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"PEDESTRIANS ON THE STRIP"

A NEIGHBORHOOD COMMERCIAL CENTER FOR BILLINGS, MONTANA

UNDERGRADUATE THESIS IN ARCHITECTURAL DESIGN

BY

MICHAEL J. HEFFNER

SUBMITTED TO THE SCHOOL OF ARCHITECTURE AS PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF ARCHITECTURE

AT

MONTANA STATE UNIVERSITY

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INTRODUCTION

Through this introduction I hope to help the reader understand why I became concerned with commercial strip developments. I also want to explain how I arrived at my thesis statement. The last item I want to explain is how I arrived at choosing a neighborhood commercial center for the subject to test statement.

I had been thinking of what I wanted to do my thesis on for a long time; and in April, 1974, I discussed doing a city planning project for Billings. This was considered a too complicated and time-consuming project for a thesis. I then considered other needs of cities, such as recreational areas, public facilities, housing problems, and commercial strip developments. In the summer of 1974 I decided to do my thesis on commercial strip developments.

I found that as a pedestrian along the strip, the only spaces that were mine were the sidewalks, the bus stops, and the store interiors. In most instances the sidewalks along strip developments are separated from 35 m.p.h. automobile traffic on one side by only a 6 inch curb and have paved parking lots on the other side. This creates an uncomfortable feeling for the pedestrian because he feels like an intruder in the automobile's domain. Even while on the sidewalks, the pedestrian has to watch out for cars turning into the parking lots. When a pedestrian tries to cross one of these parking lots, he must be on the alert for automobile traffic from every direction until he reaches the sidewalk in front of the store.

The bus stops are usually just benches set back from the sidewalk. However, some of the bus stops are protected from rain and wind by

booths. Not many of the booths are interesting in the sense of design and are usually minimal in size.

I felt the need to turn back some of the area along the strip to the pedestrian. In doing this I hope to create a place of interest to both the pedestrian and motorist. In changing the environment along the strip, the building must also change.

While trying to develop a thesis statement, I found out that it would be economically infeasible for the stores to eliminate the car. However, if the car had convenient access to the site, the retail stores could still survive economically. If this access was limited and controlled, the pedestrian could still be primary and the automobile secondary. The other area of concern in my thesis statement is how to deal with the area that is given back to the pedestrian. I felt this area had to be designed so as to draw the pedestrian into the retail stores and give him a relief from the strip.

In choosing a subject to test my thesis statement, I first considered dealing with automobile and pedestrian circulation along a three block area. This did not get involved enough into an architectural solution. I, therefore, considered other possibilities, such as shopping centers, individual commercial facilities, and arrangements of franchise facilities. It seemed, however, that the facility that could best test my thesis statement would be a neighborhood shopping center because of the pedestrian qualities.

THESIS STATEMENT:

Business areas along commercial strip developments of cities should create a desirable pedestrian shopping environment and, at the same time, maintain the convenience of automobile accessibility.

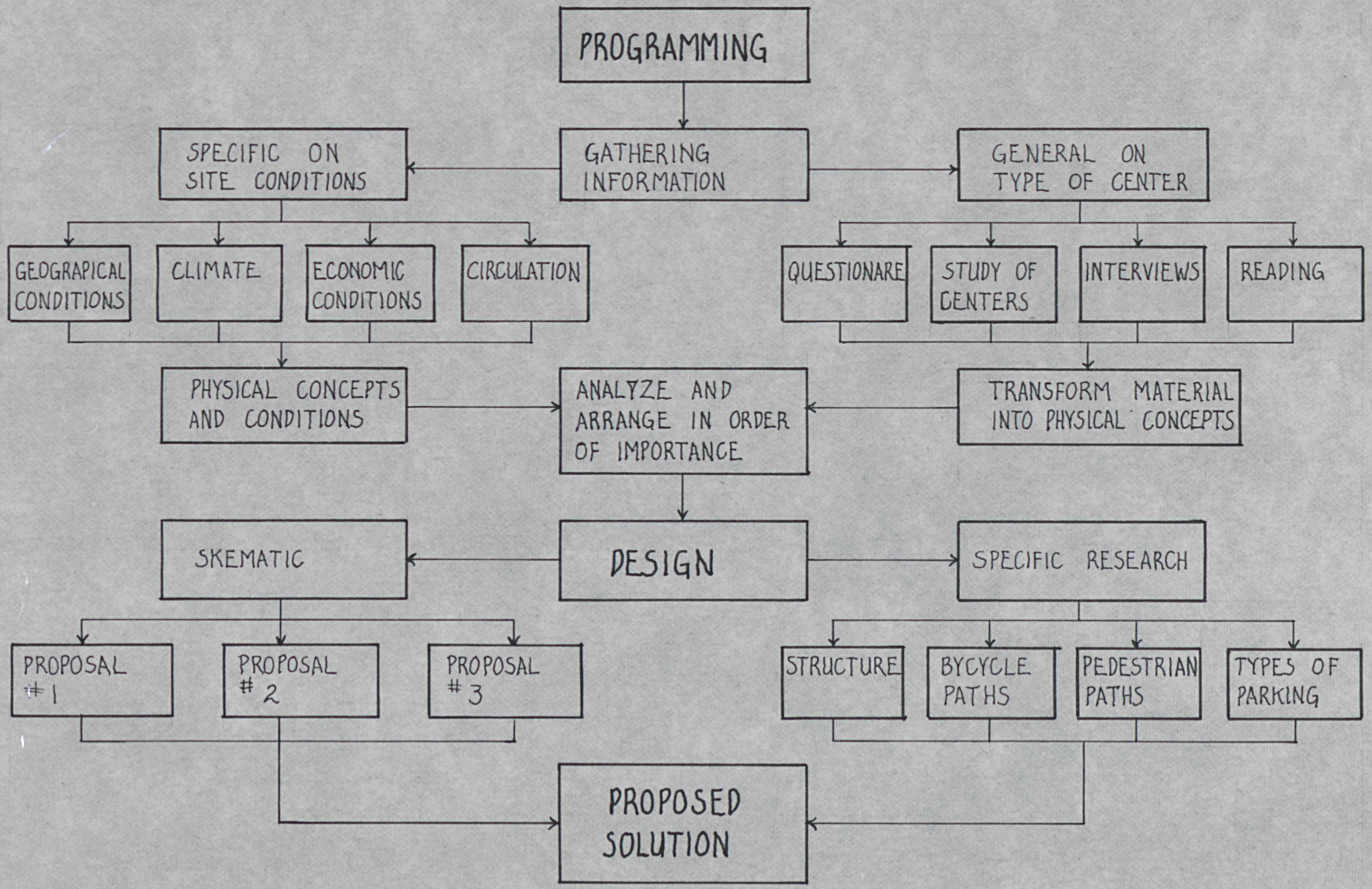
SUBJECT:

The subject I have chosen for my thesis is a neighborhood commercial center for Billings, Montana. The center would be located on Broadwater Avenue which is a developing commercial strip.

The reason I chose a neighborhood commercial center is because this type of establishment is best suited to the pedestrian. This is because it serves mainly the people within a one-half mile radius. However, at a normal walking speed of 2-1/2 m.p.h. and the normal walking time of fifteen minutes, a person could travel three-quarters of a mile.

I feel the commercial strip has yielded to the scale, accessibility, and impersonality of the automobile. The commercial strip has done this to such a degree that with the growing use of mass transit and less dependence on the automobile, it is going to be very hard to convert these buildings back to a pedestrian environment.

METHOD


PROGRAMMING
GATHERING INFORMATION
SPECIFIC ON SITE CONDITIONS
GENERAL ON TYPE OF CENTER
GEOGRAPICAL CONDITIONS
CLIMATE
ECONOMIC CONDITIONS
CIRCULATION
QUESTIONARE
STUDY OF CENTERS
INTERVIEWS
READING
PHYSICAL CONCEPTS AND CONDITIONS
ANALYZE AND ARRANGE IN ORDER OF IMPORTANCE
TRANSFORM MATERIAL INTO PHYSICAL CONCEPTS
SKEMATIC
DESIGN
SPECIFIC RESEARCH
PROPOSAL #1
PROPOSAL #2
PROPOSAL #3
STRUCTURE
BYCYCLE PATHS
PEDESTRIAN PATHS
TYPES OF PARKING
PROPOSED SOLUTION

PROGRAMMING

ECONOMICS:

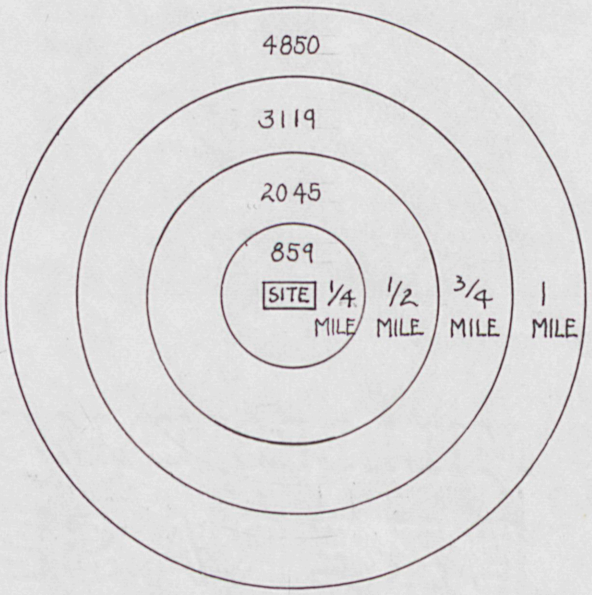
In order to find out an approximate square footage of store area that the neighborhood could support, I had to find out the population and median income. I found out the population that would be shopping at my center by taking different radii from the site. For each radius, I did a block by block population count, (16:10-14), and multiplied by the percentage estimated to shop at my facility. By multiplying the population by the median income, I found out the total cash available. See Figure 1.

Knowing the total cash available was not enough, however. I had to find out the percentage of income spent at the different types of stores in Billings, (11:723). The zoning regulations limited the types of stores that could go into a neighborhood center. Once the amount spent on each type of store was calculated, then the percentage that would be spent at the center was estimated. Then, by multiplying this percentage by the amount spent at each type of store, an approximate gross sales was established. See Figure 2.

The gross sales was then used to calculate approximate square footage. This was done by averaging out store area sales per square foot for the different types of stores. See Figure 3. Dividing the gross sales by the average sales per square foot gave me an approximate square footage which I could work with.

Figure 3 also shows that the normal amount of parking space is three times the store area. However, since the automobile is secondary in my center, I have reduced this to only twice that of the store area.

POPULATION OVER 18 YEARS OF AGE



A - 859 X .25 = 215

B - 2045 X .15 = 307

C - 3119 X .10 = 312

D - 4850 X .05 = 243

TOTAL 1,077

X Median Income in Area $ 9,598

TOTAL GROSS INCOME $ 10,337,046

Figure 1

SALES FOR ALL ESTABLISHMENTS BY KIND OF BUSINESS FOR BILLINGS

KIND OF STORE	% OF INCOME	NO.OF $	% OF POPULATION	TOTAL $
Food Stores	16.3	1,548	33	550,175
Automotive Dealers	21.7	2,062	0	N/A
General Merchandise	12.0	1,140	100	1,227,780
Eating & Drinking	8.1	769	33	281,776
Gasoline Service	6.4	608	0	N/A
Furniture, Home Furniture & Equip.	5.5	523	100	371,403
Building Material, Farm Equip,Hardware	7.5	713	100	506,459
Apparel & Access.	4.2	399	100	429,723
Drug & Proprietary	3.9	370	100	399,028
Non-Store Retails	1.7	161	100	173,936
Misc. & Services	12.7	1,180	50	635,430
TOTAL DOLLARS TO BE SPENT AT CENTER				4,575,710

Figure 2

TYPE OF STORE	SALES MILLIONS OF $	AVERAGE PER CAPITA EXPEND.	PERCENT FAMILY INCOME	STORE AREA SALES PER Sq.Ft.	PER CAPITA STORE AREA	REQUIREMENTS PARKING	TOTAL
Food Stores	57,079	301.34	12.35		3.28	9.84	13.12
Supermarkets	52,566	277.51	11.37	100	2.78	8.34	11.12
All Other	4,513	23.83	0.98	47	.50	1.50	2.00
Drug Store	8,487	44.80	1.84	90	.50	1.50	2.00
Eating & Drinking	18,412	97.20	3.98	50	1.00	6.00	8.00
Hardware	2,560	13.52	.55	52	.25	.75	1.00
Paint	882	4.66	.19	50	.10	.30	.40
Liquor	5,189	27.50	1.12	275	.10	.20	.30
Camera	379	1.66	.08	100	.02	.06	.08
Variety Stores	4,538	23.96	.98	24	1.00	3.00	4.00
Other Gen'l.Mdse.	4,928	26.02	1.07	26	1.00	3.00	4.00
Household Appl.	2,387	12.62	.52	50	.25	.75	1.00
Women's Cloth.	5,592	29.52	1.21	60	.50	1.50	2.00
Men's Cloth.	2,804	14.80	.61	60	.25	.75	1.00
Family Cloth.	2,701	14.26	.58	60	.25	.75	1.00
Shoe Stores	2,390	12.62	.52	50	.25	.75	1.00
Other Apparel	553	2.92	.12	60	.05	.15	.20
Furniture & Home Furnishings	6,826	36.04	1.48	36	1.00	3.00	4.00

Figure 3

FIGURE 3 DOCUMENTATION:

	TOTAL DOLLARS SPENT AT CENTER	4,575,710
-	SAFETY FACTOR 20%	915,142
	APPROXIMATE	$ 3,660,500
	NEW TOTAL DOLLARS SPENT AT CENTER	3,660,500
+	20 - 30% BUSINESS BY CAR	4,000,000
		4,660,500
÷	AVERAGE SALES PER SQ. FT. $68	70
	EQUALS APPROXIMATE SQ. FT.	66,600 Sq. Ft.
	PARKING X 2	133,200 Sq. Ft.

Convenience and service stores find a desirable location in planned neighborhood centers with 50,000 to 100,000 sq. ft. of building area. In areas of rapidly growing population there are often opportunities to build new centers since a population of 5,000 added families or 20,000 persons would support a new supermarket of 20,000 to 30,000 sq.ft. of store area.

GEOGRAPHICAL CONDITIONS:

Billings is located in southcentral Montana in Yellowstone County. Its position is described as Lat. 45°48.2' N., Long 108°32.2' W., Elev. 3568'.

The Billings boundaries are defined by two geographical conditions. On the north Billings is defined by the rimrocks; on the south by the Yellowstone River; on the east by the funneling together of the rimrocks and the Yellowstone River; on the west there are no geographical barriers. Billings is expanding rapidly and is breaking all these barriers. Expansion to the west, however, is the easiest and is the cause of rapidly decreasing farm lands west of Billings.

The only geographical condition that can be seen from the site is the rimrocks to the north. There are no hills or other types of geographical conditions near the site.

CLIMATOLOGICAL CONDITIONS:

Billings experiences much the same weather as the rest of Montana. The following facts were taken from (4:). Although Billings has a relatively short growing season of 133 days, it has a fairly high percentage of possible sunshine, 61%. For wind direction and relative humidity as compared to temperature, see Figure 4.

Average annual snowfall	52.4 inches
Seldom enough to close roads	
Average annual precipitation	13.1 inches
2/3 of which falls between April and October	
Average annual maximum temperature	58.7° F.
Average annual minimum temperature	35.6° F.

CLIMATE

BILLINGS (YELLOWSTONE COUNTY) Lat. 45° 48.2' N.; Long. 108° 32.2' W.; Elev. 3568

Month	Temperature: Normal: Daily Maximum	Temperature: Normal: Daily Minimum	Temperature: Normal: Monthly	Temperature: Extremes: Record Highest	Temperature: Extremes: Year	Temperature: Extremes: Record Lowest	Temperature: Extremes: Year	Normal Degrees Days	Precipitation: Normal Total	Precipitation: Maximum Monthly	Precipitation: Year	Precipitation: Minimum Monthly	Precipitation: Year	Precipitation: Maximum in 24 hrs.	Precipitation: Year	Snow, Sleet, Hail: Mean Total	Snow, Sleet, Hail: Maximum Monthly	Snow, Sleet, Hail: Year	Snow, Sleet, Hail: Maximum in 24 hrs.	Snow, Sleet, Hail: Year
(a)	(b)	(b)	(b)	21		21		(b)	(b)	21		21		21		21	21		17	
Jan.	32.3	13.4	22.9	68	1953	-30	1937	1305	0.53	1.55	1949	0.04	1941	0.60	1954‡	7.1	23.1	1949	8.8	1954
Feb.	36.1	16.0	26.1	69	1951	-38	1936	1089	0.44	1.57	1955	0.13	1954	0.61	1952	9.4	22.3	1955	9.0	1944
March	44.3	23.9	34.1	75	1943	-19	1951	958	0.93	2.70	1954	0.13	1936	0.97	1946	10.9	27.6	1935	8.0	1946
April	58.0	34.4	46.2	92	1939	-5	1936	564	1.05	4.42	1955	0.10	1944	2.48	1955	6.5	42.3	1955	23.7	1955
May	68.4	43.5	56.0	96	1936	14	1954	304	1.80	4.93	1942	0.53	1937	2.83	1952	1.1	5.5	1943	5.5	1943
June	76.5	51.5	64.0	102	1936	32	1943	119	2.61	7.64	1944	0.80	1935	2.78	1937	0.1	2.0	1950	2.0	1950
July	87.9	58.6	73.3	106	1937	42	1955‡	8	1.14	2.07	1938	0.11	1939	0.89	1955	T	1.0	1955	1.0	1955
Aug.	85.7	56.3	71.0	104	1940	40	1939	20	0.88	1.95	1951	0.05	1955	0.64	1944	T	T	1954‡	T	1954‡
Sept.	73.0	46.9	60.0	100	1950	26	1950	194	1.32	4.99	1941	0.22	1939	1.81	1941	0.5	6.0	1941	6.0	1941
Oct.	60.7	37.7	49.2	86	1953‡	4	1935	497	1.14	2.72	1949	0.02	1948	1.98	1937	3.1	23.1	1949	10.0	1949
Nov.	45.1	26.5	35.8	71	1949	-14	1955	876	0.68	1.20	1941	T	1954	0.64	1938	5.3	14.9	1936	4.5	1942
Dec.	36.0	18.4	27.2	69	1939	-17	1944	1172	0.58	1.89	1955	0.06	1940	0.71	1955	8.4	28.8	1955	13.0	1955
Year	58.7	35.6	47.2	106	Jul. 1937	-38	Feb. 1936	7106	13.10	7.64	Jun. 1944	T	Nov. 1954	2.83	May 1952	52.4	52.3	Apr. 1955	23.7	Apr. 1955

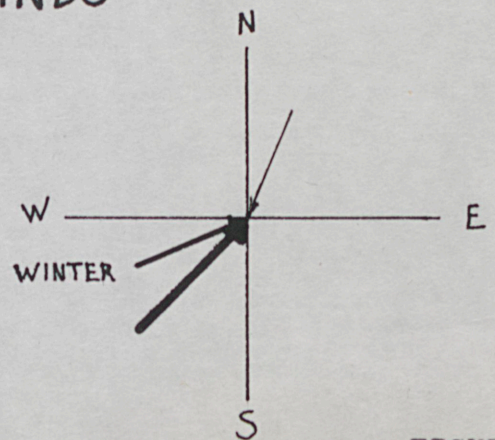
Month	Relative Humidity: 5:30 A. MST	Relative Humidity: 11:30 A. MST	Relative Humidity: 5:30 P. MST	Relative Humidity: 11:30 P. MST	Wind: Mean Hourly Speed	Wind: Prevailing Direction	Wind: Fastest Mile: Direction	Wind: Fastest Mile: Speed	Wind: Fastest Mile: Year	Pct. of Possible Sunshine	Mean Sky Cover Sunrise to Sunset	Mean Number of Days: Sunrise to Sunset: Clear	Partly Cloudy	Cloudy	Precipitation .01 Inch or More	Snow, Sleet, Hail 1.0 Inch or More	Thunderstorms	Heavy Fog	Temperatures: Max.: 90° and Above	32° and Below	Temperatures: Min.: 32° and Below	0° and Below	Growing Season
	17	17	17	17	16	7	12	12		16	16	16	16	16	21	13	16	8	21	21	21	21	
Jan.	66	62	60	65	12.8	WSW	W	66	1953	47	6.9	5	10	16	7	3	0	2	0	12	29	7	
Feb.	70	63	61	69	12.2	WSW	NW	68	1952	51	7.0	4	9	15	7	3	*	3	0	10	25	5	
March	74	61	56	71	11.7	SW	NW	56	1951‡	54	7.1	4	9	18	9	4	*	3	0	7	25	1	
April	70	48	43	62	11.7	SW	NW	72	1947	60	6.9	4	10	16	9	2	1	2	*	1	11	*	
May	72	46	42	62	11.1	SW		68	1939	61	6.5	5	12	14	10	1	5	1	1	*	2	0	
June	77	51	47	67	10.7	NNE	SE	65	1953	64	6.1	6	12	12	11	*	8	1	2	0	*	0	
July	65	40	32	51	9.9	SW	N	73	1947	78	4.0	14	12	5	7	*	3	1	12	0	0	0	
Aug.	63	40	32	48	9.5	SW	N	66	1947	75	4.2	14	12	5	6	0	7	*	10	0	0	0	
Sept.	66	47	39	55	10.2	SW	NW	61	1949	66	5.2	9	11	10	7	*	2	2	2	0	1	0	
Oct.	67	51	46	59	10.9	SW	NW	68	1949	64	5.4	10	10	11	6	2	*	2	0	1	8	0	
Nov.	67	58	56	64	11.9	SW	NW	63	1948	48	6.7	6	9	15	6	2	0	1	0	5	21	1	
Dec.	68	62	60	66	12.4	WSW	NW	66	1953	45	6.8	6	9	16	6	3	0	2	0	9	27	3	
Year	69	52	48	62	11.3	SW	N	73	Jul. 1947	61	6.1	87	125	153	91	20	31	20	27	45	149	17	133

(a) Length of record, years. (b) Normal values are based on the period 1921-1950, and are means adjusted to represent observations taken at the present standard locations. *Less than one-half. ‡Also on earlier dates, months or years. T—Trace, an amount too small to measure.

Sky	C.N	Diffused / total radiation
Clear	1.0	12%
Clear, slightly hazy	0.8	25%
Hazy	0.6	35%
Overcast	0.4	55%

C.N. = Clearance Number of the atmosphere

WINDS



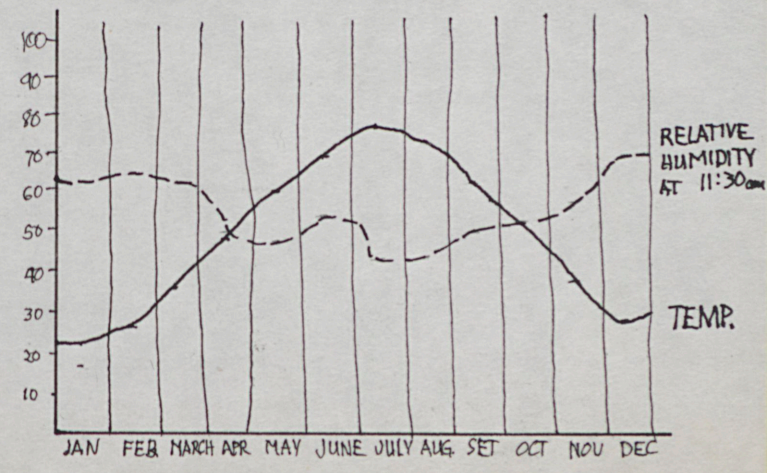


FIGURE 4

GENERAL STUDIES

The following Figures 5, 6, 7, and 8 are studies and sketches of material I found most interesting while researching for this project.

HISTORY:

Figure 5 shows the development of shopping from the open gathering place, or square, to the modern shopping center. The open square was not only a place to exchange goods, but it was also a place for festivities, visiting, politics, and shows.

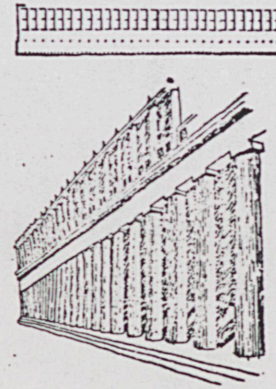
Through the ages, however, these other activities have been slowly eliminated until we ended up with the commercial strip. The strip was, for the most part, a convenient shopping machine. The shopper parked his automobile almost directly in front of the store, walked in and purchased the item he was seeking, and walked out. Nothing invited him to stay.

The shopping center started to change the shopping machine and is gradually adding more activities. These activities, such as "Crazy Days", "Midnight Madness", "Santa on the Mall", etc., are all geared towards making money. The biggest area in which I feel the shopping center fails is the area of pedestrian access. Until the pedestrian enters the shopping center, the automobile has priority and the pedestrian must watch out for his own safety.

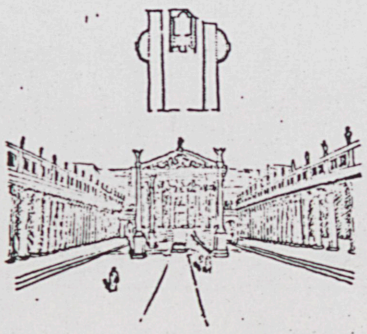
The more recent mini shopping centers are catering more towards the needs of the people. They have similar activities to the larger shopping centers but they are continually providing more facilities



OPEN MARKET



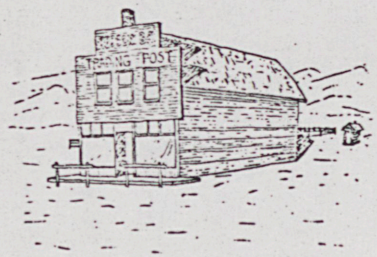
STOA



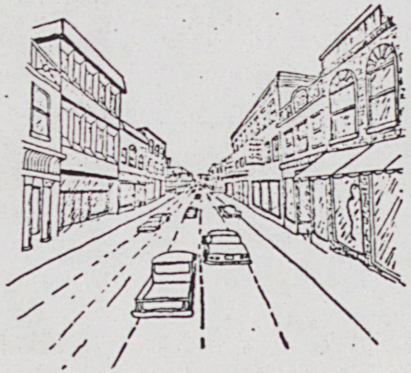
FORUM



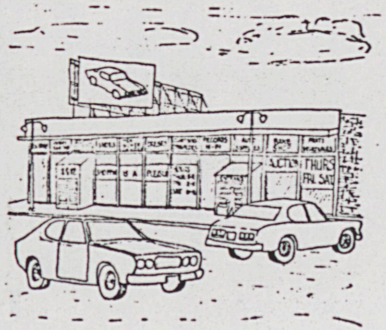
BAZAAR



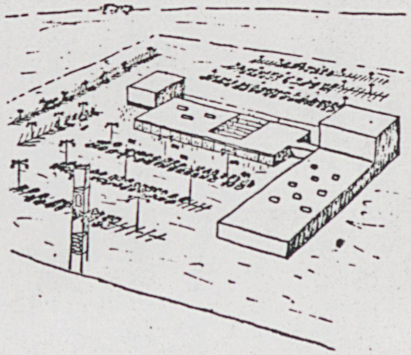
TRADING POST



DOWNTOWN



STRIP



SHOPPING CENTER

PROGRAM

THESIS MICHAEL J HEFFNER

STRIP COMMERCIAL CENTER

HISTORY

march 1975 | 1

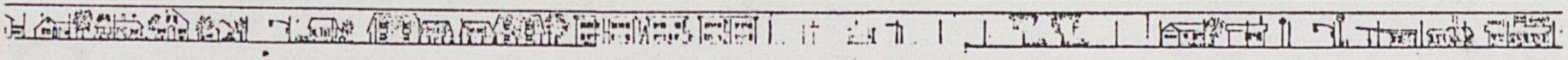


FIGURE 5

that the community needs. Some of these facilities are: meeting rooms, child care centers, theaters, restaurants, and offices.

I feel that with less dependence on the automobile, the neighborhood mini shopping center is going to have to provide a large number of facilities and activities to accommodate the people within walking or bicycling distance. These neighborhood centers are also going to have to provide the pedestrians and bicyclists safe and desirable access to them.

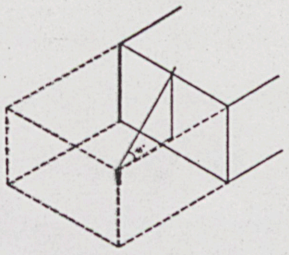
VISUAL:

The pedestrian's and bicyclist's visual attributes are much the same and require basically the same treatment. The bicyclist does have different requirements as his speed is much greater than the pedestrian's. However, once on the site, I feel the bicyclist and pedestrian will be similar enough to treat them the same visually. See Figure 6. Another difference between the bicyclist and the pedestrian is the eye level. This will cause a compromise in signs, lights, and other visual elements.

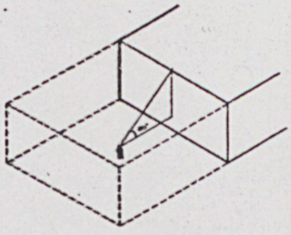
Average pedestrian eye level	5'5"
Average bicyclist eye level	7'0"

Since I am treating the pedestrian and bicyclist the same visually, from now on when I say pedestrian, I mean both pedestrian and bicyclist.

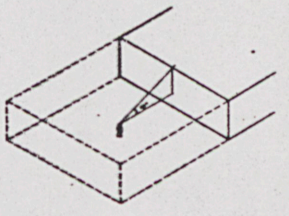
The pedestrian and the motorist, however, must be treated quite differently visually, as shown in Figures 7 and 8. The three main reasons for this are: the motorist's vision is confined by the structure of the automobile; as the speed of the motorist increases, his field of vision decreases and he is less able to comprehend details;



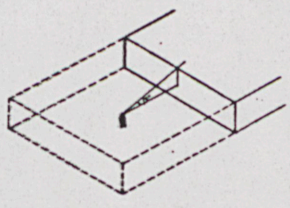
45° FACADE (–line)	45° ENCLOSURE (--line)
THE DISTANCE RELATION FOR SEEING FACADE DETAILS	FULL ENCLOSURE



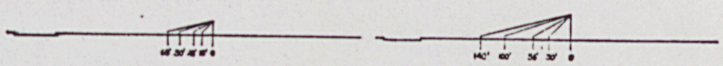
30° FACADE (–line)	30° ENCLOSURE (–line)
THE DISTANCE RELATION FOR SEEING THE WHOLE FACADE AND ITS DETAILS SIMULTANEOUSLY	THRESHOLD OF ENCLOSURE



18° FACADE (- line)	18° ENCLOSURE (--line)
THE THRESHOLD FOR DISTRACTION FOR DISTANT VISTAS	MINIMUM ENCLOSURE



14° FACADE (–line)	14° ENCLOSURE (--line)
THE FACADE FUNCTIONS AS AN EDGE TO A DISTANT VIEW	LOSS OF ENCLOSURE

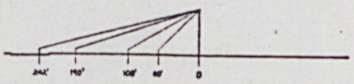


1 STORY (15')

2 STORY (30')



3 STORY (45')



4 STORY (60')

ANGLES & VISION

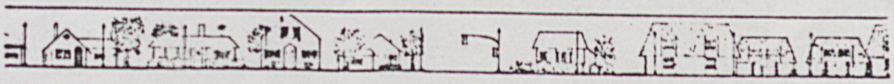


FIGURE 6

the motorist has two jobs in that he has to watch out for other traffic and find what he is looking for.

Because of the speed of the motorist, signs must be larger and more simply arranged, and lighting must be brighter. See Figure 8. Other considerations between the pedestrian and motorist will be discussed later.



HERALDRY

APPLIED IMAGERY, SYMBOL, LOGO TO IDENTIFY AT LONG DISTANCES

INFORMATION

PRIMARY INFORMATION LARGE, BRIEF - MORE SPECIFIC GET SMALLER

LOCATION	SPACE - SCALE SECTION 1"=60'-0"	SPEED	SYMBOL SIGN WOOD BLDG
EASTERN BAZAAR		3 M.P.H.	
MEDIEVAL STREET		3 M.P.H.	
MAIN STREET		3 M.P.H. 20 M.P.H.	
COMMERCIAL STRIP		35 M.P.H.	
THE STRIP		35 M.P.H.	
SHOPPING CENTER		3 M.P.H. 50 M.P.H.	
THE STRIP	SCALE 1"=200'-0"	35 M.P.H.	

SCALE & VISION

PROGRAM

THESIS MICHAEL J HEENER

STRIP COMMERCIAL CENTER

VISION STUDY

march 1975

2

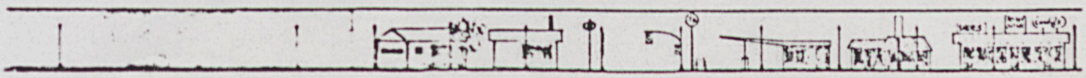
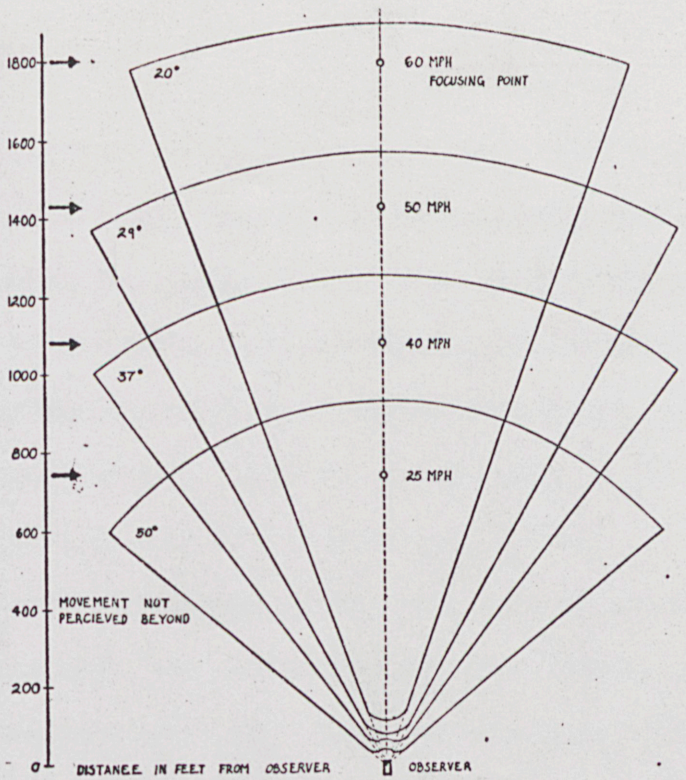


FIGURE 7



RELATIONSHIP BETWEEN FOCUSING DISTANCE, ANGLE OF VISION, AND DISTANCE OF FOREGROUND DETAIL AT SPEEDS OF 25 mph, 40 mph, 50 mph, 60 mph

SEEING TAKES TIME:

SPEED M.P.H.	REACTION TIME SEC	DISTANCE TRAVELED
25 mph	2.15 sec.	77.5 ft.
40 mph	2.15 sec.	125.0 ft.
50 mph	2.15 sec.	154.8 ft.
60 mph	2.15 sec.	189.2 ft.

SEEING DEPENDS ON LIGHT:

DAYLIGHT	CONTRAST	BRIGHTNESS
FULL SUN	2-4 %	YELLOW + GREEN
DUSK	60-70 %	YELLOW + GREEN

SEEING IS LIMITED IN SPACE:

LETTERS MUST BE 18" HIGH TO BE READ FROM 1,000'

AS SPEED INCREASES, CONCENTRATION INCREASES:

BECOMES INCREASINGLY DANGEROUS TO OBSERVE IRRELEVANT OBJECTS

VISION IN MOTION

FIGURE 8

SITE CONDITIONS

SITE DESCRIPTION:

The site I am proposing for my neighborhood commercial center is located along Broadwater Avenue, a developing commercial strip between 20th and 21st Streets West and Broadwater and Yellowstone Avenues. The site measures 800 feet along Broadwater Avenue and 460 feet back to Yellowstone Avenue.

TOPOGRAPHY:

The site is relatively flat with only a gradual 3-1/2 foot slope to the southeast over the entire 800 foot length. There are a few lower areas on the site but they can be easily levelled and do not present any serious problems. There are no rock formations or other problem areas.

UTILITIES:

Almost all utilities are easily accessible either along Broadwater Avenue on the south or from Wyoming Avenue on the east or west. These utilities include water, gas, sewer and storm sewer. Electricity is supplied from above ground powerlines either from the alley between Yellowstone and Wyoming Avenues or from the alley between Wyoming and Broadwater Avenues.

VEGETATION:

Currently, the site is used for pasturing horses and, thus, most of the vegetation is field grasses and weeds. There are some trees located along Broadwater Avenue. There is also a group of trees and some bushes located towards the southeast of the site about twenty feet from Broadwater Avenue.

ADJACENT ENVIRONMENT:

The immediate area surrounding my site consists of one and two-story single family dwellings. These homes vary a great deal as to age, but most are wooden structures with painted horizontal wood siding. There are a few brick homes and a couple of stucco homes. A large number of the homes have trees and bushes in both their front and back yards. These trees and bushes vary as to type and include: Pine, Fir, Spruce, Crabapple, Apple, Cherry, Willows, Elms, and Russian Olive. Most of the front yards are not fenced, whereas, a large number of back yards are fenced.

Directly across from my site to the south of Broadwater Avenue, the lots are presently empty to the alley. These lots, however, are zoned community commercial. In the future, then, there will be community commercial buildings directly across from my neighborhood commercial center.

In the general area surrounding my site there exists a majority of one and two-story single family dwellings. The more recent construction seems to be largely one and two-story but of the multi family two to eight plex type. The reason for this is that much of the land within a one mile radius of my site is undeveloped and is zoned R-72 or R-60. This type of zoning is a residential classification that provides for single family or multi family dwellings with a maximum of four units for R-72 and eight units for R-60. (See Figure 11.)

The area is accommodated by the Billings bus line and major arterial streets, such as Grand, Broadwater and Central Avenues running east and west, and 24th, 19th and 16th Streets running north and south.

This area is growing rapidly; and although it is close to a couple of larger commercial centers, the area is lacking in neighborhood facilities. Some of these facilities are barber shops, beauticians, doctor's offices, general offices, dentists, child care centers and meeting spaces.

There are two elementary schools and one high school in the general area. Connected with these schools are some playground areas, but no parking spaces. There is one small park in the area but it is completely lacking any recreational facilities.

AREA STUDY

I conducted an area study within a one-half mile radius of my site to find out what stores, facilities, and services already were in existence. From this study and an analysis of what stores, facilities, and services are required in a neighborhood commercial center, I determined what stores, facilities, and services were needed and which could be duplicated. The stores, facilities, and services that exist in the one-half mile radius and the number of each are as follows:

EXISTING RETAIL ESTABLISHMENTS	NUMBER
Supermarket	1
Small Grocery	1
Drug	1
Dry Cleaners	2
Barber	1
Beautician	1
Hardware	1
Offices	
Hobby	

Figure 9

Not only did I feel it necessary to find out the type and number of existing stores, facilities, and services, but their locations in relation to my site were also important. The location is important because the rapidly growing population might be able to support more

than one store of a certain type if they are not located too close to each other. The location of each of the existing retail establishments that concern my neighborhood commercial center is shown in Figure 10.

After determining what stores, facilities, and services were to be considered for my center, I did research on the compatibility and degree of compatibility between the different retail establishments. I made a compatibility chart for a neighborhood commercial center in order for it to be more easily used and understood. The chart in Figure 11 represents convenience goods and services but not facilities.

I hope to determine the best possible location for the different types of stores. I will do this by using the compatibility chart and results from my survey and research of the different types of stores.

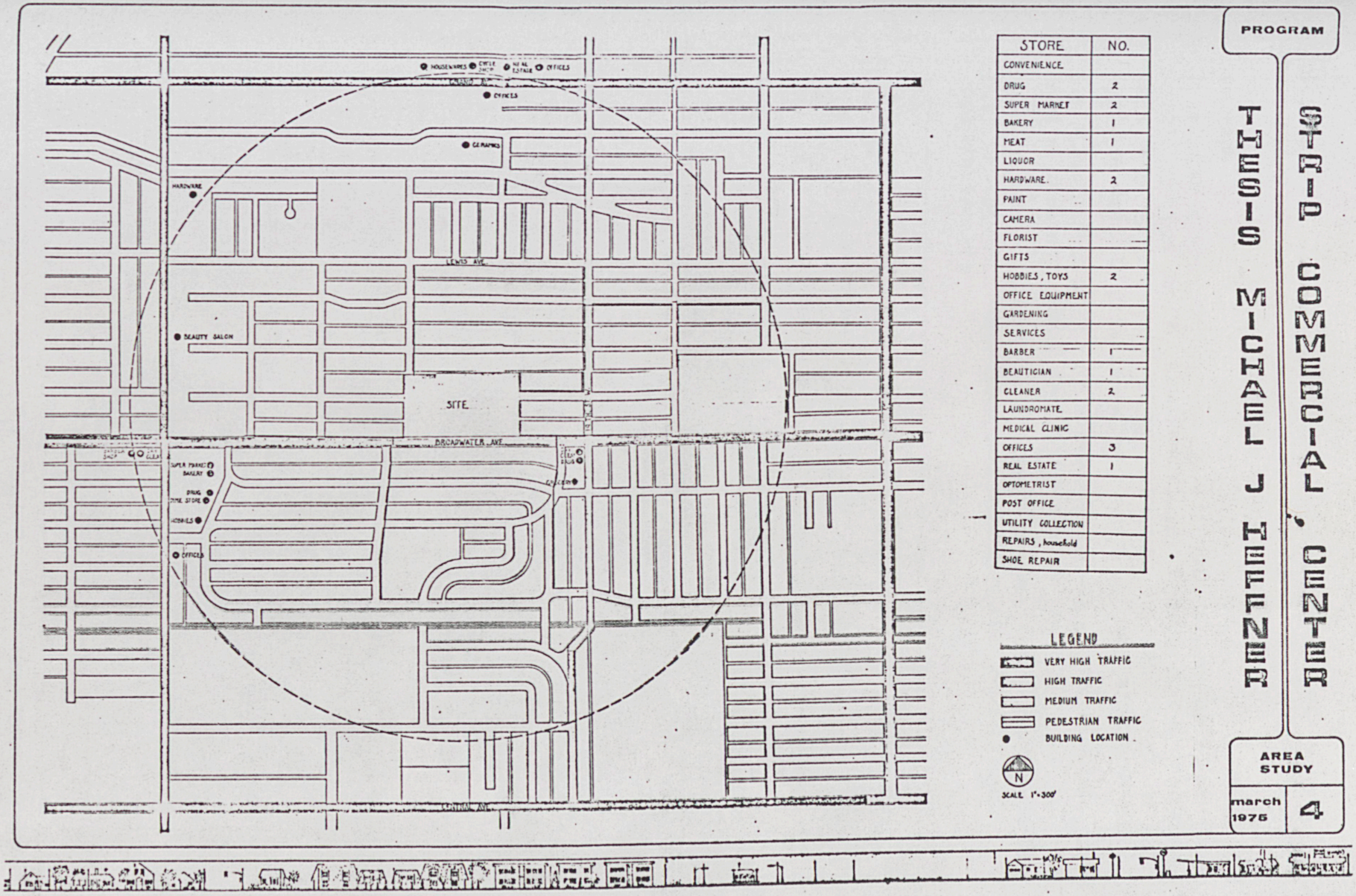

HOUSEWARES
CYCLE SHOP
REAL ESTATE
OFFICES
OFFICES
GERIATRICS
HARDWARE
LEWIS AVE.
BEAUTY SALON
SITE
BROADWATER AVE.
SUPER MARKET
BAKERY
DRUG
TIME STORE
HOBBIES
OFFICES
CAMDEN AVE.
PROGRAM
STRIP COMMERCIAL CENTER
THESIS MICHAEL J HEENER
AREA STUDY
march 1975
4
STORE
NO.
CONVENIENCE
DRUG 2
SUPER MARKET 2
BAKERY 1
MEAT 1
LIQUOR
HARDWARE 2
PAINT
CAMERA
FLORIST
GIFTS
HOBBIES, TOYS 2
OFFICE EQUIPMENT
GARDENING
SERVICES
BARBER 1
BEAUTICIAN 1
CLEANER 2
LAUNDROMATE
MEDICAL CLINIC
OFFICES 3
REAL ESTATE 1
OPTOMETRIST
POST OFFICE
UTILITY COLLECTION
REPAIRS, household
SHOE REPAIR
LEGEND
VERY HIGH TRAFFIC
HIGH TRAFFIC
MEDIUM TRAFFIC
PEDESTRIAN TRAFFIC
BUILDING LOCATION
N
SCALE 1"=300'

FIGURE 10

ZONING

NC NEIGHBORHOOD COMMERCIAL CLASSIFICATION IS INTENDED TO ACCOMODATE SHOPPING FACILITIES CONSISTING OF CONVENIENCE RETAIL AND PERSONAL SERVICES ESTABLISHMENTS WHICH SECURE THEIR PRINCIPAL TRADE BY SUPPLYING THE DAILY NEEDS OF THE POPULATION RESIDING WITHIN A 1/2 MILE RADIUS OF SUCH NEIGHBORHOOD FACILITIES.

R-72 RESIDENTIAL CLASSIFICATION IS PRIMARILY A SINGLE FAMILY RESIDENCE DISTRICT PROVIDING PROVISIONS FOR DUPLEX AND TWO FAMILY DWELLINGS.

R-60 RESIDENTIAL CLASSIFICATION IS PRIMARILY A SINGLE-FAMILY DISTRICT PROVIDING PROVISIONS FOR MULTI-FAMILY DWELLINGS WITH A MAXIMUM OF EIGHT UNITS.

COMBATIBILITY

KEY ■ HIGH 10-20% ▲ MODERATE 5-10 ⬡ SLIGHT 1-5% ⊙ INCOMPATIBLE	CONVENIENCE GOODS	DRUG	SUPER MARKET	BAKERY	MEAT	LIQUOR	HARDWARE	PAINT	CAMERA	FLORIST	GIFTS, CARDS	HOBBIES, TOYS	OFFICE EQUIP.	GARDENING	SERVICES	BARBER	BEAUTICIAN	CLEANER	LAUNDOMAT	MEDICAL CLINIC	OFFICES	REAL ESTATE	OPTOMETRIST	POST OFFICE	UTILITY COLLECTION	REPAIRS, HOUSEHOLD	SHOE REPAIRS
CONVENIENCE GOODS																											
DRUG			■	■	■	■	■	▲	▲	⬡	▲	⬡	▲	⊙		■	■	⬡	⬡	■	⬡	⬡	⬡	⬡	⬡	⊙	⬡
SUPER MARKET		■		■	■	■	■	▲	▲	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙	⬡
BAKERY		■	■		■	▲	▲	▲	▲	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙	⬡
MEAT		■	■	■		▲	▲	▲	▲	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⬡	⊙	⬡	⬡	⬡	⬡	⬡	⊙	⬡
LIQUOR		■	■	■	▲		⬡	▲	▲	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡
HARDWARE		■	■	▲	■	⬡		▲	▲	⬡	⬡	⬡	⬡	▲		⬡	⬡	⬡	⬡	⊙	⬡	⬡	⬡	⬡	⬡	⊙	⬡
PAINT		▲	▲	▲	▲	▲	▲		▲	⬡	⬡	⬡	⬡	▲		⬡	⬡	⬡	⬡	⊙	⬡	⬡	⬡	⬡	⬡	⊙	⬡
CAMERA		▲	⬡	⬡	⬡	⬡	⬡	⬡		⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙	⬡
FLORIST		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡		▲	⬡	⬡	⬡		⬡	⬡	⬡	⊙	⬡	⬡	⬡	⬡	⬡	⬡	⊙	⬡
GIFTS, CARDS		▲	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡		⬡	⬡	⊙		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙	⬡
HOBBIES, TOYS		▲	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡		⬡	⊙		⬡	⬡	⬡	⊙	⬡	⬡	⬡	⬡	⬡	⬡	⊙	⬡
OFFICE EQUIP.		▲	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	▲	⬡		⬡		⬡	⬡	⬡	⊙	⬡	⬡	▲	⬡	⬡	⬡	⊙	⬡
GADENING		⊙	⊙	⊙	⊙	▲	▲	⊙	⊙	⊙	⊙	⊙	⊙			⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
SERVICES																											
BARBER		■	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙			▲	▲	⊙	⬡	▲	⬡	⬡	⬡	⬡	⊙	▲
BEAUTICIAN		■	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙		▲		▲	⊙	⬡	▲	⬡	⬡	⬡	⬡	⊙	▲
CLEANER		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡		▲	▲		▲	⊙	▲	⬡	⊙	⬡	⊙	⊙	▲
LAUNDROMAT		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙	⊙	⊙	⊙	⊙		⊙	⊙	▲		⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙
MEDICAL CLINIC		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⊙		⬡	⬡	⬡	⬡	⬡	⊙	⊙
OFFICES		▲	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⊙	⊙		■	⊙	⬡	⊙	⊙	⊙
REAL ESTATE		▲	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⊙	⊙	■		⊙	⬡	⊙	⊙	⊙
OPTOMETRIST		▲	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⊙	⊙	⬡	⊙	⊙		⬡	⊙	⊙	⬡
POST OFFICE		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡		⬡	⊙	⬡
UTILITY COLLECTION		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡		⊙	⬡
REPAIRS, HOUSEHOLD		⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙		⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙		⊙
SHOE REPAIRS		⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙		■	▲	▲	⬡	⬡	⬡	⬡	⬡	⬡	⬡	⊙	⬡	

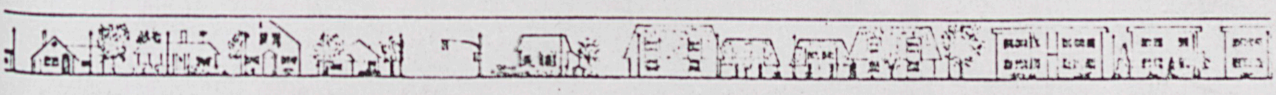


FIGURE 11

TYPES OF RETAIL ESTABLISHMENTS

In order to determine the square footage, economics, general architectural needs, and special requirements of the different types of retail establishments, I felt I not only had to do research, but I also had to understand the existing retail establishments in Billings. I was most interested in the area along Grand Avenue since Broadwater Avenue is developing in much the same way.

With the help of my advisors, I developed a survey sheet which I distributed to the managers of different types of retail establishments along Grand Avenue. I handed out 3-4 surveys to each type of store. The survey was done in order to establish general economic conditions, square footages, architectural needs, and special requirements for the retail establishments in Billings.

The area on the survey sheets that was answered least was economics. For this information, and for the retail establishments that did not reply, I had to go by national or similar neighborhood area surveys. For information I could not find, I worked with my advisor in marketing, Mr. Whitesell.

The information in the survey sheets on the following pages is used as a guideline for determining square footage, depending on the needs of my neighborhood commercial center. These survey sheets are used in conjunction with the compatibility table to determine particular locations within the center. The economic area is used to determine the size of store that can survive, and the general architectural needs are used as guidelines for store configurations.



TYPE of STORE

BARBER

ARCH. THESIS
THE COMMERCIAL STRIP
MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent	90%	generated	75%			
adver-tising	10%	shared	20%	$67 / Sq. Ft.	MUST BE LOCATED NEAR OR IN AN EASILY ACCESSIBLE COMPLEX	* DRUGS, * BEAUTICIAN, * CLEANER, * OFFICES, SHOE REPAIR
		suscipient	5%			
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
			auto	60%	front	85%	sign	✓	entrance	✓	corner	
		✓										
680			walk	40%	rear	5%	store front		middle		inter-mediate	✓
			total	100	side	10%	interior		stations		middle	✓

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent	✓	floor to ceiling		front	✓	front		height	8'-12'	levels	1	shelves	✓
incan-descent		display		rear		rear	✓	material		material		material	
natural	✓	windows		side		side						display	✓

REMARKS (special requirements)

(parking)
(landscaping)
(front facade)
(displays)
(interior)

WAITING AND CASHIER AREA CAN INCLUDE DISPLAY FOR DRYERS, SHAMPOO, & OTHER ACCESSORIES. NEED SINKS & ELECTRICAL OUTLETS

over



TYPE of STORE	
LIQUOR	

ARCH. THESIS
THE COMMERCIAL STRIP
MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent		generated		$275 / Sq.Ft.	PRIMARY LOCATION NOT NEEDED. EASY ACCESS ON GOOD ROADS.	*DRUGS, CAMERA *SUPERM MARKET *BAKERY *MEAT PAINT
adver-tising		shared				
		suscinient				
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
PER PERSON STORE .10			auto	80	front		sign		entrance		corner	
PARK .20			walk	20	rear		store front		middle		inter-mediate	
TOTAL .30			total	100	side		interior		stations		middle	

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent		floor to ceiling		front		front		height		levels		shelves	
incan-descent		display		rear		rear		material		material		material	
natural		windows		side		side						display	

REMARKS (special requirements)

(parking)
(landscaping)
(front facade)
(displays)
(interior)

LOTS OF DISPLAY AREA + SHELVING BECAUSE PEOPLE LIKE TO CHOOSE THEIR OWN AND TRY NEW TYPE OR BRANDS.
SHOULD CONSIDER A DRIVE UP WINDOW.

over

	TYPE of STORE	
	OFFICES	ARCH. THESIS THE COMMERCIAL STRIP MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent	95%	generated	100%	DEPENDENT ON OFFICE	DEPENDENT ON OFFICES	*REAL ESTATE, *OFFICE SUPPLIES, DRUG,
adver-tising	5%	shared				
		suscipient				
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
DEPENDS ON OFFICE			auto	75%	front	✓	sign	✓	entrance		corner	✓
			walk	25%	rear	✓	store front	✓	middle		inter-mediate	✓
			total	100	side	✓	interior		stations		middle	✓

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent	✓	floor to ceiling		front	✓	front		height		levels		shelves	
incan-descent	✓	display		rear		rear		material		material		material	
natural	✓	windows	✓	side	✓	side						display	

REMARKS (special requirements)

(parking)
(landscaping)
(front facade)
(displays)
(interior)

over



TYPE of STORE

PAINT



ARCH. THESIS
THE COMMERCIAL STRIP
MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent	80%	generated	95%	$50 / Sq. FT.	LOCATION MUST BE ON EASILY ACCESSIBLE ROADS AND KNOWN.	DRUGS, BAKERY, SUPER MARKET, MEAT, LIQUOR, HARDWARE, CAMERA, GARDENING
adver-tising	2%	shared	5%			
		suscinient				
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft		SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
PER PERSON				auto	98%	front		sign		entrance		corner	
STORE .10													
PARK .30				walk	2%	rear	✓	store front		middle		inter-mediate	
TOTAL .40													
		ANY	✓	total	100	side	✓	interior		stations		middle	

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent	✓	floor to ceiling		front		front		height		levels		shelves	✓
incan-descent		display	✓	rear		rear		material		material		material	
natural	✓	windows	✓	side		side						display	✓

REMARKS (special requirements)

(parking)
(landscaping)
(front facade)
(displays)
(interior)

A PICK UP AREA IS DESIREABLE. ADVERTIZING WITHIN THE STORE AND AREAS WHERE PEOPLE CAN SIT DOWN AND LOOK AT COLOR SCHEDULES.

over



TYPE of STORE

DRUG



ARCH. THESIS
THE COMMERCIAL STRIP
MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent	70%	generated	50%			
adver-tising	30%	shared	30%	#90 / Sq.Ft.	MUST BE ON EASILY ACCESSIBLE ROADS	*SUPER MARKET, *BAKERY, *MEAT *LIQUOR, *HARDWARE, PAINT, CAMERA, TOYS & HOBBIES.
		suscinient	20%			
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
800		✓	auto	90%	front	✓	sign	✓	entrance	✓	corner	✓
		✓	walk	10%	rear		store front	✓	middle	✓	inter-mediate	✓
		✓	total	100	side	✓	interior	✓	stations	✓	middle	✓
		✓										

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent	✓	floor to ceiling		front	✓	front		height		levels		shelves	✓
incan-descent		display	✓	rear		rear	✓	material		material		material	
natural	✓	windows	✓	side		side						display	✓

REMARKS (special requirements)

(parking)
(landscaping) STORAGE FOR MEDICINES, 4' HIGH COUNTER
(front facade) RAISED FLOOR
(displays)
(interior)

over



TYPE of STORE

OFFICE SUPPLIES



ARCH. THESIS
THE COMMERCIAL STRIP
MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent	80%	generated	90%			
adver-tising	20%	shared	10%	$70 / Sq. Ft.	NEEDS TO BE IN THE DOWNTOWN AREA OR NEAR A GROUPING OF OFFICES	*OFFICES, GIFTS & CARDS, REAL ESTATE
		suscipient				
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
		✓	auto	70%	front	✓	sign	✓	entrance	✓	corner	
1,700												
		✓	walk	30%	rear		store front		middle		inter-mediate	✓
			total	100	side	✓	interior	✓	stations	✓	middle	✓

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent		floor to ceiling	✓	front	✓	front		height		levels	1	shelves	✓
incan-descent		display		rear		rear	✓	material		material		material	
natural		windows	✓	side	✓	side	✓			CARPET	✓	display	✓

REMARKS (special requirements)

(parking)
(landscaping)
(front facade)
(displays)
(interior)

DISPLAY AREAS OF DIFFERENT TYPES,
STORAGE FOR PRINT PAPER & OTHER HEAVY EQUIPMENT

over

	TYPE of STORE	
	BAKERY	ARCH. THESIS THE COMMERCIAL STRIP MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent		generated		$47/Sq.Ft.	DOES BETTER NEXT TO OTHER STORES. MUST BE ACCESSIBLE	*DRUG ;*MEAT, *SUPER MARKET, LIQUOR, PAINT HARDWARE, CAMERA
adver-tising		shared				
		suscipient				
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
PER PERSON STORE .50 PARK 1.50 TOTAL 2.0			auto		front		sign		entrance		corner	
			walk		rear		store front		middle		inter-mediate	
			total	100	side		interior		stations		middle	

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent		floor to ceiling		front		front		height		levels		shelves	
incan-descent		display		rear		rear		material		material		material	
natural		windows		side		side						display	

REMARKS (special requirements)

(parking)
(landscaping)
(front facade)
(displays)
(interior)

LITTLE DISPLAY AREA. DISPLAY AREA MUST BE GLASS
LARGE AREA FOR PREPARATION AND BAKING

over

	TYPE of STORE	
	CAMERA	ARCH. THESIS THE COMMERCIAL STRIP MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent		generated		$ 90 / Sq. Ft.	MUST BE IN A KNOWN AREA, EASILY ACCESSIBLE AND NEAR OTHER STORES	DRUGS
adver-tising		shared				
		suscinient				
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
PER PERSON STORE .50 PARK 1.50 TOTAL 2.0			auto		front		sign		entrance		corner	
			walk		rear		store front		middle		inter-mediate	
			total	100	side		interior		stations		middle	

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent		floor to ceiling		front		front		height		levels		shelves	
incan-descent		display		rear		rear		material		material		material	
natural		windows		side		side						display	

REMARKS (special requirements)

(parking)
(landscaping)
(front facade)
(displays)
(interior)

POSIBILITY OF A PHOTO LAB REQUIRING A DARK ROOM AND OTHER SPECIAL EQUIPMENT. ALSO A FILM DROP OFF SHOULD BE CONSIDERED

over

	TYPE of STORE	
	FLORIST	ARCH. THESIS THE COMMERCIAL STRIP MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent	65%	generated	90%	$75 / Sq. FT.	LOCATION MUST BE ON EASILY ACCESIBLE ROADS.	HOBBIES & TOYS, HARDWARE
adver-tising	35%	shared	10%			
		suscinient				
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
690			auto	85%	front	✓	sign	✓	entrance	✓	corner	✓
			walk	15%	rear		store front	✓	middle		inter-mediate	✓
			total	100	side	✓	interior	✓	stations	✓	middle	✓

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent	✓	floor to ceiling	✓	front	✓	front		height		levels		shelves	✓
incan-descent		display	✓	rear		rear	✓	material		material		material	
natural	✓	windows	✓	side	✓	side						display	✓

REMARKS (special requirements)

(parking)
(landscaping)
(front facade)
(displays)
(interior)

NEEDS SOUTHERN EXPOSURE, HUMIDIF
COOLER FOR FRESH CUT FLOWERS
DELIVERY FACILITIES

over

	TYPE of STORE	
	VARIETY STORE	ARCH. THESIS THE COMMERCIAL STRIP MICHAEL J. HEFFNER

ECONOMICS

RENT-ADVERT.		BUISNESS		VOLUME	LOCATION	COMPATIBILITY
rent	85%	generated	60%			
adver-tising	15%	shared	30%	$35 / Sq. Ft.		
		suscinient	10%			
total	100	total	100			

MANAGEMENT PREFERENCE

SIZE sq ft	SHAPE		ACCESS		PARKING		ADVERTISING		CASHIER		BLOCK LOC.	
800			auto	85%	front	✓	sign	✓	entrance	✓	corner	✓
			walk	15%	rear		store front	✓	middle		inter-mediate	✓
			total	100	side		interior		stations	✓	middle	✓

ARCHITECTURE

INTERIOR LIGHT		GLASS		ENT.		DEL.		CEILING		FLOOR		WALL	
fluores-cent		floor to ceiling		front		front		height		levels		shelves	
incan-descent		display		rear		rear		material		material		material	
natural		windows		side		side						display	

REMARKS (special requirements)

(parking) DEPENDING ON WHAT THE STORE SALES
(landscaping)
(front facade)
(displays)
(interior)

over

DESIGN

GENERAL:

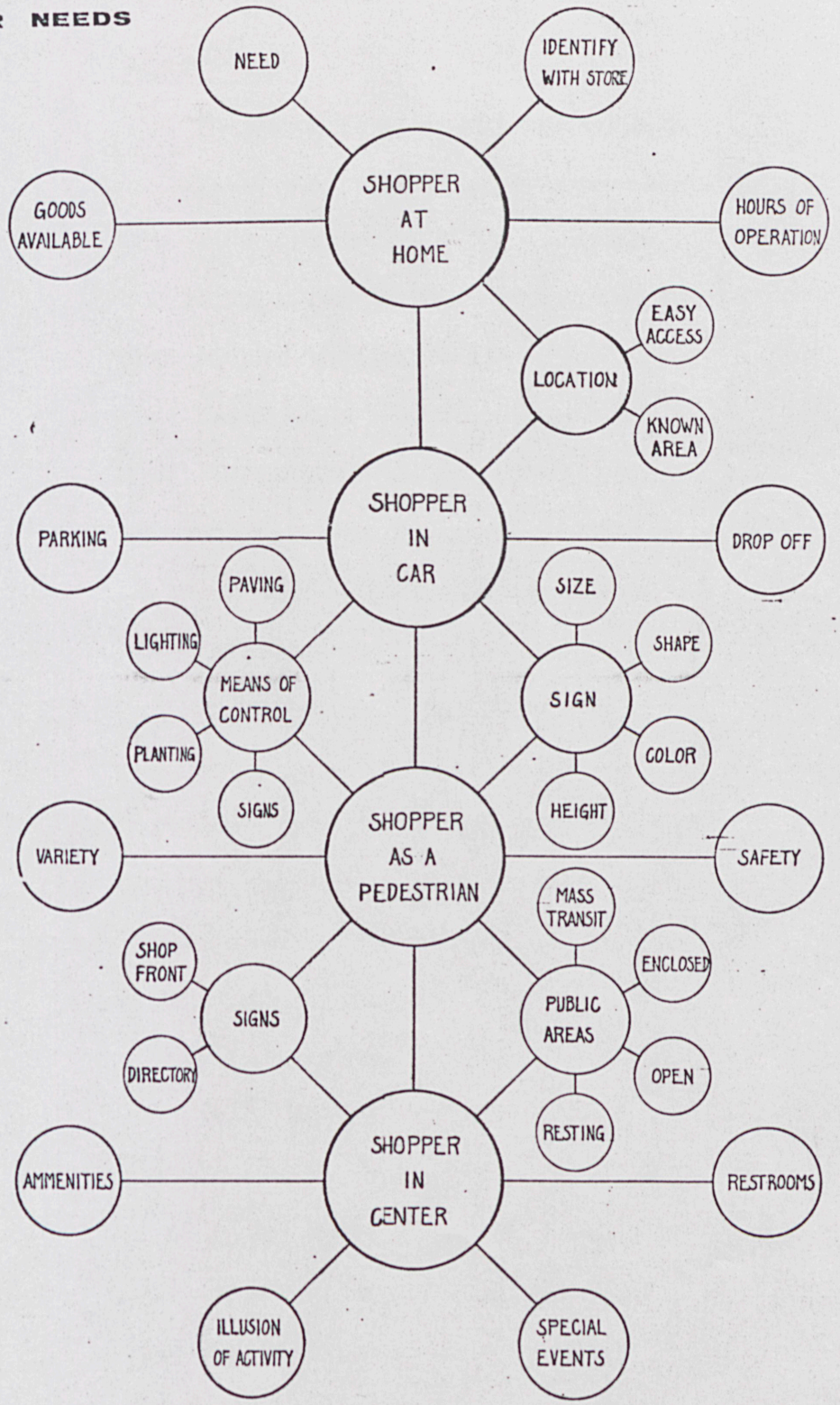
In the design stage of my project the pedestrian is my main concern. The reason for this is that I am designing a neighborhood commercial center to serve the basic needs of the residents within walking and bicycling distance. The pedestrian is being eliminated from his territory by the expansion of the commercial strip along Broadwater Avenue. In my neighborhood commercial center I am going to turn some of the land along the strip back to the pedestrian.

The neighborhood commercial center I am designing is going to try and meet the needs of the neighborhood. The center is also going to try and be a total system. By this, I mean that the center would serve the needs of the working mother and father, the housewife, the children, the people who work in the center, the retired person, and special interest groups. The center would do this by providing such amenities as a day care center, a theater with afternoon matinees, a restaurant and cafeteria, food and drugs, medical clinic, offices, a branch bank, outside recreation, special events, meeting rooms, gardening, as well as other stores and shops needed in the neighborhood.

The growing use of the bicycle and mass transit systems are signs of less dependence on the individual automobile. Although the automobile is needed at the present time to help support my neighborhood commercial center, I have made it of secondary importance. In the future, with less dependence on the automobile, I will convert the parking space back to recreational uses. I would do this at a rate of approximately one-third of the parking space being reclaimed every fifteen years. This area would then be used for recreational facilities, such as basketball courts, tennis courts, and volley ball. Some of

this area could also be used for future building expansion. At the end of a forty-five year period, only service vehicles would be allowed on the site. (See Figure 12.)

HOPPER NEEDS



PROGRAM

STRIP COMMERCIAL CENTER

THESIS MICHAEL J HELTNER

DIAGRAMS

march 1975 | 3

FIGURE 12

CIRCULATION

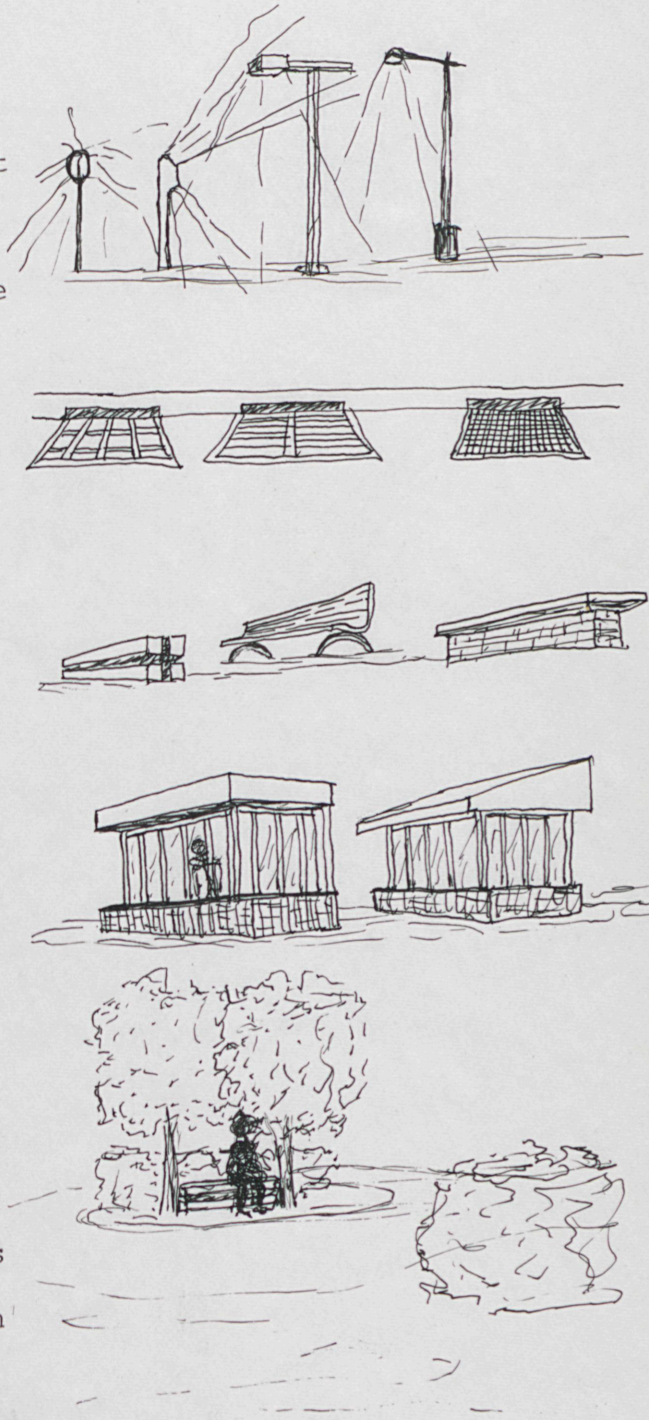
PEDESTRIAN:

The pedestrian is more susceptible to details and the immediate environment than is the motorist. This is mainly due to the speed of the motorist and the framework of the automobile.

The details I am thinking of are shown in the sketches along this page and include paving materials, lighting fixtures, building materials, color, and plantings.

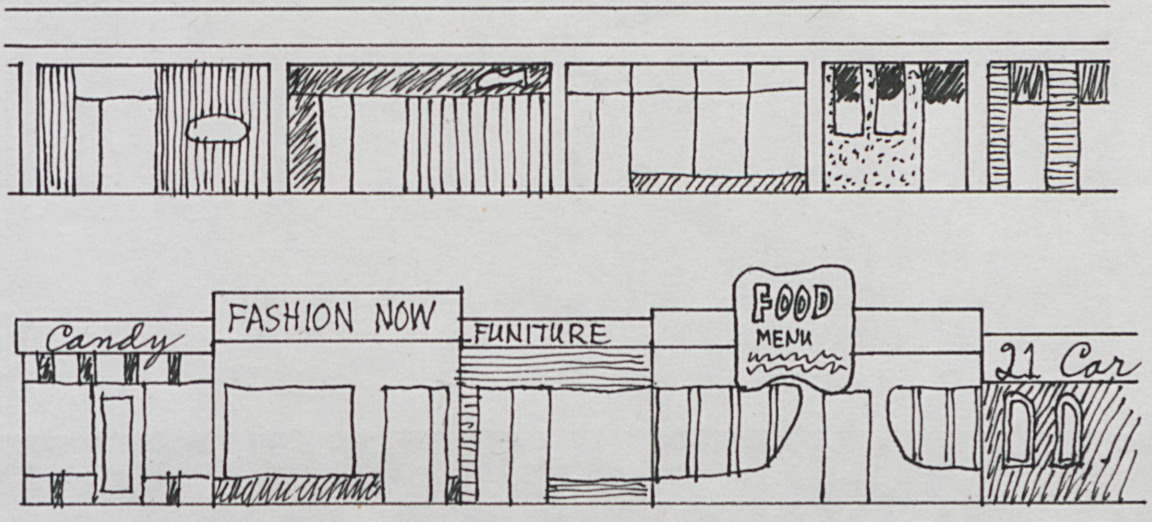
In referring to the immediate environment I am considering planting materials, transition from one space to another, protection from climatic conditions, noise, the motorist, and types of circulation control.

The pedestrian is expending energy while he walks and, therefore, he needs places to rest. Making these rest areas of different types along the circulation paths provides a more interesting and desirable experience. (See Figure 13.)



STUDY

WORKING WITHIN A FRAMEWORK



4000' MAXIMUM FOR SEEING PEOPLE

450' MAXIMUM FOR DISCERNING ACTION

80' MAXIMUM FOR RECOGNIZING A FACE

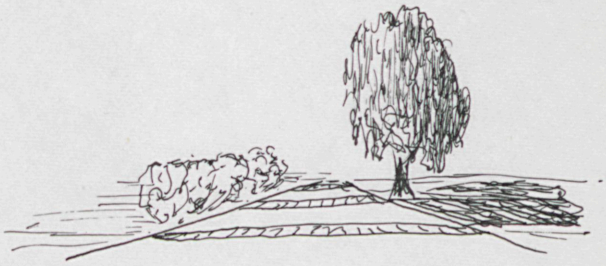
40' MAXIMUM FOR DISCERNING FACIAL EXPRESSION

10' RANGE OF CONVERSATION

3' OBSERVER

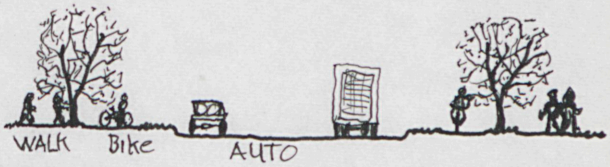
FIGURE 13

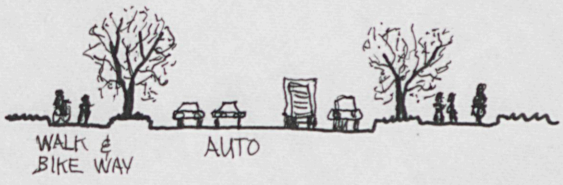
The pedestrian's circulation can be controlled by signs, plantings, paving materials and lighting.



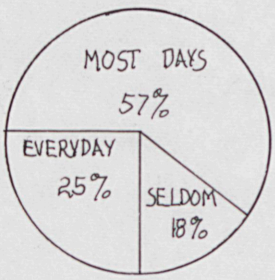
BIKES:

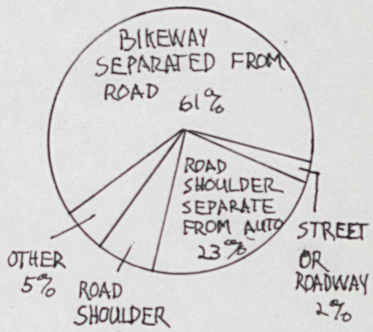
Bicycles can move safely with both pedestrians and motorist if enough room is provided and the proper controls are used. However, it is better to separate the bicyclist from the pedestrian and motorist where possible. It is also better to consolidate and minimize the amount of intersection between these three circulation paths.



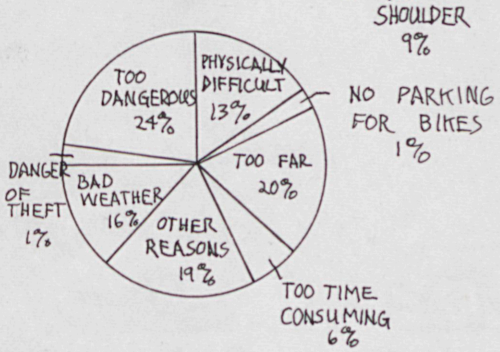


The people's desire to ride their bikes if adequate bikeways are provided and the reasons people do not ride their bikes are shown in the two diagrams on this page. (9.38)





The bicyclist has many of the same requirements as the motorist. The bicyclist requires signs as a means of control and protection; a smooth continuous paving material with proper drainage; and parking areas with hardware to prevent theft.

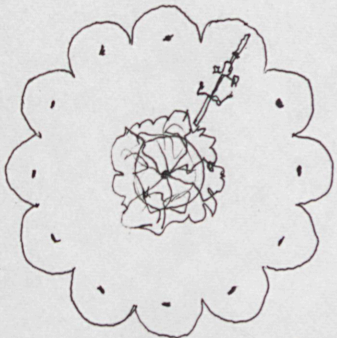


The bike's dimensions are not as large as the automobile but they still

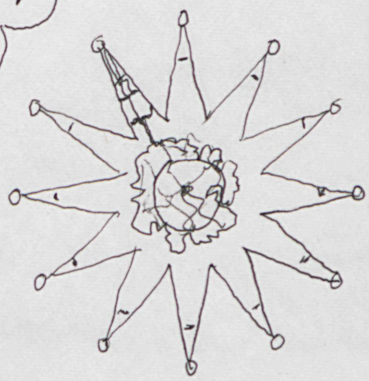
must be considered.

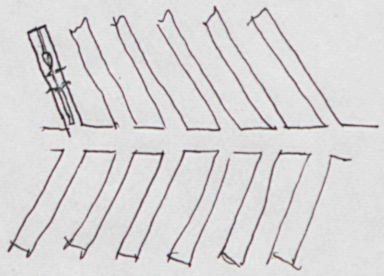
Length of bicycle	5'8"
Handlebar width	1'10"
Height of cyclist on bicycle	7'5"
Width of rider's elbows with hands on handlebars	2'2"

NUMBER OF LANES	MINIMUM WIDTH
1	3'3"
2	6'4"
3	10'0"
4	15'3"



BICYCLE FLOWER





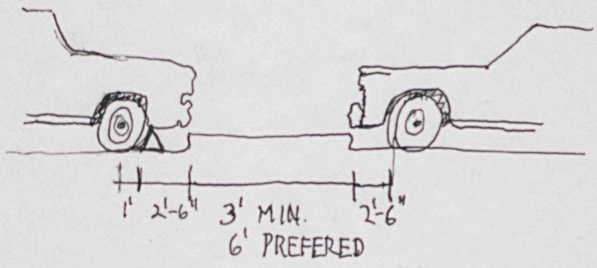
PATTERNS PAINTED ON PAVEMENT

Following these sketches, diagrams and tables and with the hope that bikeways will be developed in my area in the future, I will try to accommodate the need of the bicyclist on my site. I hope to do this in such a way as to provide a safe and convenient flow of bicycle traffic with adequate bicycle parking. I hope to make bicycle access an important part of my design.



AUTOMOBILE:

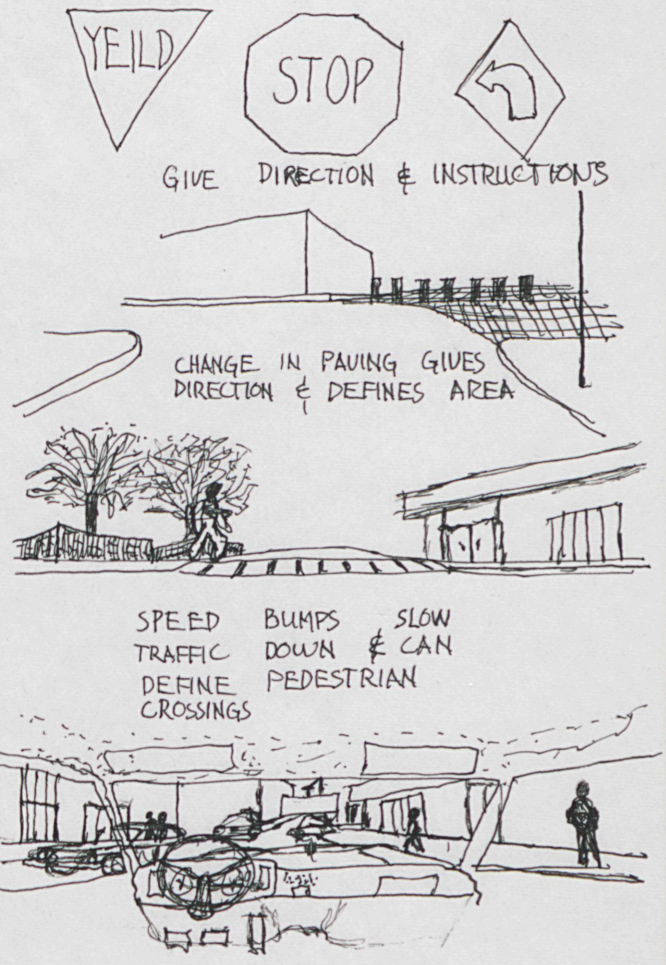
The speed and size of the automobile demand large areas for parking and a controlled circulation pattern. Some of the various parking patterns and their space requirements are shown here.



The circulation of the automobile can be controlled in a variety of different ways. Some of the different means used to control traffic are signs, lighting, paving materials, speed bumps, ballasters, and plantings. These can be combined and used in many different ways.

The structural framing of the automobile limits the amount of information the motorist can gather and comprehend. The signs must be simple and large enough for the motorist to understand at a speed of 5-15 m.p.h.

I feel that access of the automobile onto the site must be convenient in order to minimize any congestion on the main streets, however, I also feel that the automobile is secondary to the pedestrian. The automobile does not need the continuous ribbon of entrances and exits found along the commercial strips. What would be better is an adequate number of controlled entrances and exits that would reduce the amount of traffic congestion and limit the number of hazard conditions.



ELIMINATING SOME OF THE AUTO ACCESSES MAKES FOR BETTER SAFETY FOR BOTH PEDESTRIAN + AUTOMOBILE

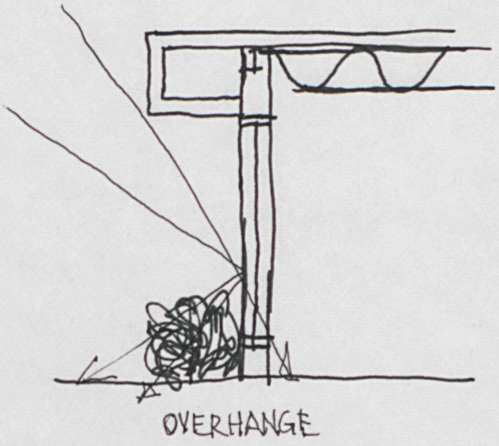
ORIENTATION

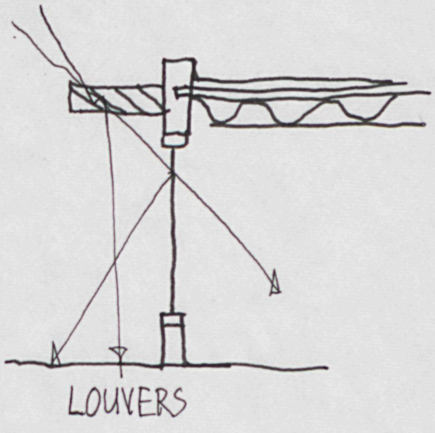
SUN:

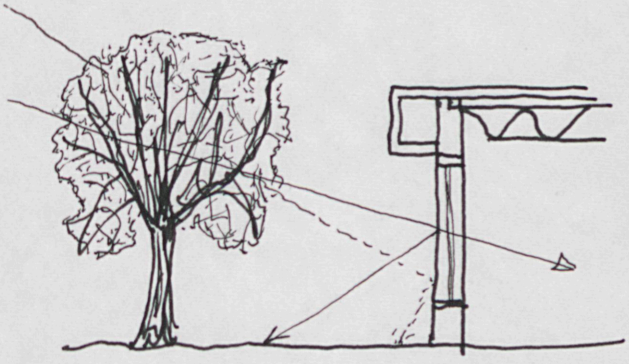
To make the best possible use of the sun's energy is a necessity in today's environment. Some of the different ways to do this are shown on this page.

The site I have chosen has an 800 foot south exposure. This exposure is not interrupted by any high-rise buildings or geographical conditions.

For the size of my building and the economics of my project, I do not feel that a solar collector is feasible at this time. However, I am providing for the addition of a solar collector in the future when the building expands. I also feel that the collectors will be more efficient and, therefore, more economically feasible in the future.







WIND:

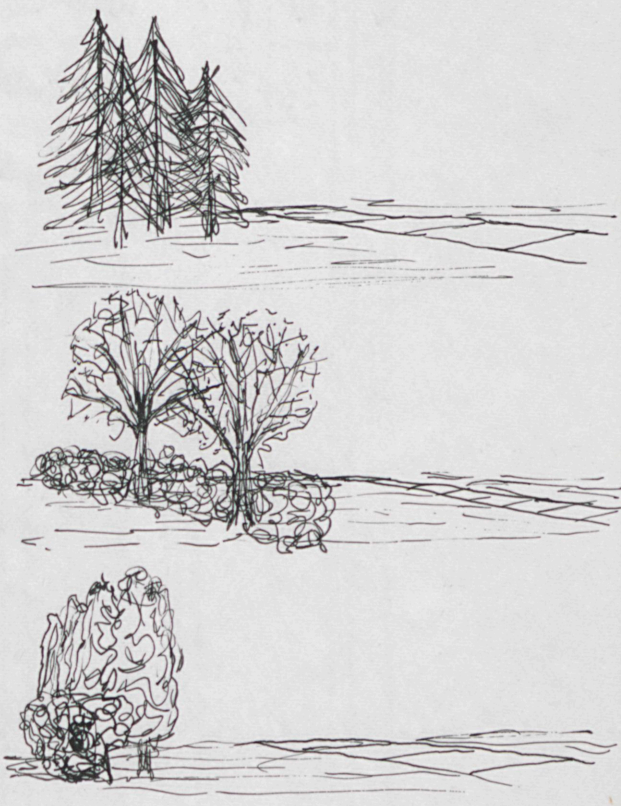
Many things can be used for protection from wind. The orientation of the building, walls, earth burms, and plantings are but a few of the ways.

The wind in Billings is mostly out of the southwest. The cold winter winds are out of the west-southwest and these are the winds I am most concerned with. The wind does not blow a great deal in Billings nor is it a strong wind.

Average annual hourly speed 11.3 mph

Average winter hourly speed 12.4 mph
(Dec., Jan., & Feb.)

Winds can cause problems around entrances and discourage pedestrian travel, therefore, protection from the wind is a very important part of my design solution. (See Figure 14.)



PROGRAM
CLIMATIC CONDITIONS
5
march 1975
NOON SUN
DAYLIGHT
BROADWAY AVE
WIND
SHADOWS 9am, 3pm

FIGURE 14

AESTHETICS

RIMROCKS:

The rimrocks are the geographical landmark of Billings. They border Billings all along the north and are a strong horizontal element. Their sandstone cliffs rise to a height of approximately 60-80 feet from the base.

The rimrocks can be seen from my site and are approximately two miles north of it. They create a horizontal band above the single story houses and are blocked from view in some cases by trees. The cliffs of the rimrocks are rugged and contain many boulders.

I feel that the horizontal and rugged quality of the rimrocks could be reflected in my design. Although the rimrocks are not that close to my site, they are such an important part of Billings that I feel they are worth considering and reflecting in my design.

SURROUNDING HOMES:

As stated before, the houses surrounding my site consist mainly of one and two-story single family dwellings. The newer construction in the area is tending toward the one and two-story four to eight plex units. These units are on a larger scale than the single family units.

The houses in the area contain individual yards with trees, bushes, flowers, and fences being used both to decorate and enhance the yards and homes and also to define property lines. Most of the homes in the area are wooden structures with painted horizontal wood siding.

The qualities of the surrounding homes that I feel should be considered in my design are residential scale, planting materials, types

of spaces created, and individuality. These elements would help the people of the neighborhood to relate to the building more and create a desirable shopping environment.

FUTURE COMMERCIAL:

It is hard to design for future commercial facilities in the neighborhood. What I mean by this section is that I know where future commercial facilities are going to go because of zoning ordinances. Having a knowledge of these zoning ordinances, I should be able to look ahead and estimate future circulation patterns. These patterns would then have an influence on my design. As I stated before, however, I hope that the design of my neighborhood commercial center would set an example for the future commercial developments in my area and along Broadwater Avenue.

PROPOSED DESIGN SOLUTION

The following four pages, 54-57, are sketches of the proposed designs which most influnced the final design.

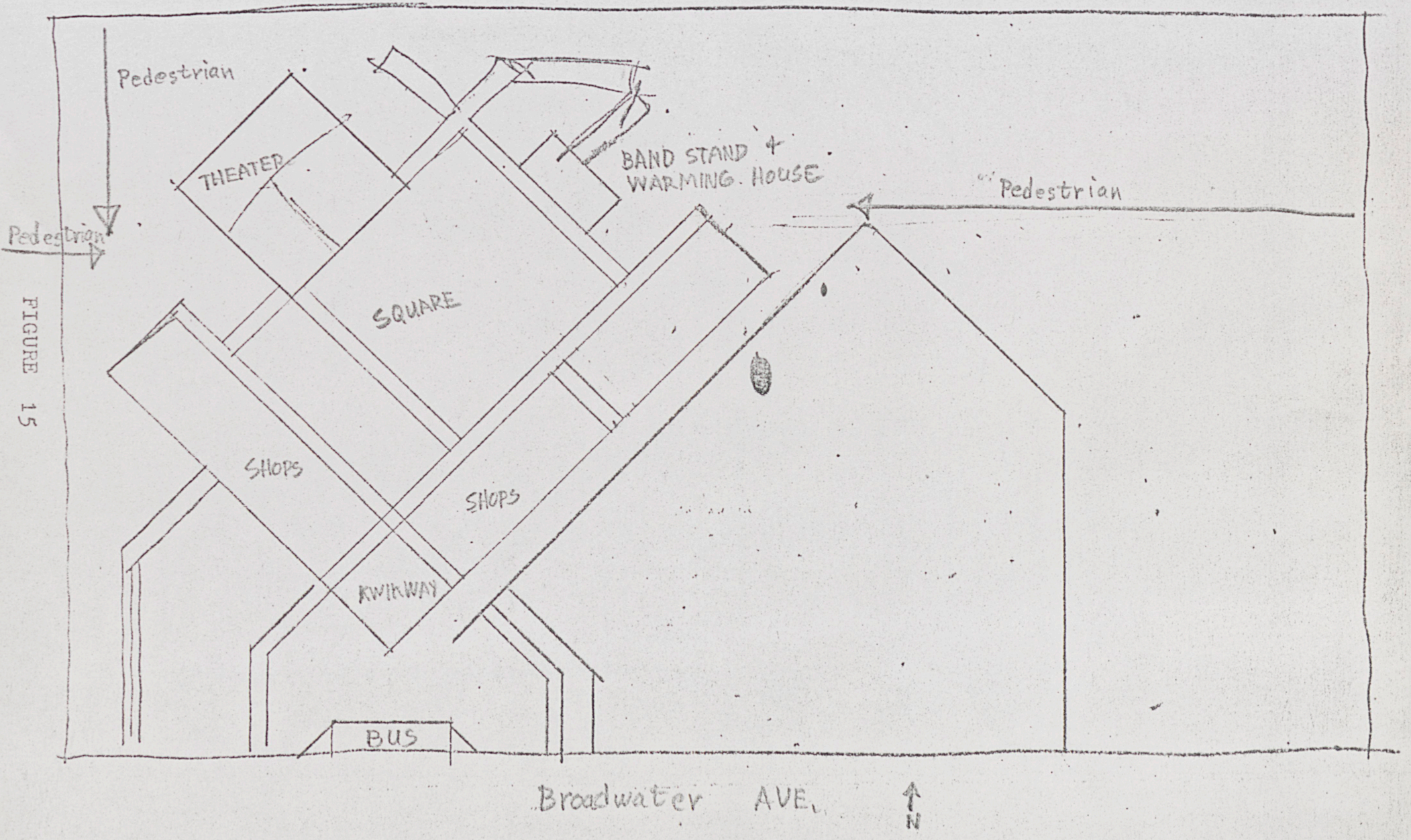

Pedestrian
THEATER
BAND STAND + WARMING HOUSE
Pedestrian
Pedestrian
SQUARE
SHOPS
SHOPS
KWIKWAY
BUS
Broadwater AVE.
N

FIGURE 15

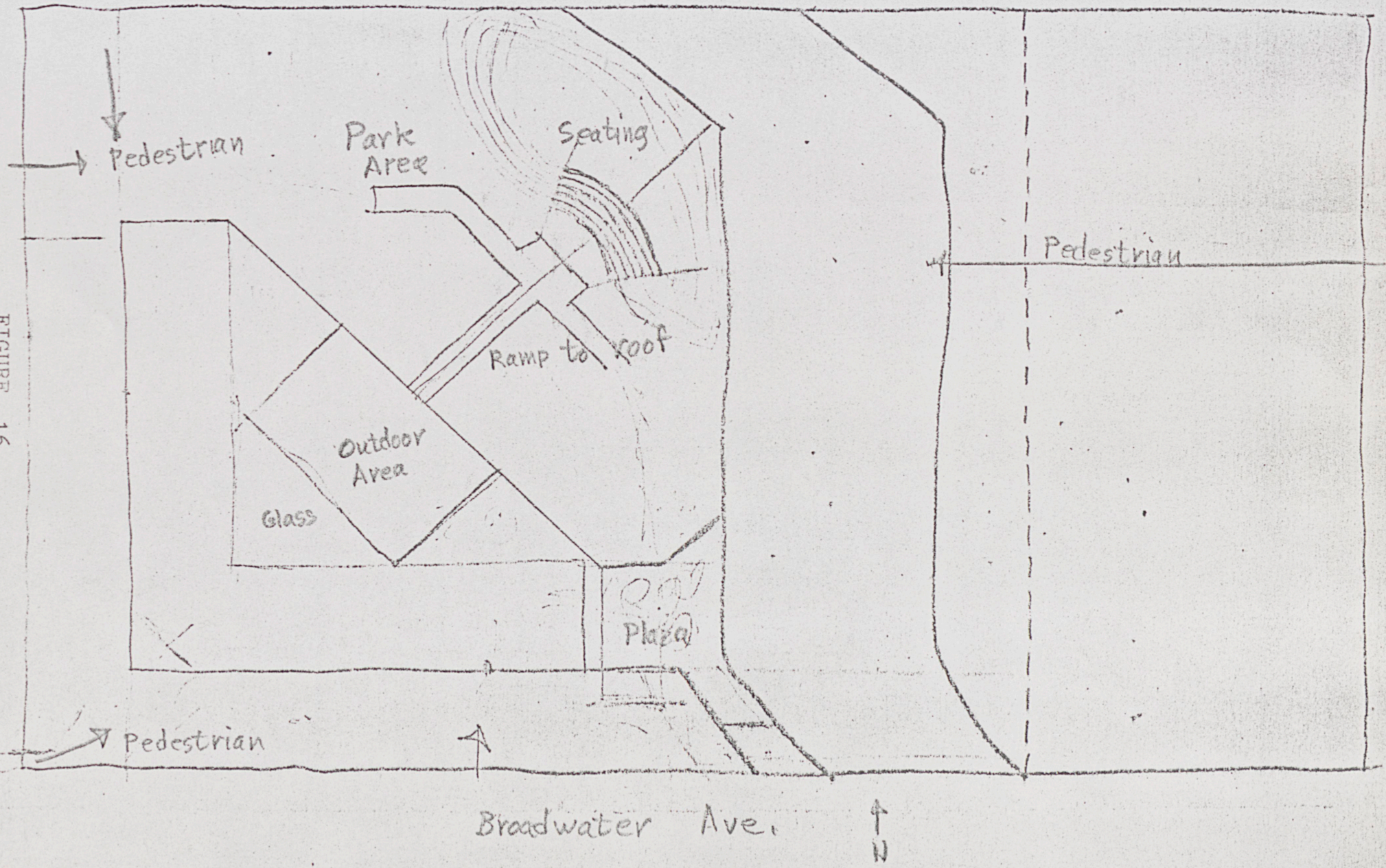

Pedestrian
Park Area
Seating
Pedestrian
Ramp to roof
Outdoor Area
Glass
Plaza
Pedestrian
Broadwater Ave.
N

FIGURE 16

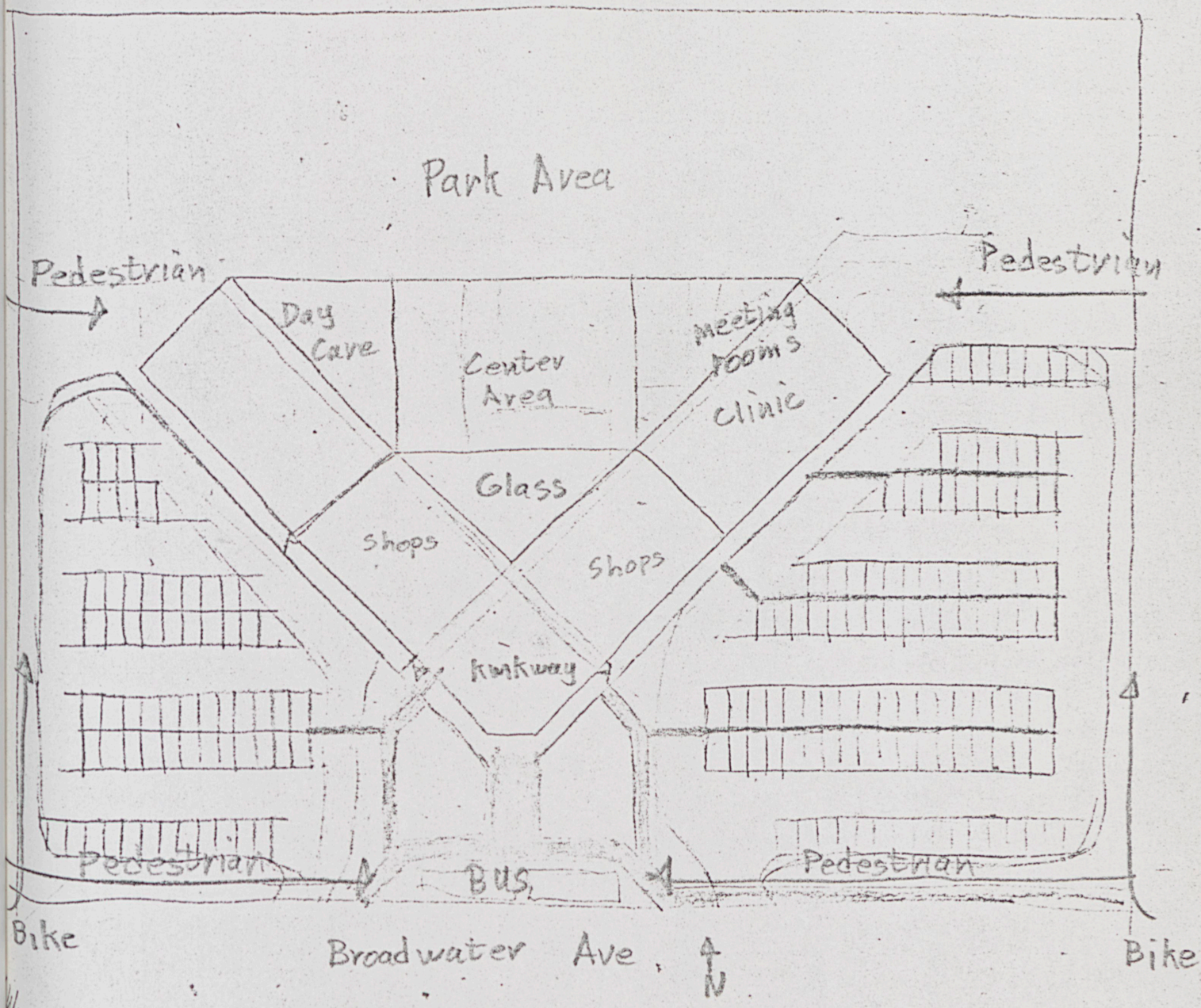

Park Area
Pedestrian
Pedestrian
Day Care
Center Area
meeting rooms
clinic
Glass
Shops
Shops
Walkway
Pedestrian
Bus
Pedestrian
Bike
Broadwater Ave.
N
Bike

FIGURE 17

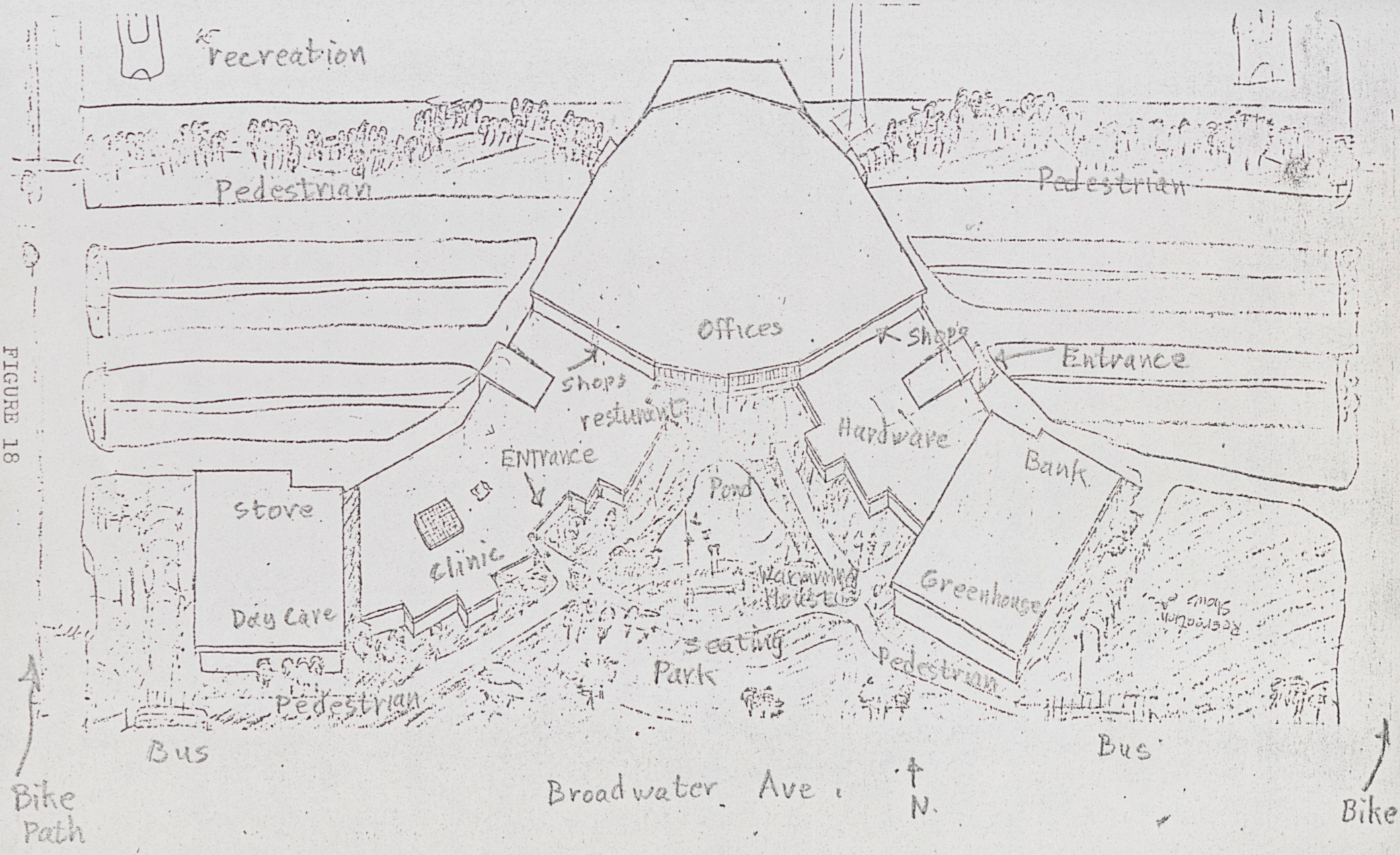

Recreation
Pedestrian
Pedestrian
Offices
Shops
Shops
Entrance
restaurant
Hardware
Bank
ENTrance
Pond
Stove
Clinic
Greenhouse
Day Care
Seating
Park
Pedestrian
Pedestrian
Bus
Bus
Bike Path
Broadway Ave.
N.
Bike

FIGURE 18

In the first proposal, figure 15, the building started to reach out to the pedestrian. A pedestrian space was being created in the center square and the building, because of its angle to Broadwater started to act as its own sign. However, there was still a mass of parking along the strip, Broadwater Ave., which both created a pedestrian hazard and continued what was already along the strip.

The second proposal, figure 16, again reached out to the pedestrian entrances and started to create a transition from strip to building and park. The open square was abandoned and turned into a park to save on materials and energy consumption. An attempt to conserve on the site and parking again created problems. In this proposal the building reflects the strip more but loses its ability to act as its own sign.

The third proposal, figure 17, reaches out to the pedestrian entrances and starts to allow for a bicycle path around the site. The building conserves energy by being enclosed and parallels the park. It again becomes its own sign because of its angle to Broadwater. Bus access is also becoming more of a concern, trying to get it close to an entrance. However, the building doesn't take part in the park and by being open to the park and closed to the parking on the south, considerable energy is lost. Also, the parking again is the same that exists along the strip.

The fourth proposal, figure 18, is very similar to my final proposal. The building opens itself up to the park and the southern exposure. The angle of the building allows it to act as its own sign. The pedestrian ways are protected from traffic and automobile access is limited. The park creates green space along the strip and becomes an active area providing skating, a pond in the summer, a plaza for art shows etc., a band concert area and other activities the center might desire. The bus stops are close to entrances and the pedestrians are funneled into the building. The entrances are becoming more defined and are starting to act as transition areas with their own small plazas. The parking is split to provide overflow parking which can also be used for recreational activities such as tennis and basketball. The bikeways follow the perimeter of the site and bike parking is provided near the entrance.

CONCLUSION

I feel that throughmy design I have tested my thesis statement and have proven it to be true. I have created a more desireable pedestrian shopping environment and provided green space along the commercial strip. I have also maintained the accessibility of the car to my site. Although, this accessibility was controlled and the automobilewas treated secondary to the pedestrian.

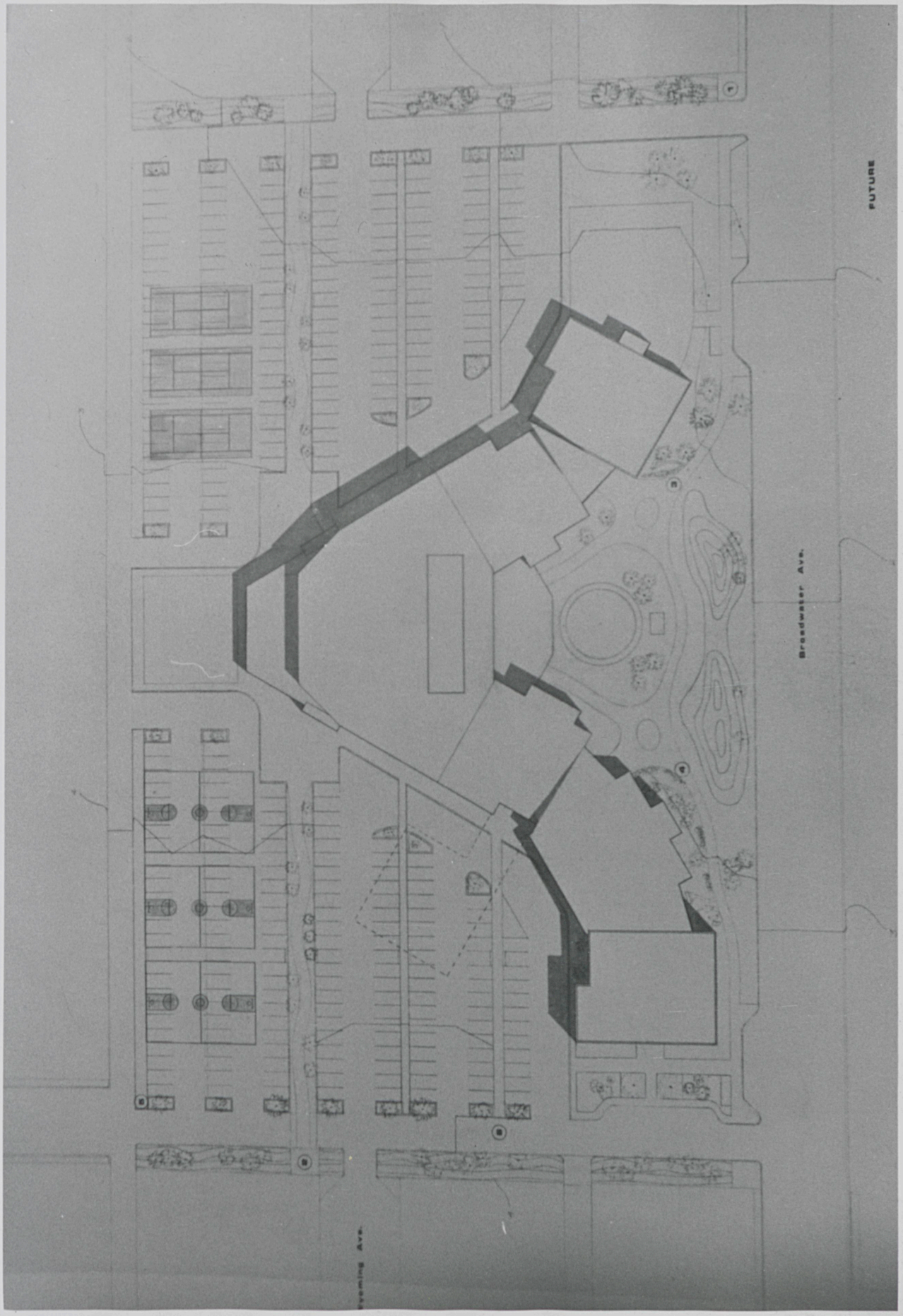
Through my research I have also proven that this strip commercial center is economically feasible. Even though it is dependent upon the auto at the present time, in the future it could be fully supported by the people within a mile radius ot the site.

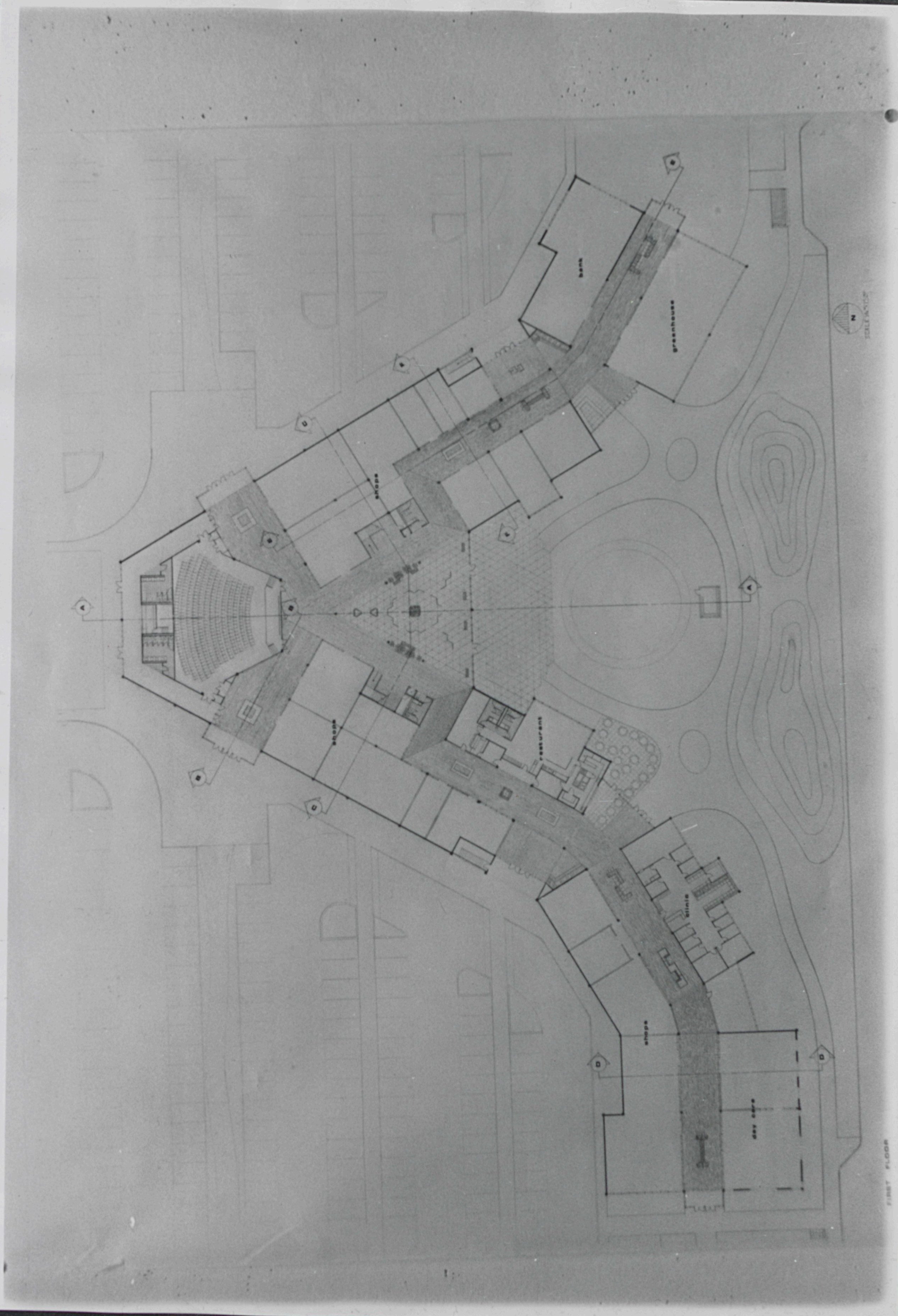
With the anticipated phasing out of the auto in the future, I have shown that part of the site could be used for permanent recreational facilities such as basketball and tennis. Other areas of the parking lot could be used for future expansion of the center. This would allow for smaller green areas and start to take on the effect of a square. Also in the future a solar collector could be added and connected to the exisiting heating unit.

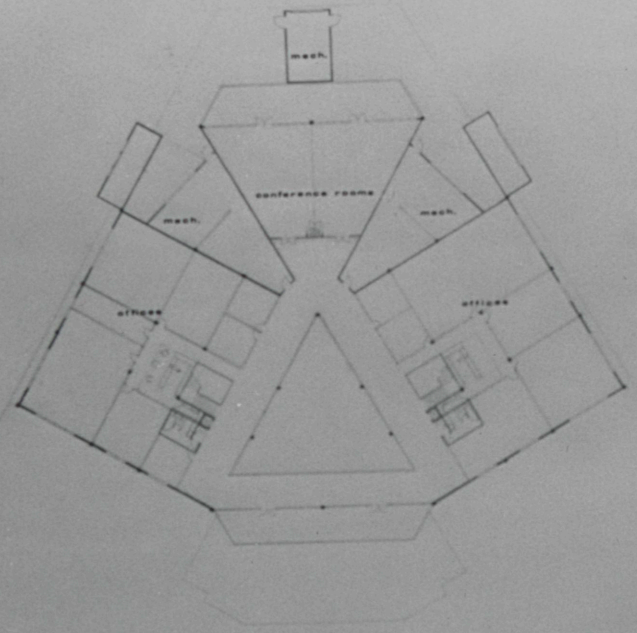
As the car is phased out the site is continually turned over to the pedestrian and becomes even more of a neighborhood center. In an attempt to provide the things needed in a neighborhood center I have included in the center, a day care center, offices, a bank, a restaurant,

meeting rooms, and a theater.

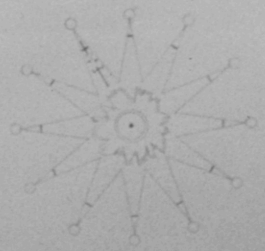
This commercial center was designed to be economically feasible at the present time. To do that, it had to serve the needs of both the pedestrian and the motorist. However, the center also anticipates the future and provides for the phasing out of the auto and the taking over of the pedestrian.


FUTURE
Broadwater Ave.

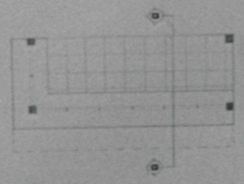

shops
greenhouse
restaurant
shops
FIRST FLOOR



SECOND FLOOR



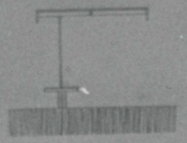
BICYCLE PARKING



PLAN

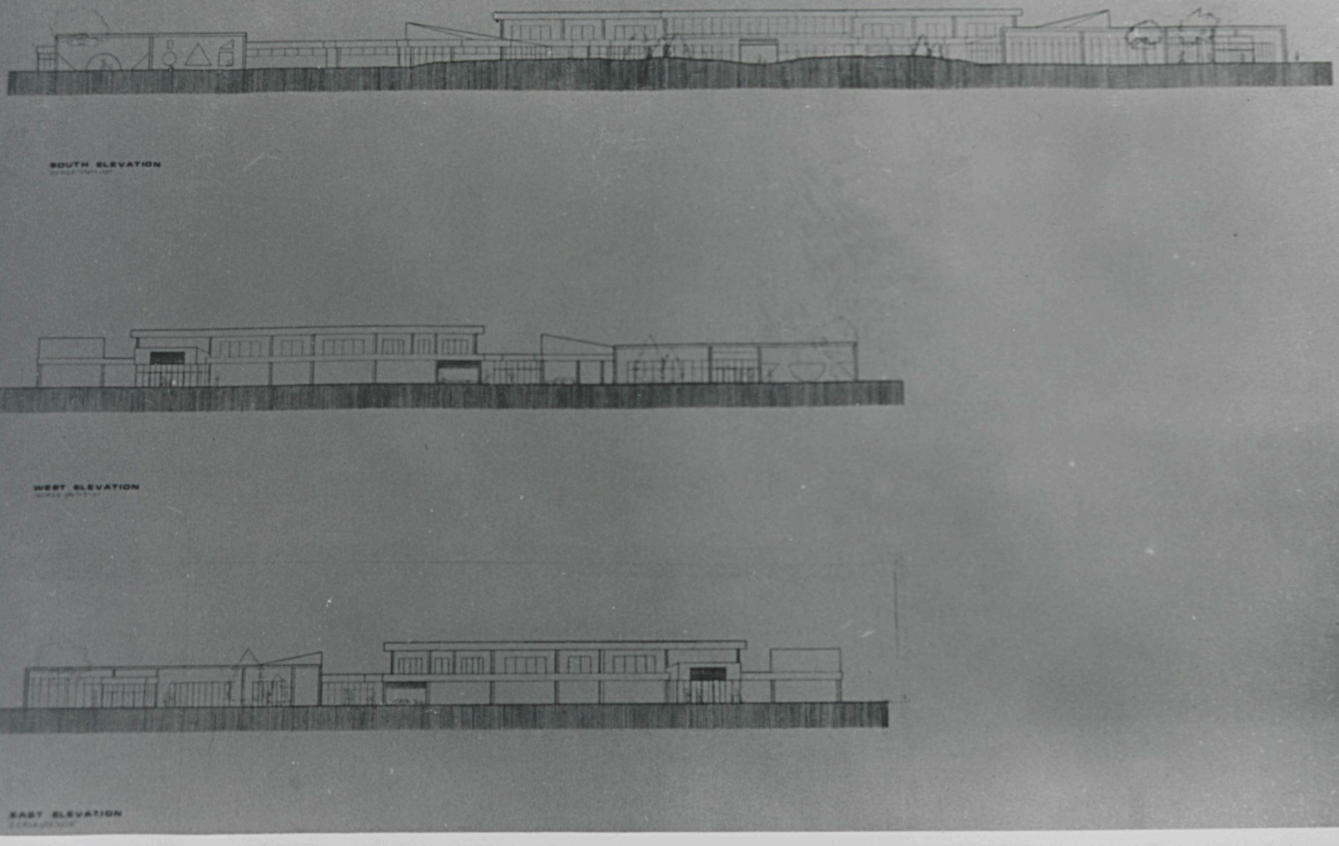


SOUTH ELEVATION



SECTION C-C

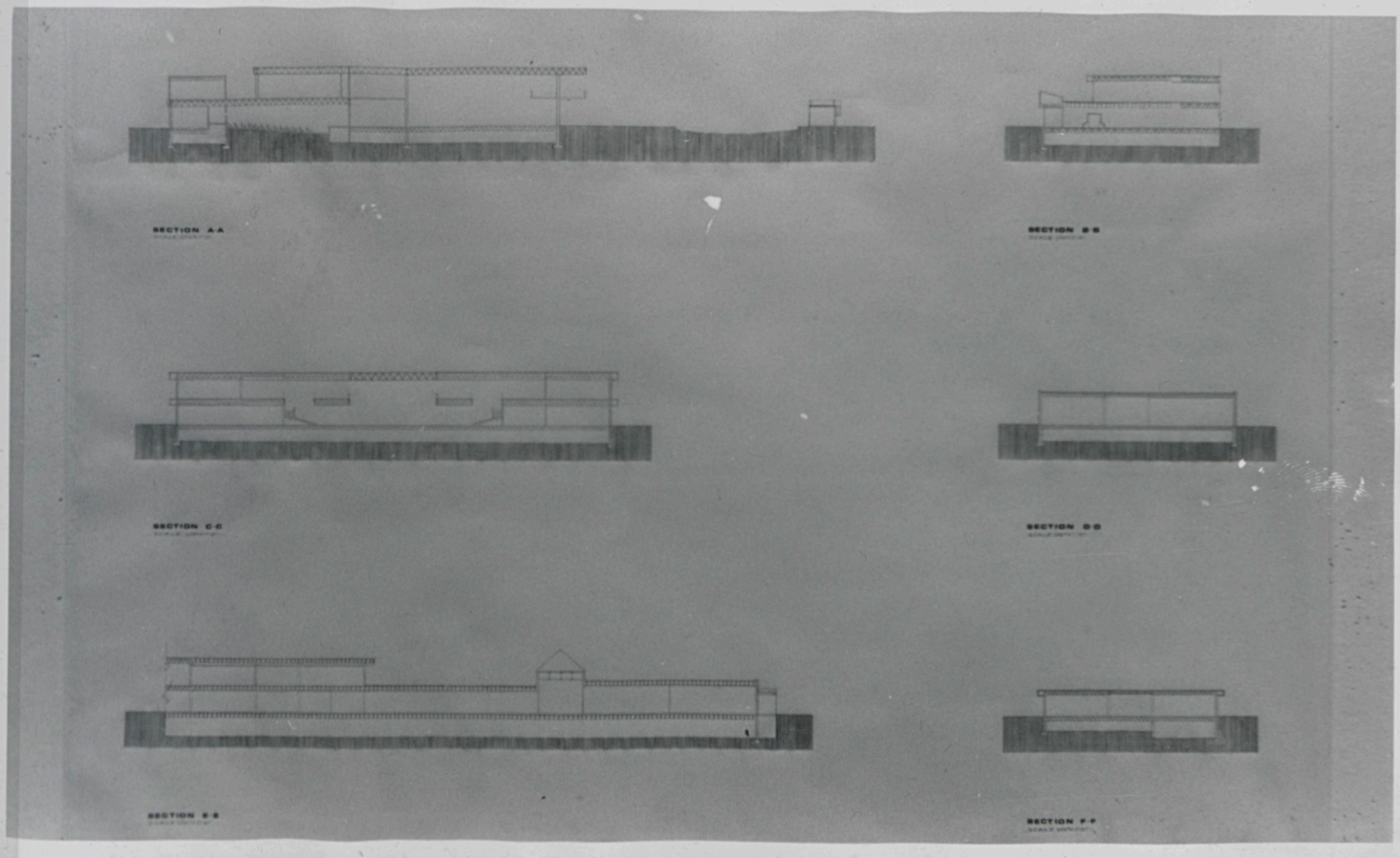
BUS STOP



SOUTH ELEVATION

WEST ELEVATION

EAST ELEVATION



SECTION A-A

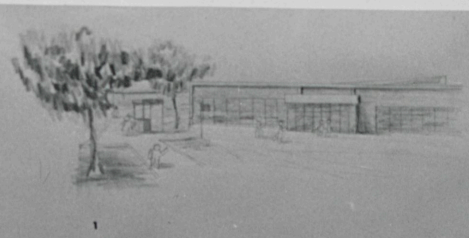
SECTION B-B

SECTION C-C

SECTION D-D

SECTION E-E

SECTION F-F



1



2



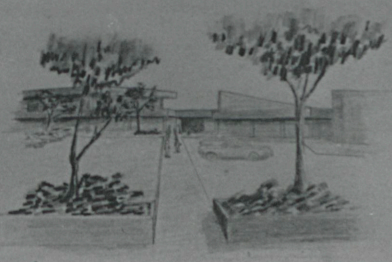
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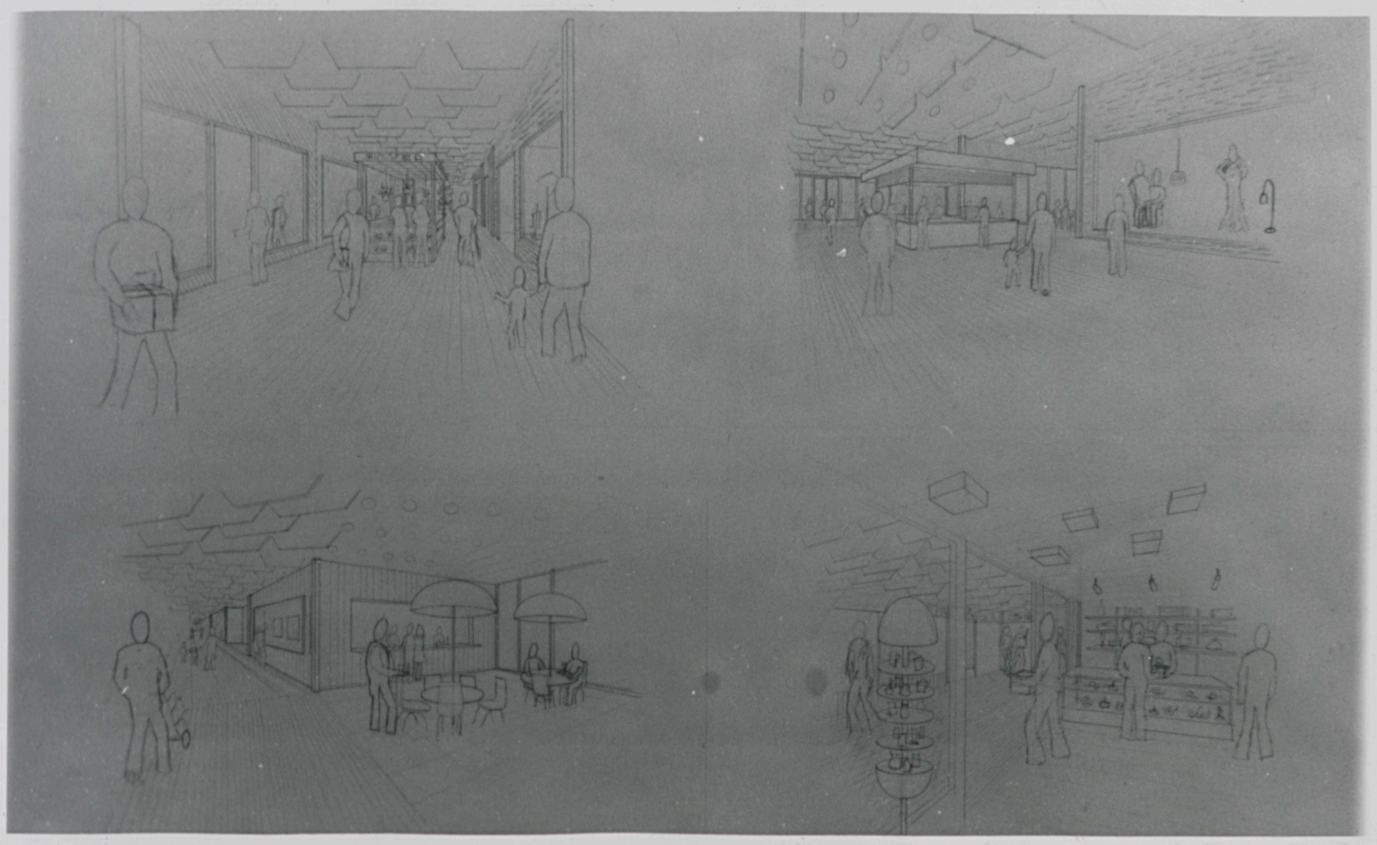
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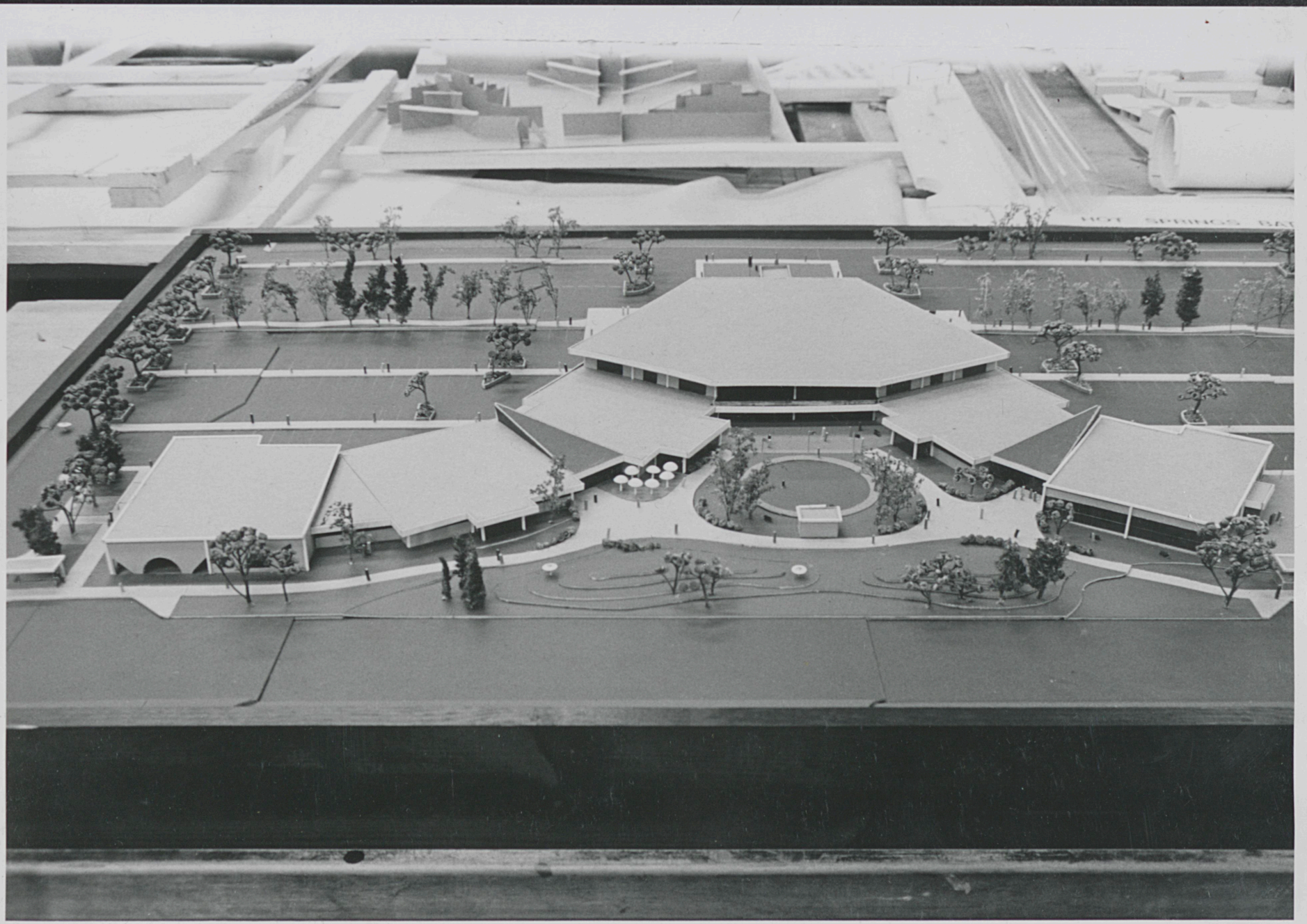


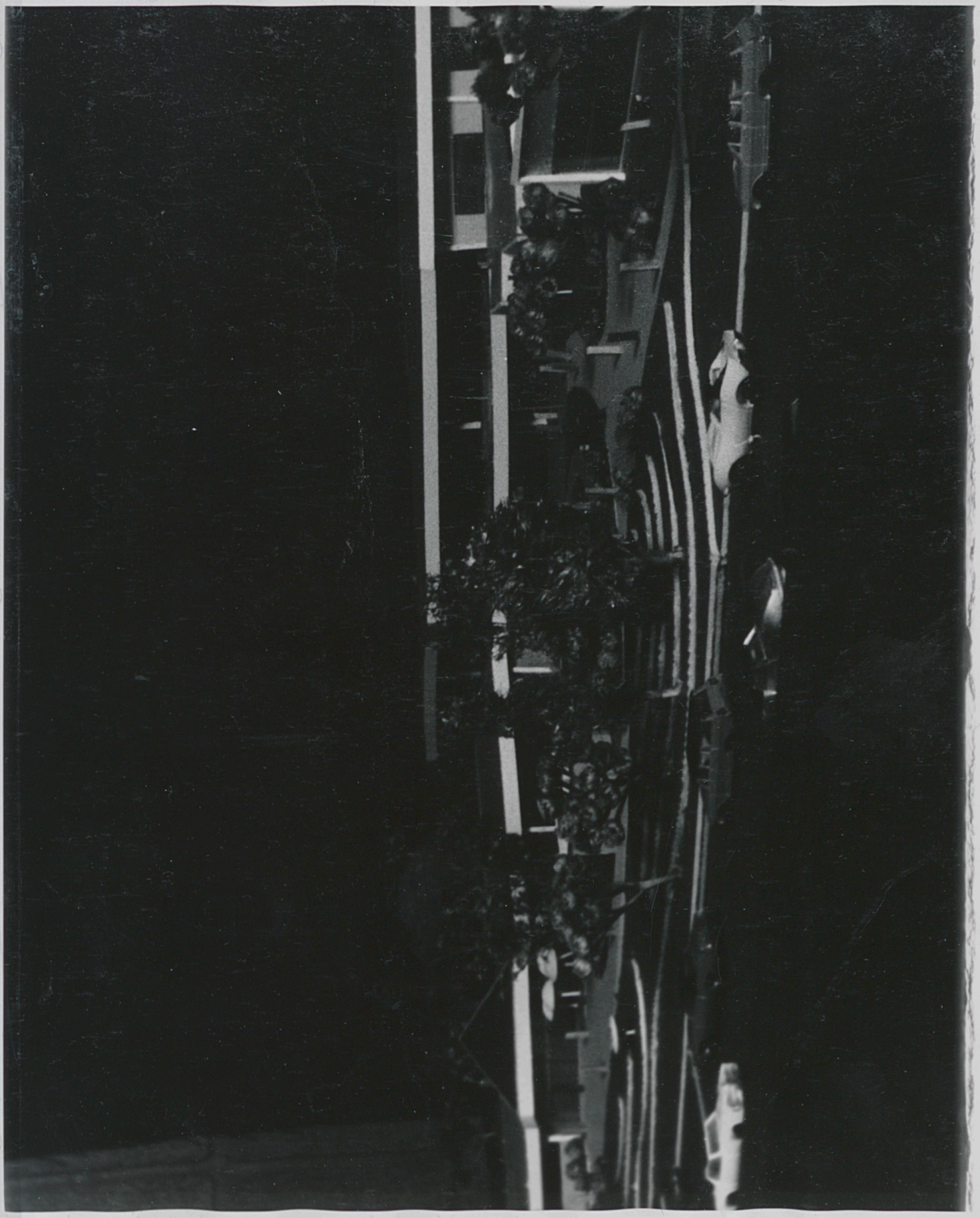
5



6







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