Remainder of New Jersey		25. <input type="checkbox"/>
<u>Other Areas</u>		
<input type="checkbox"/> 26. Maryland		26. <input type="checkbox"/>
<input type="checkbox"/> 27. New York		27. <input type="checkbox"/>

9. Do you regularly (at least four times a month) go directly from the Campus to a place other than the one you have checked in question #7?

- (1) Yes
(2) No

10. Please check your age group: (1) 20-29, (2) 30-39, (3) 40-49, (4) 50-59, (5) 60 and over.

Figure 8(d). (Continued)

**EMPLOYEE TRANSPORTATION QUESTIONNAIRE
UNIVERSITY OF PENNSYLVANIA, 1960-61 ACADEMIC YEAR**

1. Position at the University (check one)

- (1) General Office (for example: Clerical, Financial, Office Equipment, Secretarial, Stockkeepers, Athletics, Houston Hall Stores).
- (2) Technical (for example: Animal Research, Computing and Electronic Operations, Dental, Medical and Physical Laboratories, Photographic, Social Service).
- (3) Maintenance and Physical Plant (for example): Drafting, Estimating, Horticulture, Mechanical and Skilled Trades, Physical Plant Planning, Printing Operations, Security, Custodial).
- (4) Dining, Mail and Telephone Services
- (5) Library or Museum.

2. Are you presently living within walking distance of the Campus?

- (1) Yes (If "Yes" please omit question #3)
- (2) No

EMPLOYEES PRESENTLY LIVING BEYOND WALKING DISTANCE OF THE CAMPUS, please answer question #3.

3. A. What is your most usual means of transportation to the University? (Check one)

- (1) Commuter railroad
- (2) Mass transit (subway, bus, trolley)
- (3) Automobile

B. If you come by automobile, does anyone else usually come to the University in this car?

- (1) Yes
- (2) No

C. Do you ever come to the University by any other means than checked in question #3A? If so, what means and how often?

ALL EMPLOYEES

4. Please check in the table below the periods during which you are usually at the University.

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Morning							
Early afternoon							
Late afternoon							
Evening							

5. In what building is your main place of work? _____

6. Do you usually come to the Campus from (check one):

- (1) Residence
- (2) Place of work (other than Campus)
- (3) Other (Please explain) _____

7. When you leave the Campus do you usually go to (check one):

- (1) Residence
- (2) Place of work (other than Campus)
- (3) Other (please explain) _____

(OVER)

Figure 8(e). University Employee Transportation Questionnaire
(Excluding Hospital Employees)

8. Please check on the list below the location of the place from which you usually come directly to the Campus, and the location of the place to which you usually go directly when you leave the Campus. (The map attached to this questionnaire is provided for your convenient reference.)

<u>USUALLY COME FROM</u> (Place located in)	<u>University Area</u>	<u>USUALLY GO TO</u> (Place located in)
<input type="checkbox"/> 1.	Within walking distance of the Campus	1. <input type="checkbox"/>
<u>Other Areas Within Philadelphia</u>		
<input type="checkbox"/> 2.	West Philadelphia - north of Market St.	2. <input type="checkbox"/>
<input type="checkbox"/> 3.	West Philadelphia - south of Market St.	3. <input type="checkbox"/>
<input type="checkbox"/> 4.	South Philadelphia - below South St.	4. <input type="checkbox"/>
<input type="checkbox"/> 5.	Center City - between South & Vine Sts.	5. <input type="checkbox"/>
<input type="checkbox"/> 6.	Lower North Philadelphia - between Vine St. and Allegheny Ave.	6. <input type="checkbox"/>
<input type="checkbox"/> 7.	Upper North Philadelphia - Nicetown, Logan, Oak Lane	7. <input type="checkbox"/>
<input type="checkbox"/> 8.	Roxborough-Manayunk - between Fairmount Park and the Schuylkill River	8. <input type="checkbox"/>
<input type="checkbox"/> 9.	Northwest Philadelphia - Chestnut Hill, Mt. Airy, Germantown, West	9. <input type="checkbox"/>
<input type="checkbox"/> 10.	Near Northeast - between Allegheny Ave., Front Street & Rhawn Street	10. <input type="checkbox"/>
<input type="checkbox"/> 11.	Far Northeast - between Rhawn St. & northern limits of Philadelphia	11. <input type="checkbox"/>
<u>Suburbs - Northern</u>		
<input type="checkbox"/> 12.	Bucks County	12. <input type="checkbox"/>
<input type="checkbox"/> 13.	Eastern Montgomery County - e.g., Horsham, Willow Grove, Wyncote, Elkins Park, Ambler, Norristown	13. <input type="checkbox"/>
<input type="checkbox"/> 14.	Upper Montgomery County - e.g., North Wales, Lansdale, Collegeville	14. <input type="checkbox"/>
<u>Suburbs - Western</u>		
<input type="checkbox"/> 15.	Southern Montgomery County (Upper & Lower Merion Townships) - e.g., Gulph Mills, Gladwyne, Narberth, Merion, Bala-Cynwyd	15. <input type="checkbox"/>
<input type="checkbox"/> 16.	Northeast Delaware County - e.g., Wayne, Radnor, Broomall, Lawrence Park	16. <input type="checkbox"/>
<input type="checkbox"/> 17.	Eastern Delaware County - e.g., Upper Darby, Drexel Hill, Lansdowne, Swarthmore, Ridley Park	17. <input type="checkbox"/>
<input type="checkbox"/> 18.	Western Delaware County - e.g., Chester, Media	18. <input type="checkbox"/>
<input type="checkbox"/> 19.	Chester County	19. <input type="checkbox"/>
<u>Suburbs - Delaware</u>		
<input type="checkbox"/> 20.	Delaware - e.g., Wilmington	20. <input type="checkbox"/>
<u>Suburbs - New Jersey</u>		
<input type="checkbox"/> 21.	Camden City	21. <input type="checkbox"/>
<input type="checkbox"/> 22.	Rest of Camden County	22. <input type="checkbox"/>
<input type="checkbox"/> 23.	Burlington County	23. <input type="checkbox"/>
<input type="checkbox"/> 24.	Gloucester County	24. <input type="checkbox"/>
<input type="checkbox"/> 25.	Remainder of New Jersey	25. <input type="checkbox"/>
<u>Other Areas</u>		
<input type="checkbox"/> 26.	Maryland	26. <input type="checkbox"/>
<input type="checkbox"/> 27.	New York	27. <input type="checkbox"/>

9. Do you regularly (at least four times a month) go directly from the Campus to a place other than the one you have checked in question #7?

- (1) Yes
 (2) No

10. Please check your age group: (1) under 20, (2) 20-29, (3) 30-39, (4) 40-49, (5) 50-59, (6) 60 and over.

Figure 8(e). (Continued)

**EMPLOYEE TRANSPORTATION QUESTIONNAIRE
HOSPITAL OF THE UNIVERSITY OF PENNSYLVANIA
1960-61 ACADEMIC YEAR**

1. A. Employee Status at the Hospital (check one)

- (1) Full-time employee
(2) Part-time employee

B. Position at the Hospital

- (1) Administrative staff
(2) Intern
(3) Nursing (Professional and Non-Professional)
(4) Therapists and Technicians (for example: Physical and Occupational Therapists, Social Service, Medical Laboratory, Pharmacy, X-Ray)
(5) General Office (for example: Admissions, Business, Information, Library, Mail and Telephone, Medical Records, Tabulating)
(6) Maintenance and Plant Operation (for example: Mechanical and Trades, Security)
(7) Housekeeping and Dietary (for example: Food Service, Custodial, Laundry)

2. Are you presently living within walking distance of the Hospital:

- (1) Yes (If "Yes" please omit question #3)
(2) No

EMPLOYEES PRESENTLY LIVING BEYOND WALKING DISTANCE OF THE HOSPITAL, please answer question #3.

3. A. What is your most usual means of transportation to the Hospital? (Check one)

- (1) Commuter railroad
(2) Mass transit (subway, bus, trolley)
(3) Automobile

B. If you come by automobile, does anyone else usually come to the Hospital in this car?

- (1) Yes
(2) No

C. Do you ever come to the Hospital by any other means than checked in question #3A? If so, what means and how often?

EMPLOYEES

4. Please check in the table below the periods during which you are usually at the Hospital.

	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Morning (8 A.M. - 12 noon)							
Early Afternoon (12 A.M. - 4 P.M.)							
Late Afternoon (4 P.M. - 8 P.M.)							
Evening (8 P.M. - 12 Midnight)							
Night (12 Midnight - 8 A.M.)							

5. Do you usually come to the Hospital from (check one):

- (1) Residence
(2) Place of work (other than Hospital)
(3) Other (Please explain) _____

6. When you leave the Hospital do you usually go to (check one):

- (1) Residence
(2) Place of work (other than Hospital)
(3) Other (please explain) _____

(OVER)

Figure 8(f). Hospital Employee Transportation Questionnaire

7. Please check on the list below the location of the place from which you usually come directly to the Hospital, and the location of the place to which you usually go directly when you leave the Hospital.

<u>USUALLY COME FROM</u> (Place located in)	<u>University Area</u>	<u>USUALLY GO TO</u> (Place located in)
___ 1. Within walking distance of the Hospital		1. ___
<u>Other Areas Within Philadelphia</u>		
___ 2. West Philadelphia - north of Market St.		2. ___
___ 3. West Philadelphia - south of Market St.		3. ___
___ 4. South Philadelphia - below South St.		4. ___
___ 5. Center City - between South & Vine Sts.		5. ___
___ 6. Lower North Philadelphia - between Vine St. & Allegheny Ave.		6. ___
___ 7. Upper North Philadelphia - Nicetown, Logan, Oak Lane		7. ___
___ 8. Roxborough-Manayunk - between Fairmount Park and the Schuylkill River		8. ___
___ 9. Northwest Philadelphia - Chestnut Hill, Mt. Airy, Germantown, West Oak Lane		9. ___
___ 10. Near Northeast - between Allegheny Ave., Front Street and Rhawn Street		10. ___
___ 11. Far Northeast - between Rhawn St. & northern limits of Philadelphia		11. ___
<u>Suburbs - Northern</u>		
___ 12. Bucks County		12. ___
___ 13. Eastern Montgomery County - e.g., Horsham, Willow Grove, Wyncote, Elkins Park, Ambler, Norristown		13. ___
___ 14. Upper Montgomery County - e.g., North Wales, Lansdale, Collegeville		14. ___
<u>Suburbs - Western</u>		
___ 15. Southern Montgomery County (Upper & Lower Merion Townships) - e.g., Gulph Mills, Gladwyne, Narberth, Merion, Bala-Cynwyd		15. ___
___ 16. Northeast Delaware County - e.g., Wayne, Radnor Broomall, Lawrence Park		16. ___
___ 17. Eastern Delaware County - e.g., Upper Darby, Drexel Hill, Lansdowne, Swarthmore, Ridley Park		17. ___
___ 18. Western Delaware County - e.g., Chester, Media		18. ___
___ 19. Chester County		19. ___
<u>Suburbs - Delaware</u>		
___ 20. Delaware - e.g., Wilmington		20. ___
<u>Suburbs - New Jersey</u>		
___ 21. Camden City		21. ___
___ 22. Rest of Camden County		22. ___
___ 23. Burlington County		23. ___
___ 24. Gloucester County		24. ___
___ 25. Remainder of New Jersey		25. ___
<u>Other Areas</u>		
___ 26. Maryland		26. ___
___ 27. New York		27. ___

8. Do you regularly (at least four times a month) go directly from the Hospital to a place other than the one you have checked in question #6.

- (1) Yes
 (2) No

9. Please check your age group: (1) Under 20, (2) 20-29, (3) 30-39, (4) 40-49, (5) 50-59, (6) 60 and over.

10. How much time do you usually spend traveling to and from the University Hospital daily? (Total time for both directions).

Circle closest time (hours) $\frac{1}{2}$ 1 $1\frac{1}{2}$ 2 $2\frac{1}{2}$ 3 $3\frac{1}{2}$ 4 4+

Figure 8(f). (Continued)

TABLE 14. RESPONSE TO 1960-61 TRANSPORTATION QUESTIONNAIRE

CATEGORY	NUMBER OF PERSONS AT TIME OF SAMPLE	NUMBER OF QUESTIONNAIRES RETURNED	RESPONSE RATE	NUMBER OF QUESTIONNAIRES SAMPLED	SAMPLE RATE
Students	16,918	8,404	.497	2,537	.150
Faculty	3,495	1,936	.554	841	.241
Employees:					
University	2,408	1,350	.561	681	.283
Hospital	1,495	835	.559	336	.225
Survey Universe	24,316	12,525	.515	4,395	.181

made to ease data handling or were the result of some deficiencies in the available information. The following paragraphs describe the more crucial judgements which needed to be made.

Although both the trip to the University and the trip from the University were recorded on the questionnaire, it was decided to work with only the trip from the University (i.e., destination) in analyzing the non-University locations of trip ends. Checks of the data showed a very close correspondence, in terms of geographical location, between the two sets of trip ends. This experience is similar to that reported by origin-destination studies in other cities. The designation "area of destination," appearing in the text and several tables in the main body of the report, is consistent with established transportation study practice.

Unlike the other University transportation questionnaires, the student transportation questionnaire did not provide information on time periods during which the respondent was at the University.¹ Thus, such information had to be assumed. It was assumed that at the peak period 90 percent of all full time non-resident students were on Campus. This is based on, and is in accord with, results obtained for the other University population groups; none of which reported more than 91 percent of the total group population being on Campus at the peak period. Part time students were presumed to be predominantly evening students and are so referred to in the text. It was assumed that 40 percent of part time students would be on Campus during the peak evening period. This is based on the fact that most evening classes meet once or twice per week, and that very few part time students take more than two courses during the semester. It was, therefore, assumed that the average part time student is on Campus twice per week; and that,

1. The student questionnaire was the first distributed. The faculty-staff and employee questionnaires corrected this omission.

on any given weekday, two out of five part time students will be on Campus. Since those part time students attending day classes usually take courses that meet at 4:00 P.M. or later, it was assumed that part time students do not contribute to the peak which occurs during the early afternoon.

Since carloading factors were not directly obtainable from the questionnaire data, it was necessary to estimate them indirectly. The number of persons who traveled in automobiles with other passengers was reported on the questionnaires. Based upon the findings of other transportation studies, the figure of 2.5 was assumed as the average load for the multi-passenger automobile. From this, the carloading factors were derived by the formula $C = T + S + \frac{M}{2.5}$. In this formula T is the total population traveling by automobile, S is the number of single occupant automobiles, M is the number of persons traveling in multi-passenger automobile and C is the carloading factor.

Two items of information collected were not used in the analysis. These were the questions concerning alternate travel mode and frequency of use of alternate mode. These items were very poorly reported. The alternate modes that were reported did not change the overall travel pattern; the alternate and regular mode totals being approximately in balance.

Finally, it should be noted that no attempt was made to relate parking space demand to any particular building project. This was not feasible, since such information as employment, location, number of employees, and number of offices for proposed structures was not a part of the survey. As this information becomes available, it will be relatively simple to allocate parking space to each project for budgeting purposes.

APPENDIX 2

Special Event Visitors

Six facilities are located in the southeastern corner of the University area which attract large numbers of visitors: University Hospital, University Museum, Palestra, Franklin Field, Trade and Convention Center and Philadelphia General Hospital. Three of these facilities, the two hospitals and the Museum, generate demands for both peak and constant visitor parking. That portion of the University Hospital and Museum visitor parking demands which is relatively constant, as well as the peak University Hospital demand, is accounted for in the section of the preceding analysis which deals with the University's essential off-street parking needs.¹

The report of February 1961, titled Proposed Off-Street Parking Plan, analyzes the parking requirements for special event visitors in the section which begins on page 91. The analysis shows that the excessive peak demands of special events, whether or not such events take place in University facilities, are created by the fact that they are community activities with city-wide and regional significance.

1. See pages 43 and 57.

It is obvious from the February 1961 report that the University should not have the responsibility to provide off-street parking for special events which take place in its facilities. Fortunately, a major part of the University's parking system can usually be made available for special event visitor parking, because nearly all the special events occur at a time when the University's regular parking demand is very light.¹

For any requirements beyond this capability, it is in the best interest of the public and private organizations concerned to (1) continue to pool existing parking facilities to meet the needs of special events and (2) collaborate in the construction of joint-use facilities with the assistance of the City's off-street parking program.²

1. Proposed Off-Street Parking Plan, February 1961, page 93.
2. See Appendix 5.

APPENDIX 3

Motor Vehicle Registration and Control

The University initiated a motor vehicle registration program for undergraduate students beginning with the academic year 1962-63. Beginning with 1963-64, first year resident undergraduates were not permitted to bring a motor vehicle to the University area.¹

This appendix includes the explanatory statement (see Figure 9) which was distributed for the first year of registration and the number of student vehicles registered, by state or foreign country, as of January, 1963, and November, 1963 (see Table 15). The registration of motor vehicles by class, as of the same dates, is shown below:

	<u>1962-63</u>	<u>1963-64</u>
Freshmen	452	119
Sophomore	520	528
Junior	599	546
Senior	579	667
Graduate ²	<u>14</u>	<u>1</u>
GRAND TOTAL	2,164	1,861

1. In addition, see page 15 for control provisions which have been instituted beginning with academic year 1964-65.
2. Graduate students were not required to register their motor vehicles during these academic years.

UNIVERSITY of PENNSYLVANIA

MOTOR VEHICLE REGISTRATION

Beginning with the 1962-63 academic year, all motor vehicles operated by undergraduate students on campus and within the campus neighborhood must be registered with the University.

The campus and its neighborhood is defined as the area bounded by the Schuylkill River, 52nd Street, and Haverford Avenue.

An identifying decal will be issued to each registrant and must be displayed on the vehicle whenever the vehicle is within the prescribed area.

PURPOSE OF THE PROGRAM

Among the University of Pennsylvania's valued assets is a campus located close to the heart of a great city, yet so situated as to foster an academic atmosphere. Such a campus offers many advantages to students. It also imposes upon them, and upon the University, certain responsibilities.

In cooperation with City officials and with its neighbors, the University has been working toward alleviation of traffic and parking problems in the vicinity of the campus. Motor vehicle registration is one facet of this program.

Traffic hazards, congestion, and parking problems in all sections of the City are compounded by some motorists' disregard of City and State regulations. When violations occur within the campus area, the blame tends automatically to be placed upon students of the University. The registration decal will permit identification, and it will aid in the protection of the student body as a whole from unsubstantiated and unwarranted criticism.

Some universities have found it necessary to ban student-operated automobiles in order to preserve the desired environment. Motor vehicle registration, hopefully, will provide the University with information to consider whether any additional action will be required in the future.

REGISTRATION PROCEDURE

The enclosed motor vehicle registration form should be filled out and presented in person at the time and place of regular student registration.

During the term, applications and information regarding motor vehicle registration may be obtained from Campus Police Headquarters in Memorial Towers, Men's Dormitories, 37th and Spruce Streets, between 9:00 A.M. and 3:00 P.M. The identifying decal will be issued immediately upon completion of the application form. Registration should be completed at least 48 hours before the first use of the vehicle within the campus area.

THERE WILL BE NO CHARGE FOR REGISTRATION OR FOR THE DECAL.

Figure 9. Motor Vehicle Registration Explanatory Statement
for 1962-63 Academic Year

SOME DEFINITIONS AND EXPLANATIONS

For the purpose of this regulation "undergraduate student" means any student registered in any of the following full-time undergraduate schools: College, College for Women, Engineering, Nursing, Wharton, or Allied Medical Professions.

"Motor vehicle" includes automobiles, trucks, motorcycles, motor bikes, and motor scooters.

The regulation applies to all student-operated motor vehicles, regardless of ownership. It applies to vehicles operated only occasionally within the campus and its neighborhood as defined above, as well as to those operated regularly in that area.

Registration and displaying the required decal, under the provisions of this regulation, does not entitle the student to park in University off-street parking areas.

ENFORCEMENT AND PENALTIES

A student failing to comply with this regulation will be given 48 hours to complete registration. Should he fail to do so within that time, he will be fined up to \$25, which amount will be deposited in the general University fund. The student will then be given an additional 48 hours to comply with the regulation. Should he fail to register within that period, he will automatically be denied the privilege of operating a motor vehicle in the prescribed area, and may be brought before the University Committee on Discipline for further action.

ADDITIONAL INFORMATION

If a student should require additional information, it can be obtained from the Offices of either the Dean of Men or Women in Logan Hall.

A SUGGESTION

To avoid any possibility of embarrassment, it would be wise for students to register family-owned automobiles, even if the vehicle will only be operated occasionally by the student in the campus area.

IN CONCLUSION

The motor vehicle registration program is designed to help preserve the pleasant atmosphere of Pennsylvania's campus. To the student who observes traffic and parking regulations, it can bring only benefit.

Success of the program depends on student cooperation.

Figure 9. (Continued)

TABLE 15. STUDENT MOTOR VEHICLE REGISTRATION
BY STATE AND FOREIGN COUNTRY
1962-63 and 1963-64^a

STATE AND COUNTRY	1962-63	1963-64	STATE AND COUNTRY	1962-63	1963-64	STATE AND COUNTRY	1962-63	1963-64
Alabama	1	0	Massachusetts	53	44	Tennessee	2	1
Alaska	0	0	Michigan	4	2	Texas	9	8
Arizona	0	1	Minnesota	1	1	Utah	0	0
Arkansas	1	1	Mississippi	0	0	Vermont	1	0
California	9	9	Missouri	7	3	Washington	1	0
Colorado	2	1	Montana	0	2	West Virginia	2	1
Connecticut	64	52	Nebraska	1	1	Virginia	12	6
Delaware	17	14	Nevada	1	0	Wisconsin	0	4
District of Columbia	11	8	New Hampshire	8	10	Wyoming	0	0
Florida	16	17	New Jersey	290	249	Total for States	2,160	1,855
Georgia	4	3	New York	266	226	Belgium	0	1
Hawaii	0	1	New Mexico	0	0	Germany	2	1
Idaho	0	0	North Carolina	3	1	Great Britain	1	3
Illinois	9	12	North Dakota	0	0	Guatemala	0	1
Indiana	6	4	Ohio	26	25	Virgin Islands	1	0
Iowa	1	1	Oklahoma	1	2	Total for Foreign Countries	4	6
Kansas	3	1	Oregon	0	1	GRAND TOTAL	2,164	1,861
Kentucky	6	5	Pennsylvania	1,272	1,086 ^b			
Louisiana	1	2	Rhode Island	9	13			
Maine	4	6	South Carolina	1	0			
Maryland	35	31	South Dakota	0	0			

Source: Information furnished by Captain George H. Barcus.

a. As of November, 1963.

b. Includes 18 motor bikes.

APPENDIX 4

Explanation of Terms Used in This Analysis

Area of Destination: see explanation in Appendix 1.

Employees: Where appropriate, employees of the Hospital of the University of Pennsylvania are differentiated from other employees of the University working on the University's West Philadelphia Campus.

Faculty: Includes faculty and professional staff of the University's administrative offices.

Parking demand: See explanation in Appendix 1.

Resident undergraduate or graduate student: A student residing within the University area.

Students:

Graduate -- Includes graduate and professional students.

Undergraduate full time -- student working on a full time program leading toward a "degree."

Undergraduate part time -- student working on a part time program leading toward a degree or certificate. This term also refers to "special" part time students.

University area: see Figure 1.

University owned, controlled and supervised housing: Unless otherwise designated in the text, these terms are defined as being either a dormitory in the University housing system, a fraternity-sorority, or the home of a commuting student.

University population: Includes all persons studying and working on the University's West Philadelphia Campus (including employees of the Hospital of the University of Pennsylvania).

Visitors:

Special event -- See Appendix 2.

University visitor -- includes all persons not members of the University population, coming to the University on special business or to visit at the Hospital of the University of Pennsylvania.

APPENDIX 5

Suggested Policy Considerations

The following policy considerations are suggested for discussion by the University Executive Planning Committee on the Physical Plant. The combined purpose of these policies is to assure the provision of necessary parking facilities as part of the University's capital improvement program; to hold the capital funds required for off-street parking to a minimum; and to continue evaluating the University's transportation requirements in terms of a rational transportation system for the Philadelphia-Camden Metropolitan Region.

1. Parking Facilities.

Parking facilities will continue to be scheduled for construction in accordance with the University Development Plan as part of the University's capital improvement program. The means by which necessary off-street parking space is provided includes:

- a. Income from existing University parking spaces.
- b. A provision that no capital project generating a demand for off-street parking, whether private or public funds are involved, will be permitted to go forward unless the number of parking spaces certified to be necessary (after analysis and review by the Executive Planning Committee) has been budgeted for with University or other funds.

c. The Integrated Development Fund Raising Program.

d. Collaboration with private and public interests within University City for the construction, wherever feasible, of joint use facilities. (See Suggested Policy #4.)

2. Advance Property Acquisition.

Wherever feasible, property within the University development area will be acquired in advance of academic or research requirements to provide space for off-street parking until such property is required for new construction.

3. Vehicle Size.

Commuting by compact or small foreign automobiles or motor scooters will be encouraged to enlarge the usefulness of off-street parking space as much as possible.

4. University City Parking and Jitney Bus Service Programs.¹

The University will work with The West Philadelphia Corporation to bring together its member institutions, the Tri-Institutional medical center, the Trade and Convention Center, and other appropriate public and private interests to form a special purpose corporation which can provide and manage the off-street parking facilities required by each of the participants. Such collaboration will seek to obtain the support of the City's off-street parking program. The University will also work with The West Philadelphia Corporation in the development and maintenance of a jitney bus service within University City. The provision of such a service may also be made the responsibility of the aforementioned special purpose corporation.

1. As this report was being prepared for publication, the West Philadelphia Corporation had commenced negotiations with the City of Philadelphia for the establishment of a parking program for University City.

5. Railroad and Public Transportation Facilities.

The maintenance and improvement of railroad and public transit facilities serving the Campus area is considered to be extremely important, if the University's investment in off-street parking is to be held to a minimum. The University will, in collaboration with The West Philadelphia Corporation, the City of Philadelphia, the Passenger Service Improvement Corporation, The Southeastern Pennsylvania Transportation Compact Counties, The Reading Railroad, The Pennsylvania Railroad, The Penn-Jersey Transportation Study, Penjerdel (Pennsylvania-New Jersey-Delaware Corporation) and other appropriate agencies seek to develop a program which will:

- a. Provide improved and attractive bus, subway and commuter railroad service to the Campus area (including the construction of bus stop and taxi stand shelters, and subway escalators at stations serving the Campus area).
- b. Encourage all members of the University population to use railroad and/or public transit facilities wherever and whenever possible.
- c. Encourage new students, faculty and staff members to locate their residences in areas adequately served by public transit and/or commuter railroad lines.

6. University Residential Community.

Since the critical need for parking facilities is due to the high proportion of commuters among the University population, and since the present forces shaping the growth of metropolitan Philadelphia make it likely that many more of the metropolitan area's future commuters will live in neighborhoods served by better

roadway than public transit connections to the University, the University will continue to actively promote the development of a University community, with a full range of adequate housing accommodations and community facilities.

(The University currently hopes to encourage at least 50 percent of its faculty and staff members to take up residence in University City by 1970. The 1960-61 Transportation Survey found that close to 30 percent of the University population already lives within walking distance of the Campus. Considering the progress that has already been made in a very short period of time, the University will review the best available combination of means for surpassing the current 1970 goal.)

7. Motor Vehicle Registration.

As part of its continuing planning program, the University will maintain up-to-date information on the number of motor vehicles brought to the University area by all students -- graduate as well as undergraduate students, part time as well as full time.

8. Commuting Students.

The present parking administration policy which extends off-street parking privileges to students whose place of residence outside the University area is not served by a convenient means of public transportation will be continued.

9. Resident Undergraduate Students.

Since the sizeable cost of providing Campus housing facilities for undergraduate students will not permit an added expenditure for off-street parking, since it is the University's objective to house all resident undergraduate students in University owned or controlled housing, since there is a limited

amount of curb space in the University area and this space will be reduced further by the various development programs that are underway, since private off-street parking facilities within the University area are very limited, since the University will be required by City regulations to provide off-street parking facilities as part of its undergraduate housing system unless controls are instituted, and since resident freshmen have been prohibited from maintaining or operating a motor vehicle in the University area (beginning with the 1963-64 academic year), this prohibition will be extended on an annual basis so that by the 1966-67 academic year it will be in effect for all resident undergraduate students.¹

10. Resident Graduate Students.

The off-street parking program described in this report provides space for approximately one-half the number of University residential units for graduate students, based upon the ownership experience established by the Transportation Survey. However, unless appropriate regulations are established by the University, either increased automobile ownership among graduate students or City regulations may ultimately require the University to provide one off-street parking space for every graduate apartment constructed by the University. It is, therefore, suggested that graduate students living in facilities that are owned or controlled by the University only be permitted to maintain an automobile within the University area when it can be shown that adequate off-street parking arrangements have been made in either a University or (if such space is not available) in a private facility.

1. See page 15 for control provisions which have been instituted beginning with academic year 1964-65. Such provisions will be studied to determine whether they provide an effective alternative control method to the above recommendation.

11. Periodic Review of Parking Plan.

The University will periodically review the off-street parking element of the Development Plan in terms of the most up-to-date information.

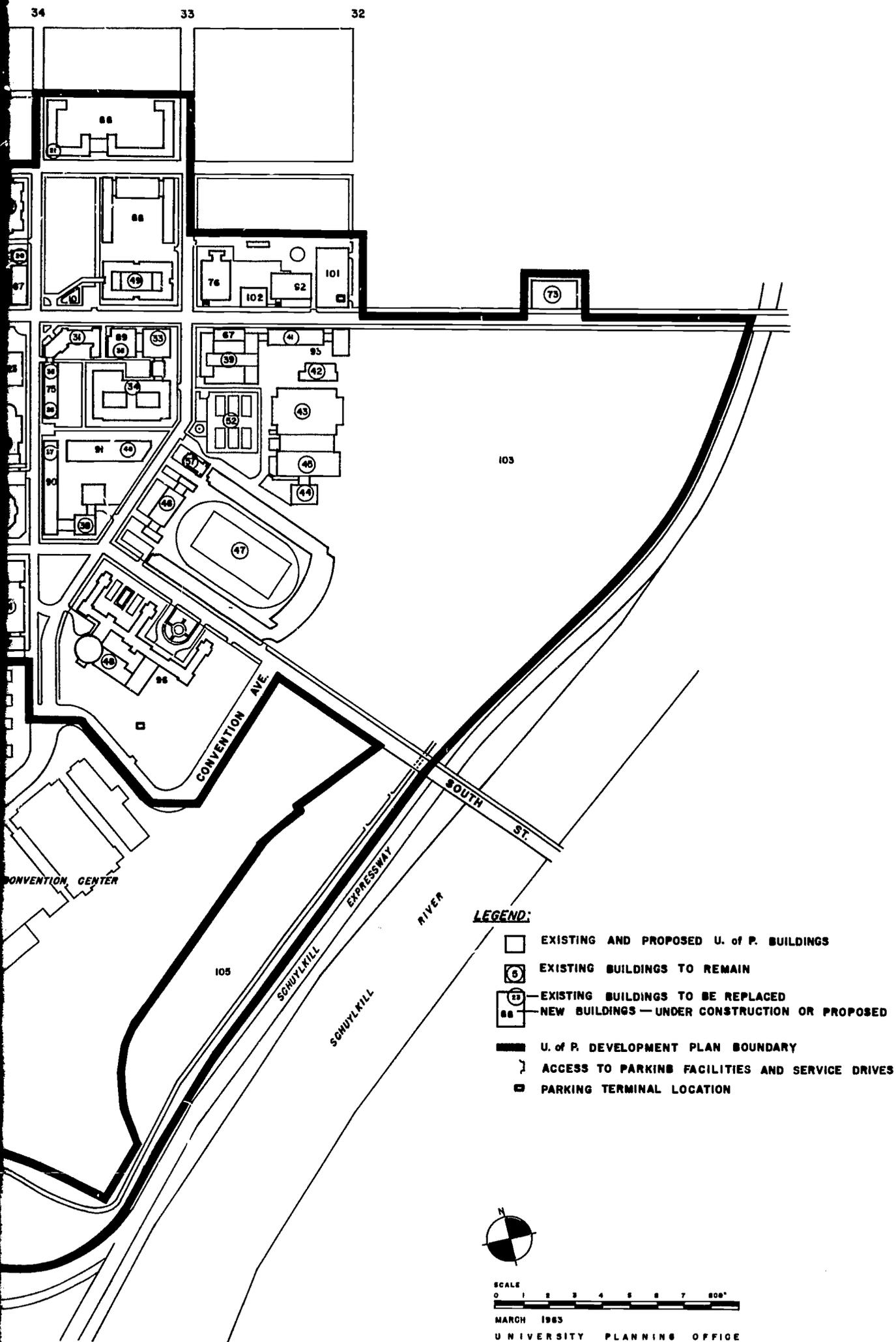
12. Amend Development Plan.

It is suggested that the existing parking element of the University Development Plan be amended in accordance with the findings and recommendations presented in Parts I and II of this study.

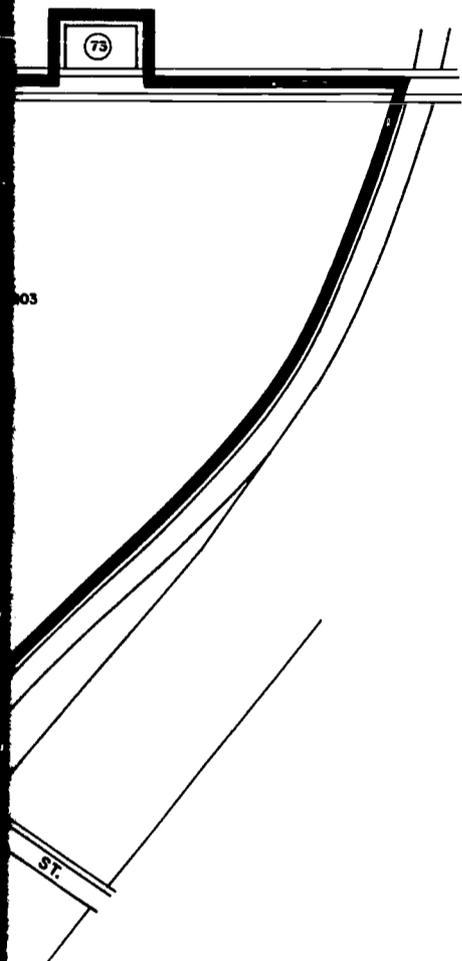
UNIVERSITY OF PENNSYLVANIA DEVELOPMENT GENERAL BUILDING LOCATION



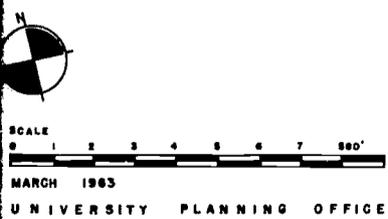
A DEVELOPMENT PLAN



- ① EVANS INSTITUTE (*Dental School*)
- ② FELS INSTITUTE OF LOCAL & STATE GOVERNMENT
- ③ PRESIDENT'S HOUSE
- ④ CHAPLAIN'S HOUSE
- ⑤ ALLIED MEDICAL PROFESSIONS
- ⑥ VETERINARY SCHOOL AND HOSPITAL
- ⑦ HILLEL FOUNDATION (*University Associated*)
- ⑧ SKINNER HALL (*Faculty Club*)
- ⑨ CHRISTIAN ASSOCIATION (*University Associated*)
- ⑩ FRATERNITY HOUSES
- 11 NEWMAN CLUB (*University Associated; Original Replaced by 81*)
- ⑫ DIETRICH HALL (*Wharton School*)
- ⑬ WISTAR INSTITUTE (*University Associated*)
- ⑭ SCHOOLS OF MEDICINE
- ⑮ ALFRED NEWTON RICHARDS MEDICAL RESEARCH BUILDING
- ⑯ MEN'S DORMITORIES
- ⑰ ENGLISH HOUSE
- ⑱ PEPPER, ROBERTS, AND STERN DORMITORIES AND COMMONS
- ⑲ LAW SCHOOL
- ⑳ POTTER (*replaced by 87*)
- ㉑ SERGEANT HALL (*see 88*)
- ㉒ COLLEGE HALL
- ㉓ NEW SCHOOL OF FINE ARTS (*former Library; see 30, 40*)
- ㉔ IRVINE AUDITORIUM
- ㉕ HOUSTON HALL
- ㉖ HARE BUILDING (*replaced by 86*)
- ㉗ LOGAN HALL
- ㉘ KINGSCOURT
- ㉙ BLANCHARD HALL (*replaced by 72*)
- ㉚ CHARLES PATTERSON VAN PELT LIBRARY (*University Library*)
- ㉛ BENNETT HALL
- 32 FINANCIAL OFFICES (*replaced by 89*)
- ㉜ MOORE SCHOOL AND ADDITION
- ㉝ TOWNE BUILDING
- ㉞ DEVELOPMENT OFFICES (*replaced by 75; see 73*)
- ㉟ JOHN MORGAN BUILDING (*replaced by 75*)
- ㊱ GENERAL LABORATORIES BUILDING (*replaced by 90*)
- ㊲ CHEMISTRY LABORATORY
- ㊳ PHYSICAL SCIENCES BUILDING
- ㊴ EXISTING SCHOOL OF FINE ARTS (*replaced by 91; see 23*)
- ㊵ DECATUR HALL (*replaced by 93*)
- ㊶ TANDEM ACCELERATOR
- ㊷ PALESTRA
- ㊸ THOMAS B.K. RINGE SQUASH COURTS
- ㊹ HUTCHINSON GYMNASIUM
- ㊺ WEIGHTMAN HALL
- ㊻ FRANKLIN FIELD
- ㊼ UNIVERSITY MUSEUM
- ㊽ WOMEN'S RESIDENCE HALLS
- ㊾ UNIVERSITY HOSPITAL
- ㊿ RAVDIN INSTITUTE (*University Hospital*)
- 52 TENNIS COURTS
- 53 NEW BIOLOGY BUILDING
- 54 ZOOLOGICAL LABORATORIES
- 55 GREENHOUSES
- 56 UNIVERSITY MAINTENANCE & REPAIR (*replaced by 72*)



- LEGEND:**
- EXISTING AND PROPOSED U. of P. BUILDINGS
 - ⑤ EXISTING BUILDINGS TO REMAIN
 - ②③ EXISTING BUILDINGS TO BE REPLACED
 - ①⑥ NEW BUILDINGS — UNDER CONSTRUCTION OR PROPOSED
 - U. of P. DEVELOPMENT PLAN BOUNDARY
 - } ACCESS TO PARKING FACILITIES AND SERVICE DRIVES
 - PARKING TERMINAL LOCATION



- ① EVANS INSTITUTE (*Dental School*)
- ② FELS INSTITUTE OF LOCAL & STATE GOVERNMENT
- ③ PRESIDENT'S HOUSE
- ④ CHAPLAIN'S HOUSE
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- ㊽ WOMEN'S RESIDENCE HALLS
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- ㊿ RAVDIN INSTITUTE (*University Hospital*)
- 52 TENNIS COURTS
- 53 NEW BIOLOGY BUILDING
- 54 ZOOLOGICAL LABORATORIES
- 55 GREENHOUSES
- 56 UNIVERSITY MAINTENANCE & REPAIR (*replaced by 72*)
- 57 THE WHITE HOUSE
- 58 ANNENBERG SCHOOL OF COMMUNICATIONS
- 59 VICTORIA APARTMENTS (*replaced by 81*)
- 60 ILLMAN CARTER (*replaced by 78*)
- 61 BIOLOGICAL ABSTRACTS
- 62 MEN'S RESIDENCE HALLS
- 63 HAROLD C. MAYER GRADUATE APARTMENTS
- 64 VETERINARY SCHOOL EXPANSION
- 65 SOCIAL SCIENCES CENTER
- 66 MEN'S RESIDENCE HALL
- 67 PHYSICAL SCIENCES BUILDING ADDITION (*see also 93*)
- 68 ACADEMIC FACILITY
- 69 MEDICAL AFFAIRS EXPANSION
- 70 MEDICAL AFFAIRS EXPANSION
- 71 LAW SCHOOL ADDITION
- 72 DANIEL W. DIETRICH MEMORIAL LIBRARY (*University Library*)
- 73 ADMINISTRATION (*see also 73*)
- 74 ACADEMIC FACILITIES (*Graduate, Professional, Research*)
- 75 HUMANITIES - PHYSICAL SCIENCES BUILDING
- 76 LABORATORY FOR RESEARCH ON THE STRUCTURE OF MATTER
- 77 EVANS INSTITUTE EXPANSION (*Dental School*)
- 78 MEN'S RESIDENCE HALLS
- 79 GRADUATE HOUSING CENTER
- 80 ALUMNI CENTER
- 81 SOCIAL SCIENCES EXPANSION
- 82 ACADEMIC FACILITIES (*Graduate, Professional, Research*)
- 83 SKINNER HALL EXPANSION (*Faculty Club*)
- 84 WISTAR INSTITUTE EXPANSION (*University Associated*)
- 85 MEDICAL AFFAIRS EXPANSION
- 86 HUMANITIES EXPANSION
- 87 ACADEMIC FACILITIES (*Graduate, Professional, Research*)
- 88 WOMEN'S RESIDENCE HALLS
- 89 MOORE SCHOOL EXPANSION
- 90 CHEMISTRY EXPANSION
- 91 PHYSICAL SCIENCES & ENGINEERING
- 92 PHYSICAL SCIENCES RESEARCH (*Particle Physics Laboratory*)
- 93 PHYSICAL SCIENCES FACILITY
- 94 ATHLETIC FACILITIES
- 95 ATHLETIC FIELDS
- 96 UNIVERSITY MUSEUM EXPANSION
- 97 SCHOOLS OF MEDICINE AND UNIVERSITY HOSPITAL DEVELOPMENT
- 98 ACADEMIC FACILITIES (*Graduate, Professional, Research*)
- 99 ST. MARY'S CHURCH
- 100 FREE LIBRARY OF PHILADELPHIA
- 101 PARKING GARAGE
- 102 PHYSICAL SCIENCES (*Research Offices*)
- 103 PHYSICAL SCIENCES-ACADEMIC-ATHLETIC FACILITIES
- 104 BOTANICAL GARDEN
- 105 RIVER FIELDS
- 106 ESCALATOR HEAD HOUSE